DRAFT

Chapter 9

Paso Robles Subbasin Groundwater Sustainability Plan

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Revisions have been proposed to the Draft GSP Chapter 9 that was originally presented to the Cooperative Committee at the April 24, 2019 Regular Meeting. The Draft GSP Chapter 9 revision is available for public review and comment and will be brought back to the Committee at the May 22, 2019 Special Meeting.

This Draft document is posted at the GSAs' websites and at pasogcp.com for duration of public comment period. Comments from the public are being collected using a comment form at www.pasogcp.com. If you require a paper form to submit by postal mail, please contact your local Groundwater Sustainability Agency (GSA).

- County of San Luis Obispo
- Shandon-San Juan Water District
- San Miguel CSD
- City of Paso Robles

Pending the Cooperative Committee's recommendation on May 22, 2019, the Draft GSP Chapter 9 will be distributed to the four Paso Robles Subbasin GSAs to receive and file.

May 15, 2019

Paso Robles Subbasin
Groundwater Sustainability Plan
Chapter 9 Projects and Management Actions

Prepared for the Paso Robles Subbasin Cooperative Committee and the Groundwater Sustainability Agencies

MONTGOMERY & ASSOCIATES

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9 MANAGEMENT ACTIONS AND PROJECTS

9.1 Introduction

This chapter describes the process for deciding what management actions to implement in the Subbasin to attain sustainability in accordance with §354.42 and §354.44 of the SGMA regulations. Management actions described herein are non-structural programs or policies that are intended to reduce or optimize local groundwater use. This chapter also describes the most feasible projects involving new or improved infrastructure to import or develop new water supplies for the Subbasin that may be implemented by willing individual entities to offset pumping and lessen the degree to which the management actions would be needed. Because the implementation of projects depends on willing participants and/or successful funding votes and is uncertain, this GSP focuses on the GSAs' implementation of management actions as the means to achieve sustainability. The need for management actions (and projects if implemented) is based on the following Subbasin conditions that were described in previous chapters.

- Groundwater levels are declining in many parts of the Subbasin, indicating that the amount of groundwater pumping is more than the natural recharge (Chapter 5)
- Water budgets (Chapter 6) indicate that amount of groundwater in storage will continue to decline in the future at an estimated rate of nearly 14,000 acre-feet per year (AFY), which assumes no increase in pumping. If undeveloped properties also develop in a way that requires the use of groundwater, the deficit would be greater.

To stop persistent declines in groundwater levels, achieve the sustainability goal by 2040, and avoid undesirable results through 2070 as required by SMGA regulations, groundwater pumping reductions will be needed. In most cases, a reduction in groundwater pumping will occur as a result of management actions, except where a new water supply is provided and used in lieu of pumping groundwater. Projects to bring in new water supplies included in this chapter are based on previous publicly-vetted feasibility studies[1].

The circumstances under which management actions will be implemented, as well as the criteria that will definitively trigger implementation, modification, or termination of these actions are described in this chapter. The groundwater management actions are intended to stabilize groundwater elevations, meet the estimated groundwater storage deficit described in Chapter 6, and address all other sustainability indicators. Management actions to directly reduce groundwater pumping will be implemented where necessary.

The triggers in this GSP are for any of the minimum thresholds described in Chapter 8. The most important of these in the Subbasin are related directly to stabilizing groundwater levels. If

[1] Paso Robles Groundwater Basin Supplemental Supply Options Feasibility Study, January 2017

groundwater levels are stabilized and/or sustained, none of the associated undesirable results described in Chapter 8 will occur.

The management actions (and projects if implemented) identified in this GSP will achieving groundwater sustainability by avoiding Subbasin-specific undesirable results by 2040.

De Minimis Groundwater Users

While the number of *de minimis* groundwater users in the basin is significant, they are not currently regulated under this GSP. Growth of *de minimis* groundwater extractors could warrant regulated use in this GSP in the future. Growth will be monitored and reevaluated periodically.

9.2 Implementation Approach and Criteria for Management Actions

Specific criteria will be used by the GSAs to determine the need for and type of management actions required to stabilize groundwater levels, reduce depletion of groundwater from storage, and avoid undesirable results. During GSP implementation, monitoring associated with applicable sustainability indicators will be conducted and the results will be reported to DWR and the public at least annually, as described in Chapter 7. Monitoring results will be evaluated and compared to measurable objective and minimum thresholds (Chapter 8) for each sustainability indicator to ensure that undesirable results are avoided and that progress is made toward achieving the sustainability goal. Each metric identified in Chapter 7 will be monitored to evaluate the need for implementation of management actions. If metrics are trending toward minimum thresholds, the GSAs would accelerate actions to implement high priority management actions to stabilize groundwater levels. Using authorities outlined in Sections 10725 to 10726.9 of the California Water Code, the GSAs would ensure the maximum degree of local control and flexibility consistent with this GSP to commence management actions.

Concurrent with monitoring Subbasin conditions, the GSAs will begin activities to:

- Develop an efficient, equitable, and practical decision-making process and system for implementing management actions.
- Address data gaps identified in the GSP.
- Expand and improve monitoring networks.
- Track the development of water supply projects.

In addition, the GSAs would commence outreach that would include informational materials, public meetings, and hearings in anticipation of management actions and/or projects. Key outreach goals would include:

- Create awareness, solicit input, and garner acceptance of management actions and projects.
- Present information on management actions and projects including the types of actions being considered, where in the Subbasin these actions are needed, the range of associated costs, and the funding mechanisms.
- Present groundwater level monitoring results and how they are being used to determine when and where management actions and projects might be needed.

Because the amount of groundwater pumping in the Subbasin is more than the estimated sustainable yield of about 61,000 AFY (Chapter 6) and groundwater storage is being depleted, the GSAs will begin to implement as early as possible after GSP adoption management actions under an approach as described in Section 9.3. The effect of the management actions will be reviewed annually, and additional management actions will be implemented as necessary to avoid undesirable results.

In general, management actions will be implemented before projects because projects take many years to implement. Management actions fall into two levels as described in more detail in the subsequent sections. In general, Level 1 management actions will be used in all Subbasin areas and reflect basic GSP operations, including funding necessary studies and early planning work, monitoring and filling data gaps with additional monitoring sites, annual reports and GSP updates and promoting voluntary reductions in groundwater pumping aimed at both keeping groundwater levels stable and avoiding undesirable results. Level 2 management actions will also be implemented in areas experiencing persistent declines. Because Level 2 management actions will require hearings and present legal risks that need to be addressed, efforts to define and gain approvals for the scope and detail associated with Level 2 management actions will begin soon after GSP adoption. There is a strong need for adequate information to justify Level 2 management actions and considering that information will be a critical part of initial GSP implementation. Level 2 management actions will be designed to enforce specific reductions in groundwater pumping. Individual entities may also choose to develop programs that would raise funds for alternative approaches such as purchasing and fallowing cropland and contributing to projects that bring in new water supplies to offset groundwater demand. Figure 9-1 shows a flowchart of the conceptual GSP implementation approach.

Public meetings and hearings will be held to determine when and where in the Subbasin management actions are needed. A proportional and equitable approach to funding implementation of the GSP and any optional actions will be developed in accordance with all

State laws and applicable public process requirements. During these meetings and hearings, input from the public, interested stakeholders, and groundwater pumpers will be considered and incorporated into the decision-making process.

At a time in the future when the effects of management actions have stabilized groundwater levels, the GSAs will reassess the need for continuing these actions. At a minimum, the reassessment process would be done as part of the 5-year review and report to the regulatory agencies. During this process, landowners may petition for a reassessment of fees enacted to support management actions and projects.

Any rules, regulations, ordinances or resolutions under consideration for adoption to implement the GSP for common conditions and users require substantially identical actions by each GSA Board to assure similar practices and conditions across the Basin receive similar treatment under this GSP.

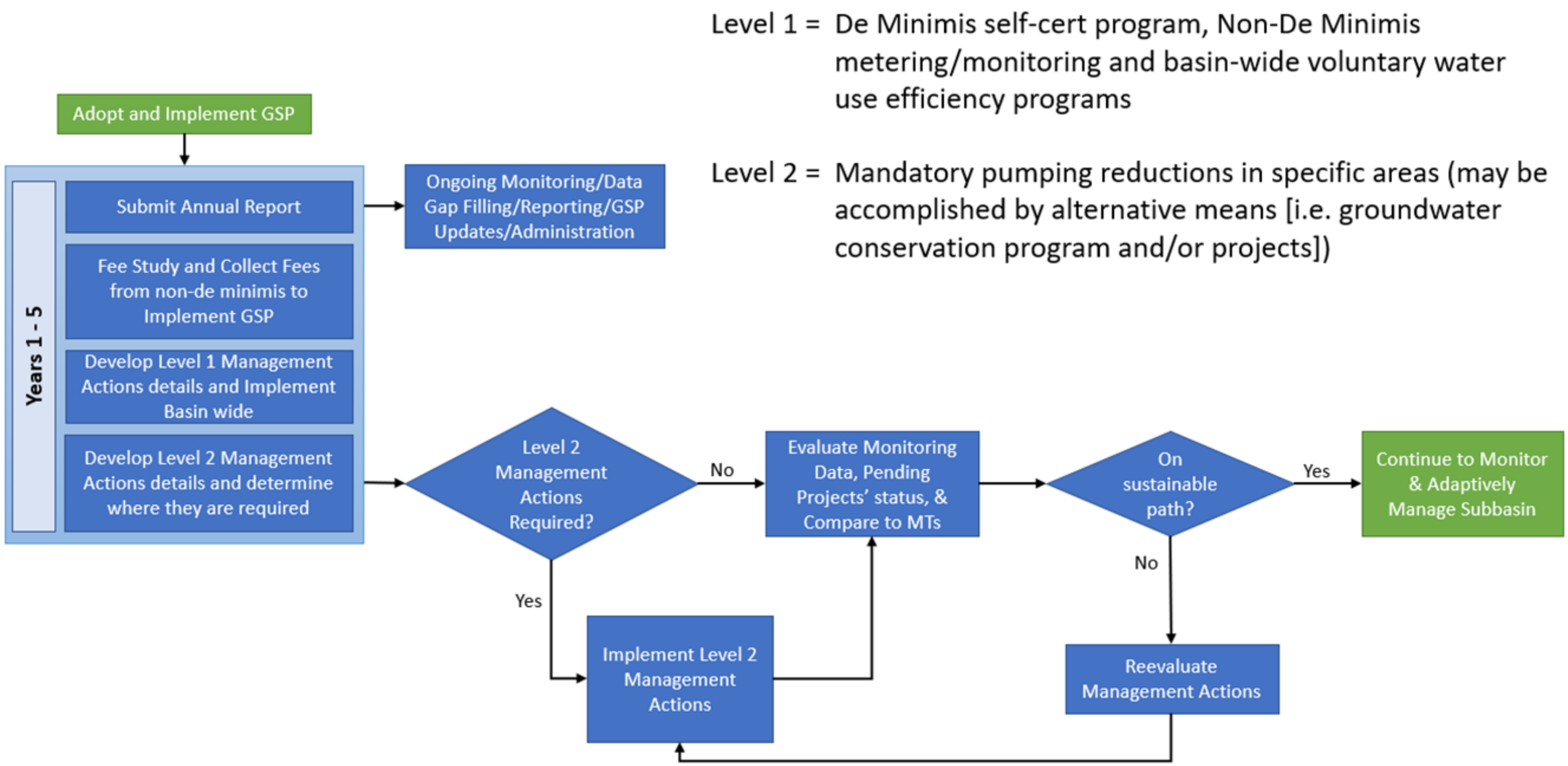

Figure 9-1: Conceptual Implementation Approach for Management Actions and Projects

9.3 Level 1 Management Actions

Several potential Level 1 management actions are included in this GSP; however, not all of them will necessarily be implemented by the GSAs. To the extent possible, they will be implemented in relatively short order by individual pumpers or individual entities on a voluntary basis in a data driven process. Level 1 management actions implemented under the GSP will be integrated into or be consistent with existing applicable programs and plans to the extent possible.

The following subsections outline the various Level 1 management actions. Level 1 management actions will be implemented using input from stakeholders and in a data-driven process.

Level 1 management actions may include:

- Encouraging BMPs to optimize and reduce groundwater use.
- Initiating a well interference mitigation program that includes:
  - Rotating groundwater pumping on agreed upon schedules to optimize and reduce groundwater use.
  - Well spacing requirements
- Promoting stormwater capture.
- Voluntary fallowing of irrigated crop land.

Soon after GSP adoption, Level 1 management actions will be developed and implemented, while concurrently data collection and planning for Level 2 management actions will begin. Individual entities will likely also begin planning projects. Public outreach would be conducted to educate and solicit input. The time required to implement these actions will vary depending on the level of effort required for development. More detail on the Level 1 management actions is provided in subsequent sections of this chapter.

9.3.1 Best Water Use Practices

BMPs are activities, practices, and application of responsible use that, if promoted effectively, funded adequately, and applied rigorously and broadly, could reduce groundwater pumping. To improve adoption of BMPs, the GSAs may develop programs to support implementation of BMPs. Effective BMPs could result in:

- Efficient irrigation practices by avoiding unbeneficial irrigation.
- A better accounting of annual precipitation and its contribution to soil moisture in all irrigation decisions and delay commencing irrigation until soil moisture levels require replenishment.

- Optimization of irrigation needs for frost control if sprinklers are used.
- More optimal irrigation practices by monitoring crop water use with soil and plant monitoring devices and tie monitoring data to ET estimates.
- Conversion from high water demand crops to lower water demand crops.

Many growers already use BMPs, but improvements can be made. A goal of promoting BMPs is to broaden their use to more growers in the Subbasin. *De minimis* groundwater users will be encouraged to use BMPs as well. Promoting BMPs will include broad outreach to groundwater pumpers in the Subbasin to emphasize the importance of adopting BMPs and understanding their positive benefits for mitigating declining groundwater levels and forestalling mandated reductions in groundwater extraction on their property.

9.3.1.1 Relevant Measurable Objectives

BMPs would benefit the groundwater elevation, groundwater storage, and land subsidence measurable objectives.

9.3.1.2 Expected Benefits and Evaluation of Benefits

The primary benefit from initiating BMPs is reduced Subbasin pumping. A connected secondary benefit is mitigating the decline, or raising, groundwater elevations. An ancillary benefit from stable or rising groundwater levels may include avoiding subsidence. Because it is unknown how much pumping will be reduced from promoting BMPs, it is difficult to quantify the expected benefits at this time.

Reductions in groundwater pumping will be measured directly through the flowmeter program and recorded in the Data Management System (DMS). Changes in groundwater elevation will be measured with the groundwater level monitoring program. Subsidence will be measured with the CGPS station network. Changes in groundwater storage will be estimated using the groundwater level proxy. Information about the monitoring programs is provided in Chapter 7. Isolating the effect of BMPs on groundwater levels will be challenging because they are only one of several management actions that may be implemented concurrently in the Subbasin.

9.3.1.3 Circumstances for Implementation

BMPs and related outreach will be promoted and implemented soon after adoption of the GSP. No other triggers are necessary or required.

9.3.1.4 Public Noticing

Public meetings will be held to inform the groundwater pumpers and other stakeholders that BMPs are being developed. Groundwater pumpers and interested stakeholders will have the opportunity at these meetings to provide input and comments on the BMPs. The BMPs will be promoted through a focused outreach campaign.

9.3.1.5 Permitting and Regulatory Process

No permitting or regulatory process is needed for establishing and promoting BMPs.

9.3.1.6 Implementation Schedule

Implementing BMPs will begin immediately after the GSP is adopted and when funds become available. The GSAs envision that BMPs will be promoted and established within two years of GSP adoption.

9.3.1.7 Legal Authority

No legal authority is needed to promote and establish BMPs.

9.3.1.8 Estimated Cost

The estimated cost for promoting and establishing BMPs during the first two years of GSP implementation is $100,000. Monitoring of BMPs will have an estimated annual cost of $25,000 to $50,000.

9.3.2 Well Interference Mitigation Program

The GSAs may implement a program to mitigate well interference in the Subbasin. This program could include encouraging or mandating the following elements:

- Rotation of pumping schedules in impacted areas
- Minimum well spacing requirements for new wells

The net effect of implementing a program to mitigate well interference would be a reduction in groundwater pumping.

9.3.2.1 Relevant Measurable Objectives

An interference mitigation program would benefit the groundwater elevation, groundwater storage, and land subsidence measurable objectives.

9.3.2.2 Expected Benefits and Evaluation of Benefits

The primary benefit from the well interference program will be less pumping in the Subbasin. A connected secondary benefit will be mitigating the decline, or raising, groundwater elevations from reduced pumping. An ancillary benefit from stable or rising groundwater elevations may include avoiding subsidence. Because the amount of pumping reduction from an interference mitigation program is unknown at this time, it is difficult to quantify the expected benefits.

Reductions in groundwater pumping will be measured directly through the flowmeter program and recorded in the DMS. Changes in groundwater elevation will be measured with the groundwater level monitoring program. Subsidence will be measured with the CGPS station network. Changes in groundwater storage will be estimated using the groundwater level proxy. Information about the monitoring programs is provided in Chapter 7. Isolating the effect of the interference mitigation program on groundwater levels will be challenging because it will be only one of several management actions that may be implemented concurrently in the Subbasin.

9.3.2.3 Circumstances for Implementation

The interference mitigation program will be initiated only after a public hearing has been held to finalize the details of the interference mitigation program.

9.3.2.4 Public Noticing

Public meetings will be held to inform the public that interference mitigation program is being developed. The interference mitigation program will be developed in an open and transparent process. The public and interested stakeholders will have the opportunity at these meetings to provide input and comments on the process and the program elements.

9.3.2.5 Permitting and Regulatory Process

The interference mitigation program may be subject to CEQA. Pumping rotation schedules and well spacing requirements may need to be implemented by amending or establishing new ordinances.

9.3.2.6 Implementation Schedule

The interference mitigation program is a Level 1 management action and would be established and implemented within two years of GSP adoption.

9.3.2.7 Legal Authority

California Water Code §10726.4 provides GSAs the authorities to establish well spacing requirements and establish pumping rotation schedules.

9.3.2.8 Estimated Cost

The cost to develop and implement the interference mitigation program is estimated to be up to $750,000 depending on the final components included. This estimated cost of the CEQA permitting process and the annual cost of data collection, data management, and program compliance are unknown at this time.

9.3.3 Promote Stormwater Capture

Stormwater and dry weather runoff capture projects, including Low Impact Development (LID) standards for new or retrofitted construction, could be promoted as priority projects to be implemented as described in the San Luis Obispo County Stormwater Resource Plan (SWRP). The SWRP outlines an implementation strategy to ensure valuable, high-priority projects with multiple benefits. While the benefits are not easily quantified, the State is very supportive of such efforts. Stormwater capture projects in several areas of the Basin, including reaches of the Huer Huero, San Juan and Estrella drainages are likely to be pursued.

This management action covers two types of stormwater capture activities. The first stormwater capture activity involves retaining and recharging onsite runoff. Examples of this type of activity include LID and on-farm recharge of local runoff. The second stormwater capture activity involves recharge of unallocated storm flows. These actions require temporary diversions of storm flows from streams, and transport of those flows to recharge locations.

9.3.3.1 Relevant Measurable Objectives

Stormwater capture may benefit the groundwater elevation, groundwater storage, and land subsidence measurable objectives.

9.3.3.2 Expected Benefits and Evaluation of Benefits

The primary benefit from the stormwater capture program is to mitigate the decline of, or possibly raise, groundwater elevations through addition recharge. An ancillary benefit from stable or rising groundwater elevations may include avoiding subsidence. Because the amount of recharge that could be accomplished from the program is unknown at this time, it is difficult to quantify the expected benefits.

Changes in groundwater elevation will be measured with the groundwater level monitoring program. Subsidence will be measured with the CGPS station network. Changes in groundwater storage will be estimated using the groundwater level proxy. Information about the monitoring programs is provided in Chapter 7. Isolating the effect of the stormwater capture program on groundwater levels will be challenging because it will be only one of several management actions that may be implemented concurrently in the Subbasin.

9.3.3.3 Circumstances for Implementation

Assuming applicable permitting requirements can be met, there are no other triggers required for the stormwater capture program.

9.3.3.4 Public Noticing

Public meetings will be held to inform the public that stormwater capture program is being developed. The stormwater capture program will be developed in an open and transparent process. The public and interested stakeholders will have the opportunity at these meetings to provide input and comments on the process and the program elements.

9.3.3.5 Permitting and Regulatory Process

Recharge of stormwater by retaining and recharging onsite runoff does not require permits. Recharge of unallocated storm flows is currently subject to the SWRCB's existing temporary permit for groundwater recharge program. The SWRCB is currently developing five-year permits for capturing high flow events. Recharge of unallocated storm flows will be subject to the terms of these five-year permits if and when they are enacted. Stormwater capture may also be subject to CEQA permitting.

9.3.3.6 Implementation Schedule

The stormwater capture program is a Level 1 management action and would be established and implemented within two years of GSP adoption.

9.3.3.7 Legal Authority

Other than acquiring required permits and the right to divert stormwater, there are no other legal authorities required to implement stormwater capture.

9.3.3.8 Estimated Cost

The cost to develop and implement the stormwater capture program is estimated to be $250,000. This estimated cost of the CEQA permitting and the annual costs of data collection, data management, and program compliance are unknown at this time.

9.3.4 Voluntary Fallowing of Agricultural Land

The GSAs may consider developing a program to promote voluntary fallowing of crop land to reduce overall groundwater demand. These are considerations for developing such a program:

- A process may be necessary to allow the landowner to justify and request the ability to retain previous irrigation rights that can be held for a timeframe approved by the GSAs.

- A process to request to reestablish groundwater use may be necessary, including notification, outreach and continued monitoring of local wells.

- Currently some property owners are irrigating crops solely for the purpose of protecting their right to use water and to maintain property values. If given the opportunity to create a "place holder" for those rights, some irrigators may choose to forego the expense of farming and extracting water. Other landowners may also find the program attractive.

- This program would likely need to be designed to protect the right to extract groundwater, but to leave in abeyance actual extraction. This is the value offered to the landowner, not payments.

- These properties may need to remain designated as irrigated so they would not be lost permanently from agricultural production.

9.3.4.1 Relevant Measurable Objectives

The voluntary fallowing program would benefit the groundwater elevation, groundwater storage, and land subsidence measurable objectives.

9.3.4.2 Expected Benefits and Evaluation of Benefits

The primary benefit of the voluntary fallowing program would be reduced Subbasin pumping. This benefit would be facilitated by a process where landowners who elected to voluntarily fallow their land and cease groundwater pumping could retain and reinstate their right to pump at some point in the future. A connected secondary benefit is mitigating the decline of, or raising, groundwater elevations from the reduced pumping. An ancillary benefit from stable or rising groundwater elevations may include avoiding subsidence. Because it is unknown how many landowners will willingly enter the land fallowing program, it is difficult to quantify the expected benefits at this time.

Reductions in groundwater pumping will be measured directly through the flowmeter program and recorded in the DMS. Changes in groundwater elevation will be measured with the groundwater level monitoring program. Subsidence will be measured with the CGPS station network. Changes in groundwater storage will be estimated using the groundwater level proxy. Information about the monitoring programs is provided in Chapter 7. Isolating the effect of the voluntary fallowing program on sustainability metrics will be challenging because it will be only one of several management actions that may be implemented concurrently in the Subbasin.

9.3.4.3 Circumstances for Implementation

The land fallowing program will be implemented only after a public hearing has been held to finalize program details.

9.3.4.4 Public Noticing

Public meetings will be held to inform groundwater pumpers and other stakeholders that a voluntary fallowing program is being developed. The voluntary fallowing program will be developed in an open and transparent process. The public and interested stakeholders will have the opportunity at these meetings to provide input and comments on the process and the program elements.

9.3.4.5 Permitting and Regulatory Process

The land fallowing program is subject to CEQA.

9.3.4.6 Implementation Schedule

Voluntary land fallowing is a Level 1 management action and may be established and implemented within one year of GSP adoption.

9.3.4.7 Legal Authority

California Water Code §10726.3(c) provides GSAs the authorities to provide for a program of voluntary land fallowing.

9.3.4.8 Estimated Cost

The cost to develop and implement the voluntary land fallowing program is estimated to be $200,000. This cost does not include the cost of the CEQA permitting, or any ongoing oversight to ensure that the fallowing program is maintained in accordance with agreements.

9.4 Level 2 Management Actions

Implementation of more aggressive Level 2 management actions may be necessary to address areas of persistent groundwater level decline. (Figure 9-1). Level 2 management actions may include:

- Mandatory pumping reductions in specific areas
- Developing funding structures to pay for and implement alternative programs and projects that achieve the same reductions:

- A groundwater conservation program designed to control groundwater pumping by regulating, limiting or suspending pumping from individual groundwater wells or from all groundwater wells in areas where minimum thresholds are threatened or exceeded.
- Retirement of agricultural Land and suspending the associated groundwater pumping.

9.4.1 Mandatory pumping reductions in specific areas

The amount of mandatory pumping reductions is uncertain, and will depend on the anticipated effectiveness of the Level 1 management actions as well as the extent of the specific areas identified for mandatory reduction. The water budget presented in Chapter 6 suggests that a pumping reduction of approximately 18% will be needed across the Subbasin to reduce pumping to the sustainable yield. Larger pumping reductions will likely be necessary in specific areas to arrest groundwater level declines. The actual pumping reduction mandated by the GSAs will be determined only after the anticipated effectiveness of Level 1 management actions are assessed through groundwater level trend and pumping data, and specific areas for pumping reduction are identified. To achieve this reduction where necessary, GSAs will develop a program that would likely include the following components:

1. Determination of baseline pumping in specific areas based on:
   a. Area specific declines and estimated yield in that area
   b. Historical Use
   c. Land uses and corresponding irrigation requirements
2. A methodology to determine who has to cut back and how much considering, though not limited to, water rights and evaluation of anticipated benefits from projects bringing in supplemental water
3. A timeline for reduction of pumping ("ramp down") in specific areas as required to achieve sustainability by 2040

Determination of baseline pumping in specific areas will need to be established and guidance developed by DWR in response to legislative directives for consistent implementation of the Water Conservation Act of 2009, as is used in Urban Water Management Plans, may be helpful. Baseline pumping would be ramped down to meet water use targets in specific areas until total pumping in the Subbasin is less than or equal to the estimated sustainable yield. Estimated sustainable yield will be updated periodically as new data are developed. The ramp down schedule would be developed during program development; the rate of ramp down would depend on when the program starts and projections of how long lower pumping rates are required in specific areas in order to achieve sustainability by 2040.The specific ramp down amounts and timing would be reassessed periodically by the GSAs as needed to achieve sustainability. These adjustments would occur when additional data and analyses are available to refine the sustainable yield estimate.

9.4.1.1 Relevant Measurable Objectives

Mandatory reductions in groundwater pumping in specific areas would benefit the groundwater elevation, groundwater storage, and land subsidence measurable objectives in those areas.

9.4.1.2 Expected Benefits and Evaluation of Benefits

The primary benefit from the mandatory pumping reduction is reduced pumping. A connected benefit of reduced pumping is mitigating the decline, or raising, groundwater elevations. An ancillary benefit from stable or increasing groundwater elevations may include avoiding subsidence. The program is designed to ramp down pumping to the sustainable yield; therefore, the quantifiable benefit is to maintain pumping within the sustainable yield.

Reductions in groundwater pumping will be measured directly through the flowmeter program and recorded in the DMS. Changes in groundwater elevation are an important metric for the mandatory pumping reduction program and will be measured with the groundwater level monitoring program. Subsidence will be measured with the CGPS station network. Changes in groundwater storage will be estimated using the groundwater level proxy. Information about the monitoring programs is provided in Chapter 7. Isolating the effect of the mandatory pumping reduction program on sustainability metrics will be challenging because it will be only one of several management actions that may be implemented concurrently in the Subbasin. However, as the pumping ramp down is initiated, the correlation between reduced pumping and higher groundwater levels may become more apparent.

9.4.1.3 Circumstances for Implementation

The mandatory pumping reduction program will be implemented after it is demonstrated through analysis that the anticipated Level 1 management actions would be insufficient to stabilize groundwater levels, avoid undesirable results, and reduce the amount of pumping to the sustainable yield. Evaluation of monitoring data would be conducted, and public hearings would be held to determine when and where in the Subbasin the mandatory pumping reduction program should be initiated, and to determine a proportional and equitable funding framework for the program.

9.4.1.4 Public Noticing

Public meetings will be held to inform groundwater pumpers and other stakeholders that the mandatory pumping reduction program is being developed. The mandatory pumping reduction program will be developed in an open and transparent process. Groundwater pumpers and other stakeholders will have the opportunity at these meetings to provide input and comments on the process and the program elements.

9.4.1.5 Permitting and Regulatory Process

The mandatory pumping reduction program is subject to CEQA. The mandatory pumping reduction program would be developed in accordance with all applicable groundwater laws and respect all groundwater rights.

9.4.1.6 Implementation Schedule

Developing and implementing the mandatory pumping reduction program would likely take approximately one year.

9.4.1.7 Legal Authority

California Water Code §10726.4 (a)(2) provides GSAs the authorities to control groundwater extractions by regulating, limiting, or suspending extractions from individual groundwater wells or extractions from groundwater wells in the aggregate.

9.4.1.8 Estimated Cost

The cost to develop and implement the mandatory pumping reduction program is estimated to be $350,000. This does not include the cost of the CEQA permitting or any ongoing program oversight.

9.4.2 Groundwater Conservation Program

A groundwater conservation program could be implemented to achieve the necessary reductions in groundwater pumping using elements similar to a water market. This program would include a tiered pumping fee structure. Funds raised under this program may be used by GSAs to implement a pumping allowance program, fallow or retire agricultural land, participate in the development of sustainability projects, and provide monitoring and oversight to ensure there are no unintended consequences from implementing the programs and projects. The GSAs will conduct substantial public outreach and hold meetings to educate and solicit input on the groundwater conservation program. This outreach program will be designed to ensure that the conservation program is equitable to all beneficial groundwater users and uses, and that it is consistent with groundwater laws and water rights.

The groundwater conservation program will provide groundwater pumpers flexibility in how they manage water and how Subbasin achieves groundwater sustainability. All non-exempt groundwater pumpers will be able to make individual decisions on how much groundwater they pump based on their perceived best interests. Some groundwater pumpers may choose to reduce pumping, others may choose to buy water from neighbors or retire land, while others may choose to pay for importing new water supplies.

Because substantial negotiation among Subbasin groundwater users and public input will be needed to develop an equitable fee structure and other elements of the groundwater conservation program, many program details will need to be developed during GSP implementation. Concepts that could be included in the groundwater conservation program include:

- A tiered pumping rate structure. This structure will be the fundamental mechanism to promote broad voluntary reductions in groundwater pumping and to fund land fallowing and water supply projects.
- A process to create initial pumping allowances that are quantified for every non-exempt groundwater pumper. These allowances are not water rights (§10720.5). Instead, they form the basis of the tiered pumping fee structure.
- Pumping allowances would be ramped down over time to be within the Subbasin sustainable yield before 2040.
- Pumping would be recorded or estimated annually for all pumpers that are subject to fees. Pumping amounts would be reported to the GSAs annually, stored in the DMS and reported to DWR.
- GSAs would use the base rate funds to acquire water rights or contracts; as well as plan, design, permit, and develop and implement one or more of the management actions or projects described in this chapter. GSAs would use the surcharge funds to buy irrigation rights, irrigated property or to pay annual costs of purchasing and treating water and delivering it into the Subbasin.
- Groundwater pumpers could acquire carryover pumping credits, obtain recharge credits, and transfer pumping allowances to other properties.
- Provisions for how non-irrigated land is accounted for.
- Provisions for how *de minimis* pumpers are accounted for.

Additional details on, and considerations regarding the components that might be included in a groundwater conservation program are provided in the following sections.

9.4.2.1 Tiered Pumping Fee Structure

To induce deeper reductions in groundwater pumping in the area(s) where Level 1 management actions are insufficient for achieving sustainability, a tiered pumping fee structure would be implemented. All non-exempt pumpers would be charged a groundwater replenishment fee. Groundwater pumped within a pumping allowance would be charged a base fee. Groundwater pumped above a pumping allowance is charged the base fee plus a surcharge. The thresholds that define each tier along with the fee charged for each tier would be determined in hearings, public outreach and be subject to final Board approval. The tiers and fees will be established to address areas where reduced pumping is needed and to provide a mechanism to fund projects that may be implemented in these areas.

Individual groundwater pumpers may choose to switch to less water-intensive crops, implement water use efficiencies, or transition to non-groundwater sources. Alternatively, if reducing pumping is not the best economic option, a groundwater pumper may instead pay an overproduction surcharge.

The fee structure and allowances may not be uniform across the Subbasin in the final groundwater conservation program. Portions of the Subbasin with localized groundwater decline may be subject to different fee structures and pumping ramp down schedules to promote additional conservation.

9.4.2.2 Site Specific Carryover

To provide groundwater pumpers the flexibility to pump more during dry years and less during wet years, a site specific carryover program might be developed. The amount a groundwater a pumper can carryover would likely be limited to an amount equal to their current pumping allowance. The GSAs may elect to impose an annual loss factor that reduces a groundwater pumpers carryover credits due to natural hydrogeologic losses from the Subbasin. The exact loss percentage would be agreed to in the final water charges framework. A robust monitoring system and extraction schedule would be needed to ensure there are no unintended consequences, such as well interference, associated with the program.

The carryover element of pumping allowances allows groundwater pumpers to pump more water only if they have previously accumulated pumping credits and offers significant flexibility to groundwater pumpers while keeping long-term pumping within the sustainable yield. This directly addresses the requirements of the SGMA regulations §354.44(b)(9) which requires that, "chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods".

Water recharged by an individual or entity will be recognized by award of recharge credit to the recharging individual or entity on a one acre-foot for one acre-foot basis, subject to losses that the GSAs may elect to impose. Recharge credit balances will be reduced or debited when the recharged water is recovered. The GSAs will develop a system of confirming and accounting for recharge credits and debits (addressed further below). An entity such as a GSA may opt to recharge groundwater for the benefit of all groundwater users. In that case, there will be no need to transfer recharge credits from the entity to the individual groundwater users and the groundwater pumping allowance of all users will be adjusted accordingly.

9.4.2.3 Re-location and Transfer of Pumping Allowances

A program to allow for moving pumping allowances between properties temporarily or permanently may be developed. Such re-location of pumping allowances is subject to review by GSAs and applicants will be required to report groundwater levels and extractions annually to minimize impact to nearby groundwater pumpers and ensure that sustainability goals are being met. GSAs will document the re-location using well and hydrogeologic data. The GSP model may be used to assess any significant and unreasonable impacts from the proposed relocation. Re-locating pumping allowances provides pumpers with flexibility and maintains consistency with San Luis Obispo County's current Agriculture Offset Program. Groundwater pumping allowances could also be permanently or temporarily transferred between different owners and could be used for another pumping purpose. Protections for neighboring wells will be built into the program. An appropriate application, permitting, reporting and funding process would be evaluated for this program.

9.4.2.4 Non-Irrigated Land

Land that is not under irrigation when the GSP is adopted may not be provided an initial pumping allowance if a Groundwater Conservation Program is established because the GSP assumes, but does not require, that there will be no increase in demand on the Subbasin. The GSP recognizes that owners of such land may wish to begin pumping in the future consistent with their overlying rights. Such pumping is not limited by this GSP. To enable the Subbasin to attain sustainability in accordance with §354.42 and §354.44 of the SGMA regulations, non-exempt groundwater pumpers who did not receive an initial pumping allowance may:

1. Acquire pumping allowance from willing sellers subject to GSA approval,
2. Buy into a project that delivers surface water to the same area of the Subbasin, and/or
3. Pay the surcharges associated with pumping above their pumping allowance.

9.4.2.5 Relevant Measurable Objectives

The groundwater management program would benefit the groundwater elevation, groundwater storage, and land subsidence measurable objectives.

9.4.2.6 Expected Benefits and Evaluation of Benefits

The primary benefit from implementing groundwater conservation program is reduced Subbasin pumping. A connected benefit of reduced pumping is mitigating the decline, or raising, groundwater elevations. An ancillary benefit from stable or increasing groundwater elevations may include avoiding subsidence. The program is designed to ramp down pumping to the sustainable yield; therefore, the quantifiable benefit is to maintain pumping within the sustainable yield.

Reductions in groundwater pumping will be measured directly through the flowmeter program and recorded in the DMS. Changes in groundwater elevation are an important metric for the groundwater conservation program and will be measured with the groundwater level monitoring program. Subsidence will be measured with the CGPS station network. Changes in groundwater storage will be estimated using the groundwater level proxy. Information about the monitoring programs is provided in Chapter 7. Isolating the effect of the groundwater conservation program on sustainability metrics will be challenging because it will be only one of several management actions that may be implemented concurrently in the Subbasin. However, as the pumping ramp down is initiated, the correlation between reduced pumping and higher groundwater levels may become more apparent.

9.4.2.7 Circumstances for Implementation

The groundwater conservation program will be implemented only after it is demonstrated through monitoring data that the Level 1 management actions were insufficient to stabilize groundwater levels, avoid undesirable results, and reduce the amount of pumping to the sustainable yield. Evaluation of monitoring data would be conducted, and public hearings would be held to determine when and where in the Subbasin the groundwater conservation program should be initiated, and to determine a proportional and equitable funding framework for the program.

9.4.2.8 Public Noticing

Public meetings will be held to inform groundwater pumpers and other stakeholders that the groundwater conservation program is being developed. The groundwater conservation program will be developed in an open and transparent process. Groundwater pumpers and other stakeholders will have the opportunity at these meetings to provide input and comments on the process and the program elements.

9.4.2.9 Permitting and Regulatory Process

The groundwater conservation program is subject to CEQA. The groundwater conservation program would be developed in accordance with all applicable groundwater laws and respect all groundwater rights. Depending on the funding approach agreed to for developing this management action, the fee structure implemented as part of the groundwater conservation program would likely be subject to the requirements of proposition 218 or proposition 26.

9.4.2.10 Implementation Schedule

Developing and implementing the groundwater conservation program would likely take approximately two years, which includes time for a proposition 218 or proposition 26 vote.

9.4.2.11 Legal Authority

California Water Code §10730 provides GSAs the authorities to impose fees, including fees on groundwater pumping.

9.4.2.12 Estimated Cost

The cost to develop and implement the groundwater conservation program is estimated to be $750,000. This does not include the cost of the CEQA permitting or any ongoing program oversight.

9.4.3 Agricultural Land and Pumping Allowance Retirement

Revenues from the groundwater conservation program may be used by GSAs to acquire and retire irrigated land and/or the pumping allowance (and potentially carryover credits and recharge credits) from a property to reduce pumping. If GSAs implement the program, the following are likely components and considerations:

- All acquisitions will be completed on a voluntary basis from willing sellers at negotiated market prices. GSAs would cease irrigation on acquired land to reduce pumping.
- All transactions will be recorded with deed restrictions at the SLO County office of the Clerk Recorder. GSAs could coordinate with other local agencies and stakeholders to determine beneficial uses of the acquired land.
- Acquired pumping allowances would be held in the relevant GSA's pumping allowance account and would be used only as needed to support re-purposing of acquired irrigated land (e.g. establishment of native vegetation). GSAs could consider selling purchased land with only *de minimis* use attached to recapture funds for further reinvestment in water conservation or to reduce groundwater pumping.
- GSAs may use flowmeter readings, electric bills and/or aerial photographs to assess and actual value of the water use that is being retired.

- Reports would be prepared to document the process and value of acquired property; these reports would be made public. The long-term economic loss due to permanent retirement of irrigated agricultural land and proportional loss of tax revenue will be considered. The local taxing agencies will be notified and comments solicited before land is retired.

GSAs may consider allowing landowners to sell pumping allowances to a GSA separate from land in order to convert their land to rural residential use. Hearings will be required to weigh impacts to infrastructure, permanent loss of farmland and the availability and wisdom of expending retired water. The number of *de minimis* wells authorized on converted land will be based on the amount of pumping allowance sold to the GSA. The final ratio of sold pumping allowance to number of *de minimis* wells allowed will be negotiated in the future. For illustrative purposes, one *de minimis* well could be authorized for every 40 to 60 acre-feet of pumping allowance sold to the GSA.

GSAs, property owners and the County could choose to study and later advocate for a County ordinance that might allow a process for conversion of irrigated agricultural land to rural residential development, which could result in substantial reductions in groundwater use. Before this conversion could occur and to ensure any such plan was broadly equitable, substantial analyses would be required to evaluate the consequences, benefits and costs of improving infrastructure and public services to serve the new residential growth.

9.4.3.1 Relevant Measurable Objectives

The groundwater management program would benefit the groundwater elevation, groundwater storage, and land subsidence measurable objectives. Benefits to groundwater elevations and land subsidence would depend on where land retirement occurred.

9.4.3.2 Expected Benefits and Evaluation of Benefits

The primary benefit from land retirement is reduced Subbasin pumping. A connected secondary benefit is mitigating the decline, or raising, groundwater elevations. Depending on the location of the land retirement, ancillary benefits of stable or rising groundwater elevations may include avoiding subsidence. Because it is unknown how many landowners will willingly enter the land retirement program, it is difficult to quantify the expected benefits at this time.

Reductions in groundwater pumping will be measured directly and recorded in the DMS. Changes in groundwater elevation will be measured with the groundwater level monitoring program. Subsidence will be measured with the CGPS station network. Changes in groundwater storage will be estimated using the groundwater level proxy. Information about the monitoring programs is provided in Chapter 7. Isolating the effect of the land retirement program on sustainability metrics will be challenging because it will be only one of several management actions that may be implemented concurrently in the Subbasin.

9.4.3.3 Circumstances for Implementation

The agricultural land retirement program relies on funds from the groundwater conservation program. Therefore, this program is implemented concurrently with the groundwater conservation program. Agricultural land retirement relies on willing sellers.

9.4.3.4 Public Noticing

Public meetings will be held to inform groundwater pumpers and other stakeholders that the agricultural land retirement program is being developed. The agricultural land retirement program will be developed in an open and transparent process. Groundwater pumpers and other stakeholders will have the opportunity at these meetings to provide input and comments on the process and the program.

Any agricultural land retirement achieved through a land sale will be recorded by deed restriction with the County of San Luis Obispo Office of the Tax Assessor. All agricultural land retirement, whether through sale of land or specific restrictions on groundwater extraction, will be recorded by deed restriction on the property title of the affected parcels at the County Assessor's Office and also in the publicly accessible portion of the DMS.

9.4.3.5 Permitting and Regulatory Process

The agricultural land retirement program is subject to CEQA. No other permitting or regulatory processes are necessary for buying land or pumping allowances, beyond those required by the County, GSA Policy, or this GSP.

9.4.3.6 Implementation Schedule

The agricultural land retirement program would begin concurrently with the groundwater conservation program. The agricultural land retirement program would take approximately one year to develop and implement. Although the land retirement program would be ongoing, it would rely on willing sellers and would likely be implemented intermittently.

9.4.3.7 Legal Authority

California Water Code §10726.2 provides GSAs the authority to purchase, among other things, land, water rights, and privileges.

9.4.3.8 Estimated Cost

The cost to develop and implement the agricultural land retirement program is estimated to be $250,000. This does not include the cost of the CEQA permitting or any ongoing oversight of the program.

Market values for agricultural land in the Paso Basin under strict application of SGMA Regulations in the future are unknown. Those willing to offer their property or their pumping rights will seek the best price the current market will bear. Current values are reported to range from $20,000 per acre to above $40,000 per acre (American Society of Farm Managers and Rural Appraisers, 2018).

Annual applied water factors used for the Ordinance range from 1.25 acre-feet per acre to 4.8 acre-feet per acre, depending upon crop type. Retiring one acre of eligible land would reduce pumping by 1.25 acre-feet to 4.8 acre-feet. Assuming the GSAs can acquire and retire land for $20,000 per acre to $40,000 per acre, the cost per acre-foot of pumping reduction will range from approximately $4,200 per acre-foot to $32,000 per acre-foot. If amortized over 30 years at a 4% interest rate, these one-time capital expenditures are equivalent to annualized costs of approximately $240 per acre-foot to $1,850 per acre-foot. In a scenario where groundwater extraction fees are high and are recognized as permanent, land values may change.

9.5 Projects

Projects involve new or improved infrastructure to import or develop new water supplies for the Subbasin. Several potential projects are described in this GSP that may be implemented by willing entities to offset pumping and lessen the degree to which the management actions would be needed. The implementation of projects depends on willing participants and/or successful funding votes. The Groundwater Conservation Program, if implemented, may provide funding for GSAs to participate in project development efforts.

The projects presented in this GSP rely on six potential sources of water for groundwater recharge or in-lieu use:

1. Tertiary treated wastewater supplied and sold by City of Paso Robles and the San Miguel CSD to private groundwater extractors to us in lieu of groundwater. This water is commonly referred to as recycled water (RW).
2. State Water Project (SWP) water
3. Nacimiento Water Project (NWP) water
4. Salinas Dam/Santa Margarita Reservoir water
5. Local recycled water

6. Flood flows from local rivers and streams

These six water sources are described in more detail in Appendix H. Of these six sources, only RW, SWP, NWP, and Salinas Dam currently have sufficiently reliable volumes of unused water to justify the expense of new infrastructure to be used on a regular basis for supplementing water supplies in the Subbasin. Capturing flood flows from local rivers and streams in permitted projects will be pursued, but because they provide an unknown volume of new supplies on an intermittent basis, the cost of the requisite infrastructure may make this source a lower priority. Therefore, the initial focus of new supply is on developing RW, SWP, NWP, and Salinas Dam projects in the Subbasin.

9.5.1 Overview of Project Types

There are two major types of projects that can be developed to supplement the Subbasin's groundwater supplies:

1. In-lieu use through direct delivery for irrigation or municipal use
2. Direct recharge through recharge basins

Each of these projects types is described below, including a generalized discussion of efficiency for each type of project. In this context, project efficiency is the ratio of the amount of water imported by the project to the benefit the project has to the deep aquifers that provide most of the agricultural and municipal water in the Subbasin.

9.5.1.1 In-Lieu Recharge through Direct Delivery

Direct delivery projects use available water supplies for irrigation in lieu of groundwater. This option offsets the use of groundwater, allowing the groundwater basin to recharge naturally. Direct delivery projects rely on the construction of a pipeline to deliver the water to agricultural users, as well as a pump station and storage facility to handle supply and demand variations. Direct delivery is a highly efficient method to reduce groundwater pumping because it directly offsets and decreases the amount of water pumped from the aquifer, allowing the aquifer levels to rebound through natural recharge. One of the drawbacks of direct delivery is that the delivered water must be available during the dry season, a time period when water supplies are less likely to be available, especially during a dry year.

9.5.1.2 Direct Recharge through Recharge Basins

Recharge basins are large artificial ponds that are filled with water which seeps from the basin into the groundwater system. The recharge efficiency of a recharge basin is contingent on the properties of the underlying soil as well as losses to evaporation. Water placed in recharge basins has the potential to seep into streambed alluvium and flow out of the basin before it can recharge the deeper aquifers. Recharge efficiencies can range greatly and it is not always evident how much benefit the recharge has on the groundwater levels in the aquifer below. Recharge through recharge basins can occur all year round; although efficiency might be lower during the rainy seasons if underlying soils are already saturated. Recharge basins have the advantage of generally being less expensive to build and operate than in-lieu distribution systems.

The current assumption is that any project using direct recharge through recharge basins will be initiated and owned by the County of San Luis Obispo GSA. This assumption results prevents private ownership of recharged groundwater from these projects, allowing all recharged groundwater to be available to all groundwater pumpers.

9.5.2 General Project Provisions

Many of the priority and substitute projects listed below are subject to similar requirements. These general provisions that are applicable to all projects include certain permitting and regulatory requirements, the methodology for public notice, and the legal authority to initiate and complete the projects. This section assumes the GSAs implement the Groundwater Conservation Program to generate revenue for participating in the development of projects for illustrative purposes.

9.5.2.1 Summary of Permitting and Regulatory Processes

Projects of this magnitude will require an environmental review process via CEQA. Projects will require either an Environmental Impact Report, and Negative Declaration, or a Mitigated Negative Declaration.

There will be a number of local, county and state permits, right of ways, and easements required depending on pipeline alignments, stream crossings, and project type.

Recharge basin projects must adhere to the Salt/Nutrient Management Plan for the Paso Robles Groundwater Basin (RMC 2015). Projects with wells will require a well construction permit.

9.5.2.2 Public Noticing

Before any project initiates construction as part of GSP implementation, it will go through a public notice process to ensure that all groundwater uses and users have ample opportunity to comment on projects before they are built. The general steps in the public notice process will include the following:

- GSA staff will bring an assessment of the need for the project to the Cooperative Committee in a publicly noticed meeting. This assessment will include:
    - A description of the undesirable result that may occur if action is not taken,

    - A description of the proposed project
    - An estimated cost and schedule for the proposed project
    - Any alternatives to the proposed project
- The Cooperative Committee will notice stakeholders in the area of the proposed project and allow at least 30 days for public response
- After the 30-day public response period, the Cooperative Committee will not whether or not to approve construction of the project.
- As water levels respond and stabilize above minimum thresholds, the Cooperative Committee may initiate a process to reassess and reevaluate the project and make adjustments as necessary. This reassessment process will comprise a similar set of initial meetings and activities as the initial project approval including being briefed by staff at a public Cooperative Committee meeting, issuing public notice, receiving public response, and holding a subsequent vote by the Cooperative Committee

In addition to the public noticing detailed above, all projects will follow the public noticing requirements per CEQA.

9.5.2.3 Legal Authority Required for Projects and Basis for That Authority within The Agency

California Water Code §10726.2 provides GSAs the authority to purchase, among other things, land, water rights, and privileges. Additionally, an assessment of the legal rights to acquire and use various water sources is included in Appendix H.

9.5.3 Conceptual Projects

Six projects are included in this GSP as conceptual projects and have been identified after extensive public meetings and studies over the last decade. These projects will not necessarily be implemented, but they represent eight reasonable projects that could help achieve sustainability throughout the Subbasin. Conceptual projects were developed throughout different regions in the basin to address future localized declines in groundwater elevations. Projects were sized based on the locations of available supplies and pumping demands in different areas of the Paso Robles Basin. Actual projects will be highly dependent on the ability of the GSAs and/or individual entities to negotiate with water suppliers and purchase the surface waters described in Appendix H and with landowners.

Table 9-1. Conceptual Projects

Project Name	Water Supply	Project Type	Approximate Location	Average Volume (AFY)
City Recycled Water Delivery	RW	Direct Delivery	Near City of Paso Robles	2,200
San Miguel Recycled Water Delivery	RW	Direct Delivery	Near San Miguel	200 [a]
NWP Delivery at Salinas and Estrella River Confluence	NWP	Direct Delivery	Near the confluence of the Salinas and Estrella Rivers	2,800
NWP Delivery North of City of Paso Robles	NWP	Direct Delivery	North of Huer Huero Creek, due west of the airport	1,000
NWP Delivery East of City of Paso Robles	NWP	Direct Delivery	East of the City of Paso Robles	2,000
Expansion of Salinas Dam	Salinas River	River Recharge	Along the Salinas River	1,000

Notes: (a) Average volume amounts may be updated in final GSA based on more recent information
(b) Approximate locations are assumed to establish the benefit calculations required by SGMA

Short descriptions of each priority project are included below, along with a map showing general project locations. Generalized costs are also included for planning purposes. Components of these projects including facility locations, pipeline routes, recharge mechanisms, and other details may change in future analyses. Therefore, each of the projects listed below should be treated as a generalized project that represents a number of potential detailed projects.

9.5.3.1 Assumptions Used in Developing Projects

Assumptions that were used to develop projects and cost estimates are provided in Appendix I. Assumptions and issues for each project need to be carefully reviewed and revised during the pre-design phase of each project. Project designs, and therefore costs, could change considerably as more information is gathered.

The cost estimates included below are class 5, order of magnitude estimates. These estimates were made with little to no detailed engineering data. The expected accuracy range for such an estimate is within +50 percent or –30 percent. The cost estimates are based on our perception of current conditions at the project location. They reflect our professional opinion of costs at this time and are subject to change as project designs mature.

Capital costs include major infrastructure including pipelines, pump stations, customer connections, turnouts, recharge basins, and storage tanks. Capital costs also include 30% contingency for plumbing appurtenances, 15% increase for general conditions, 15% for contractor overhead and profit, and 8% for sales tax. Engineering, legal, administrative, and project contingencies was assumed as 30% of the total construction cost and included within the capital cost. Land acquisition at $30,000/acre was also included within capital costs.

Annual operations and maintenance (O&M) fees include the costs to operate and maintain new project infrastructure. O&M costs also include any pumping costs associated with new infrastructure. O&M costs do not include O&M or pumping costs associated with existing infrastructure, such as existing SWP NWP O&M costs because these are assumed to be part of water purchase costs. Water purchase costs were assumed to include repayment of loans for existing infrastructure; however, these purchase costs will need to be negotiated. The terms of such a negotiation could vary widely.

Capital costs were annualized over thirty years and added with annual O&M costs and water purchase costs to determine an annualized dollar per acre-foot ($/AF) cost for each project. This $/AF value might not always represent the $/AF of basin benefit ($/AF-benefit). For instance, if the Department of Water Resources (DWR) delivered less than 60% of SWP allocation, the $/AF-benefit would increase. Similarly, if water that is delivered to a recharge basin recharges into the deep aquifer at a higher efficiency than assumed, the $/AF-benefit would increase.

9.5.3.2 Preferred Project 1: City Recycled Water Delivery

This project will use up to 2,200 AFY of disinfected tertiary effluent for in-lieu recharge in the central portion of the basin near and inside the City of Paso Robles. Water that is not used for recycled water purposes will be discharged to Huer Huero Creek with the potential for additional recharge benefits. The general layout of this project and relevant monitoring wells are shown on Figure 9-2. Infrastructure includes upgraded wastewater treatment plant and pump station, 5.8 miles of pipeline, a storage tank, numerous turnouts, and a discharge to Huer Huero Creek. Additional length of pipeline will also be constructed as part of this project – a private pipeline to the north of the main line which will deliver recycled water to a larger geographical area. The private pipeline is not shown on Figure 9-2 and is not included in the cost estimate. The cost to upgrade the wastewater treatment plant is also not included in the cost estimate, since the upgrades were required per the NPDES permit regardless of use for recycled water. Since this project is already in the predesign phase, the predesign project cost estimate is provided for this GSP.

9.5.3.2.1 RELEVANT MEASURABLE OBJECTIVES

The measurable objectives benefiting from this groundwater project include:

- Groundwater elevation measurable objectives in the central portion of the Subbasin
- The groundwater storage measurable objective

- Land subsidence measurable objectives in the central portion of the Subbasin

9.5.3.2.2 *Expected Benefits and Evaluation of Benefits*

The primary benefit from the Paso Robles RW project is higher groundwater elevations in the Central portion of the Subbasin due to in-lieu recharge from the direct use of the RW and recharge through Huer Huero Creek. Ancillary benefits of shallower groundwater elevations may include an increase in groundwater storage, improved groundwater quality from recharge of high-quality water, and avoiding subsidence. The GSP model was used to quantify the expected benefit from this project. Figure 9-3 shows the expected groundwater level benefit predicted by the GSP model after 10 years of project operation. Figure 9-3 expresses the benefit as feet of groundwater. The groundwater level benefit shown on Figure 9-3 is a measure of how much higher groundwater elevations are expected to be with the project rather than without the project.

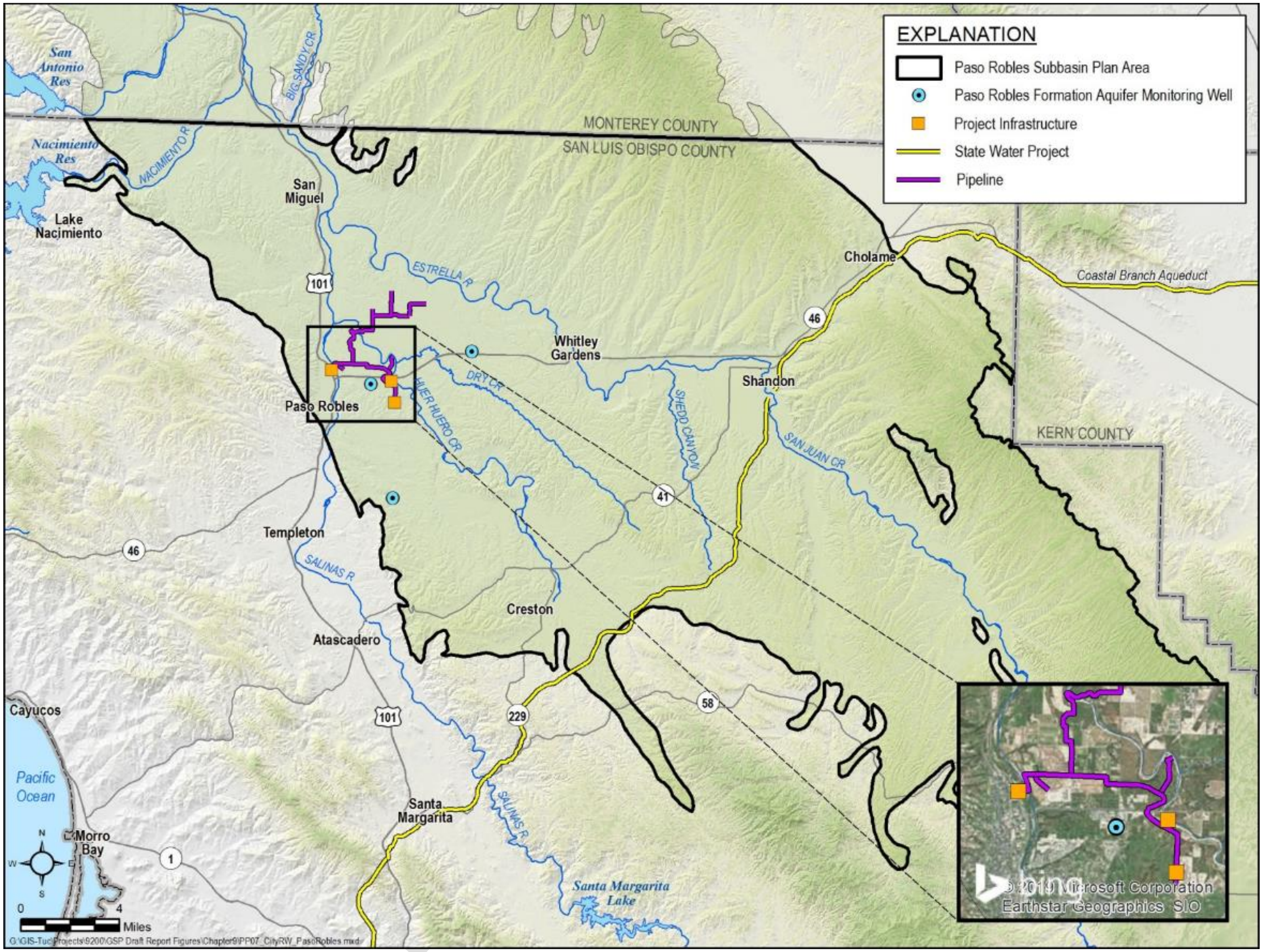

Figure 9-2. Paso Robles RW Project Layout

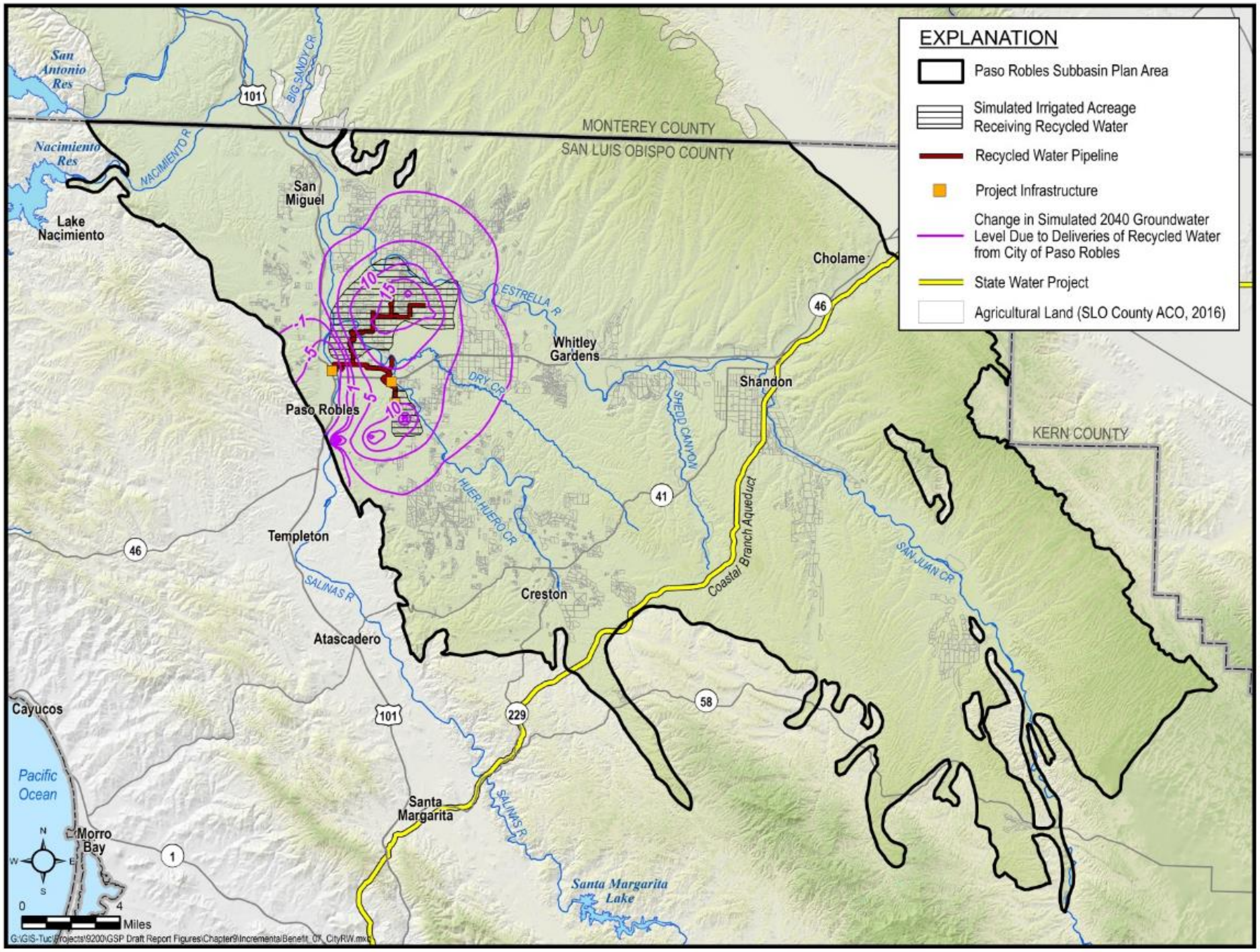

Figure 9-3. Groundwater Level Benefit of Paso Robles RW Project in Central Subbasin

Changes in groundwater elevation will be measured with the groundwater level monitoring program detailed in Chapter 7. Subsidence will be measured with the CGPS station network detailed in Chapter 7. A direct correlation between the Paso Robles RW project and changes in groundwater levels may not be possible because this is only one among many management actions and projects that might be implemented in the Subbasin.

9.5.3.2.3 *Circumstances for Implementation*

This project is already being implemented by the City of Paso Robles. The monitoring wells 26S/12E-26E07, 26S/13E-16N01, and 27S/12E-13N01 will likely be positively impacted by this project.

9.5.3.2.4 *Implementation Schedule*

The project is underway. The phase design is expected to be complete by 2019 and construction complete by 2021. The implementation schedule is presented on Figure 9-4.

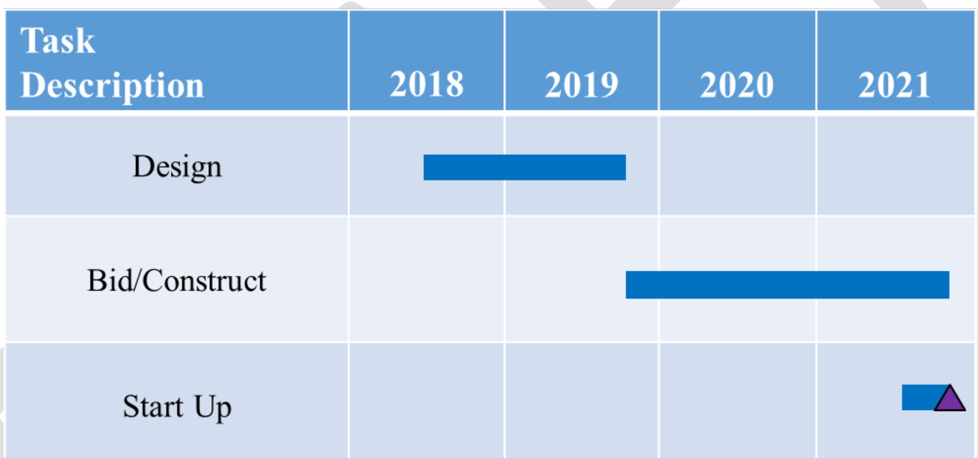

Figure 9-4. Implementation Schedule for Paso Robles RW in Central Subbasin

9.5.3.2.5 *Estimated Cost*

The estimated total project cost for this project is $22M. The cost and financing for the project is being determined by the City of Paso Robles. Annual O&M costs are not provided in this GSP. The cost ($/AF) of this water will be set by the City of Paso Robles and is not included in this GSP.

9.5.3.3 Preferred Project 2: San Miguel CSD Recycled Water Delivery

The San Miguel RW project is currently in the planning phases; therefore, the project concepts presented herein are preliminary.

This project is a planned project that involves the upgrade of San Miguel Community Services District (CSD) wastewater treatment plant to meet California Code of Regulations (CCR) Title 22 criteria for disinfected secondary recycled water for irrigation use by vineyards. Potential customers include one on the east side of the Salinas River, and a group of customers northwest of the wastewater treatment plant. The project might include the utilization of process discharge from a nearby processing facility for additional water recycling. The project could provide between 200 and 450 AFY of additional water supplies. The general layout of this project and relevant monitoring wells are shown on Figure 9-5. The infrastructure shown here includes a treatment plant upgrade, and two pipelines delivering water to customers. The actual project size and infrastructure will be determined based on project feasibility and negotiations with suppliers and customers. For more information on technical assumptions and cost assumptions, refer to Appendix I.

9.5.3.3.1 Relevant Measurable Objectives

The measurable objectives benefiting from this groundwater project include:

- Groundwater elevation measurable objectives in the northern portion of the Subbasin
- The groundwater storage measurable objective
- Land subsidence measurable objectives in the northern portion of the Subbasin

9.5.3.3.2 Expected Benefits and Evaluation of Benefits

The primary benefit from RW use for irrigation is higher groundwater elevations in the northern portion of the Subbasin due to in-lieu recharge from the direct use of the RW. Ancillary benefits may include an increase in groundwater storage and avoiding subsidence. The GSP model was used to quantify the expected benefit from this project. Figure 9-6 shows the expected groundwater level benefit predicted by the GSP model after 10 years of project operation. Figure 9-6 expresses the benefit as feet of groundwater. The groundwater level benefit shown on Figure 9-6 is a measure of how much higher groundwater elevations are expected to be with the project rather than without the project

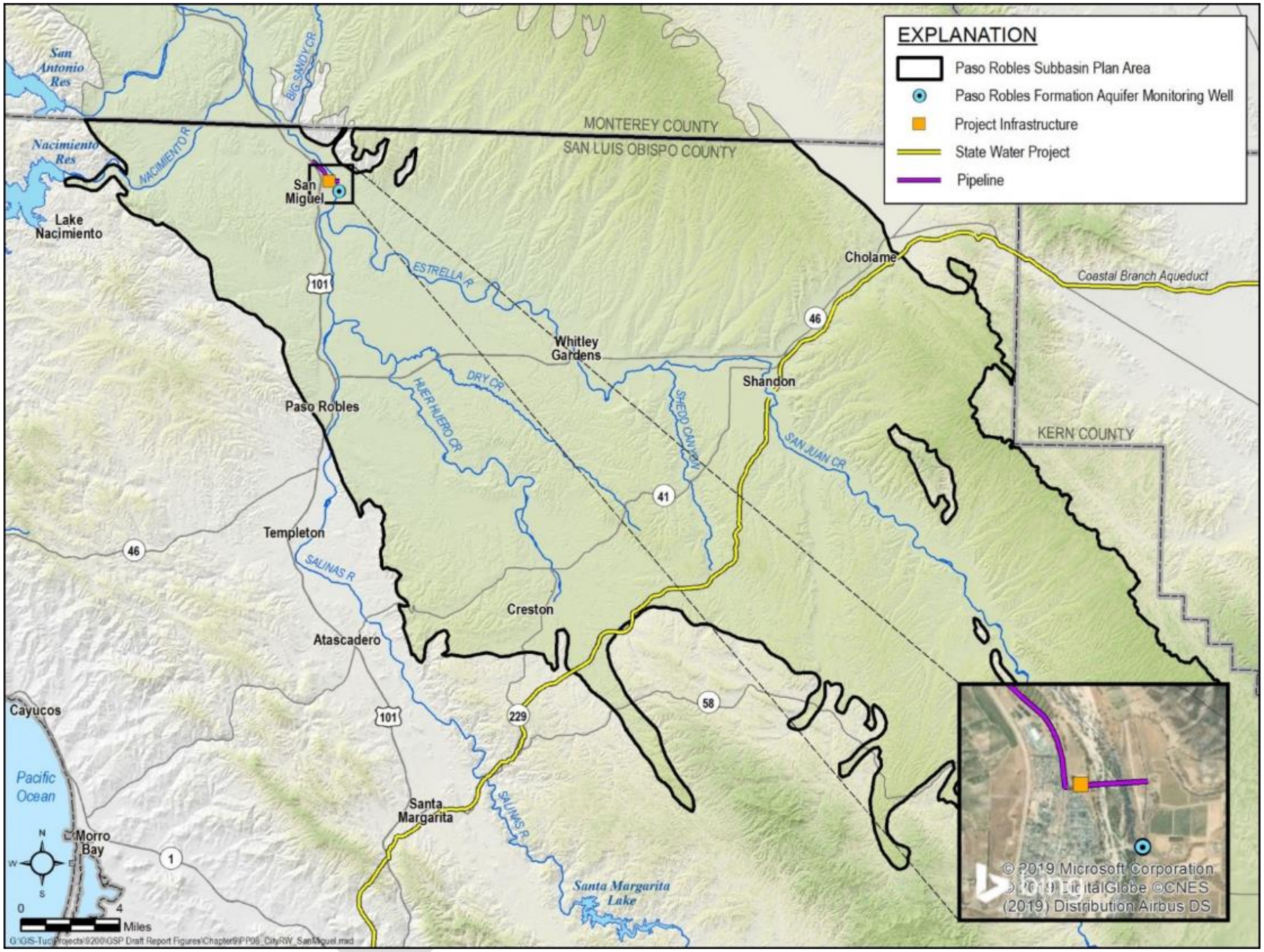

Figure 9-5. Conceptual San Miguel CSD RW Project Layout

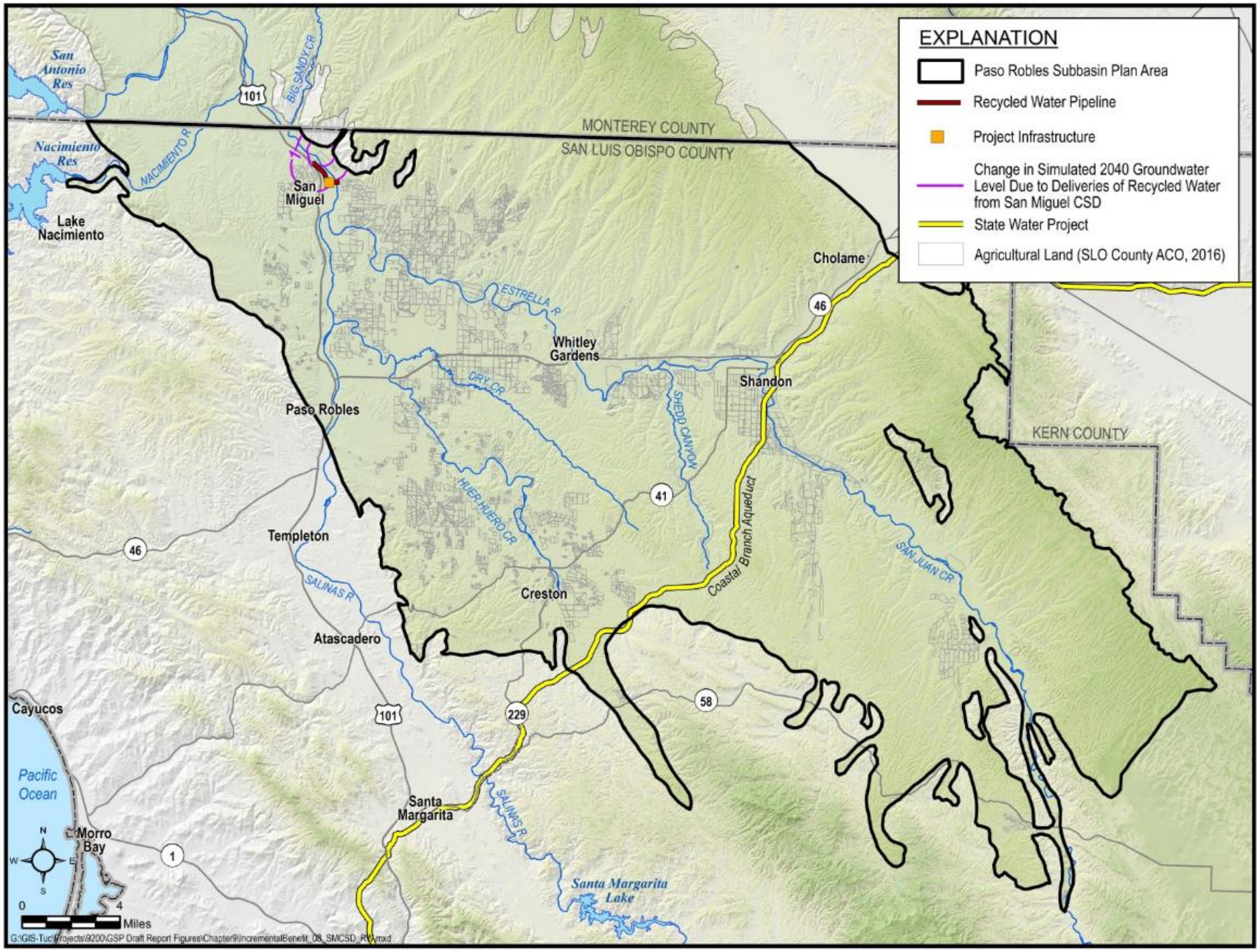

Figure 9-6. Groundwater Level Benefit of San Miguel CSD RW Project

Changes in groundwater elevation will be measured with the groundwater level monitoring program detailed in Chapter 7. Subsidence will be measured with the CGPS station network detailed in Chapter 7. A direct correlation between the San Miguel CSD RW Project and changes in groundwater levels may not be possible because this is only one among many management actions and projects that might be implemented in the Subbasin.

9.5.3.3.3 Circumstances for Implementation

Most projects are implemented on an as-needed basis. The primary approach to attaining sustainability relies on pumping reductions in response to the groundwater conservation program. If pumping reductions are inadequate for achieving sustainability, the funds raised by the water charge framework will be used to initiate projects throughout the Subbasin. The San Miguel CSD RW Project will be initiated if, after five years, groundwater levels in the northern portion of the monitoring network continue to decline at unsustainable rates. In particular, continued unsustainable groundwater level declines in monitoring well 25S/12E-16K05 will trigger implementation of this project. Additional triggers will be added as the monitoring well network expands.

This project is a planned project being undertaken by San Miguel CSD and may be implemented regardless of the triggered implementation scheme presented herein.

9.5.3.3.4 Implementation Schedule

The implementation schedule is presented on Figure 9-7. The project will take 4 to 6 years to implement. The actual project start date is to be determined on an as-needed basis or by San Miguel CSD.

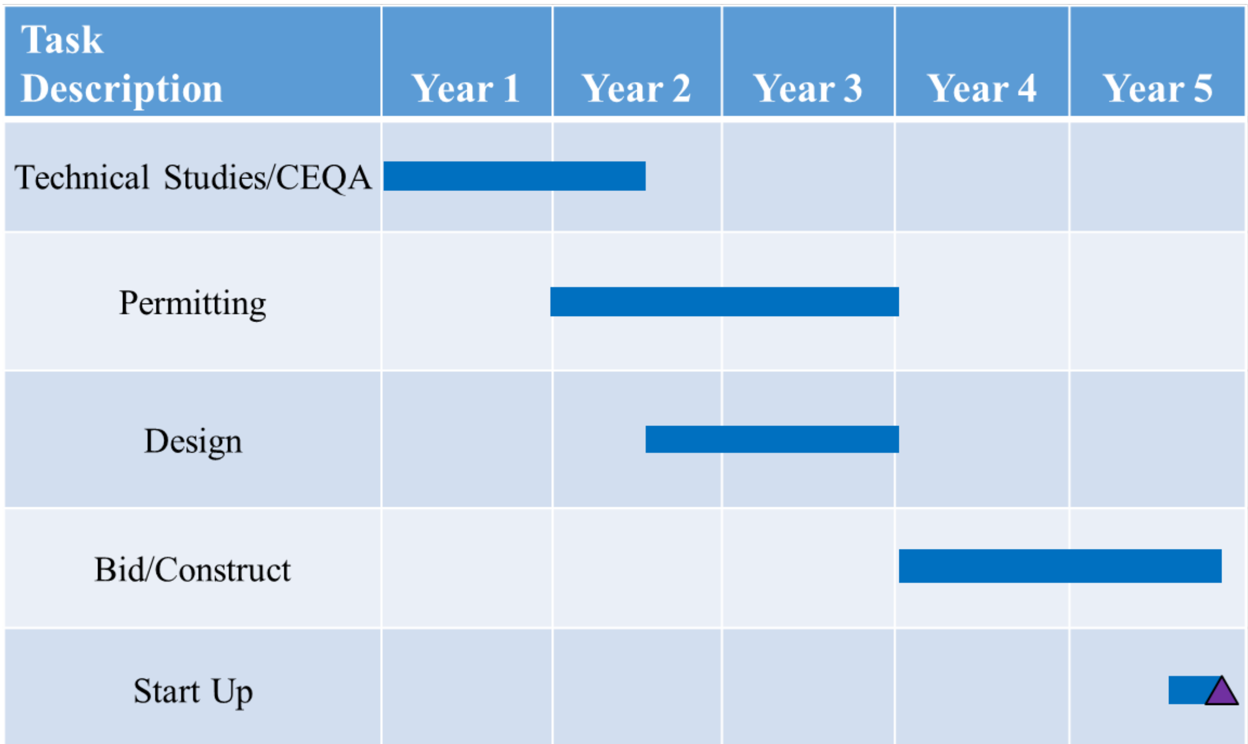

Figure 9-7. Implementation Schedule for San Miguel RW

9.5.3.3.5 *Estimated Cost*

This project is currently in the planning phases, and the San Miguel RW project presented herein might not accurately reflect the most current design concept. The cost of the potential project that is described herein was estimated for the purposes of the GSP. The estimated total project cost for this project is $15M, not including wastewater treatment plant upgrades. Cost can be covered by the bonding capacity developed through the groundwater conservation program. Annual O&M costs are estimated at $340,000. O&M costs would be covered by the overproduction surcharges. Based on a 30-year loan at a 5% interest rate, the cost of water for this project would be approximately $2,900/AF. Additional details regarding how costs were developed are included in Appendix I.

9.5.3.4 Preferred Project 3: NWP Delivery at Salinas and Estrella River Confluence

This project directly delivers up to 3,500 AFY of NWP water to agricultural water users near the confluence of the Salinas and Estrella Rivers, and an area north of the Estrella River. On average, this project will provide 2,800 AFY of water for use in lieu of groundwater pumping in the region.

The general layout of this project and relevant monitoring wells are shown on Figure 9-14. Infrastructure includes a new NWP turnout, 13 miles of pipeline, a 700 horsepower (hp) pump station, and two river crossings: one crossing of the Salinas River and one crossing of the Estrella River. For more information on technical assumptions and cost assumptions, refer to Appendix I.

9.5.3.4.1 Relevant Measurable Objectives

The measurable objectives benefiting from this project include:

- Groundwater elevation measurable objectives in the central portion of the Subbasin
- The groundwater storage measurable objective
- Land subsidence measurable objectives in the central portion of the Subbasin

9.5.3.4.2 Expected Benefits and Evaluation of Benefits

The primary benefit from in-lieu recharge using NWP water is higher groundwater elevations in the central portion of the Subbasin. Ancillary benefits of shallower groundwater elevations may include an increase in groundwater storage and avoiding subsidence. The GSP model was used to quantify the expected benefit from this project. Figure 9-15 shows the expected groundwater level benefit predicted by the GSP model after 10 years of project operation. Figure 9-15 expresses the benefit as feet of groundwater. The groundwater level benefit shown on Figure 9-15 is a measure of how much higher groundwater elevations are expected to be with the project rather than without the project.

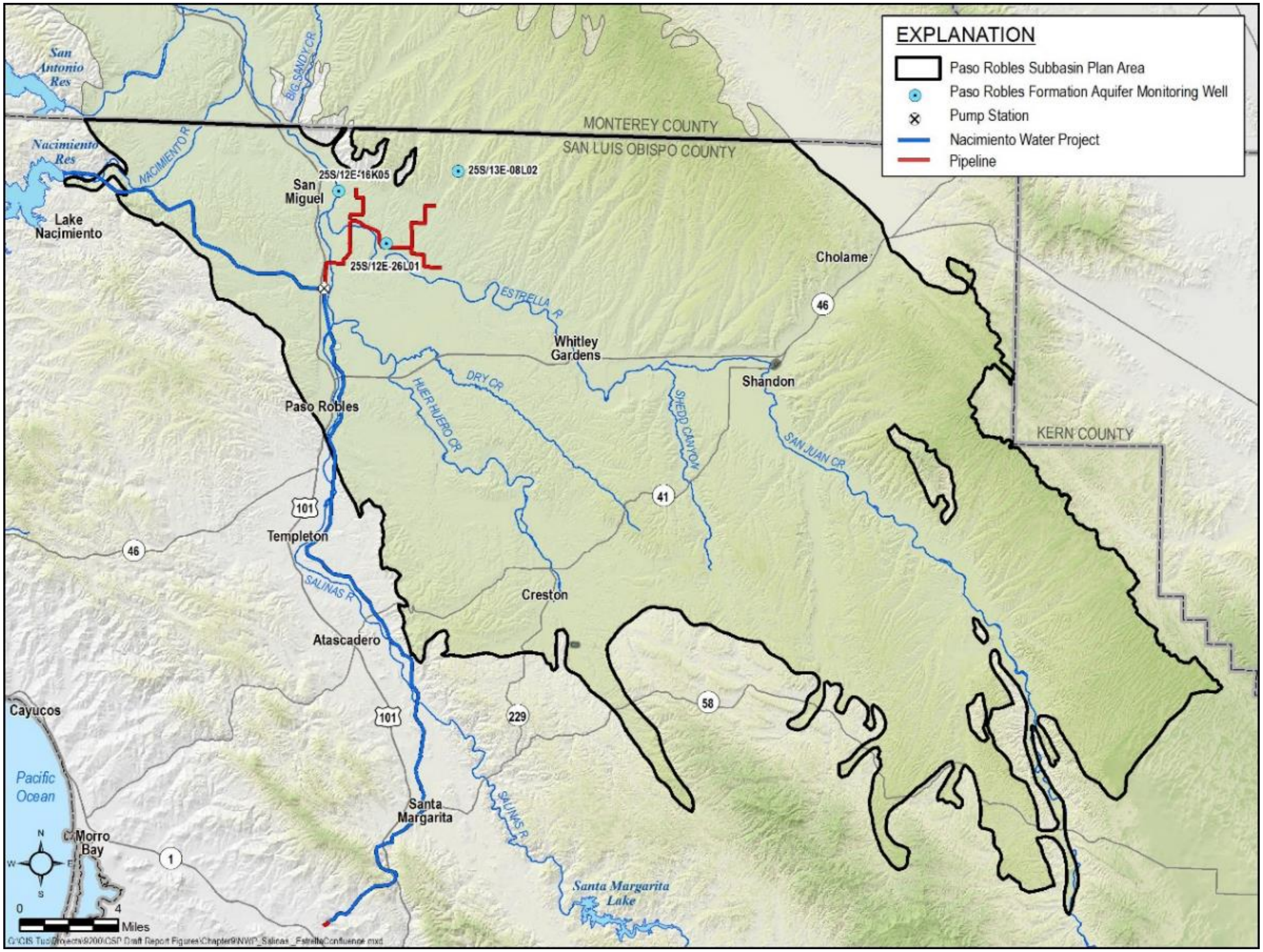

Figure 9-8. Conceptual NWP Delivery at Salinas and Estrella River Confluence Project Layout

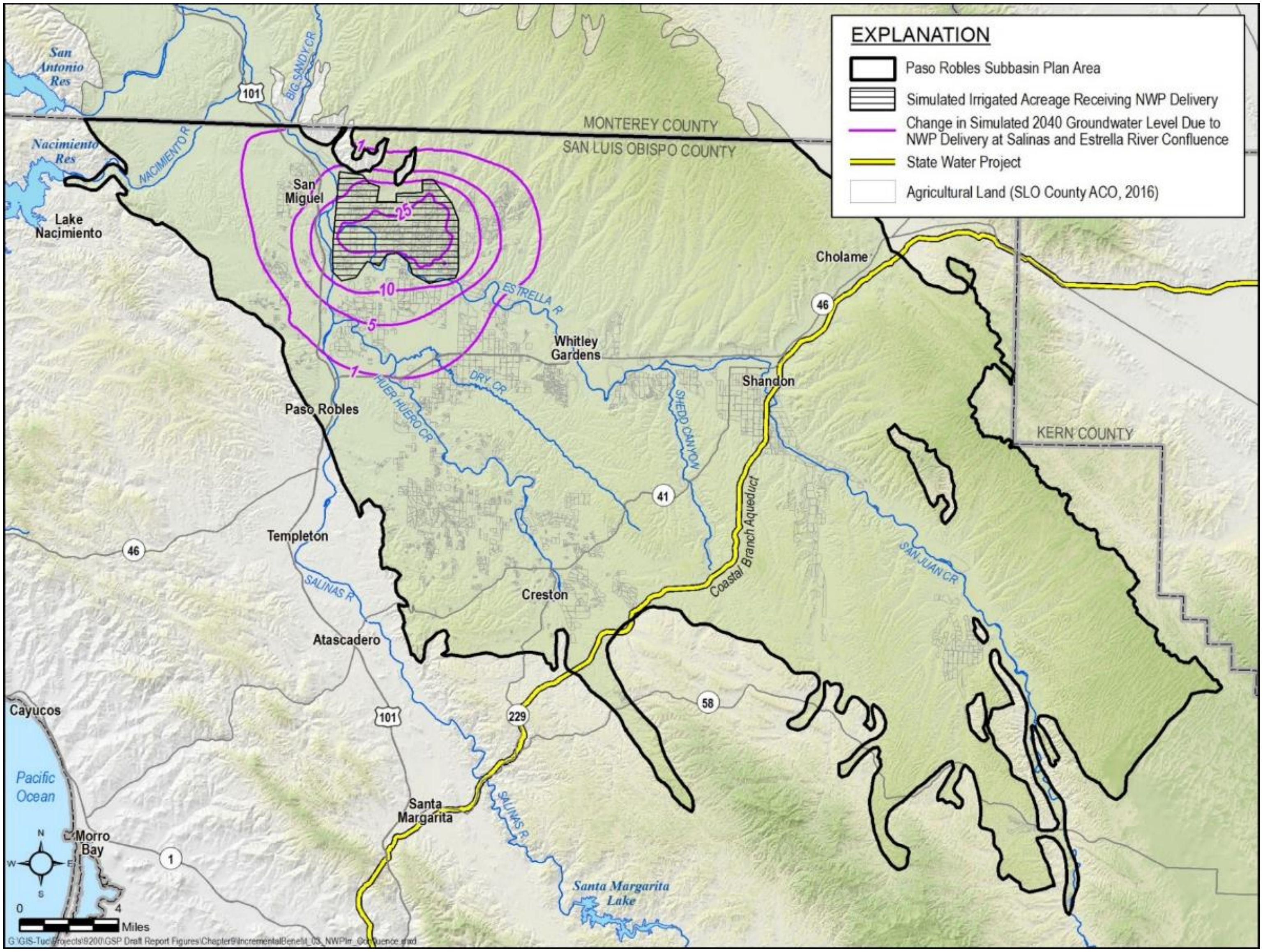

Figure 9-9. Groundwater Level Benefit of NWP Delivery at Salinas and Estrella River Confluence

Changes in groundwater elevation will be measured with the groundwater level monitoring program detailed in Chapter 7. Subsidence will be measured with the CGPS station network detailed in Chapter 7. A direct correlation between in-lieu recharge and changes in groundwater levels may not be possible because this is only one among many management actions and projects that may be implemented in the Subbasin.

9.5.3.4.3 CIRCUMSTANCES FOR IMPLEMENTATION

All projects are implemented on an as-needed basis. The primary approach to attaining sustainability relies on pumping reductions in response to the water charges framework. If pumping reductions are inadequate for achieving sustainability, the funds raised by the water charge framework will be used to initiate projects throughout the Subbasin. The project to deliver water for in-lieu recharge near the Salinas and Estrella confluence will be initiated if, after five years, groundwater levels in the northern portion of the monitoring network continue to decline at unsustainable rates. In particular, continued unsustainable groundwater level declines in monitoring wells 25S/12E-16K05, 25S/12E-26L01, and 25S/13E-08L02 will trigger implementation of this project. Additional triggers will be added as the monitoring well network expands.

9.5.3.4.4 IMPLEMENTATION SCHEDULE

The implementation schedule is presented on Figure 9-16. The project will take 4 to 6 years to implement depending on the time required to negotiate procurement of NWP water.

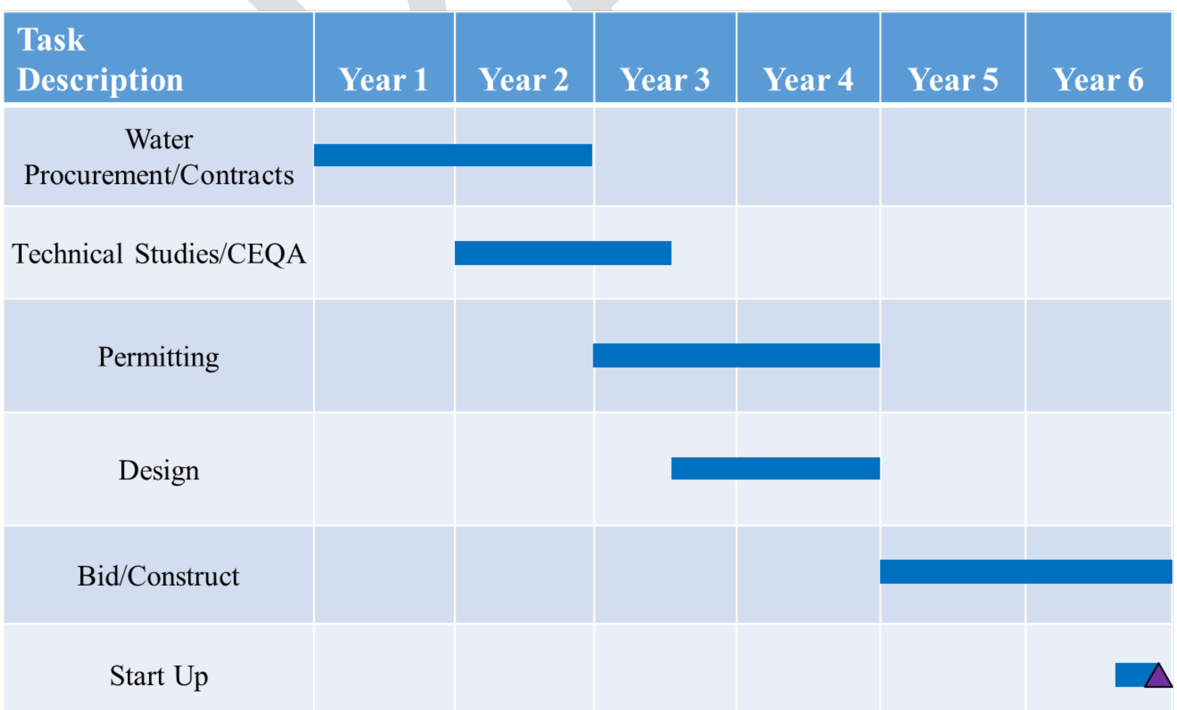

Figure 9-10. Implementation Schedule for NWP Delivery at Salinas and Estrella River Confluence

9.5.3.4.5 ESTIMATED COST

The estimated total project cost for this project is $50M. The project cost will be covered by the bonding capacity developed through the water charges framework. Annual O&M costs are estimated at $740,000. The average annual cost of NWP purchased water is estimated at $2.4M based on an average year delivery of 2,800 AFY. However, the unit price would need to be negotiated, and the actual amount of water available will vary year to year thereby affecting the actual annual purchase cost. O&M and water purchase costs would be covered by the overproduction surcharges. Based on a 30-year loan at a 5% interest rate, the cost of water for this project would be approximately $3,200/AF. Additional details regarding how costs were developed are included in Appendix I.

9.5.3.5 Preferred Project 4: NWP Delivery North of City of Paso Robles

This project provides up to 1,250 AFY of NWP water for direct delivery to agricultural water users north of the Paso Robles airport. On average, this project will provide 1,000 AFY of water for use in lieu of groundwater pumping in the region.

The general layout of this project and relevant monitoring wells are shown on Figure 9-17. Infrastructure includes a new NWP turnout, 5.6 miles of pipeline, a 130 hp pump station, and one river crossing for the Salinas River. For more information on technical assumptions and cost assumptions, refer to Appendix I.

9.5.3.5.1 RELEVANT MEASURABLE OBJECTIVES

The measurable objectives benefiting from this project include:

- Groundwater elevation measurable objectives in the central portion of the Subbasin
- The groundwater storage measurable objective
- Land subsidence measurable objectives in the central portion of the Subbasin

9.5.3.5.2 EXPECTED BENEFITS AND EVALUATION OF BENEFITS

The primary benefit from in-lieu recharge using NWP water is higher groundwater elevations in the central portion of the Subbasin. Ancillary benefits of shallower groundwater elevations may include an increase in groundwater storage and avoiding subsidence. The GSP model was used to quantify the expected benefit from this project. Figure 9-18 shows the expected groundwater level benefit predicted by the GSP model after 10 years of project operation. Figure 9-18 expresses the benefit as feet of groundwater. The groundwater level benefit shown on Figure

9-18 is a measure of how much higher groundwater elevations are expected to be with the project rather than without the project.

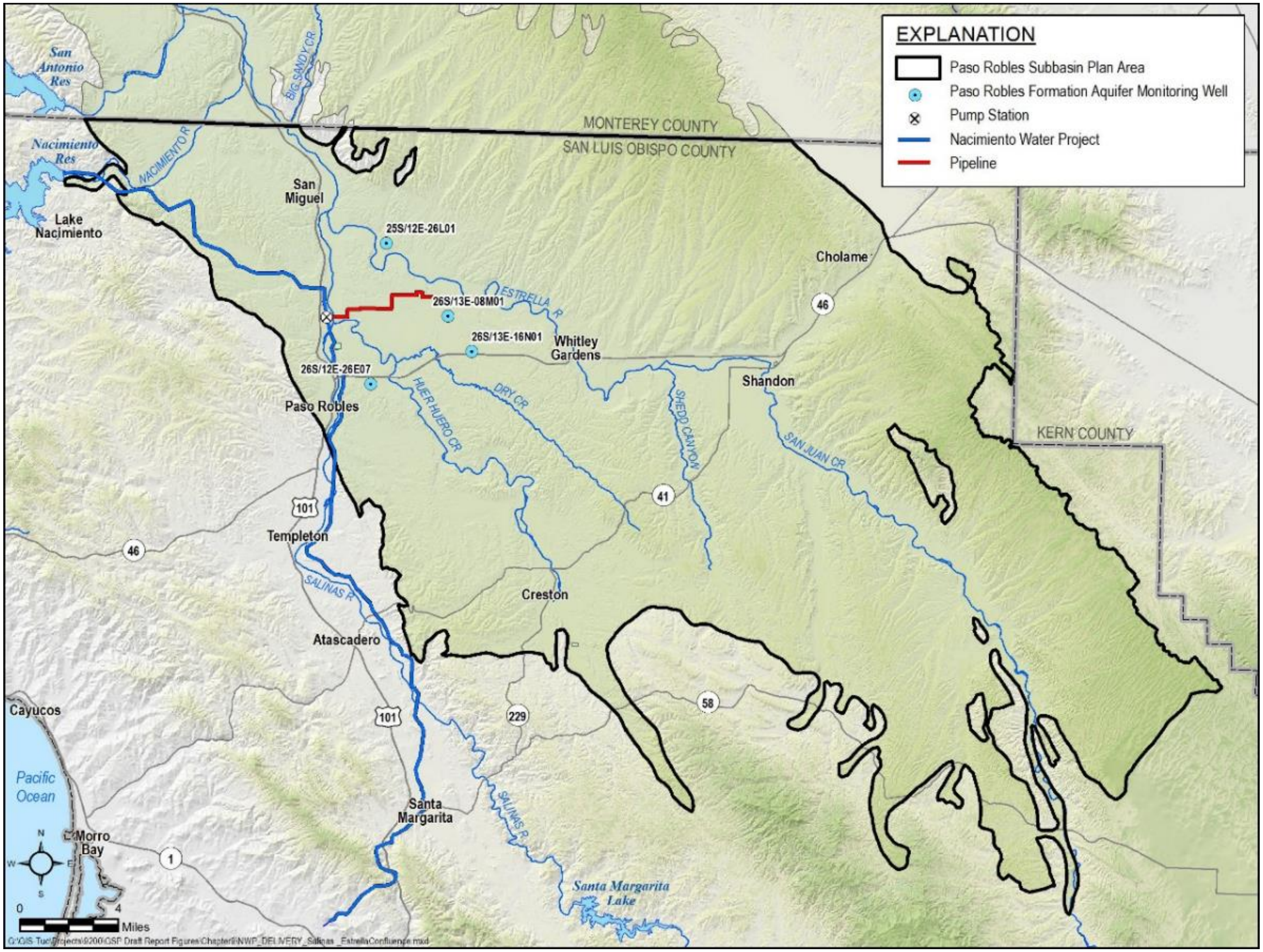

Figure 9-11. Conceptual NWP Delivery North of City of Paso Robles Project Layout

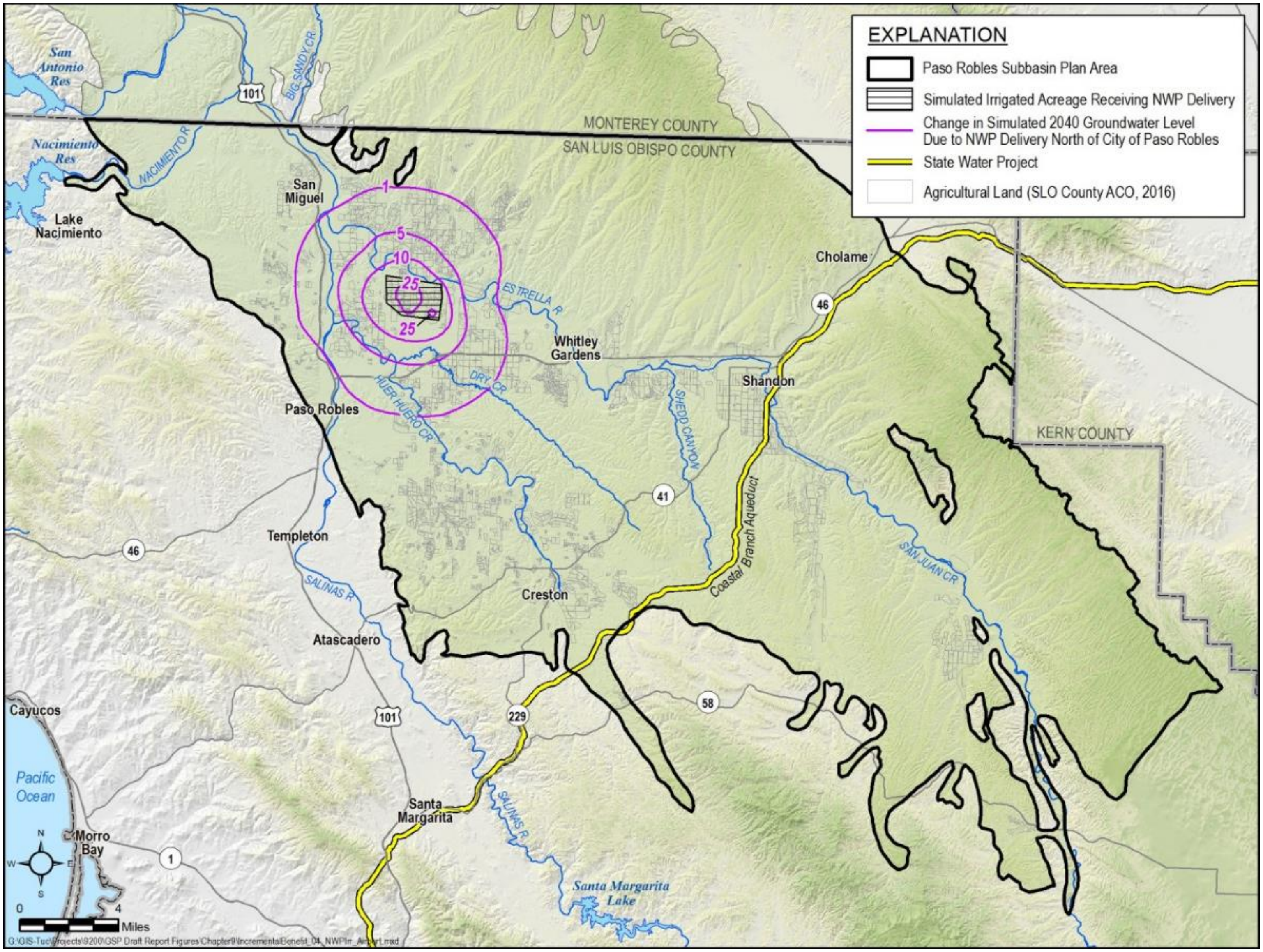

Figure 9-12. Groundwater Level Benefit from NWP Delivery North of City of Paso Robles

Changes in groundwater elevation will be measured with the groundwater level monitoring program detailed in Chapter 7. Subsidence will be measured with the CGPS station network detailed in Chapter 7. A direct correlation between in-lieu recharge and changes in groundwater levels may not be possible because this is only one among many management actions and projects that may be implemented in the Subbasin.

9.5.3.5.3 CIRCUMSTANCES FOR IMPLEMENTATION

All projects are implemented on an as-needed basis. The primary approach to attaining sustainability relies on pumping reductions in response to the water charges framework. If pumping reductions are inadequate for achieving sustainability, the funds raised by the water charge framework will be used to initiate projects throughout the Subbasin. The project to deliver water for in-lieu recharge north of the airport will be initiated if, after five years, groundwater levels in the northern portion of the monitoring network continue to decline at unsustainable rates. In particular, continued unsustainable groundwater level declines in monitoring wells 26S/13E-08M01, 26S/13E-16N01, 25S/12E-26L01, and 26S/12E-26E07 will trigger implementation of this project. Additional triggers will be added as the monitoring well network expands.

9.5.3.5.4 IMPLEMENTATION SCHEDULE

The implementation schedule is presented on Figure 9-19. The project will take 4 to 6 years to implement depending on the time required to negotiate procurement of NWP water.

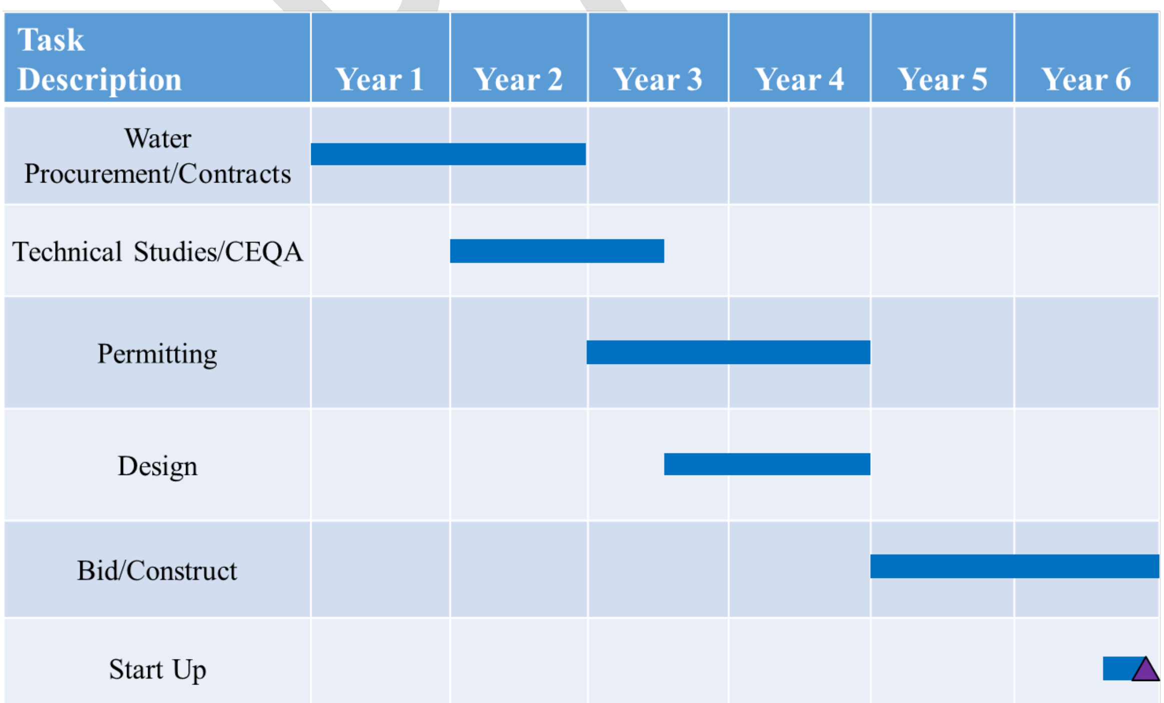

Figure 9-13. Implementation Schedule for NWP Delivery North of City of Paso Robles

9.5.3.5.5 *ESTIMATED COST*

The estimated total project cost for this project is $22M. The project cost will be covered by the bonding capacity developed through the water charges framework. Annual O&M costs are estimated at $150,000. The average annual cost of NWP purchased water is estimated at $1.2M based on an average year delivery of 1,000 AFY. However, the unit price would need to be negotiated, and the actual amount of water available will vary year to year thereby affecting the actual annual purchase cost. O&M and water purchase costs would be covered by the overproduction surcharges. Based on a 30-year loan at a 5% interest rate, the cost of water for this project would be approximately $2,800/AF. Additional details regarding how costs were developed are included in Appendix I.

9.5.3.6 Preferred Project 5: NWP Delivery East of City of Paso Robles

This project provides up to 2,500 AFY of NWP water to for direct delivery to agricultural water users east of the City of Paso Robles. On average, this project will provide 2,000 AFY of water for use in lieu of groundwater pumping in the region.

The general layout of this project and relevant monitoring wells are shown on Figure 9-20. Infrastructure includes a new NWP turnout, 5.6 miles of pipeline, a 130 hp pump station, and two river crossings one crossing of the Estrella River and one crossing of a tributary to the Estrella River. For more information on technical assumptions and cost assumptions, refer to Appendix I.

9.5.3.6.1 *RELEVANT MEASURABLE OBJECTIVES*

The measurable objectives benefiting from this project include:

- Groundwater elevation measurable objectives in the central portion of the Subbasin
- The groundwater storage measurable objective
- Land subsidence measurable objectives in the central portion of the Subbasin

9.5.3.6.2 *EXPECTED BENEFITS AND EVALUATION OF BENEFITS*

The primary benefit from in-lieu recharge using NWP water is higher groundwater elevations in the central portion of the Subbasin. Ancillary benefits of shallower groundwater elevations may include an increase in groundwater storage and avoiding subsidence. The GSP model was used to quantify the expected benefit from this project. Figure 9-21 shows the expected groundwater level benefit predicted by the GSP model after 10 years of project operation. Figure 9-21 expresses the benefit as feet of groundwater. The groundwater level benefit shown on Figure

9-21 is a measure of how much higher groundwater elevations are expected to be with the project rather than without the project.

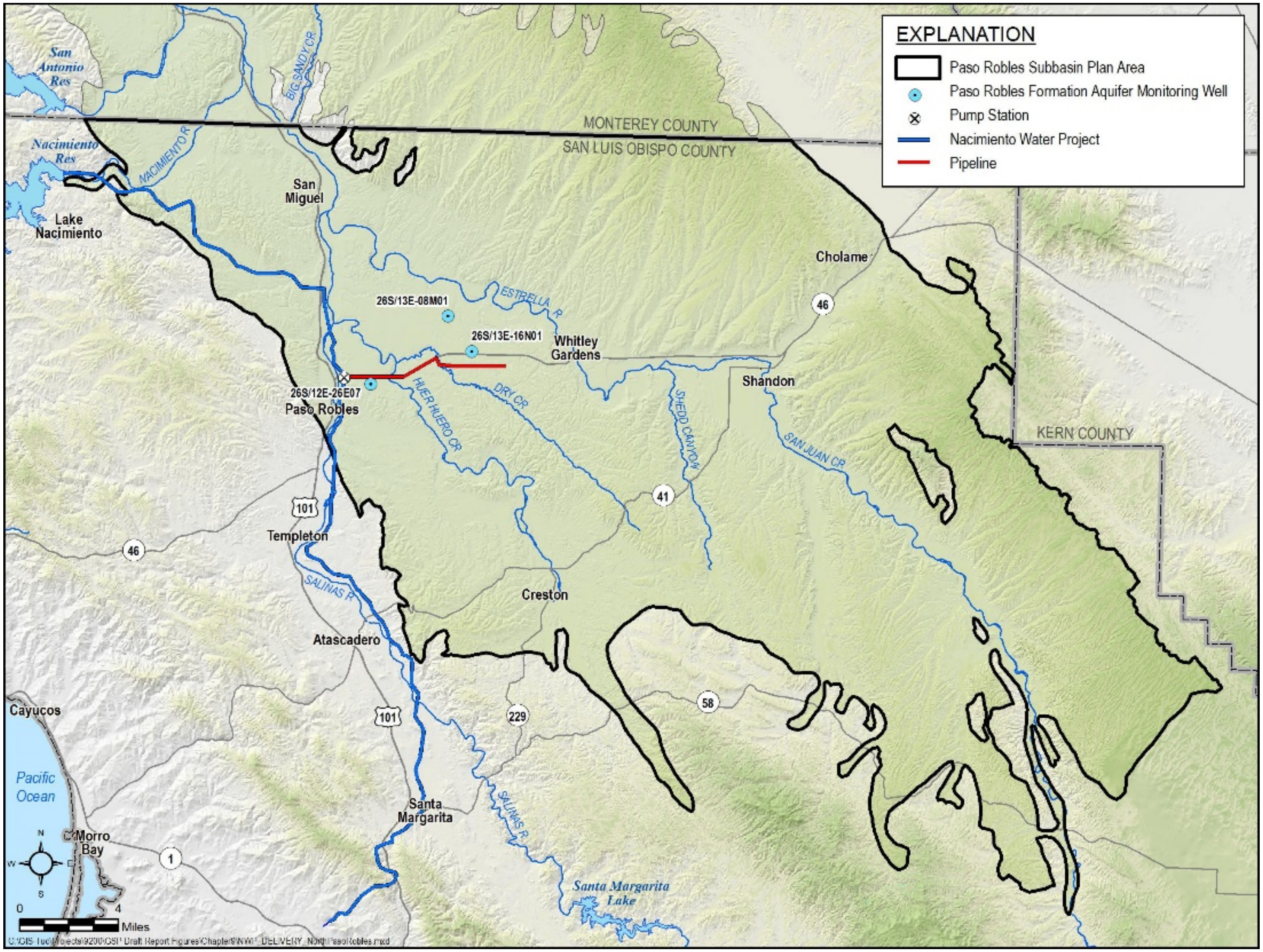

Figure 9-14. Conceptual NWP Delivery East of City of Paso Robles Project Layout

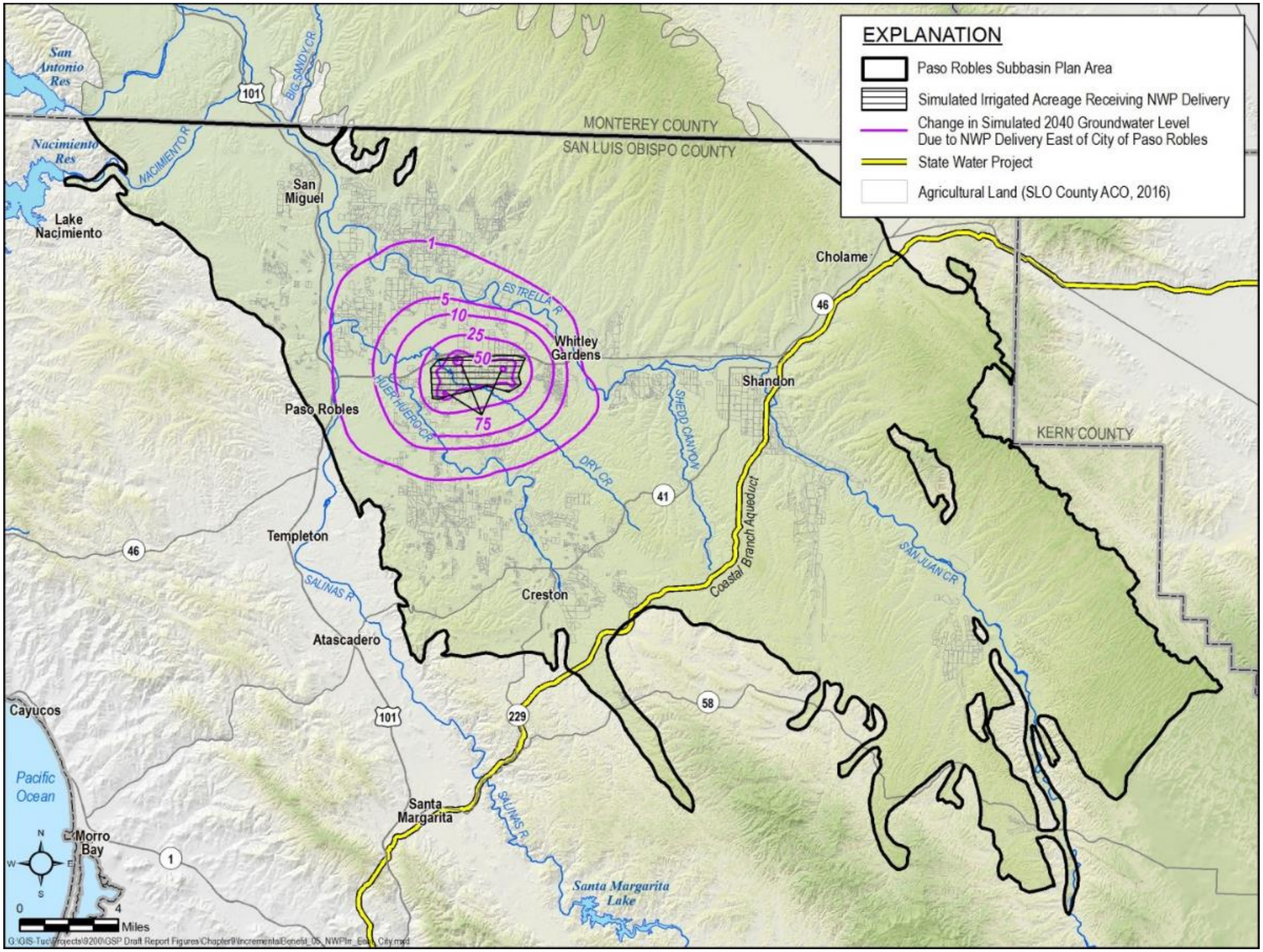

Figure 9-15. Groundwater Level Benefit from NWP Delivery East of City of Paso Robles

Changes in groundwater elevation will be measured with the groundwater level monitoring program detailed in Chapter 7. Subsidence will be measured with the CGPS station network detailed in Chapter 7. A direct correlation between in-lieu recharge and changes in groundwater levels may not be possible because this is only one among many management actions and projects that may be implemented in the Subbasin.

9.5.3.6.3 CIRCUMSTANCES FOR IMPLEMENTATION

All projects are implemented on an as-needed basis. The primary approach to attaining sustainability relies on pumping reductions in response to the water charges framework. If pumping reductions are inadequate for achieving sustainability, the funds raised by the water charge framework will be used to initiate projects throughout the Subbasin. The project to deliver water for in-lieu recharge east of the City of Paso Robles will be initiated if, after five years, groundwater levels in the central portion of the monitoring network continue to decline at unsustainable rates. In particular, continued unsustainable groundwater level declines in monitoring wells 26S/13E-16N01, 26S/13E-08M01 and 26S/12E-26E07 will trigger implementation of this project. Additional triggers will be added as the monitoring well network expands.

9.5.3.6.4 IMPLEMENTATION SCHEDULE

The implementation schedule is presented on Figure 9-22. The project will take 4 to 6 years to implement depending on the time required to negotiate procurement of NWP water.

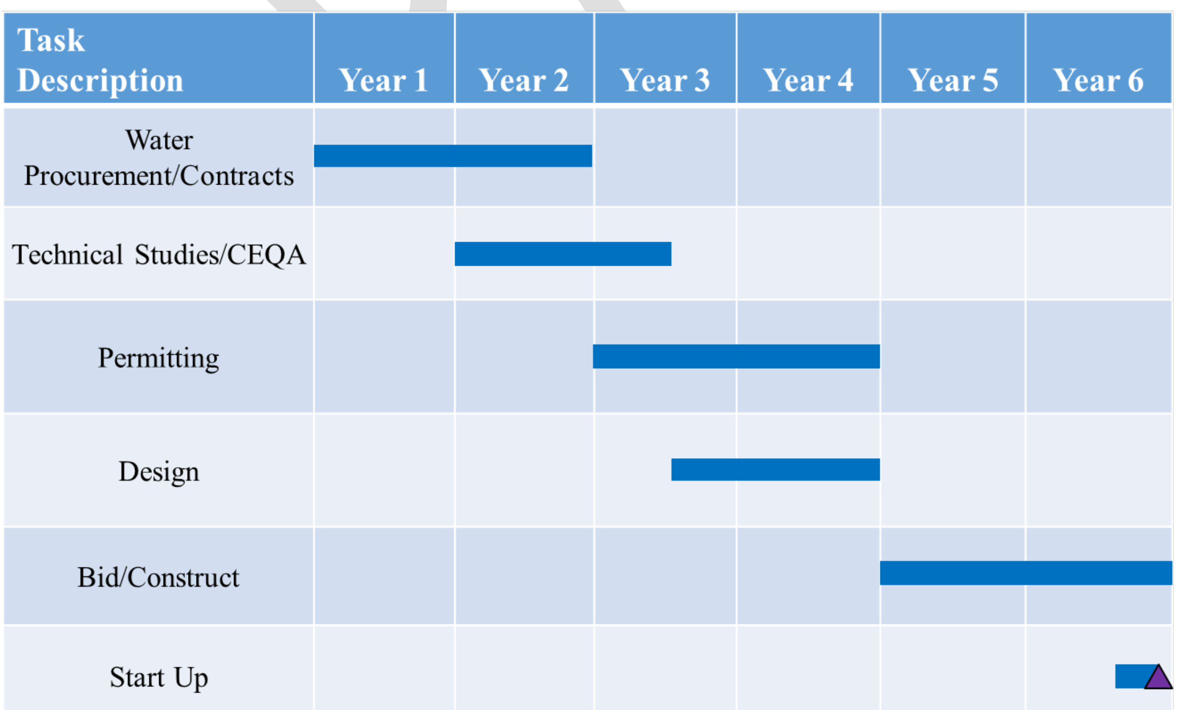

Figure 9-16. Implementation Schedule for NWP Delivery East of City of Paso Robles

9.5.3.6.5 *ESTIMATED COST*

The estimated total project cost for this project is $32M. The project cost will be covered by the bonding capacity developed through the water charges framework. Annual O&M costs are estimated at $380,000. The average annual cost of NWP purchased water is estimated at $2.4M based on an average year delivery of 2,000 AFY. However, the unit price would need to be negotiated, and the actual amount of water available will vary year to year thereby affecting the actual annual purchase cost. O&M and water purchase costs would be covered by the overproduction surcharges. Based on a 30-year loan at a 5% interest rate, the cost of water for this project would be approximately $2,400/AF. Additional details regarding how costs were developed are included in Appendix I.

9.5.3.7 Preferred Project 6: Expansion of Salinas Dam

SLOCFCWCD operates the Salinas Dam to provide water to the City of San Luis Obispo. The storage capacity of the lake is 23,843 AF; however, the City has existing water rights of 45,000 AF of storage. It is anticipated that funding would be sought to help the cost of retrofitting the dam and expanding the storage capacity by installing gates along the spillway. A risk assessment for the Dam is scheduled for the summer of 2019.

There may be opportunities to use the water from the expanded reservoir storage to benefit the Subbasin. One possibility would be to schedule summer releases from the storage to the Salinas River, which would benefit the Subbasin by recharging the basin through the Salinas River. Another way this project might indirectly benefit the Subbasin is if the City of San Luis Obispo were to use more of their Salinas River water allocation, thereby freeing up the NWP water for purchase by the GSAs.

9.5.3.7.1 *RELEVANT MEASURABLE OBJECTIVES*

The measurable objectives benefiting from this project include:

- Groundwater elevation measurable objectives in the central portion of the Subbasin
- The groundwater storage measurable objective
- Land subsidence measurable objectives in the central portion of the Subbasin

9.5.3.7.2 *EXPECTED BENEFITS AND EVALUATION OF BENEFITS*

The primary benefit from releasing additional water to the Salinas River during the summer is higher groundwater elevations along the Salinas River. Ancillary benefits of shallower groundwater elevations may include an increase in groundwater storage and avoiding subsidence. The GSP model was used to quantify the expected benefit from this project. Figure 9-23 shows the expected groundwater level benefit predicted by the GSP model after 10 years of project operation. Figure 9-23 expresses the benefit as feet of groundwater. The groundwater level benefit shown on Figure 9-23 is a measure of how much higher groundwater elevations are expected to be with the project rather than without the project.

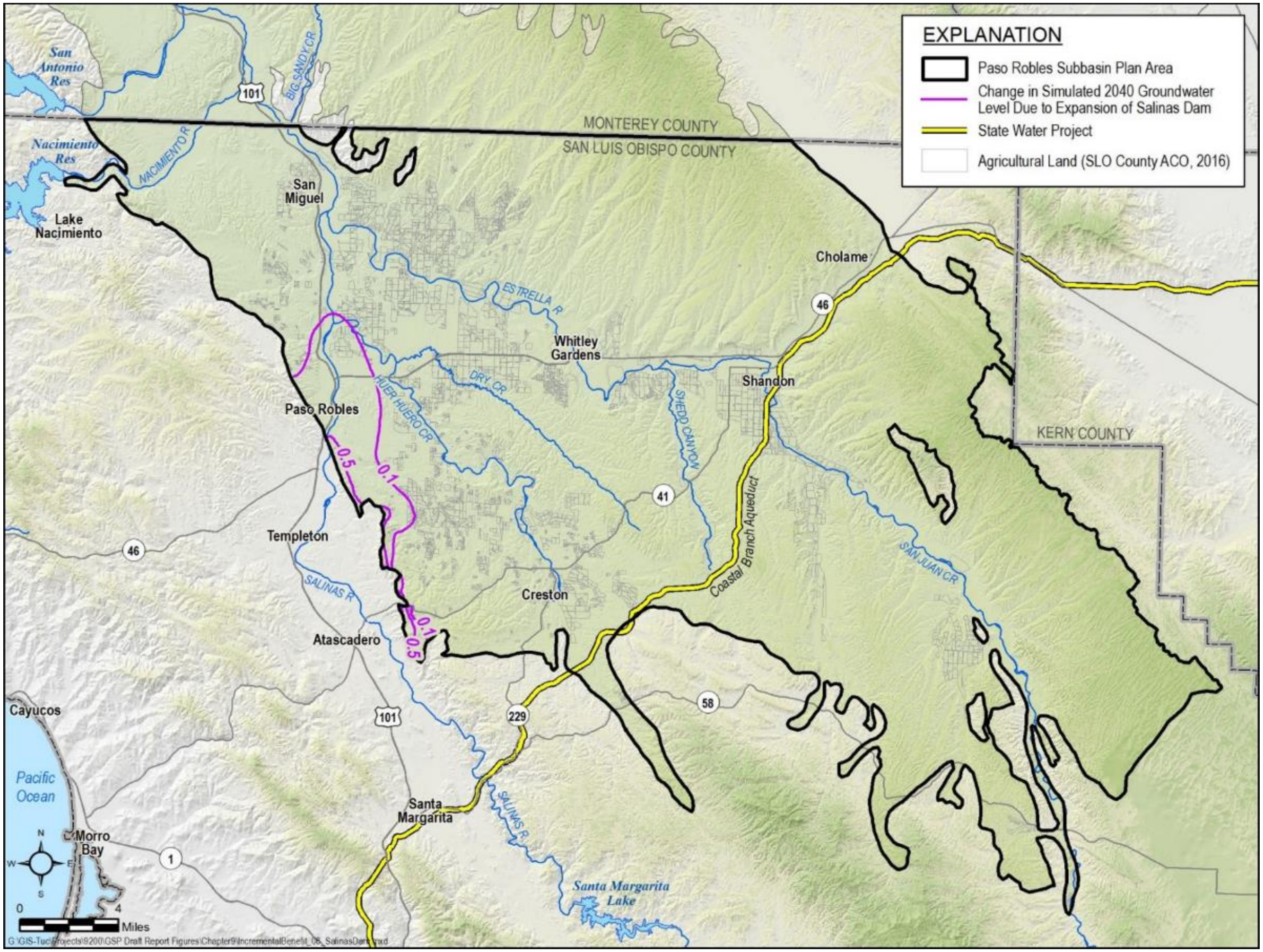

Figure 9-17. Groundwater Level Benefit from Salinas River Summer Releases

9.5.3.7.3 Circumstances for Implementation

All projects are implemented on an as-needed basis. The primary approach to attaining sustainability relies on pumping reductions in response to the water charges framework The project to release Salinas River water during the summer will be initiated if, after two years, groundwater levels near the Salinas River continue to decline at unsustainable rates. In particular, continued unsustainable groundwater level declines in monitoring wells 25S/12E-16K05, 26S/13E-16N01, 27S/12E-13N01 and 27S/13E-30N01 will trigger implementation of this project. Additional triggers will be added as the monitoring well network expands.

9.5.3.7.4 Implementation Schedule

The implementation schedule is presented on Figure 9-24. The project will take 4 to 5 years to implement.

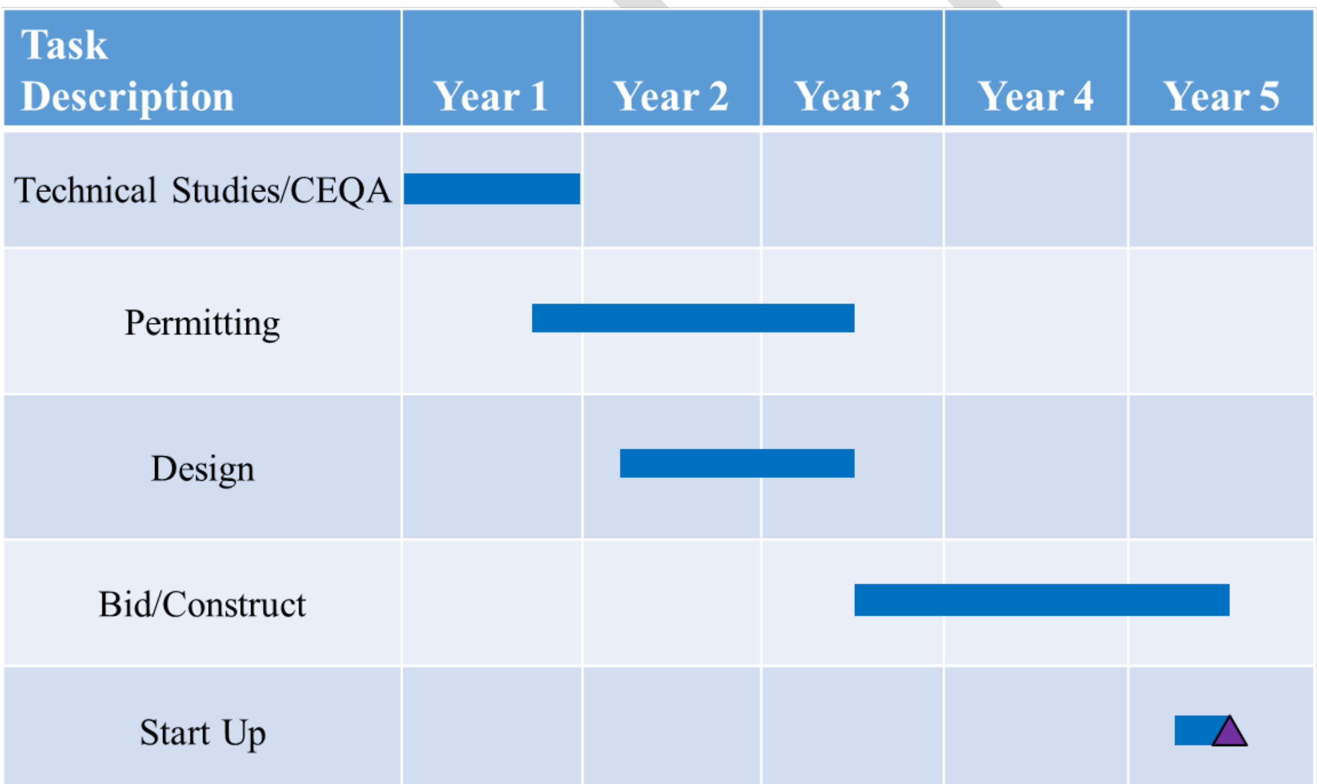

Figure 9-18. Implementation Schedule for Expansion of Salinas Dam

9.5.3.7.5 Estimated Cost

The cost to increase the storage capacity behind the Salinas Dam has been estimated at between $30M and $50M. O&M costs have not been estimated at this time. Some of these costs may be available from federal sources. No additional capital cost would be required to release water to the Salinas River for recharge during the summer months.

9.5.4 Substitute Projects

Four substitute projects are described within this GSP. They are summarized in Table 9-2 and described below.

Table 9-2. Substitute Projects

Project Name	Water Supply	Project Type	Approximate Location	Amount (AFY)
Recharge Basin in Southwestern Subbasin	SWP	Recharge Basin	Near the intersection of O'Donovan Rd and Lady Amhurst Way	2,200
Recharge Basin in Eastern Subbasin	SWP	Recharge Basin	Near E. Centre St and San Juan Rd	930
Recharge Basin North of City of Paso Robles	NWP	Recharge Basin	Near the confluence of the Salinas and Huer Huero Creek	1,500
Flood Flow Capture and Recharge North of City of Paso Robles	Salinas River	Recharge Basin	Near the confluence of the Salinas and Huer Huero Creek	164

9.5.4.1 Relevant Measurable Objectives

The measurable objectives benefiting from a recharge basin include:

- Groundwater elevation measurable objectives in the southwest portion of the Subbasin
- The groundwater storage measurable objective
- Land subsidence measurable objectives in the southwest portion of the Subbasin

9.5.4.2 Substitute Project 1: Recharge Basin in Southwestern Subbasin

This project uses recharge basins to recharge up to 3,800 AFY of treated water from the SWP Coastal Branch pipeline into the Paso Robles Formation Aquifer in the southwest portion of the Subbasin. On average, 2,280 AFY would be discharged to the recharge basin. With an assumed recharge efficiency of 50%, an average of 1,140 AFY would benefit the basin by percolating into the deeper aquifer. The actual recharge efficiency is currently unknown.

The general layout of this project and relevant monitoring wells are shown on Figure 9-25. Infrastructure includes a new SWP Coastal Branch turnout, a 3,900 ft long pipeline, and a

20-acre recharge basin. No pumps are necessary to deliver water to the recharge basin in this location, as the pressure in the Coastal Branch is likely sufficient. A recharge rate of 6-inches/day was assumed for this region. For more information on technical assumptions and cost development, refer to Appendix I.

Other factors would also impact feasibility, including hydrogeological characteristics, land available for purchase, and Coastal Branch capacity.

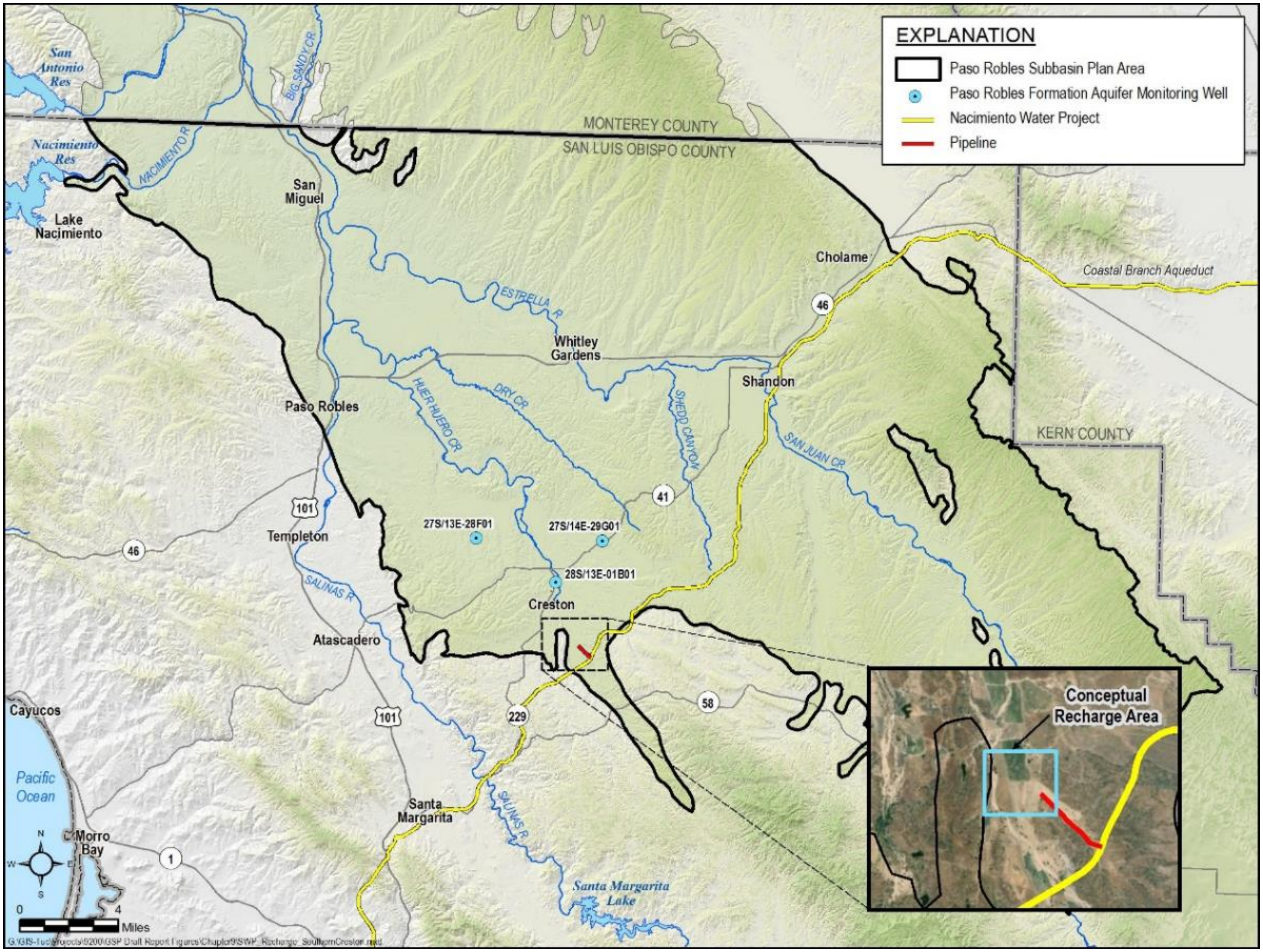

Figure 9-19. Conceptual Recharge Basin in Southwestern Subbasin Project Layout

9.5.4.2.1 *EXPECTED BENEFITS AND EVALUATION OF BENEFITS*

The primary benefit from SWP recharge via recharge basins is higher groundwater elevations in the Southwest portion of the Subbasin. Ancillary benefits of shallower groundwater elevations may include an increase in groundwater storage and avoiding subsidence. The GSP model was used to quantify the expected benefit from this project. Figure 9-26 shows the expected groundwater level benefit predicted by the GSP model after 10 years of project operation. Figure 9-26 expresses the benefit as feet of groundwater. The groundwater level benefit shown on Figure 9-26 is a measure of how much higher groundwater elevations are expected to be with the project rather than without the project.

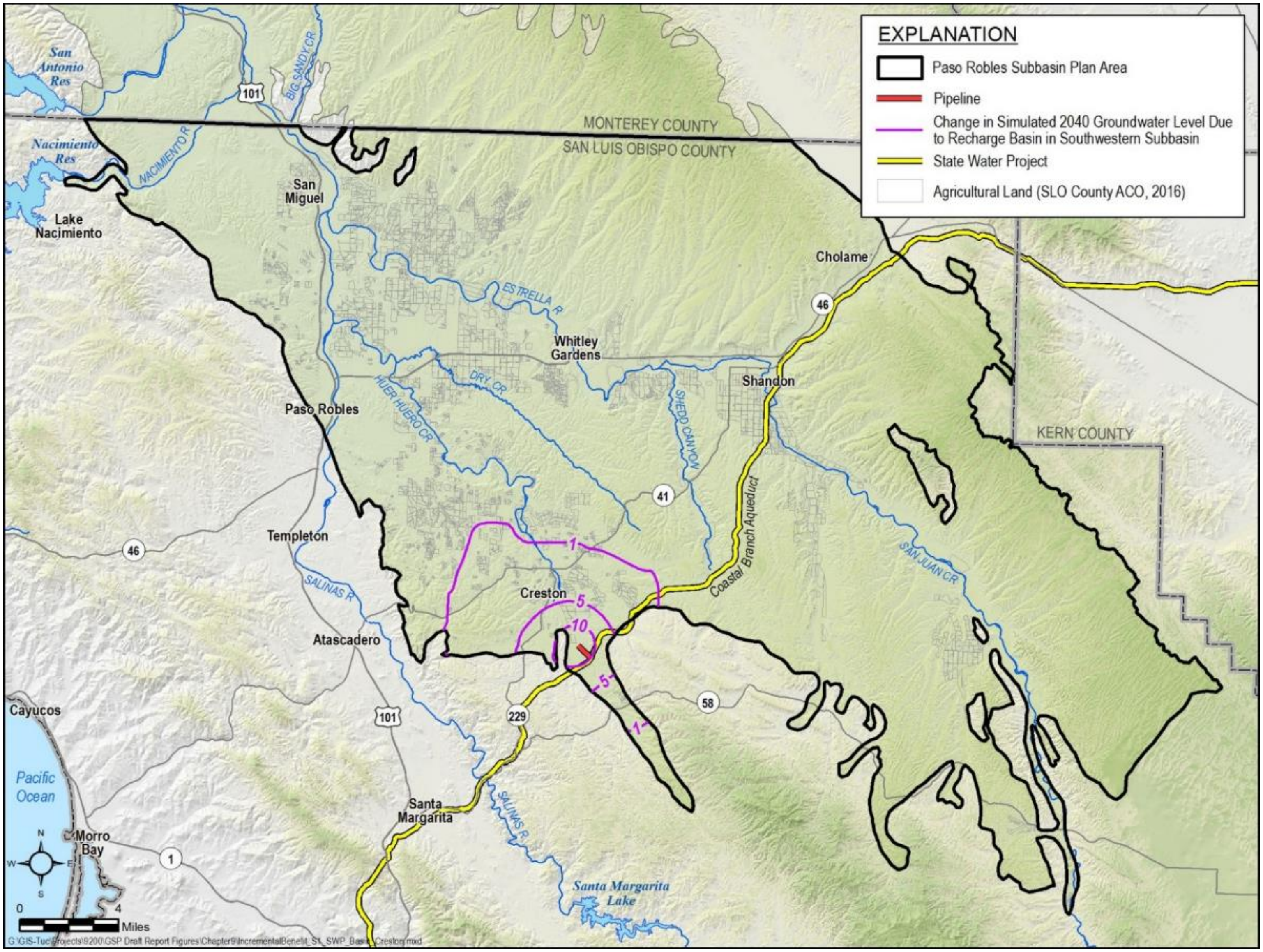

Figure 9-20. Groundwater Level Benefit from Recharge Basin in Southwestern Subbasin

Changes in groundwater elevation will be measured with the groundwater level monitoring program detailed in Chapter 7. Subsidence will be measured with the CGPS station network detailed in Chapter 7. A direct correlation between SWP recharge and changes in groundwater levels may not be possible because this is only one among many management actions and projects that may be implemented in the Subbasin.

9.5.4.2.2 Circumstances for Implementation

All projects are implemented on an as-needed basis. The primary approach to attaining sustainability relies on pumping reductions in response to the water charges framework. If pumping reductions are inadequate for achieving sustainability, the funds raised by the water charge framework will be used to initiate projects throughout the Subbasin. The project to recharge SWP water in the southwestern corner of the Subbasin will be initiated if, after five years, groundwater levels in the southwestern portion of the monitoring network continue to decline at unsustainable rates. In particular, continued unsustainable groundwater level declines in monitoring wells 28S/13E-01B01, 27S/14E-29G01 and 27S/13E-28F01 will trigger implementation of this project. Additional triggers will be added as the monitoring well network expands.

9.5.4.2.3 Implementation Schedule

The implementation schedule is presented on Figure 9-27. The project will take 4 to 6 years to implement depending on the time required to negotiate procurement of SWP water. The actual project start date is to be determined.

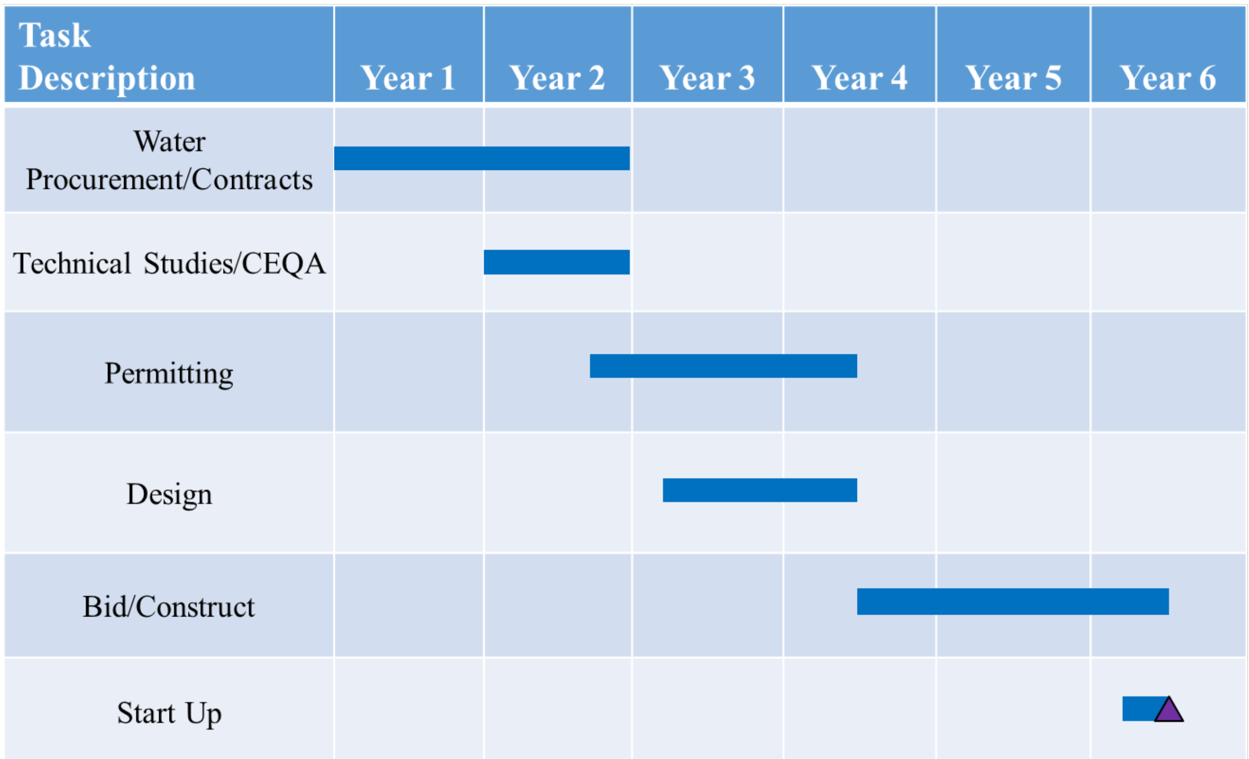

Figure 9-21. Implementation Schedule for Recharge Basin in Southwestern Subbasin

9.5.4.2.4 Estimated Cost

The estimated total project cost for this project is $4.3M. The project cost will be covered by the bonding capacity developed through the water charges framework. Annual O&M costs are estimated at $42,000. The average annual cost of SWP purchased water is estimated at $2.7M based on an average year delivery of 2,280 AF. However, the unit price would need to be negotiated, and the actual amount of water available will vary year to year thereby affecting the actual annual purchase cost. O&M and water purchase costs would be covered by the overproduction surcharges. Based on a 30-year loan at a 5% interest rate, the cost of water for this project would be approximately $1,400/AF. Additional details regarding how costs were developed are included in Appendix I.

9.5.4.3 Substitute Project 2: Recharge Basin in Eastern Subbasin

This project uses recharge basins to recharge up to 1,400 AFY of treated water from the SWP Coastal Branch pipeline into the Paso Robles Formation Aquifer in the central eastern portion of the Subbasin. On average, 840 AFY would be delivered to the recharge basin. With an assumed recharge efficiency of 50%, an average of 420 AFY would benefit the basin by percolating into the deeper aquifer. The actual recharge efficiency is currently unknown.

The general layout of this project and relevant monitoring wells are shown on Figure 9-28. Infrastructure includes a new SWP Coastal Branch turnout, a 1,200 ft long pipeline, and an 8-acre recharge basin. No pumps are necessary to deliver water to the recharge basin in this location, as the pressure in the Coastal Branch is likely sufficient. A recharge rate of 6-inches/ day was assumed for this region. For more information on technical assumptions and cost development, refer to Appendix I.

Other factors would also impact feasibility, including hydrogeological characteristics, land available for purchase, and Coastal Branch capacity.

9.5.4.3.1 RELEVANT MEASURABLE OBJECTIVES

The measurable objectives benefiting from a recharge basin include:

- Groundwater elevation measurable objectives in the eastern central portion of the Subbasin
- The groundwater storage measurable objective
- Land subsidence measurable objectives in the eastern central portion of the Subbasin

9.5.4.3.2 EXPECTED BENEFITS AND EVALUATION OF BENEFITS

The primary benefit from SWP recharge via recharge basins is higher groundwater elevations in the Southwest portion of the Subbasin. Ancillary benefits of shallower groundwater elevations may include an increase in groundwater storage and avoiding subsidence. The GSP model was used to quantify the expected benefit from this project. Figure 9-29 shows the expected groundwater level benefit predicted by the GSP model after 10 years of project operation. Figure 9-29 expresses the benefit as feet of groundwater. The groundwater level benefit shown on Figure 9-29 is a measure of how much higher groundwater elevations are expected to be with the project rather than without the project.

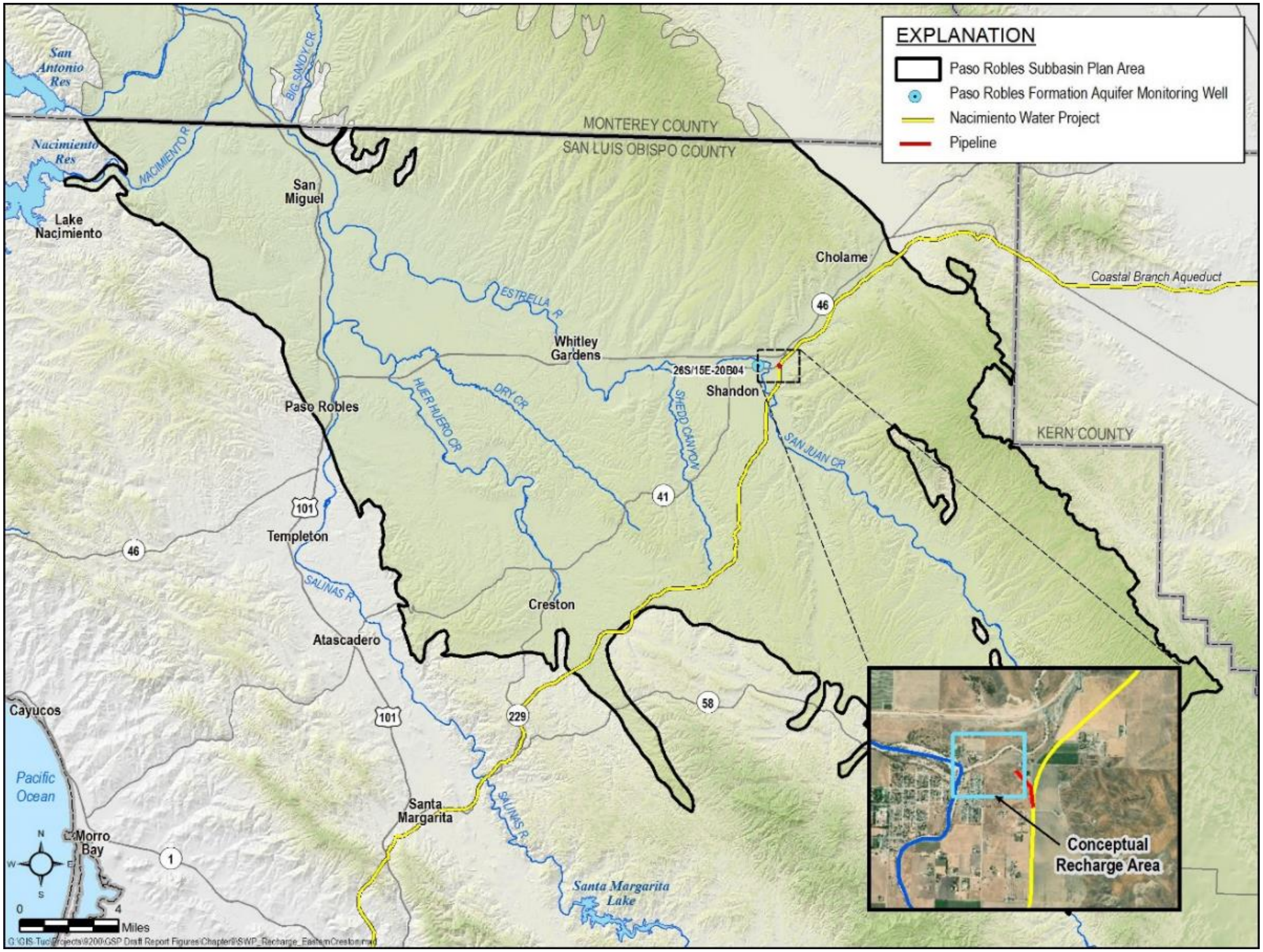

Figure 9-22. Conceptual Recharge Basin in Eastern Subbasin Project Layout

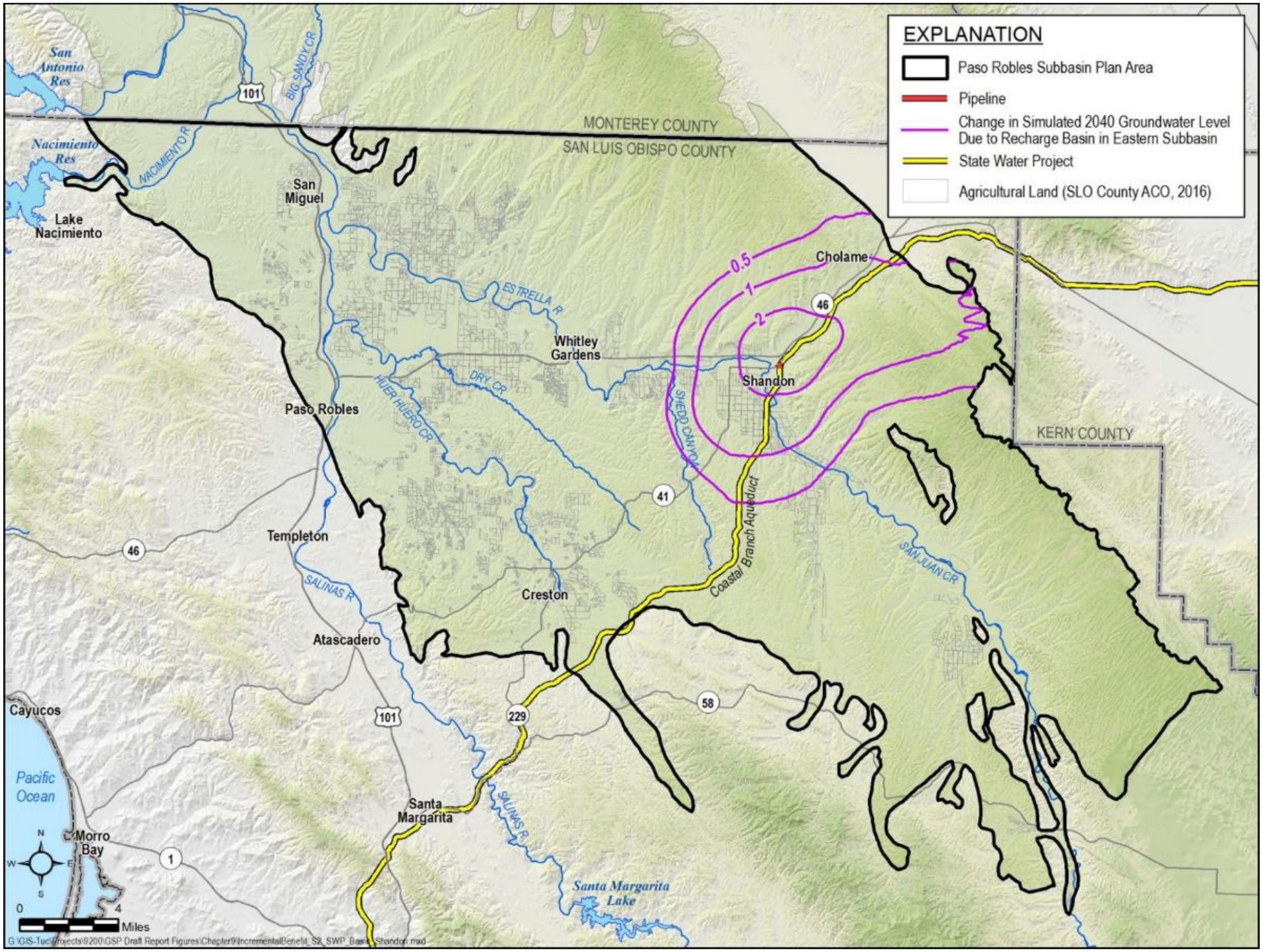

Figure 9-23. Groundwater Level Benefit from Recharge Basin in Eastern Subbasin

Changes in groundwater elevation will be measured with the groundwater level monitoring program detailed in Chapter 7. Subsidence will be measured with the CGPS station network detailed in Chapter 7. A direct correlation between SWP recharge and changes in groundwater levels may not be possible because this is only one among many management actions and projects that may be implemented in the Subbasin.

9.5.4.3.3 CIRCUMSTANCES FOR IMPLEMENTATION

All projects are implemented on an as-needed basis. The primary approach to attaining sustainability relies on pumping reductions in response to the water charges framework. If pumping reductions are inadequate for achieving sustainability, the funds raised by the water charge framework will be used to initiate projects throughout the Subbasin. The project to recharge SWP water in the central eastern portion of the Subbasin will be initiated if, after five years, groundwater levels in the southwestern portion of the monitoring network continue to decline at unsustainable rates. In particular, continued unsustainable groundwater level declines in monitoring well 26S/15E-20B04 would trigger implementation of this project. Additional triggers will be added as the monitoring well network expands.

9.5.4.3.4 IMPLEMENTATION SCHEDULE

The implementation schedule is presented on Figure 9-30. The project will take 4 to 6 years to implement depending on the time required to negotiate procurement of SWP water. The actual project start date is to be determined.

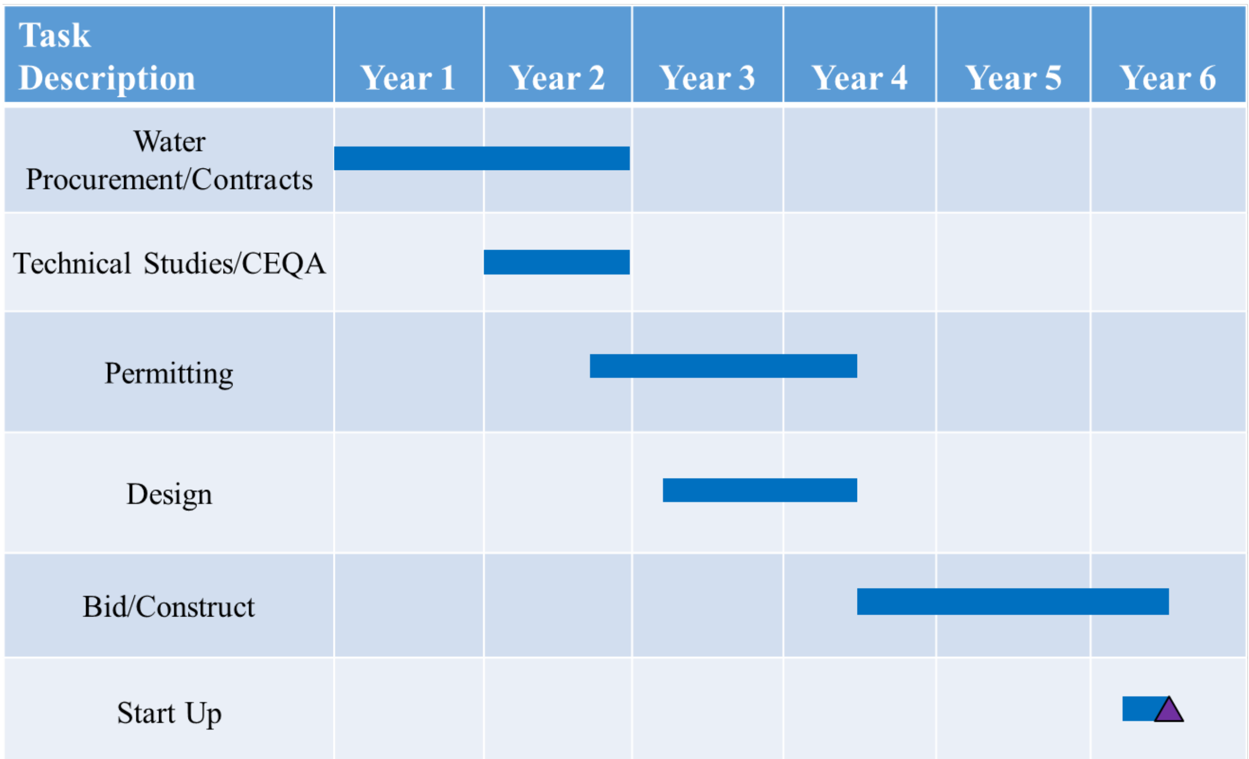

Figure 9-24. Implementation Schedule for Recharge Basin in Eastern Subbasin

9.5.4.3.5 Estimated Cost

The estimated total project cost for this project is $1.9M. The project cost will be covered by the bonding capacity developed through the water charges framework. Annual O&M costs are estimated at $39,000. The average annual cost of SWP purchased water is estimated at $1M based on an average year delivery of 840 AF. However, the unit price would need to be negotiated, and the actual amount of water available will vary year to year thereby affecting the actual annual purchase cost. O&M and water purchase costs would be covered by the overproduction surcharges. Based on a 30-year loan at a 5% interest rate, the cost of water for this project would be approximately $1,400/AF. Additional details regarding how costs were developed are included in Appendix I.

9.5.4.4 Substitute Project 3: Recharge Basin North of City of Paso Robles

This project uses recharge basins to recharge up to 1,880 AFY of treated water from the SWP Coastal Branch pipeline into the Paso Robles Formation Aquifer in the central western portion of the Subbasin, just north of the City of Paso Robles. On average, 1,500 AFY would be discharged to the recharge basin. With an assumed recharge efficiency of 50%, an average of 750 AFY would benefit the basin by percolating into the deeper aquifer. The actual recharge efficiency is currently unknown.

The general layout of this project and relevant monitoring wells are shown on Figure 9-31. Infrastructure includes a new NWP turnout, a 640 ft long pipeline, and a 12-acre recharge basin. No pumps are necessary to deliver water to the recharge basin in this location. The location of the recharge basin is approximately 30' higher than the NWP pipeline with a short pipeline length of 640', and there is likely sufficient pressure in the NWP pipeline to move water through this pipe length. A recharge rate of 6-inches/day was assumed for this region. For more information on technical assumptions and cost development, refer to Appendix I.

Other factors would also impact feasibility, including hydrogeological characteristics, land available for purchase, and NWP pipeline capacity.

9.5.4.4.1 RELEVANT MEASURABLE OBJECTIVES

The measurable objectives benefiting from recharge basins include:

- Groundwater elevation measurable objectives in the western central portion of the Subbasin
- The groundwater storage measurable objective
- Land subsidence measurable objectives in the western central portion of the Subbasin

9.5.4.4.2 EXPECTED BENEFITS AND EVALUATION OF BENEFITS

The primary benefit from NWP recharge via recharge basins is higher groundwater elevations in the western central portion of the Subbasin. Ancillary benefits of shallower groundwater elevations may include an increase in groundwater storage and avoiding subsidence. The GSP model was used to quantify the expected benefit from this project. Figure 9-32 shows the expected groundwater level benefit predicted by the GSP model after 10 years of project operation. Figure 9-32 expresses the benefit as feet of groundwater. The groundwater level benefit shown on Figure 9-32 is a measure of how much higher groundwater elevations are expected to be with the project rather than without the project.

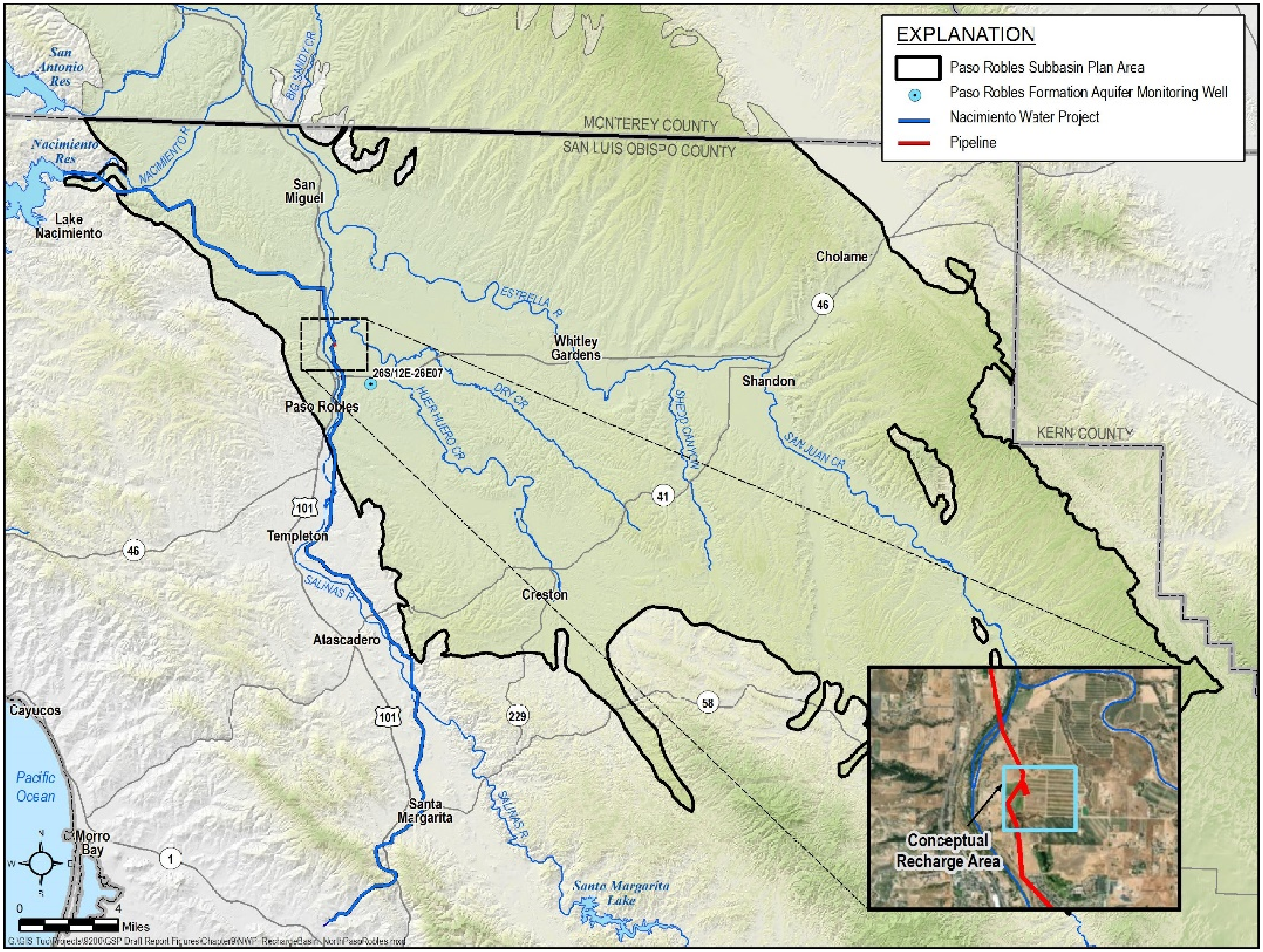

Figure 9-25. Conceptual Recharge Basin North of City of Paso Robles Project Layout

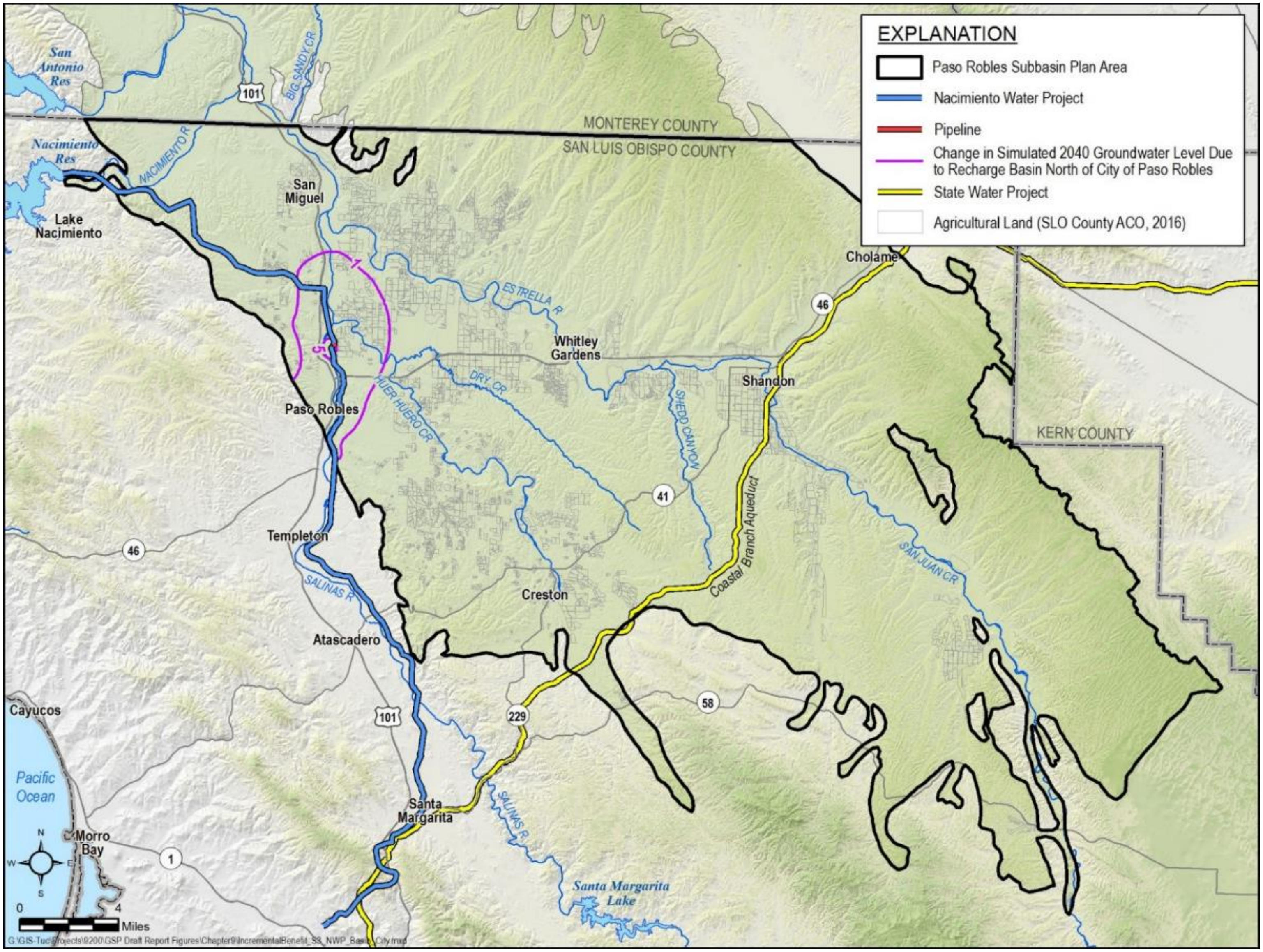

Figure 9-26. Groundwater Level Benefit from Recharge Basin North of City of Paso Robles

Changes in groundwater elevation will be measured with the groundwater level monitoring program detailed in Chapter 7. Subsidence will be measured with the CGPS station network detailed in Chapter 7. A direct correlation between NWP recharge and changes in groundwater levels may not be possible because this is only one among many management actions and projects that will be implemented in the Subbasin.

9.5.4.4.3 Circumstances for Implementation

All projects are implemented on an as-needed basis. The primary approach to attaining sustainability relies on pumping reductions in response to the water charges framework. If pumping reductions are inadequate for achieving sustainability, the funds raised by the water charge framework will be used to initiate projects throughout the Subbasin. The project to recharge SWP water in the western central region of the Subbasin will be initiated if, after five years, groundwater levels in the western central portion of the monitoring network continue to decline at unsustainable rates. In particular, continued unsustainable groundwater level declines in monitoring well 26S/12E-26E07 would trigger implementation of this project. Additional triggers will be added as the monitoring well network expands.

9.5.4.4.4 Implementation Schedule

The implementation schedule is presented on Figure 9-33. The project will take 4 to 6 years to implement depending on the time required to negotiate procurement of NWP water. The actual project start date is to be determined.

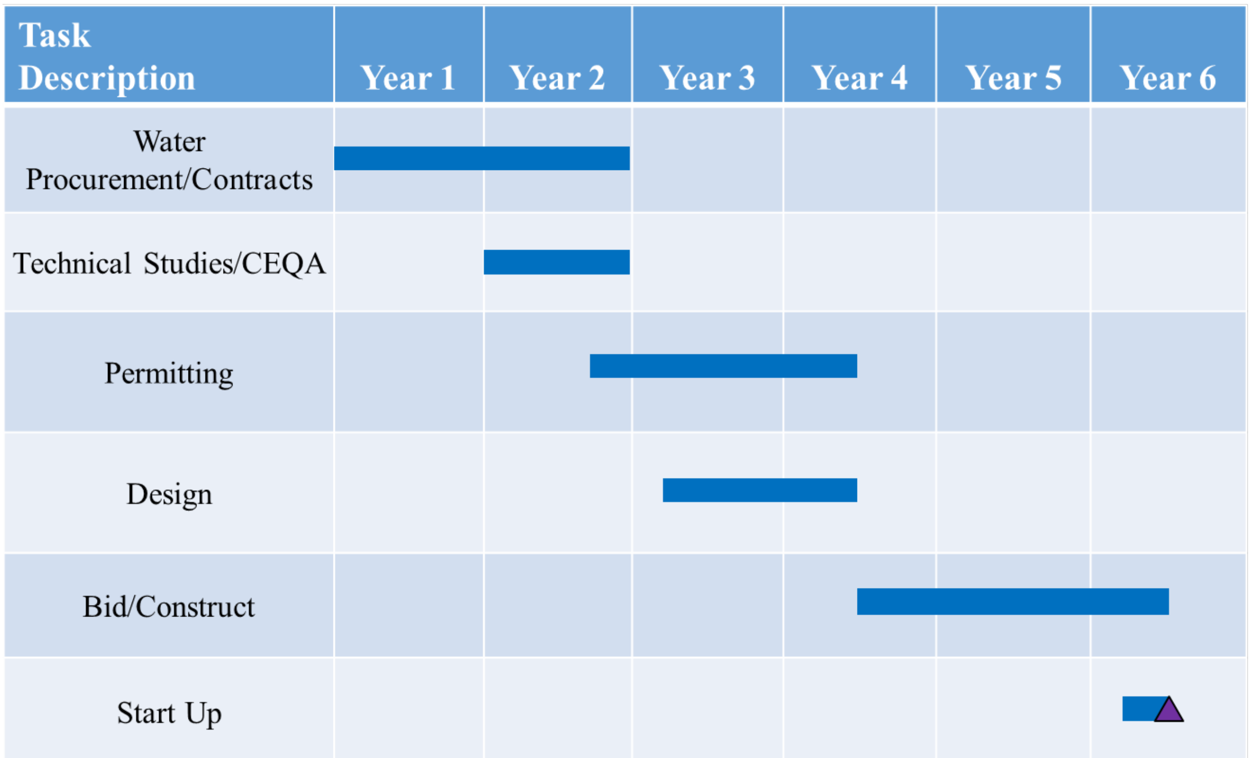

Figure 9-27. Implementation Schedule for Recharge Basin North of City of Paso Robles

9.5.4.4.5 ESTIMATED COST

The estimated total project cost for this project is $1.8M. The project cost will be covered by the bonding capacity developed through the water charges framework. Annual O&M costs are estimated at $53,000. The average annual cost of NWP purchased water is estimated at $1.8M based on an average year delivery of 1,500 AF. However, the unit price would need to be negotiated, and the actual amount of water available will vary year to year thereby affecting the actual annual purchase cost. O&M and water purchase costs would be covered by the overproduction surcharges. Based on a 30-year loan at a 5% interest rate, the cost of water for this project would be approximately $1,300/AF. Additional details regarding how costs were developed are included in Appendix I.

9.5.4.5 Substitute Project 4: Flood Flow Capture and Recharge North of City of Paso Robles

This project uses recharge basins to recharge up to 10 cfs of Salinas River water. Under DWR's draft streamlined permit, an average of 164 AFY would be diverted from the Salinas River and discharged to a 40-acre recharge basin.

The general layout of this project and relevant monitoring wells are shown on Figure 9-34. Infrastructure includes six new radial collector wells, 2,600 ft of pipeline, a 150 hp pump station, and a 40-acre recharge basin. One factor that could increase the cost of this project is the availability of land for purchase near the Salinas River. It is worth noting that the land used for recharge is available for use in the summer months, since recharge from the Salinas River would only occur during the winter months. Based on a 30-year loan at a 5% interest rate, the cost of water for this project would be approximately $6,800/AF. For more information on technical assumptions and cost development, refer to Appendix I.

Other factors would also impact feasibility, including hydrogeological characteristics and the finalized language in the DWR streamlined permit.

9.5.4.5.1 RELEVANT MEASURABLE OBJECTIVES

The measurable objectives benefiting from a recharge basin include:

- Groundwater elevation measurable objectives in the central portion of the Subbasin
- The groundwater storage measurable objective
- Land subsidence measurable objectives in the central portion of the Subbasin

9.5.4.5.2 EXPECTED BENEFITS AND EVALUATION OF BENEFITS

The primary benefit from local recharge from the Salinas River is higher groundwater elevations in the central portion of the Subbasin. Ancillary benefits of shallower groundwater elevations may include an increase in groundwater storage and avoiding subsidence. The GSP model was used to quantify the expected benefit from this project. Figure 9-35 shows the expected groundwater level benefit predicted by the GSP model after 10 years of project operation. Figure 9-35 expresses the benefit as feet of groundwater. The groundwater level benefit shown on Figure 9-35 is a measure of how much higher groundwater elevations are expected to be with the project rather than without the project.

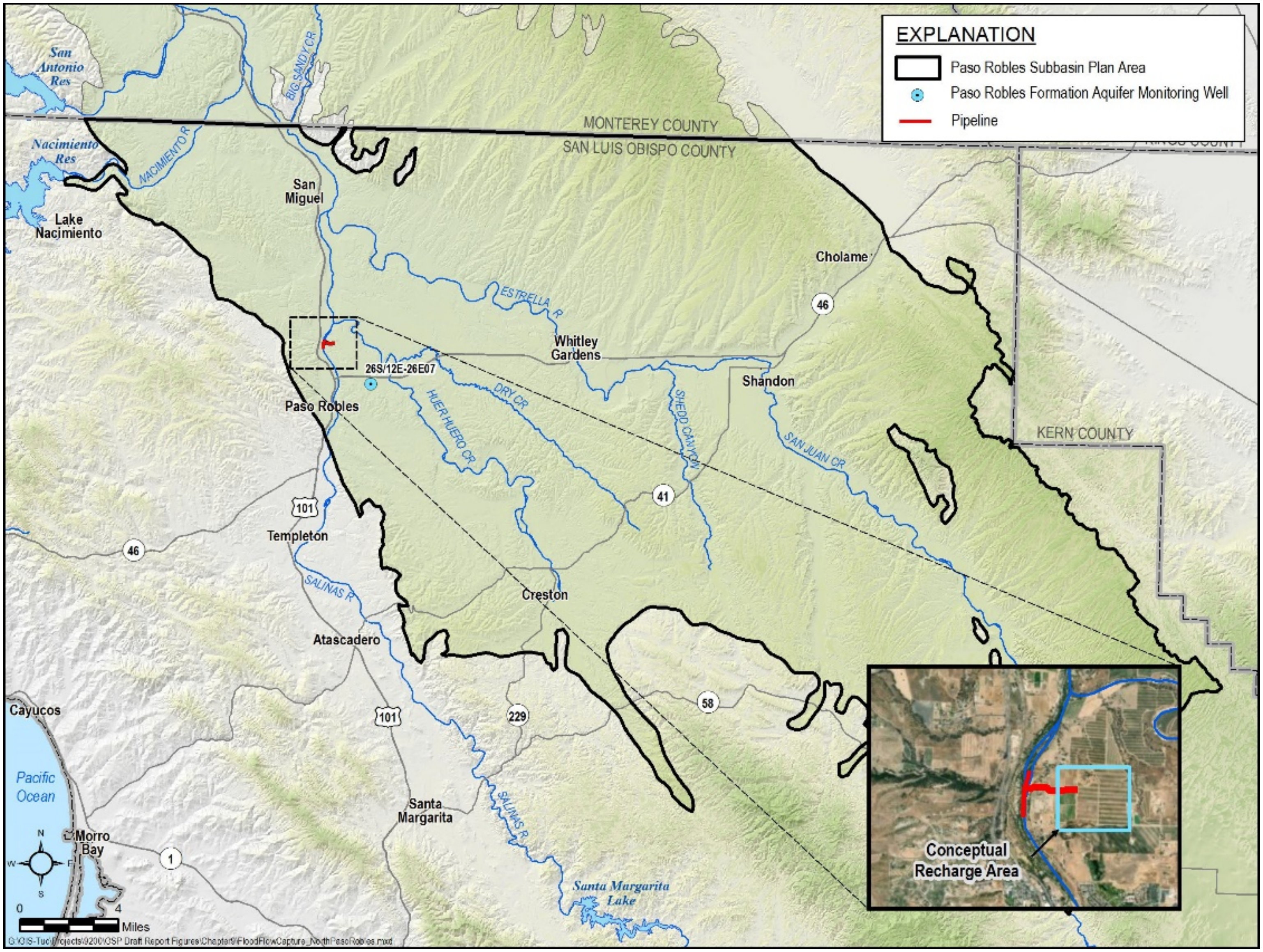

Figure 9-28. Conceptual Flood Flow Capture and Recharge North of City of Paso Robles Project Layout

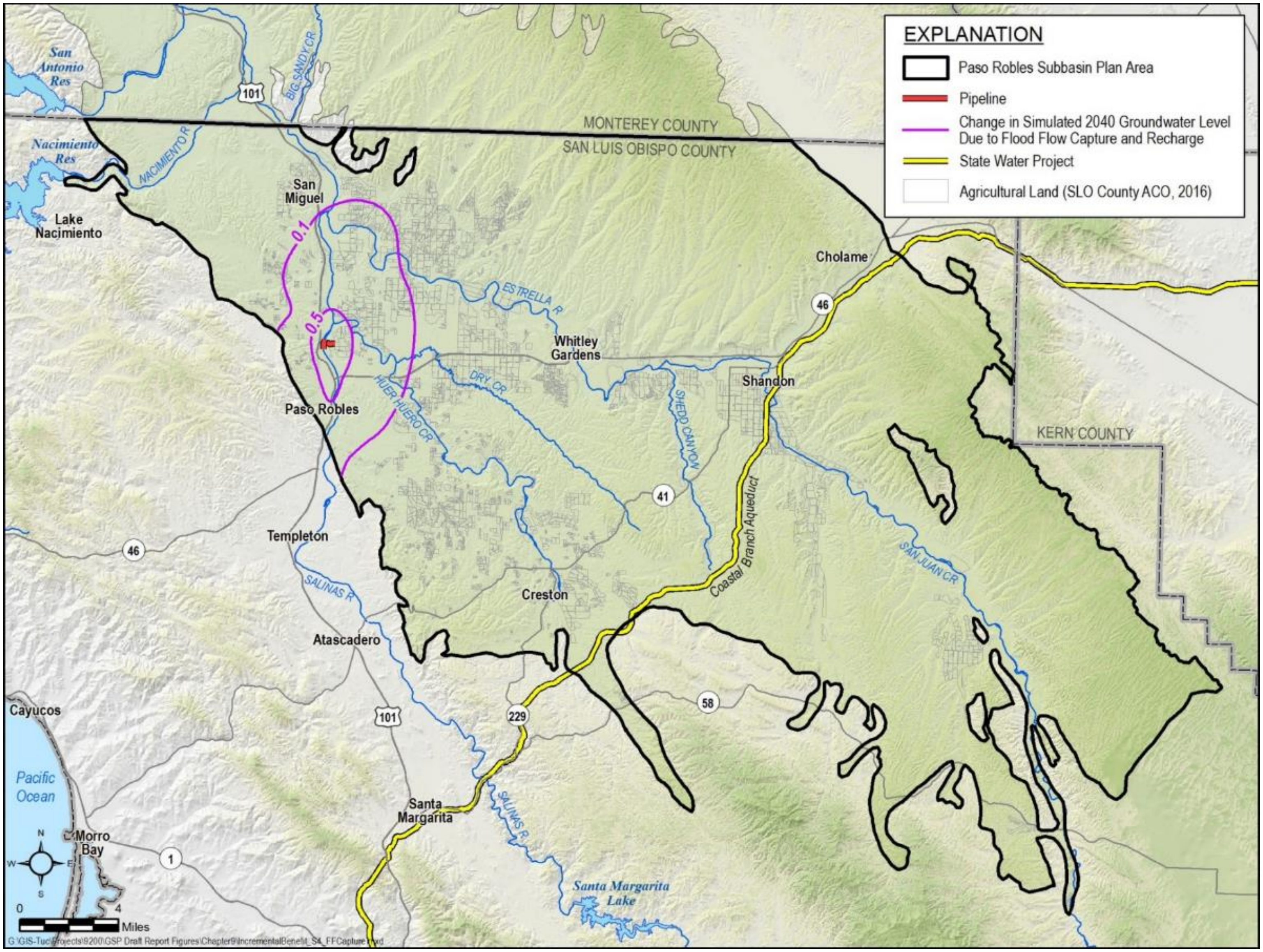

Figure 9-29. Groundwater Level Benefit from Flood Flow Capture and Recharge North of City of Paso Robles

Changes in groundwater elevation will be measured with the groundwater level monitoring program detailed in Chapter 7. Subsidence will be measured with the CGPS station network detailed in Chapter 7. A direct correlation between local recharge and changes in groundwater levels may not be possible because this is only one among many management actions and projects that will be implemented in the Subbasin.

9.5.4.5.3 CIRCUMSTANCES FOR IMPLEMENTATION

All projects are implemented on an as-needed basis. The primary approach to attaining sustainability relies on pumping reductions in response to the water charges framework. If pumping reductions are inadequate for achieving sustainability, the funds raised by the water charge framework will be used to initiate projects throughout the Subbasin. The project to recharge SWP water in the southwestern corner of the Subbasin will be initiated if, after five years, groundwater levels in the southwestern portion of the monitoring network continue to decline at unsustainable rates. In particular, continued unsustainable groundwater level declines in monitoring well 26S/12E-26E07 would trigger implementation of this project. Additional triggers will be added as the monitoring well network expands.

9.5.4.5.4 IMPLEMENTATION SCHEDULE

The implementation schedule is presented on Figure 9-36. The project will take 4 to 6 years to implement depending on the time required to negotiate procurement of NWP water. The actual project start date is to be determined.

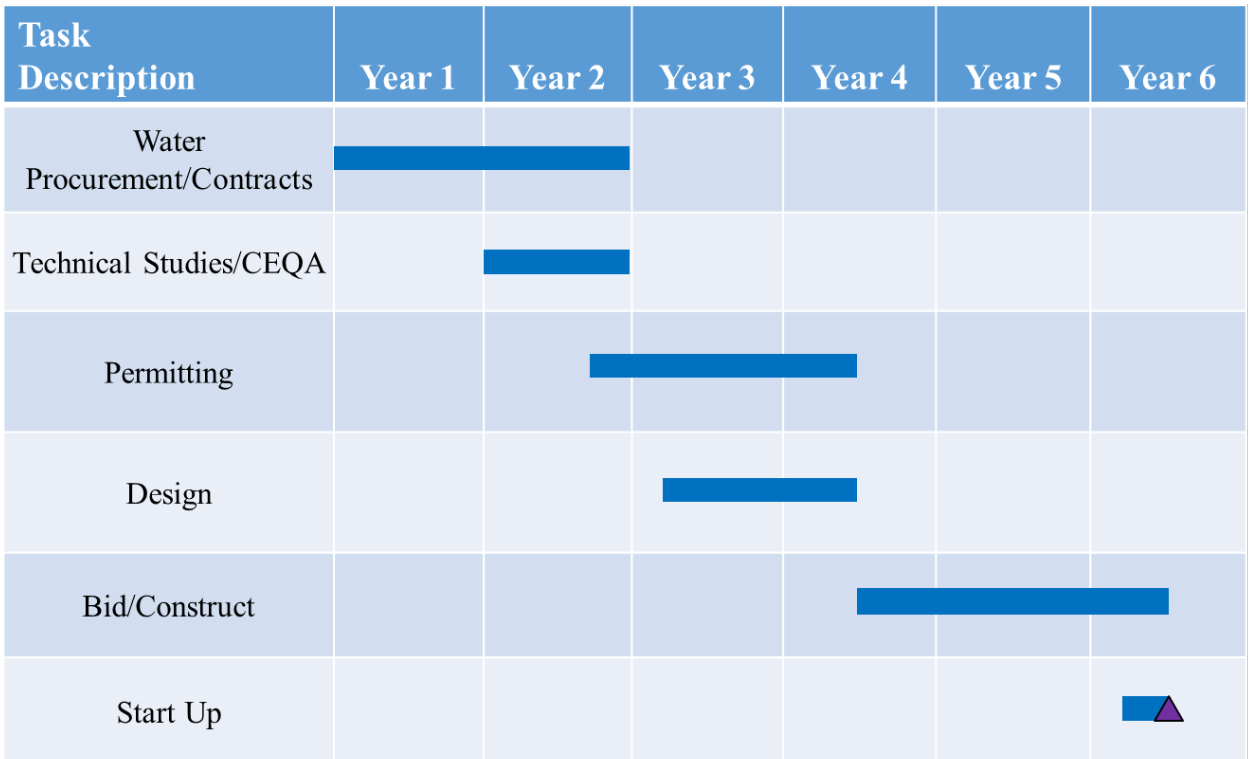

Figure 9-30. Implementation Schedule for Flood Flow Capture and Recharge North of City of Paso Robles

9.5.4.5.5 ESTIMATED COST

The estimated total project cost for this project is $13M. The project cost will be covered by the bonding capacity developed through the water charges framework. Annual O&M costs are estimated at $200,000 for 164 AF of water. This water would not be available every year. There is no direct cost associated with the diversion of Salinas River water. O&M costs would be covered by the overproduction surcharges. Additional details regarding how costs were developed are included in Appendix I.

9.6 Other Groundwater Management Activities

Although not specifically funded or managed by this GSP, a number of associated groundwater management activities will be promoted and encouraged by the GSAs as part of general good groundwater management practices.

9.6.1 Continue Urban and Rural Residential Conservation

Existing water conservation measures should be continued, and new water conservation measures promoted for residential users. Conservation measures may include the use of low flow toilet fixtures, or laundry-to-landscape greywater reuse systems. Conservation projects can reduce demand for groundwater pumping, thereby acting as in-lieu recharge.

9.6.2 Watershed Protection and Management

Watershed restoration and management can reduce stormwater runoff and improving stormwater recharge into the groundwater basin. While not easily quantified and therefore not included as projects in this document, watershed management activities may be worthwhile and benefit the basin.

9.6.3 Retain and Enforce the Existing Water Export Ordinance

San Luis Obispo County's existing water export ordinance should be enforced and retained. The ordinance requires a permit for the movement of sale of groundwater across the county line. To obtain a permit, the water sale cannot negatively impact a nearby overlier, result in seawater intrusion, or result in a cone of depression greater than the landowner's property line. This ordinance will continue to protect the county's water supplies.

9.7 Demonstrated Ability to Attain Sustainability

To demonstrate the ability to attain sustainability, a groundwater management scenario that included both projects and management actions was modeled. The scenario included all of the conceptual projects listed in Section 9.5.3. In addition to the conceptual projects, pumping was reduced to bring groundwater elevations to the measurable objectives by 2040 and maintain the same groundwater elevations through 2070.

The GSP model was adapted to simulate the scenario described above over the GSP implementation period from 2020 through 2040. The ability to achieve sustainability was quantified by comparing 2040 simulated groundwater levels under each of the two scenarios against the Measurable Objective surface – as described in Chapter 8 – for both the Paso Robles formation aquifer and the Alluvial aquifer.

Individual hydrographs comparing the predicted groundwater elevations to the measurable objectives at each representative monitoring site are included in Appendix J.

9.8 Management of Groundwater Extractions and Recharge and Mitigation of Overdraft

This GSP is specifically designed to mitigate the decline in groundwater storage with a combined program of management actions designed to promote voluntary reductions in pumping and provide authority for mandatory pumping reductions where necessary. Individual entities may also implement alternative management programs and/or projects designed to develop new water supplies. If implemented, funds collected through a Groundwater Conservation Program would support fallowing of existing land and reducing pumping, and supplementing the groundwater resource with imported water, either through direct recharge or in-lieu means.

10 REFERENCES

SWRP 2018. San Luis Obispo County Stormwater Resource Plan. Public Draft. September 2018. https://www.slocounty.ca.gov/Departments/Public-Works/Forms-Documents/Committees-Programs/Stormwater-Resource-Plan/Documents/2018-09-10-SWRP-Public-Draft.aspx

WSC 2011. Water Systems Consulting, Inc. *Capacity Assessment of the Coastal Branch, Chorro Valley & Lopez Pipelines.* 2011.