Paso Robles Groundwater Basin Management Plan

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in association with

GEI Consultants

FUGRO

CHG

Paso Robles Basin Groundwater Management Plan

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Abbreviations and Acronyms

Basin	Paso Robles Groundwater Basin
BMOs	Basin Management Objectives
CASGEMs	California Statewide Groundwater Elevations Monitoring Program
CCVT	Central Coast Vineyard Team
City	City of Paso Robles
County	San Luis Obispo County
CSAs	County Service Areas
District	San Luis Obispo County Flood Control and Water Conservation District
DPH	California Department of Public Health (formerly Department of Health Services)
DPW	County Department of Public Works
DWR	California Department of Water Resources
GAC	Groundwater Advisory Committee
GMAs	Groundwater Management Activities
GMP	Groundwater Management Plan
IRWMP	Integrated Regional Water Management Plan
M&I	Municipal and Industrial
MCWRA	Monterey County Water Resources Agency
MOU	Memorandums of Understanding
msl	mean sea level
NRCS	Natural Resources Conservation Service
Plan	Paso Robles Groundwater Basin Management Plan
PRIOR	Paso Robles Imperiled Overlying Rights
PRWCA	Paso Robles Wine Country Alliance
RCS	Resource Capacity Study
RMS	Resource Management System
State	State of California
SWP	State Water Project

TDS	total dissolved solids
UWMP	Urban Water Management Plan
WRAC	Water Resource Advisory Committee
WPAs	Water Planning Areas

1 Introduction

1.1 Introduction

The Paso Robles Groundwater Basin (Basin) is located in northern San Luis Obispo County (County) and southern Monterey County and was described in the 1958 California Department of Water Resources (DWR) Bulletin 118, San Luis Obispo County Investigation. As part of the efforts to map the groundwater basins in the State of California (State) presented in Bulletin 118, DWR identified the Paso Robles Area Groundwater Subbasin of the Salinas Valley Groundwater Basin and designated it as Basin Number 3-4.06. The Basin boundary was later updated in the Paso Robles Groundwater Basin Study (2002) and is shown on Figure 1-1.

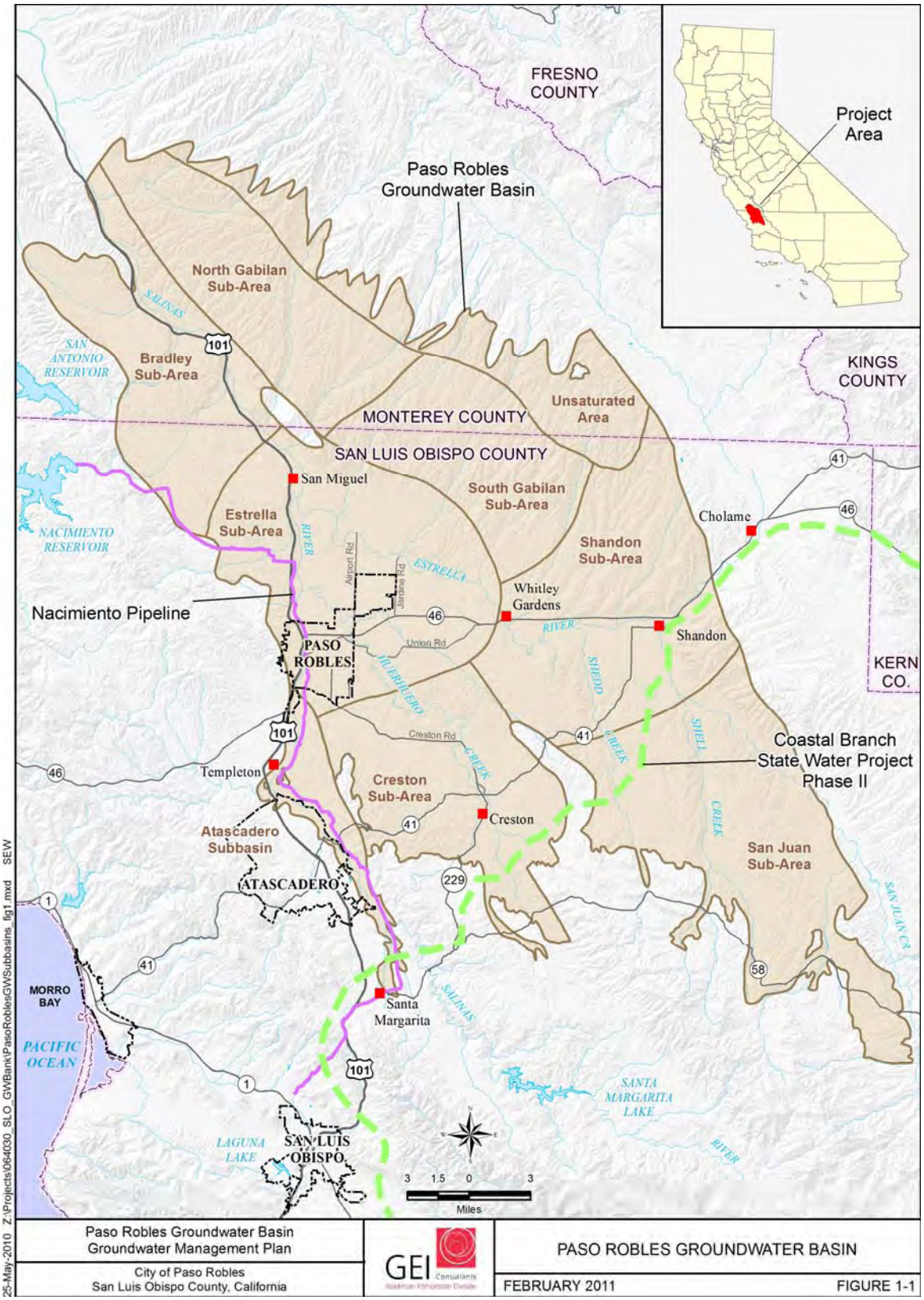
The Basin supplies water for 29 percent of the County's population and an estimated 40 percent of the agricultural production of the County. The municipal and industrial (M&I), domestic, and agricultural demands in the Basin currently rely exclusively on groundwater (including the underflow of streams). The M&I water demands include the cities of Paso Robles and Atascadero, the communities of Templeton, Shandon, Creston, and San Miguel, Bradley, Camp Roberts, and the small community systems in Whitley Gardens and Garden Farms. Individual domestic groundwater users and isolated subdivisions are located throughout the Basin, often in the more rural areas dispersed among the agricultural areas. Agricultural water users constitute an estimated 67 percent of the pumpage in the Basin and are concentrated on the alluvial valleys of the streams and rivers and along the Highway 46 corridor.

Over the past decade, the San Luis Obispo County Flood Control and Water Conservation District (District) and the City of Paso Robles (City) have worked with other pumpers in the Basin to begin a more organized approach to groundwater management as described in Section 2.

The Basin Study (Fugro, 2002) estimated the volume of groundwater storage along with basin inflows and outflows. These values were used to compile a hydrologic budget (water balance) and establish a perennial yield (also called the safe yield) for the Basin at 94,000 acre-feet per year. In 2005, the perennial yield was modified to 97,700 acre-feet per year based on additional analysis.

Based on a recent (Todd, 2007) monitoring report, the Basin was not at the safe yield although some areas were experiencing significant declines in groundwater elevations. A later study completed in 2009 suggests groundwater pumping was approaching the safe yield of the Basin, which led to the recommendation to do a groundwater management plan.

Figure 1-1. Paso Robles Groundwater Basin



The Resource Capacity Study prepared by the San Luis Obispo County Planning Department in November 2010 states that the Basin is near or at perennial yield, and contains land use and water use monitoring and conservation recommendations within the authority of the County and District to help ensure the sustainability of the Basin into the future.

The Paso Robles Basin Groundwater Management Plan was prepared coincident with the preparation of the Resource Capacity Study as well as other ongoing studies to develop a stakeholder-driven voluntary plan to provide a framework for future groundwater management activities. This project was funded by a grant from the Local Groundwater Assistance Act of 2000 (California Water Code Section 10795 et seq) to provide grants to public agencies to conduct groundwater studies or to carry out groundwater monitoring and management activities. Local Groundwater Assistance Grants (AB303) are awarded by the California Department of Water Resources (DWR). Funding was available in 2007-2008 for AB303 grants.

The purpose of this Plan is to develop a common understanding of the groundwater issues and management opportunities in the Basin and identify and support projects such as conjunctive use, recycled wastewater, and demand management, which will improve groundwater management. Following development of the Plan, the goal is to implement the activities identified in the Plan to achieve the Basin Management Objectives that are identified in the Plan. Figure 1-2 shows some of the interconnectivity of the groundwater management activities that are part of groundwater management planning and implementation. The approach illustrated in Figure 1-2 was applied during the development of this Plan.

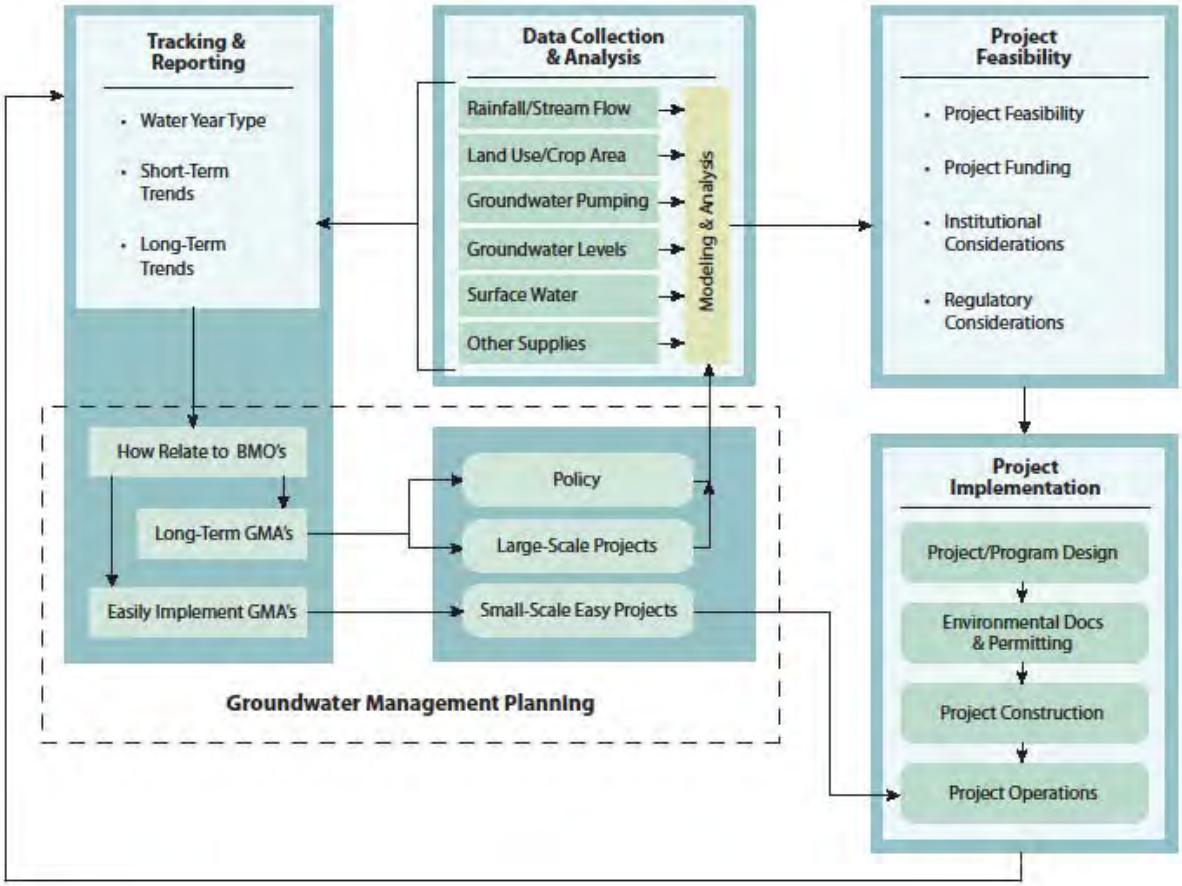
Groundwater management requires groundwater level and other data collected and analyzed on a routine basis (typically annually) to establish the current conditions of the groundwater basin. Groundwater data is tracked and reported to agencies, interested parties, and stakeholders.

This information is also used to establish groundwater management goals and objectives (referred to as Basin Management Objectives [BMOs]) and identify specific actions (referred to as Groundwater Management Activities [GMAs]).

Depending on the difficultly and complexity of GMAs, additional analysis may be needed to support their implementation. Relatively simple projects that are feasible and provide benefit may be able to be implemented easily, while more complex, large, expensive projects or projects that include multiple agencies may require additional analysis and studies to establish their feasibility and quantify their benefits.

The effects of these projects and other groundwater management activities are expected to result in changed groundwater conditions which are monitored and reported to the agencies, interested parties, and stakeholders.

Figure 1-2. Groundwater Management in the Paso Robles Groundwater Basin



1.2 Regional Groundwater Management Plan Area

The Basin was first formally defined by the California Department of Water Resources (DWR, 1958). In 1979, the DWR published a detailed investigation of the San Luis Obispo County portion of the Basin (DWR, 1979).

The Basin encompasses an area of approximately 505,000 acres (790 square miles). The Basin ranges from the Garden Farms area south of Atascadero to San Ardo in Monterey County, and from the Highway 101 corridor east to Shandon (Figure 1-1). Most of the Basin is hydraulically connected by thick sedimentary sections. The Basin is divided into smaller subareas based on water quality, source of recharge, groundwater movement, and the contours of the base of permeable sediments.

The Atascadero Subbasin is defined as that portion of the Basin west of the Rinconada fault. Between Atascadero and Creston, the Rinconada fault juxtaposes less permeable Monterey Formation rocks with the Paso Robles Formation basin sediments. South of the City of Paso Robles, the Paso Robles Formation is found on both sides of the Rinconada fault; however, the fault zone is believed to form a leaky barrier that restricts flow from the Atascadero

Subbasin to the main part of the Basin. As a result of this, the Atascadero Subbasin is considered a hydrologically distinct subbasin within the Basin. The Rinconada Fault does not act as a hydraulic barrier to groundwater flow in the Salinas River Alluvium. As such, groundwater flow in the Alluvium is continuous along the stretch of the Salinas River that traverses the entire Basin. The Atascadero Subbasin encompasses the Salinas River corridor area south of Paso Robles and includes the communities of Garden Farms, Atascadero, and Templeton.

The western boundary of the Basin roughly follows Highway 101 from Santa Margarita northward to Hames Valley. The eastern boundary follows a rough line from Highway 58 in the San Juan Creek area northward to Shandon and Cholame. The Basin is downstream of and hydraulically connected by alluvial deposits to the Pozo Groundwater Basin south of the Basin, and to the Cholame Groundwater Basin north of the Basin. The Basin outlet is northwest and downstream of Bradley, where it is hydraulically connected with the Salinas Valley Groundwater Basin.

The Basin was subdivided into subareas in the Phase I Report (Fugro, 2002) as a practical approach to organize the 790 square mile Basin into smaller informal areas (see Figure 1-1) and listed below.

1. Atascadero Subbasin
2. Creston Subarea
3. San Juan Subarea
4. Estrella Subarea
5. Shandon Subarea
6. North Gabilan Subarea
7. South Gabilan Subarea
8. Bradley Subarea

Just north of San Miguel there is an area of basement rock that extends to the ground surface that is not considered part of the groundwater basin. This area is located between the Estrella, North Gabilan, and Bradley Subareas, but is not considered to be part of any of them.

Near the edges of the Basin, the Paso Robles Formation becomes thin, and wells located in these areas may tap the Paso Robles Formation as well as basement rock. Because of this, wells tapping both the Paso Robles Formation and basement rocks may experience different groundwater level conditions than wells tapping only the Paso Robles Formation.

1.3 Existing Groundwater Management Activities

Since 1998, the local agencies and local stakeholders via a public “North County Water Forum” including Monterey County Water Resources Agency have worked in cooperation to complete several projects to support the technical investigations and improve groundwater management in the Basin. These efforts, listed below, demonstrate the interest, support, and

continuing commitment of the individual agencies, stakeholders, and interested parties in protecting the Basin's groundwater resources. Much of the information developed in the efforts was incorporated into the Plan.

- Master County Water Plan (EDAW, 1998)
- Paso Robles Groundwater Basin Study (Fugro West, 2002)
- Monitoring Program Evaluation (Cleath & Associates, 2003)
- Paso Robles Groundwater Basin Study Phase II –Numerical Model Development, Calibration, and Application (Fugro West , 2005)
- Paso Robles Groundwater Basin Agreement (2005)
- San Luis Obispo County Integrated Regional Water Management Plan (San Luis Obispo County Flood Control and Water Conservation District, 2005)
- City of Paso Robles Urban Water Management Plan (Todd Engineers,2007)
- City of Paso Robles Water Resources Plan Integration and Capital Improvement Program (T.J. Cross Engineers, 2007)
- Annual Report on the Paso Robles Groundwater Basin (Todd Engineers, 2007)
- Paso Robles Groundwater Basin Water Banking Feasibility Study (GEI Consultants, Inc., 2007)
- Evaluation of Paso Robles Groundwater Basin Pumping – Water Year 2006 (Todd Engineers, 2009)
- Paso Robles Groundwater Basin Water Balance Review and Update (Fugro, 2010)
- San Luis Obispo County Master Water Plan (Wallace Group,2010, ongoing)
- Peer Review of Paso Robles Groundwater Basin Studies (Gus Yates, 2010)
- Revised Resource Capacity Study – Water Supply in the Paso Robles Groundwater Basin (San Luis Obispo County Planning Department, 2011)

Each of these groundwater management activities is described below.

1.3.1 Master County Water Plan (1998)

This update of the Master Water Plan evaluated 12 distinct "Water Planning Areas" throughout the County, tabulating water demand and published yields of developed water sources for each area. The result of this effort was an overall inventory of how demand matched supply throughout the County, noting priorities for development of supply projects and guidance for the pace of building permit issuance. This proved to be the foundation document that pointed to the need to further study the County's largest water supply – the Paso Robles Groundwater Basin.

1.3.2 Paso Robles Groundwater Basin Study (2002)

In 2002, the Paso Robles Groundwater Basin Study (Basin Study) investigated the hydrogeologic conditions and quantified the water supply capability of the Basin by defining the lateral and vertical extent of the aquifer, groundwater flow and movement, and current water quality conditions. The Basin Study identified the subareas within the Basin and local hydrogeologic settings based upon water quality, source of recharge, groundwater movement, and basin depth.

The Basin Study estimated the volume of groundwater storage along with basin inflows and outflows. These values were used to compile a hydrologic budget (water balance) and establish a perennial yield for the Basin of 94,000 acre-feet per year. Demand at the time was estimated at 82,600 acre-feet per year and is predominantly agricultural demand. The author recommended the development of a numerical groundwater model (described below) to evaluate future hydraulic conditions.

1.3.3 Paso Robles Groundwater Monitoring Program Evaluation (2003)

The County has been monitoring groundwater levels for more than 40 years in the Basin. The Monitoring Program Evaluation was completed to evaluate the efficiency and effectiveness of the County's Groundwater Level Monitoring Program for wells located in the Basin. Based on the final report of the 154 wells in the program, County Public Works employees monitor 99 wells, and 55 wells are monitored by local municipal water company employees (who forward the data to the County's Public Works Department for inclusion in the monitoring program database). The report provides several recommendations for improving the groundwater level measuring program.

1.3.4 Paso Robles Groundwater Basin Study Phase II – Numerical Model Development, Calibration, and Application (2005)

In 2005, a numerical groundwater flow model was developed as a quantitative tool to evaluate future hydraulic conditions of the Basin. The model was used to refine uncertainties in the hydrologic budget and evaluate the Basin's response to current and future water demands with and without supplemental water, including areas of declining water levels. In 2007, the model was used in the Water Banking Feasibility Study (described below) to evaluate potential recharge and water banking projects and identify management practices that could be employed to optimize water use. This effort revised the Basin perennial yield estimate to 97,700 acre-feet per year.

1.3.5 Paso Robles Groundwater Basin Agreement (2005)

The Agreement was entered into on August 19, 2005 by the District, several overlying landowners who have organized as the Paso Robles Imperiled Overlying Rights (PRIOR) group, and the City of Paso Robles and County Service Area No. 16 (collectively referred to as Municipal Users). Since 2005, additional overlying landowners and the San Miguel Community Services District, as a Municipal User, have also signed the Agreement. The Agreement requires the District to declare the Basin to be in a state of overdraft, when appropriate, at which point a period of time is conferred to allowing overlying landowners sufficient time to react to such

a declaration. In the Agreement, the District serves as the technical advisor to both the Landowners and Municipal Users.

The Agreement recognizes the need for monitoring and appropriate management of the existing Basin supplies and also recognizes that bringing additional water resources to the Basin could delay or avoid entirely the Basin becoming overdrafted in the future. The Agreement also recognizes signatories' desire to preserve their respective groundwater rights, notwithstanding implementation of any management measures, thereby providing the framework for cooperation among the Landowners and Municipal Users to participate in the development of a groundwater management plan.

1.3.6 San Luis Obispo County Region Integrated Regional Water Management Plan (2007)

The District, in cooperation with the District's Water Resources Advisory Committee (WRAC), prepared the Region's Integrated Regional Water Management Plan (IRWMP) to align water resources management planning efforts for achieving sustainable water resources Countywide with the State planning efforts through 2030. The IRWMP was used to support the Region's water resource management planning and submittal of grant applications to fund these efforts. The IRWMP established specific goals and objectives to achieve water resources sustainability. The IRWMP integrated 19 different water management strategies that have or will have a role in protecting the region's water supply reliability, water quality, ecosystems, groundwater, and flood management objectives. The integration of these strategies resulted in a list of action items (projects, programs, and studies) needed to implement the IRWMP. District staff and the WRAC Integrated Regional Water Management Subcommittee prioritized the action items. The IRWMP was adopted in December 2005 and updated in July 2007.

The IRWMP identified the following groundwater monitoring and management objectives that are intended to ensure the region's groundwater resources remain suitable for continued use.

- Continue monitoring and reporting programs for groundwater basins in the region.
- Evaluate and consider groundwater banking programs.
- Protect and improve groundwater quality from point and non-point sources of pollution.
- Conduct public education and outreach regarding groundwater protection.
- Identify areas of known or expected conflicts and target stakeholders on specific actions that they should take to help protect groundwater basin quality and supply.
- Recharge groundwater with high-quality water.

The groundwater management objectives and strategies presented for the Region in the IRWMP will be used to guide the development of the Groundwater Management Plan for the Basin.

1.3.7 City of Paso Robles Urban Water Management Plan (2007)

The Urban Water Management Plan (UWMP) supported the IRWMP by describing the City's current and future water demands, identifying current water supply sources, and assessing supply reliability for the City. The UWMP describes the City's reliance on groundwater and its support of efforts to avoid overdraft by developing additional sources. These sources include water conservation, surface water from Lake Nacimiento, and the use of recycled water for irrigation. The Plan identifies beneficial impacts to groundwater quality through the use of these sources.

1.3.8 Water Resources Plan Integration and Capital Improvement Program (2007)

The City prepared the integrated plan at the conclusion of eight significant water resource reports prepared on the City's behalf. The integrated plan is a sequencing of the recommended actions from the eight individual plans, accompanied by a capital improvement program to provide funding. This document captures the City's overall water resource goals and identifies a self-sustaining water resource portfolio for the City, along with steps necessary to build that portfolio. The Plan reinforced the need for the City to secure entitlement of water from the Nacimiento Water Project. The City's decade long involvement in the Nacimiento Water Project culminated in 2004 when the City secured the entitlement to 4,000 acre-feet per year from the Nacimiento Water Project. Since then, the City has embarked on design of a water treatment plant in 2007, developed a private well policy in 2007, and is poised to upgrade the City's wastewater treatment plant to facilitate water recycling efforts.

1.3.9 Annual Report on the Paso Robles Groundwater Basin (2007)

The Annual Report on the Paso Robles Groundwater Basin (Annual Report) was prepared in 2007 to continue to monitor and evaluate groundwater conditions in order to delay or avoid Basin overdraft. The Annual Report provides an update of the rainfall, groundwater levels and storage, and groundwater management planning for the 1997 to 2006 period that has taken place since the completion of the Basin Study (Phase I Report) in 2002, which included the 1981 to 1997 period.

During the 1997 to 2006 period, this report estimated that groundwater storage declined by about 29,800 acre-feet (about 3,300 acre-feet per year). Recommendations from the Annual Report include continuing the cooperative efforts to improve groundwater level monitoring and updating the groundwater pumping estimates from the Phase I report.

1.3.10 Paso Robles Groundwater Basin Water Banking Feasibility Study (2007)

The Paso Robles Groundwater Basin Water Banking Feasibility Study (Feasibility Study) was identified as an "A1" priority project in the County's IRWMP and was undertaken by the District to determine the feasibility of banking available State Water Project (SWP) supplies in order to improve the overall water supply reliability in the County. This investigation is important to the region because it evaluates opportunities to more fully utilize the unused portion of the District's 25,000 acre-feet per year SWP supply, which could

improve local groundwater conditions, increase dry-year water supplies, improve local groundwater quality, provide greater flexibility in groundwater management, and reduce the dependence on imported water supplies in below normal years.

The primary purpose of the Feasibility Study was to determine the technical feasibility of a recharge or water banking project in the Basin. The technical feasibility was based on the local hydrogeologic suitability and engineering feasibility. Additional groundwater management and operational considerations as well as environmental and permitting issues were also identified. Three potential recharge areas were evaluated separately for both recharge and water banking alternatives. Two of the areas may provide opportunities for recharge or water banking operations. The Feasibility Study was only based on physical feasibility and design. Institutional and cost considerations would need to also be addressed to determine if the project should be implemented in those locations.

Some of the groundwater management related recommendations from this project included:

1. Preparing a groundwater management plan to provide a framework for managing the Basin and establishing Basin Management Objectives.
2. Continue the District's annual groundwater monitoring plan to track changes in groundwater levels and quality.
3. Installing dedicated monitoring wells, as needed, to fill data gaps.

1.3.11 Evaluation of Paso Robles Groundwater Basin Pumping – Water Year 2006 (2009)

This report updates the pumping estimate from the Paso Robles Groundwater Basin Study (Basin Study), which provided estimates of pumping for water years 1997 and 2000.

This report utilized land use, population, well production, well locations, and water demand information to estimate the 2006 groundwater pumping by use sector including agricultural, urban, small water systems, and rural groundwater use for the different subareas within the Basin. The estimated groundwater pumping in 2006 totaled 88,154 acre-feet, about 90 percent of the estimated perennial yield (97,700 acre-feet) for the entire Basin. Pumping within the Atascadero Subbasin in 2006 totaled 15,532 acre-feet, about 94 percent of the estimated perennial yield (16,400 acre-feet).

A new estimate of projected groundwater pumping in 2025 was made based upon this information. The annual groundwater pumping projected for 2025 totaled 107,779 acre-feet (adjusted for gross agricultural pumping), about 110 percent of the perennial yield.

1.3.12 Paso Robles Groundwater Basin Water Balance Review and Update (2010)

This report provides an update of the water balance for the Paso Robles Groundwater Basin and the Atascadero Subbasin for the water years 1998 to 2009, as well as an analysis of the effect of importing water on the water balance for both the Basin and Subbasin for the future period of 2010 to 2025.

The water balance calculations presented in the report show that demand in both the Atascadero Subbasin and the Paso Robles Groundwater Basin as a whole is approaching the average annual perennial yield. The results of this study suggest that future groundwater storage investigations should evaluate the groundwater storage separately for the three different aquifer regimes (shallow alluvial aquifers, the Paso Robles Formation in the Subbasin, and the Paso Robles Formation within the entire Basin). This study reinforces the need for the implementation of an effective monitoring plan to further improve the understanding of the relationships between the aquifer regimes and support improved groundwater management in the Basin.

1.3.13 San Luis Obispo County Master Water Plan (2010, ongoing)

The purpose of the County Master Water Plan is to present a complete picture of the water resources management in San Luis Obispo County and how the practices (i.e., water use, policy adoption, planning, and project implementation) of all the entities within the County influence each other with respect to water resources. This ongoing project separates the County into three sub-regions (North Coast, South Coast, and Inland) and further divides them into sub-regional Water Planning Areas (WPAs) that were formed in consideration of physical boundaries such as groundwater basins and watershed and jurisdictional boundaries. Information is summarized in the Master Water Plan for the WPAs.

Technical Memorandum No. 3 titled 'Task C.3 Water Supply Inventory and Assessment-Water Supply, Demand, and Water Quality provides a draft summary of the existing and projected water demands and supplies within the County for local purveyors. The Paso Robles Groundwater Basin is included within WPA 13 and 14 within the Inland Sub-Region.

1.3.14 Peer Review of Paso Robles Groundwater Basin Studies

An independent review of the groundwater basin studies was prepared to compare some approaches and conclusions of previous reports regarding the status of the conditions in the Paso Robles Groundwater Basin. A total of five reports were reviewed as part of the peer review, which included a more detailed comparison of the Todd 2009 Report and the Fugro 2010 Report. The Todd report found declines in the basin and subbasin storage between the 2000 and 2006. The peer review concluded that groundwater pumping was nearing the perennial yield, and those efforts to supplement the groundwater supplies will help to maintain the balance. The peer review recommended several courses of action that included:

- Continuing to monitor groundwater levels across the Basin and improve monitoring in areas not currently covered in the County's water level monitoring program.
- Update and enhance the groundwater flow model.
- Secure supplemental water supplies to reduce groundwater pumping.
- Support cooperative groundwater management in the Basin.

1.3.15 Revised Resource Capacity Study – Water Supply in the Paso Robles Groundwater Basin

The Resource Capacity Study (RCS) addresses the state of the Paso Robles Groundwater Basin based on work already completed, which included:

- Paso Robles Groundwater Basin Study (Fugro, 2002)
- Paso Robles Groundwater Basin Study Phase II – Numerical Model Development, Calibration, and Application (Fugro, 2005)
- Evaluation of Paso Robles Groundwater Basin Pumping – Water Year 2006 (Todd, 2009)
- Paso Robles Groundwater Basin Water Balance Review and Update (Fugro, 2010)

These studies have calculated the water use by major water use sectors (agriculture, rural land uses, small commercial uses, municipal systems, and small community systems). The results of these studies show that groundwater use has increased during the 1980 to 2009 period to the point where the Basin outflows (including groundwater pumping) will soon be greater that Basin inflows (recharge).

The County's Resource Management System (RMS) provides a mechanism for ensuring a balance between land development and the resources necessary to sustain such development. When a resource deficiency becomes apparent, efforts are made to determine how the resource capacity might be expanded, where conservation measures could be introduced to extend the availability of the unused capacity, or where development should be limited or redirected to areas with remaining resource capacity.

The RMS uses three levels of severity designations from Level of Severity I (least severe) to Level of Severity III (most severe) based on the rate of depletion and an estimate of the remaining capacity, if any. The Levels of Severity for water supply are summarized below:

1. **LOS I:** Level I is reached for a water resource when increasing water demand projected over nine years equals or exceeds the estimated dependable supply.

2. **LOS II:** Level II for a water resource occurs when water demand projected over seven years (or other lead time determined by a resource capacity study) equals or exceeds the estimated dependable supply.

3. **LOS III:** A Level of Severity III exists when water demand equals the available resource; the amount of consumption has reached the dependable supply of the resource.

According to the above designation, an LOS III can be established if a basin has reached its perennial yield *or dependable supply will be depleted before new supplies are developed* (emphasis added in RCS). The January RCS recommends a Level of Severity III for the Paso Robles Groundwater Basin and a level of Severity I for the Atascadero Basin.

The RCS also recommended actions to include:

- Water conservation measures that will lead to more efficient water use.
- Land use controls that will reduce conflicts over the limited groundwater resource.

The RCS also recognizes the following important decision-making constraints, which complicate any action the County may wish to take:

- The County has a limited regulatory role in water use, especially by cities and agriculture. Therefore it will be difficult for the County to directly affect the use of water by the two primary groundwater users.
- The County's primary regulatory role is land use regulation and building permit issuance.
- The major portion of the basin outflows are not measured, but are estimated. While municipal pumping is measured, agricultural, rural, and small community/commercial pumping is estimated. This adds uncertainty regarding actual groundwater use.
- Identification of changing groundwater levels is based on somewhat limited data.

Because the County's primary regulatory role is land use regulation and issuance of building permits, it had developed recommended actions that emphasize this regulatory role. These actions are consistent with the County's General Plan in the Conservation and Open Space Element and the Agricultural Element.

2 Need for Groundwater Management Planning

2.1 Legislative Requirements

Groundwater management is planned and coordinated locally to ensure a sustainable groundwater basin to meet future water supply needs. With the passage of AB 3030 in 1992, local water agencies were provided a systematic way of formulating Groundwater Management Plans (GMPs) (California Water Code, Sections 10750 et seq.). AB 3030 also encourages coordination between local entities through joint power authorities or Memorandums of Understanding (MOU).

AB 3030 was amended in 2002 with the passage of The Groundwater Management and Planning Act of 2002 (SB 1938). The act amends existing law related to groundwater management by local agencies. The law requires any public agency seeking State funds administered through DWR for the construction of any groundwater projects or groundwater quality projects to prepare and implement a GMP with certain specified components. Prior to this legislation, there were no required plan components. New requirements include establishing Basin Management Objectives, preparing a plan to involve other local agencies in a cooperative planning effort, and adopting monitoring protocols that promote efficient and effective groundwater management.

2.2 GMP Components

The Paso Robles Groundwater Management Plan includes three types of components: SB 1938 mandatory components, AB 3030 and SB 1938 voluntary components, and DWR Bulletin 118-suggested components. The seven mandatory components that are required to be compliant with SB 1938 are addressed in the GMP. The GMP also addresses the 12 specific technical elements identified in the California Water Code, along with the seven recommended components identified in DWR Bulletin 118 (DWR 2003). Table 2-1 lists the required and recommended components and identifies the specific location within this GMP where the information can be found.

Table 2-1. Paso Robles Basin GMP Components

Components	Section
SB 1938 Mandatory Components	
1. Documentation of public involvement statement	Appendix C
2. Basin Management Objectives (BMOs)	Section 4
3. Monitoring and management of groundwater elevations, groundwater quality, inelastic land subsidence, and changes in surface water flows and quality that directly affect groundwater levels or quality or are caused by pumping	Section 4 and Appendix D
4. Plan to involve other agencies located in the groundwater basin	Section 6
5. Adoption of monitoring protocols	Appendix E
6. Map of groundwater basin boundary, as delineated by DWR Bulletin 118, with agency boundaries that are subject to GMP	Section 3
7. For agencies not overlying groundwater basins, prepare the GMP using appropriate geologic and hydrogeologic principles	Not Applicable
AB 3030 and SB 1938 Voluntary Components	
1. Control of saline water intrusion	Section 5
2. Identify and manage well protection and recharge areas	Section 5
3. Regulate the migration of contaminated groundwater	Section 5
4. Administer well abandonment and destruction program	Section 5
5. Control and mitigate groundwater overdraft	Section 5
6. Replenish groundwater	Section 5
7. Monitor groundwater levels	Section 4 and Appendix E
8. Develop and operate conjunctive use projects	Section 7
9. Identify well-construction policies	Section 5
10. Develop and operate groundwater contamination cleanup, recharge, storage, conservation, water recycling, and extraction projects	Section 5
11. Develop relationships with State and federal regulatory agencies	Section 6
12. Review land use plans and coordinate with land use planning agencies to assess activities that create reasonable risk of groundwater contamination	Section 5 and Section 7
DWR Bulletin 118 Suggested Components	
1. Manage with guidance of advisory committee	Section 6
2. Describe area to be managed under GMP	Section 1
3. Create links between BMOs and goals and actions of GMP	Section 4
4. Describe GMP monitoring programs	Section 4 and Appendix E
5. Describe integrated water management planning efforts	Section 7
6. Report of implementation of GMP	Section 7
7. Evaluate GMP periodically	Section 7

2.3 Purpose and Goals of the Groundwater Management Plan

This document presents a locally developed, stakeholder-driven GMP that reflects current State law; coordinates existing groundwater management; and defines actions for developing projects and management programs to monitor the operation of the groundwater basin and to improve the long-term sustainability of groundwater resources in the Paso Robles Groundwater Basin.

This GMP provides action items that, when implemented, will maintain or enhance groundwater levels and water quality, minimize inelastic land subsidence, and manage available surface and groundwater conjunctively to allow greater operational flexibility.

The purpose of the GMP is to provide a framework for coordinating groundwater and surface water management activities into a cohesive set of management objectives and implementing the actions necessary to meet those objectives.

The purposes of this project include:

- Build upon the existing organization of local water purveyors, agricultural interests, and individual stakeholders to develop a regional understanding of the groundwater setting and groundwater management opportunities in the Basin.
- Formulate groundwater management actions that lead to improved groundwater information gathering and data management within the Basin.
- Identify water supply and demand management projects and programs that can be implemented to improve long-term water supply reliability in the Basin.
- Establish a regional and on-going approach to groundwater management that is accepted in the Basin and recognized by other local, State, and federal agencies and that can be used successfully to pursue grant funding to implement projects that support improved groundwater management.

The project goals include:

- Alert stakeholders to the state of the Basin and the actions needed to keep this Basin in balance and avoid heading into the projected state of overdraft.
- Complete and adopt the GMP, particularly the BMOs.
- Expand the existing groundwater monitoring program, consider additional monitoring efforts, and develop an annual reporting format for the Basin Plan area.
- Continue to coordinate recent land and water use analysis for the Basin with countywide planning efforts such as the Resource Capacity Study and implementation of the Conservation Element of the General Plan, which is led by the Planning Department, and County Master Water Plan, which is led by the Public Works Department.

Key results of the planning process documented in this GMP include:

- Developing general consensus among stakeholders regarding the characterization of the area's water problems, current and future demands, and groundwater conditions.
- Documenting the area's groundwater management goals and objectives, including specific BMOs, to help measure progress in attaining goals.
- Developing specific groundwater management actions and common programs for the Paso Robles Groundwater Basin.
- Developing management plan components to maintain groundwater quality and prevent land subsidence in the basin.
- Providing an implementation plan to direct future groundwater management activities.

2.4 Authority to Prepare Regional Groundwater Management Plan

The San Luis Obispo County Flood Control and Water Conservation District has the authority to prepare a groundwater management plan within the unincorporated portions of the Paso Robles Groundwater Basin within San Luis Obispo County through California Water Code, Division 6, Part 2.75 (Sections 10750 et seq.). The City of Paso Robles has the authority to manage the groundwater resources within their city limits. The City of Paso Robles and the District acted as co-project managers in development of this GMP. This GMP is consistent with the provisions of California Water Code, Sections 10750 et seq., as amended January 1, 2003.

3 Water Resources Setting

This section summarizes the water resources conditions present in the GMP area. It describes the historical and baseline conditions of the water resources in the Paso Robles Basin and contains an overview of the physical setting, including the climate, soils, and geology and describes the major planning considerations related to those issues. This section includes a discussion of the current and future land use and associated water demands, water supplies and sources, existing water supply facilities, groundwater levels, and water quality conditions.

3.1 Scope and Approach

Previous reports were reviewed and the available data were analyzed to document the historical and existing conditions of the groundwater basin and to identify unique characteristics of the GMP area. Groundwater data were analyzed to evaluate trends, document changes in storage, and assess groundwater occurrence, flow, and quality. Groundwater hydrographs were prepared at different locations throughout the GMP area. The results of the analyses were used by the Groundwater Advisory Committee (GAC) stakeholders to establish GMP goals and objectives. The data and results of the analyses are summarized in this section. More detailed data and results are provided in the appendices.

3.2 Physical Setting

3.2.1 Groundwater Basin

The Basin was first formally defined by the California Department of Water Resources (DWR, 1958). In 1979, the DWR published a detailed investigation of the San Luis Obispo County portion of the Basin (DWR, 1979).

The Basin encompasses an area of approximately 505,000 acres (790 square miles). The Basin ranges from the Garden Farms area south of Atascadero to San Ardo in Monterey County, and from the Highway 101 corridor east to Shandon (Figure 1-1). Most of the Basin is hydraulically connected by thick sedimentary sections. The Basin is divided into smaller subareas based on water quality, source of recharge, groundwater movement, and the contours of the base of permeable sediments.

The Atascadero Subbasin is a hydrologically distinct subbasin within the Basin, and encompasses the Salinas River corridor area south of Paso Robles and includes the communities of Garden Farms, Atascadero, and Templeton. The Atascadero Subbasin is defined as that portion of the Basin west of the Rinconada fault. Between Atascadero and Creston, the Rinconada fault juxtaposes less permeable Monterey Formation rocks with the Paso Robles Formation basin sediments. South of the City of Paso Robles, the Paso Robles Formation is found on both sides of the Rinconada fault; however, the fault zone is believed to form a leaky barrier that restricts flow from the Atascadero Subbasin to the main part of

the Basin in the Paso Robles Formation. The alluvial deposits along the Salinas River overlie the Paso Robles Formation and are not affected by the fault, so groundwater flow in the alluvium between the Atascadero Subbasin and the rest of the Basin is not impeded.

The western boundary of the Basin roughly follows Highway 101 from Santa Margarita northward to Hames Valley. The eastern boundary follows a rough line from Highway 58 in the San Juan Creek area northward to Shandon and Cholame. The Basin is downstream of and hydraulically connected by alluvial deposits to the Pozo Groundwater Basin south of the Basin, and to the Cholame Groundwater Basin north of the Basin. The Basin outlet is northwest of and downstream of Bradley, where it is hydraulically connected with the Salinas Valley Groundwater Basin.

These adjacent basins do not provide significant recharge to the Paso Robles Groundwater Basin. Recharge to the Basin occurs by percolation of stream water and by infiltration of precipitation. No distinct areas of recharge have been identified (i.e. forebay), so it is assumed to be distributed throughout the Basin.

The Basin was subdivided into subareas in the Phase I Report as a practical approach to organize the 790 square mile Basin into smaller informal areas (see Figure 1-1) and listed below:

1. Atascadero Subbasin
2. Creston Subarea
3. San Juan Subarea
4. Estrella Subarea
5. Shandon Subarea
6. North Gabilan Subarea
7. South Gabilan Subarea
8. Bradley Subarea

These subareas are not hydrologically distinct. Groundwater and surface water flows occur between subareas. However, dividing the Basin into subareas enables Basin Management Objectives and Groundwater Management Activities (GMAs) to be tailored to the water use characteristics of the subareas.

3.2.2 Basin Topography

The Paso Robles Groundwater Basin is a broad, flat valley with the Estrella River running westward into the Salinas River. The Salinas River runs along the western side of the valley northward toward Monterey County and out of the basin. Surrounding the basin are rolling hills and mountains. To the north and northeast are the Gabilan Highlands and Cholame Hills, and to the west and south are the Santa Lucia and La Penza Ranges. Numerous drainages flow from these hills into the Estrella and Salinas Rivers.

3.2.3 Geology

The stratigraphy in the watershed of the Basin includes the water-bearing geologic units that form the Basin aquifer, and the non-water bearing geologic units that underlie and are adjacent to the Basin sediments. Brief descriptions of the water bearing and non-water bearing geologic formations are provided below. The complete description of the geology and hydrogeologic setting is provided in the Paso Robles Groundwater Basin Study (Fugro, 2002).

3.2.3.1 Alluvium

Alluvial deposits occur beneath the flood plains of the rivers and streams within the basin. These deposits reach a depth of about 100 feet below ground surface and are typically comprised of coarse sand and gravel.

3.2.3.2 Paso Robles Formation

The Paso Robles Formation extends from ground surface and is typically 700 to 1,200 feet thick, although thicknesses of more than 2,500 feet occur in some areas. The formation is a Plio-Pleistocene, predominantly non-marine geologic unit comprised of relatively thin, often discontinuous sand and gravel layers interbedded with thicker layers of silt and clay. It was deposited in alluvial fan, flood plain, and lake depositional environments. The formation is typically unconsolidated and generally poorly sorted.

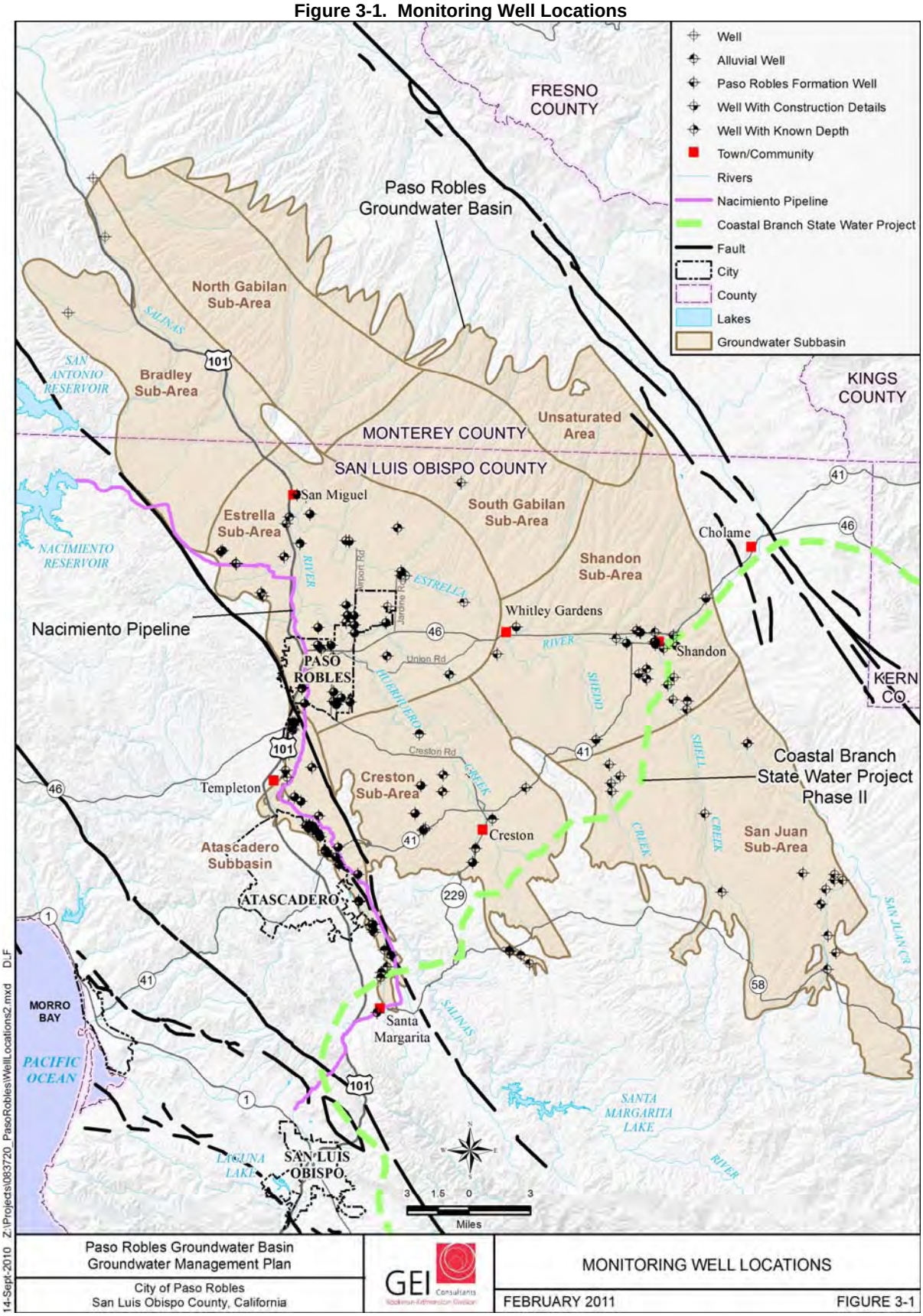
3.2.3.3 Older Formations

Underlying the basin sedimentary beds are older geologic formations that typically have lower permeability and/or porosity. In some cases, these older beds yield in excess of 50 gpm but they often have poor quality water or are of limited extent, such as are found along a fault fracture zone. The older geologic units crop out along the basin border. In general, the geologic units underlying the basin include Tertiary-age consolidated sedimentary beds, Cretaceous-age metamorphic rocks, and granitic rock.

3.3 Groundwater Conditions

In the Basin, the County has been monitoring groundwater levels for more than 40 years. In 2003, an evaluation of the monitoring network was completed to evaluate the efficiency and effectiveness of the County's Monitoring Program for wells located in the Basin. Based on the final report, approximately 159 wells in the monitoring program (see Figure 3-1). Most wells are monitored by County Public Works employees and remaining wells are monitored by local municipal water company employees (who forward the data to the County's Public Works Department for inclusion in the monitoring program database). Additionally, three wells are located in Monterey County and are monitored by the Monterey County Water Resources Agency.

Figure 3-1. Monitoring Well Locations



San Luis Obispo County's existing groundwater level monitoring network in the Basin was used as the initial data set to identify potential wells that are representative of groundwater conditions in different areas of the Basin. This initial set of wells was screened to identify a short list of representative wells for each subarea. Table 3-1 identifies the number wells currently included in the monitoring network.

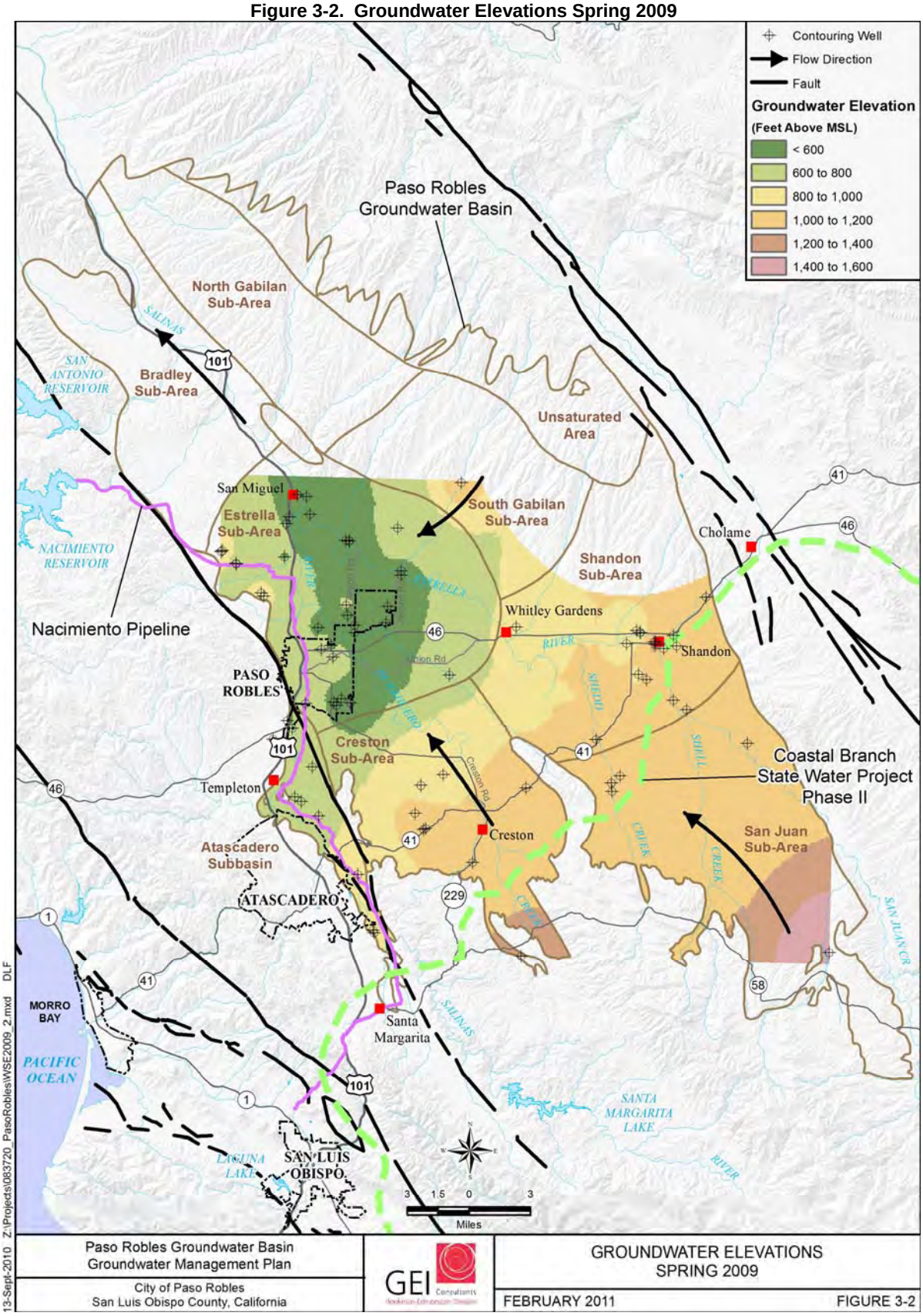
Table 3-1. Wells in the San Luis Obispo County Monitoring Network

Groundwater Subarea	Wells Currently in Program
Atascadero Subbasin	51
Bradley	0
Creston	17
Estrella	50
Gabilan (North and South)	1
San Juan	16
Shandon	24
TOTAL	**159**

3.3.1 Current Groundwater Levels

The most recent groundwater level elevation map is from the spring of 2009 shows that groundwater levels in the Basin range from approximately 1,500 feet above mean sea level (msl) in upland areas to less than 600 feet msl in the northwestern Bradley area as shown on Figure 3-2. Groundwater moves generally northwesterly from the San Juan area into Shandon and then into the Estrella area. Groundwater flow from Creston is also northerly into the Estrella area. In the northern portion of the Basin, groundwater moves southwesterly toward Estrella and the Salinas River in the area near San Miguel.

Figure 3-2. Groundwater Elevations Spring 2009



3.3.2 Change in Groundwater Levels

A groundwater elevation change map has been prepared that represents the changes in groundwater levels for the 1997 to 2009 period and is shown on Figure 3-3. This map shows that the greatest change in groundwater elevations has occurred in the Estrella Subarea, and to a lesser extent in the Creston and Shandon Subareas. Groundwater levels in the western portion of the Paso Robles Basin have declined in excess of 70 feet since 1997 during a period when precipitation was just slightly less than the to the long-term average annual precipitation.

The area with the greatest change in groundwater elevation has been identified in the Resource Capacity Study as the Estrella/Creston Area of Concern, and has been shown to have the greatest and most consistent decline of water levels since 1980. While there is no perennial yield estimate for this area, the sustained groundwater level decline represents a stressing of the groundwater resource and has resulted in water quality problems or has required wells to be deepened.

Additional information on the changes in groundwater levels for each of the subareas is provided in Section 4.4.The continuing decline suggests that, at least locally, the rate of extraction exceeds the ability of the basin to recharge the area.

3.3.3 Soil Characteristics and Surface Recharge Potential

Most of the groundwater recharge in the Paso Robles Basin results from the infiltration of precipitation. Surface recharge potential in the Paso Robles Basin is a function of soil type. As such, the surface soil conditions are one of the primary factors affecting groundwater recharge in the Paso Robles Basin.

The surface recharge potential of the soil was interpreted based on the hydrologic soil groups as categorized by the Natural Resources Conservation Service (NRCS). Hydrologic soil groups are classified according to their ability to infiltrate water and affect runoff. The soils are grouped according to the amount of water infiltration when the soils are thoroughly wet and receive additional precipitation. The four hydrologic soil groups are:

Group A: Soils having a high infiltration rate (low runoff potential) when thoroughly wet.
Group B: Soils having a moderate infiltration rate when thoroughly wet.
Group C: Soils having a slow infiltration rate when thoroughly wet.
Group D: Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet.

Figure 3-4 shows the hydrologic soil groups in the Paso Robles Basin. The areas associated with soils with highest infiltration rate (Group A) are located along small stretches of the larger rivers and creeks in the basin, including the Salinas River, Estrella River, and Huerhuero Creek. In general, Group B soils (i.e., those with moderate infiltration rate) are located predominately on the valley areas of the Paso Robles Basin in the Atascadero Subbasin, San Juan Subarea, and portions of the Creston and Estrella Subareas. Group C and Group D soils are present on the hills surround the basin floor.

Figure 3-3. Difference in Spring Groundwater Elevations 1997 to 2009

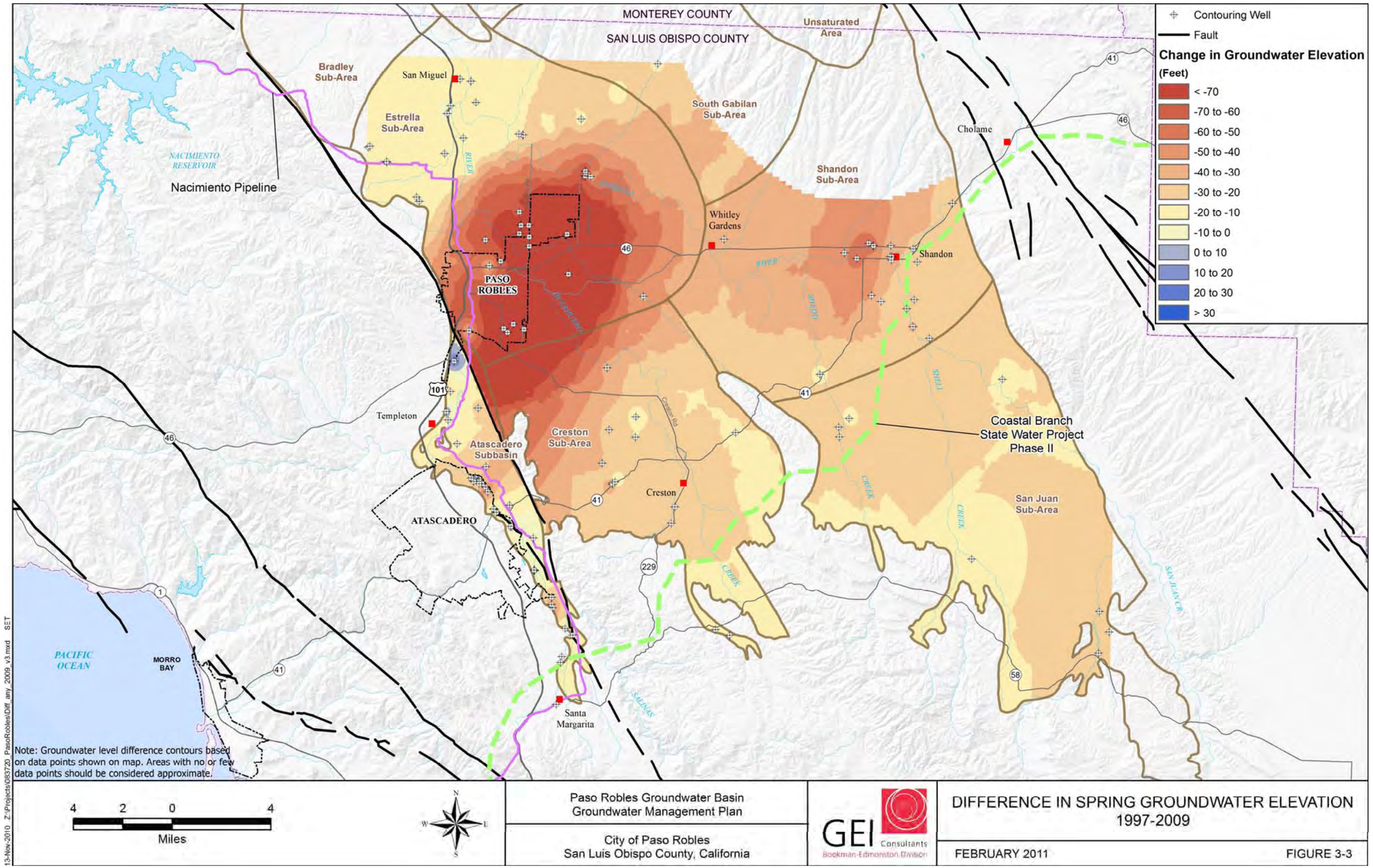
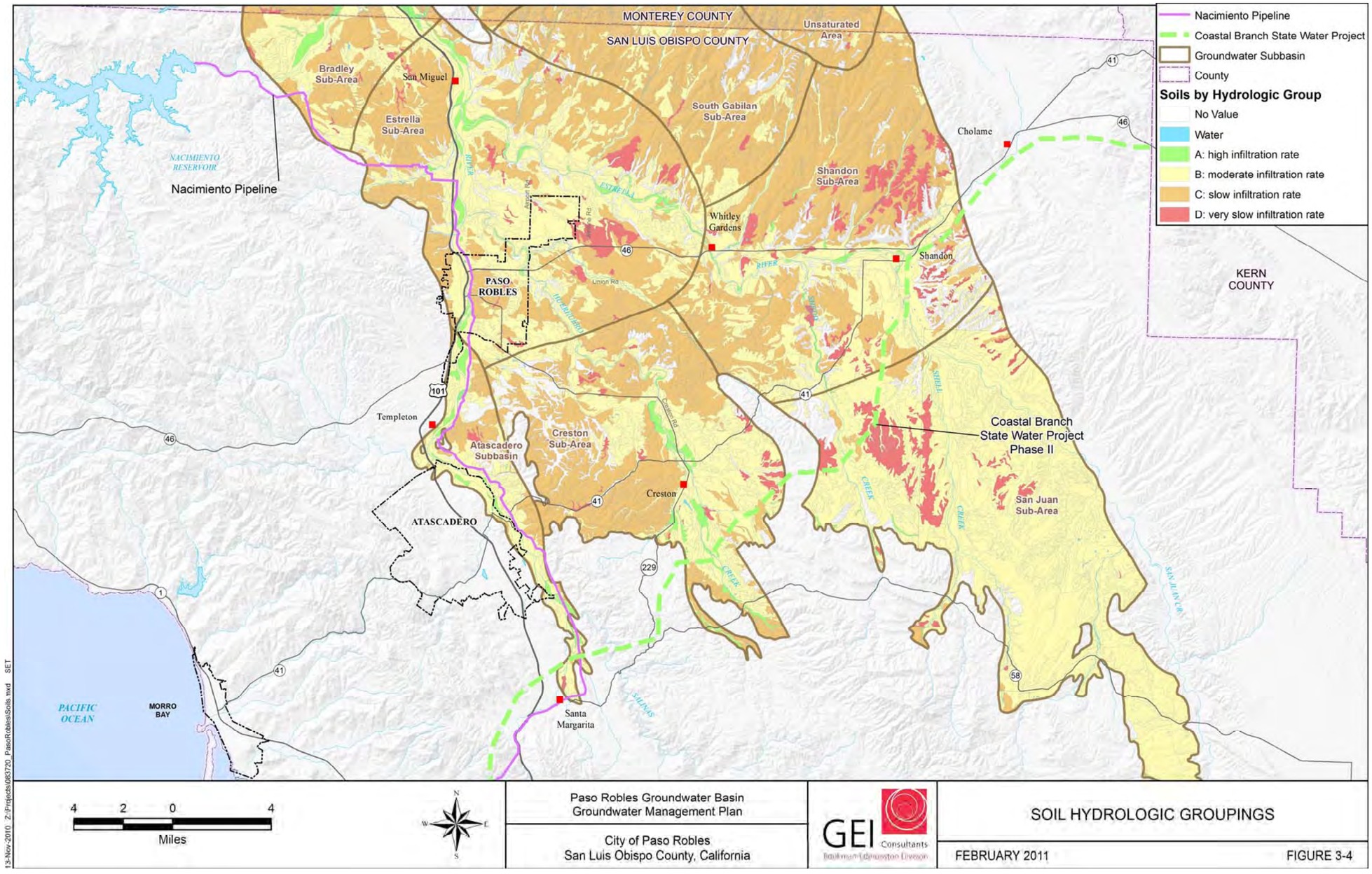


Figure 3-4. Soil Infiltration Rates



3.4 Land Subsidence Conditions

Land subsidence is the lowering of the land surface elevation due to changes that occur underground. Common causes of land subsidence from human activities include pumping water, oil, and gas from subsurface reservoirs; dissolution of limestone, causing sinkholes; collapse of underground mines; drainage of organic soils; and hydro-compaction. Historically, there has been land subsidence in California resulting from over drafting of the groundwater basin.

No direct measurements of subsidence have been made in the area using extensiometers or repeat benchmark calibration. However, InSAR has been used in the area to remotely map land-surface displacements. This technology uses radar images taken from satellites that are used to create maps of change in land surface elevation. The studies done in the area show that an area three miles northeast of Paso Robles has shown a downward displacement from 0.6 to 2.1 inches (Valentine, D. W. et al., 1997). There is no direct correlation of the measured land subsidence with change in groundwater levels over a long period in time, but some of the areas of land subsidence appear to correspond with areas of significant groundwater level decline between the spring of 1997 and fall of 1997.

3.5 Groundwater Quality Conditions

The Phase I Report (Fugro and Cleath, 2002) describes the general water quality of the groundwater Basin with respect to general minerals and selected minor constituents. The Phase I Report analysis indicated generally good overall water quality, but noted some areas of rising concentrations of total dissolved solids (TDS), chloride, and nitrate. Potential sources of these three constituents could include wastewater discharges, agricultural practices, irrigation with recycled water, and/or pumping or upwelling from deeper aquifers.

In general, the quality of groundwater in the Basin is relatively good, with few areas of poor quality and few significant trends of ongoing water quality deterioration. Historical water quality trends were evaluated to identify areas of deteriorating water quality. A major water quality trend is defined as a clear trend that would result in a change in the potential use of water within 50 years, if continued. The following major trends of water quality deterioration in the Basin were identified:

- Increasing TDS and chlorides in shallow Paso Robles Formation deposits along the Salinas River in the central Atascadero Subbasin.
- Increasing chlorides in the deep, historically artesian aquifer northeast of Creston.
- Increasing TDS and chlorides near San Miguel.
- Increasing nitrates in the Paso Robles Formation in the area north of Highway 46, between the Salinas River and the Huerhuero Creek.
- Increasing nitrates in the Paso Robles Formation in the area south of San Miguel.
- Increasing TDS and chlorides in deeper aquifers near the confluence of the Salinas and Nacimiento rivers.
- Increasing levels of arsenic and manganese in the City of Paso Robles wells.

These trends underscore the need for improved management of the Basin to mitigate declining groundwater levels in several areas of the Basin.

3.6 Climate-Precipitation

The Paso Robles Groundwater Basin has a semi-arid Mediterranean climate, which is characterized by hot sunny summers and cool winters. Most of the precipitation occurs in the winter between November and April.

Rainfall is the primary source of recharge to the groundwater basin, and it is pertinent to understand rainfall's relationship to groundwater management activities in the basin. The average rainfall over the basin ranges from about 18 inches in the west (at the Atascadero MWC Gage #34) to 11 inches in the east (at the Shandon #73) as shown on Table 3-2. Figure 3-5 shows the location of selected precipitation stations in the basin. The historical annual rainfall recorded is represented along the Salinas River at Paso Robles Gage (Gage #10) for the 1960 to 2009 period (50 years), shown on Figure 3-6. During this period, rainfall was highly variable, ranging from about 5 inches to over 30 inches per year, and averaging 14.88 inches per year.

Table 3-2. Precipitation Stations in the Paso Robles Groundwater Basin

Precipitation Station	Period of Record	Average Annual Precipitation (inches)			
		Period of Record	1960 to 2009	1981 to 2009	1997 to 2009
Paso Robles Gage #10	1901 to 2009	15.04	14.88	14.49	13.73
Atascadero Mutual WC #34	1931 to 2009	17.65	17.85	17.58	17.49
Erickson Ranch 52.1	1928 to 2009	11.89	12.81	12.85	13.15
Shandon # 73	1937 to 2009	10.69	10.76	11.10	11.06
Sinclair #125	1949 to 2009	11.69	12.02	12.21	11.67

Figure 3-5. Precipitation and Surface Water Gaging Stations in the Paso Robles Area

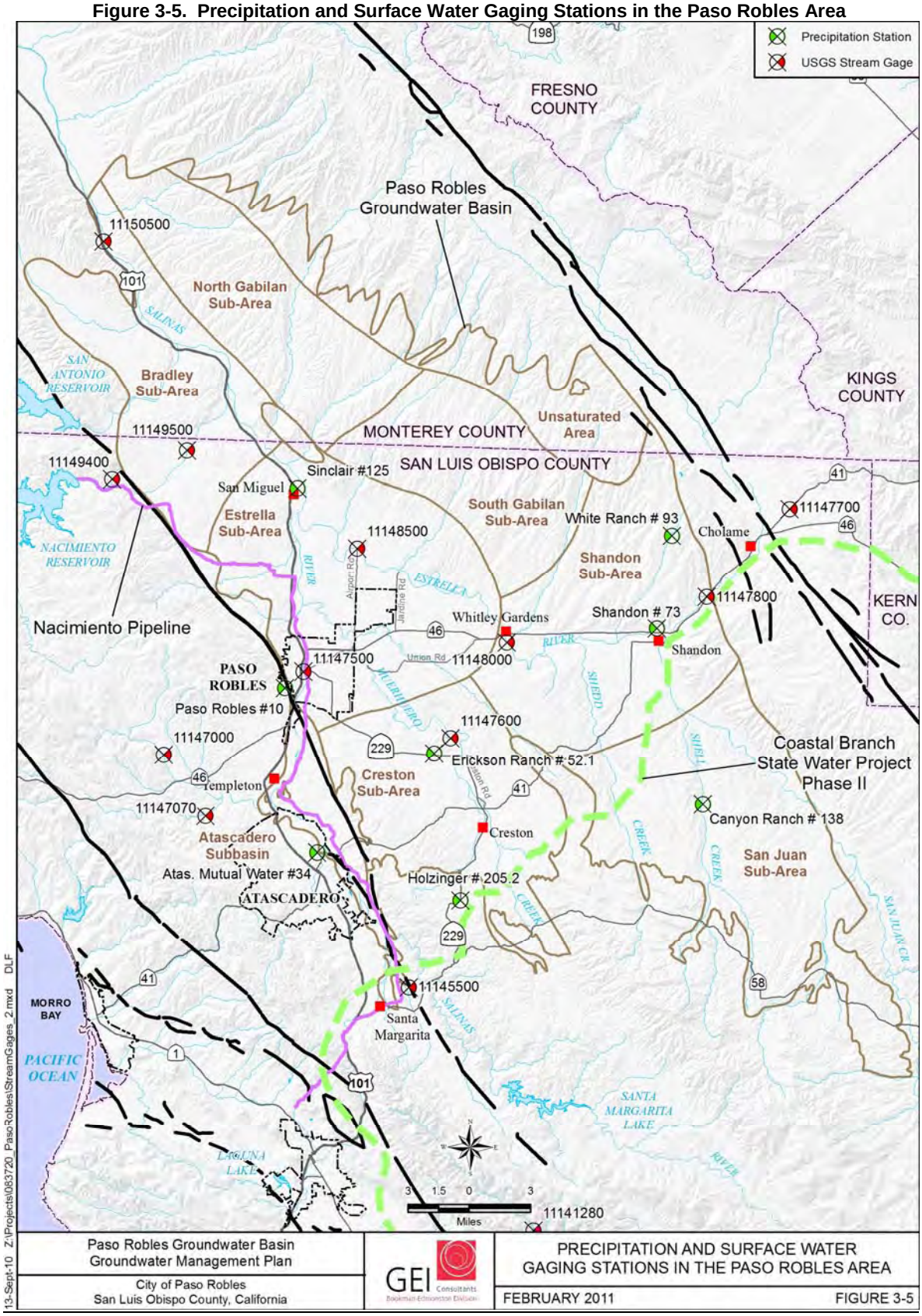
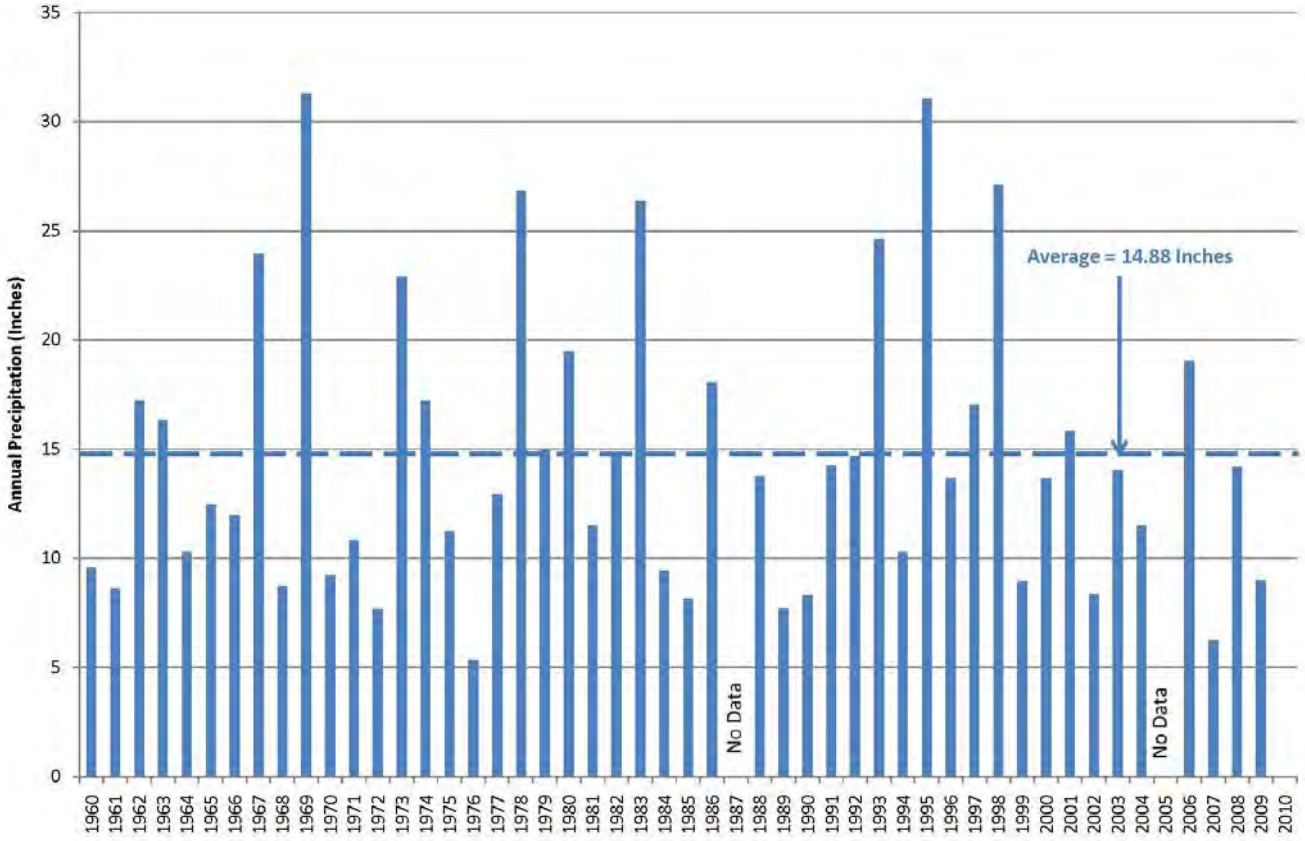


Figure 3-6. Annual Precipitation at the Paso Robles Gage for 1960-2009



For the last 13 years (1997 to 2009) the rainfall at this gage has averaged 14.6 inches per year as shown on Figure 3-6 and included both dry and wet periods typical of the long-term record. This period (2000-2009) is fairly representative of the overall rainfall annual amounts and variation.

3.7 Water Supplies

Historically, California water users have relied on multiple sources of water supply in order to meet changing and increasing water demands. Typically, local water providers mix and match their supply sources to maximize water supply and quality and minimize costs to meet both current and long-term water supply requirements. Water users in the Paso Robles Groundwater Basin have relied almost exclusively on groundwater. Beginning in 2010 surface water will become available to some purveyors on the west side of the basin to reduce the local groundwater pumping demand. This section briefly describes the groundwater and surface water supplies available in the Basin.

3.7.1 Surface Water Supplies

Two water supplies available to the Basin include the State Water Project and the Nacimiento Water Project.

3.7.1.1 State Water Project

The California Department of Water Resources operates the State Water Project (SWP). It is the largest State-built water and power project in the United States. Though the SWP first started delivering water in the 1960s, the Central Coast was not served until 1997 when the Coastal Branch Aqueduct, supplying Santa Barbara and San Luis Obispo counties, was completed.

The SWP was built with a capacity to deliver about 4.2 million acre-feet (maf) of water. Recent annual deliveries to the 29 contractors have averaged about 2.3 maf and peaked at 3.5 maf in 2000, so the SWP has available physical capacity to make additional deliveries, assuming the water supply is also available at the same time.

An individual contractor's portion of its SWP annual allocation is presented on Table A of their contract. Table A contract amounts are not a guarantee of the available supply to the contractor each year, but rather a tool in an allocation process that defines an individual contractor's share. The Table A annual allocation for the San Luis Obispo County Flood Control and Water Conservation District totals 25,000 acre-feet at an instantaneous rate of delivery of 35 cfs. This corresponds to a monthly delivery rate of 2,083 acre-feet. The County currently utilizes 4,830 acre-feet per year of the Table A annual allocation, which is delivered to 11 urban water users in the County listed on Table 3-3.

The community of Shandon (through C.S.A No. 16) is the only subscriber to SWP water located in the Basin. They have not accessed this supply. The location for a turnout to the Shandon area was constructed on Coastal Branch. The turnout and additional facilities would need to be completed before SWP water could be delivered to Shandon.

Table 3-3. State Water Project Subscribers Water Users

State Water Project Subscribers Water Users	Amount (AFY)
Avila Beach CSD	100
Avila Valley MWC	20
California Men's Colony	400
C.S.A. No. 16-1	100
County Operations Center	425
City of Morro Bay	1,313
Oceano CSD	750
City of Pismo Beach	1,240
San Luis Coastal USD	7
San Miguelito MWC	275
Cuesta College	200
TOTAL	**4,830**
Drought Buffer	variable
Unassigned Supply	20,170
Total SWP Table A Supply	**25,000**

3.7.1.2 Nacimiento Water Project

The Nacimiento Dam was constructed in 1957 by Monterey County Flood Control and Water Conservation District (now known as the Monterey County Water Resources Agency [MCWRA]). In 1959, San Luis Obispo County secured the rights to 17,500 acre-feet of water per year from Lake Nacimiento. After a long series of studies and negotiations, the Nacimiento Water Project was initiated. Agencies and communities that are participating in the project are listed below and the amount of water they have contracted to receive is shown on Table 3-4. The City of Paso Robles, Atascadero Mutual Water Company, and Templeton Community Services District, which are all part of the Paso Robles Groundwater Basin, currently subscribe to 6,250 acre-feet of water from the Nacimiento Water Project. When these supplies become available, they can be used to offset groundwater pumping and accommodate additional growth.

Table 3-4. Nacimiento Water Project Water Users

NWP Water Users	Amount (AFY)
City of Paso Robles	4,000
Atascadero MWC	2,000
City of San Luis Obispo	3,380
Templeton CSD	250
CSA 10 A	25
Total Assigned	**9,655**
Unassigned Supply	7,845
Total NWP Supply	**17,500**

3.7.2 Groundwater Supplies

The hydrogeologic analysis and later groundwater modeling of the Paso Robles Groundwater Basin estimated the perennial yield for the Basin to be about 97,700 acre-feet per year. The demands on the groundwater basin listed on Table 3-5 show that in 1997, the total annual demand of 76,404 acre-feet per year was about 78 percent of the perennial yield. By 2006, demands had increased to 89,473 acre-feet per year representing about 92 percent of the perennial yield. Projected groundwater demands are estimated to be almost 108,000 acre-feet per year by 2025. This represents 110 percent of the estimated perennial yield.

Table 3-5. Groundwater Pumping Demand in the Paso Robles Groundwater Basin for Selected Years

Demand Type	1997(1)	2006(2)	2025(3)
Agricultural (Estimated Gross Pumping)	51,791	60,000	66,860
Municipal	13,513	15,665	19,373
Small Community Systems(4)			
Small Commercial Systems	1,700	2,323	5,042
Rural	9,400	11,485	16,504
Total Demand	76,404	89,473	107,779
Percent Increase in Demands from 1997			141%
Perennial Yield(5)	97,700	97,700	97,700
Groundwater Demand as Percent of Perennial Yield	78%	92%	110%

Values in Acre-Feet
Notes:
(1)Source: Fugro, 2002 (Table 59)
(2)Source: Todd 2009 (Table 14)
(3)Source: Todd 2009 (Table 14, modified to reflect gross agriculture pumping)
(4)Included in Rural Demands
(5)Source: Fugro, 2005

The water demands and corresponding groundwater pumping is not uniformly distributed across the entire basin. As a result of long-term localized areas of groundwater pumping, groundwater declines are occurring in some parts of the Basin, including the Estrella, Creston, and Shandon Subareas.

3.8 Land Uses and Water Demands within Plan Area

The water demands and supplies for the Paso Robles Groundwater Basin are summarized from several of the documents identified in Section 1. Historically, all water demands in the Basin have been meet with groundwater. This is expected to change in 2010 when Nacimiento Project Water becomes available for use for some of the water users in the Basin.

Water demands in the Basin have generally been organized into five different "user sectors" including:

- **Agricultural** - Agricultural water demands are estimated using the crop acreage and water demands of different types of crops to determine the overall agricultural water demand. This method is used because records of agricultural pumping are not kept and reported.
- **Municipal** - Municipal pumping in the Basin includes four public water purveyors: 1) City of Paso Robles; 2) Atascadero Mutual Water Company; 3) Templeton Community Services District (CSD); and 4) San Miguel Community Services District. Pumping records were used to accurately calculate total municipal pumping.
- **Rural Residential** - Rural pumping includes domestic water use by development in rural areas. The estimate was derived by using parcel data and applying a water use factor, since records are not kept and reported.
- **Small Community Systems** - Small community systems include mutual water companies, county service areas and mobile home parks. For systems that report groundwater pumping, well records were used to accurately determine their pumping. Using these reports, estimates were derived for the systems that do not report their water use.
- **Small Commercial Systems -** Small commercial pumping includes such users as wineries, golf courses, and schools. Water use estimates are based on factors from the Pacific Institute and information from consultation with winery operators.

The demands were distributed to the subareas in the Basin to support the development of subarea-specific Basin Management Objectives as part of the preparation of the Groundwater Management Plan. Table 3-6 shows the distribution of the demands by demand type by subarea for 2006. In 2006, agricultural demands were about 67 percent of the total demand in the Basin, with about one-third of the total agricultural demand occurring in the Estrella Subarea. Municipal demands were about 18 percent of the total demand and are concentrated in the Atascadero Subbasin and the Estrella Subarea. The small community demands are included as part of rural domestic demands. Rural domestic demands were about 13 percent of the total demand. Small commercial demands total about three percent of the total demand, and are concentrated in the Estrella Subarea.

Table 3-6. Distribution of 2006 Water Demands to Subareas

Subarea	Demand Type						
	Agriculture	Municipal	Small Community Systems	Small Commercial Systems	Rural Domestic	Total	Percentage
Atascadero Subbasin	1,348	11,735	0	430	2,032	15,545	17%
Bradley	6,933	0	0	184	109	7,226	8%
Creston	9,936	0	0	37	2,338	12,311	14%
Estrella	23,111	3,930	0	1,603	5,433	34,077	38%
North Gabilan	1,758	0	0	0	50	1,808	2%
San Juan	5,347	0	0	0	105	5,452	6%
Shandon	9,896	0	0	69	1,205	11,170	12%
South Gabilan	1,671	0	0	0	213	1,884	2%
Total	**60,000**	**15,665**	**0**	**2,323**	**11,485**	**89,473**	**100%**
Percent of Total	**67%**	**18%**	**0%**	**3%**	**13%**	**100%**	

The following sections describe the historic water demands for each of the subareas in the Basin.

3.8.1 Atascadero Subbasin

The Atascadero Subbasin is located in the western portion of the Paso Robles Groundwater Basin and has an area of approximately 14,577 acres, which makes up about three percent of the area of the Basin. The Rinconada Fault separates the Atascadero Subbasin from the Paso Robles Basin. The Salinas River flows north roughly paralleling Highway 101 through the subbasin, entering the Estrella Subarea of the Basin near the City of Paso Robles.

This subarea includes the City of Paso Robles and the City of Atascadero's community of Templeton. The Atascadero Mutual Water Company is the water purveyor to the City of Atascadero, but wastewater treatment is provided by the City of Atascadero. The Templeton Community Services District (CSD) provides potable water and wastewater treatment services to the community of Templeton.

Table 3-7 presents the estimated water demands by type for years 1997 and 2006. Municipal demands make up most of the total demand. The total water use in 1997 was estimated at about 14,500 acre-feet and by 2006 totaled about 15,545 acre-feet, representing about 17 percent of the total water use in the Basin. All these demands were met with groundwater, including the Salinas River underflow. Water demands in the Atascadero subbasin increased by about 1,000 acre-feet during the 1997 to 2006 period as shown on Table 3-7.

Table 3-7. Estimated Water Demands in the Atascadero Subbasin for 1997 and 2006

Groundwater Demand		Demand Type					
		Agricultural	Municipal	Small Community	Small Commercial	Rural Domestic	TOTAL
2006 Demand	(acre-feet)	1,348	11,735	0	430	2,032	15,545
Estimated 1997 Demand	(acre-feet)	1,023	11,376	0	300	1,800	14,499
Difference (2006 less 1997)	**(acre feet)**	**325**	**359**	**0**	**130**	**232**	**1,046**

2006 Demand Assumptions: Based on Evaluation of Paso Robles Groundwater Basin Pumping Water Year 2006 (Todd, May 2009) and Agricultural Commissioner records in 2006

2006 Municipal demand includes City of Paso Robles groundwater pumping from river wells in the subbasin (3,933 acre-feet)

1997 Demand Assumptions: 1997 Demands from Paso Robles Groundwater Basin Study (Fugro 2002).

Distribution of agricultural demands based on crop acreages from 1997 DWR land use survey for San Luis Obispo County.

Small community demands included in rural domestic demand

Beginning in 2011, Nacimiento Pipeline will begin delivering surface water to the Atascadero Mutual Water Company (up to 2,000 acre-feet per year) and the Templeton Community Services District (up to 250 acre-feet per year) to offset some of the municipal groundwater pumping.

3.8.2 Bradley Subarea

The Bradley Subarea is located along the northwestern portion of the Paso Robles Groundwater Basin and has an area of approximately 55,500 acres, which makes up about 11 percent of the area of the Basin. Much of the subarea is located in Monterey County. The Salinas River flows northwest through the subarea. The Nacimiento River and the San Antonio River drain the western portion of the Basin. Several creeks draining the North Gabilan Subarea flow into the Salinas River within the subarea. Highway 101 parallels the Salinas River through the subarea. Much of the subarea south of the San Antonio River is within the limits of Camp Roberts.

The water use in 2006 totaled about 7,226 acre-feet representing about eight percent of the water use in the Basin. The water users in the Bradley Subarea and their uses are shown in Table 3-8. All water demands in the subarea are met with groundwater, and the total demand has increased by about 1,000 acre-feet between 1997 and 2006 as shown on Table 3-8.

Table 3-8. Estimated Water Demands in the Bradley Subarea for 1997 and 2006

Groundwater Demand		Demand Type					
		Agricultural	Municipal	Small Community	Small Commercial	Rural Domestic	TOTAL
2006 Demand	(acre-feet)	6,933	0	0	184	109	7,226
Estimated 1997 Demand	(acre-feet)	6,001	0	0	136	88	6,225
Difference (2006 less 1997)	**(acre feet)**	**932**	**0**	**0**	**48**	**21**	**1,001**

2006 Demand Assumptions: Based on Evaluation of Paso Robles Groundwater Basin Pumping Water Year 2006 (Todd, May 2009)

1997 Demand Assumptions: 1997 Demands from Paso Robles Groundwater Basin Study (Fugro 2002).

Distribution of agricultural demands based on crop acreages from 1997 DWR land use survey for San Luis Obispo County.

3.8.3 Creston Subarea

The Creston Subarea is located in the southern portion of the Paso Robles Groundwater Basin and has an area of approximately 57,000 acres, which makes up about 11 percent of the area of the Basin. The Rinconada fault separates the Creston Subarea from the Atascadero Subbasin. The Huerhuero Creek flows northwest through the subarea, entering the Estrella Subarea southeast of the City of Paso Robles. This subarea includes the community of Creston. There are no public water purveyors in the subarea.

The water use in 2006 totaled about 12,311 acre-feet representing about 14 percent of the water use in the Basin. The primary use of groundwater in this subarea is for agriculture, with rural uses making up most of the remaining water use. Water demands in the Creston Subarea increased by about 1,800 acre-feet during the 1997 to 2006 period as shown on Table 3-9.

Table 3-9. Estimated Water Demands in the Creston Subarea for 1997 and 2006

Groundwater Demand		Demand Type					
		Agricultural	Municipal	Small Community	Small Commercial	Rural Domestic	TOTAL
2006 Demand	(acre-feet)	9,936	0	0	37	2,338	12,311
Estimated 1997 Demand	(acre-feet)	8,600	0	0	27	1,880	10,507
Difference (2006 less 1997)	**(acre-feet)**	**1,336**	**0**	**0**	**10**	**458**	**1,804**

2006 Demand Assumptions: Based on Evaluation of Paso Robles Groundwater Basin Pumping Water Year 2006 (Todd, May 2009)

1997 Demand Assumptions: 1997 Demands from Paso Robles Groundwater Basin Study (Fugro 2002).

Distribution of agricultural demands based on crop acreages from 1997 DWR land use survey for San Luis Obispo County.

3.8.4 Estrella Subarea

The Estrella Subarea is located in the western portion of the Paso Robles Groundwater Basin and has an area of approximately 82,500 acres, which makes up about 16 percent of the area of the Basin. This subarea includes the City of Paso Robles (City) and the San Miguel Communities Services District. The Salinas River flows north, roughly paralleling Highway 101. Huerhuero Creek enters the subarea from the Creston Subarea and flows into the Salinas River near the City of Paso Robles. The Estrella River flows from the Shandon Subarea and enters the Salinas River north of the City.

The water use in 2006 totaled about 34,077 acre-feet representing about 38 percent of the water use in the Basin. The water users in the Estrella Subarea and their uses are shown in Table 3-10. In 2006, the entire demand was met with groundwater. There is a diverse group of water users in this subarea. About two-thirds of the pumping in this subarea is for agricultural uses. Rural and municipal users account for about one-third of the groundwater pumping. Water demands in the Estrella Subarea increased by about 6,300 acre-feet during the 1997 to 2006 period as shown on Table 3-10.

Table 3-10. Estimated Water Demands in the Estrella Subarea for 1997 and 2006

Groundwater Demand		Demand Type					
		Agricultural	Municipal	Small Community	Small Commercial	Rural Domestic	TOTAL
2006 Demand	(acre-feet)	23,111	3,930	0	1,603	5,433	34,077
Estimated 1997 Demand	(acre-feet)	20,004	2,137	0	1,186	4,368	27,695
Difference (2006 less 1997)	**(acre feet)**	**3,107**	**1,793**	**0**	**417**	**1,065**	**6,383**

2006 Demand Assumptions: Based on Evaluation of Paso Robles Groundwater Basin Pumping Water Year 2006 (Todd, May 2009)

1997 Demand Assumptions: 1997 Demands from Paso Robles Groundwater Basin Supply (Fugro, 2002).

Distribution of agricultural demands based on crop acreages from 1997 DWR land use survey for San Luis Obispo County.

1997 Municipal demand includes City of Paso Robles groundwater pumping from basin wells (1,911 acre-feet)

Small community demands included in rural domestic demand

Beginning in 2011, up to 4,000 acre-feet of surface water from the Nacimiento Pipeline will be available to the City of Paso Robles to offset some of the municipal groundwater pumping. The City will not be able to use this supply until a water treatment plant is constructed, which is anticipated to come on-line by 2013.

3.8.5 North Gabilan Subarea

The North Gabilan Subarea is located along the northeastern portion of the Paso Robles Groundwater Basin. The North Gabilan Subarea has an area of approximately 52,600 acres, which makes up about 11 percent of the area of the Basin. Almost all of the North Gabilan Subarea is located in Monterey County.

The water use in 2006 totaled about 1,808 acre-feet representing about two percent of the water use in the Basin. The water users in the North Gabilan Subarea and their uses are shown on Table 3-11. Water demands in the North Gabilan Subarea have increased by total of about 250 acre-feet between 1997 and 2006 as shown on Table 3-11.

Table 3-11. Estimated Water Demands in the North Gabilan Subarea for 1997 and 2006

Groundwater Demand		Demand Type					
		Agricultural	Municipal	Small Community	Small Commercial	Rural Domestic	TOTAL
2006 Demand	(acre-feet)	1,758	0	0	0	51	1,808
Estimated 1997 Demand	(acre-feet)	1,522	0	0	0	41	1,563
Difference (2006 less 1997)	**(acre-feet)**	**236**	**0**	**0**	**0**	**10**	**246**

2006 Demand Assumptions: Based on Evaluation of Paso Robles Groundwater Basin Pumping Water Year 2006 (Todd, May 2009)

1997 Demand Assumptions: 1997 Demands from Paso Robles Groundwater Basin Study (Fugro 2002).

Distribution of agricultural demands based on crop acreages from 1997 DWR land use survey for San Luis Obispo County.

3.8.6 San Juan Subarea

The San Juan Subarea is located in the southeastern portion of the Paso Robles Groundwater Basin and has an area of approximately 84,000 acres, which makes up about 17 percent of the area of the Basin. The San Juan Subarea lies south-southeast of Shandon and includes the agricultural land along San Juan Creek, Camatta Canyon, Shell Creek Road, and Shedd Canyon. These creeks flow northward through the subarea where they eventually become part of the Estrella River in the Shandon Subarea.

The water use in 2006 totaled about 5,452 acre-feet representing about six percent of the water use in the Basin. The water users in the San Juan Subarea and their uses are delineated in Table 3-12. Water demands in the San Juan Subarea are met by groundwater. The demands have increased by a total of about 740 acre-feet between 1997 and 2006 as shown on Table 3-12.

Table 3-12. Estimated Water Demands in the San Juan Subarea for 1997 and 2006

Groundwater Demand		Demand Type					
		Agricultural	Municipal	Small Community	Small Commercial	Rural Domestic	TOTAL
2006 Demand	(acre-feet)	5,347	0	0	0	105	5,452
Estimated 1997 Demand	(acre-feet)	4,628	0	0	0	84	4,712
Difference (2006 less 1997)	**(acre-feet)**	**719**	**0**	**0**	**0**	**21**	**740**

2006 Demand Assumptions: Based on Evaluation of Paso Robles Groundwater Basin Pumping Water Year 2006 (Todd, May 2009)

1997 Demand Assumptions: 1997 Demands from Paso Robles Groundwater Basin Study (Fugro 2002).

Distribution of agricultural demands based on crop acreages from 1997 DWR land use survey for San Luis Obispo County

3.8.7 Shandon Subarea

The Shandon Subarea is located in the eastern portion of the Paso Robles Groundwater Basin and has an area of approximately 74,800 acres, which makes up about 15 percent of the area of the Basin. This subarea includes the communities of Whitley Gardens and Shandon. Cholame Creek enters the Basin from the northeast flowing westward. It is joined by the San Juan Creek which flows northward from the San Juan Subarea, near the town of Shandon to form the Estrella River, which then flows west and northwest through the Estrella Subarea and enters the Salinas River north of the City of Paso Robles.

The water use in 2006 totaled about 11,170 acre-feet representing about 12 percent of the water use in the Basin. The water users in the Shandon Subarea and their uses are delineated in Table 3-13. Water demands in the Shandon Subarea met by groundwater increased by about 1,600 acre-feet during the 1997 to 2006 period as shown on Table 3-13.

Table 3-13. Estimated Water Demands in the Shandon Subarea for 1997 and 2006

Groundwater Demand		Demand Type					
		Agricultural	Municipal	Small Community	Small Commercial	Rural Domestic	TOTAL
2006 Demand	(acre-feet)	9,896	0	0	69	1,205	11,170
Estimated 1997 Demand	(acre-feet)	8,566	0	0	51	969	9,586
Difference (2006 less 1997)	**(acre-feet)**	**1,330**	**0**	**0**	**18**	**236**	**1,584**

2006 Demand Assumptions: Based on Evaluation of Paso Robles Groundwater Basin Pumping Water Year 2006 (Todd, May 2009)

1997 Demand Assumptions: 1997 Demands from Paso Robles Groundwater Basin Study (Fugro 2002).

Distribution of agricultural demands based on crop acreages from 1997 DWR land use survey for San Luis Obispo County

3.8.8 South Gabilan Subarea

The South Gabilan Subarea is located along the northeastern portion of the Paso Robles Groundwater Basin. The South Gabilan Subarea has an area of approximately 44,500 acres, which makes up about nine percent of the area of the Basin. The northern portion of the South Gabilan Subarea is located in Monterey County. The South Gabilan Subarea is drained by several small creeks that flow into the Estrella River; the small creeks draining the North Gabilan Subarea flow into the Salinas River.

The water use in 2006 totaled about 1,884 acre-feet representing about two percent of the water use in the Basin. The water users in the South Gabilan Subarea and their uses are shown on Table 3-14. Water demands in the South Gabilan Subarea have increased by total of about 250 acre-feet between 1997 and 2006 as shown on Table 3-14.

Table 3-14. Estimated Water Demands in the South Galiban Subarea for 1997 and 2006

Groundwater Demand		Demand Type					
		Agricultural	Municipal	Small Community	Small Commercial	Rural Domestic	TOTAL
2006 Demand	(acre-feet)	1,671	0	0	0	213	1,884
Estimated 1997 Demand	(acre-feet)	1,446	0	0	o	171	1,617
Difference (2006 less 1997)	**(acre-feet)**	**225**	**0**	**0**	**0**	**42**	**267**

2006 Demand Assumptions: Based on Evaluation of Paso Robles Groundwater Basin Pumping Water Year 2006 (Todd, May 2009)

1997 Demand Assumptions: 1997 Demands from Paso Robles Groundwater Basin Study (Fugro 2002).

Distribution of agricultural demands based on crop acreages from 1997 DWR land use survey for San Luis Obispo County

4 Goals and Objectives

Groundwater management involves understanding the available groundwater resources in order to make informed decisions about meeting existing and future water needs. This section establishes the goals and objectives that will be used to direct groundwater management activities.

4.1 Overview of Basin Management Objectives

The State advocates the concept of Basin Management Objectives (BMOs) that are locally-developed guidelines for groundwater management that describe actions to be taken by well owners in response to well-monitoring data. The BMOs allow for more generalized objectives to be developed that are quantified and measureable so that improvements in groundwater management can be tracked and monitored. The BMO concept was also developed to meet the groundwater management needs within a basin that has different groundwater users and/or overlapping jurisdictional agencies. This approach allows the BMO concept to overcome some of the common difficulties associated with defining safe yield and overdraft in a groundwater Basin.

A feature of the BMO method includes the flexibility to modify management objectives as knowledge of the Basin increases. Each area can set its own BMO for one or more wells within the area and pursue its specific groundwater management goals as long as they do not negatively affect neighboring areas. This is a key concept of BMO development – that water management practices or activities in one management area should not negatively affect the water management objectives of another area.

The BMO method of management seeks to protect the Basin from:

- Unacceptable depletion of groundwater in storage
- Degradation of groundwater quality
- Inelastic land subsidence, which is a permanent lowering of the ground surface resulting from compaction of geologic materials caused by groundwater extraction.

4.2 Development of BMOs and GMAs

The groundwater level data collected by the County is the most comprehensive groundwater-related data set in the Basin. Additionally, the stakeholders identified groundwater level declines as the most pressing issue in the Basin. These two factors lead to the determination that at this time, BMOs would be developed for groundwater levels. In addition to groundwater levels affecting total groundwater in storage, groundwater levels are also used as a surrogate for potential groundwater quality impacts and land subsidence impacts associated with groundwater level decline.

In the future, specific BMOs may be developed for groundwater quality and land subsidence when more data is available for either of those subjects.

4.2.1 BMO Workshops

Three workshops were held to meet with the stakeholders in each subarea to review the available information, develop draft BMOs, and identify some activities that could be implemented to meet the BMOs.

The workshops were as follows:

> BMO Workshop No. 1 – April 11, 2010: for the Atascadero, Creston, and Estrella Subareas
>
> BMO Workshop No. 2 – May 10, 2010: for the Bradley and North Gabilan Subareas
>
> BMO Workshop No. 3 – May 10, 2010: for the San Juan, Shandon, and South Gabilan Subareas

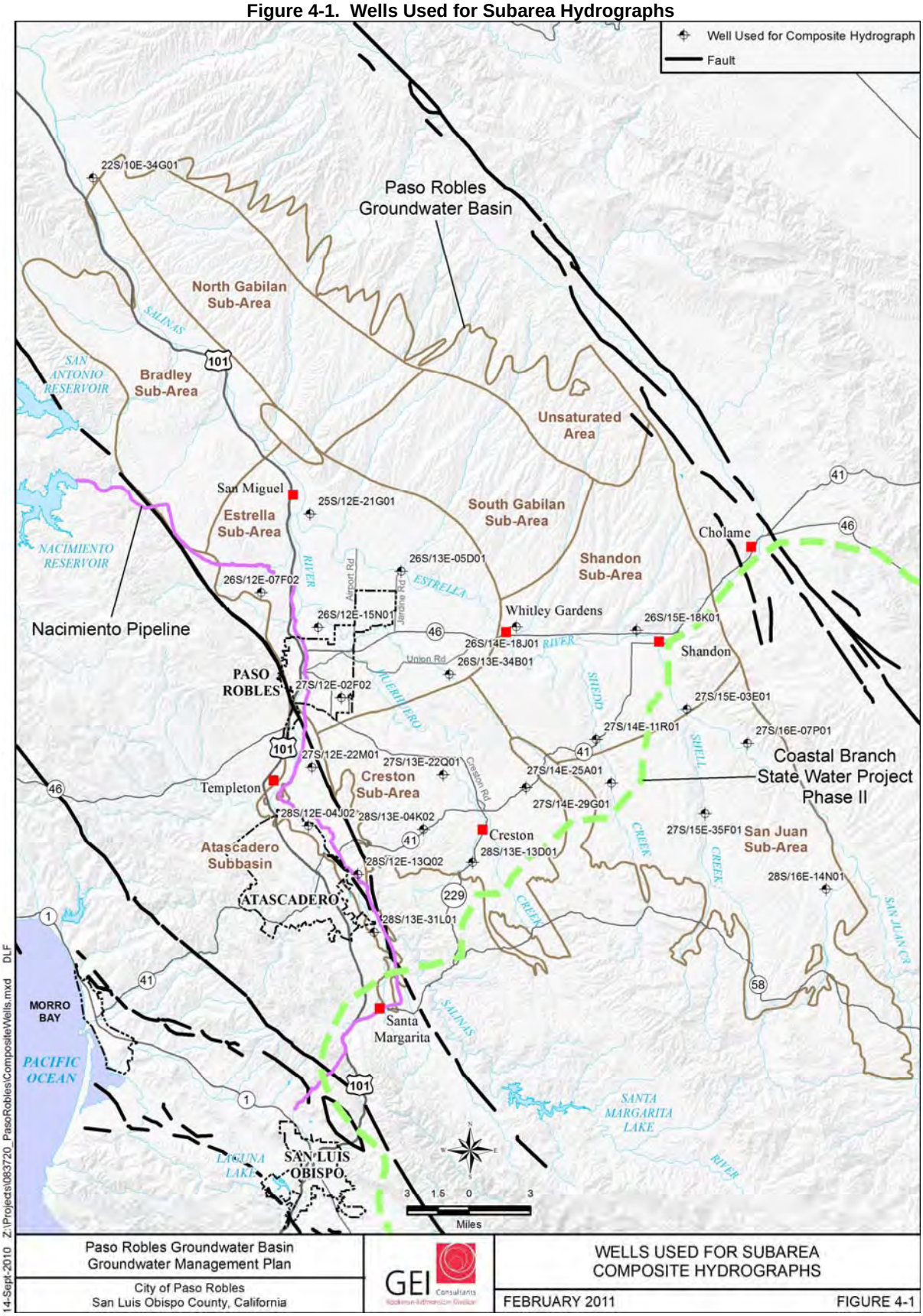
Each of the workshops was well attended by interested parties and stakeholders from each subarea. The list of attendees for the BMO workshops is included in Appendix D. Each subarea stakeholder was provided a packet of subarea-specific information that was used to support the development of BMOs and identification of groundwater management activities (GMAs).

A summary document was produced following the workshops and distributed to the stakeholders for review and comment. The results of the BMO workshops were used to develop the BMOs described below.

4.2.2 BMO Key Wells and Subarea Hydrographs

As part of the development of groundwater level BMOs, key wells were identified within the each subarea to establish the representative groundwater levels that will be used to monitor the change in groundwater levels. Since the Paso Robles Basin groundwater monitoring network is voluntary, there is a limited amount of information that is available to identify key wells. The key wells were selected based on number of monitoring observations during the 1981 to 2009 period of record and the geographic location within the subarea. The wells meeting these two criteria were identified as key wells and used to develop the subarea hydrographs. The locations of these key wells used to create the subarea-specific BMO hydrographs are shown on Figure 4-1.

Figure 4-1. Wells Used for Subarea Hydrographs



4.2.3 Groundwater Management Activities

Groundwater Management Activities (GMAs) are intended to identify the steps or actions taken to meet the BMOs. It should be recognized that both BMOs and GMAs should be evaluated and updated routinely (every few years) as additional information is collected or in response to changing conditions.

4.3 General Basin Management Objectives

The goal of the GMP is to locally manage and protect groundwater resources for all beneficial uses in a long-term sustainable, environmentally sound, economical, and equitable manner. For purposes of meeting the goals of groundwater management stated in Section 2.3 the agencies and stakeholders will support the Basin Management Objectives described in this section. Two sets of BMOs have been developed reflecting the regional nature of this groundwater management plan: (1) broad level BMOs are designed to have basin-wide, regional perspectives [Section 4.3], and (2) more specific BMOs have been developed for each Subarea [Section 4.4].

4.3.1 Maintain and Improve Groundwater Levels

Groundwater levels in the basin generally reflect the overlying level of development of all use types (agricultural, municipal, small commercial, small community, and rural domestic). Groundwater levels have experienced the greatest levels of decline in the areas with the highest level of development, and near the center of those areas with the greatest level of development. This objective is intended to ensure that the overall groundwater levels in the basin are maintained to provide long-term reliable sources of water for the economic well-being of the area. General activities and projects that maintain and improve groundwater levels include projects that:

- Reduce groundwater pumping
- Increase overall water supply
- Increase water reuse or recycled water supply
- Protect and increase groundwater recharge
- Limit future increases in groundwater pumping

Some of the considerations for implementing these activities to improve groundwater levels are summarized on Table 4-1, including agencies that may be responsible for implementation of the various projects, the relative cost and schedule for the projects, and the overall implementation complexity.

Table 4-1. Implementation of GMAs to Maintain and Improve Groundwater Levels

Groundwater Management Activity	Implementation Considerations			
	Implementation Responsibility	Relative Implementation Schedule	Relative Implementation Cost	Overall Implementation Complexity
Potential activities to reduce groundwater pumping:				
1) Reduce agricultural pumping	Individual Growers	Short	low-medium	low-medium
2) Reduce municipal pumping	Urban Purveyors Customers	Ongoing	low-medium	low-medium
Potential activities to increase water supply:				
1) Import Nacimiento Project Water	Organized Water Purveyors	Short (6 months) to medium (2-3 years)	high	high
2) Import State Water Project Water	Organized Water Purveyors	Long - More than 10 years	high	high
Potential reuse or recycled water projects:				
1) Implement agricultural water reuse program	Individual Growers	Additional savings generally not feasible because use of drip irrigation	low-medium?	low-medium?
2) Increase municipal water recycling program	Organized Water Purveyors	Long - More than 10 years	high	high
Potential groundwater recharge projects:				
1) Protect natural recharge areas	Organized Water Purveyors / Landowners	Medium to long	Medium - high	Medium - high
2) Recharge imported surface water	Organized Water Purveyors	Long - More than 10 years	high	high
3) Recharge municipal reclaimed water	Organized Water Purveyors	Long - More than 10 years	high	high
4) Recharge storm water	Organized Water Purveyors / Landowners	Medium to long	medium - high	high
Manage future increases in groundwater pumping:				
1) Land use planning policies that do not allow net increase in groundwater pumping	County/City			

4.3.2 Maintain and Improve Groundwater Quality

The general water quality of the groundwater basin with respect to general minerals and selected minor constituents is good, but there are some areas of rising concentrations of total dissolved solids (TDS), chloride, and nitrate. Potential sources of these constituents include wastewater discharges (septic and municipal), agricultural practices, and irrigation with recycled water. General activities and projects that maintain and improve groundwater quality include projects that:

- Protect the water quality in the confined aquifer from by ensuring the proper construction of groundwater wells, including seals to separate the aquifer systems.
- Limit the impacts of the migration of contamination groundwater by incorporating available groundwater quality data into groundwater management operations.
- Limit upwelling of groundwater from the deeper aquifers by maintaining groundwater levels.

4.3.3 Protect Against Potential Inelastic Land Surface Subsidence

Historically, no land surface subsidence has been identified within the Basin. General activities and projects that protect against inelastic land subsidence resulting from groundwater level declines include those projects that maintain and improve groundwater levels. Additional activities could include projects that:

- Coordinate potential future land subsidence monitoring opportunities with State and federal agencies.
- Manage the groundwater basin to prevent land subsidence.
- Adjust groundwater management activities if land subsidence resulting from declining groundwater level is identified.

4.3.4 Protect Against Adverse Impacts to Surface Water Flows

Except along the Salinas River, there is little information regarding the relationship and interaction between surface water and groundwater in the Basin. There are few, if any, perennial streams in the Basin. Information on this relationship is needed to develop an understanding of the implications on the recharge/discharge areas and water quality conditions. General activities and projects that improve the understanding of groundwater and surface water interaction include projects that:

- Monitor river stage and nearby unconfined groundwater levels along the Salinas River.
- Evaluate this information to understand the relationship between surface water flows and groundwater levels at specific locations to determine the effect on groundwater levels and quality, including the potential impact of agricultural return flows on groundwater quality (to the extent any exist within the basin) and runoff from rural residences, horse pastures, roads, etc.

4.3.5 Groundwater Monitoring and Assessment

Groundwater monitoring provides the data and information needed to make groundwater management decisions. Groundwater level monitoring program is currently conducted by San Luis Obispo County. The California Statewide Groundwater Elevation Monitoring Program was created by legislation SBx7-6 in 2009. It will formalize how groundwater levels are reported to the State.

Current groundwater monitoring efforts include participation by various local districts and purveyors and San Luis Obispo County. An updated Monitoring Plan was developed for this GMP and is included in Appendix E.

The Monitoring Plan identifies the extent of the existing groundwater monitoring program in the unconfined and confined aquifer systems for groundwater elevations. The Monitoring Plan was prepared based on the existing wells monitored by several different agencies in the basin and provided recommendations for additional groundwater elevation and quality monitoring. This plan will be implemented by the GAC member agencies. Specific activities and projects that improve groundwater monitoring and assessment of groundwater conditions include projects that:

- Implement the Monitoring Plan included in Appendix E.
- Fill the data gaps in the Monitoring Plan with new dedicated multi-completion monitoring wells (if funding is available).

4.3.6 Evaluate and Implement Feasible Water Conservation Measures

Certain water conservation practices may be evaluated to determine their ability to improve water levels and water quality in the Basin. These may include water conservation opportunities for all land use types (agricultural, municipal, small commercial, small community, and rural domestic). General activities that support improved water demand management and water conservation include projects that:

- Identify current and potential conservation practices for each land use type.
- Quantify existing conservation practices being implemented.
- Develop outreach programs to encourage water conservation.
- Identify water reuse and water recycling opportunities
- Identify potential Low Impact Development (LID) opportunities for existing and new residential and commercial developments
- Provide incentives for water conserving devices/practices.

4.4 Subarea Basin Management Objectives

This section describes the identification of the groundwater level BMOs for individual subareas within the Basin.

The groundwater level BMOs established by the stakeholders for each subarea are listed in Table 4-2. In general, BMOs were selected to maintain or stabilize groundwater levels at or

near current conditions. Several subareas identified this as the initial BMO with the expectation that stabilizing groundwater levels needed to be achieved before improving groundwater levels could be considered.

Table 4-2. Basin Management Objective by Subarea

Subarea/Subbasin	Basin Management Objective (BMO)
Atascadero	Stabilize groundwater levels at 2009 levels
Bradley	Maintain groundwater levels
Creston	Stop decline and stabilize levels at 2009 levels
Estrella	Stabilize groundwater levels
North Gabilan	Maintain groundwater levels
San Juan	Maintain groundwater levels
Shandon	Stabilize groundwater levels
South Gabilan	Maintain groundwater levels

The initial Groundwater Management Activities identified during the stakeholder workshops are listed on Table 4-3. Many of the GMAs identified are common to several subareas. The subarea descriptions that follow include more detailed information about the draft BMOs and GMAs identified by the stakeholders through the workshops.

Table 4-3. Identified Groundwater Level GMAs by Subarea

Subarea/ Subbasin	Increase monitoring and reporting	Increase water conser-vation	Manage Growth	Use Nacimiento Project Water	Cloud-seeding	Prevent export from basin	Ground-water recharge and banking	Use State Water Project Water	Form irrigation or water district
Atascadero	X	X	X	X			X		
Bradley	X				X				
Creston	X	X	X			X	X		
Estrella	X	X		X					
North Gabilan									
San Juan	X								
Shandon		X			X		X	X	X
South Gabilan									

4.4.1 Atascadero Subbasin

The changes in groundwater levels in the Atascadero Subbasin are currently recorded at 51 wells that are included in the groundwater monitoring network. Four of these wells were selected to be representative of changes in groundwater level conditions in the subbasin. The locations of these four wells are shown on Figure 4-1.

The composite hydrograph showing the annual change and cumulative change in the average groundwater levels during the 1981 to 2009 period in the Atascadero Subbasin is included in Figure 4-2. This figure shows that in a single year, the average groundwater level can increase or decrease by up to 15 feet. The overall trend of the average groundwater levels has remained relatively constant since the early 1980s with groundwater levels rising and falling primarily in response to changing hydrologic conditions and increasing demands.

Representative precipitation data for the Atascadero Subbasin is recorded at the Atascadero Mutual Water Company precipitation Gage # 34. Precipitation data is available for this gage for the 1931 to 2009 period, during which annual precipitation averaged 17.65 inches. The annual rainfall for 1981 to 2009 period was about average (17.58 inches) compared to the period of record at that gage.

Figure 4-2. Atascadero Subbasin Composite Hydrograph and Annual Precipitation

Sub-Area Information	
Sub-Area	Atascadero
Basin Name	Atascadero

Sub-Area Well Records	
Period of Record	1966-2009
Num. BMO Wells	4

Report Information	
Report Start Year	1981
Period of Record	1981-2009

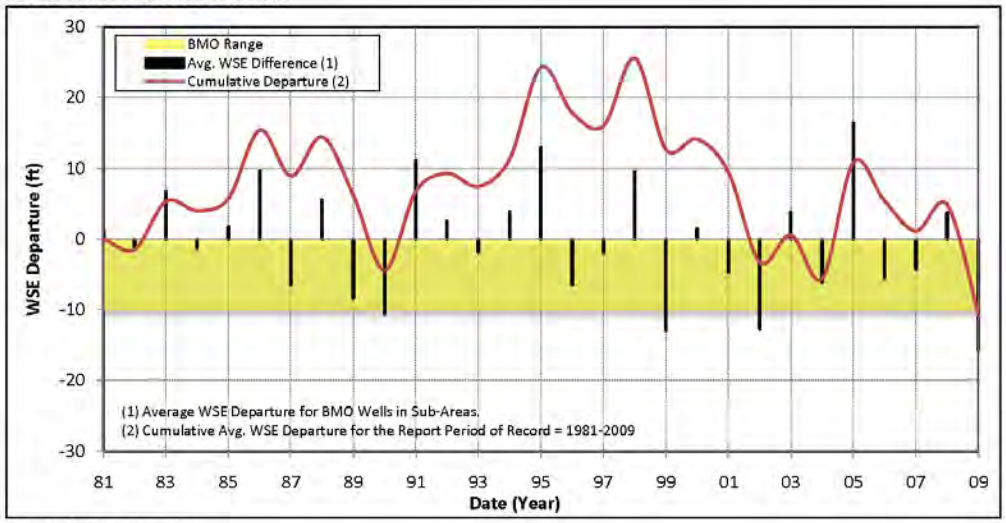
Raingage Information	
Raingage Name	Atas. Mutual Water # 34
Raingage Elev.	835.00 ft

Raingage Records	
Period of Record	1966-2009
Average Precip.	17.64 in

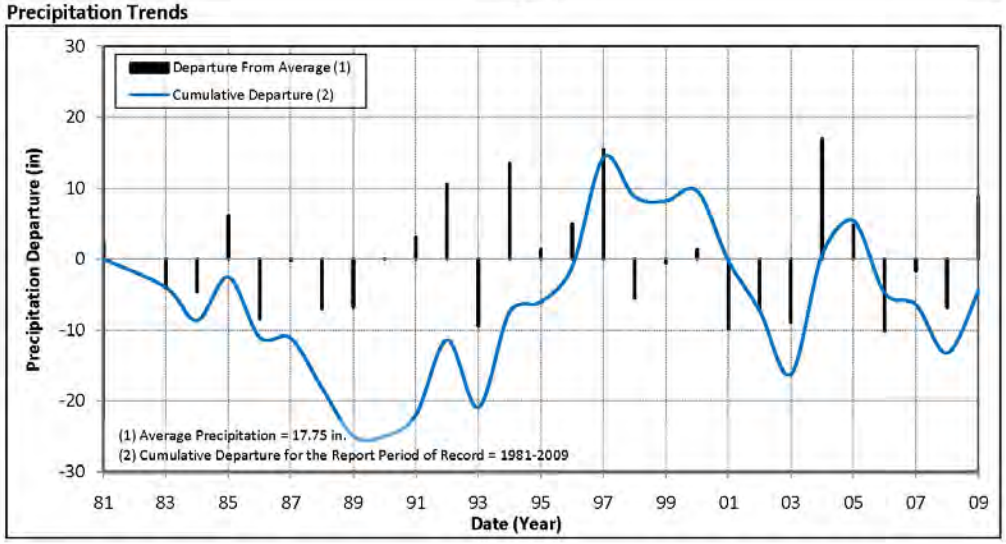
Trend Analysis Results	
BMO Departure[1)]	(10.00 ft)
2009 Departure	(10.75 ft)

NOTES: 1) BMO Cumulative Departure Since 1981

Water Surface Elevation Trends



Precipitation Trends



Based in part on this information, the stakeholders representing the Atascadero Subbasin determined that an acceptable draft BMO for groundwater levels that would include stabilizing groundwater levels at about the 2009 level. This represents a decline of about 10 feet from the 1981 groundwater levels as shown on Figure 4-2.

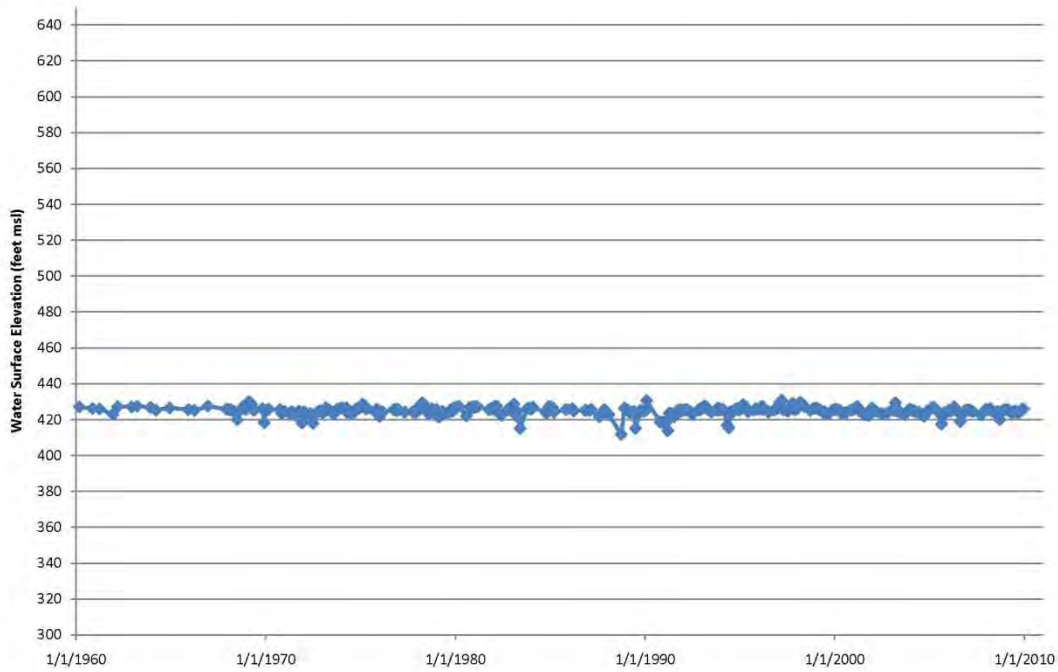
The following actions GMAs were identified by the stakeholders to stabilize groundwater levels in the Atascadero Subbasin. The GMAs are briefly described below.

- **Increase monitoring and reporting on groundwater conditions:** This GMA includes expanding the groundwater monitoring network in the Atascadero Subbasin through the addition of new wells to the volunteer monitoring network.
- **Increase water conservation education and implementation**: This GMA includes increasing the awareness of the impact of water conservation on reducing groundwater pumping. The effectiveness of the water conservation program will be difficult to verify for rural and agricultural areas without metering well production. The effectiveness of the GMA will be based on the changing behavior of individual water users and impacts on groundwater level trends in the area. The effectiveness of this GMA will be evaluated on an annual basis.
- **Managing the growth and corresponding increase in water demands**: This GMA includes identifying potential land use planning activities that may be used to reduce the rate of growth of water demand in the subbasin. In areas outside the jurisdiction of the cities of Atascadero and Paso Robles, land use planning is the responsibility of the San Luis Obispo County Department of Planning and Building.
- **Maximize the amount of Nacimiento Project Water in the Subbasin**: This GMA includes utilizing the existing Nacimiento Project Water already acquired for use in the subbasin, and explore opportunities to utilize unassigned Nacimiento Project Water.
- **Consider storm water management opportunities to increase local groundwater recharge**: This GMA includes evaluating the feasibility of recharging storm water runoff in the streams and creeks of the Basin. The potential benefit (in groundwater recharge) has not been evaluated for this GMA at this time.

4.4.2 Bradley Subarea

The changes in groundwater levels in the Bradley Subarea are currently recorded at one well that is included in the groundwater monitoring network of Monterey County Water Resources Agency (MCWRA). Construction details for this well are unknown and it may not be representative of groundwater levels throughout the Bradley or North Gabilan Subareas. The lack of data prevents the development of groundwater level hydrographs or composite hydrographs as developed for other subareas. The lone hydrograph available for these two subareas is shown in Figure 4-3. The location is shown on Figure 4-1.

Figure 4-3. Well Hydrograph in the Bradley Subarea



The hydrograph shown in Figure 4-3 is for a well located near the Salinas River downstream of the confluence of the Salinas River and the Nacimiento River. It appears that groundwater levels in this well reflect the interaction of the Salinas River and the alluvial aquifer materials adjacent to the river. Flows from the Salinas River, along with releases from Nacimiento Reservoir, help maintain groundwater levels in the alluvial aquifer near the Salinas River.

At this time, we are not aware of any reports or anecdotal information that suggests groundwater levels in the Bradley Subarea is declining to the point of causing problems for local groundwater users.

The different levels of BMOs were discussed at the workshop. As described above, there is very little available information to support the development of much targeted BMOs. Based on the available information, the BMO for the Bradley Subarea is to maintain high groundwater levels. The lack of an extensive monitoring network in this part of the Basin will prevent more detailed analysis at this time.

- **Continue monitoring and reporting on groundwater conditions:** Continue and improve monitoring – look to add monitoring well near the San Luis Obispo-Monterey County boundary between the Nacimiento River and the town of San Miguel.
- **Consider reestablishing Cloud Seeding Program:** Consider benefits of re-establishing the cloud seeding program in the Nacimiento and San Antonio watersheds. Cloud seeding was conducted in the past by MCWRA, and is estimated to have increased inflow into Lake Nacimiento and San Antonio Reservoirs by about 20 percent.

4.4.3 Creston Subarea

The changes in groundwater levels in the Creston Subarea are currently recorded at 17 wells that are included in the groundwater monitoring network. Four of these wells were selected to be representative of changes in groundwater level conditions in the eastern portion of the subarea. The locations of these four wells are shown on Figure 4-1. Since a well was not available in the northwestern portion of the subarea where well levels have declined most dramatically, these wells are not representative of the entire subarea.

The composite hydrograph showing the annual change and cumulative change in the average groundwater levels during the 1981 to 2009 period in the Creston Subarea is shown on Figure 4-4. This figure shows the average groundwater levels in the subarea appear to have peaked at about 1999. Since this time, groundwater levels have generally declined. This may be due in part to the increase in water demands between 1997 and 2006.

Representative precipitation data for the Creston Subarea is recorded at the Erickson Ranch precipitation Gauge # 52.1. Precipitation data is available for this gauge for the 1928 to 2009 period, during which annual precipitation averaged 11.89 inches. The annual rainfall for the 1981-2009 period was about one inch higher on average (12.85 inches) compared to the period of record at that gauge.

Based in part upon this information, the stakeholders representing the Creston Subarea determined that an acceptable draft BMO for groundwater levels in the Creston Subarea would include stopping the current rate of decline experienced in the last 10 years, and stabilizing groundwater levels at about the 2009 level as presented in the composite hydrograph (average of four wells) in the next five to ten years.

Figure 4-4. Creston Subarea Composite Hydrograph and Annual Precipitation

Sub-Area Information	
Sub-Area	Creston
Basin Name	Paso Robles

Sub-Area Well Records	
Period of Record	1960-2009
Num. BMO Wells	4

Report Information	
Report Start Year	1981
Period of Record	1981-2009

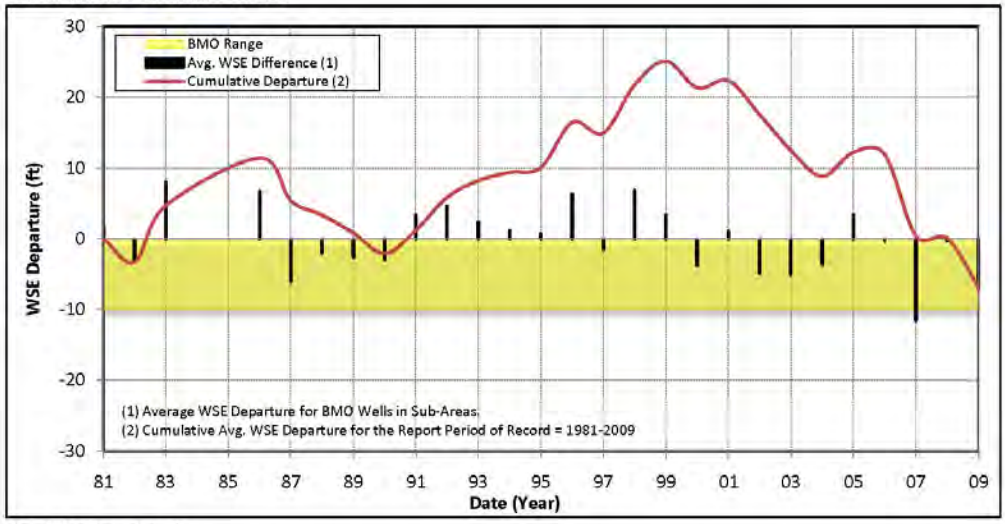
Raingage Information	
Raingage Name	Atas. Mutual Water # 34
Raingage Elev.	835.00 ft

Raingage Records	
Period of Record	1960-2009
Average Precip.	17.64 in

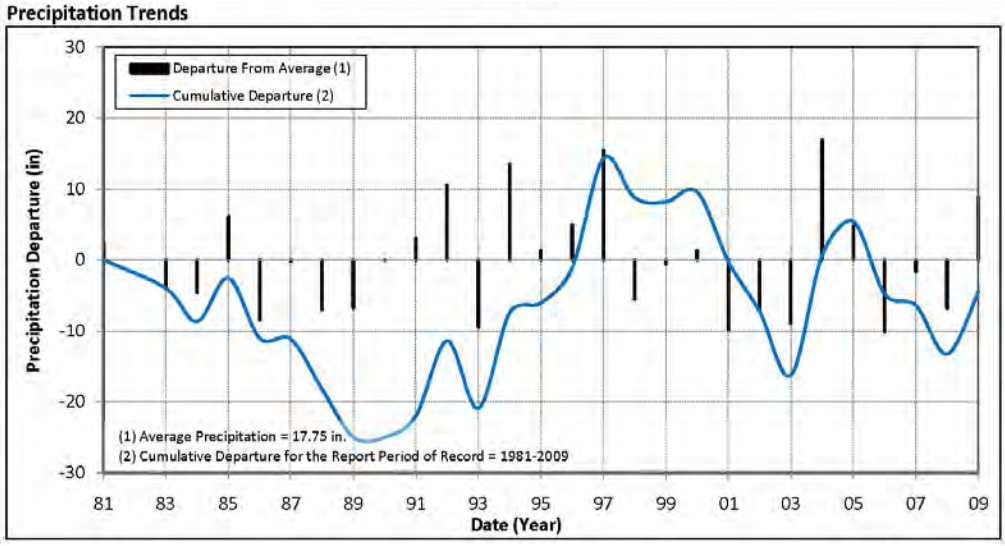
Trend Analysis Results	
BMO Departure[1)]	(10.00 ft)
2009 Departure	(6.91 ft)

NOTES: 1) BMO Cumulative Departure Since 1981

Water Surface Elevation Trends



Precipitation Trends



The following GMAs were identified by the Creston Subarea stakeholders to stabilize groundwater levels in the Creston Subarea.

- **Increase monitoring and reporting on groundwater conditions**: This GMA includes expanding the groundwater monitoring network in the Creston Subarea through the addition of new wells to the volunteer monitoring network. Additional wells are needed in the northwest portion of the subarea near the Estrella Subarea where historic groundwater level decline has been the greatest.
- **Increase water conservation education and implementation**: This GMA includes increasing the awareness of the impact of water conservation on reducing groundwater pumping. The effectiveness of the water conservation program will be difficult to verify for rural and agricultural areas without metering well production. The effectiveness of the GMA will be based on the changing behavior of individual water users and stabilized groundwater levels. The effectiveness of this GMA will be evaluated on an annual basis.
- **Managing the growth and corresponding increase in water demands**: This GMA includes identifying potential land use planning activities that may be used to reduce the rate of growth of rural residential development in the subarea. Throughout this subarea, land use planning is the responsibility of the San Luis Obispo County Department of Planning and Building. This GMA may include:
    - Moratorium on lot splits and subdivisions.
    - No net increase in groundwater use resulting from additional rural residential development via General Plan Amendments.
- **Preventing export of groundwater from the Basin:** This GMA includes identifying potential activities that result in exporting groundwater from the Basin. At this time, additional information is necessary to quantify the occurrence of groundwater pumping for export from the Basin. [to date this has not been quantified]
- **Consider storm water management opportunities to increase local groundwater recharge:** This GMA includes evaluating the feasibility of recharging storm water runoff in the streams and creeks of the Basin, at offstream locations and by retaining storm water onsite. The potential benefit (in groundwater recharge) has not been evaluated for this GMA at this time.

4.4.4 Estrella Subarea

The changes in groundwater levels in the Estrella Subarea are currently recorded at 50 wells that are included in the groundwater monitoring network. Six of these wells were selected to be representative of changes in groundwater level conditions in the subarea. The locations of these six wells are shown on Figure 4-1.

The composite hydrograph showing the annual change and cumulative change in the average groundwater levels during the 1981 to 2009 period in the Estrella Subarea is shown on Figure 4-5. Groundwater levels steadily declined during the period by over 70 feet.

Representative precipitation data for the Estrella Subarea is recorded at the Paso Robles precipitation Gage # 10. Precipitation data is available for this gage for the 1901 to 2009

period, during which annual precipitation averaged 15.04 inches. The annual rainfall for the 1981 to 2009 period was about one-half inch below average (14.49 inches) compared to the period of record at that gage.

The Estrella Subarea recorded the largest decline in groundwater levels (about 50 feet) during the 1997 to 2009 period. During this time, the average annual precipitation at the Paso Robles Gage was just below average (13.73 inches), suggesting that increased groundwater demands contributed significantly to the decline in groundwater levels in this subarea.

Based on this information, the stakeholders representing the Estrella Subarea determined that an acceptable draft BMO for groundwater levels in the subarea would include stabilizing groundwater levels at about the 2009 level. The goal of recovery of groundwater levels was identified as desirable by private domestic well owners, but the group agreed that such an objective was over-reaching at this time. The following GMAs were identified by the stakeholders to stabilize groundwater levels in the Estrella Subarea.

- **Increase data collection and monitoring and reporting on groundwater conditions:** It was determined that there is enough information to know that there is a problem, however, additional and better information is needed to further understand the problem.
- **Increase water conservation education and implementation:** The stakeholders recognized that additional conservation is needed. Some stakeholders felt that the amount of savings that can be achieved is limited. Other stakeholders felt that additional conservation in the agricultural sector could play a significant role in reducing groundwater demand and achieving the BMO of stabilizing water levels.
- **Nacimiento Project Water:** The stakeholders reached consensus regarding the use of Nacimiento Project Water to help alleviate the groundwater decline problem, but it was also recognized as not being the sole solution.

Figure 4-5. Estrella Subarea Composite Hydrograph and Annual Precipitation

Sub-Area Information	
Sub-Area	Estrella
Basin Name	Paso Robles

Sub-Area Well Records	
Period of Record	1967-2009
Num. BMO Wells	6

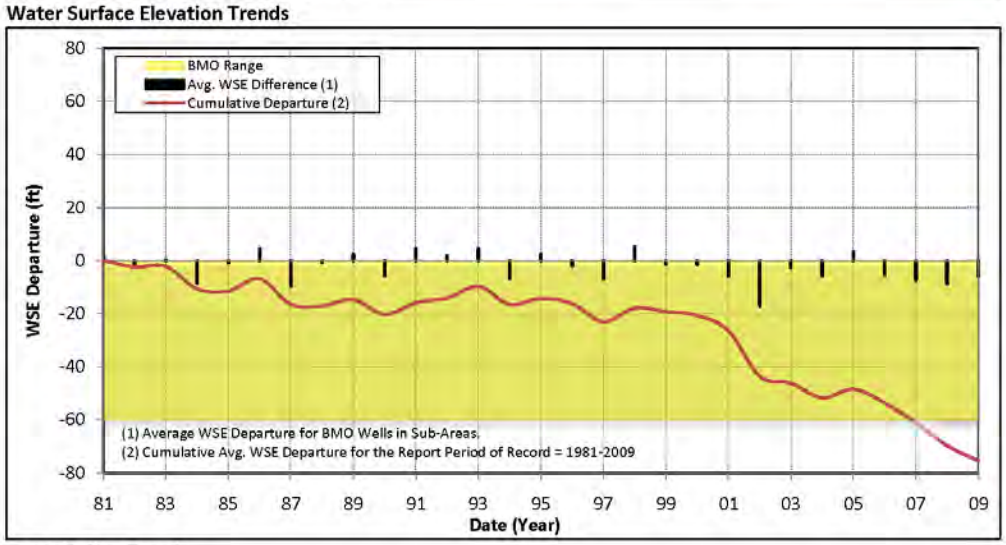
Report Information	
Report Start Year	1981
Period of Record	1981-2009

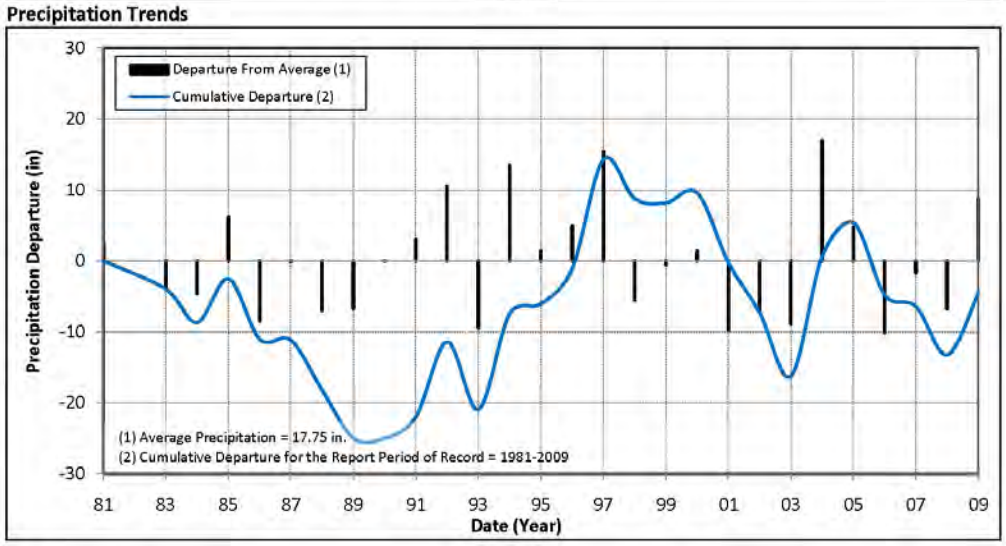
Raingage Information	
Raingage Name	Atas. Mutual Water # 34
Raingage Elev.	835.00 ft

Raingage Records	
Period of Record	1967-2009
Average Precip.	17.64 in

Trend Analysis Results	
BMO Departure[1]	(60.00 ft)
2009 Departure	(75.43 ft)

NOTES: 1) BMO Cumulative Departure Since 1981





4.4.5 North Gabilan Subarea

Overall water demand and groundwater use is low in the North Gabilan Subarea. There is also limited groundwater level data available, and no data that could be used to represent average groundwater levels in the subarea. Additionally, there are not identified groundwater problems or issues that have been presented to the Groundwater Advisory Committee. Because of the limited available data and identification of groundwater issues in the subarea, it is not practical to identify BMOs that can be measured at this time. The initial GMA

proposed at this time would include additional groundwater level monitoring to begin to track changes in groundwater levels. BMOs and additional GMAs may be developed after additional groundwater level data has been collected.

4.4.6 San Juan Subarea

4.4.6.1 Basin Management Objective

The changes in groundwater levels in the San Juan Subarea are currently recorded at 15 wells that are included in the groundwater monitoring network. Four of these wells were selected to be representative of changes in groundwater level conditions in the subarea. The locations of these four wells are shown on Figure 4-1.

The composite hydrograph showing the annual change and cumulative change in the average groundwater levels during the 1981 to 2009 period in the San Juan Subarea is shown on Figure 4-6. This figure shows that the groundwater levels in the San Juan Subarea are highly variable on an annual basis. It appears that groundwater levels in the San Juan Subarea respond quickly to changes in hydrologic conditions, with average groundwater levels increasing or decreasing by as much as 35 feet in a single year.

Representative precipitation data for the San Juan Subarea is recorded at the Shandon precipitation Gage # 73. Precipitation data is available for this gage for the 1937 to 2009 period, during which annual precipitation averaged 10.69 inches. The annual rainfall for 1981-2009 period was about one-half inch above average (11.06 inches) compared to the period of record at that gage.

During the 1981 to 1997 period, average groundwater levels changed considerably on a year-to-year basis, but there was no net significant difference in the cumulative groundwater levels at the end of the 16-year period. During the 1997 to 2006 period, the average groundwater levels in the San Juan Subarea declined by about 20 feet. Finally, during the 2006 to 2009 period, the average groundwater levels declined slightly (less than 5 feet). Overall, during the 1981 to 2009 period, average groundwater levels in the San Juan Subarea declined by about 25 feet.

Figure 4-6. San Juan Subarea Composite Hydrograph and Annual Precipitation

Sub-Area Information	
Sub-Area	San Juan
Basin Name	Paso Robles

Sub-Area Well Records	
Period of Record	1960-2009
Num. BMO Wells	4

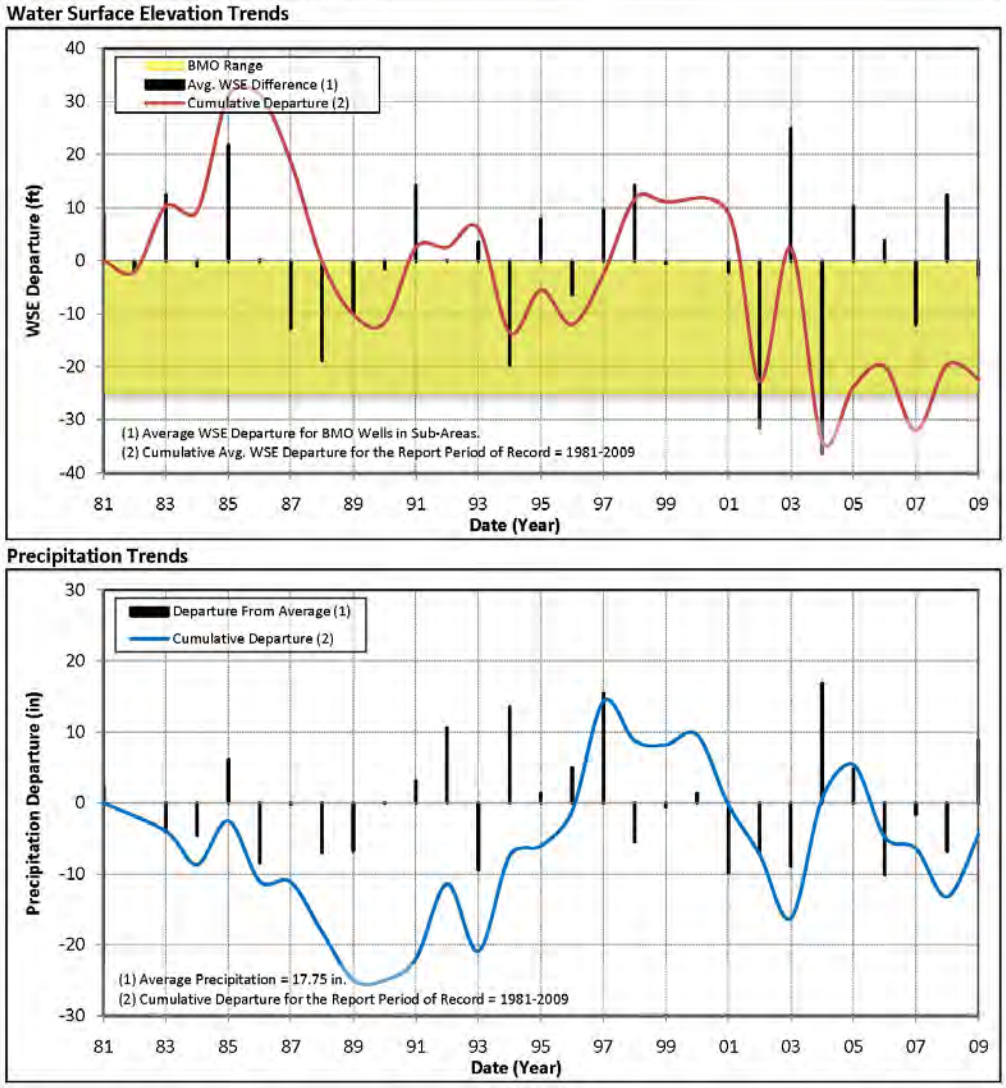
Report Information	
Report Start Year	1981
Period of Record	1981-2009

Raingage Information	
Raingage Name	Atas. Mutual Water # 34
Raingage Elev.	835.00 ft

Raingage Records	
Period of Record	1960-2009
Average Precip.	17.64 in

Trend Analysis Results	
BMO Departure[1]	(25.00 ft)
2009 Departure	(22.24 ft)

NOTES: 1) BMO Cumulative Departure Since 1981



Based on this information, the stakeholders representing the San Juan Subarea determined that an acceptable draft BMO for groundwater levels in the subarea would include stabilizing groundwater levels at about the 2009 level. The following GMAs were identified by the stakeholders to stabilize groundwater levels in the San Juan Subarea.

- **Continue monitoring and reporting on groundwater conditions:** The stakeholders suggest continuing the groundwater level monitoring and reporting program. The

existing monitoring network provides reasonable coverage for the subarea at this time based upon the current groundwater level conditions. Additional monitoring wells could be added, but are not considered as important as continuing to actively monitor and report on groundwater levels to extend the historical period of record.

4.4.7 Shandon Subarea

The changes in groundwater levels in the Shandon Subarea are currently recorded at 24 wells that are included in the groundwater monitoring network. Four of these wells were selected to be representative of changes in groundwater level conditions in the subarea. The locations of these four wells are shown on Figure 4-1.

The composite hydrograph illustrating the annual change and cumulative change in the average groundwater levels during the 1981 to 2009 period in the Shandon Subarea is shown on Figure 4-7.

This figure shows that the average groundwater levels the Shandon Subarea are highly variable on an annual basis. During the 1981 to 1997 period, average groundwater levels in the Shandon Subarea have declined by about 33 feet.

During the 1997 to 2006 period, average groundwater levels fluctuated annually, but resulted in very little net decline (about 2 feet) compared to 1997 levels.

Finally, from 2006 to 2009 period, the average groundwater levels declined by about 30 feet. Overall, during the 1981 to 2009 period (28 years), average groundwater levels in the Shandon Subarea declined by about 65 feet (about 2.3 feet per year), in response to a combination of increasing water demands that are met by groundwater.

Representative precipitation data for the Shandon Subarea is recorded at the Shandon precipitation Gage # 73. Precipitation data is available for this gage for the 1937 to 2009 period, during which annual precipitation averaged 10.69 inches. The annual rainfall for 1981-2009 period was about one-half inch above average (11.06 inches) compared to the period of record at that gage.

Based on this information, the stakeholders representing the Shandon Subarea determined that an acceptable draft BMO for groundwater levels in the subarea would include stabilizing groundwater levels at about the 2009 level, but there was concern about the cost of the program. The following GMAs were identified by the stakeholders to stabilize groundwater levels in the Shandon Subarea.

- **Groundwater Recharge and Banking Programs:** The discussions did not focus on the details of this project or the approach, but did identify potential groundwater recharge or banking of either imported supplies or from storm water runoff as potential sources of groundwater recharge. One potential project that was discussed was an inflatable dam project such as was done along the Salinas River in Northern Monterey County. No additional details were provided on that potential project.

- **State Water Project supplies for Shandon:** The community of Shandon has not used its 100 acre-feet of State Water Project water (SWP) to date. This project would include tying in to the Coastal Branch were it passes through Shandon to access the 100 acre-feet of supply. SWP supplies on the Coastal Branch are treated at the Polonio Pass Water Treatment Plant. This project would reduce municipal groundwater pumping in the Shandon area by the amount delivered from the SWP, thereby reducing groundwater pumping.

  An alternative of this GMA would be to pursue additional SWP supplies that could also be delivered to Shandon. San Luis Obispo County has a contract allocation to additional SWP supplies that it has not used, and is not currently using. These supplies could be a potential source of water to the area. Additional capacity in Phase II of the Coastal Branch would be needed to deliver water in excess of the 100 acre-feet supply currently contracted to Shandon by the County. An investigation regarding the additional capacity of the Coastal Branch is currently being pursued by the District.

- **Formation of Irrigation District or Water District:** The discussion focused on the **potential** need to form an irrigation district or water district to import surface water into the Basin. Irrigation districts/water districts are often formed to pursue large projects that benefit a larger group of water users. Such a district may be formed to pursue a groundwater recharge or water banking project that would rely on imported surface water.

- **Increase water conservation education and implementation:** The stakeholders recognized that additional conservation may result in a water savings, but were not sure if it **would** be cost effective. There was no objection to promoting conservation, and some discussions explored different conservation methods (such as alternative frost-control measures) since most growing operations are already on drip, and landscaping in Shandon is generally modest.

- **Precipitation Enhancement:** This was brought up for discussion, but it was unclear whether this project would work for the Shandon area.

Figure 4-7. Shandon Subarea Composite Hydrograph and Annual Precipitation

Sub-Area Information	
Sub-Area	Shandon
Basin Name	Paso Robles

Sub-Area Well Records	
Period of Record	1967-2009
Num. BMO Wells	4

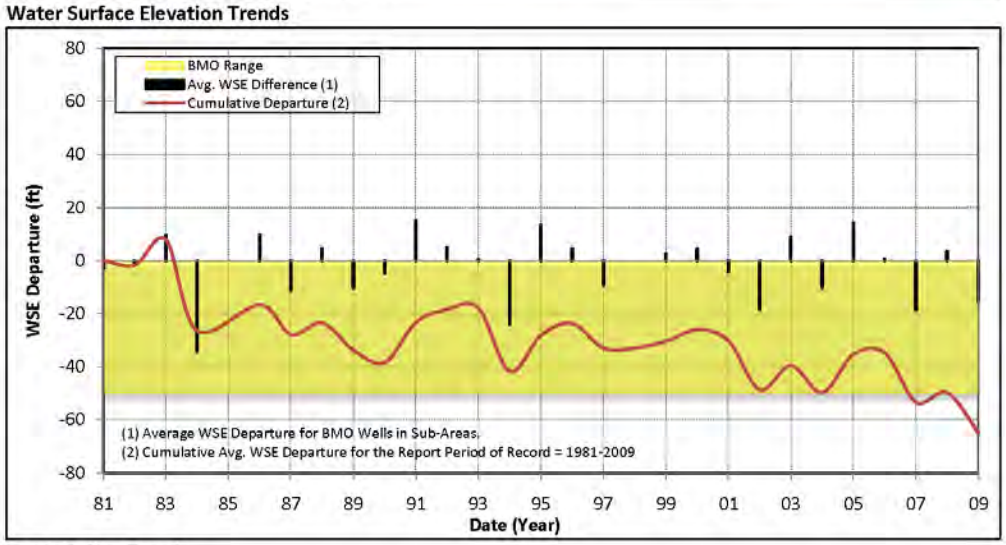
Report Information	
Report Start Year	1981
Period of Record	1981-2009

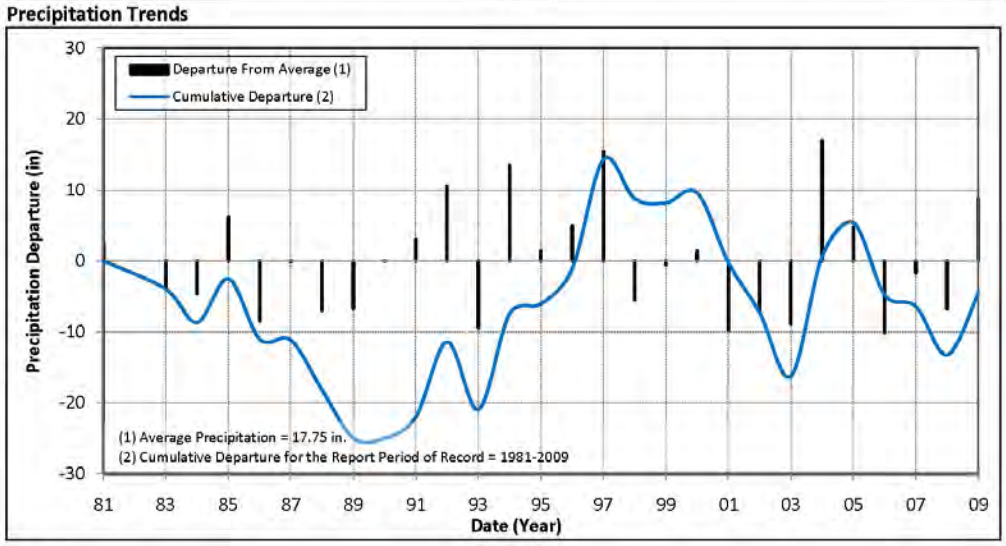
Raingage Information	
Raingage Name	Atas. Mutual Water # 34
Raingage Elev.	835.00 ft

Raingage Records	
Period of Record	1967-2009
Average Precip.	17.64 in

Trend Analysis Results	
BMO Departure[1]	(50.00 ft)
2009 Departure	(64.99 ft)

NOTES: 1) BMO Cumulative Departure Since 1981





4.4.8 South Gabilan Subarea

Overall water demand and groundwater use is low in the South Gabilan Subarea. There is also limited groundwater level data available, and no data that could be used to represent average groundwater levels in the subarea. Additionally, there are no identified groundwater problems or issues that have been presented to the Groundwater Advisory Committee.

Because of the limited available data and identification of groundwater issues in the subarea, it is not practical to identify BMOs that can be measured at present. The initial GMA proposed at this time would include additional groundwater level monitoring to begin to track changes in groundwater levels. BMOs and additional GMAs may be developed after additional groundwater level data have been collected.

5 Groundwater Management Plan Components

The Plan includes a variety of actions that are required by the Water Code, recommended by DWR Bulletin 118 California's Groundwater (DWR, 2003), and identified as optional programs under the Water Code. These actions are grouped into the following groundwater management components.

1. Stakeholder Involvement
2. Groundwater Monitoring and Data Collection
3. Groundwater Resource Protection
4. Groundwater Sustainability
5. Water Demand Management

The relationship of these components to the Basin Management Objectives identified in Section 4 is presented on Table 5-1. Each of these components is described in more detail in this section.

Table 5-1. Groundwater Management Component Summary

Groundwater Management Components		Basin Management Objectives					
		Maintain and Improve Groundwater Levels	Maintain and Improve Groundwater Quality	Protect Against Potential Inelastic Land Surface Subsidence	Protect Against Adverse Impacts to Surface Water Flows	Groundwater Monitoring and Assessment	Evaluate and Implement Feasible Water Conservation Measures
1. Stakeholder Involvement and Coordination							
1.1	Involvement with Stakeholders and Public	X				X	
1.2	Formation of a GAC for GMP Development and Implementation	X				X	X
1.3	Coordination with other agencies	X	X		X	X	X
1.4	Coordination with other water management planning efforts	X				X	X
2. Groundwater Monitoring and Data Collection							
2.1	Groundwater Elevation Monitoring	X				X	
2.2	Groundwater Quality Monitoring		X			X	
2.3	Inelastic Land Subsidence Monitoring			X		X	
2.4	Data Management System	X	X	X	X	X	X
2.5	Project Reporting	X	X	X	X	X	X
3. Groundwater Resource Protection							
3.1	Well Construction, Abandonment and Destruction Policies		X				
3.2	Wellhead Protection Measures		X				
3.3	Monitor Contaminated and Poor Quality Groundwater		X			X	
3.4	Control of Saline Water Intrusion		X			X	
4. Groundwater Sustainability							
4.1	Replenishment of High Quality Groundwater Extracted by Water Producers	X		X	X		
4.2	Construction and Operation of Recharge, Storage, and Extraction Projects	X	X	X	X		
4.3	Management of Sustained Groundwater Levels	X	X	X	X		
4.4	Modeling and Technical Analysis	X				X	X
5. Water Demand Management and Conservation							
5.1	Agricultural Water Management Practices	X	X				X
5.2	Urban Water Management Practices	X	X				X
5.3	Rural residential Water Management Practices	X	X				X

5.1 Component 1 – Stakeholder Involvement and Coordination

This component outlines the ongoing processes that will be used during the implementation of the Plan to involve stakeholders and coordinate with appropriate agencies involved in groundwater management activities in the Basin. A Governance Subcommittee was formed during the development of the Plan to consider the potential governance process for the implementation of the Plan. The subcommittee met on January 6, 2011. The results of the subcommittee meeting are described below.

5.1.1 Steering Committee

The Governance Subcommittee determined that a Steering Committee would be formed with the purpose of facilitating the implementation of the Plan. The Steering Committee would consist of 15 representatives from (one from each entity):

- Cities of Atascadero and Paso Robles
- Atascadero Mutual Water Company, Templeton CSD, San Miguel CSD – if they each choose to send a representative
- SLO County (Flood Control and Water Conservation District)
- Paso Robles Wine Country Alliance
- Central Coast Vineyard Team
- SLO County Farm Bureau
- SLO Cattlemen's Association
- PRIOR
- Four general At-Large positions, trying to balance vineyards, other agriculture, and rural residential

The qualifications for membership on the Steering Committee would include being a stakeholder or representative of a stakeholder group, years of relevant experience, and demonstrated commitment to the process. The listed agencies and organizations will select their representatives.

The Steering Committee would meet monthly at the beginning of the implementation process and probably quarterly as implementation continues. These meetings would be open to the public.

The Steering Committee will continue to hold public meetings to provide opportunities for additional public outreach and communication.

The Steering Committee will continue to coordinate water management activities within the Basin to work cooperatively with stakeholders and interested parties to achieve the agreed-upon BMOs through the implementation of the Groundwater Management Activities. The GAC will also develop an outreach and educational program to engage other water interests in management of the Paso Robles Basin.

Historically, the water issues and efforts in the Basin have been discussed via a stakeholder – run "North County Water Forum." The District, County, and City have developed reports

regarding the Basin, as noted, utilizing the North County Water Forum (NCWF) as a stakeholder review group at significant milestones in the development of the reports. Similarly, the GAC, in implementing the Plan, can utilize the group of contacts associated with the NCWF to obtain feedback on deliverables and activities.

5.1.2 Agricultural Interests

In the Paso Robles Basin, no water districts or irrigation districts exist to provide water to agricultural water users because all agricultural water demands have been meet with groundwater pumped from landowner wells. While there are no agricultural water purveyors in the Basin, organized groups have formed to represent agricultural water interests in the Basin.

In 2006, vineyards make up approximately 85 percent of the agricultural acreage and 76 percent of the agricultural water demand. In the Paso Robles Basin, the Paso Robles Wine Country Alliance (PRWCA) and the Central Coast Vineyard Team (CCVT) are working to address vineyard-related water use issues.

Other crops, including row crops, olives, alfalfa, and row crops are also grown within the Paso Robles Basin, but may not have local industry-specific organizations to directly represent these interests, so non-vineyard, agricultural related groundwater management activities will be coordinated with the County Farm Bureau. As those groups become engaged, their representatives may become involved in the GAC.

5.1.2.1 Paso Robles Wine Country Alliance

The PRWCA actively promotes water use efficiency and sustainable practices. PRWCA recently formed the Wine Industry Water Committee (Water Committee), which is intended to '*… provide a broader coordination for inputs and feedback to our government partners in water evaluation, water quality, and water management planning.'* The Water Committee's role is to oversee, prioritize, and guide innovative, sustainable conservation efforts that promote and maintain a sound wine growing region; while preserving and protecting the long-term availability of water supply for all users. The Water Committee represents over 15,000 acres through its membership, and as part of the PRWCA, will encourage the implementation of voluntary, industry-accepted water management practices aimed at improving water use efficiency.

5.1.2.2 Central Coast Vineyard Team

The Central Coast Vineyard Team is a network of 300 local farmers that strive to protect the resources valuable to our farms and our communities by educating and guiding towards sustainable vineyard practices. The CCVT identifies and promotes the most environmentally safe, viticulturally and economically sustainable farming methods, while maintaining or improving quality and flavor of wine grapes. The CCVT looks to be a model for wine grape growers and will promote the public trust of stewardship for natural resources. Since 1996, the CVTT has helped growers conduct self assessments that address resource conservation, including water use efficiency best management practices.

5.1.3 Coordination with Agencies with Land Use Planning Responsibilities

Several of the management actions identified have clear policy requirements and implications. For example, effective protection of natural recharge areas will require coordination and communication with entities responsible for land use policies.

The development of consistent land use policies could be assisted by a regional groundwater forum such as the GAC. The purpose of this forum would be to foster coordination and cooperation among participating agencies to manage the Basin and to provide a framework for the formulation of Basin-wide projects and programs for the protection and use of groundwater resources.

For example, given the mutual concern of agencies within the Basin regarding the preservation of natural recharge areas and the protection of these areas from pollutants, local agencies could work through the forum to inform one another about land use practices that may contribute to groundwater degradation and the importance of reducing the occurrence of these land use practices. Some of these agencies with land use responsibilities in the Basin include:

- San Luis Obispo County Planning Department
- Monterey County Planning Department
- City of Paso Robles
- City of Atascadero
- State of California

Other issues may require coordination with additional local agencies.

5.1.4 Integration with Other Water Management Planning Efforts

This component addresses the need to integrate the Plan with other water–related efforts when making decisions to ensure multiple viewpoints are addressed. This requires coordination with individual local agencies, other regional planning efforts as well as Statewide planning efforts. The Plan is a living document that supports other planning efforts and in turn is also dependent upon other water management planning efforts that may occur in the Basin over time. The GAC and the Plan will need to be accessible to those efforts and Plan implementation should be coordinated with them. Some of these related water management efforts may include:

- Urban Water Management Plans
- Watershed Management Plans
- Integrated Regional Water Management Plans
- Water Master Plans
- General Plan Updates
- Resource Management System/Resource Capacity Study
- California Water Plan Update

5.2 Component 2 – Groundwater Monitoring and Data Collection

Improved groundwater monitoring and analysis and archiving of collected data are needed to implement several of the recommended management actions (e.g., conjunctive management and water quality management). The existing groundwater monitoring program is described in Section 3.3.1.

Additional monitoring is needed to fill several data gaps identified in the Plan. It is also recommended that the GAC utilize the existing County groundwater elevation database to facilitate the storage, retrieval, and archiving of groundwater data in the future.

5.2.1 Groundwater Elevation Monitoring

Groundwater elevation data is one of the primary sets of information available to the Groundwater Advisory Committee to understand the current groundwater conditions and longer term trends in groundwater elevations. To date, the District has used groundwater level data from the voluntary monitoring network to determine groundwater elevations in the Paso Robles Basin. Additional groundwater elevation data is needed to improve the understanding of the groundwater basin and support future management efforts such as updating the groundwater model.

The following actions could improve the groundwater monitoring and reporting program in the Paso Robles Basin. The recommendations are organized into improvements to the voluntary monitoring network, and development of a dedicated monitoring network. These are described in more detail in Appendix E.

5.2.1.1 Improvements to Voluntary Monitoring Network

Recommended steps needed to improve voluntary groundwater level monitoring network include:

- Increase the number of wells in groundwater level monitoring network in the Paso Robles Basin.
- Obtain well construction data for existing wells included in monitoring network to improve understanding of aquifer being represented by each well.
- Increase groundwater level monitoring frequency from semi-annual to quarterly. If this cannot be done for all wells in the monitoring network, it should at least be done for selected wells (such as the key BMO wells) that have construction information and a historical water level record.
- Expand the monitoring network to include areas experiencing changes in groundwater levels (see Figure 3-3) or changing land use conditions.

The GAC should assist the District with soliciting volunteers.

5.2.1.2 Development of a Dedicated Monitoring Network

The groundwater level monitoring network could be expanded by including dedicated monitoring wells to provide long-term continuity of the monitoring program and fill existing gaps in the monitoring network. The GAC should provide recommendations on the need for dedicated monitoring wells. Dedicated monitoring wells should be outfitted with transducers to record water level data at selected time intervals. This information should be downloaded routinely and included into annual reporting. This would provide additional information on the seasonal changes in water levels that are currently not captured in the spring and fall monitoring.

The dedicated monitoring well network could be expanded to include monitoring wells:

- In critical areas of concern where groundwater levels have declined or are experiencing groundwater level declines.
- In areas where there are data gaps either because there are no wells in the existing monitoring well network.
- At the edges of the developed land use in the Basin. These areas may not be experiences seasonal or long-term trends associated with localized pumping, so may be able to provide additional background water level data.

Some of the areas identified for dedicated monitoring network include:

- City of Paso Robles
- Creston Road Area
- Union Road Area
- Highway 46 west of Whitley Gardens
- Jardine Road Area
- Airport Road- Highway 101
- Highway 46 east of Whitley Gardens
- Creston Area
- Shandon Area
- Highway 41 south of Shandon
- North of San Miguel
- East of San Miguel

Some of the locations for additional monitoring are shown on Figure 5-1. Additional information is provided in Appendix E.

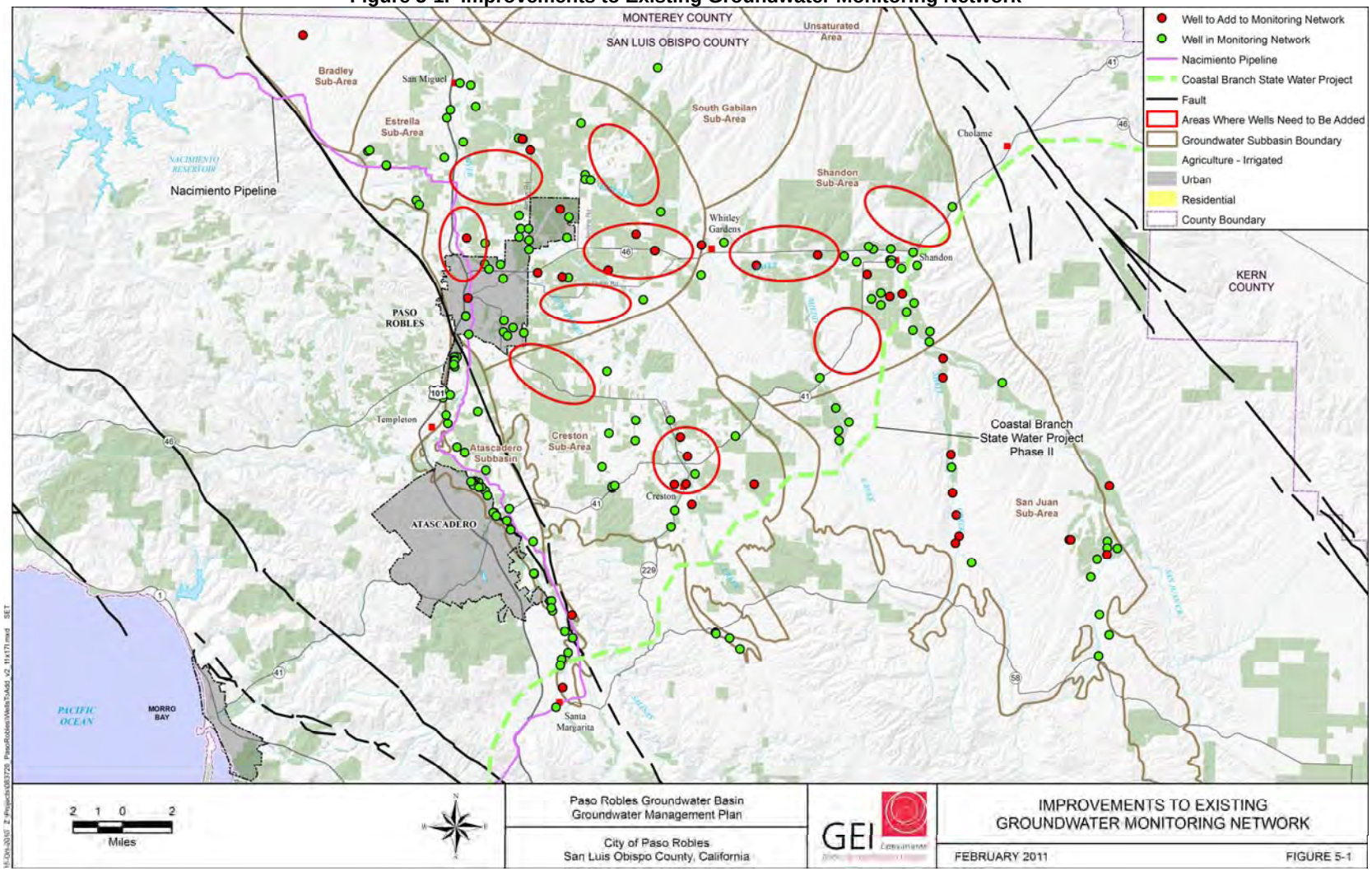
5.2.2 Groundwater Quality Monitoring

Many of the wells in the Paso Robles Basin are used for agricultural purposes. These wells are often monitored by well operators to ensure crop productivity. These monitoring records are typically kept private and are not public information. Water quality monitoring of drinking water sources has been performed by municipalities and private water purveyors in the Paso Robles Basin as required by the California Department of Public Health under Title 22, California Code of Regulations. Sources of water quality data include DWR, local

municipalities, USGS, and local growers. This information has been sufficient to develop an assessment of the general water quality conditions in the Basin necessary to support the existing land uses. Future conditions including land use changes may be served by expanding the water quality monitoring network to serve as a warning for changes in groundwater quality. Steps to improve groundwater quality monitoring network may include:

- Increase number of wells in groundwater quality monitoring network.
- Get well construction data for existing wells included in monitoring network to improve understanding of aquifer being represented by each well.
- Include groundwater quality considerations during the development of a dedicated groundwater monitoring network.
- Collect privately maintained water quality data from willing providers for purposes of project feasibility analysis. Confidentiality of the original data must be maintained.

Figure 5-1. Improvements to Existing Groundwater Monitoring Network



5.2.3 Inelastic Land Subsidence Monitoring

Because there has been no significant long-term land subsidence in the Basin there are no plans to develop a formal program to monitor and measure the rate of inelastic land surface subsidence within the Basin. The need for land subsidence monitoring will continue to be considered on an annual basis.

5.2.4 Data Management and Project Reporting Recommendations

Data management and project reporting are essential components of groundwater management. These efforts support all the monitoring activities described above, and involve communication with stakeholders and agencies. The data management and reporting activities associated with Plan implementation are described below.

5.2.4.1 County Groundwater Level Database

The County manages the groundwater level data it collects in a Microsoft Access database. The database contains approximately 159 wells that are monitored by the County or their cooperating partners within the Basin. Much of the information is considered confidential, so there are currently no plans to make the database accessible to the public.

As part of this Plan, a data management tool was developed to improve the capability of the existing database to extract specified data and display it in a report-ready format. This tool can be used in the future to generate individual well hydrographs or subarea hydrographs (as presented in Section 4).

5.2.4.2 County GIS Data

The District and the County collect water usage information and agricultural crop permit records and land use information that is in GIS format that could be accessed to support groundwater basin management efforts as needed.

5.2.4.3 Paso Robles Groundwater Basin Annual Report

Routine reporting of the conditions of the groundwater basin is an essential component of long-term groundwater management. Several reports have been prepared in the Basin documenting the groundwater conditions at a certain point in time. Part of this Plan is to development of an annual reporting framework that will facilitate consistent reporting on several aspects of groundwater management that are needed to make decisions on future groundwater management activities. The purpose of the Annual Report is to:

- Document the current conditions of the groundwater basin based on current data.
- Compare the current conditions to the established Basin Management Objectives.
- Evaluate the progress of the implementation of the Groundwater Management Activities identified in the Plan.

- Determine the effectiveness of the current management of the Basin at meeting the BMOs.
- Recommend the next steps to be undertaken to continue managing the groundwater resources of the Basin.

The 2009 Annual Report is included in Appendix E.

5.2.4.4 CASGEM Water Level Reporting Requirements

Future groundwater elevation monitoring and reporting will need to comply with the California Statewide Groundwater Elevations Monitoring Program (CASGEMs). This legislation, passed in 2009, is intended to establish a collaborative process between local monitoring parties and DWR to collect groundwater elevations statewide and make them available to the public.

To comply with CASGEMS:

- Local parties may assume responsibility for monitoring and reporting groundwater elevations.
- DWR will work cooperatively with local monitoring entities to achieve monitoring programs that demonstrate seasonal and long-term trends in groundwater elevations.
- A 'Monitoring Entity' is identified for each basin to coordinate monitoring in the basin and the reporting to DWR.
- Where a Monitoring Entity is not established, DWR will perform the monitoring functions. If local parties do not volunteer to perform the groundwater monitoring functions, DWR will assume those functions, and those parties will become ineligible for water grants and loans from the State.

The major deadlines for this effort include:

- On or before January 1, 2011: Parties seeking to assume groundwater level elevation monitoring functions must notify DWR. The District has notified DWR that they will be the monitoring entity for the Paso Robles Groundwater Basin.
- On or before January 1, 2012: Monitoring entities shall begin reporting seasonal groundwater elevation measurements.

5.3 Groundwater Resource Protection

The groundwater users of the Basin consider groundwater resource protection a critical component for ensuring its long-term sustainability. Groundwater resource protection includes basin recovery and sustainability as well as contamination prevention. Prevention measures include well construction, abandonment, and destruction policies, wellhead protection, and the monitoring and control of contaminated, poor quality, or saline water.

5.3.1 Well Construction, Abandonment, and Destruction Policies

Well construction and demolition standards are designed specifically to protect groundwater quality. Management actions to assist local agencies in complying with public health standards include the following components:

- Installation of sanitary well seals on all new wells in accordance with the California Well Standards.
- Installation of wells that conform to San Luis Obispo County and Monterey County standards include an impermeable seal between the upper and lower aquifers to prevent low quality water in the upper aquifer from entering the lower aquifer, where such low quality water exists.
- Abandonment of wells in accordance with the California Well Standards.

These management actions (currently enforced by California Department of Public Health and San Luis Obispo County and Monterey County) are particularly valuable in unincorporated areas not served by a water purveyor and could also apply to agricultural wells within the Basin in the future.

5.3.1.1 Implementation of Well Construction Policies

The San Luis Obispo County Environmental Health Services (in San Luis Obispo County) and Monterey Environmental Health Services (in Monterey County) administer the well permitting program within the Paso Robles Groundwater Basin. The well construction standards implemented by Environmental Health Services are consistent with those recommended in State Water Code Section 13801. This section of the State Water Code requires that counties, cities, and water agencies to adopt the State Model Well Ordinance as a minimum standard for well construction or a more rigorous standard if desired. The Environmental Health Services Departments have enacted well ordinances adopting the *California Well Standards, Bulletin 74-81*, and all supplements for the two counties. The Environmental Health Services staff also issue applications and review construction plans and specifications for wells drilled in the county and require and maintain well logs and water well driller reports for constructed wells.

The GAC will facilitate the following actions:

- Ensure that all member agencies are provided a copy of the applicable county well construction ordinance and that they understand the proper well construction procedures.
- Coordinate with member agencies to provide guidance, as appropriate, on well construction to prevent creating conduits through regionally confining beds.

5.3.1.2 Administration of Well Abandonment and Destruction Programs

It is believed that there may be many unknown, obsolete, or abandoned water supply wells within the Paso Robles Basin. These wells may provide potential conduits for contamination between aquifers or from saline water sources at depth.

One of the primary concerns of local agencies is the groundwater contamination risk posed by unused wells that have not been properly destroyed. Section 21 of DWR Bulletin 74-81 and revisions contained in Part II of Bulletin 74-90 allow classification of unused wells into two types: abandoned and inactive. An abandoned well is defined as one that has not been used for a period of one year and whose owner has declared the well will not be used again. If the well has not been used during the past year but the owner demonstrates his/her intention to use the well again for supplying water, the well is considered inactive. Four criteria must be met in order for a well to be maintained in inactive rather than abandoned classification. These criteria are:

- The well has no defects.
- The well is securely covered.
- The well is clearly marked.
- The surrounding area is kept clear of brush and debris.

Failure to meet these criteria could result in the well being classified as abandoned under current regulations. All abandoned wells, exploration, or test holes and monitoring wells must be destroyed as stated in Section 22 of Bulletin 74-81 and revisions contained in Bulletin 74-90.

An abandonment program should focus on those wells that pose the greatest threat to groundwater; however, numerous factors make the abandonment and destruction of wells difficult. These factors include lack of consistency in records regarding well construction, location, and use; cost of well destruction; and the defined classification for abandonment of wells. Well construction within the study area has taken place for nearly a century, with records and standards altered over time. Recent records pertinent to construction and location of new wells are more complete than earlier records that are often inconsistent. The lack of financial incentive for well owners to declare a well as abandoned also reduces the effectiveness of the well abandonment program.

The San Luis Obispo County Environmental Health Services and the Monterey County Environmental Health Services administers the well destruction program for those portions of the Paso Robles Groundwater Basin within their jurisdiction. The standards for construction are identified in the County code sand are based on State of California standards.

The GAC members, including San Luis Obispo and Monterey County, should facilitate the following actions for lands within their jurisdictions:

- Ensure that all GAC members and local agencies are provided a copy of the code and understand the proper destruction procedures and support implementation of these procedures.
- Follow up with local agencies and well owners on reported abandoned and destroyed wells to confirm information collected from DWR and receive information on abandoned and destroyed wells to fill gaps in county records.
- Obtain “wildcat” maps from California Division of Oil, Gas, and Geothermal Resources to ascertain the extent of historic gas well drilling operations in the area

because these wells could function as conduits of contamination if not properly destroyed.
- Seek funding to develop and implement a program to assist well owners in the proper destruction of abandoned wells.

5.3.2 Wellhead Protection Measures

The purpose of wellhead protection is to protect the groundwater used as a public supply, thereby reducing the costly treatment otherwise needed to meet relevant drinking water quality standards. A Wellhead Protection Area (WHPA), as defined by the Federal Wellhead Protection Program established by Section 1428 of the Safe Drinking Water Act Amendment of 1986, is "…the surface and subsurface area surrounding a water well or wellfield supplying a public water system, through which contaminants are reasonably likely to move toward and reach such water well or wellfield." The WHPA may also be the recharge area that provides the water to a well or wellfield. Unlike surface watersheds that can be easily determined from topography, WHPAs can vary in size and shape depending on subsurface geologic conditions, the direction of groundwater flow, pumping rates, and aquifer characteristics.

Identification of WHPAs is a component of the Drinking Water Source Assessment and Protection (DWSAP) Program administered by the California DPH. DPH set a goal for all water systems Statewide to complete Drinking Water Source Assessments by December 31, 2002. Table 5-2 identifies the water suppliers that have completed their required assessments by performing the three major components required by DPH listed below:

- Delineation of capture zones around sources (wells).
- Inventory of Potential Contamination Activities (PCAs) within protection areas.
- Vulnerability analysis to identify the PCAs to which the source is most vulnerable.

The GAC will facilitate the following actions:

- Request that member agencies provide vulnerability summaries from the DWSAP Program to be used for guiding management decisions in the basin.
- Contact groundwater basin managers in other areas of the State for technical advice, effective management practices, and "lessons learned," regarding establishing wellhead protection areas.

Table 5-2. Water Supplier DWSAP in the Paso Robles Groundwater Basin

System Number	System Name	Number of Sources
4000210	Creston's Country Store	1
4000649	Los Robles Mobile Home Estates	3
4000656	Santa Margarita KOA	2
4000693	Creston Elementary School	2
4000699	Paso Robles Truck Plaza, LLC	1
4000714	Santa Margarita Recreation Area	1
4000790	Paso Robles RV Ranch	1
4010002	Atascadero Mutual Water Co	18
4010003	San Miguelito MWC	3
4010006	Paso Robles Beach Water Assn	1
4010007	Paso Robles Water Department	15
4010010	San Miguel Community Services District	2
4010019	Templeton CSD	11
4010024	SLO CWWD No. 6-Santa Margarita	4
4010028	SLO CSA No. 16 -Shandon	2
4010080	Nacimiento Water Project	1
4010831	El Paso De Robles Youth Corr. Facility	3
4010832	Atascadero State Hospital	3
4010900	Caltrans -Shandon Rest Stop	1

5.3.3 Monitor Contaminated and Poor Quality Groundwater

The potential migration of poor quality groundwater is of concern to all groundwater users. Also of concern is any localized contamination of groundwater by point sources in the Basin.

While the GAC does not have authority or responsibility, it will coordinate with responsible parties and regulatory agencies to keep GAC members informed of the status of any groundwater contamination in the basin.

The GAC will facilitate the following:

- Coordinate with San Luis Obispo County and other groundwater users to continue the water quality data reporting program data for public supply wells and Basin characterization.
- If detections are found, facilitate meetings to inform groundwater users of the contamination and its potential spread. Specifically, the consideration of altering groundwater extraction patterns or altering production wells in the vicinity of areas of poor groundwater quality or pollutant plume to change the groundwater gradient.
- Provide a forum to share all information on mapped contaminant plumes and hazardous materials release sites. This mapping can be used to show where future monitoring wells should be located.
- Track upcoming regulations on septic systems, agricultural discharges, and other regulatory programs that pertain to water quality and inform groundwater users.

5.3.4 Control of Saline Intrusion

There are no known occurrences of saline water intrusion within the Basin. Although currently not a problem, there are hydraulic conditions such as depressed groundwater levels that could allow saline water intrusion to occur in the future from water at depth in the aquifer. If saline intrusion is identified by the monitoring program in the future, then an approach can be developed to address the problem.

The GAC will coordinate with member agencies to facilitate the following:

- Continue the existing groundwater quality monitoring in the Paso Robles Subbasin to identify occurrences of saline water.
- Observe total dissolved solids (TDS) concentrations in public supply wells that are routinely sampled under the DPH Title 22 Program for potentially increasing levels of salinity.

5.4 Groundwater Sustainability

To ensure a viable and sustainable groundwater resource, the Plan seeks to increase the amount of groundwater in storage in the Basin over the long term. This includes protecting natural recharge areas, supplementing natural recharge to better manage groundwater levels in the Basin.

5.4.1 Replenishment of High Quality Groundwater Extracted by Water Producers

An important component of groundwater management is the protection of major recharge and withdrawal zones. This strategy has far-reaching effects in the Paso Robles Groundwater Basin because rainfall infiltration provides much of the recharge to the Basin. To ensure an adequate supply of high quality groundwater, groundwater recharge must be adequate to replenish extracted groundwater.

Groundwater recharge from the surface occurs primarily from 1) infiltration and recharge of precipitation and 2) infiltration from streamflow. As shown on Figure 3-4, the soils of Basin have varying infiltration rates. Because infiltration of rainfall upon the ground surface is considered to be the primary source of recharge, the areas with the highest infiltration rates (greatest potential for recharge) should be preserved.

Planned urban development in the Paso Robles Basin may impact these natural recharge areas. These trends underscore the need to more precisely identify and map the remaining natural recharge areas and to use this mapping to protect important sources of recharge. The objective is to develop specific planning actions that offer varying degrees of protection, depending upon an area's significance as a source of recharge. Types of protection could include programs to educate public and planning entities about the importance of protecting recharge areas.

The first step in implementing this management action would be to identify recharge areas and develop a GIS-based analysis of natural recharge areas, to inform land use planning entities (San Luis Obispo County and cities of Paso Robles and Atascadero) of the importance of these areas and to make recommendations for their protection. Databases that are maintained by the Water Board and local land trust organizations may be helpful. Additional information such as groundwater levels in undeveloped portions of the basin and identification of near surface impediments to percolation of water is needed to support the identification and ultimate projection of recharge areas in the Basin.

A comprehensive approach to the protection and management of the major recharge and withdrawal zones is needed to preserve and protect recharge areas. The GAC supports the evaluation of the surface soils and surface geology within and directly adjacent to its boundary for the purpose of delineating areas having potentially high recharge rates. The GAC supports land use measures that will preserve potential recharge areas from development that would reduce or eliminate their effectiveness as recharge sites. These efforts will need to be coordinated with the San Luis Obispo County Planning Department and/or with other agencies associated with land use planning authority in the Basin.

The GAC member agencies will facilitate the following:

- Support the identification of areas having high potential for contributing to aquifer recharge and continue to communicate with land use planning entities to enact measures that will protect these lands from development that would reduce their value as recharge sites.
- Communicate with DWR and other governmental agencies studying groundwater and river interactions and infiltration potential.
- Collaborate with local land trust organizations (e.g., Land Conservancy of SLO County, California Rangeland Trust) and resource conservation agencies/organizations (e.g., Resource Conservation Districts, NRCS) to encourage protection of recharge areas.

5.4.2 Construction and Operation of Recharge, Storage, and Extraction Projects

All the groundwater users in the Basin including the District, cities, water providers, and agricultural interests share responsibility for the development and operation of recharge, storage, and extraction projects to provide long-term sustainability of the available groundwater resources.

The Paso *Robles Groundwater Banking Feasibility Study* completed in 2008 contains a feasibility-level evaluation of groundwater recharge and groundwater banking potential using a portion of the County's unused State Water Project allocation in the Paso Robles Basin using the existing available information and models. The feasibility study evaluated three locations for recharge or groundwater banking operations. Two of the three locations evaluated may provide opportunities for groundwater recharge/groundwater banking, but additional analysis would be needed to further refine the project yield and evaluate project costs, environmental and legal constraints and the impacts on overlying landowners. A significant portion of the costs for any of the alternatives evaluated construction of a new pipeline to convey the water from the Polonio Pass Water Treatment Plant to the recharge locations. The implementation timeframe for this project or similar projects is typically about 10 to 20 years.

To the extent feasible, the GAC may also support measures to coordinate development and optimize operation of facilities to improve the basin-wide effectiveness and efficiency of water management.

The GAC will facilitate the following:

- Encourage sharing of information on project planning, design, and operation among local agencies and private groundwater users.
- Promote a coordinated approach toward project development and operation to lower the costs and increase the benefits of water management efforts.
- Seek State and federal funding for projects and programs that will contribute to recharge of the groundwater basin, if determined to be feasible.
- Attempt to identify viable, cost effective projects that contribute to increased recharge within the Basin.
- Support update of the existing groundwater model that can be used to evaluate groundwater management opportunities, which may include groundwater recharge projects.

5.4.2.1 Imported Water Supplies

Imported water supplies may be available to water users in the Paso Robles Basin as described in Section 3 from the State Water Project (imported from outside of the County) and the Nacimiento Water Project (imported from outside the Basin, but within the County). The Nacimiento Water Project will provide a new supply of surface water to the Paso Robles Basin. When these supplies become available, they can be used to offset groundwater pumping and accommodate additional growth based on the use of surface water.

5.4.2.1.1 City of Paso Robles

The City of Paso Robles is a participant in the Nacimiento Water Project, with a current allocation of 4,000 AFY. A water rate increase was adopted by the City in 2010 that will take effect beginning January 2011. The rate increase will enable the design and construction of a 4 mgd capacity potable water treatment plant to move forward. The plant is currently under design and is scheduled for completion in 2013. The water treatment plant will enable the City to utilize its full Nacimiento Water Project water allocation and reduce groundwater pumping significantly from current levels. Use of this new supply is projected to have a beneficial effect on groundwater level decline rates in the Estrella sub-area and the basin as a whole.

5.4.2.1.2 City of Atascadero

The City of Atascadero is a participant in the Nacimiento Water Project, with a current allocation of 2,000 AFY. The water will be used to recharge the groundwater table in the vicinity of the current Salinas River underflow well fields so that it can be treated in the same manner as the rest of their groundwater supply.

5.4.2.1.3 Templeton CSD

The Templeton CSD is a participant in the Nacimiento Water Project, with a current allocation of 250 AFY. TCSD plans to receive raw water from the Nacimiento Water Project and is currently evaluating their plans to treat this water.

5.4.2.1.4 County Service Area No. 16

CSA 16 is located in the Shandon area and has the rights to 100 AFY from the State Water Project. Because of the high cost to develop this supply and the lack of need at the time, in 1995, the Board of Supervisors approved offering their 100 AFY allocation for sale to other entities in the County.

5.4.2.2 Recycled Water Potential in the Paso Robles Groundwater Basin

Currently, there is no direct use of treated wastewater in the basin. The cities of Atascadero and Paso Robles, and Templeton and San Miguel CSDs each operate wastewater treatment plants that discharge treated secondary effluent to the Salinas River using percolation ponds. However, direct use of recycled water for irrigation and indirect use for groundwater recharge could provide a significant quantity of water to offset current and future groundwater use within the basin.

The quantity of water available for potential recycled uses will increase as population increases. The amount of wastewater available for recycling is typically 40 to 50 percent of urban potable water deliveries on an annual basis. While some of this water is treated and contributes to basin return flows, much is now discharged from the basin to the north as Salinas River underflow.

Future direct and indirect use of recycled water within the Paso Robles basin can play a significant role in improved basin management. However, the primary impediment to implementation in the near-term is the high cost of upgrading treatment plant processes and the recycled water distribution system. Water quality concerns for recycled water users must also be addressed. Potential State and federal grant funding sources could help defray these costs, making these projects more feasible. It is recommended that the municipalities and service districts providing wastewater services pursue all potential county, State, and federal grant and loan sources to move these projects forward.

Table 5-3. 2009 Wastewater Discharges

	City of Paso Robles	City of Atascadero	Templeton CSD	San Miguel CSD
Year 2009	3,291	1,050	144	134
Average (1998 to 2009)	3,189	1,083	163	130
Minimum (1998 to 2009)	2,948	965	134	115
Maximum (1998 to 2009)	3.389	1,334	235	176

5.4.2.2.1 City of Paso Robles Water Recycling Plans

In 2000, the City of Paso Robles prepared a Comprehensive Recycled Water Study (Carollo, July 2000). The study assessed the existing wastewater treatment and disposal system and evaluated several alternatives for recycled water use. More recently, the City's Urban Water Management Plan (2005) and the Recycled Water Study Update (Boyle, 2006) identified alternatives for the reuse of treated wastewater. Four recycled water options were identified, including: 1) Groundwater recharge (requiring tertiary treatment and denitrification), 2) restricted irrigation (second effluent), 3) unrestricted irrigation (tertiary treatment), and 4) groundwater recharge (tertiary treatment and desalination).

The City of Paso Robles wastewater treatment plant currently produces secondary effluent with limited reuse potential. However, several thousand acre-feet of water of treated wastewater could be available for reuse if treatment capabilities at the Paso Robles Wastewater Treatment Plant are upgraded to include tertiary treatment and denitrification.

To prepare for future use of recycled water, Paso Robles is currently in the process of designing a wastewater treatment plant upgrade that will include denitrification in the first phase and the addition of tertiary treatment in the second phase. The project schedule calls for the Phase 1 plant upgrade to be completed in 2013, pending the approval of an increase in customer wastewater rates in 2011. The Phase I upgrade will set the stage for implementation of water recycling in the future. The Urban Water Management Plan 2005 identified 2025 as a target date for implementation of water recycling. The implementation of the Phase II upgrade and the construction of the first phase of a recycled water distribution system to deliver irrigation water to Barney Schwartz Park, local golf courses, and new development will depend on available funding. Paso Robles plans to complete a water

recycling master plan in 2010/11 that will identify potential direct users, groundwater recharge sites, pipeline routes, and project cost estimates.

5.4.2.2.2 Templeton CSD Water Recycling Plans

In addition, the Templeton CSD may be making future provisions to expand and divert additional wastewater flows (which currently flow to the City of Paso Robles WWTP) in order to recycle additional treated effluent into the Salinas River underflow via percolation ponds, increasing available water for extraction.

5.4.3 Management of Sustained Groundwater Levels

While the Basin is experiencing declining groundwater levels over a significant area of the Basin, it has not been identified to be in a state of overdraft. The GAC will continue to facilitate actions to support groundwater levels in the Basin, which include:

- Continue to support existing groundwater elevation monitoring and reporting programs in the Basin.
- Support efforts to expand the voluntary groundwater monitoring network while at the same time pursuing the development of a dedicated groundwater monitoring network to supplement the existing network.
- Encourage the implementation of water conservation programs in all water use sectors (agricultural, municipal, small commercial, small community, and rural residential) to reduce groundwater pumping.
- Seek funding for programs and projects that would improve groundwater conditions in the Basin.
- Support programs that reduce groundwater pumping through substitution of surface water or recycled water for groundwater.
- Be aware of the impact of potential changing land use conditions on groundwater resources in the Basin.
- Identify other opportunities to reduce water demand such as rainwater harvesting and storm water capture for groundwater recharge.

5.4.4 Modeling and Technical Analysis

The original groundwater model developed for the Paso Robles Basin has been used to support several different groundwater related projects including establishing an initial perennial yield estimate and evaluating the effects of groundwater recharge and banking alternatives. The recent peer review of the model and other technical analyses completed in the basin has lead to the recommendation that the model should be updated in the next three to five years.

A model update framework needs to be developed to guide the update process that identifies the specific issues to be addressed by the model, appropriate approaches, and data sets necessary to support the model update. The GAC will support the ongoing technical analysis undertaken in the Basin and the steps necessary to update the groundwater model, which may include:

- Developing modeling goals and objectives for the model update to identify:
    - What questions do we want the model to answer?
    - What methods or approaches should be used to calculate soil moisture budgets, water budgets, and change in storage?
- Identifying the data sets that need to be developed or improved to support model development, which may include:
    - Groundwater level data
    - Groundwater pumping data
    - Agricultural demand data (including irrigated acreages, irrigation methods and implementation of BMPs)
    - Hydrogeologic data
    - Surface water and groundwater level data to improve understanding of the surface-groundwater interaction at selected locations across the basin
    - Developing other data sets as needed to support specific analyses

5.5 Water Demand Management and Conservation

Water demand management and water conservation provides the primary management activities to reduce groundwater pumping in the Paso Robles Basin and influence groundwater level declines. Water conservation opportunities apply to all water use categories. Water demand and conservation are organized below by water use category for the agricultural, urban, and rural residential water use categories.

5.5.1 Agricultural Water Demand Management and Conservation

5.5.1.1 Statewide Agricultural Water Management Requirements

Agricultural water management in California is addressed at the State, County, and local levels, and includes input from industry organizations such as the Agricultural Water Management Council. The State of California recently passed the Water Conservation Act of 2009 as part of SBx7-7. SBx7-7 includes two provisions related to agricultural water management. The first provision includes water conservation, measurement, and reporting activities for agricultural water suppliers. This provision focuses on the measurement of the volume of water delivered to customers and adopting a pricing structure based at least in part on the quantity of water delivered. In this legislation, a 'customer' is defined as "a *purchaser of water from a water supplier who uses water for agricultural purposes.*"

There are currently no agricultural water suppliers in the Paso Robles Groundwater Basin, so this provision does not apply within the Paso Robles Groundwater Management Plan Area.

SBx7-7 also includes provisions for DWR along with the Agricultural Water Management Council, academic experts, and other stakeholders to develop a methodology for quantifying the efficiency of agricultural water use. DWR is required to report back to the Legislature on or before December 31, 2011 on the proposed methodology and plan for implementation.

There is currently no requirement for implementation of the methodology in the State. While neither of these provisions currently apply to agricultural water management in the Basin, the intent of these activities should be considered while developing an agricultural water management strategy and appropriate water management actions in the Paso Robles Basin.

5.5.1.2 GMP Coordination with the Local Agricultural Interests

The following potential activities have been identified by PRWCA and other stakeholders to facilitate coordination between the Plan implementation, the PRWCA Water Committee, the CCVT and other agricultural groups. Those activities that were identified by PRWCA as potential actions they favor are indicated by "(PRWCA)" following the action. The Plan encourages that the following actions be reviewed and implemented as appropriate by the PRWCA, CCVT, other agricultural groups, and other stakeholders.

Near-term Actions (next three years)

- Identify and disseminate vineyard and winery Best Management Practices (BMPs) in the Paso Robles Basin based on industry accepted standards. (PRWCA)
- Continue programs that educate and encourage the advantages to conduct self audits to optimize water use efficiency and water budgeting through a business plan perspective. (PRWCA)
- Conduct regular outreach activities within PRWCA and CCVT membership and other vineyards and other ag commodities in the Basin to further the implementation of BMPs. (PRWCA)
- Coordinate with the County to conduct an outreach program to encourage growers to voluntarily make wells available to the County's groundwater level monitoring program in the Basin. (PRWCA)
- Participate in the UC Extension Irrigation Study, which is scheduled for completion in 2012. (PRWCA)
- Develop an approach to benchmark estimate water savings from future BMP implementation. (PRWCA)
- Develop a report that identifies vineyard Best Management Practices (BMPs) in the Paso Robles basin, based on industry-accepted standards. The report would also provide data on the number of acres of vineyards that have implemented various BMPs.
- Develop a report that identifies BMPs for other agricultural commodities in the Basin.
- Establish a methodology to estimate the volume of additional water that can be conserved through additional BMP implementation among growers.

Long-term Actions (beyond three years)

- Continue to support BMP implementation.
- Continue to support groundwater level monitoring activities in the Basin.

- Continue to encourage participation in BMP implementation programs and groundwater level monitoring activities.

5.5.2 Urban Water Demand Management and Conservation

5.5.2.1 City of Paso Robles

From 1999 to 2008, total annual per capita water use within the City of Paso Robles (based on total water pumped) average was 241 gallons per capita per day (gpcd). In 2009, the City established a Water Conservation Manager position, implemented mandatory outdoor watering use restrictions and began the process of implementing comprehensive, long-range water conservation programs. The immediate goal of the watering restrictions was to reduce peak summer demand by 20 percent to alleviate water production shortage cause by lowering water levels in City wells. The restrictions have been successful the last two summers and will be continued until the Nacimiento WTP is on-line. The long-term objectives of ongoing conservation programs are: 1) Meet the California Senate Bill 7 mandate of achieving a 20 percent reduction in per capita use by the year 2020 (approximately 193 gpcd), and 2) implement the comprehensive list of Municipal Best Management Practices programs outlined in the California Urban Water Conservation Coalition Memorandum of Understanding.

In 2008/09, the City of Paso Robles implemented a comprehensive water conservation program that included the following:

- Toilet replacement rebates.
- Turf replacement rebates for conversion to drought-tolerant landscaping.
- Home water surveys (audits).
- Large turf area audits and commercial/industrial water surveys (CII).
- Workshops on low-water-use landscaping.
- Conservation outreach and education programs (includes radio and print media advertising, brochures, direct mail, bill stuffers, bill messages, signage, event sponsorship and participation).
- School Education programs in the Paso Robles Schools.
- Conservation website development.
- Passage of a Water Efficient Landscape Ordinance that limits the amount of turf in new residential and commercial development, and prohibits turf in new public road rights-of-way. The ordinance also includes new efficient irrigation design standards.
- Continued enforcement of summer watering restrictions (3-day watering schedule).

Additional programs that may be considered for implementation in the future include:

- Rebates for High Efficiency Clothes Washers.
- CII customer incentive programs (rebates) for conservation technology investments.

The combined effect of Paso Robles' water conservation programs and the conservation impact of planned water rate increases is projected to achieve an estimated 20 percent reduction in overall per capita water use, compared to historical water use rates prior to mandatory summer water use restrictions.

5.5.2.2 Atascadero Mutual Water Company

Atascadero Mutual Water Company is a member of the California Urban Water Conservation Council, Groundwater Guardian Program, Alliance for Water Efficiency, Water Education Foundation, and SLO County Partners in Water Conservation.

5.5.2.3 Templeton Community Services District

The Templeton Community Service District (TCSD) currently promotes water conservation throughout the TSCD service area. The District has a full-time water conservation coordinator who works to educate the public through informational workshops, literature, handouts, and occasional rebate programs. Recently, the TCSD has revised their Water Conservation Ordinance to ensure that conservation standards for the TCSD remain current and effective. The TCSD is an active member in the SLO County Partners in Water Conservation, Central Coast Partners in Water Quality, and the California Urban Water Conservation Council.

5.5.3 Rural Residential Demand Management and Conservation

Rural residential areas are located throughout the valley floor portion of the Paso Robles Basin, and rely on groundwater to meet their water needs. Increased groundwater use in and around these areas has added to the regional decline in groundwater levels over time. Because some rural residential users rely on relatively shallow individual wells, drawdown in pumping wells as the basin overall has declined has resulted in groundwater levels dropping below the bottom of their wells.

A conservation program is needed to reduce water use and improve efficiency among rural residential water users. Such a program could include components to reduce indoor and outdoor water use. Some components for Rural Residential demand management and water conservation program could include:

- Development of a water conservation incentive program for rural residential water users.
- Development of water education and outreach materials for rural residential water users.
- Development and dissemination of landscape planning materials that encourage conservation and increase or promote storm water capture and recharge. These efforts could be coordinated with the identification of soil infiltration rates to encourage local groundwater recharge.
- Development of programs that increase water reuse opportunities such as:
    - Rainwater harvesting

- Greywater use
- Water recycling

The likely entity to conduct a conservation program for rural residential users is the County. Partnering with other organizations (cities and CSDs with programs already in place, the RCD, NRCS, Ag Commissioner, etc.) and seeking grants will help with staffing and financial resources.

6 Stakeholder Involvement

The City of Paso Robles along with the San Luis Obispo County Flood Control and Water Conservation District lead the preparation of the Paso Robles Regional Groundwater Management Plan. This plan was developed to comply with provisions of the Groundwater Management Planning Act of 2002, including provisions related to public involvement processes. Some of the components of the stakeholder involvement process are described below.

6.1 Groundwater Advisory Committee

A Groundwater Advisory Committee was formed to discuss the groundwater management issues of the Basin and guide the planning process to develop the Plan. The GAC was formed from interested parties and stakeholder, many of whom had participated in previous groundwater-related efforts as part of the North County Water Forum. Through detailed discussions, the GAC with input from stakeholders and interested parties representing the seven subareas of the Basin developed the initial BMOs and related implementation plan. The GMP is the result of an approximately two-year effort, including, a six-month suspension of the project from February 2009 until November 2009 because of grant funding issues.

6.2 Public Involvement

An extensive public involvement process was included in the efforts to develop the GMP. Some of the components of the public involvement process include the following:

The initial mailing list included over 40 contacts. A flyer (included in Appendix C) announcing the preparation of the groundwater management plan was sent to each person on the contact list. Emails were also sent to each email address with an electronic version of the flyer attached.

During the completion of the Paso Robles Groundwater Basin Water Banking Feasibility Study in 2007, and during grant application preparation process (to prepare the Plan), the City of Paso Robles and the District notified stakeholders for their intent to prepare a groundwater management plan.

6.2.1 GAC Communications

Communications regarding the GAC meetings and the opportunity to participate in the GMP development were distributed electronically via the email distribution list, and by posting information on the County's and the City's websites along with other Paso Robles Groundwater Basin information.

During the project, draft deliverables, meeting notices, and briefings were distributed electronically via email. Project deliverables and presentations were also posted on the County's website.

GAC members and stakeholders provided comments to the County and/or City by email or by mail or phone conversation.

6.2.2 GAC Meetings and Workshops

- GAC No. 1 - January 15, 2009: This was the project kickoff meeting. Goals for this meeting included:
  - Provide project overview and approach
  - Describe project schedule and coordination activities
  - Identify the GAC members (listed on Table 6-1 below)

Table 6-1. GAC Members and Subarea Representatives

Name	Affiliation	Subarea
Jay Short	Templeton CSD	Atascadero
John Neil	Atascadero Mutual Water Co.	Atascadero
Sue Luft	WRAC	Creston
Duane Picanco	Paso Robles City	Creston Estrella
Dave & Debra Compton	Private	Estrella
Ray Allen	SLO Co Cattlemen	Estrella
Robert Johnson	Monterey County Water Resources Agency	North Gabilan Bradley
Steve Sinton	PRIOR	San Juan
Willy Cunha	Sunview Shandon	San Juan
Dennis Bowman	Green River MWC	Shandon
Mike Kelley	Green River MWC	Shandon
Mike Steinboer	Green River MWC	Shandon
Randy Diffenbaugh	Shandon Advisory Committee	Shandon
Bob Roos	North County Water Forum	
Joy Fitzhugh	SLO Co Farm Bureau	

Additional GAC meetings were held on the dates listed below. The attendance lists and presentation materials for each meeting and workshop are included in Appendix G.

- GAC No. 2 – November 12, 2009
- GAC No. 3 – February 25, 2010
- BMO Workshop No. 1 – April 19, 2010
- BMO Workshop No. 2 – May 10, 2010
- BMO Workshop No. 3 – May 10, 2010
- GAC No. 4 – August 2, 2010
- GAC No. 5 – December 2, 2010
- GAC No. 6 – February 10, 2011

The Basin Management Objective Workshops were held in April and May 2010 with the different subareas to support their development of groundwater Basin Management Objectives.

The GAC meetings and workshops generally coincided with project deliverables to get review and comment from the GAC during the development of the Plan. Draft materials were generally made available ahead of the meetings, and reviewed at the GAC meetings to identify and address any questions related to the draft materials. Each GAC member, stakeholder, and interested parties were provided the opportunity to review and comment on the draft materials. Comments were provided to the County or City, and forwarded to the project team for incorporation into the Plan.

6.2.3 Involvement of Other Agencies and Entities

The preparation of the GMP was coordinated by the City of Paso Robles and the District, and included participation from a wide variety of stakeholders and local agencies that represented interests in the Paso Robles Basin. Throughout the planning process, all the entities, stakeholders, and interested parties were invited and encouraged to participate in developing the Plan. The sign-in lists from the GAC meetings and workshops include over 40 different entities that represent the different water user groups in the basin. Additionally, the City of Paso Robles and the District met several times with representatives of the PRWCA/CCVT to discuss agricultural water conservation opportunities.

6.2.4 Coordination with Other Agencies

The GAC has coordinated the planning process with other neighboring water agencies and subbasins. Monterey County Water Resources Agency is a member of the GAC for the Paso Robles Basin GMP, and also represents Monterey County interests and coordinates with activities associated with the Salinas Valley Groundwater Basin and Nacimiento Reservoir. The GMP has also coordinated within San Luis Obispo County through the San Luis Obispo County Integrated Regional Water Management Plan and the San Luis Obispo County Master Water Plan. Draft copies of the GMP were provided to these agencies.

6.2.5 Public Involvement

The GAC will continue to coordinate water management activities within the basin and to work cooperatively for implementation of the BMOs outlined in this Plan. The GAC will also develop an outreach and educational program to engage other water interests in water management within the Basin.

The GAC will continue to work with the PRWCA/CVVT and other agricultural groups to improve data collection efforts in the Basin and coordinate groundwater management efforts.

6.2.6 Developing Relationships with State and Federal Agencies

Over the last several years, the water interests in the Paso Robles Basin have been working with a variety of State and federal agencies including:

- University of California Extension to assess vineyard irrigation practices and water usage.
- United States Geological Survey to investigate land subsidence.
- Natural Resources Conservation Service, through their participation in numerous groundwater projects.
- California Department of Water Resources:
    - Investigated groundwater banking feasibility in the Paso Robles Basin (grant funded project)
    - Preparation of an Integrated Regional Water Management Plan for San Luis Obispo County

Additional coordination is expected with the Central Coast Regional Water Quality Control Board due to anticipated changes to the Agricultural Waiver Program and salt nutrient management planning.

6.2.7 Dispute Resolution Process

The groundwater users in the Paso Robles Basin have used the following approaches to resolve issues in the Basin which demonstrate their ability to work together:

- North County Water Forum has served forum for discussion of water related issues in the Paso Robles Basin over the last ten years during many of the projects identified in Section 1 of the Plan. The GAC is an extension of this group, and will continue to provide a forum for discussion and early resolution of groundwater issues in the Basin.
- The Water Resources Advisory Committee has been used as a venue to address water management issues affecting San Luis Obispo County, including the Paso Robles Basin.
- The Paso Robles Groundwater Basin Agreement was developed in 2005 in response to groundwater rights issues among the Landowners and Municipal Users in the Basin. The Agreement stated that the Basin was not in a state of overdraft at that time, and outlined the procedures for determining the Basin is in a condition of overdraft.

The dispute resolution process will be formalized as part of the Basin governance during the implementation of the Plan.

7 Plan Implementation

This section includes a discussion of the approach, schedule, and funding information to support the implementation of the Plan.

The County of San Luis Obispo (County), including the San Luis Obispo County Flood Control and Water Conservation District is the local agency with the authority to lead Plan implementation. The lead agency will coordinate with the other ongoing efforts in the Basin and their respective lead agencies.

7.1 Implementation of Groundwater Management Activities

This section of the implementation plan identifies the specific Groundwater Management Activities and the lead parties responsible for their implementation. The GMAs presented on Table 7-1 are organized by the Groundwater Components described in Section 5. Each GMA includes its relative implementation priority and status, approximate schedule for implementation, and the lead parties responsible for its implementation, including the identification of a lead agency. It should be emphasized that all actions and participation of agencies and stakeholders is voluntary in nature, and subject to annual budgeting approvals.

It should be noted that several County departments are currently involved in work efforts associated with this Plan, including Public Works, Planning and Building, Public Health, and the Agricultural Commissioner's Office. Determining the specific roles and support of Plan efforts by those departments is also an implementation recommendation, and will be considered in annual budgeting and other decisions.

Table 7-1
Summary of Plan Implementation Progress

Component Category	Priority/ Status	Implementation Schedule			Stakeholder and Agency Participation				
		Reoccurring (Annual)	Within Three-Years	Beyond Three Years	Steering Committee	County	Urban Water Purveyors	Agriculture	Rural Residential
Component Category 1: Stakeholder Involvement and Coordination									
1.1 Involvement with Stakeholders and Public									
1. Provide public briefings at meetings (WRAC, Board Meetings, Other) and GMP annual meetings regarding GMP implementation progress.	High - Ongoing	X			Facilitate				
2. Work with private groundwater users and local water purveyors to maximize outreach on GMP activities.	High - Ongoing	X			Facilitate				
1.2 Formation of a Groundwater Advisory Committee for GMP Development and Implementation									
1. Invite local agencies that are managing groundwater, local advisory committees, and private well owners to participate on GAC through Steering Committee	Completed	X			Facilitate				
2. Develop a semi-annual GAC meeting schedule to report on the state of the Basin and address ongoing issues. These meetings may be incorporated into ongoing projects in the Basin as appropriate.	High	X			Facilitate				
3. Develop a formal mechanism for ongoing implementation of this GMP that includes a Steering Committee and Technical Advisory Committee	High	X			Facilitate				
1.3 Coordination with Other Agencies									
1. Coordinate with agencies with land use planning authority to coordinate land use planning regulations with groundwater management activities.	Ongoing	X			Facilitate	X	City Paso Robles City of Atascadero		
2. Coordinate implementation of the recommendations of the Paso Robles Groundwater Basin Resources Capacity Study	Medium		X		Facilitate	X			
1.4 Integration with Other Water Management Planning Efforts									
1. Integrate with San Luis Obispo County IRWMP Efforts.	Completed - Ongoing	X			Facilitate	X			
2. Integrate with San Luis Obispo County Master Water Plan.	Ongoing				Facilitate	X			
Component Category 2: Groundwater Monitoring and Data Collection									
2.1 Groundwater Elevation Monitoring									
1. Coordinate with local purveyors, San Luis Obispo County, DWR, and other basin groundwater extractors to identify additional appropriate wells for monitoring in addition to the County's water level monitoring.	High - Ongoing	X			Facilitate	X	All water purveyors	PRWCA & Other Growers	Individual Residents
2. Coordinate with local purveyors, San Luis Obispo County, DWR, and other basin groundwater extractors to ensure that the selected wells are maintained as part of a long-term monitoring network.	High - Ongoing	X				X	All water purveyors	PRWCA & Other Growers	Individual Residents
3. Coordinate with local agencies, DWR, and other basin groundwater extractors to ensure that needed water level data are collected, verify that uniform data collection protocols are used among agencies, and confirm that data sharing and archiving procedures are implemented.	High - Ongoing	X				X	All water purveyors	PRWCA & Other Growers	Individual Residents
4. Consider ways to fill gaps in the monitoring well network by identifying additional suitable existing wells or identifying opportunities for constructing new monitoring wells.	High - Ongoing	X			Facilitate	X			
5. Annually assess groundwater storage and elevation trends and conditions based on the network. Compare current trends to historical trends. Present findings to DWR and coordinate on future program modifications.	High	X			Facilitate	X			
6. Establish District as Monitoring Entity in California Statewide Groundwater Elevation Monitoring Program. Submit groundwater elevation data to DWR annually.	High - Immediate	X				X			
7. Assess the adequacy of the groundwater storage and elevation monitoring well networks annually.	High - Ongoing	X			Facilitate	X			
2.2 Groundwater Quality Monitoring									
1. Coordinate with County to ensure that the selected wells are maintained as part of a long-term monitoring network.	High	X				X	All Water Purveyors		
2. Consider ways to fill gaps in the monitoring well network by identifying additional suitable existing wells or identifying opportunities for constructing new monitoring wells.	Medium	X			Facilitate	X	All Water Purveyors		
3. Coordinate with County, other basin groundwater extractors, and other local, State, and federal agencies to identify where wells may exist in areas with sparse groundwater quality data. Identify opportunities for collecting and analyzing water quality samples from those wells. If wells are sampled through other programs, coordinate with the appropriate agency on sharing of data.	Medium	X				X	All Water Purveyors		

Table 7-1
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Component Category	Priority/ Status	Implementation Schedule			Stakeholder and Agency Participation				
		Reoccurring (Annual)	Within Three-Years	Beyond Three Years	Steering Committee	County	Urban Water Purveyors	Agriculture	Rural Residential
4. Assess Current groundwater trends in comparison to historical trends. Present findings to DWR and coordinate on future program modifications.	Medium	X				X	All Water Purveyors		
5. Assess the adequacy of the groundwater quality monitoring well network annually.	Medium	X				X	All Water Purveyors		
2.3 Inelastic Land Subsidence Monitoring									
1. Coordinate with DWR on the necessity of developing and implementing a monitoring program.	Low			X		X	All Water Purveyors		
2. Explore funding opportunities for the installation of subsidence extensometers and other benchmarks to perform periodic repeat-level surveys at the benchmarks if a monitoring program is determined to be warranted.	Low			X		X			
3. Educate local agencies on the potential for land surface subsidence and signs that could be indicators of subsidence.	Low			X		X			
2.4 Data Management System									
1. Continue to coordinate with County and other water purveyors to determine what types of data are currently available and in what formats.	High - Ongoing	X				X			
2. Incorporate recommendations from County's Data Enhancement Plan to improve data management storage, analysis, and dissemination.	High	X				X			
3. Develop data management methods on an "as needed" basis for data determined critical to the management of water resources in the Basin.	Medium	X				X			
2.5 Project Reporting									
1. Reporting groundwater levels to DWR as part of CASGEMs Program	High	X				SLOC FCWCD			
2. Establish Annual Monitoring Report Format to support annual reporting in the Basin	Completed	X				SLOC FCWCD			
3. Develop implementation reporting format to communicate GMP progress to stakeholders and interested parties.	High	X			Facilitate	SLOC FCWCD			
Component Category 3: Groundwater Resource Protection									
3.1 Well Construction, Abandonment and Destruction Policies									
1. Schedule a meeting with the County Department of Public Health, interested M&I water purveyors, and private well owners to facilitate the exchange of information of existing County well ordinances and discuss possible new ordinances.	High	X			Facilitate	X	X	X	X
2. Request copies of the most recent delineated investigation borders for remediation sites or other known groundwater contaminant sources to; County, M&I water purveyors, and private well owners within the Basin for their review and possible use.	Medium		X		Facilitate	X	X	X	X
3. Provide support to local agencies and private well owners on well construction, destruction, and abandonment as requested. For example, providing access to existing analysis on subsurface hydrogeology for the construction of new wells.	Medium	X			Facilitate	X	X	X	X
4. Obtain "wildcat" well map from California Division of Oil and Gas to ascertain the extent of historical gas well drilling operations in the area as these wells could function as conduits of contamination if not properly destroyed.	Low		X		Facilitate	X			
3.2 Wellhead Protection Measures									
1. Request that municipalities provide vulnerability summaries from the DWSAP to the GAC to be used for guiding management decisions in the basin.	Medium				Facilitate	X	X		
3.3 Monitor Contaminated and Poor Quality Groundwater									
1. Request information from the RWQCB and other responsible agencies with regard to water quality concerns within the basin.	Low		X			X			
2. Provide local agencies with all information obtained from OES and the RWQCB on the extent of the investigation areas of contaminant plumes and contaminated sites for their information in developing groundwater extraction patterns and in the siting of future production or monitoring wells.	Low		X			X			
3.4 Control of Saline Water Intrusion									
1. Request information from the RWQCB and other responsible agencies with regard to water quality concerns within Basin.	Medium			X		X			
2. Acquire geophysical logs for oil and gas exploration borings. These logs are available through the State of Department of Conservation Division of Oil and Gas. These electrical geophysical logs will delineate the base of freshwater at each boring location.	Low			X		X			

Table 7-1
Summary of Plan Implementation Progress

Component Category	Priority/ Status	Implementation Schedule			Stakeholder and Agency Participation				
		Reoccurring (Annual)	Within Three-Years	Beyond Three Years	Steering Committee	County	Urban Water Purveyors	Agriculture	Rural Residential
3. Publish information on salinity trends in annual basin report.	Low			X		X			
Component Category 4: Groundwater Sustainability									
4.1 Replenishment of High Quality Groundwater Extracted by Water Producers									
1. Complete analysis of groundwater recharge areas in Basin	Medium		X			X			
2. Collaborate with other resource organizations to encourage protection of recharge areas.	Medium		X		Facilitate	X		Resource Conservation Districts, Land Trust Organizations	
3. Continue pursuing the projects to deliver Nacimiento Water Project within the Paso Robles Groundwater Basin	High		X			X			
4.2 Construction and Operation of Recharge, Storage, and Extraction Projects									
1. Refine instituional, economic, and environmental analysis at locations identified for groundwater banking	Low			X		X			
4.3 Additional Groundwater Management Opportunities									
1. Identify potential storm water recharge opportunities in the Basin	Medium		X			X	City of Paso Robles City of Atascadero		
4.4 Modeling and Technical Analysis									
1. Develop modeling goals and objectives to guide model update	High		X		Facilitate	X			
2. Identify additional technical analyses necessary to support model update	High		X			X			
3. Collect data needed to support technical analyses and model update.	High	X				X			
4. Complete technical analysis necessary to support future groundwater model update	High	X				X			
5. Complete groundwater model update	High			X		X			
6. Meet with County and local agencies that may experience surface water and groundwater interaction to understand the importance of issues, and the need for future studies.	Medium		X			X			
7. Develop program to understand groundwater surface water interaction along the Salinas River.	Medium			X		X			
8. Coordinate with DWR on the development of uniform data collection protocols and data sharing and archiving procedures.	High	X				X			
Component Category 5: Water Management									
5.1 Agricultural Water Management Practices									
1. Coordinate groundwater management activities with Paso Robles Wine Country Alliance Water Committee (Semi-Annual Meetings) with GAC	High	semi-annual			Facilitate	X		PRWCA/ CCVT	
2. Complete UC Extension study on vineyard irrigation practices and disseminate results to stakeholders	High		X			X		PRWCA/ CCVT	
3. Develop and disseminate to area growers vineyard irrigation BMPs	High		X		Facilitate	X		PRWCA/ CCVT	
4. Develop and disseminate to area growers, agricultural (non-vineyard) irrigation BMPs	High		X		Facilitate	X		PRWCA, CCVT, Farm Bureau, RCD's	
5. Evaluate effectiveness of BMPs outreach programs	High	X			Facilitate	X		PRWCA, CCVT, Farm Bureau, RCD's	
6. Identify water conservation measures for wine making operations. Prepare and disseminate outreach materials.	High	X			Facilitate	X		PRWCA/ CCVT	

Table 7-1
Summary of Plan Implementation Progress

Component Category	Priority/ Status	Implementation Schedule			Stakeholder and Agency Participation				
		Reoccurring (Annual)	Within Three-Years	Beyond Three Years	Steering Committee	County	Urban Water Purveyors	Agriculture	Rural Residential
7. Develop winery water use efficiency materials and landscape BMP's	Medium		X		Facilitate	X		PRWCA/ CCVT	
8. Make available water use efficiency outreach materials for non-PRCWA vineyards and wineries.	High - Ongoing	X			Facilitate	X		PRWCA/ CCVT	
9. Develop and disseminate region-specific BMPs that support long-term vineyard and winery water sustainability.	High - Ongoing	X			Facilitate	X		PRWCA/ CCVT	
10. Develop outreach program to encourage growers to participate in County's voluntary groundwater level monitoring program.	High - Ongoing	X			Facilitate	X		PRWCA/ CCVT Farm Bureau	
11. Support outreach and communication of groundwater management planning activities to growers.	High - Ongoing	X			Facilitate	X		PRWCA/ CCVT Farm Bureau	
12. Identify well owners located in gaps in the existing voluntary groundwater level monitoring network.	High - Ongoing	X			Facilitate	X		PRWCA/ CCVT Farm Bureau	
13. Develop water conservation BMPs for non-viticulture agriculture.	Medium				Facilitate	X		PRWCA/ CCVT Farm Bureau	
5.2 Urban Water Management Practices									
1. Evaluate Low Impact Development opportunities to improve local groundwater recharge.	Medium	X					City of Paso Robles City of Atascadero		
2. Identify Water Conservation BMPs	Medium	X					City of Paso Robles City of Atascadero		
3. Develop urban landscaping guidelines to promote water use efficiency, reduce runoff and encourage groundwater recharge	Medium	X					City of Paso Robles City of Atascadero		
4. Investigate stormwater capture and recharge program	Medium		X			X	City of Paso Robles City of Atascadero		
5.3 Rural Residential Water Management Practices									
1. Develop a water conservatoin outreach and educaiton program for rural areas. The outreach program will inform rural groundwater users of the state of the Basin, include suggested conservation and efficiency measures, and if possible, provide incentives to water conservation and efficiency efforts	Medium		X			X	Partner	RCD's	Individual Residents
3. Develop a rural residential landscape ordinance to promote water use efficiency, reduce runoff and encourage groundwater recharge	Medium		X			X	Partner		Individual Residents
4. Facilitate programs to support homeowner water recycling, greywater reuse and stormwater capture (SLO GreenBuild does much of this already, the Planning Departmetn already has these in their code)	Medium		X			X			Individual Residents

Key:
DWR = California Department of Water Resources
DWSAP = Drinking Water Source Assessment and Protection Program
GAMA = Groundwater Ambient Monitoring and Assessment Program
GMP = Groundwater Management Plan
LUST = Leaky Underground Storage Tank
MWC = Mutual Water Company
OES = Office of Emergency Services
PRIOR – Paso Robles Imperiled Overlying Rights
PRWCA = Paso Robles Wine Country Alliance
RWQCB = Regional Water Quality Control Board
WRAC – Water Resources Advisory Committee

SLOC-FCWCD
SLOC - Planning
SLOC - Public Health

7.2 Implementation Schedule

The prioritization of project, programs, and strategies is included on Table 7-1. The result of the discussions was the identification of phases instead of a specific priority list. Implementation of the GMAs recommended in the Plan is scheduled in three phases:

7.2.1 Phase I - Ongoing Groundwater Management Activities:

These activities may continue throughout the planning horizon, including:

- Participation in Semi-annual GAC meetings.
- Preparation and distribution of annual reports.
- Development of funding mechanism to support ongoing groundwater management activities.
- Performance of groundwater monitoring and sharing of data.
- Coordination and cooperation with water entities, Monterey County, and State and federal agencies.
- Periodic review of groundwater monitoring and groundwater management activities
- Compliance with California Statewide Groundwater Elevation Monitoring Program requirements.
- Coordination of Plan with implementation of San Luis Obispo County's land use policies in the Basin.

7.2.2 Phase II-Near Term Projects (Next Three Years):

These projects are intended to be implemented within the next three years and include:

- Implementation of water conservation projects, including agricultural, urban, and rural residential water conservation projects.
- Development and continued implementation of best management practices for agricultural, urban, and rural residential water users.
- Identification of potential conjunctive use project.
- Identification of groundwater recharge areas.
- Improvements to the County's data management system consistent with the Data Enhancement Plan.
- Improvements to the groundwater monitoring network by installing some dedicated monitoring wells and bringing additional production wells into the network.
- Pursuit of grant funding opportunities to improve the groundwater monitoring network.
- Development of a strategy to update the existing groundwater model.
- Collection of the data sets necessary to update the existing groundwater model.
- Identification projects to utilize unallocated Nacimiento Project Water within the Basin.
- Identification water reuse and water recycling opportunities.
- Inclusion of Paso Robles Basin groundwater recharge and conjunctive use projects in update of San Luis Obispo County IRWMP.

7.2.3 Phase III-Long-Term Projects (Beyond Three Years):

These projects are planned for implementation beyond three years:

- Update and enhance the existing basin-wide groundwater model.
- Implementation of wastewater treatment and capacity enhancements.
- Development of conjunctive use projects.
- Identification and development of recharge projects.
- Continue implementation of conservation and demand management programs.

7.3 Annual Implementation Report

Each year, the District will prepare a report describing the progress made in implementing Groundwater Management Activities and the effects of these activities on meeting basin-wide and subarea BMOs. The report will include maps of spring groundwater elevations and tabular summaries of ongoing management actions. The report narrative will present details of implementation activities and describe developments in the basin that are not part of the groundwater management plan implementation but that impact groundwater conditions in the basin (e.g., hydrologic conditions, siting of new industrial facilities, newly identified contaminant plumes, and trends on water quality). The report is dependent on the Basin stakeholders providing groundwater data to the District through the GAC.

7.4 Financial Planning for Recommended Actions and Project Implementation

Progress toward the implementation of the GMP is contingent upon securing adequate funding to complete the program. Two avenues that are available for funding are grant funding and funds generated internally by the groundwater users in the Basin.

7.4.1 Grant Funding

Identified grant funding opportunities include the following:

- **Local Groundwater Assistance Act (AB303)** – There is anticipated to be one more round of AB303 funding to be available either in late 2010 or early 2011. This funding is focused on groundwater related projects such as improvements to the groundwater monitoring network. This program has a $250,000 limit for projects.
- **Proposition 84 – IRWMP Implementation Grants** – Projects must be included in the San Luis Obispo County IRWMP project list to be eligible for this funding opportunity. The project priority would be established through the IRWMP project prioritization process for the IRMWP. San Luis Obispo County is not planning to update their IRWMP (add new projects to the project list) until 2011.

7.4.2 Developing a Zone of Benefit

Revenue generated internally by local agencies through the development of a Zone of Benefit may provide a long-term source of funding available for implementation of the plan. Internally generated revenues are important because they are controlled by the member entities and represent a local commitment to plan implementation and achievement of the BMOs. Local financial support is often required by grant programs and by other sources of outside financing.

7.4.3 Joint Funding Agreement

The basin could develop a Joint Funding Agreement (either as a JPA or a MOU) to fund ongoing groundwater management activities in the Basin. This agreement would establish an annual budget to fund the continued and ongoing groundwater management efforts within the Basin. These funds could be used to finance:

- Annual groundwater level monitoring and reporting
- Other data collection efforts
- Technical investigations
- Model update and application

7.5 Periodic Review and Updated of the Plan

In addition to the annual reports of the state of the Basin and implementation progress, there is a need to periodically review and, if necessary, refine the Plan. These reviews would be scheduled at five-year intervals and would concentrate on analyzing information presented in the previous annual reports and consolidating the observations of GAC members and local agencies. The reviews would identify areas where the plan has been successfully implemented as well as areas where deficiencies were apparent. In areas where implementation has proceeded satisfactorily, the plan revision might include increasingly detailed information regarding the specifics of implementation. In areas where progress was less than anticipated, approaches would be discussed to either bring implementation of specific actions back on track or to change course and focus efforts on other actions believed to have a higher likelihood of success.

8 References

California Department of Water Resources, California's Groundwater, Bulletin 118 – Update 2003, 2003.

Fugro West and Cleath and Associates, Paso Robles Groundwater Basin Study, 2002.

Fugro West, Inc. Paso Robles Groundwater Basin Water Balance Review and Update, 2010.

San Luis Obispo County Flood Control and Water Conservation District, San Luis Obispo County Integrated Regional Water Management Plan, 2005.

San Luis Obispo County Planning Department, Revised Resource Capacity Study – Water Supply in the Paso Robles Groundwater Basin, 2010.

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Todd Engineers, Evaluation of Paso Robles Groundwater Basin Pumping Water Year 2006, 2009.

Valentine, D.W., et al. Use of InSAR to Identify Land-surface Displacements Caused by Aquifer-System Compaction in the Paso Robles Area, San Luis Obispo County, California. USGS Open File Report 00-447, 1997.

Wallace Group, Technical Memorandum No. 3 Water Supply Inventory and Assessment – Water Supply, Demand, and Water Quality.

Yates, Gus, Peer Review of Paso Robles Groundwater Studies, 2010.

Appendix A Paso Robles GMP Preparation Resolutions

C Howard
File

San Luis Obispo County Flood Control and Water Conservation District Notice of Public Hearing Paso Robles Basin Groundwater Management Plan

Tribune 3/8/11

NOTICE IS HEREBY GIVEN that on March 22, 2011, at the San Luis Obispo County Flood Control and Water Conservation District (District) Board Room, 1055 Monterey Street (Monterey and Santa Rosa Streets), San Luis Obispo, California 93408, the District will hold a public hearing on whether or not to adopt a resolution of intention to draft a groundwater management plan (GMP) for the Paso Robles Groundwater Basin pursuant to California Water Code section 10750 et seq. This matter is scheduled to be heard on or after 9:00 a.m. on March 22, 2011. For further information, the Board's agenda will be available at **http://www.slocounty.ca.gov/archivedmeetings.htm** on or after March 16, 2011.

Dated: February 18, 2011

Julie L. Rodewald
County Clerk-Recorder and Ex-Officio Clerk of the Board of Supervisors

By: /s/*Sandy Currens*
Deputy Clerk

March 8, 14, 2011 6930415

Appendix B Paso Robles GMP Adoption Resolutions

Paso Robles Basin Groundwater Management Plan –

Adoption of the Groundwater Management Plan

Notices of adoption of the Groundwater Management Plan will be added as Agencies and Stakeholder groups adopt the Plan.

Appendix C Meeting Announcements

SAN LUIS OBISPO COUNTY
DEPARTMENT OF PUBLIC WORKS
Paavo Ogren, Director
County Government Center, Room 207 • San Luis Obispo, CA 93408 • (805) 781-5252
Fax (805) 781-1229 email address: pwd@co.slo.ca.us

December 31, 2008

Subject: Participation in the Development of the Paso Robles Groundwater Basin Management Plan

Dear Paso Robles Groundwater Basin Stakeholder:

Over the past several years, there have been many activities related to managing and monitoring the Paso Robles Groundwater Basin (Basin), including the completion of a comprehensive Basin study, update and computer model, Groundwater Level Measuring Program Evaluation, Paso Basin Agreement and Water Banking Feasibility Study. In addition, several organizations in the Basin have conducted, or will conduct, their own management, monitoring and project-specific activities. The City of Paso Robles (City), in cooperation with the San Luis Obispo County Flood Control and Water Conservation District (District), was recently awarded an AB 303 Local Groundwater Assistance Grant to consolidate these efforts into a comprehensive, coordinated, Senate Bill (SB) 1938-compliant Groundwater Management Plan (GMP) for the Basin.

Completion of a SB 1938-compliant GMP, will have many benefits, including:

- Provision of a framework for improved groundwater management to maintain groundwater levels, protect groundwater quality, and avoid subsidence.
- Development of a regional understanding of the groundwater setting and groundwater management opportunities in the Basin by building upon the existing organization of local water purveyors, agricultural interests, and stakeholders of the North County Water Forum to form the Groundwater Advisory Committee in the hopes of mitigating future conflicts.
- Identification of existing and future projects and programs that can be implemented to improve long-term water supply reliability in the Basin.
- Establishment of a locally-controlled and comprehensive approach to groundwater management that will be accepted in the Basin and recognized by other state and federal agencies and that can be used to pursue grant funding for groundwater related projects and programs in the Basin.

In order to address a broad range of groundwater related issues in the Basin, your organization is invited to participate in the development of the GMP through the public outreach and stakeholder involvement process, including participation in the Groundwater Advisory Committee.

Please complete and return the enclosed survey, indicating your organization's willingness to participate in the development of a Groundwater Management Plan for the Paso Robles Groundwater Basin. A copy of the scope of work and project schedule to complete the GMP is also enclosed for your reference.

On behalf of the City of Paso Robles and all of the entities that depend upon the water in the Paso Robles Groundwater Basin, I hope your organization is able to join us in taking this proactive, cooperative step. If you have any questions, please contact me (805-781-1016; choward@co.slo.ca.us) or the City's Water Resources Manager, Christopher Alakel (805-237-3861; calakel@prcity.com). We hope to see you at the Project Kick-off Meeting on January 15th – flyer enclosed.

Sincerely,

COURTNEY HOWARD, P.E.
Water Resources Engineer

Enclosures

c: Christopher Alakel, City of Paso Robles
Dean Benedix, Utilities Division Manager
Sylas Cranor, Engineer

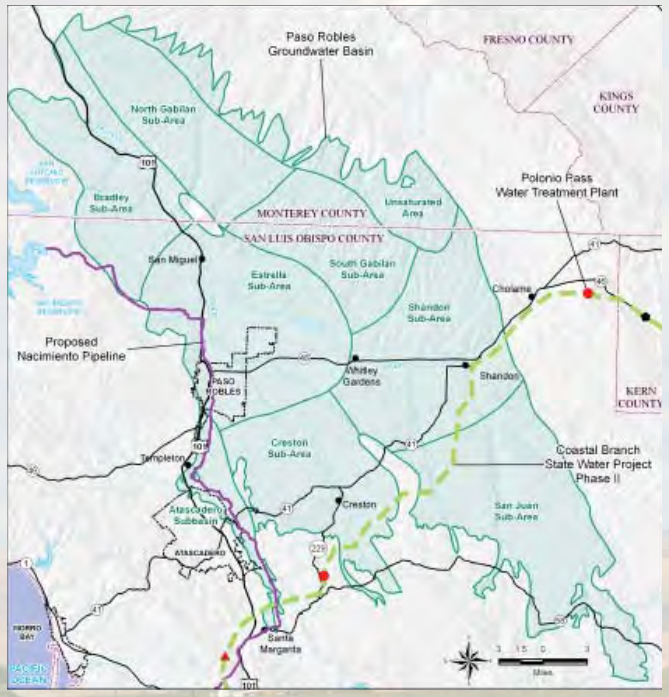
File: CF 500.132.01

L:\UTILITY\DEC08\Agency Outreach Letter final123108 #2.doc.choward.taw

Introducing

The Paso Robles Groundwater Basin Management Plan

San Luis Obispo County recently completed an Integrated Regional Water Management Plan. The plan contains groundwater monitoring and management objectives for the groundwater basins in the County, including the Paso Robles Groundwater Basin. In response to these objectives, The City of Paso Robles and San Luis Obispo County are leading the preparation of a groundwater management plan (GMP) for the Paso Robles Groundwater Basin. The GMP will address groundwater conditions, identify local and basin-wide groundwater issues, and outline measures to protect groundwater resources within the plan area (shown at right).



A Project Kickoff Meeting will be held:

Thursday, January 15, 2009
5 p.m. — 7 p.m
City of Paso Robles
Emergency Operations Center
900 Park Street

The meeting will include a review of the project purpose, approach, and schedule. Additionally, the formation of the Groundwater Advisory Committee will be discussed. The purpose of the Groundwater Advisory Committee is to assist in developing the GMP. The draft GMP is scheduled to be released in July 2009, with the final GMP due December 2009.

Parties interested in the GMP are encouraged to participate in the planning process by attending public meetings scheduled by the Groundwater Advisory Committee.

Paso Robles Groundwater Basin Groundwater Management Plan
Project Schedule (updated Dec 10, 2008)

Task Name	2008	2009											
	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Task 1 - Administrative Requirements of Groundwater Management Plan Process													
Task 2 - Public Outreach and Stakeholder Involvement		△	△		△			△ WRAC		△			△ WRAC
Task 3 - Identify Groundwater Issues and Develop Basin Management Objectives				TM1									
Task 4 - Water Demand and Supply Analysis					TM2								
Task 5 - Prepare 2009 Annual Groundwater Report			SAP										DMS GWR
Task 6 - Prepare Groundwater Management Plan								DGMP					FGMP
Task 7 - Technical Review - QA/QC		SAP	TM1	TM2			DGMP			DMS GWR		FGMP	
Task 8 - Project Management													

△ Groundwater Advisory Committee (GAC) Meetings
WRAC - Water Resouce Advisory Committee Meetings

TM 1 - Groundwater Issues and Provisional BMOs
TM 2 - Exising and Projected Land and Water Use
SAP - Sampling and Analysis Plan
DMS - Groundwater Data Management System
GWR - 2009 Annual Groundwater Report
DGMP - Draft Groundwater Management Plan
FGMP - Final Groundwater Management Plan

Task Specified Activity

Ongoing, intermittent Activity

Exhibit A

Scope of Work

The Scope of Work is divided into the following eight major tasks:

Task 1 – Administrative Requirements of Groundwater Management Plan Process
Task 2 – Public Outreach and Stakeholder Involvement
Task 3 – Identify Groundwater Issues and Develop Basin Management Objectives
Task 4 – Water Demand and Supply Analysis
Task 5 – Prepare 2009 Annual Groundwater Report
Task 6 – Prepare Groundwater Management Plan
Task 7 – Technical Review – QA/QC
Task 8 – Project Management

Task 1 – Administrative Requirements of Groundwater Management Plan Process

The purpose of this task is to provide support to satisfy the administrative requirements for completing an SB 1938-compliant Plan. These administrative requirements occur primarily at the beginning and end of the preparation of the Plan. The consultant will assist the project participants (City, County, and other agencies that state intent to adopt plan) in:

- Establishing a public participation/public involvement process including:
  - Inviting and encouraging public participation in the development of the Plan.
  - Forming the Paso Robles Basin Groundwater Advisory Committee (Paso Robles Basin GAC) of interested parties and stakeholders. The North County Water Forum will be used as the starting point for the formation of the Paso Robles Basin GAC.
  - Reviewing notices prior to publication of City Council and other meetings in local newspapers regarding development of the Plan; notice of intent to develop the Plan; notice of the availability of the draft Plan; and notice of the availability of the final Plan to be circulated for agency adoption.

- Assisting the project participants in complying with the public involvement requirement in SB 1938.
- Assisting the project participants with other administrative procedures.

Task 2 – Public Outreach and Stakeholder Involvement

This task includes activities associated with the public outreach and stakeholder involvement process, such as communication with Basin stakeholders and other interested parties. There is an established and very active stakeholder process in northern San Luis Obispo County. This process has been used extensively to address issues and build consensus among a very diverse group of stakeholders.

The consultant will support the City and County with this task. This task involves 14 meetings:

- Ten regularly scheduled workshops for the Paso Robles Basin GAC to guide development of the Plan, review of project deliverables, and receipt of comments on the plan development and interim deliverables.
- Three briefings to the WRAC at selected times in the project schedule to provide meaningful updates to the WRAC.
- Paso Robles City Council and possibly County Board of Supervisors briefings.
- Up to four additional briefings will be provided to the local advisory bodies during the preparation of the Plan to keep the local stakeholders and interested parties informed of the progress of the Plan and to elicit feedback.

Additional efforts under this task may include:

- Circulation of newsletters in advance of the meetings as part of public outreach and stakeholder involvement.
- Providing visual aids, copies of presentations and deliverables, and refreshments at meetings.
- Providing meeting agenda and minutes as well as other announcements regarding the Plan on the City's and County's websites and distributing this information at the meetings.
- Coordinating with local and federal agencies.

Task 3 – Identify Groundwater Issues and Develop Basin Management Objectives

The purpose of this task is to identify the groundwater management issues within the Plan Area and develop BMOs that identify the groundwater management activities that are linked to each BMO. The BMOs will include objectives for water levels, water quality, and land subsidence. The activities associated with the development of BMOs will address the groundwater management components and may be organized into the following groups.

- Groundwater protection issues may include:
  - Control of saline water
  - Identification of well protection and recharge areas
  - Regulation of the migration of contaminated groundwater
  - Administration of a well abandonment and well destruction program
  - Identification of well construction policies
  - Coordination with agencies responsible for groundwater contamination cleanup, recharge, storage, recycling, and extraction projects
  - Review of land use plans and coordination with planning agencies to assess activities that create a reasonable risk for groundwater contamination
- Groundwater use/recharge issues may include:
  - Prevention and mitigation of conditions of overdraft
  - Replenishment of groundwater extracted by water producers
  - Monitoring of groundwater quality and storage levels
  - Facilitating conjunctive use operations

The groundwater subareas listed below were identified in the Basin Study (Fugro, 2002) based on water quality, source of recharge, groundwater movement, and contours on the base of permeable sediments. The Annual Report (Todd Engineers, 2007) used these same subbasin/subarea delineations. It is expected that the BMOs will be developed based upon the groundwater subarea delineations from the Basin Study:

- North Gabilan Subarea
- Bradley Subarea
- South Gabilan Subarea
- Estrella Subarea
- Creston Subarea
- Shandon Subarea
- Atascadero Subbasin

This task will be led by the consulting team. Independent technical review of this task will be completed by the consulting team as described in Task 7. The deliverable for this task will be a technical memorandum documenting the groundwater issues and provisional BMOs for each subarea.

Task 4 – Water Demand and Supply Analysis

The purpose of this task is to document the current and future land use and the associated water uses in the Basin based on readily available information. There are three land use and water use planning activities in the County that are coincident with the proposed schedule for the development of the Plan whose scope includes analyzing the water demand and water supply in the Basin.

- **Resource Capacity Study** - In its June 5, 2007, meeting, the Board recommended a Level of Severity I designation for the Basin, indicating a low immediacy of resource deficiency. This designation was made with reference to the 1980-1997 groundwater level decreases in the Estrella subarea and to increases in the extent of overlying land uses, including ranchettes, golf courses, and vineyards. As a result of this designation, County staff was directed to prepare a Resource Capacity Study that will focus on the area of groundwater level decrease. A draft Resource Capacity Study is expected to be available in January 2009.

- **Conservation Element of the County General Plan** - The Conservation Element of the County's General Plan is being updated to improve, consolidate, and revise the existing policies and programs, including those related to water resources. "Cutting edge" policies will be developed related to green building, watershed protection, water conservation, biological resource protection, and conservation-oriented land use patterns such as smart growth that may have an impact on future groundwater basin management efforts. The Conservation Element of the County General Plan will be completed by the County Planning Department. A draft Conservation Element is anticipated to be available in November 2008.

- **Countywide Master Water Plan** - In addition, the Countywide Master Water Plan update is scheduled for 2010. Incorporating recent documents such as urban water management plans, general plan updates, and water/wastewater master plans, the Countywide update will include current and future water use projections for water planning areas. The Groundwater Management Plan development will coincide with the Master Water Plan development and it is anticipated that the consultant and the County Public Works Department will support one another during the process.

The County Department of Planning staff will be responsible for completing the Resource Capacity Study and Conservation Element, and the Public Works staff will be responsible for completing the Countywide Master Water Plan update described above.

The *Update for the Paso Robles Groundwater Basin* (Update) (Todd Engineers, December 2007) provided an overview of the current conditions of the Basin building on the Groundwater Basin studies (Fugro 2002 and 2005). The report provided an update from 1997 through 2006 on rainfall, groundwater levels and storage, and groundwater management. An update of pumping in the Basin will be completed in the next few months The Update report and pumping update will become part of the Resource Capacity Study. The first Annual Groundwater Report, prepared as part of this Plan, will include monitoring data collected in 2007 through 2009 and discuss changes in land use, water use, pumping, groundwater levels, and groundwater quality.

Independent technical review of this task will be provided by the consulting team as described in Task 7. The deliverable for this task is a technical memorandum documenting the existing and expected future land and water use conditions. In addition, the GIS files used in the analysis will be provided to the City and County Planning Department.

Task 5 – Prepare 2009 Annual Groundwater Report

The purpose of this task is to build upon the existing groundwater monitoring taking place in the Basin and to formalize the groundwater monitoring program. This includes the following activities:

- Prepare a Sampling and Analysis Plan (SAP) that includes monitoring protocols for the Basin.
- Develop a data management system to store, manage, analyze, and present monitoring data.
- Review available data to identify wells for each subarea that represent the overall trends for use in development of provisional BMOs.
- Prepare groundwater level maps for spring and fall 2009.
- Summarize groundwater level and quality data.
- Develop the format for future annual groundwater reports.
- Prepare the 2009 Annual Groundwater Report.

This task will be led by the consulting team. The deliverables for this task include the Sampling and Analysis Plan and the 2009 Annual Groundwater Report, which will present the results of the 2007 through 2009 monitoring activities. In addition, this task will include a data management system. The data management system software will be non-proprietary and the consultant will provide the County and City with all the data files and provide general guidance in operation of the data management system, if needed.

Independent technical review of this task will be provided by the consulting team as described in Task 7. In addition, the draft 2009 Annual Groundwater Report will be presented to the Paso Robles Basin GAC, WRAC, and interested local advisory committees in order to obtain review and comment by the stakeholders and interested parties.

Task 6 – Prepare Groundwater Management Plan

A draft and final version of the Plan will be completed as part of this task. The draft document will be made available to the project participants, stakeholders, and DWR for review and comment. The final document will be prepared, based on information collected on the draft document. The final Plan will be provided to the project participants for adoption. Project costs associated with this task are for the production and distribution of 10 draft and 20 final copies of the Plan.

This task will include the preparation of an implementation plan that will be used to guide groundwater management in the Basin and support other planning efforts such as the IRWMP. The project participants and stakeholders will develop the implementation plan, which will address:

- Continuation of the groundwater monitoring program, including the analysis and reporting of annual groundwater conditions
- Continuation of monitoring groundwater protection efforts
- Ongoing planning for groundwater recharge and conjunctive use opportunities
- Planning to periodically update the Plan as additional information is developed
- Identifying funding for continued groundwater management activities in the subbasin.

This task will be led by the consulting team. Independent technical review of this task will be completed by the consulting team as described in Task 7. In addition, the draft GMP will be presented to the Paso Robles Basin GAC, the WRAC and interested local advisory committees in order to get review and comment by the stakeholders and interested parties.

Task 7 – Technical Review – QA/QC

This task includes an independent technical review by the members of the consulting team experienced in groundwater management, but not directly involved in the development of this GMP. This internal QA/QC will provide additional review and expertise to the project to ensure that it meets the expectations of the local project participants and stakeholders, provides a vision and framework for the implementation of groundwater management in the Basin, and meets the requirements for SB 1938. The technical review is expected to focus on four specific areas:

- Identification of groundwater issues and development of BMOs (Task 3)
- Documentation of the water demand and supply analysis (Task 4)
- Preparation of the Sampling and Analysis Plan and the 2009 Annual Groundwater Report (Task 5)
- Review of the draft groundwater management plan including the implementation plan (Task 6).

Task 8 – Project Management

This task includes general project management and coordination during throught the project. This task includes:

Preparing monthly invoices and progress reports

- The progress report is to conclude a brief narrative of the task that are underway and their progress to date. Also, the consultant shall develop and maintain a project scheduled that will be updated regularly and submitted with the monthly progress reports.

Project Deliverables

The project deliverables identified in the work plan are listed below.

- Participation in six project meetings and up to eight briefings **(Task 2)**
- Technical memorandum documenting BMOs **(Task 3)**
  - Techical memorandum draft and final report – A task outline and approach shall be submitted, reviewed, and approved prior to commencing with a TM Draft and final.
- Interim technical memorandum documenting water use and supply analysis **(Task 4)**
  - Technical memorandum draft and final report – A task outline and approach shall be submitted, reviewed, and approved prior to commencing with a TM Draft and final.
- Sampling and Analysis Plan and Groundwater Report Draft, and Final **(Task 5)**
- 2009 Annual Groundwater Report **(Task 5)**
- Water level and water quality data management system **(Task 5)**
- Draft and final Plan **(Task 6)**
- Monthly progress reports and schedule updates **(Task 8)**

NORTH COUNTY WATER FORUM

Templeton Community Services District
420 Crocker Street
Templeton

Thursday, September 4, 2008
5:00 to 6:30 p.m.

Paso Robles Groundwater Basin Topics for Discussion:

- Agenda Amendments

- Relationships between Paso Basin planning/projects, local planning/projects and county-wide planning/projects

- Current and Future Basin Pumping Analysis

- Resource Capacity Study of the area of significant groundwater level decline

  Results of the pumping analysis will be incorporated into a draft RCS currently scheduled to be presented during the December NCWF meeting.

- Grant to complete a Paso Robles Basin Groundwater Management Plan

  The State Department of Water Resources has funded the grant application to develop a Groundwater Management Plan for the Paso Robles Groundwater Basin. The original Groundwater Management Plan Grant Application is posted at www.slocountywater.org/site/Water%20Resources/Reports/index.htm, however it is very large (40 mb). A hard copy for viewing at the Public Works Department in San Luis Obispo or CD upon request is available. The scope and schedule will be modified to reflect the reduced funding amount of $208,000 and Grant Agreement deadline of May 15, 2010.

Questions? Please contact Courtney Howard at (805) 781-1016 or choward@co.slo.ca.us

PASO ROBLES GROUNDWATER BASIN
GROUNDWATER MANAGEMENT PLAN
GROUNDWATER ADVISORY COMMITTEE MEETING

Emergency Operations Center
900 Park Street
Paso Robles

Thursday, January 15, 2009
5:00 to 7:00 p.m.

All Paso Robles Groundwater Basin (Basin) stakeholders are invited to attend this Paso Robles Groundwater Basin Management Plan (GMP) Kick-off Meeting.

Topics for Discussion:

- Scope of Work
- Schedule
- Participation

Questions? Please contact Courtney Howard at (805) 781-1016 or choward@co.slo.ca.us

View Basin reports online at:

http://www.slocountywater.org/site/Water%20Resources/Water%20Forum/index.htm

PASO ROBLES GROUNDWATER BASIN
GROUNDWATER MANAGEMENT PLAN
GROUNDWATER ADVISORY COMMITTEE MEETING

Emergency Operations Center
900 Park Street
Paso Robles

Thursday, November 12, 2009
5:30 to 7:30 p.m.

All Paso Robles Groundwater Basin (Basin) stakeholders are invited to attend this Paso Robles Groundwater Basin Management Plan (GMP) re-Kick-off Meeting. Grant funding is available again to move forward with this important project. See attached brochure for additional information.

Topics for Discussion:

- Scope of Work
- Schedule
- Participation

Questions? Please contact Courtney Howard at (805) 781-1016 or choward@co.slo.ca.us

View Basin reports online at:

http://www.slocountywater.org/site/Water%20Resources/Water%20Forum/index.htm

PASO ROBLES GROUNDWATER BASIN
GROUNDWATER MANAGEMENT PLAN
GROUNDWATER ADVISORY COMMITTEE MEETING

Paso Robles City Hall Council Chambers
1000 Spring Street
Paso Robles

Thursday, December 2, 2010
5:30 to 7:30 p.m.

All Paso Robles Groundwater Basin (Basin) stakeholders are invited to attend.

The meeting presentation and the Draft Groundwater Management Plan will be available on the following websites by Thursday:

www.prcity.org/government/

http://www.slocountywater.org/site/Water%20Resources/Water%20Forum/index.htm

The purpose of the meeting will be to provide an overview of the Draft Plan in order to facilitate your review, and discuss components of the Plan not addressed previously.

Comments on the Draft Plan will be due January 5th in order to provide a proposed final draft in advance of a February meeting.

Questions? Please contact Courtney Howard at (805) 781-1016 or choward@co.slo.ca.us

View Basin reports online at:

http://www.slocountywater.org/site/Water%20Resources/Water%20Forum/index.htm

PASO ROBLES GROUNDWATER BASIN
GROUNDWATER MANAGEMENT PLAN
GROUNDWATER ADVISORY COMMITTEE MEETING

Paso Robles City Hall Council Chambers
1000 Spring Street
Paso Robles

Thursday, February 25, 2010
5:30 to 7:30 p.m.

All Paso Robles Groundwater Basin (Basin) stakeholders are invited to attend.

Topics for Discussion:

- Basin Issues
- Basin Management Objectives

Questions? Please contact Courtney Howard at (805) 781-1016 or choward@co.slo.ca.us

View Basin reports online at:

http://www.slocountywater.org/site/Water%20Resources/Water%20Forum/index.htm

PASO ROBLES GROUNDWATER BASIN
GROUNDWATER MANAGEMENT PLAN

ATASCADERO, ESTRELLA, AND CRESTON SUBAREAS
GROUNDWATER ADVISORY COMMITTEE MEETING

Paso Robles City Hall Council Chambers
1000 Spring Street
Paso Robles

Monday, April 19, 2010
5:30 to 8:30 p.m.

As the next step in developing the Groundwater Management Plan for the Paso Basin, the project team will be holding a workshop to develop basin management objectives and potential actions for the **Atascadero, Estrella, and Creston subareas**. While the three subareas will meet at the same time, we will be breaking into your subareas for separate discussions.

A similar workshop for the San Juan, Shandon, North Gabilan, South Gabilan and Bradley subareas will be held at a later date.

In order to have a successful workshop, we would like at least one representative to be available from the following entities/groups (thank you to those that have responded):

- The agricultural community (vineyards, wineries, ranching, other crops)
- Rural residents from each subarea
- RCD and/or NRCS
- Advisory Bodies
- PRIOR
- San Miguel CSD
- City of Paso Robles
- Templeton CSD
- Atascadero MWC
- City of Atascadero

Any other entities/groups that can help to provide input and distribute information for these subareas are also welcome.

Questions? Please contact Courtney Howard at (805) 781-1016 or choward@co.slo.ca.us

View Basin reports online at:

://www.slocountywater.org/site/Water%20Resources/Water%20Forum/index.htm

PASO ROBLES GROUNDWATER BASIN
GROUNDWATER MANAGEMENT PLAN

SAN JUAN, SHANDON, BRADLEY AND GABILAN SUBAREAS
GROUNDWATER ADVISORY COMMITTEE MEETING

Shandon High School Gym
First Street
Shandon

Monday, May 10, 2010
7:00 p.m.

As the next step in developing the Groundwater Management Plan for the Paso Basin, the project team will be holding a workshop to develop basin management objectives and potential actions for the **San Juan, Shandon, Bradley, North Gabilan and South Gabilan subareas**. While the five subareas will meet at the same time, we will be breaking into your subareas for separate discussions.

In order to have a successful workshop, we would like at least one representative to be available from the following entities/groups (thank you to those that have responded):

- Shandon
- Green River MWC
- the agricultural community (vineyards, wineries, ranching, other crops)
- rural residents from each subarea
- Upper Salinas-Las Tablas RCD and/or NRCS
- Shandon Advisory Council
- PRIOR

Any other entities/groups that can help to provide input and distribute information for these subareas are also welcome.

Questions? Please contact Courtney Howard at (805) 781-1016 or choward@co.slo.ca.us

View Basin reports online at:

://www.slocountywater.org/site/Water%20Resources/Water%20Forum/index.htm

PASO ROBLES GROUNDWATER BASIN
GROUNDWATER MANAGEMENT PLAN
GROUNDWATER ADVISORY COMMITTEE MEETING

Paso Robles City Hall Council Chambers
1000 Spring Street
Paso Robles

Monday, August 2, 2010
5:30 to 7:30 p.m.

All Paso Robles Groundwater Basin (Basin) stakeholders are invited to attend.

A draft agenda is attached for your review.

Questions? Please contact Courtney Howard at (805) 781-1016 or choward@co.slo.ca.us

View Basin reports online at:

http://www.slocountywater.org/site/Water%20Resources/Water%20Forum/index.htm

PASO ROBLES GROUNDWATER BASIN
GROUNDWATER MANAGEMENT PLAN
GROUNDWATER ADVISORY COMMITTEE MEETING

Paso Robles City Hall Council Chambers
1000 Spring Street
Paso Robles

Thursday, February 10, 2010
5:30 to 7:30 p.m.

All Paso Robles Groundwater Basin (Basin) stakeholders are invited to attend.

The revised Draft Groundwater Management Plan and Monitoring Plan are available on the following websites:

www.prcity.org/government/

http://www.slocountywater.org/site/Water%20Resources/Water%20Forum/index.htm

Additional appendices will be added to the websites over the next several days.

The purpose of the meeting will be to review changes to the Draft Plan, discuss the composition of the Groundwater Advisory Committee and potentially consider or nominate at-Large members, and discuss the next steps in Plan implementation.

Key updates to the Plan included:

- More clearly defining the role of the Paso Robles Wine Country Alliance as to their members, rather than the broader agricultural community.
- Refining the role of the County in Plan implementation.
- Incorporating the results of the Governance Subcommittee meeting into the governance for Plan implementation.
- Incorporating general edits and comments.

Questions? Please contact Courtney Howard at (805) 781-1016 or choward@co.slo.ca.us

View Basin reports online at:

http://www.slocountywater.org/site/Water%20Resources/Water%20Forum/index.htm

Appendix D BMO Workshop Summaries

Summary of Basin Management Objective Workshop
For the Atascadero Subbasin

The draft Basin Management Objectives (BMOs) for groundwater levels in the Atascadero Subbasin were discussed and developed by stakeholders of Atascadero Subbasin at the Paso Robles Groundwater Basin Management Plan BMO Workshop held on April 19 at the City of Paso Robles City Council Chambers. The stakeholders from the Atascadero Subbasin that attended the Workshop are listed below:

Name	Affiliation
Della Barret	Resident (private well or AMCW)
Kathy Sweet	Resident (private well or AMCW)
Keith Larson	City of Paso Robles
Bob Roos	Resident (private well or AMCW)
Jackie Magill	Resident (private well or AMCW)
John Neil	Atascadero Mutual Water Company
John Hollenbeck	Resident (private well or AMCW)
Carrie Jones	Resident (private well or AMCW)
Jay Short	Templeton CSD
Susan Litteral	Resident (private well or AMCW)/NRCS

Jim Magill recorded the information discussed by the Atascadero Subarea Stakeholders. The Atascadero Subbasin Stakeholders generally reached consensus on most of the issues presented below.

Basin Management Objectives are intended to provide quantifiable and measureable targets so that progress towards improved groundwater management can be tracked. BMOs are being developed for subareas within the Paso Robles Groundwater Basin (Basin) to represent the differing groundwater conditions and necessary management activities.

Groundwater Management Activities (GMAs) are intended to identify the steps or actions taken to meet the BMOs. It should be recognized that both BMOs and GMAs should be evaluated and updated routinely (every few years) as additional information is collected, or in response to changing conditions.

Groundwater Levels in the Atascadero Subarea are affected by:

- Annual hydrologic conditions
- Changes in water demands that are met with groundwater

There are currently about 150 wells located within the limits of the Paso Robles Groundwater Basin that are monitored by the San Luis Obispo County Department of Public Works and the Monterey County Water Resources Agency. These wells are used to track the changes in groundwater level trends through time at a specific location, or across an area for a specific date. The changes in groundwater levels in the Atascadero Subbasin are currently recorded at 33 wells that are included in the groundwater monitoring network.

Groundwater Levels in the Atascadero Subbasin are affected by:

- Annual hydrologic conditions
- Changes in water demands that are met with groundwater

The rate of decline changes through time in response to changing hydrologic conditions and changes in the amount of local groundwater pumping. The composite hydrograph of four wells (currently in the monitoring network) was selected to represent the conditions in the subbasin is shown on Figure 1. These wells will be used as an indicator to how groundwater levels in the subarea are changing over time.

Groundwater levels in the Atascadero Subbasin tend to have a greater range in annual response than other subareas, with average groundwater levels increasing or decreasing by up to 15 feet in single years. The overall trend of the average groundwater levels has remained relatively constant since the early 1980s with groundwater levels rising and falling in response to changing hydrologic conditions and increasing demands. The 2009 average groundwater levels are within ten feet of the 1981 levels as shown on Figure 1. Based on the pattern exhibited on this figure, a single wet year could return the average groundwater levels to the 1981 conditions. It is not clear how the increase in demands since the late 1990s likely contributes to the overall declining groundwater levels of about 30 feet during the 1997 to 2009 period.

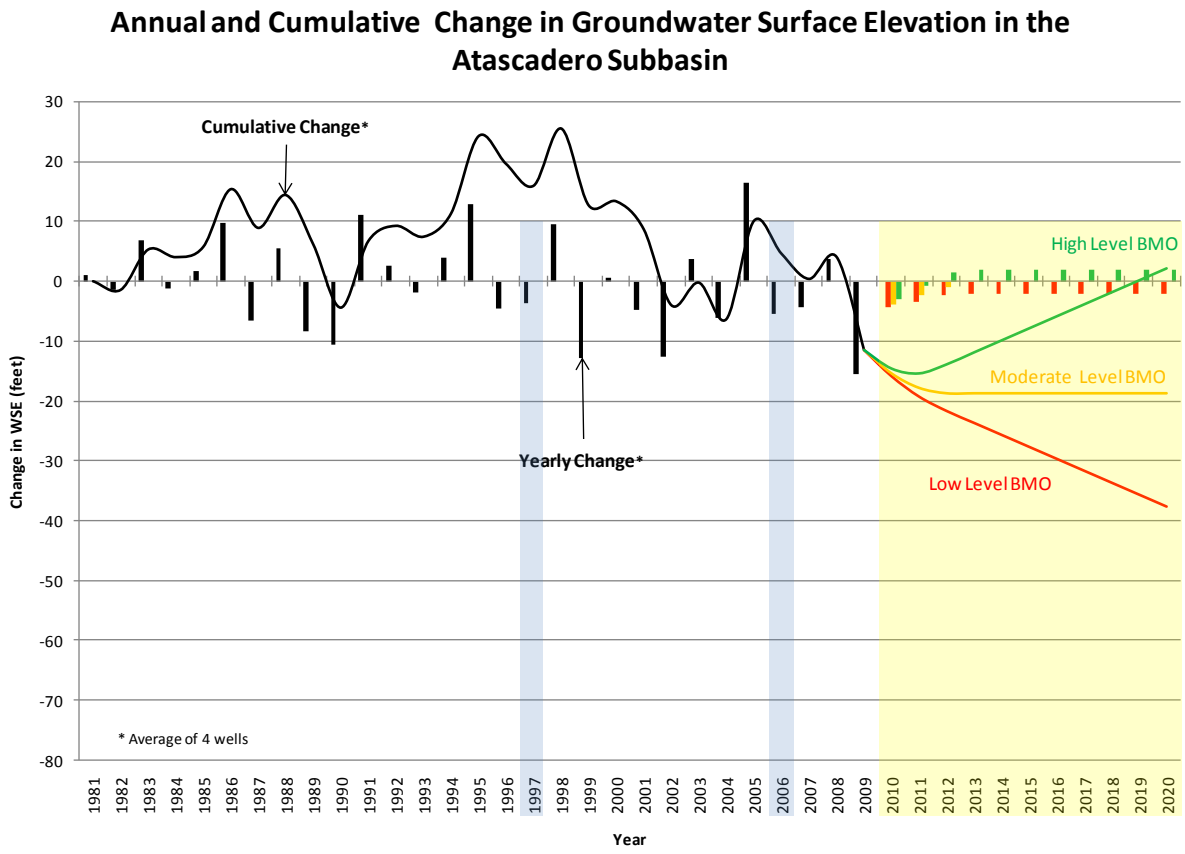


Figure 1. Composite Hydrograph of Four Selected Wells in the Atascadero Subbasin

The 2010 to 2020 period included on Figure 1 shows potential range of changes in groundwater levels in the subarea under different levels of BMOs. Low level BMOs would be expected to result in a continuing decline or groundwater levels similar to those experienced during the 1997 to 2009 period. The moderate level BMO would eventually result in no change in groundwater levels (stabilized groundwater levels). The high level BMO would result in improvement of groundwater levels over time. These projected groundwater levels are intended to show the differences in groundwater levels based on target groundwater levels (BMOs) selected for the subarea, and the magnitude of the GMAs implemented. Additional analysis is needed to quantify the result (in terms of groundwater levels) due to the implementation of GMAs in the subarea.

Water demands in the Atascadero Subarea met by groundwater increased by about 1,000 acre-feet during the 1997 to 2006 period as shown on Table 1. This increase in demands may have contributed to the decline of groundwater levels during this period. These higher demands, along with drier conditions during the 2006 to 2009 period, likely contributed to the increased rate of groundwater level decline (about five feet per year) during this period.

Table 1. Estimated Water Demands in the Atascadero Subarea for 1997 and 2006

GROUNDWATER DEMAND BY DEMAND TYPE FOR 1997 AND 2006 FOR THE ATASCADERO SUBBASIN							
Groundwater Demand		Demand Type					
		Agricultural	Municipal	Small Community	Small Commercial	Rural Domestic	TOTAL
2006 Demand	(acre-feet)	1,348	11,735	0	430	2,032	15,545
Estimated 1997 Demand	(acre-feet)	1,023	11,376	0	300	1,800	14,499
Difference (2006 less 1997)	(acre-feet)	325	359	0	130	232	1,046

2006 Demand Assumptions: Based on Evaluation of Paso Robles Groundwater Basin Pumping Water Year 2006 (Todd, May 2009)

1997 Demand Assumptions: 1997 Demands form Paso Robles Groundwater Basin Study (Fugro, 2002)
Distribution of agricultural demands based on crop acreages from 1997 DWR land use survey for San Luis Obispo County.
1997 Municipal demand includes City of Paso Robles groundwater pumping from river wells(3,933 acre-feet)
Small community demands included in rural domestic demand

Draft Basin Management Objectives

The Atascadero Subbasin stakeholders determined that an acceptable draft BMO for groundwater levels in the Atascadero Subbasin would include stabilizing groundwater levels at about the 2009 level as presented in the composite hydrograph (average of four wells). This draft BMO had strong consensus among the participants.

Potential Groundwater Management Activities

The following Groundwater Management Activities (GMAs) were identified by the Atascadero Subbasin Stakeholders to stabilize groundwater levels in the Atascadero Subbasin. The potential benefit from these GMAs has not been quantified for the Atascadero Subbasin (in terms of changes in groundwater

levels), so it has not been determined if implementation of the GMAs will result in stabilized groundwater levels.

GMA 1: Increase monitoring and reporting on groundwater conditions: This GMA includes expanding the groundwater monitoring network in the Atascadero Subbasin through the addition of new wells to the volunteer monitoring network.

Groundwater level measurements are currently taken by the County in the spring and fall of each year. Spring water levels will be used to track year-to-year changes and long-term trends in groundwater levels because they represent more stable conditions. Groundwater levels will be made available on a regular basis (semi-annually) within two months after most current readings, and will be included in the Paso Robles Groundwater Basin Annual Report. This level of monitoring and reporting of groundwater levels should be sufficient for determining the effectiveness of the GMAs at this time. Additional monitoring and reporting may be needed at some future date.

While this GMA does not directly result in changes in groundwater levels, it will help communicate conditions to individuals and support implementation of groundwater management activities in the subarea.

The San Luis Obispo County Flood Control and Water Conservation District would likely be the lead entity of a cooperative group formed to collect, organize, and report on groundwater conditions in the Paso Robles Groundwater Basin on a regular basis. Atascadero Mutual Water Company, City of Paso Robles and Templeton Community Services District collect water level data that is provided to the District for inclusion in the monitoring program.

GMA 2: Increase water conservation education and implementation: This GMA includes increasing the awareness of the impact of water conservation on reducing groundwater pumping. The effectiveness of the water conservation program will be difficult to verify for rural and agricultural areas without metering well production. The effectiveness of the GMA will be based on the changing behavior of individual water users and impacts on groundwater level trends in the area. The effectiveness of this GMA will be evaluated on an annual basis.

This GMA had large consensus of the Atascadero Subbasin stakeholders. Some of the specific water conservation activities identified include:

- Municipal water purveyors have implemented some level of conservation to date. The effectiveness of these efforts can be tracked by the delivery volumes. Because municipal water demands compose the largest single demand type in the subbasin, there is the greatest opportunity for reduction in groundwater pumping. Based on 2006 municipal demands in the Atascadero Subbasin, a 10% level conservation could result in a reduction in demand of about 880 acre-feet per year.
- Agricultural Water Conservation (opportunities for reductions in groundwater pumping resulting from agricultural conservation programs may be limited in the Atascadero Subbasin due to the comparatively small agricultural demand). Based on 2006 agricultural

demands in the Atascadero Subbasin, a 10% level conservation could result in a reduction in demand of about 130 acre-feet per year.

- Rural Residential Water Conservation (opportunities for reductions in groundwater pumping resulting from rural residential conservation programs may be limited in the Atascadero Subbasin due to the comparatively small rural residential demand). Based on 2006 rural domestic demands in the Atascadero Subbasin, a 10% level conservation could result in a reduction in demand of about 200 acre-feet per year. Water conservation programs in the rural residential sector may focus on the following:
    - Landscape Water Use
    - Consider controls on non-agricultural ponds
    - Development of conservation outreach and incentive programs implemented by San Luis Obispo County

Responsibility for implementing certain components of this GMA may include both the San Luis Obispo County Department of Planning and Building, and the San Luis Obispo County Flood Control and Water Conservation District. The Atascadero Mutual Water Company, City of Paso Robles, and Templeton Community Services District are responsible for implementing water conservation programs within their service areas.

GMA 3: Managing the growth and corresponding increase in water demands: This GMA includes identifying potential land use planning activities that may be used to reduce the rate of growth of water demand in the subbasin. In areas outside the jurisdiction of the cities of Atascadero and Paso Robles, land use planning responsibilities are the responsibility of the San Luis Obispo County Department of Planning and Building. The cities have implemented land use policies that limit water use rates and promote water conservation, such as limiting turf in new development. In addition, higher water rates paid by city water customers encourage efficient water use. Any policies established in areas where San Luis Obispo County has jurisdiction would be applied to the entire Basin, not just this subarea. This GMA may include:

- Building moratorium on lot splits and subdivisions
- Discretionary lots splits would require meters on the new well and the existing well
- No net increase in water use resulting from additional rural residential development
- Promote greywater use
- Minimize turf areas
- Meter new wells
- Offset water use
- Explore opportunities for residential rainwater harvesting

Responsibility for implementing this GMA may include both the San Luis Obispo County Department of Planning and Building and the cities of Atascadero and Paso Robles.

GMA 4: Maximize the amount of Nacimiento Project Water in the Subbasin: This GMA includes utilizing the existing Nacimiento Project Water already acquired for use in the subbasin, and explore opportunities to utilize unassigned Nacimiento Project Water.

The San Luis Obispo County Flood Control and Water Conservation District would be one of the lead agencies responsible for implementing this GMA. Local water purveyors would be responsible for developing and implementing projects to acquire supplies from the Nacimiento Water Project.

GMA 5: Consider storm water management opportunities to increase local groundwater recharge: This GMA includes evaluating the feasibility of recharging storm water runoff in the streams and creeks of the Basin. The potential benefit (in groundwater recharge) has not been evaluated for this GMA at this time.

The San Luis Obispo County Flood Control and Water Conservation District and Department of Planning and Building, and City of Atascadero would likely be the lead agencies responsible for implementing this GMA.

DRAFT

Summary of Basin Management Objective Workshop
For the Bradley and North Gabilan Subareas

The draft Basin Management Objectives (BMOs) for groundwater levels in the Bradley and North Gabilan Subareas were discussed and developed by stakeholders at the Paso Robles Groundwater Basin Management Plan BMO Workshop held on May 10 at the Paso Robles City Council Chambers. The stakeholders from the subareas that attended the workshop are listed below:

Name	Affiliation
Robert Johnson	Monterey County Water Resources Agency
Keith Larson	City of Paso Robles
Christopher Alakel	City of Paso Robles
Courtney Howard	San Luis Obispo County

Courtney Howard recorded the information discussed by the stakeholders.

Basin Management Objectives are intended to provide quantifiable and measureable targets so that progress towards improved groundwater management can be tracked. BMOs are being developed for subareas within the Paso Robles Groundwater Basin (Basin) to represent the differing groundwater conditions and necessary management activities.

Groundwater Management Activities (GMAs) are intended to identify the steps or actions taken to meet the BMOs. It should be recognized that both BMOs and GMAs should be evaluated and updated every few years as additional information is collected, or in response to changing conditions.

Groundwater Levels in the Bradley and North Gabilan Subareas are affected by:

- Annual hydrologic conditions
- Changes in water demands that are met with groundwater

There are currently about 150 wells located within the limits of the Paso Robles Groundwater Basin that are monitored by the San Luis Obispo County Department of Public Works and the Monterey County Water Resources Agency. These wells are used to track the changes in groundwater level trends through time at a specific location, or across an area for a specific date.

The changes in groundwater levels in the Bradley Subarea are currently recorded at one well that is included in the groundwater monitoring network of Monterey County Water Resources Agency (MCWRA). This well is located near the Salinas River just north of the subarea boundary, and may not be representative of groundwater levels throughout the Bradley or North Gabilan Subareas. The lack of data prevents the development of groundwater level hydrographs, or composite hydrographs as developed for other subareas. The lone hydrograph available for these two subareas is shown in Figure 1.

The hydrograph shown in Figure 1 is for a well located near the Salinas River downstream of the confluence of the Salinas River and the Nacimiento River. It appears that groundwater levels in this well reflect the interaction of the Salinas River and the alluvial aquifer materials adjacent to the river. Flows

from the Salinas River, along with releases from Nacimiento Reservoir, help maintain groundwater levels in alluvial aquiver near the Salinas River.

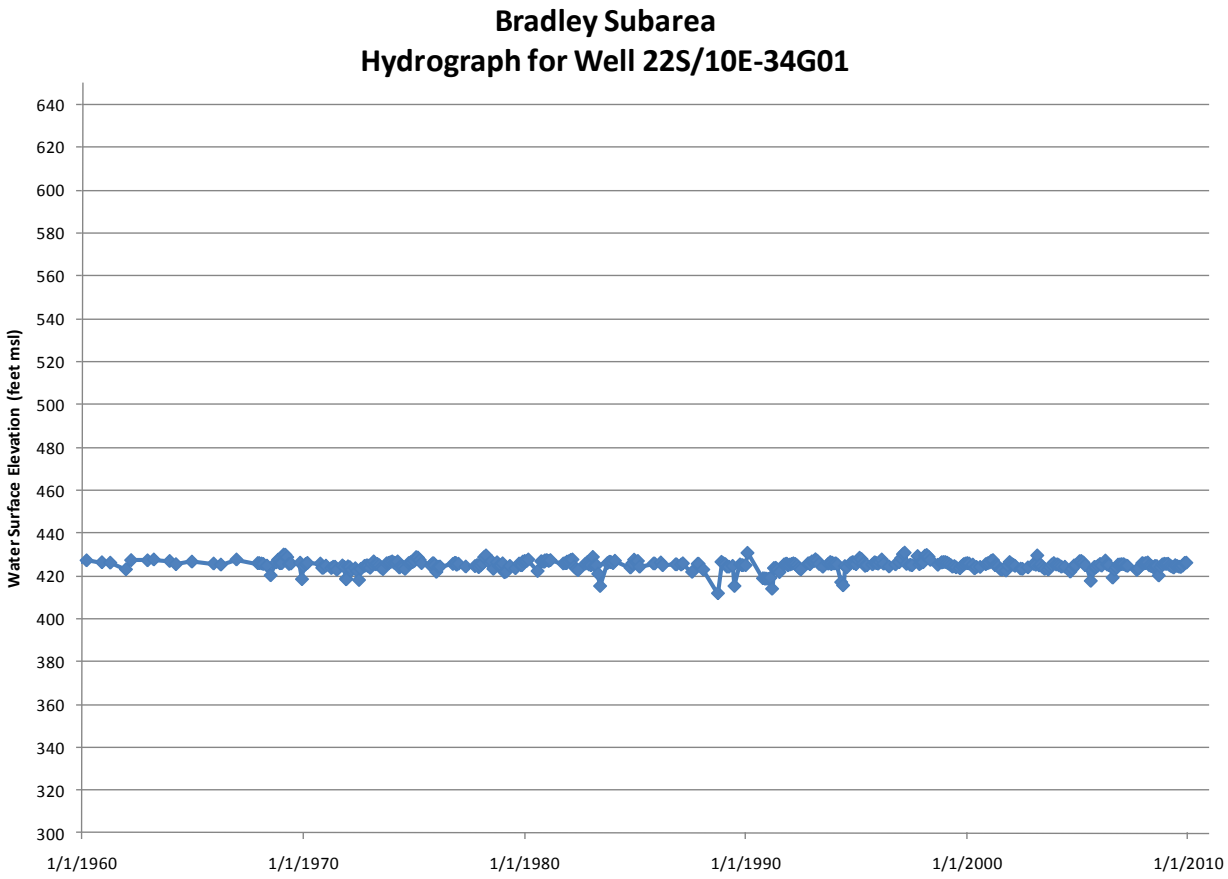


Figure 1. Well Hydrograph in the Bradley Subarea

At this time, we are not aware of any reports or anecdotal information that suggests groundwater levels in the Bradley Subarea or the North Gabilan Subarea are declining to the point of causing problems for local groundwater users.

Water demands in the Bradley Subarea met by groundwater have increased by total of about 1,000 acre-feet between 1997 and 2006 as shown on Table 1.

Table 1. Estimated Water Demands in the Bradley Subarea for 1997 and 2006

GROUNDWATER DEMAND BY DEMAND TYPE FOR 1997 AND 2006 FOR THE BRADLEY SUBAREA							
Groundwater Demand		Demand Type					
		Agricultural	Municipal	Small Community	Small Commercial	Rural Domestic	TOTAL
2006 Demand	(acre-feet)	6,933	0	0	184	109	7,226
Estimated 1997 Demand	(acre-feet)	6,001	0	0	136	88	6,225
Difference (2006 less 1997)	(acre-feet)	932	0	0	48	21	1,001
2006 Demand Assumptions:	Based on Evaluation of Paso Robles Groundwater Basin Pumping Water Year 2006 (Todd, May 2009)						
1997 Demand Assumptions:	1997 Demands from Paso Robles Groundwater Basin Study (Fugro, 2002)						
	Distribution of agricultural demands based on crop acreages from 1997 DWR land use survey for San Luis Obispo County.						

Water demands in the North Gabilan Subarea met by groundwater have increased by total of about 250 acre-feet between 1997 and 2006 as shown on Table 2.

Table 2. Estimated Water Demands in the North Gabilan Subarea for 1997 and 2006

GROUNDWATER DEMAND BY DEMAND TYPE FOR 1997 AND 2006 FOR THE NORTH GABILAN SUBAREA							
Groundwater Demand		Demand Type					
		Agricultural	Municipal	Small Community	Small Commercial	Rural Domestic	TOTAL
2006 Demand	(acre-feet)	1,758	0	0	0	51	1,809
Estimated 1997 Demand	(acre-feet)	1,522	0	0	0	41	1,563
Difference (2006 less 1997)	(acre-feet)	236	0	0	0	10	246
2006 Demand Assumptions:	Based on Evaluation of Paso Robles Groundwater Basin Pumping Water Year 2006 (Todd, May 2009)						
1997 Demand Assumptions:	1997 Demands from Paso Robles Groundwater Basin Study (Fugro, 2002)						
	Distribution of agricultural demands based on crop acreages from 1997 DWR land use survey for San Luis Obispo County.						

Draft Basin Management Objectives

The different levels of BMOs were discussed at the workshop. As described above there is very little available information to support the development of very targeted BMOs. Based on the available information, the BMO for the Bradley Subarea and the North Gabilan Subarea are to maintain groundwater levels high. The lack of an extensive monitoring network in this part of the Basin will prevent more detailed analysis of this.

Potential Groundwater Management Activities

GMA 1: Continue monitoring and reporting on groundwater conditions: Continue and improve monitoring – look to add monitoring well near the SLO-Monterey county boundary between the Nacimiento River and the town of San Miguel

GMA 2: Consider reestablishing Cloudseeding Program: Consider benefits of re-establishing the cloud seeding program in the Nacimiento and San Antonio watersheds. Cloud seeding was conducted in the past by MCWRA, and is estimated to have increased outflow of Lake Nacimiento and San Antonio Reservoirs by about 20 percent.

Summary of Basin Management Objective Workshop
For the Creston Subarea

The draft Basin Management Objectives (BMOs) for groundwater levels in the Creston Subarea were discussed and developed by stakeholders of Creston Subarea at the Paso Robles Groundwater Basin Management Plan BMO Workshop held on April 19 at the City of Paso Robles City Council Chambers. The stakeholders from the Creston Subarea that attended the Workshop are listed below:

Name	Affiliation
Sue Luft	WRAC/Grower/RR
Karl Luft	Grower/RR
Sheila Lyons	Rural Resident
David Lyons	Rural Resident
Dana Merrill	Grower
Fritz Helzer	Grower
Claudia Engel	Creston AB
Pam Finley	Templeton AAG

Sue Luft recorded the information discussed by the Creston Subarea Stakeholders. The Creston Subarea Stakeholders generally reached consensus on most of the issues presented below.

Basin Management Objectives are intended to provide quantifiable and measureable targets so that progress towards improved groundwater management can be tracked. BMOs are being developed for subareas within the Paso Robles Groundwater Basin (Basin) to represent the differing groundwater conditions and necessary management activities.

Groundwater Management Activities (GMAs) are intended to identify the steps or actions taken to meet the BMOs. It should be recognized that both BMOs and GMAs should be evaluated and updated routinely (every few years) as additional information is collected, or in response to changing conditions.

Groundwater Levels in the Creston Subarea are affected by:

- Annual hydrologic conditions
- Changes in water demands that are met with groundwater

There are currently about 150 wells located within the limits of the Paso Robles Groundwater Basin that are monitored by the San Luis Obispo County Department of Public Works and the Monterey County Water Resources Agency. These wells are used to track the changes in groundwater level trends through time at a specific location, or across an area for a specific date.

The changes in groundwater levels in the Creston Subarea are currently recorded at 13 wells that are included in the groundwater monitoring network. Based on the groundwater level data collected in the Creston Subarea, there has been a general decline in groundwater levels observed and recorded at selected wells located throughout the subarea since the 1960s. The rate of decline changes through time in response to changing hydrologic conditions and changes in the amount of local groundwater pumping. The composite hydrograph of four wells (currently in the monitoring network) was selected to

represent the conditions in the subarea is shown on Figure 1. These wells will be used as an indicator to how groundwater levels in the subarea are changing over time.

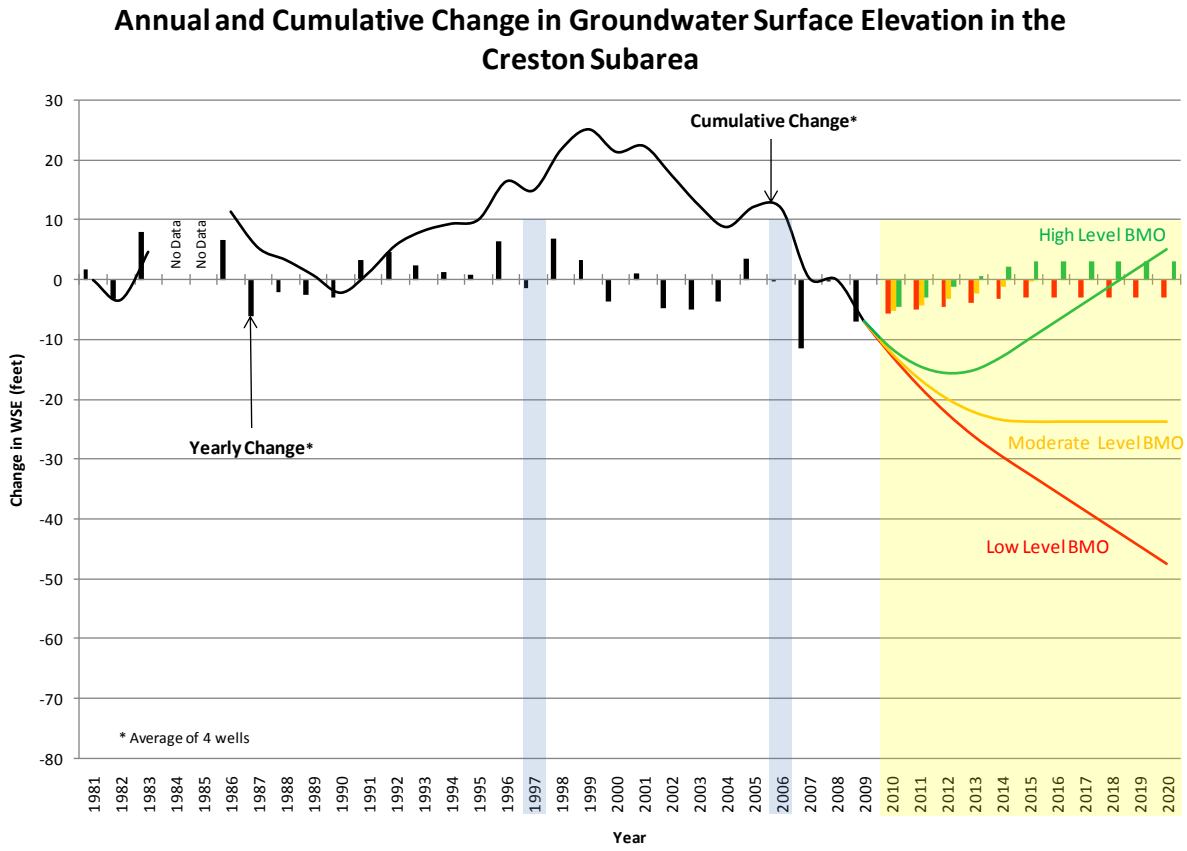


Figure 1. Composite Hydrograph of Four Selected Wells in the Creston Subarea

The average groundwater levels in the subarea appear to have peaked at about 1999. Since this time, groundwater levels have generally declined. This may be due in part to the increase in water demands between 1997 and 2006. During the 1997 to 2006 period, average groundwater levels have declined by less than five feet, but during the 2006 to 2009 period, the average groundwater levels declined by about 20 feet, so it appears that the increase in demands and the numerous dry years have contributed to the declining groundwater levels currently being experienced.

The 2010 to 2020 period included on Figure 1 shows potential range of changes in groundwater levels in the subarea under different levels of BMOs. Low level BMOs would be expected to result in a continuing decline of groundwater levels similar to those experienced during the 1997 to 2009 period. The moderate level BMO would eventually result in no change in groundwater levels (stabilized groundwater levels). The high level BMO would result in improvement of groundwater levels over time. These projected groundwater levels are intended to show the differences in groundwater levels based on target groundwater levels (BMOs) selected for the subarea, and the magnitude of the GMAs implemented. Additional analysis is needed to quantify the result (in terms of groundwater levels) due to the implementation of GMAs in the subarea.

Water demands in the Creston Subarea met by groundwater increased by about 1,800 acre-feet during the 1997 to 2006 period as shown on Table 1. This information does identify when this increase occurred, but it is likely to have contributed to the slight decline of groundwater levels during this period. These higher demands, along with drier conditions during the 2006 to 2009 period likely contributed to the increased rate of groundwater level decline (about seven feet per year) during this period.

Table 1. Estimated Water Demands in the Creston Subarea for 1997 and 2006

GROUNDWATER DEMAND BY DEMAND TYPE FOR 1997 AND 2006 FOR THE CRESTON SUBAREA							
Groundwater Demand		Demand Type					
		Agricultural	Municipal	Small Community	Small Commercial	Rural Domestic	TOTAL
2006 Demand	(acre-feet)	9,936	0	0	37	2,338	12,311
Estimated 1997 Demand	(acre-feet)	8,600	0	0	27	1,880	10,507
Difference (2006 less 1997)	(acre-feet)	1,336	0	0	10	458	1,804
2006 Demand Assumptions:	Based on Evaluation of Paso Robles Groundwater Basin Pumping Water Year 2006 (Todd, May 2009)						
1997 Demand Assumptions:	1997 Demands from Paso Robles Groundwater Basin Study (Fugro, 2002)						
	Distribution of agricultural demands based on crop acreages from 1997 DWR land use survey for San Luis Obispo County.						

Draft Basin Management Objectives

The Creston Subarea stakeholders determined that an acceptable draft BMOs for groundwater levels in the Creston Subarea would include stopping the current rate of decline experienced in the last 10 years, and stabilizing groundwater levels at about the 2009 level as presented in the composite hydrograph (average of four wells) in the next five to ten years.

Potential Groundwater Management Activities

The following Groundwater Management Activities (GMAs) were identified by the Creston Subarea Stakeholders to stabilize groundwater levels in the Creston Subarea. The potential benefit from these GMAs has not been quantified for the Creston Subarea (in terms of changes in groundwater levels), so it has not been determined if implementation of the GMAs will result in stabilized groundwater levels.

GMA 1: Increase monitoring and reporting on groundwater conditions: This GMA includes expanding the groundwater monitoring network in the Creston Subarea through the addition of new wells to the volunteer monitoring network. Additional wells would be needed in the northwest portion of the subarea near the Estrella Subarea where historic groundwater level decline has been the greatest.

Groundwater level measurements are currently taken by the County in the spring and fall of each year. Spring water levels will be used to track year-to-year changes and long-term trends in groundwater levels because they represent more stable conditions. Groundwater levels will be made available on a regular basis (semi-annually) within two months after most current readings, and will be included in the

Paso Robles Groundwater Basin Annual Report. This level of monitoring and reporting of groundwater levels should be sufficient for determining the effectiveness of the GMAs at this time. Additional monitoring and reporting may be needed at some future date.

While this GMA does not directly result in changes in groundwater levels, it will help communicate conditions to individuals and support implementation of groundwater management activities in the subarea.

The San Luis Obispo County Flood Control and Water Conservation District would likely be the lead entity of a cooperative group formed to collect, organize, and report on groundwater conditions in the Paso Robles Groundwater Basin on a regular basis.

GMA 2: Increase water conservation education and implementation: This GMA includes increasing the awareness of the impact of water conservation on reducing groundwater pumping. The effectiveness of the water conservation program will be difficult to verify for rural and agricultural areas without metering well production. The effectiveness of the GMA will be based on the changing behavior of individual water users. The effectiveness of this GMA will be evaluated on an annual basis. Some of the specific water conservation activities identified include:

- Agricultural Water Conservation
- Rural Residential Water Conservation
    - Landscape Water Use
    - Consider controls on non-agricultural ponds

Responsibility for implementing this GMA may include both the San Luis Obispo County Department of Planning and Building, and the San Luis Obispo County Flood Control and Water Conservation District.

GMA 3: Managing the growth and corresponding increase in water demands: This GMA includes identifying potential land use planning activities that may be used to reduce the rate of growth of rural residential development in the subarea. Throughout much of the Basin, land use planning responsibilities are the responsibility of the San Luis Obispo County Department of Planning and Building. Any policies established would be applied to the entire Basin, not just this subarea. This GMA may include:

- Building moratorium on lot splits and subdivisions
- No net increase in water use resulting from additional rural residential development

The San Luis Obispo County Department of Planning and Building would likely be responsible for implementing this GMA.

GMA 4: Preventing export of groundwater from the Basin: This GMA includes identifying potential activities that result in exporting groundwater from the Basin. At this time, additional information is necessary to quantify the occurrence of groundwater pumping for export from the Basin.

The San Luis Obispo County Flood Control and Water Conservation District and Department of Planning and Building would likely be the lead agencies responsible for implementing this GMA.

GMA 5: Consider storm water management opportunities to increase local groundwater recharge: This GMA includes evaluating the feasibility of recharging storm water runoff in the streams and creeks of the Basin. The potential benefit (in groundwater recharge) has not been evaluated for this GMA at this time.

The San Luis Obispo County Flood Control and Water Conservation District and Department of Planning and Building would likely be the lead agencies responsible for implementing this GMA.

DRAFT

Summary of Basin Management Objective Workshop
For the Estrella Subarea

The draft Basin Management Objectives (BMOs) for groundwater levels in the Estrella Subarea were discussed and developed by stakeholders of Estrella Subarea at the Paso Robles Groundwater Basin Management Plan BMO Workshop held on April 19 at the City of Paso Robles City Council Chambers. The stakeholders from the Estrella Subarea that attended the Workshop are listed below:

Name	Affiliation
Joy Sprague	Rural Resident
Walter Heer	
Christopher Alakel	City of Paso Robles
Chuck Pritchard	Upper Salinas/Las Tablas Resource Conservation District (US/LT RCD)
Jerry Reaugh	Grower
Lisa Bodrogi	(Paso Robles Wine Country Alliance (PRWCA)
Joe Plummer	Grower
Debra Compton	Grower
Steve Carter	Grower
John Wallace	San Miguel CSD
Tom Zehnder	

Iris Priestaf recorded the information discussed by the Estrella Subarea Stakeholders. The Estrella Subarea Stakeholders generally reached consensus on the level of Basin Management Objectives, but did not reach consensus on the Groundwater Management Activities.

Basin Management Objectives are intended to provide quantifiable and measureable targets so that progress towards improved groundwater management can be tracked. BMOs are being developed for subareas within the Paso Robles Groundwater Basin (Basin) to represent the differing groundwater conditions and necessary management activities.

Groundwater Management Activities (GMAs) are intended to identify the steps or actions taken to meet the BMOs. It should be recognized that both BMOs and GMAs should be evaluated and updated routinely (every few years) as additional information is collected, or in response to changing conditions.

Groundwater Levels in the Estrella Subarea are affected by:

- Annual hydrologic conditions
- Changes in water demands that are met with groundwater

There are currently about 150 wells located within the limits of the Paso Robles Groundwater Basin that are monitored by the San Luis Obispo County Department of Public Works and the Monterey County Water Resources Agency. These wells are used to track the changes in groundwater level trends through time at a specific location, or across an area for a specific date.

The changes in groundwater levels in the Estrella Subarea are currently recorded at 50 wells that are included in the groundwater monitoring network. Based on the groundwater level data collected in the Estrella Subarea, there has been a general decline in groundwater levels observed and recorded at selected wells located throughout the subarea since the 1960s. The rate of decline changes through time in response to changing hydrologic conditions and changes in the amount of local groundwater pumping. The composite hydrograph of six wells (currently in the monitoring network) was selected to represent the conditions in the subarea is shown on Figure 1. These wells will be used as an indicator to how groundwater levels in the subarea are changing over time.

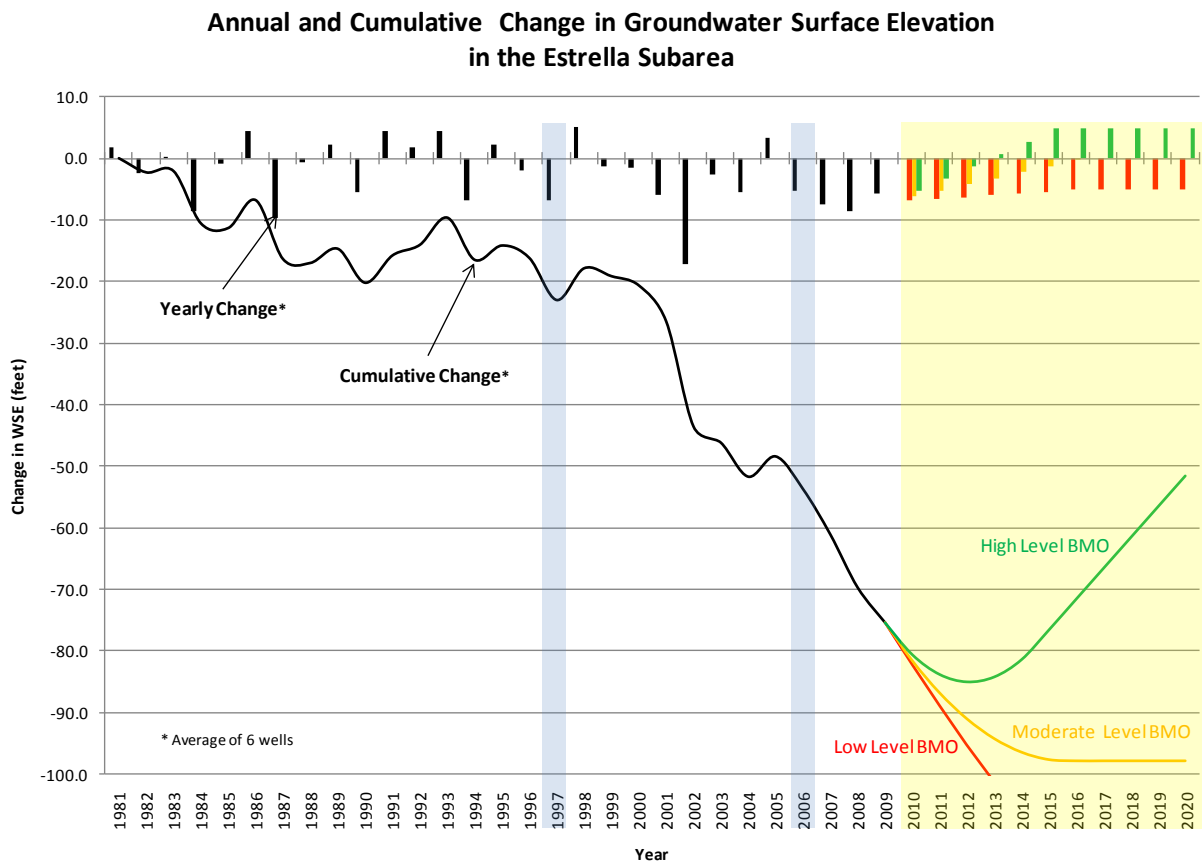


Figure 1. Composite Hydrograph of Six Selected Wells in the Estrella Subarea

Based on the composite hydrograph shown in Figure 1, the average groundwater levels in the Estrella Subarea have declined by about 20 feet between 1981 and 1997. Then, between 1997 and 2006 average groundwater levels have declined by an additional 30 feet. During this same period, water demands in the Estrella Subarea met by groundwater have increased by a total of about 6,300 acre-feet as shown on Table 1. Finally, from 2006 to 2009 the average groundwater levels declined by about 35 feet. During the 1981 to 2009 period, average groundwater levels in the Estrella Subarea declined by about 80 feet, in response to a combination of increasing in water demands that are met by groundwater and a series of dry years in the later years of the period.

The 2010 to 2020 period included on Figure 1 shows potential range of changes in groundwater levels in the subarea under different levels of BMOs. Low level BMOs would be expected to result in a continuing decline or groundwater levels similar to those experienced during the 1997 to 2009 period. The moderate level BMO would eventually result in no change in groundwater levels (stabilized groundwater levels). The high level BMO would result in improvement of groundwater levels over time. These projected groundwater levels are intended to show the differences in groundwater levels based on target groundwater levels (BMOs) selected for the subarea, and the magnitude of the GMAs implemented. Additional analysis is needed to quantify the result (in terms of groundwater levels) due to the implementation of GMAs in the subarea.

Water demands in the Estrella Subarea met by groundwater increased by about 6,300 acre-feet during the 1997 to 2006 period as shown on Table 1. This increase in demands contributed to the significant decline of groundwater levels during this period. These higher demands, along with drier conditions during the 2006 to 2009 period likely contributed to the increased rate of groundwater level decline (almost 10 feet per year) during this period.

CALCULATION OF NEAR-TERM GROUNDWATER PUMPING ESTIMATES FOR THE ESTRELLA SUBAREA WITH IMPLEMENTATION OF SELECTED GROUNDWATER MANAGEMENT ACTIVITIES (1)

Table 1. Estimated Water Demands in the Estrella Subarea for 1997 and 2006

GROUNDWATER DEMAND BY DEMAND TYPE FOR 1997 AND 2006 FOR THE ESTRELLA SUBAREA							
Groundwater Demand		Demand Type					
		Agricultural	Municipal	Small Community	Small Commercial	Rural Domestic	TOTAL
2006 Demand	(acre-feet)	23,111	3,930	0	1,603	5,433	34,077
Estimated 1997 Demand	(acre-feet)	20,004	2,137	0	1,186	4,368	27,695
Difference (2006 less 1997)	(acre-feet)	3,107	1,793	0	417	1,065	6,382
2006 Demand Assumptions:	Based on Evaluation of Paso Robles Groundwater Basin Pumping Water Year 2006 (Todd, May 2009)						
1997 Demand Assumptions:	1997 Demands from Paso Robles Groundwater Basin Study (Fugro, 2002)						
	Distribution of agricultural demands based on crop acreages from 1997 DWR land use survey for San Luis Obispo County.						
	1997 Municipal demand includes City of Paso Robles groundwater pumping from basin wells(1,911 acre-feet) and San Miguel (226 acre-feet)						
	Small community demands included in rural domestic demand						

POTENTIAL REDUCTION IN GROUNDWATER DEMAND FROM GROUNDWATER MANAGEMENT ACTIVITIES FOR THE ESTRELLA SUBAREA

Groundwater Management Activity		Demand Type					
		Agricultural	Municipal	Small Community	Small Commercial	Rural Domestic	TOTAL
Monitoring and Reporting		0	0	0	0	0	0
Establish Groundwater Level Monitoring		0	0	0	0	0	0
Prepare Annual Groundwater Level Report		0	0	0	0	0	0
Improve Groundwater Monitoring Network		0	0	0	0	0	0
Conservation and Demand Management		**2,310**	**0**	**0**	**160**	**540**	**3,010**
Reduction of Agricultural Groundwater Pumping(4)	percent	10%	0%	0%	0%	0%	
	(acre-feet)	2,310	0	0	0	0	2,310
Reduction of Municipal and Domestic Groundwater Pumping (2)	percent	0%	20%	10%	10%	10%	
	(acre-feet)	0	(3)	0	160	540	700
Land Use Planning/zoning (6)	percent	0%	0%	0%	0%	0%	
	(acre-feet)	0	0	0	0	0	0
New Supplies		**0**	**2,000**	**0**	**0**	**0**	**2,000**
Increase Use of Surface Water (5)	(acre-feet)	0	2,000	0	0	0	2,000
Increase Use of Recycled Water (6)	(acre-feet)	0	0	0	0	0	0

Draft Basin Management Objectives

Three levels of BMOs were discussed by the Estrella Subarea stakeholders. There was consensus that groundwater level declines are a shared problem for the subarea, and that the severity of decline varies across the area. It was also identified that the proposed low-level BMO (essentially do-nothing) was unacceptable.

The medium level BMO of stabilizing groundwater levels was identified as a reasonable objective at this time, but there was concern about the cost and feasibility.

The high level BMO of recovery of groundwater levels was identified as desirable by private domestic wells owner, but the group agreed that such an objective was over-reaching at this time.

Potential Groundwater Management Activities

The stakeholders reached consensus that there is no magic bullet that will solve the problem, but that the solution will likely involve a combination of activities such as additional water conservation, Nacimiento water supplies, a groundwater recharge program (e.g. using State Water Project or urban runoff), redistribution of pumping, and wastewater discharge/water recycling.

The following Groundwater Management Activities (GMAs) were identified by the Estrella Subarea Stakeholders to stabilize groundwater levels in the Estrella Subarea. The potential benefit from these GMAs has not been quantified for the Estrella Subarea (in terms of changes in groundwater levels), so it has not been determined if implementation of the GMAs will result in stabilized groundwater levels.

GMA 1: Increase data collection and monitoring and reporting on groundwater conditions: It was determined that there is enough information to know that there is a problem, however, additional and better information is needed to further understand the problem.

The stakeholders recognize that this GMA does not directly result in changes in groundwater levels, but will help communicate condition to individuals and support implementation of groundwater management activities in the subarea. It was recognized that additional private wells need to be made part of the County well network on a voluntary basis. This is particularly true in specific areas within the subarea currently lacking wells in the water level monitoring network.

GMA 2: Increase water conservation education and implementation: The stakeholders recognized that additional conservation is needed. Some stakeholders felt that the amount of savings that can be achieved is limited. Other stakeholders felt that additional conservation in the agricultural sector could play a significant role in reducing groundwater demand and achieving the BMO of stabilizing water levels. There were several discussions about the potential additional savings from conservation, but consensus could not be reached about the potential savings that could be achieved by the different water use categories (urban, agricultural, and rural). During the conversations each group stated that they believed there was limited opportunity for additional gains from conservation in their demand type, but believed additional conservation could be achieved in other demand types.

GMA 3: Nacimiento Project Water: The stakeholder reached consensus regarding the use of Nacimiento Project Water help alleviate the groundwater decline problem, but it was also recognized as not being the sole solution.

Issues Lacking Consensus

The two primary issues lacking consensus in the subarea was the degree to which additional conservation could be implemented for urban, agricultural, and rural uses.

The Paso Robles Groundwater Basin has largely centralized management because of a lack of water districts or local water agencies, so there was no consensus about the agency or organization that would have the responsibility for prioritizing and implementing the identified groundwater management activities.

DRAFT

Summary of Basin Management Objective Workshop
For the San Juan Subarea

The draft Basin Management Objectives (BMOs) for groundwater levels in the San Juan Subarea of the Paso Robles Groundwater Basin (Basin) were discussed and developed by stakeholders of San Juan Subarea at the Paso Robles Groundwater Basin Management Plan BMO Workshop held on May 10 at the Shandon High School Gymnasium. The stakeholders from the San Juan Subarea that attended the Workshop are listed below:

Name	Affiliation
Amy Gillman	5th District Legislative Assistant
Steve Sinton	Shandon
Randy Diffenbaugh	Shandon Advisory Committee
Susan Litteral	Natural Resource Conservation Service
Doug Felipponi	SJV FET
Mary Russell	Shandon

Susan Litteral recorded the information discussed by the San Juan Stakeholders.

The San Juan Subarea Stakeholders generally reached consensus on the level of Basin Management Objectives and on the Groundwater Management Activities.

Basin Management Objectives are intended to provide quantifiable and measureable targets so that progress towards improved groundwater management can be tracked. BMOs are being developed for subareas within the Paso Robles Groundwater Basin (Basin) to represent the differing groundwater conditions and necessary management activities.

Groundwater Management Activities (GMAs) are intended to identify the steps or actions taken to meet the BMOs. It should be recognized that both BMOs and GMAs should be evaluated and updated routinely (every few years) as additional information is collected, or in response to changing conditions.

Groundwater Levels in the San Juan Subarea are affected by:

- Annual hydrologic conditions
- Changes in water demands that are met with groundwater

There are currently about 150 wells located within the limits of the Paso Robles Groundwater Basin that are monitored by the San Luis Obispo County Department of Public Works and the Monterey County Water Resources Agency. These wells are used to track the changes in groundwater level trends through time at a specific location, or across an area for a specific date.

The changes in groundwater levels in the San Juan Subarea are currently recorded at 10 wells that are included in the groundwater monitoring network. Overall, groundwater levels have been fairly stable in the San Juan Subarea. The composite hydrograph of four wells (currently in the monitoring network) was selected to represent the conditions in the subarea is shown on Figure 1 for the 1981 to 2009

period. These wells will be used as an indicator to how groundwater levels in the subarea are changing over time.

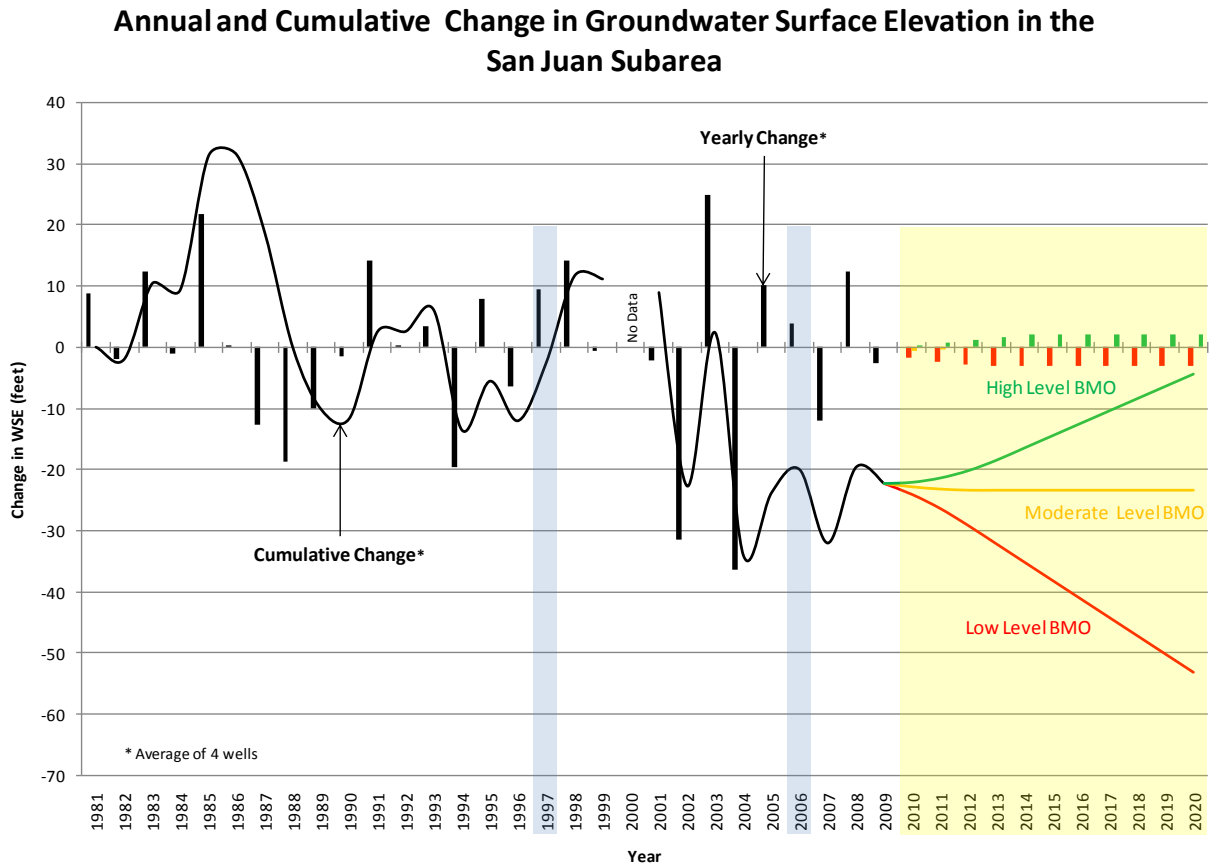


Figure 1. Composite Hydrograph of Four Selected Wells in the San Juan Subarea

Based on the composite hydrograph shown in Figure 1, the San Juan Subarea shows highly variable annual changes in groundwater levels. It appears that groundwater levels in the San Juan Subarea respond quickly to changes in hydrologic conditions, with average groundwater levels increasing or decreasing by as much as 35 feet in a single year.

During the 1981 and 1997 period, average groundwater levels changed considerably on a year-to-year basis, but there was no net significant difference in the cumulative groundwater levels at the end of the 16-year period. During the 1997 and 2006 period, the average groundwater levels in the San Juan Subarea declined by about 20 feet. Finally, during the 2006 to 2009 period, the average groundwater levels declined slightly (less than 5 feet). Overall, during the 1981 to 2009 period, average groundwater levels in the San Juan Subarea declined by about 25 feet.

The 2010 to 2020 period included on Figure 1 shows potential range of changes in groundwater levels in the subarea under different levels of BMOs. Low level BMOs would be expected to result in a continuing decline or groundwater levels similar to those experienced during the 1997 to 2009 period. The moderate level BMO would eventually result in no change in groundwater levels (stabilized groundwater

levels). The high level BMO would result in improvement of groundwater levels over time. These projected groundwater levels are intended to show the differences in groundwater levels based on target groundwater levels (BMOs) selected for the subarea, and the magnitude of the GMAs implemented. Additional analysis is needed to quantify the result (in terms of groundwater levels) due to the implementation of GMAs in the subarea.

The stakeholders mentioned that the area is primarily planted with field crops, and very few permanent crops. The statement was made that the amount of annual plantings are based in part on the depth to groundwater, because greater depth to groundwater increases pumping costs, at some point it will become uneconomical to grow some crops. This pattern of behavior (not planting some crops when groundwater levels are low) may contribute to the recovery response in groundwater levels, and preventing long-term groundwater level declines in the subarea.

Water demands in the San Juan Subarea met by groundwater have increased by a total of about 740 acre-feet between 1997 and 2006 as shown on Table 1. Looking at just these two single years of estimated water demand data may not provide a clear picture of the annual variation in agricultural water demand in the subarea.

Table 1. Estimated Water Demands in the San Juan Subarea for 1997 and 2006

Groundwater Demand		Demand Type					
		Agricultural	Municipal	Small Community	Small Commercial	Rural Domestic	TOTAL
2006 Demand	(acre-feet)	5,347	0	0	0	105	5,452
Estimated 1997 Demand	(acre-feet)	4,628	0	0	0	84	4,712
Difference (2006 less 1997)	(acre-feet)	719	0	0	0	21	740
2006 Demand Assumptions:	Based on Evaluation of Paso Robles Groundwater Basin Pumping Water Year 2006 (Todd, May 2009)						
1997 Demand Assumptions:	1997 Demands from Paso Robles Groundwater Basin Study (Fugro, 2002)						
	Distribution of agricultural demands based on crop acreages from 1997 DWR land use survey for San Luis Obispo County.						

Draft Basin Management Objectives

The different levels of BMOs were discussed at the workshop. There was consensus among the stakeholders that groundwater levels fluctuate considerably, but that there was no real concern of long-term declining groundwater levels at this time. Because the subarea experiences periods of rising and falling groundwater levels, the stakeholders expect the cumulative change in average groundwater levels to fluctuate over time, but return to zero net change in groundwater levels (no change from 1981 levels) without implementation of large scale groundwater management activities.

Potential Groundwater Management Activities

Because of the nature of the subarea, and pattern of groundwater use, this subarea may not have the same need for Groundwater Management Activities (GMAs) as other subareas in the

Basin. The following GMA was identified by the San Juan Subarea Stakeholders to stabilize groundwater levels in the San Juan Subarea.

GMA 1: Continue monitoring and reporting on groundwater conditions: The stakeholders suggest continuing the groundwater level monitoring and reporting program. The existing monitoring network provides reasonable coverage for the subarea at this time based upon the current groundwater level conditions. Additional monitoring wells could be added, but are not considered as important as continuing to actively monitoring and reporting on groundwater levels to extend the historical period of record.

DRAFT

Summary of Basin Management Objective Workshop
For the Shandon Subarea

The draft Basin Management Objectives (BMOs) for groundwater levels in the Shandon Subarea of the Paso Robles Groundwater Basin were discussed and developed by stakeholders of the Shandon Subarea at the Paso Robles Groundwater Basin Management Plan BMO Workshop held on May 10 at the Shandon High School Gymnasium. The stakeholders from the Shandon Subarea that attended the Workshop are listed below:

Name	Affiliation
Mike Clay	Red Cedar Vineyard
Dennis Bowman	Green River Mutual Water
Greg Jaeger (South Gabilan)	Rural Resident
Sydney Wattles	Shandon Home-Owner
Keith Larson	City of Paso Robles
Frank Mecham	SLO County
Kate Twisselman	Shandon Advisory Committee
Raymond Twisselman	Shandon Resident
Les Diffenbaugh	Shandon Resident
Fritz Helzer	Shandon Hills Vineyard

Courtney Howard (San Luis Obispo County Public Works Department Staff) recorded the information discussed by the Shandon Subarea Stakeholders. One stakeholder from the South Gabilan Subarea attended the workshop and participated in the discussions of the Shandon Subarea stakeholders.

While not all of the Shandon Subarea stakeholders are experiencing the same magnitude of groundwater level decline or type of groundwater quality deterioration, they generally reached consensus on the level of Basin Management Objectives, and some of the Groundwater Management Activities. One of the biggest concerns was the cost of the GMAs identified, and their overall cost effectiveness at improving groundwater levels in the subarea.

Basin Management Objectives are intended to provide quantifiable and measureable targets so that progress towards improved groundwater management can be tracked. BMOs are being developed for subareas within the Paso Robles Groundwater Basin (Basin) to represent the differing groundwater conditions and necessary management activities.

Groundwater Management Activities (GMAs) are intended to identify the steps or actions taken to meet the BMOs. It should be recognized that both BMOs and GMAs should be evaluated and updated routinely (every few years) as additional information is collected, or in response to changing conditions.

Groundwater Levels in the Shandon Subarea are affected by:

- Annual hydrologic conditions
- Changes in water demands that are met with groundwater

There are currently about 150 wells located within the limits of the Paso Robles Groundwater Basin that are monitored by the San Luis Obispo County Department of Public Works and the Monterey County Water Resources Agency. These wells are used to track the changes in groundwater level trends through time at a specific location, or across an area for a specific date.

The changes in groundwater levels in the Shandon Subarea are currently recorded at 18 wells that are included in the groundwater monitoring network. Based on the groundwater level data collected in the Shandon Subarea, there has been a general decline in groundwater levels observed and recorded at selected wells located throughout the subarea since the 1960s. The rate of decline changes through time in response to changing hydrologic conditions and changes in the amount of local groundwater pumping. The composite hydrograph of four wells (currently in the monitoring network) was selected to represent the conditions in the subarea (shown on Figure 1) for the 1981 to 2009 period. These wells will be used as an indicator to how groundwater levels in the subarea are changing over time.

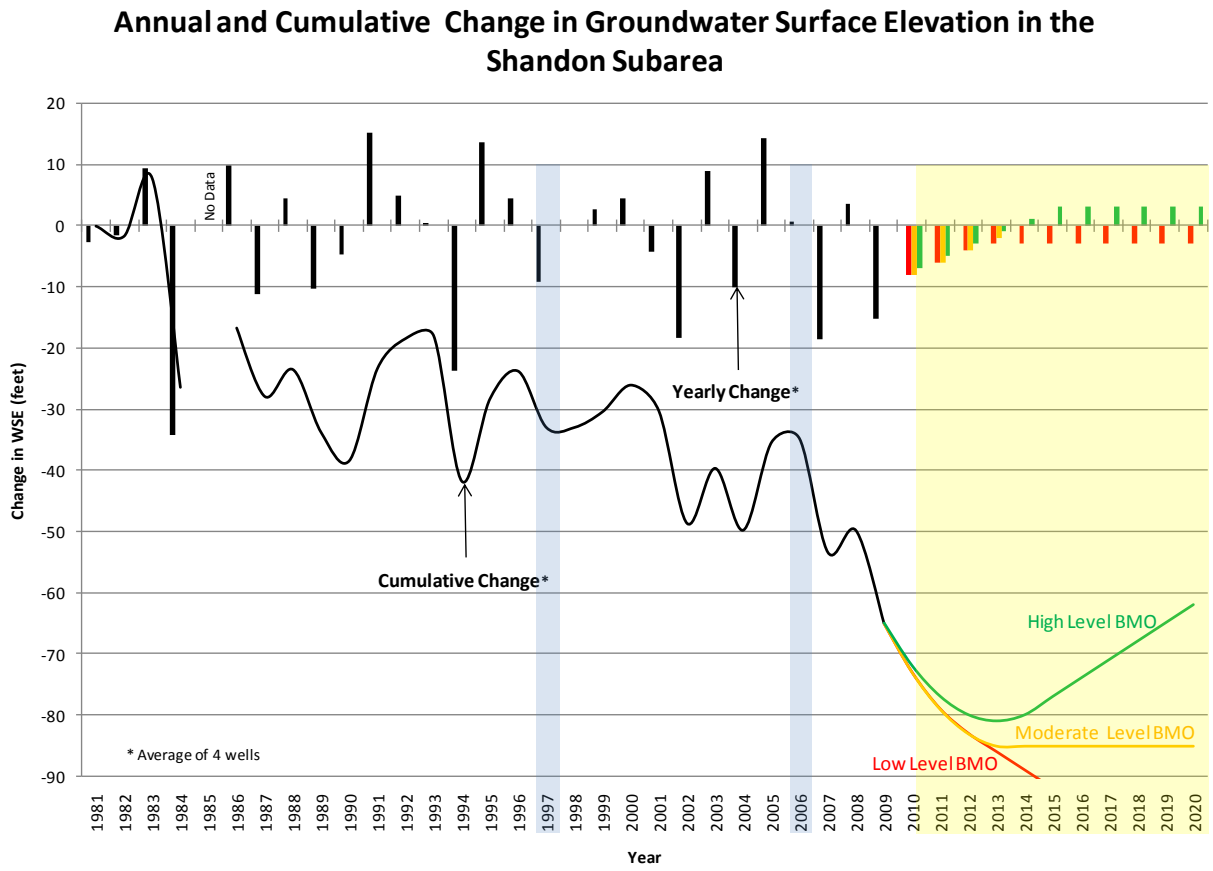


Figure 1. Composite Hydrograph of Four Selected Wells in the Shandon Subarea

Based on the composite hydrograph shown in Figure 1, the Shandon Subarea shows a wide range of annual changes in groundwater levels, with a general trend of declining groundwater levels.

During the 1981 to 1997 period, average groundwater levels in the Shandon Subarea have declined by about 33 feet. During the 1997 to 2006 period, average groundwater levels fluctuated annually, but resulted in very little net decline (about 2 feet) compared to 1997 levels. Finally, from 2006 to 2009 period, the average groundwater levels declined by about 30 feet. Overall, during the 1981 to 2009 period (28 years), average groundwater levels in the Shandon Subarea declined by about 65 feet (about 2.3 feet per year), in response to a combination of increasing in water demands that are met by groundwater, and in the later years of the period, a series of dry years.

The 2010 to 2020 period included on Figure 1 shows potential range of changes in groundwater levels in the subarea under different levels of BMOs. Low level BMOs would be expected to result in a continuing decline or groundwater levels similar to those experienced during the 1997 to 2009 period. The moderate level BMO would eventually result in no change in groundwater levels (stabilized groundwater levels). The high level BMO would result in improvement of groundwater levels over time. These projected groundwater levels are intended to show the differences in groundwater levels based on target groundwater levels (BMOs) selected for the subarea, and the magnitude of the GMAs implemented. Additional analysis is needed to quantify the result (in terms of groundwater levels) due to the implementation of GMAs in the subarea.

Water demands in the Shandon Subarea met by groundwater increased by about 1,600 acre-feet during the 1997 to 2006 period as shown on Table 1. This increase in demands may have contributed to the slight decline of groundwater levels during this period. These higher demands, along with drier conditions during the 2006 to 2009 period likely contributed to the increased rate of groundwater level decline (about 10 feet per year) during this period.

Table 1. Estimated Water Demands in the Shandon Subarea for 1997 and 2006

GROUNDWATER DEMAND BY DEMAND TYPE FOR 1997 AND 2006 FOR THE SHANDON SUBAREA							
Groundwater Demand		Demand Type					
		Agricultural	Municipal	Small Community	Small Commercial	Rural Domestic	TOTAL
2006 Demand	(acre-feet)	9,896	0	0	69	1,205	11,170
Estimated 1997 Demand	(acre-feet)	8,566	0	0	51	969	9,586
Difference (2006 less 1997)	(acre-feet)	1,330	0	0	18	236	1,584
2006 Demand Assumptions:	Based on Evaluation of Paso Robles Groundwater Basin Pumping Water Year 2006 (Todd, May 2009)						
1997 Demand Assumptions:	1997 Demands from Paso Robles Groundwater Basin Study (Fugro, 2002)						
	Distribution of agricultural demands based on crop acreages from 1997 DWR land use survey for San Luis Obispo County.						

Draft Basin Management Objectives

The stakeholders were initially concerned that the only way to stop the declining groundwater levels was to force people to stop pumping. Initially, the discussions of the group suggested a 'survival of the fittest' approach to groundwater pumping where only those with the deepest wells and the ability to afford pumping would continue to pump as costs increased. The others would be put out of business or be forced to make changes to their water use requirements.

After continued discussions, it was generally agreed that stabilizing groundwater levels was an appropriate objective at this time, but there is a concern about the cost and feasibility of stabilizing groundwater levels.

Potential Groundwater Management Activities

The stakeholders reached consensus that there was no single activity that would solve the problem, but that the solution will likely involve a combination of activities. The following Groundwater Management Activities (GMAs) were identified by the Shandon Subarea stakeholders to stabilize groundwater levels in the Shandon Subarea. The potential benefit from these GMAs has not been quantified for the Shandon Subarea (in terms of changes in groundwater levels), so it has not been determined if implementation of the GMAs will result in stabilized groundwater levels.

GMA 1: Groundwater Recharge and Banking Programs: The discussions did not focus on the details of this project or the approach, but did identify potential groundwater recharge or banking of either imported supplies or from storm water runoff as potential sources of groundwater recharge. One potential project that was discussed was an inflatable dam project such as was done along the Salinas River in Northern Monterey County. No additional details were provided on that potential project.

GMA 2: State Water Project supplies for Shandon: The community of Shandon has not used its 100 acre-feet of State Water Project water (SWP) to date. This project would include tying in to the Coastal Branch were it passes through Shandon to access the 100 acre-feet of supply. SWP supplies on the Coastal Branch are treated at the Polonio Pass Water Treatment Plant. This project would reduce municipal groundwater pumping in the Shandon area by the amount delivered from the SWP, thereby reducing groundwater pumping.

An alternative of this GMA would be to pursue additional SWP supplies that could also be delivered to Shandon. San Luis Obispo County has a contract allocation to additional SWP supplies that it has not used, and is not currently using. These supplies could be a potential source of water to the area. Additional capacity in Phase II of the Coastal Branch would be needed to deliver water in excess of the 100 acre-feet supply currently contracted to Shandon by the County. An investigation regarding the additional capacity of the Coastal Branch is currently being pursued by the District.

GMA 3: Formation of Irrigation District or Water District: The discussion focused on the potential need to form an irrigation district or water district to import surface water into the Paso Robles Groundwater Basin. Irrigation Districts/Water Districts are often formed to pursue large projects that benefit a larger group of water users. Such a district may be formed to

pursue a groundwater recharge or water banking project that would rely on imported surface water.

GMA 4: Increase water conservation education and implementation: The stakeholders recognized that additional conservation may result in a water savings, but were not sure if it would be cost effective. There was no objection to promoting conservation, and some discussions explored different conservation methods (such as alternative frost-control measures) since most growing operations are already on drip, and landscaping in Shandon is generally modest.

GMA 5: Precipitation Enhancement: This was brought up for discussion, but it was unclear whether this project would work for the Shandon area.

DRAFT

Appendix E Groundwater Elevation Monitoring Program

Paso Robles Groundwater Basin Management Plan

Groundwater Level Monitoring Network Plan for the Paso Robles Groundwater Basin

Paso Robles Groundwater Basin – Groundwater Advisory Committee

February 2011

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Abbreviations and Acronyms

Basin	Paso Robles Groundwater Basin
BMOs	Basin Management Objectives
City	City of Paso Robles
County	San Luis Obispo County
CSAs	County Service Areas
District	San Luis Obispo County Flood Control and Water Conservation District
DPW	County Department of Public Works
DWR	California Department of Water Resources
GAC	Groundwater Advisory Committee
IRWMP	Integrated Regional Water Management Plan
M&I	Municipal and Industrial
MCWRA	Monterey County Water Resources Agency
State	State of California
TDS	total dissolved solids
UWMP	Urban Water Management Plan
WRAC	Water Resources Advisory Committee

1 Introduction

1.1 Introduction

The Paso Robles Groundwater Basin (Basin) is located in northern San Luis Obispo County (County) and southern Monterey County and was described in the 1958 California Department of Water Resources (DWR) Bulletin 118, San Luis Obispo County Investigation. As part of the efforts to map the groundwater basins in the State of California (State) presented in Bulletin 118, DWR identified the Paso Robles Area Groundwater Subbasin of the Salinas Valley Groundwater Basin and designated it as Basin Number 3-4.06. The Basin boundary was later updated in the Paso Robles Groundwater Basin Study (2002) and is shown on Figure 1-1.

The Basin encompasses an area of approximately 505,000 acres (790 square miles). The Basin ranges from the Garden Farms area south of Atascadero to San Ardo in Monterey County, and from the Highway 101 corridor east to Shandon (Figure 1-1). Most of the Basin is hydraulically connected by thick sedimentary sections. The Basin is divided into smaller subareas based on water quality, source of recharge, groundwater movement, and the contours of the base of permeable sediments.

The Atascadero Subbasin is defined as that portion of the Basin west of the Rinconada fault. Between Atascadero and Creston, the Rinconada fault juxtaposes less permeable Monterey Formation rocks with the Paso Robles Formation basin sediments. South of the City of Paso Robles, the Paso Robles Formation is found on both sides of the Rinconada fault; however, the fault zone is believed to form a leaky barrier that restricts flow from the Atascadero Subbasin to the main part of the Basin. As a result of this, the Atascadero Subbasin is a hydrologically distinct subbasin within the Basin. The Rinconada Fault does not act as a hydraulic barrier to groundwater flow in the Salinas River Alluvium. As such, groundwater flow in the Alluvium is continuous along the stretch of the Salinas River that traverses the entire Basin. The area encompasses the Salinas River corridor area south of Paso Robles and includes the communities of Garden Farms, Atascadero, and Templeton.

The Basin was subdivided into subareas in the Phase I Report (Fugro, 2002) as a practical approach to organize the 790 square mile Basin into smaller informal areas (see Figure 1-1) and listed below.

1. Atascadero Subbasin
2. Creston Subarea
3. San Juan Subarea
4. Estrella Subarea
5. Shandon Subarea

6. North Gabilan Subarea
7. South Gabilan Subarea
8. Bradley Subarea

Over the past decade, the San Luis Obispo County Flood Control and Water Conservation District (District) and the City of Paso Robles (City) have worked with other pumpers to develop a more organized approach to groundwater management in the Basin. The preparation of the Paso Robles Basin Groundwater Management Plan (Plan) is one of the current activities to improve groundwater management.

The Plan was prepared coincident with the preparation of the Resource Capacity Study as well as other ongoing studies to develop a stakeholder-driven voluntary plan to provide a framework for future groundwater management activities. This project was funded by a grant from the Local Groundwater Assistance Act of 2000 (California Water Cost Section 10795 et seq) to provide grants to public agencies to conduct groundwater studies or to carry out groundwater monitoring and management activities. Local Groundwater Assistance Grants (AB303) are awarded by the California Department of Water Resources (DWR). Funding was available in 2007-2008 for AB303 grants.

Groundwater management requires groundwater level and other data collected and analyzed on a routine basis (typically annually) to establish the current conditions of the groundwater basin. This information is tracked and reported to agencies, interested parties, and stakeholders.

There are currently about 160 wells located within the limits of the Paso Robles Basin that are monitored by the San Luis Obispo County Department of Public Works, cooperating agencies, and the Monterey County Water Resources Agency.

The goals of the groundwater level monitoring and reporting program in the Paso Robles Basin include:

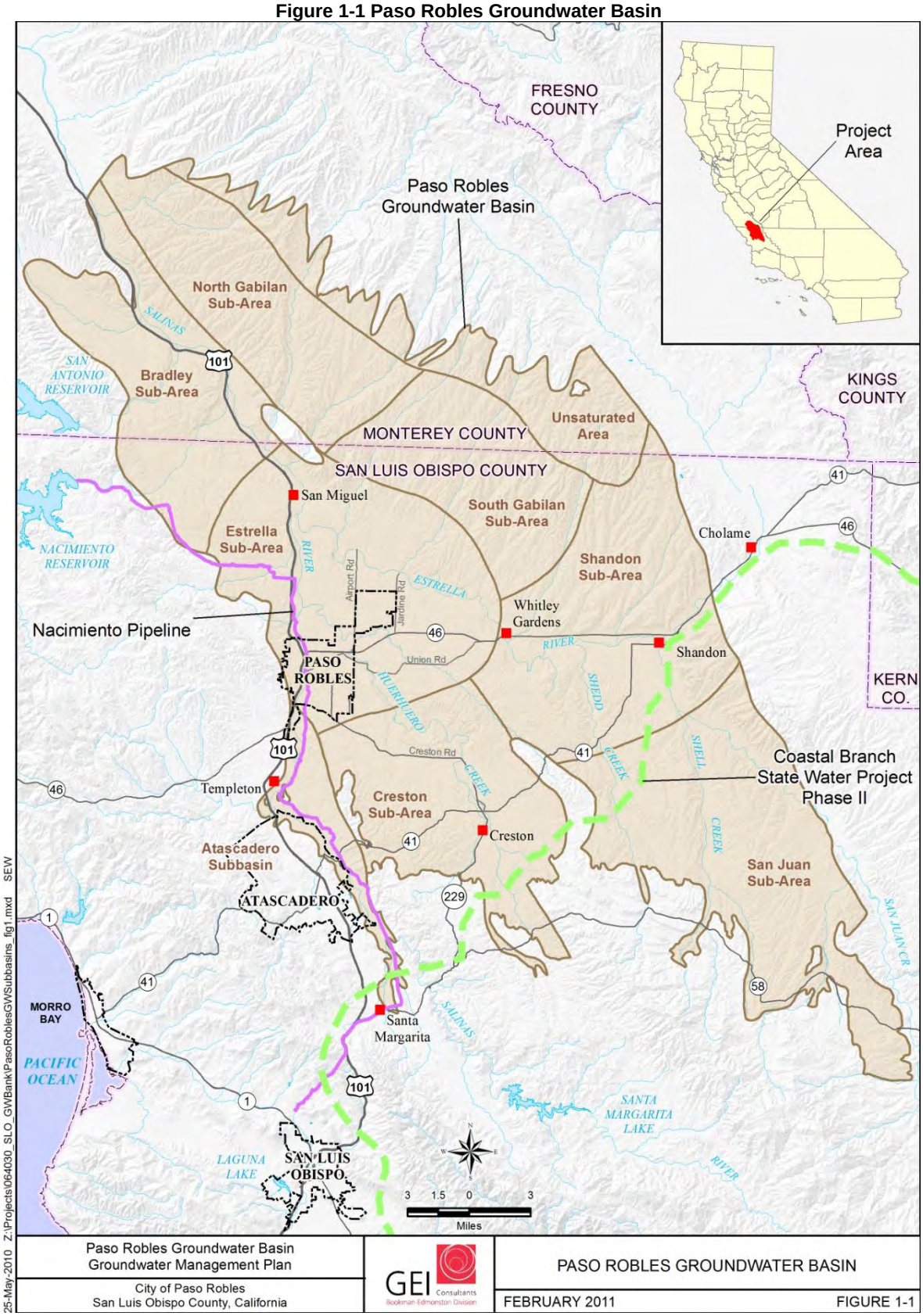
- Assessing groundwater elevations on an annual basis including trends, conditions, and adequacy of the groundwater level monitoring network.
- Preparing and distributing annual groundwater level monitoring reports to the public and public officials.
- Developing an outreach program to obtain groundwater level data from private pumpers and private well owners in the Basin.
- Coordinating with local, state, and federal agencies to develop better information on groundwater level monitoring and comply with current monitoring and report requirements such as California Statewide Groundwater Elevation Monitoring (CASGEMs) Program.

There are gaps in the monitoring network both laterally and vertically which, if filled, would improve the ability of groundwater users and managers in the Basin to fully understand the state of the groundwater conditions.

This Groundwater Level Monitoring Network Plan was prepared as part of the Paso Robles Groundwater Basin Management Plan to identify and document the groundwater level monitoring network and potential actions to improve the network. This Groundwater Level Monitoring Network is organized as follows:

- Section 1 – Introduction
- Section 2 – Existing Monitoring Network
- Section 3 – Monitoring Protocols
- Section 4 – Recommendations for Improving Groundwater Level Monitoring Network
- Section 5 – References

Figure 1-1 Paso Robles Groundwater Basin



2 Existing Monitoring Network

In the Paso Robles Basin, the County has been monitoring groundwater levels on a semi-annual basis (spring and fall) for more than 50 years to support general planning and engineering purposes.

The monitoring takes place from a voluntary monitoring network of production wells. The voluntary monitoring network has changed over time as wells have been lost, or new wells have been added to the network. In 2003, an evaluation of the monitoring network in the Paso Robles Basin was completed by Cleath and Associates to evaluate the efficiency and effectiveness of the County"s Monitoring Program for wells located in the Basin. In 2008, this analysis was updated by Cleath & Associates for San Luis Obispo County"s county-wide monitoring program, and included changes in the Paso Robles Basin since the 2003 report.

These reports are used as the basis for describing the groundwater level monitoring network in the Paso Robles Basin. The Paso Robles Basin monitoring network should include wells that produce water from either the alluvial aquifers or the Paso Robles Formation aquifers.

- **Shallow Aquifer Monitoring** - The report identified the importance of including monitoring wells in the shallow alluvial aquifers of the Salinas River, Estrella River, Huer Huero Creek, and San Juan Creek. If possible, these wells should be located near stream gages to support future analysis of stream recharge.

- **Paso Robles Formation Monitoring** - The Paso Robles Formation includes various aquifer types including shallow-unconfined zones, lower-confined zones (pressure zones) and thermal aquifer zones. Monitoring wells should be included in the monitoring network which taps each of these different aquifer zones.

The wells included in the monitoring network are selected based on aquifer definition and uniform areal distribution. There are approximately 159 wells in the current monitoring program (see Figure 2-1), County Public Works employees monitor 100 wells, and 57 wells are monitored by local municipal water company employees (who forward the data to the County"s Public Works Department for inclusion in the monitoring program database). Additionally, three wells are located in Monterey County and are monitored by the Monterey County Water Resources Agency.

Table 2-1 lists the number of monitoring wells in each subarea, with more wells in the areas of the greatest population density (in the urban areas) and the largest developed agricultural areas. In general, many of the wells in the Atascadero Subbasin and the Estrella Subarea are associated with urban land uses. In the Creston Subarea and the rest of the Basin, monitoring wells are located adjacent to agricultural lands.

During the 2008 Monitoring Program Evaluation, criteria were developed to improve the monitoring network by identifying existing wells to add to the monitoring program, and identify existing wells to be eliminated from the monitoring program. The general criteria for selecting wells for inclusion in the monitoring network included:

- Wells included in the program should be located geographically throughout the Basin and vertically throughout the aquifer system to provide groundwater level data that represents natural static water levels that are not influenced by transient conditions.
- Selected wells should not pump frequently or be within 1,000 feet of a high producing well or wells tapping the same aquifer.
- Two wells that tap different aquifers may be located in close proximity to each other without producing redundant monitoring data.
- Because younger alluvial deposits contain aquifers separated from deeper aquifers, and the Paso Robles Formation typically contains multiple aquifers, there should be separate program wells in a particular subarea that tap these various aquifers.
- The various Paso Robles Formation aquifer types to be represented by program wells include shallow-unconfined zones, lower-confined (pressure) zones, and in some locations thermal aquifer zones.
- Monitoring well distribution should be based on population density and projected population growth, and on current and projected land use because of the greater well pumping impacts in these areas.

Groundwater level data is currently recorded in bound field books containing card files from each well. Each well card file includes the well name, a location sketch, description of the well head and access, water level measurement and reference point, depth to water by date, observer"s initials and comments. Well construction reports should be obtained for all wells included in the monitoring network that would include much of this information.

During development of the Paso Robles Groundwater Management Plan, recent land use data was collected to compare the current land use to the existing monitoring network. This identified additional gaps in the monitoring network.

These gaps are located adjacent to areas currently experiencing declining groundwater levels, or are in areas where limited or no water level data is available. Figure 2-2 shows the locations of the wells to be added to the existing groundwater monitoring network (listed on Table 2-1) and areas that need additional monitoring where existing wells have not been identified.

Some of these areas include:

- Around the City of Paso Robles
- Creston Road Area
- Union Road Area
- Highway 46 west of Whitley Gardens
- Jardine Road Area

- Airport Road- Highway 101
- Highway 46 east of Whitley Gardens
- Creston Area
- Shandon Area
- Highway 41 south of Shandon
- North of San Miguel
- East of San Miguel

Table 2-1. Monitoring Program in the Paso Robles Groundwater Basin

Groundwater Subarea	Wells Currently in Program	Wells Added to Program	Wells Dropped From Program	Wells In Updated Program
Atascadero Subbasin	51	2	0	53
Bradley	0	1	0	1
Creston	17	6	2	21
Estrella	50	11	5	56
Gabilan (North and South)	1	0	0	1
San Juan	16	10	2	24
Shandon	24	5	4	25
TOTAL	**159**	**35**	**13**	**181**

Figure 2-1 Existing Well Monitoring Network

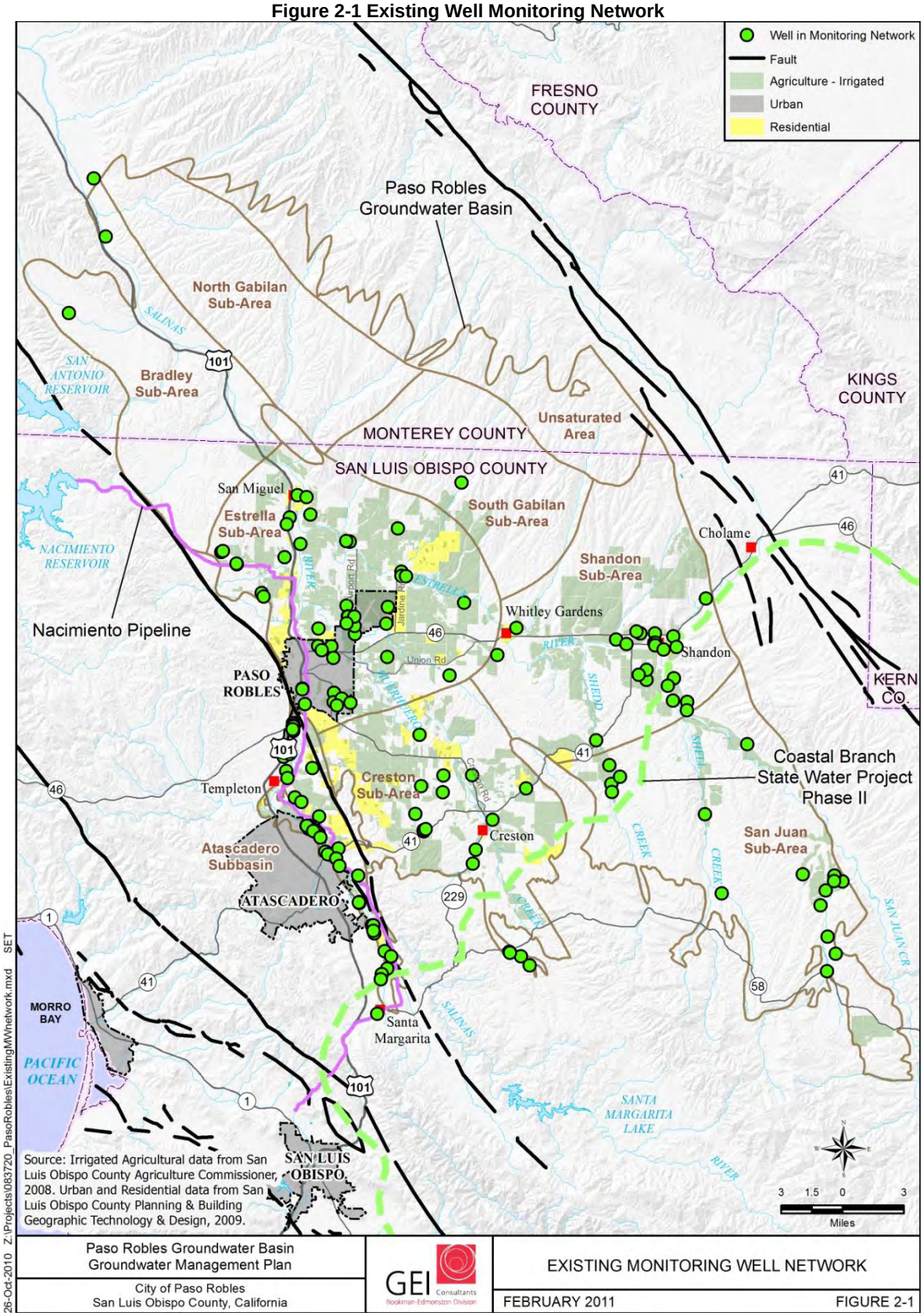
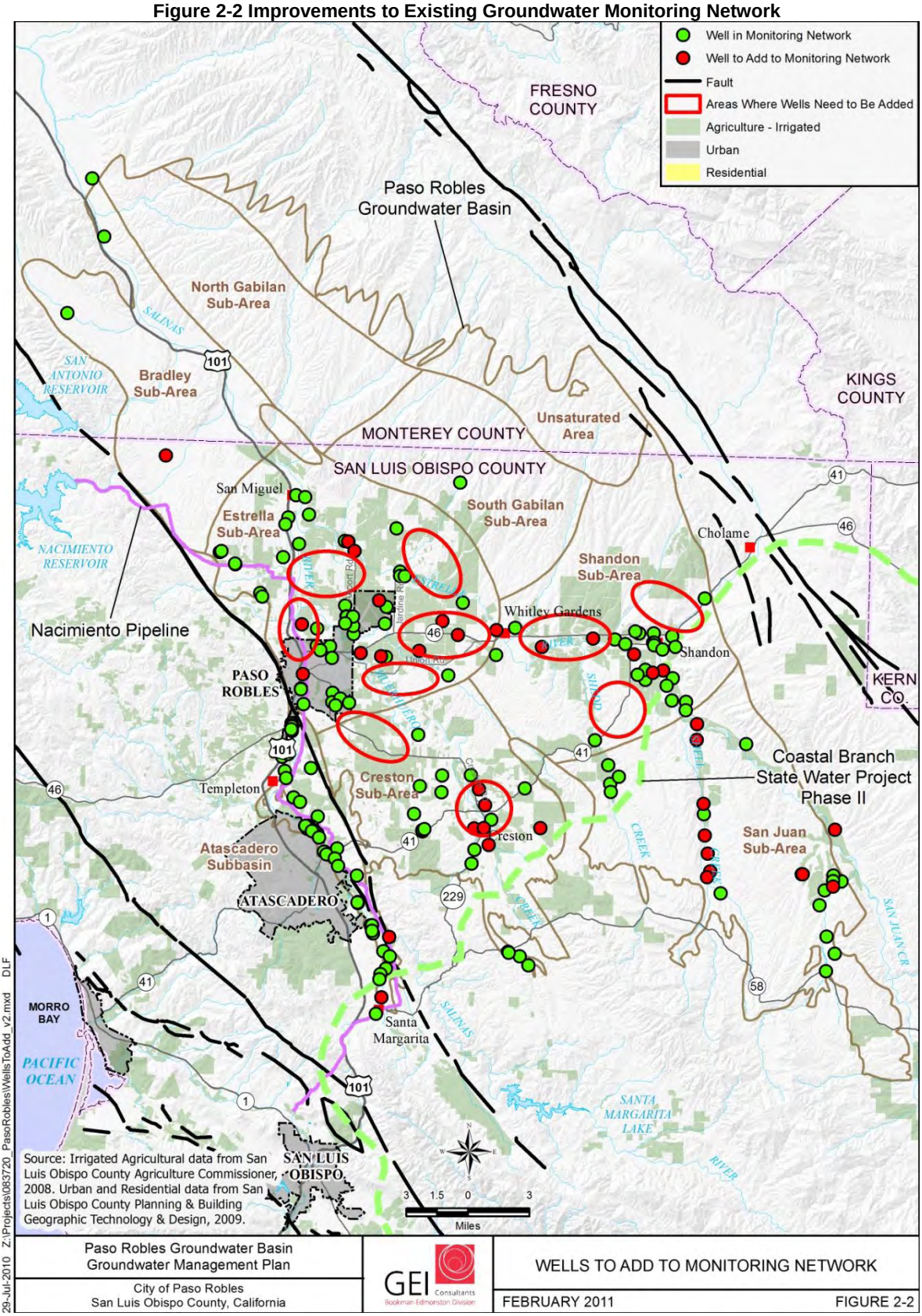


Figure 2-2 Improvements to Existing Groundwater Monitoring Network



3 Monitoring Protocols

The following is the standard operating procedure used by the County for the determination of groundwater surface elevations for wells in the Paso Robles Groundwater Basin monitoring network. These procedures may be varied or changed as required, depending on the site conditions, and equipment limitations.

In all instances, the actual procedures employed will be documented and described on the Groundwater Level Form. The water level measurements are used to construct water table or potentiometric surface maps and to determine flow direction as well as other aquifer characteristics.

Groundwater levels shall be measured in all wells on a semi-annual basis. If possible, sampling personnel should make groundwater level measurements in the same week but at no time should the measurements be taken over a period exceeding two-weeks.

3.1 Preparation for Field Work

Prior to collecting groundwater levels and before going to the field, sampling personnel shall clean, maintain, and test the water level sounder.

The sampling personnel will assemble the following equipment and supplies:

- Copies of Groundwater Level Form on waterproof paper
- Copies of well cards for wells being monitored
- Copy Monitoring Network Location map
- Electrical water level sounder
- Measuring Tape with gradations in tenths and hundredths of feet.
- Ballpoint pen (waterproof) and clipboard
- Paper towels
- Bleach
- Spray bottles
- Distilled water

During use of a water level sounder, it is possible for the cable to become stretched or shortened because of tangles and obstructions in wells. Before each monitoring event, the water level sounder shall be calibrated by laying it out and comparing it with a steel tape and the results documented. When calibration measurements show that the measurements are greater than 0.10 feet off in 100 feet, the cable shall be replaced.

Measurement locations will be identified and appropriate accommodations and permissions for site access will be made.

3.2 Monitoring Procedures

The following procedures shall be used to measure the depth to water at each designated monitoring well.

3.2.1 Verify the Reference Point

Distance above or below ground level to the reference point (RP) at which depth to water in the well is measured, i.e. TOC (Top of Casing). Make sure the measurement is equal to the one listed on the first well card for each well. If there is a difference in the distance, make a note in the remarks and correct the data on the front of the card.

3.2.2 Recording of Measurements

Each well has been assigned a unique identification number and a common name. The Groundwater Level Form will be used to record all groundwater level measurements and other information regarding well while in the field.

Groundwater level measurements will be measured to the nearest 0.01 foot. To obtain a depth to water measurement, the electric sounder cable will be lowered slowly into the well through the access port until the sounder indicates submergence by a beeping sound and/or light, depending on the type of sounder being used. At this point, the sampling personnel will note the depth to water from the reference point. The depth shall be confirmed by lifting the sounder above the water surface by about 2 to 3 feet and then re-measuring the depth to water. If the depth remains constant, the depth-to-water shall be recorded on the Groundwater Level Form, along with the time and date of the measurement. If the depth changes, the sampling personnel shall indicate that on the form, as well as the variable nature of the measurement and its possible cause (e.g., bouncing, recovering water levels, oil on water surface). The following measurements will be recorded:

- **Depth from Reference Point**: Total distance from the reference point to the top of the water.

- **Reference Point Distance**: Total distance from ground to reference point. If the reference point is above the ground surface, the reference point distance is a positive value. If the reference point is below the ground surface, the reference point distance is a negative value.

- **Depth to Water**: Total distance from the ground surface to the top of the water. It is calculated as the „Depth from Reference Point" less the „Reference Point Distance".

- **Obs. Init**.: Initials of sampling personnel

- **Remarks**: Any special remarks will go in this area.

3.2.3 Static Measurement Verification

The following procedure will be used to verify if a well has or has not been recently been pumping (for example, the difference it greater than 0.02 feet or there are other indicators of recent pumping). Once the depth of the water is measured, pull the end of the sounder up ½ inch and wait about 5 minutes to see if a signal is acquired. If it does re-acquire a signal, pull it up ½ inch again and wait to see if a signal is acquired. If it is reacquired, make a note in the remarks section "Well rebounding". If the pump is hot or the water pipe is cool, a note should be made in the remarks section.

If sampling personnel will be working in the area and it won"t be an inconvenience they may check at a later time to see if the well isn"t pumping. "Well Pumping" will be written on the data card.

3.2.4 Well Actively Pumping

If a well is actively pumping, unless it is stated on the well"s first page, the measurement will not be taken.

3.2.5 Maintenance and Cleaning of Equipment

Prior to obtaining the water level measurement at each well and between each well site, the bottom 10 feet of the electric sounder cable shall be rinsed in a solution of sodium hypochlorite (liquid bleach) and distilled water. The solution shall consist of bleach and distilled water in a one-tablespoon-to-one-quart ratio (a concentration of about 200 parts per million chlorine is desirable). The sounder shall then be rinsed thoroughly three times with distilled water and allowed to air-dry. Thorough cleaning of equipment is necessary to avoid any possibility of cross-contamination and transport of bacteria between wells.

3.2.6 Discontinuing Records

If there is a well that has not been monitored during the last three monitoring periods, i.e. could not find, no opening in top, removed, make a special note and this well will be considered for removal from the network.

3.3 Quality Assurance

In the field, the following general quality assurance/quality control (QA/QC) procedures apply:

1. All instrumentation must be operated in accordance with operating instructions as supplied by the manufacturer, unless otherwise specified.

2. Each well should be tested at least twice in order to compare results. If results do not agree to within 0.02 feet, a third measurement should be taken and the readings averaged. Notes about the inconsistent measurements and their possible cause should be made on the Groundwater Level Form.

3. Results should be compared to historical measurements while in the field and significant discrepancies noted and resolved if possible.

4. Wells for which no or questionable measurements are obtained need to be documented by the sampling personnel in the remarks section of the Groundwater Level Form.

After field personnel have completed their work, the data shall be entered into an electronic spreadsheet or database. The groundwater level measurements shall be proofed for accuracy by a second person within five days of obtaining the measurements. Should a measurement appear suspicious, a confirmation reading shall be obtained.

4 Recommendations for Improving the Groundwater Level Monitoring Network

This section identifies some of the activities related to maintaining and improving the groundwater level monitoring network. Several different factors may contribute to the improvements to the monitoring network, which may include the following:

- Recent groundwater monitoring legislation
- Improvements to the existing voluntary monitoring network
- Improvements to the data collected from wells in the existing monitoring network
- Development of a dedicated monitoring network to supplement the existing voluntary monitoring network
- Recommendations from the Resource Capacity Study regarding groundwater monitoring

Each of these are described below.

4.1 Complying with New Groundwater Monitoring Legislation

Future groundwater elevation monitoring and reporting will need to comply with the California Statewide Groundwater Elevations Monitoring Program (CASGEMs). This legislation, passed in 2009 is intended to establish a collaborative process between local monitoring parties and DWR to collect groundwater elevations statewide and make them available to the public.

To comply with CASGEMs:

- Local parties may assume responsibility for monitoring and reporting groundwater elevations.
- DWR will work cooperatively with local monitoring entities to achieve monitoring programs that demonstrate seasonal and long-term trends in groundwater elevations.
- A „Monitoring Entity" is identified for each basin to coordinate monitoring in the basin and the reporting to DWR.
- Where a Monitoring Entity is not established, DWR will perform the monitoring functions. If local parties do not volunteer to perform the groundwater monitoring functions, DWR will assume those functions, and those parties will become ineligible for water grants and loans from the State.

The major deadlines for this effort include:

- On or before January 1, 2011: parties seeking to assume groundwater level elevation monitoring functions must notify DWR.
- On or before January 1, 2012: Monitoring entities shall begin reporting seasonal groundwater elevation measurements.

To comply with CASGEMs Program requirements the District should consider the following actions:

- The San Luis Obispo County FCWCD should be identified with DWR as the groundwater monitoring lead in the Paso Robles Basin.
- Document the recent effort completed to evaluate the existing groundwater level monitoring network to determine the status of the existing wells and identify new wells to be included in network.
- Continue to coordinate data collection efforts among local agencies and data exchange with DWR.
- Submit a copy of the 2009/2010 Groundwater Level Monitoring Report to DWR to comply with their reporting requirements.

4.2 Improving the Existing Voluntary Monitoring Network

The District currently encourages well owners to consider adding their wells to the voluntary monitoring network. Figure 2-2 identifies areas where additional monitoring wells are needed to fill in gaps in the groundwater level monitoring network. The purpose of improving the voluntary monitoring network includes:

- Increasing the number of wells in groundwater level monitoring network
- Collecting available well construction data for existing wells included in monitoring network to improve understanding of aquifer being represented by each well
- Expanding the monitoring network to include areas experiencing changes in groundwater levels or changing land use conditions

Expanding the voluntary groundwater level monitoring network could be done by:

- Developing an outreach and education program to increase the understanding of the importance of the monitoring program
- Developing support for the program among responsible stakeholder groups to encourage participation among their membership
- Identifying specific locations needed for additional monitoring and identifying interested well owners

Interested well owners should contact the County Department of Public Works to inform them of their interest in making their well available to the District monitoring network. At that point the District will evaluate the candidate well for inclusion in the program. The

County Department of Public Works is currently developing a screening process to include additional wells into the monitoring network that includes the steps described below.

Step 1 – Contact District: Contact the District to confirm your interest in making your well available for inclusion in the voluntary monitoring network. Complete the Volunteer Application Form and provide the following information about your well to the District (Attachment A):

- **Well Location**: To determine if the well is located within a DWR designated groundwater basin, and identify if there are already three or more County monitored wells within a mile of the proposed well that tap the same aquifer.
- **Well Construction Information**: To determine the depth of the well and aquifers being tapped.
- **Existing Groundwater Level Data**: Includes past groundwater level data to determine the history of groundwater levels in the well to compare to other nearby wells.
- **Recent Well History**: To document any recent changes in the well, pumps, or changes in groundwater production or quality.

Step 2 - Initial Assessment: Applies screening criteria to determine the suitability for including the well in the monitoring network.

- **Well Location**: To determine if the well is located within a DWR designated groundwater basin, and identify if there are already three or more County monitored wells within a mile of the proposed well that tap the same aquifer.
- **Well Access**: To determine that there is safe, reliable and relatively easy access to the well.
- **Well Condition**: To confirm that well construction information is available, and if any changes have been made to the well (such as deepening the well).
- **Land Use**: To track historic changes in land use and corresponding groundwater levels, and monitor areas of future anticipated land use changes.
- **Water Levels**: An area experiencing historic water levels trends (rising or dropping) should have nearby County monitored wells to identify the extent of the area showing the trends.

Step 3 - Field Evaluation: Conducted to determine the well accessibility (in the field) and the conditions of the well.

- **Well Access**: To determine that the well:
  - Is free of hazardous conditions or obstacles, and there is safe parking and access to the wellhead.
  - Is accessible in all seasons and bad weather conditions.
  - Has an accessible sounding port that allows entry to the well with an electric sounder.

- **Well Condition**: To determine that the well:
  - Is free of down-hole obstructions that could interfere with water level measurements.
  - Does not have any down-hole problems such as oily conditions.
  - Does not produce any sand which may be an indication of a problem with the well construction.

Suitable wells that pass the 2-step screening process may be added to the Paso Robles Basin groundwater level monitoring network.

4.3 Improving Information on Existing Monitoring Wells

Well construction data may not be available for all wells currently included in the monitoring network. Downhole surveys of some of the existing wells currently being monitored could be conducted to obtain construction details and determine which aquifers are being monitored. These downhole surveys would improve the understanding of the groundwater levels and groundwater movement in the area of the well.

For wells without construction records, video logs could be performed during pump maintenance. Recent technology developments allow down-hole investigation of wells without having to remove their pumps and can provide a video survey to determine their screen intervals; estimate the amount of flow contributed by aquifer (allowing the aquifer characteristics to be estimated) and collect water quality samples by aquifer. These video surveys do have limitations due to the pump column being in the well during the survey. The well owner could notify the County and the well logging service to coordinate these efforts with their pump maintenance.

4.4 Adding Dedicated Monitoring Wells

The groundwater level monitoring network could be expanded by including dedicated monitoring wells to provide long-term continuity of the monitoring program, and fill existing gaps in the monitoring network. Dedicated monitoring wells are typically placed away from production wells so they will not be subject to the effect of pumping wells on their observations. Additionally, dedicated monitoring wells are not subject to removal from the monitoring network which may result if production wells change ownership. Dedicated monitoring wells should be outfitted with transducers to record water level data at selected time intervals. This allows a more detailed glimpse at the changes in groundwater levels over a short duration (hours, days, or weeks) compared to semi-annual monitoring. This can be especially important in the summer months when groundwater pumping is greatest but may not be captured in the spring and fall monitoring.

The dedicated monitoring well network could be expanded to include monitoring wells:

- In critical areas of concern where groundwater levels have declined or are experiencing groundwater level declines.

- In areas where there are data gaps because there are no wells in the existing monitoring well network.
- At the edges of the developed land use in the Basin. These areas may not be experience seasonal or long-term trends associated with localized pumping.

This could be done by:

- Developing a long-term strategy to develop and finance a dedicated monitoring network
- Prioritizing the areas of greatest concern to install dedicated monitoring wells
- Identifying specific locations (parcels) to site dedicated monitoring wells
- Pursue grant funding opportunities to implement the dedicated monitoring network

Figure 2-2 identifies areas that may be suitable for adding dedicated monitoring wells. These locations may be modified by the CASGEMs guidelines when they are released (expected in Fall 2010).

The dedicated monitoring network should be designed in such a fashion that it could eventually replace the use of production wells for the purpose of monitoring groundwater levels. When established, the dedicated monitoring well network may include between 20 to 40 wells. Initially, ten to fifteen wells could be added in those locations described previously. The actual location each well should be evaluated in the context of the large dedicated monitoring network so as to optimize the value of each well. Developing an effective and efficient dedicated monitoring network (with regard to the number of wells and their locations) could reduce the installation costs and future monitoring costs. The cost of the installation of dedicated monitoring wells ranges in the Paso Robles Basin is currently estimated at $30,000 to $40,000,

4.5 Relationship of Resource Capacity Study and Groundwater Level Monitoring Program

The Resource Capacity Study (RCS) addresses the state of the Paso Robles Groundwater Basin based on whether the Basin is being used at or beyond its dependable supply currently or will be within a certain period of time. The RCS uses available studies that calculated the perennial yield and water use by major water use sectors (agriculture, rural land uses, small commercial uses, municipal systems, and small community systems) in order to make this determination. The results of these studies show that groundwater use has increased during the 1980 to 2009 period to the point where the Basin outflows (including groundwater pumping) will soon be greater that Basin inflows (recharge). The RCS includes recommendations for land-use and monitoring actions based on the results of the studies.

The RCS recognizes that there are over-arching issues that complicate any action the County might wish to take, two of which are related to the Groundwater Level Monitoring Plan:

1. The major portion of Basin outflows are not measured, but are estimated. While municipal pumping is measured, agricultural, rural, and small community/commercial pumping is estimated. This adds to the uncertainty regarding actual groundwater use.

2. Identification of changing groundwater levels is based on limited data.

Because the County is the lead agency in coordinating the collection of groundwater level data, the Monitoring Plan should be regularly reviewed to ensure consistency with any monitoring actions ultimately implemented by the County.

4.6 Summary of Improvements

The following list summarizes the suggested improvements to the groundwater level monitoring network described in this section:

- The San Luis Obispo County FCWCD should be identified with DWR as the Monitoring Entity in the Paso Robles Basin.
- Document the recent effort completed to evaluate the existing groundwater level monitoring network to determine the status of the existing wells and identify new wells to be included in network
- Continue to coordinate data collection efforts among local agencies and data exchange with DWR
- Submit a copy of the 2009/2010 Groundwater Level Monitoring Report to DWR to comply with their reporting requirements.
- Develop an outreach and education program to increase the understanding of the importance of the monitoring program and foster support for the program among individuals and stakeholder groups to encourage participation among their membership
- Inform private wells owners about the 2-step process to add their well to the voluntary monitoring well network.
- Identify specific locations needed for additional wells in the voluntary monitoring network and interested well owners in those areas
- Develop a long-term strategy and finance plan to evaluate the development of a dedicated monitoring network
- Prioritize the areas of greatest concern to install dedicated monitoring wells and identify specific locations (parcels) to site dedicated monitoring wells
- Secure the right to access all new key wells together with retaining voluntary access to existing wells having useful histories to ensure that the County"s investment in these records is protected.
- Prioritize the areas of greatest concern to install dedicated monitoring wells and identify specific locations (parcels) to site dedicated monitoring wells

- Continue to conduct semi-annual groundwater measurements to chart the scope of groundwater level changes

Attachment A

PASO ROBLES GROUNDWATER BASIN
GROUNDWATER MANAGEMENT PLAN

Groundwater Level Monitoring Network
Well Interest Form

Well Location: _____

Subarea:_____

Address:_____

Well Construction Information (total depth/ depth of well screens/(gpm):

_____
_____

Existing Groundwater Level Data:

- What are the current trends in groundwater levels in your well?

_____
_____

Recent Well History:

- Have you had to take any actions related to maintain production in your well (deepen wells/ replace pump/ lower pumps)?

_____
_____

General Comments:

_____
_____
_____
_____

Volunteer Application Form

SAN LUIS OBISPO COUNTY
DEPARTMENT OF PUBLIC WORKS

County Government Center, Room 207 • San Luis Obispo CA 93408 • (805) 781-5252

(Please print or write legibly)

Name: _____ Date: _____

Address: _____ PO Box: _____

City: _____ State: _____ Zip: _____ County: _____

Home Phone: ( ) _____ Daytime Phone: ( ) _____

Email Address: _____ Daily Internet Access: Yes / No

Give a brief description of your location (Latitude/Longitude and assessor's parcel number if available):

_____

_____

Nearest Cross streets/roads:

_____

_____

Please use the box on the right to draw a map of your site and /or attach a picture.

Diagram of Site:

How did you find out about volunteering? _____

Please return this form to:

Kim Hubbs
County Government Center, Room 207
San Luis Obispo, CA 93408

Fax Number: (805) 788-2182
Phone Number: (805) 781-5272

For Staff Use Only

Station Name: _____
Station Number: _____
Latitude: _____ Longitude: _____
Date of Field Review: _____
Date Station Num Issued: _____
Date Received/Shipped Gauge: _____

Thank you for volunteering!

5 References

California Department of Water Resources, California‟s Groundwater, Bulletin 118 – Update 2003, 2003.

Cleath & Associates, Paso Robles Groundwater Monitoring Program Evaluation, 2003.

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Valentine, D.W., et al. Use of InSAR to Identify Land-surface Displacements Caused by Aquifer-System Compaction in the Paso Robles Area, San Luis Obispo County, California. USGS Open File Report 00-447, 1997.

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Appendix F Annual Monitoring Report

Annual Monitoring Report for Calendar Year 2009

City of Paso Robles

Submitted to:
Paso Robles Groundwater Basin –
Groundwater Advisory Committee

Date: February 9, 2011

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1 Introduction

The purpose of this report is to summarize groundwater conditions in the Paso Robles Groundwater Basin for 2009. This report supports the implementation of the Paso Robles Groundwater Management Plan (Plan) completed in February 2011 by:

- Documenting annual changes in groundwater levels based on information collected from the existing monitoring network.
- Comparing changes in groundwater levels to the Basin Management Objectives (BMOs) identified in the Plan.
- Identifying Groundwater Management Activities (GMAs) undertaken during the development of the Groundwater Management Plan and identifying activities anticipated to be undertaken in 2011 in an attempt to meet the BMOs.

1.1 Paso Robles Groundwater Basin

The Paso Robles Groundwater Basin (Basin) is located in northern San Luis Obispo County (County) and southern Monterey County and was described in the 1958 California Department of Water Resources (DWR) Bulletin 118, San Luis Obispo County Investigation. As part of the efforts to map the groundwater basins in the State of California (State) presented in Bulletin 118, DWR identified the Paso Robles Area Groundwater Subbasin of the Salinas Valley Groundwater Basin and designated it as Basin Number 3-4.06. The Basin boundary was later updated in the Paso Robles Groundwater Basin Study (2002) and is shown on Figure 1-1.

The Basin was first formally defined by the California Department of Water Resources (DWR, 1958). In 1979, the DWR published a detailed investigation of the San Luis Obispo County portion of the Basin (DWR, 1979).

The Basin encompasses an area of approximately 505,000 acres (790 square miles). The Basin ranges from the Garden Farms area south of Atascadero to San Ardo in Monterey County, and from the Highway 101 corridor east to Shandon (Figure 1-1). Most of the Basin is hydraulically connected by thick sedimentary sections. The Basin is divided into smaller subareas based on water quality, source of recharge, groundwater movement, and the contours of the base of permeable sediments.

The Atascadero Subbasin is defined as that portion of the Basin west of the Rinconada fault. Between Atascadero and Creston, the Rinconada fault juxtaposes less permeable Monterey Formation rocks with the Paso Robles Formation basin sediments. South of the City of Paso Robles, the Paso Robles Formation is found on both sides of the Rinconada fault; however, the fault zone is believed to form a leaky barrier that restricts flow from the Atascadero Subbasin to the main part of the Basin. As a result of this, the Atascadero Subbasin is

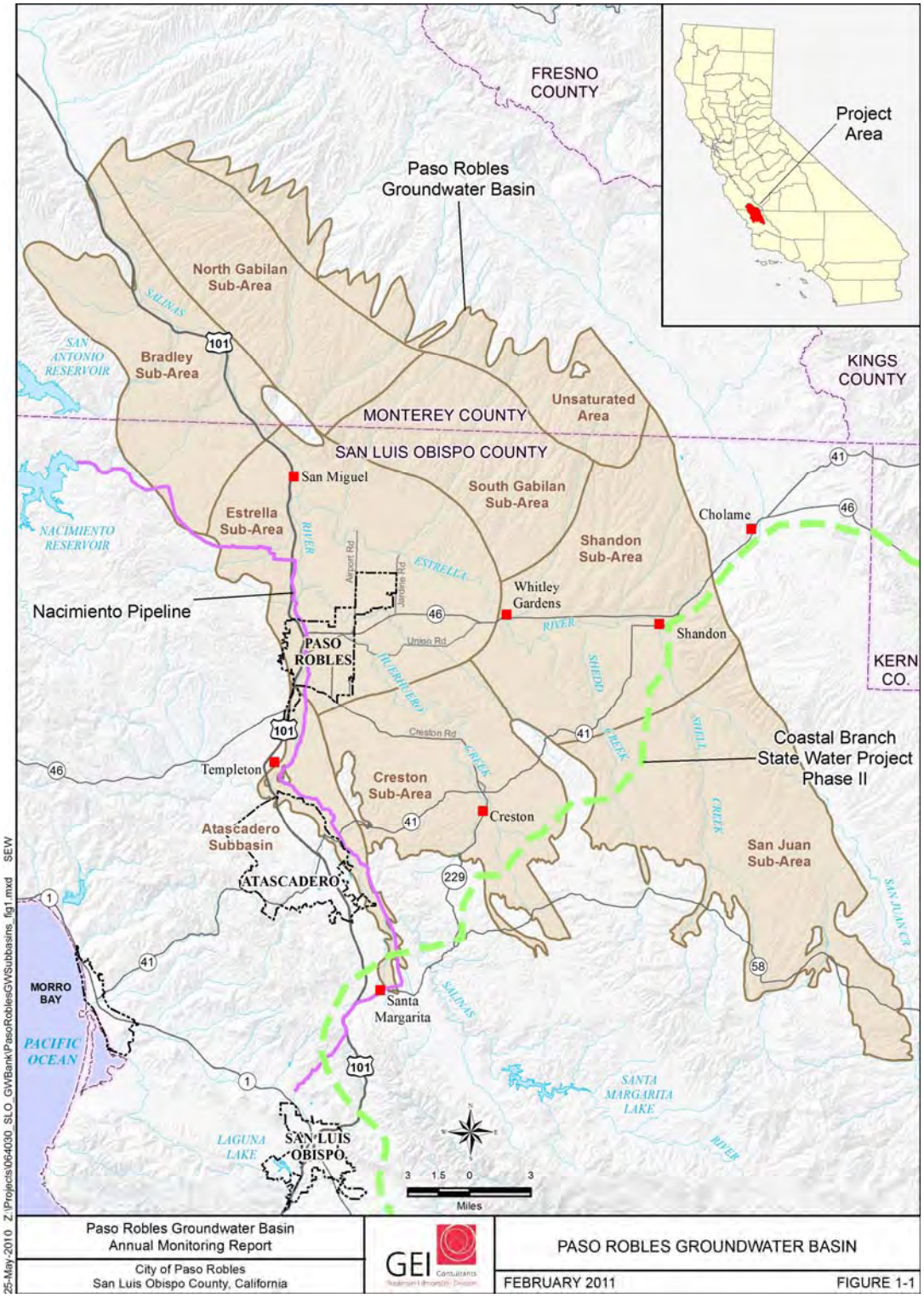
considered a hydrologically distinct subbasin within the Basin. The Rinconada Fault does not act as a hydraulic barrier to groundwater flow in the Salinas River Alluvium. As such, groundwater flow in the Alluvium is continuous along the stretch of the Salinas River that traverses the entire Basin. The Atascadero Subbasin encompasses the Salinas River corridor area south of Paso Robles and includes the communities of Garden Farms, Atascadero, and Templeton.

The western boundary of the Basin roughly follows Highway 101 from Santa Margarita northward to Hames Valley. The eastern boundary follows a rough line from Highway 58 in the San Juan Creek area northward to Shandon and Cholame. The Basin is downstream of and hydraulically connected by alluvial deposits to the Pozo Groundwater Basin south of the Basin, and to the Cholame Groundwater Basin north of the Basin. The Basin outlet is northwest and downstream of Bradley, where it is hydraulically connected with the Salinas Valley Groundwater Basin.

The Basin was subdivided into subareas in the Phase I Report (Fugro, 2002) as a practical approach to organize the 790 square mile Basin into smaller informal areas (see Figure 1-1) listed below:

1. Atascadero Subbasin
2. Creston Subarea
3. San Juan Subarea
4. Estrella Subarea
5. Shandon Subarea
6. North Gabilan Subarea
7. South Gabilan Subarea
8. Bradley Subarea

Figure 1-1. Paso Robles Groundwater Basin



1.2 Groundwater Level Monitoring Network

In the Basin, the County has been monitoring groundwater levels for more than 40 years. In 2003, an evaluation of the monitoring network was completed to evaluate the efficiency and effectiveness of the County's Monitoring Program for wells located in the Basin. Based on the final report, approximately 159 wells in the monitoring program (see Figure 1-2). Most wells are monitored by County Public Works employees and the remaining wells are monitored by local municipal water company employees (who forward the data to the County's Public Works department for inclusion in the monitoring program database). Additionally, three wells are located in Monterey County and are monitored by the Monterey County Water Resources Agency.

The County's Monitoring Program provides the best available groundwater elevation information to guide current groundwater management activities at current levels of implementation.

Figure 1-2. Monitoring Well Locations

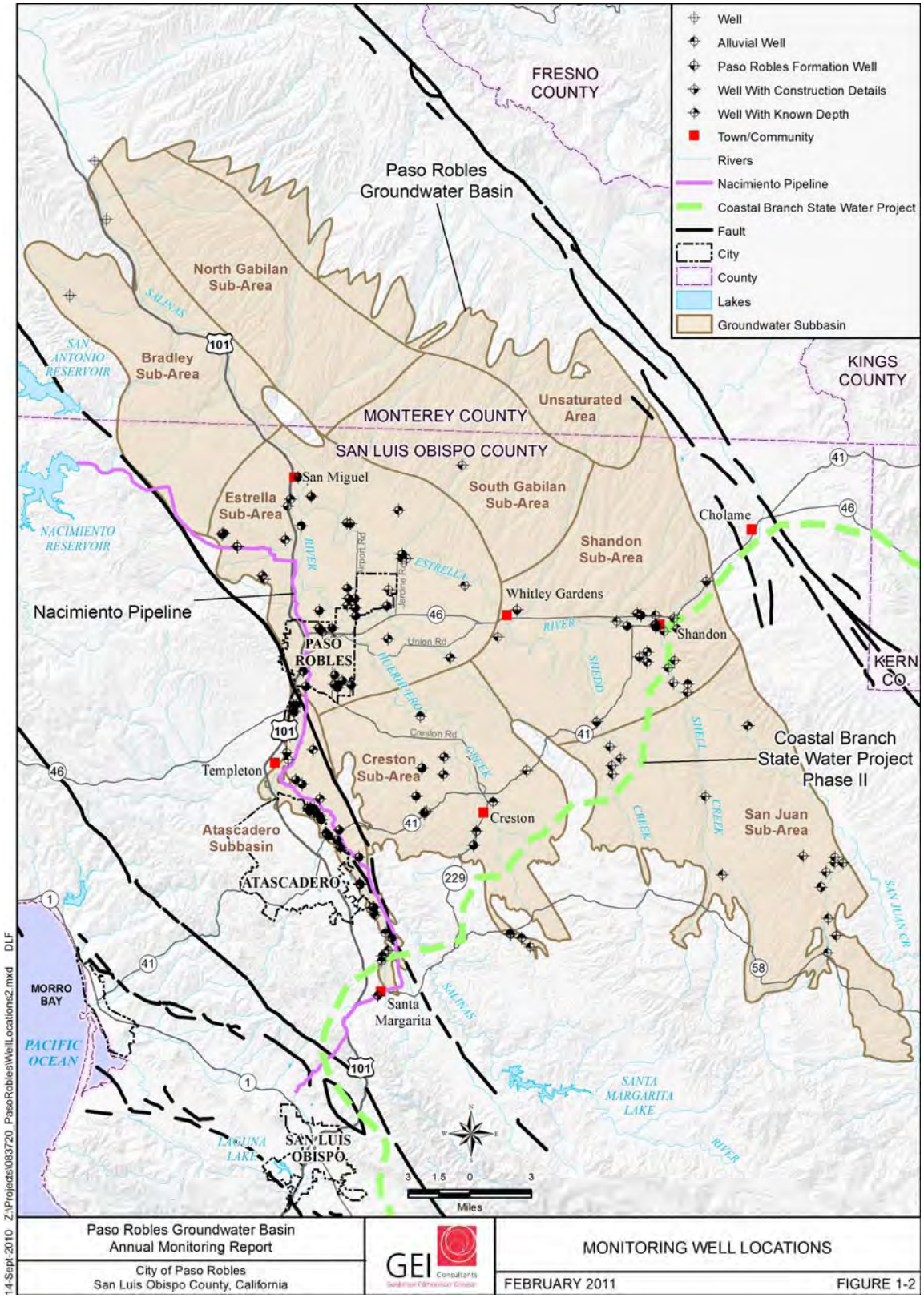


Table 1-1. Wells in the San Luis Obispo County Monitoring Network

Groundwater Subarea	Wells Currently in Program
Atascadero Subbasin	51
Bradley	0
Creston	17
Estrella	50
Gabilan (North and South)	1
San Juan	16
Shandon	24
TOTAL	**159**

2 Conditions for Calendar Year 2009

This section describes the conditions in the Paso Robles Groundwater Basin for calendar year 2009, including:

- Land and water use conditions
- Surface water imports
- Hydrologic conditions
- Groundwater elevations
- Groundwater quality data

2.1 Land and Water Use Conditions

The water demands and supplies for the Paso Robles Groundwater Basin are summarized from several of the documents as described in the Plan. Historically, all water demands in the Basin have been met with groundwater. This changed in early 2011 when Nacimiento Project Water began delivering water to some water users in the Basin.

Water demands in the Basin have generally been organized into five different "user sectors" including:

- **Agricultural** - Agricultural water demands are estimated using the crop acreage and water demands of different types of crops to determine the overall agricultural water demand. This method is used because records of agricultural pumping are not kept and reported.
- **Municipal** - Municipal pumping in the Basin includes four public water purveyors: 1) City of Paso Robles; 2) Atascadero Mutual Water Company; 3) Templeton Community Services District (CSD); and 4) San Miguel Community Services District. Pumping records were used to accurately calculate total municipal pumping.
- **Rural Residential** - Rural pumping includes domestic water use by development in rural areas. The estimate was derived by using parcel data and applying a water use factor, since records are not kept and reported.
- **Small Community Systems** - Small community systems include mutual water companies, county service areas, and mobile home parks. For systems that report groundwater pumping, well records were used to accurately determine their pumping. Using these reports, estimates were derived for the systems that do not report their water use.
- **Small Commercial Systems** - Small commercial pumping includes such users as wineries, golf courses, and schools. Water use estimates are based on factors from the Pacific Institute and information from consultation with winery operators.

The most recent Basin-wide water demand data is available for 2006 conditions, which are believed to represent approximate conditions for 2009. This information will be updated in the future as additional information is collected.

Table 2-1 shows the distribution of the demands by demand type and subarea for 2006. In 2006, agricultural demands were about 67 percent of the total demand in the Basin, with about one-third of the total agricultural demand occurring in the Estrella Subarea. Municipal demands were about 18 percent of the total demand and are concentrated in the Atascadero Subbasin and the Estrella Subarea. The small community demands are included as part of rural domestic demands. Rural domestic demands were about 13 percent of the total demand. Small commercial demands total about three percent of the total demand, and are concentrated in the Estrella Subarea.

Table 2-1. Distribution of 2006 Water Demands to Subareas

Subarea	Demand Type						
	Agriculture	Municipal	Small Community Systems	Small Commercial Systems	Rural Domestic	Total	Percentage
Atascadero Subbasin	1,348	11,735	0	430	2,032	15,545	17%
Bradley	6,933	0	0	184	109	7,226	8%
Creston	9,936	0	0	37	2,338	12,311	14%
Estrella	23,111	3,930	0	1,603	5,433	34,077	38%
North Gabilan	1,758	0	0	0	50	1,808	2%
San Juan	5,347	0	0	0	105	5,452	6%
Shandon	9,896	0	0	69	1,205	11,170	12%
South Gabilan	1,671	0	0	0	213	1,884	2%
Total	**60,000**	**15,665**	**0**	**2,323**	**11,485**	**89,473**	**100%**
Percent of Total	**67%**	**18%**	**0%**	**3%**	**13%**	**100%**	

2.2 Surface Water Imports

Several agencies and communities are participating in the Nacimiento Water Project to bring surface water into the Paso Robles Groundwater Basin. Table 2-2 lists the contract amounts and will track annual deliveries by year. Deliveries from the Nacimiento Project are expected to begin in early 2011.

Table 2-2 Imported Supplies from the Nacimiento Water Project

Entity	Contract Amount (Acre-Feet)	2010	2011	Total
City of Paso Robles	4,000	0		
Atascadero MWC	2,000	0		
Templeton CSD	250	0		
Total	6,250	0		

2.3 Hydrologic Conditions

The Paso Robles Groundwater Basin has a semi-arid Mediterranean climate, which is characterized by hot sunny summers and cool winters. Most of the precipitation occurs in the winter between November and April.

Rainfall is the primary source of recharge to the groundwater basin, and it is important to understand rainfall's relationship to groundwater management activities in the basin. The average rainfall over the basin ranges from about 18 inches in the west (at the Atascadero MWC Gage #34) to 11 inches in the east (at the Shandon #73) as shown on Table 2-3. Figure 2-1 shows the location of selected precipitation stations in the basin. The historical annual rainfall recorded is represented along the Salinas River at Paso Robles Gage (Gage #10) for the 1960 to 2009 period (50 years), shown on Figure 2-2. During this period, rainfall was highly variable, ranging from about 5 inches to over 30 inches per year, and averaging 14.88 inches per year.

Table 2-3. Precipitation Stations in the Paso Robles Groundwater Basin

Precipitation Station	Period of Record	Average Annual Precipitation (inches)			
		Period of Record	1960 to 2009	1981 to 2009	1997 to 2009
Paso Robles Gage #10	1901 to 2009	15.04	14.88	14.49	13.73
Atascadero Mutual WC #34	1931 to 2009	17.65	17.85	17.58	17.49
Erickson Ranch 52.1	1928 to 2009	11.89	12.81	12.85	13.15
Shandon # 73	1937 to 2009	10.69	10.76	11.10	11.06
Sinclair #125	1949 to 2009	11.69	12.02	12.21	11.67

Figure 2-1. Precipitation and Surface Water Gaging Stations in the Paso Robles Area

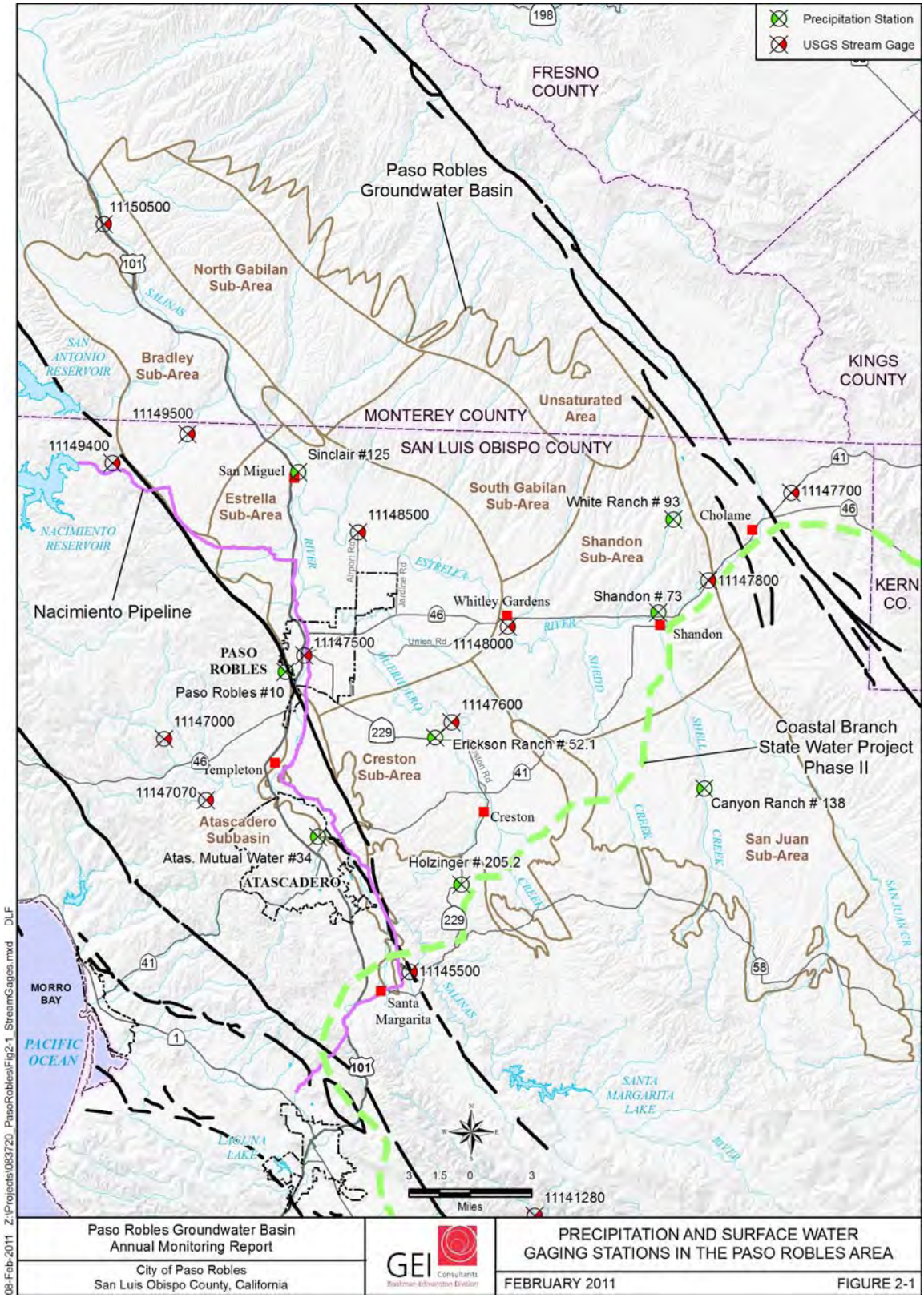
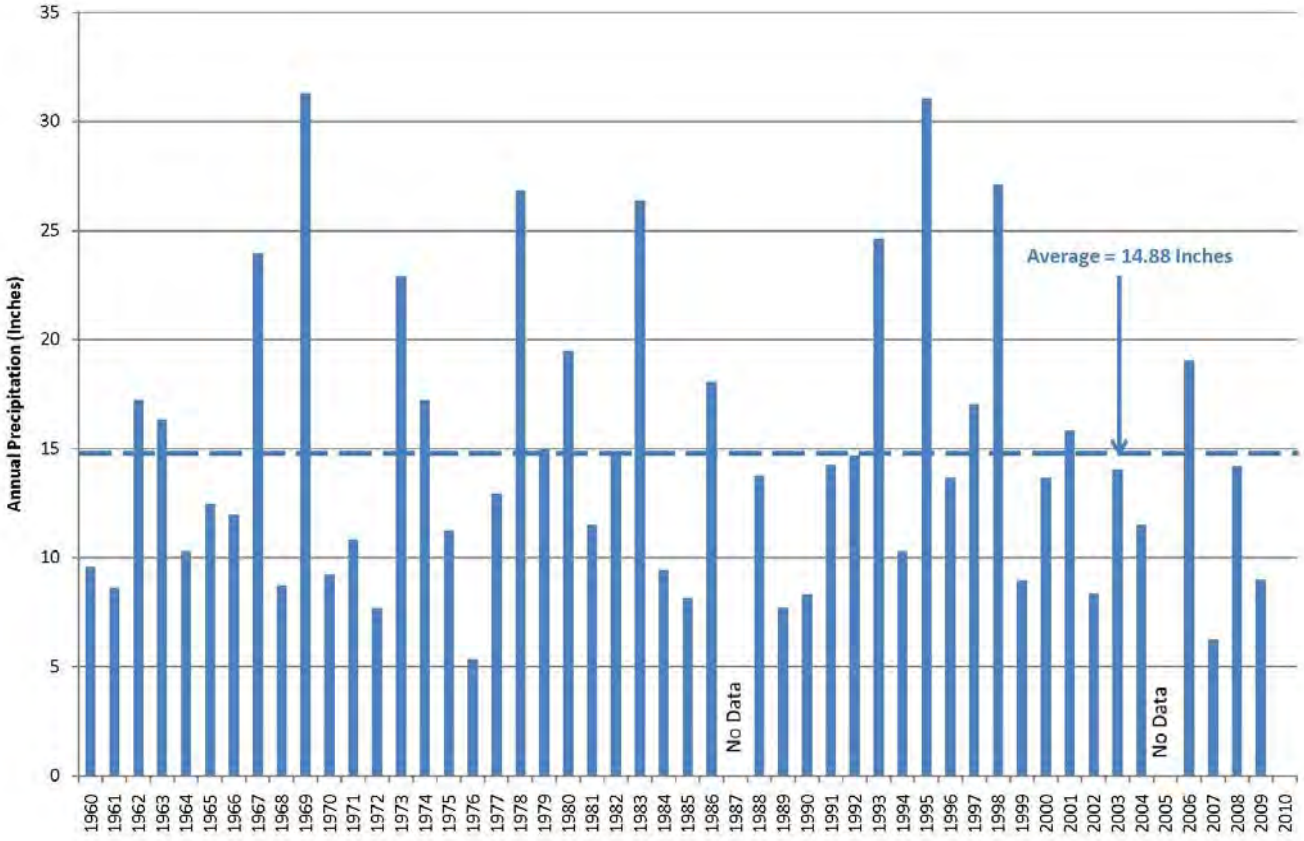


Figure 2-2. Annual Precipitation at the Paso Robles Gage for 1960-2009



2.4 Groundwater Levels

2.4.1 Current Groundwater Levels

Spring 2009 shows that groundwater levels in the Basin range from approximately 1,500 feet above mean sea level (msl) in upland areas to less than 600 feet msl in the northwestern Bradley area as shown on Figure 2-3. Groundwater moves generally northwesterly from the San Juan area into Shandon and then into the Estrella area. Groundwater flow from Creston is also northerly into the Estrella area. In the northern portion of the Basin, groundwater moves southwesterly toward Estrella and the Salinas River in the area near San Miguel.

2.4.2 Long-Term Change in Groundwater Levels

A groundwater elevation change map has been prepared that represents the changes in groundwater levels for the 1997 to 2009 period and is shown on Figure 2-4. This map shows that the greatest change in groundwater elevations has occurred in the Estrella Subarea, and to a lesser extent in the Creston and Shandon Subareas. Groundwater levels in the western portion of the Paso Robles Basin have declined in excess of 70 feet since 1997 during a period when precipitation was just slightly less than the long-term average annual precipitation.

2.4.3 Groundwater Quality

In general, the quality of groundwater in the Basin is relatively good, with few areas of poor quality or trends of ongoing water quality deterioration. Historical water quality trends were evaluated to identify areas of deteriorating water quality. Some areas are experiencing rising concentrations of total dissolved solids (TDS), chloride, and nitrate. The water quality data is collected by entities that deliver potable water. Table 2-4 provides a range of values for selected water quality constituents for agencies within the Paso Robles Basin.

The first dataset was provided by the San Luis Obispo County Department of Public Works Water Quality Database. Values from this dataset are measured in milligrams per liter (mg/L) or micrograms per liter (ug/L). These ranges were calculated from the provided dataset and cover a variety of wells under the jurisdiction of each listed entity.

The second dataset was gleaned from annual water quality reports provided by water agencies or cities. Values from this dataset are measured in parts per million (ppm) or parts per billion (ppb). Ranges were provided in each report and are unique to that agency's analysis set.

Table 2-4. Selected Groundwater Quality Data

Agency/Project	Analysis Full Name	Range	Units
SAN LUIS OBISPO CSA #16 - SHANDON	Chloride	61.7 - 114	mg/L
	Manganese	< 5	ug/L
	Nitrate and Nitrite Combined as Nitrogen	2420 - 4130	ug/L
	Nitrate as Nitrogen	2420 - 4140	ug/L
	Nitrate as NO3	10.7 - 18.3	mg/L
	Total Dissolved Solids	390 - 550	mg/L
SAN LUIS OBISPO CSA 23 - SANTA MARGARITA	Arsenic	< 1.0 - 6.2	ug/L
	Manganese	<5 - 12	ug/L
	Nitrate as Nitrogen	< 100 - 321	ug/L
	Nitrate as NO3	< 0.443 - 1.4	mg/L
SAN MIGUEL COMMUNITY SERVICES DISTRICT	Chloride	78.8 - 114	mg/L
	Manganese	< 5 -	ug/L
	Nitrate and Nitrite Combined as Nitrogen	3500 - 3600	ug/L
	Nitrate as Nitrogen	2340 - 11200	ug/L
	Nitrate as NO3	10.4 - 49.6	mg/L
	Total Dissolved Solids	580 - 770	mg/L
SANTA MARGARITA RECREATION AREA	Nitrate as Nitrogen	- <100	ug/L
	Nitrate as NO3	- < 0.443	mg/L
CITY OF PASO ROBLES	Arsenic	ND - 6.3	ppb
	Chloride	35 - 150	ppm
	Manganese	ND - 27	ppb
	Nitrate and Nitrite Combined as Nitrogen	ND - 3500	ppb
	Nitrate as Nitrogen	---	---
	Nitrate as NO3	ND - 28.5	ppb
	Total Dissolved Solids	370 - 740	ppm
ATASCADERO MUTUAL WATER COMPANY	Arsenic	---	---
	Chloride	11 - 220	ppm
	Manganese	ND - 0.046	ppb
	Nitrate and Nitrite Combined as Nitrogen	---	---
	Nitrate as Nitrogen	---	---
	Nitrate as NO3	ND - 16	ppb
	Total Dissolved Solids	350 - 990	ppm
TEMPLETON COMMUNITY SERVICES DISTRICT	Arsenic	0 - 12	ppb
	Chloride	57 - 165	ppm
	Manganese	0 - 7.8	ppb
	Nitrate and Nitrite Combined as Nitrogen	---	---
	Nitrate as Nitrogen	0 - .95	ppm
	Nitrate as NO3	0 - 43	ppb
	Total Dissolved Solids	560 - 1000	ppm

2.4.4 Land Subsidence

There has been no significant long-term land subsidence in the Basin so currently there are no plans to develop a formal program to monitor and measure the rate of inelastic land surface subsidence within the Basin. The need for land subsidence monitoring will continue to be considered on an annual basis.

Figure 2-3. Groundwater Elevations Spring 2009

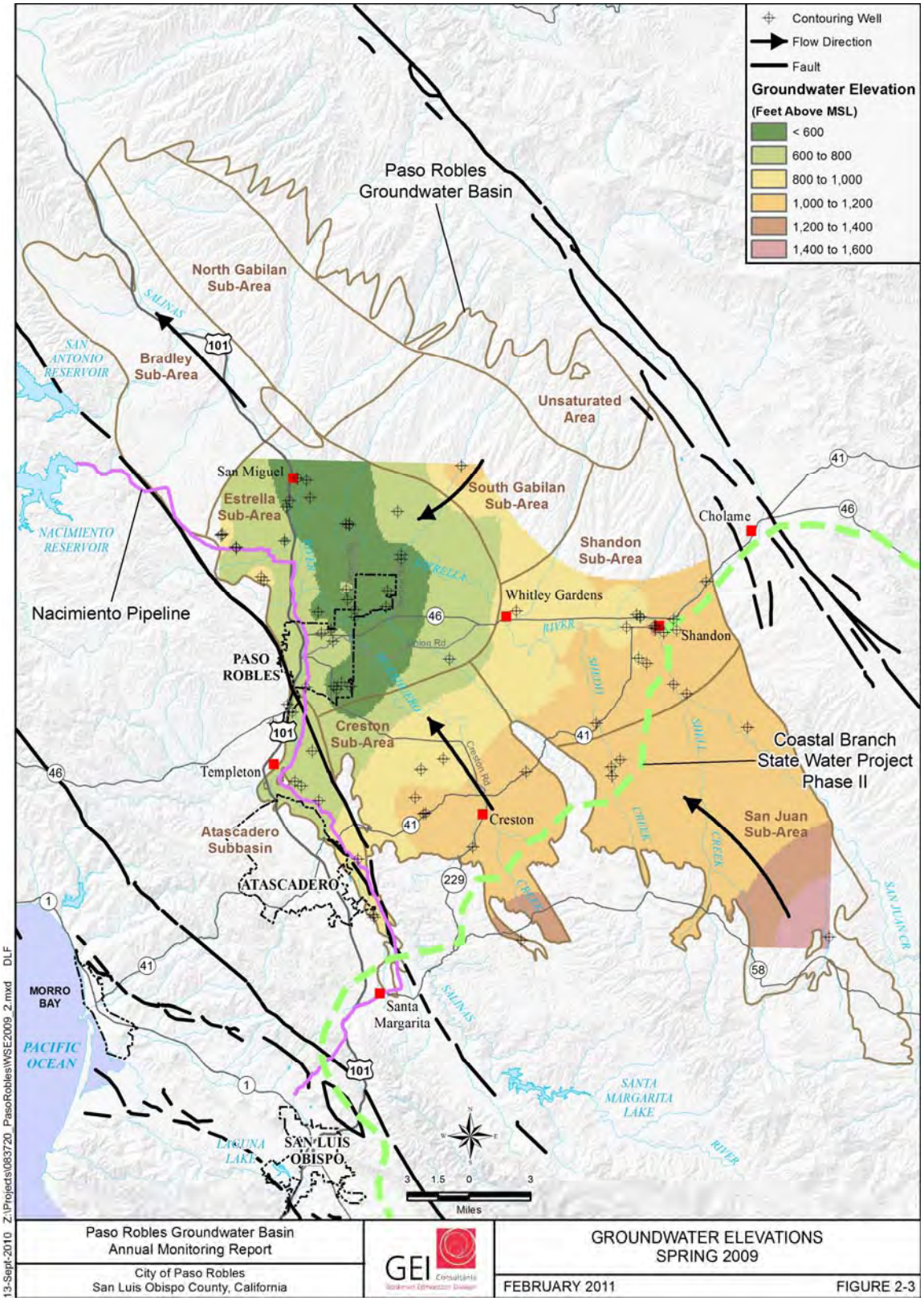
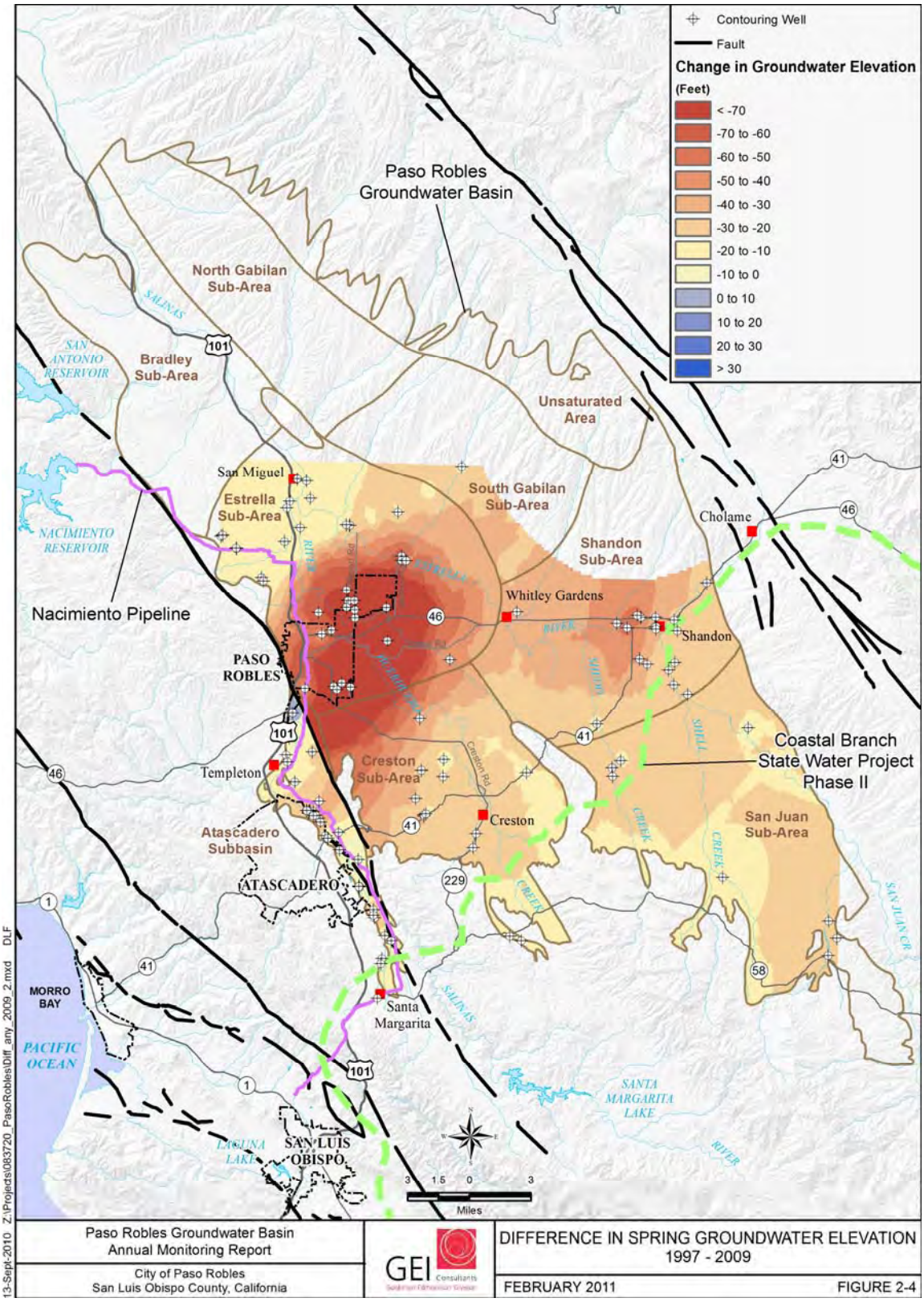


Figure 2-4. Difference in Spring Groundwater Elevations 1997 to 2009



3 Basin Management Objectives

During the development of the Groundwater Management Plan, the groundwater level BMOs established by the stakeholders for each subarea are listed in Table 3-1. The BMOs are used to establish a long-term management goal for groundwater levels. Each year, the measured groundwater levels will be compared to the groundwater level BMO to determine the condition of the Basin. This information will be reported by the Steering Committee to the Groundwater Advisory Committee and other interested parties and stakeholders to improve the understanding of the current conditions of the groundwater basin, and support future groundwater management decisions.

In general, the initial groundwater level BMO was selected by the subarea stakeholders to maintain or stabilize groundwater levels at or near current conditions. Several subareas identified this as the initial BMO with the expectation that stabilizing groundwater levels needed to be achieved before improving groundwater levels could be considered.

Table 3-1. Basin Management Objective by Subarea

Subarea/Subbasin	Basin Management Objective (BMO)
Atascadero	Stabilize groundwater levels at 2009 levels
Bradley	Maintain groundwater levels
Creston	Stop decline and stabilize levels at 2009 levels
Estrella	Stabilize groundwater levels
North Gabilan	Maintain groundwater levels
San Juan	Maintain groundwater levels
Shandon	Stabilize groundwater levels
South Gabilan	Maintain groundwater levels

A summary of groundwater level conditions is presented below for each subarea based on the BMO hydrographs prepared during the development of the Paso Robles Basin Groundwater Management Plan.

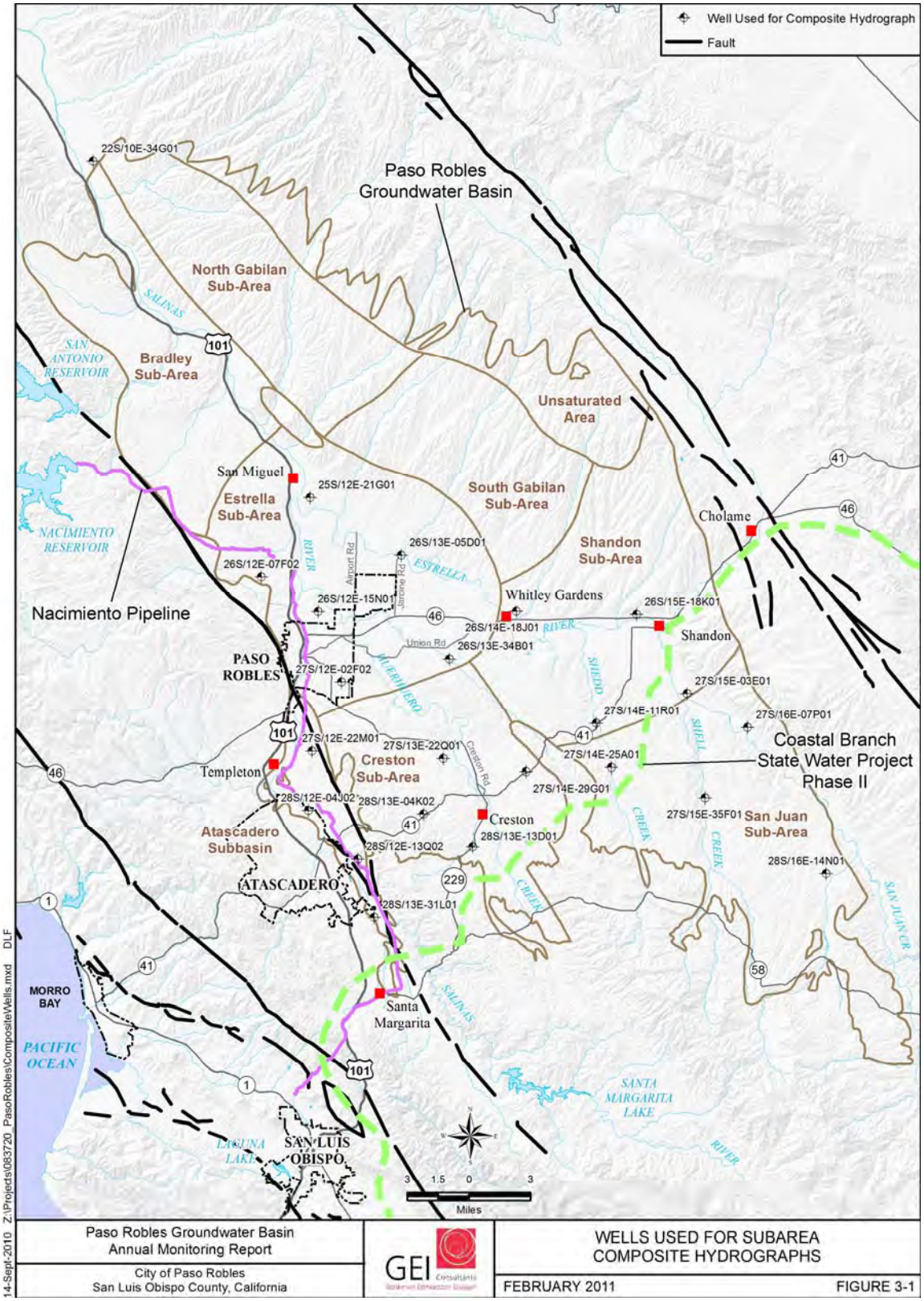
As part of the development of groundwater level BMOs, key wells were identified within each subarea to establish the representative groundwater levels that will be used to monitor the change in groundwater levels. Since the Paso Robles Basin groundwater monitoring network is voluntary, there is a limited amount of information that is available to identify key wells. The key wells were selected based on number of monitoring observations during the 1981 to 2009 period of record and the geographic location within the subarea. The wells meeting these two criteria were identified as key wells and used to develop the subarea hydrographs. The locations of these key wells used to create the subarea-specific BMO hydrographs are shown on Figure 3-1.

In addition to the BMO hydrograph that shows annual changes in groundwater levels for the 1981 to 2009 period, a summary table presenting the recent changes (since 2008) in groundwater levels is provided for each subarea. This table provides an annual comparison of the following:

- The annual change in the groundwater level associated with BMO hydrograph
- The cumulative change in groundwater levels since 1981
- A comparison of the current groundwater level to the established BMO groundwater level

This information can be used to determine the groundwater levels trends, determine the effectiveness of current groundwater management activities, and provide direction for future activities.

Figure 3-1. Wells Used for Subarea Hydrographs



3.1 Atascadero Subbasin

The location of the four wells identified to be representative of changes in groundwater level conditions in the Atascadero Subbasin is shown on Figure 3-1. The composite hydrograph showing the annual change and cumulative change in the average groundwater levels during the 1981 to 2009 period in the Atascadero Subbasin is included in Figure 3-2.

This figure shows that in a single year, the average groundwater level can increase or decrease by up to 15 feet. The overall trend of the average groundwater levels has remained relatively constant since the early 1980s with groundwater levels rising and falling primarily in response to changing hydrologic conditions and increasing demands.

Figure 3-2. Atascadero Subbasin Composite Hydrograph and Annual Precipitation

Sub-Area Information	
Sub-Area	Atascadero
Basin Name	Atascadero

Sub-Area Well Records	
Period of Record	1966-2009
Num. BMO Wells	4

Report Information	
Report Start Year	1981
Period of Record	1981-2009

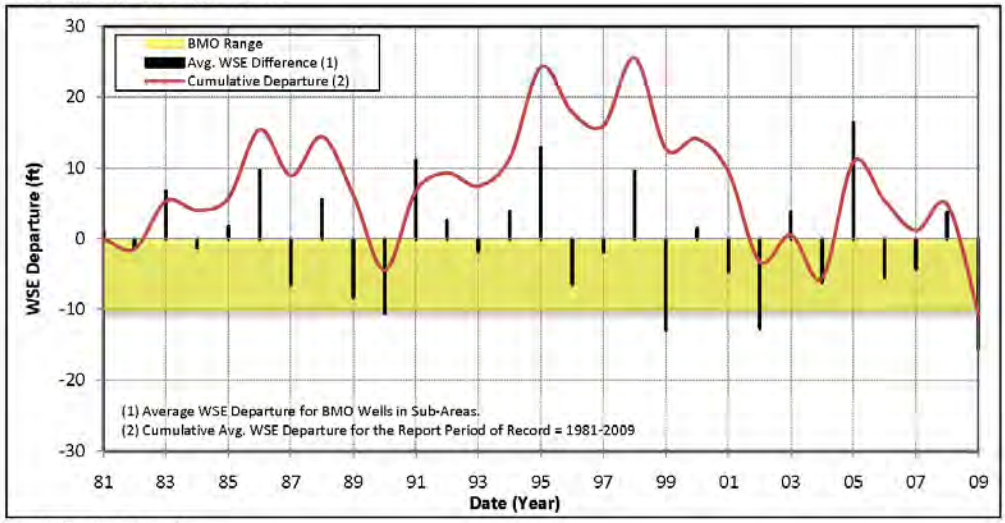
Raingage Information	
Raingage Name	Atas. Mutual Water # 34
Raingage Elev.	835.00 ft

Raingage Records	
Period of Record	1966-2009
Average Precip.	17.64 in

Trend Analysis Results	
BMO Departure[1)]	(10.00 ft)
2009 Departure	(10.75 ft)

NOTES: 1) BMO Cumulative Departure Since 1981

Water Surface Elevation Trends



Precipitation Trends

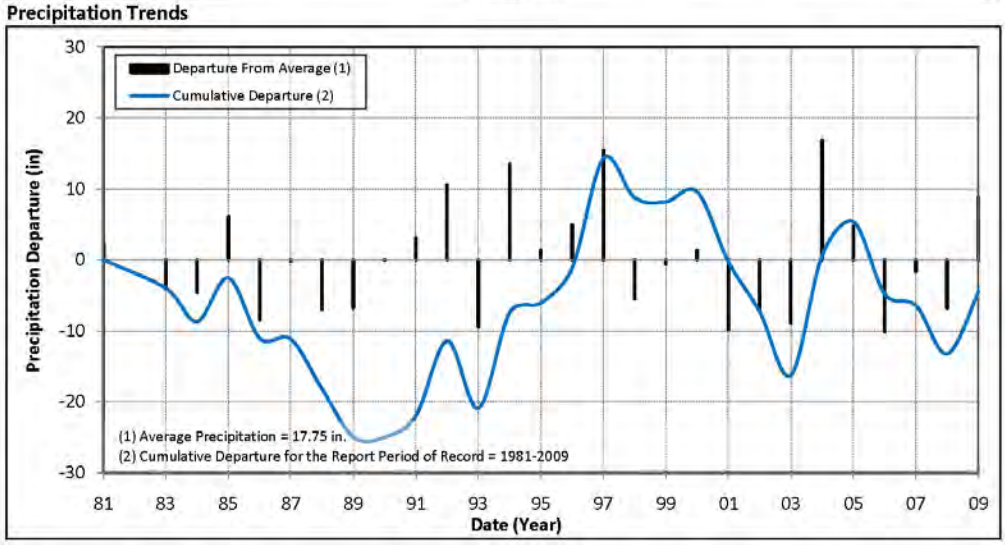


Table 3-2 presents the changes in BMO groundwater levels in the Atascadero Subbasin since 2008. In 2008, the composite BMO groundwater levels increased by 3.7 feet resulting in a cumulative groundwater level change since 1981 of +4.9 feet (14.8 feet above the BMO level). In 2009, the composite BMO groundwater levels decreased by 15.6 feet resulting in a cumulative groundwater level change of -10.8 feet (0.8 feet below the BMO level) since 1981.

At this time, groundwater levels in the Atascadero Subbasin are just below the established BMO level. This is the first time the observed BMO groundwater level has dropped below the established BMO level.

Table 3-2. Changes BMO Groundwater Levels in the Atascadero Subbasin

Period	Annual Change (feet)	Cumulative Change Since 1981 (feet)	Comparison of Cumulative Change to BMO Level (feet)
BMO Groundwater Level			**-10**
2008 Observed Level	3.7	+4.8	+14.8
2009 Observed Level	-15.6	-10.8	-0.8

3.2 Bradley Subarea

The changes in groundwater levels in the Bradley Subarea are currently recorded at one well that is included in the groundwater monitoring network of Monterey County Water Resources Agency (MCWRA). Construction details for this well are unknown and it may not be representative of groundwater levels throughout the Bradley Subarea. The lack of data prevents the development of groundwater level hydrographs or composite hydrographs as developed for other subareas. At this time, we are not aware of any reports or anecdotal information that suggests groundwater levels in the Bradley Subarea are declining to the point of causing problems for local groundwater users.

3.3 Creston Subarea

The location of the four wells identified to be representative of changes in groundwater level conditions in the Creston Subarea is shown of Figure 3-1. The composite hydrograph showing the annual change and cumulative change in the average groundwater levels during the 1981 to 2009 period in the Creston Subarea is included in Figure 3-3. This figure shows the average groundwater levels in the subarea appear to have peaked at about 1999. Since this time, groundwater levels have generally declined. This may be due to the increase in water demands between 1997 and 2006.

Figure 3-3. Creston Subarea Composite Hydrograph and Annual Precipitation

Sub-Area Information	
Sub-Area	Creston
Basin Name	Paso Robles

Sub-Area Well Records	
Period of Record	1960-2009
Num. BMO Wells	4

Report Information	
Report Start Year	1981
Period of Record	1981-2009

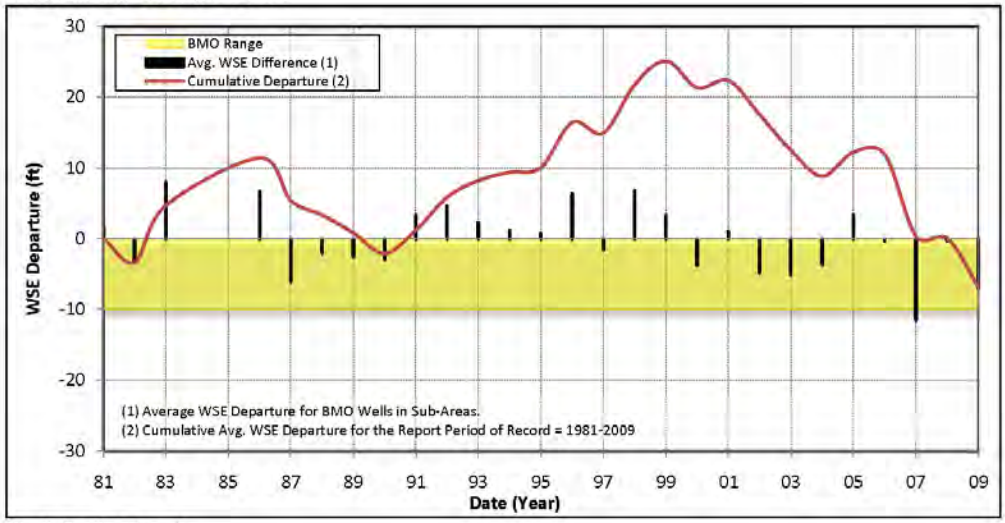
Raingage Information	
Raingage Name	Atas. Mutual Water # 34
Raingage Elev.	835.00 ft

Raingage Records	
Period of Record	1960-2009
Average Precip.	17.64 in

Trend Analysis Results	
BMO Departure[1)]	(10.00 ft)
2009 Departure	(6.91 ft)

NOTES: 1) BMO Cumulative Departure Since 1981

Water Surface Elevation Trends



Precipitation Trends

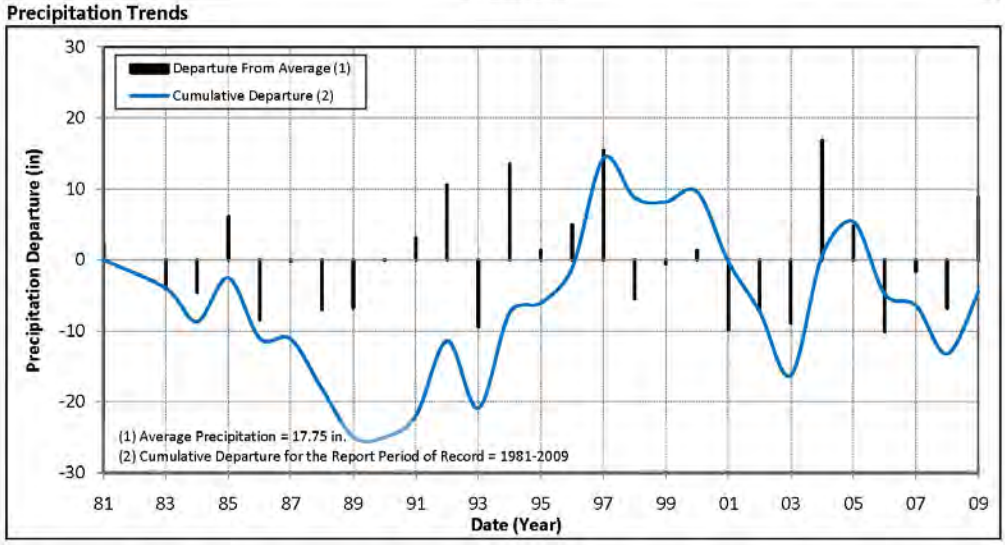


Table 3-3 presents the changes in BMO groundwater levels in the Creston Subbasin since 2008. In 2008, the composite BMO groundwater level decreased by 0.3 feet resulting in a cumulative groundwater level change of +0.1 feet since 1981 (10.1 feet above the BMO level). In 2009, the composite BMO groundwater level decreased by 7.0 feet resulting in a cumulative groundwater level change of -6.9 feet since 1981 (3.1 feet above the BMO level).

At this time, groundwater levels in the Creston Subarea are just within the established BMO level. It should be noted that the BMO wells selected from the Creston Subarea are not entirely representative of the entire subarea because no wells were available in the northwestern portion of the subarea. Based on the low and declining groundwater levels in the adjacent Estrella Subarea, groundwater levels in the northwestern portion of the Creston Subarea are anticipated to be lower than other parts of the subarea.

Table 3-3. Changes BMO Groundwater Levels in the Creston Subarea

Period	Annual Change (feet)	Cumulative Change Since 1981 (feet)	Comparison of Cumulative Change to BMO Level (feet)
BMO Groundwater Level			**-10**
2008 Observed Level	-0.3	+0.1	+10.1
2009 Observed Level	-7.0	-6.9	+3.1

3.4 Estrella Subarea

The location of the six wells identified to be representative of changes in groundwater level conditions in the Estrella Subarea is shown on Figure 3-1. The composite hydrograph showing the annual change and cumulative change in the average groundwater levels during the 1981 to 2009 period in the Estrella Subarea is included in Figure 3-4, which shows groundwater levels steadily declining during the period by over 70 feet. The Estrella Subarea recorded the largest decline in groundwater levels (about 50 feet) during the 1997 to 2009 period.

Figure 3-4. Estrella Subarea Composite Hydrograph and Annual Precipitation

Sub-Area Information	
Sub-Area	Estrella
Basin Name	Paso Robles

Sub-Area Well Records	
Period of Record	1967-2009
Num. BMO Wells	6

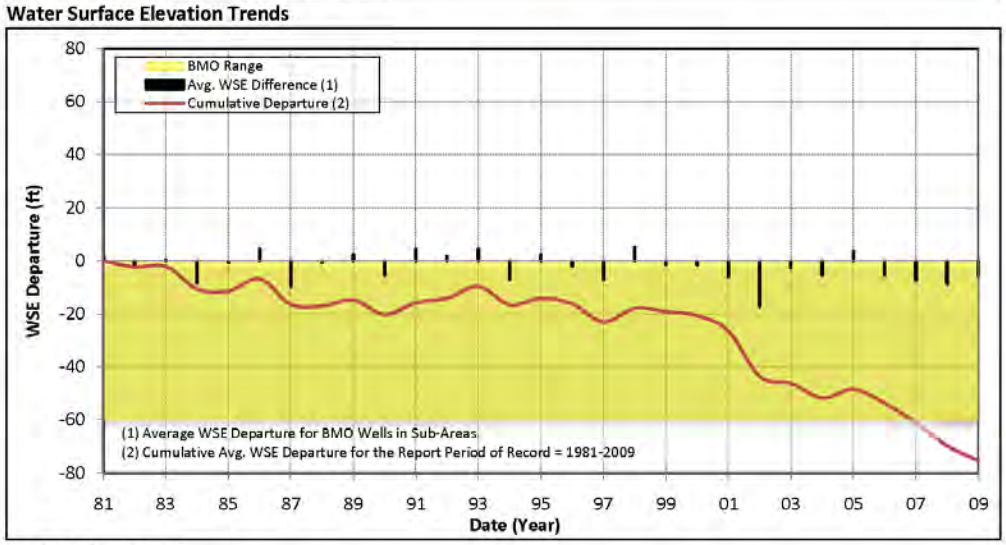
Report Information	
Report Start Year	1981
Period of Record	1981-2009

Raingage Information	
Raingage Name	Atas. Mutual Water # 34
Raingage Elev.	835.00 ft

Raingage Records	
Period of Record	1967-2009
Average Precip.	17.64 in

Trend Analysis Results	
BMO Departure[1]	(60.00 ft)
2009 Departure	(75.43 ft)

NOTES: 1) BMO Cumulative Departure Since 1981



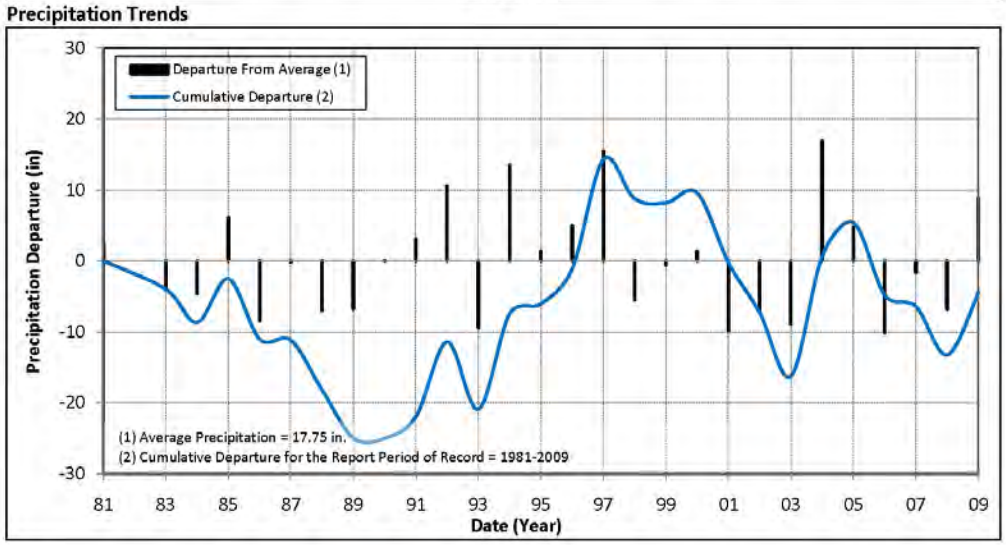


Table 3-4 presents the changes in BMO groundwater levels in the Estrella Subarea since 2008. In 2008, the composite BMO groundwater level decreased by 8.6 feet resulting in a cumulative groundwater level decline of 69.7 feet since 1981 (9.7 feet below the BMO level). In 2009, the composite BMO groundwater level decreased by 5.7 feet resulting in a cumulative groundwater level decline of 75.4 feet since 1981 (15.4 feet below the BMO level).

At this time, groundwater levels in the Estrella Subarea are below the established BMO level, and have dropped for the last two years.

Table 3-4. Changes BMO Groundwater Levels in the Estrella Subarea

Period	Annual Change (feet)	Cumulative Change Since 1981 (feet)	Comparison of Cumulative Change to BMO Level (feet)
BMO Groundwater Level			**-60**
2008 Observed Level	-8.6	-69.7	-9.7
2009 Observed Level	-5.7	-75.4	-15.4

3.5 North Gabilan Subarea

There is limited groundwater level data available, and no data that could be used to represent the average groundwater levels in the North Gabilan subarea. Additionally, there are no identified groundwater problems or issues that have been presented to the Groundwater Advisory Committee. Because of the limited available data and identification of groundwater issues in the subarea, it is not practical to identify BMOs that can be measured at this time.

3.6 San Juan Subarea

The location of the four wells identified to be representative of changes in groundwater level conditions in the San Juan Subarea is shown of Figure 3-1. The composite hydrograph showing the annual change and cumulative change in the average groundwater levels during the 1981 to 2009 period in the San Juan Subarea is included in Figure 3-5, which shows that the groundwater levels in the San Juan Subarea are highly variable on an annual basis. It appears that groundwater levels in the San Juan Subarea respond quickly to changes in hydrologic conditions, with average groundwater levels increasing or decreasing by as much as 35 feet in a single year. Overall, during the 1981 to 2009 period, average groundwater levels in the San Juan Subarea declined by about 25 feet.

Figure 3-5. San Juan Subarea Composite Hydrograph and Annual Precipitation

Sub-Area Information	
Sub-Area	San Juan
Basin Name	Paso Robles

Sub-Area Well Records	
Period of Record	1960-2009
Num. BMO Wells	4

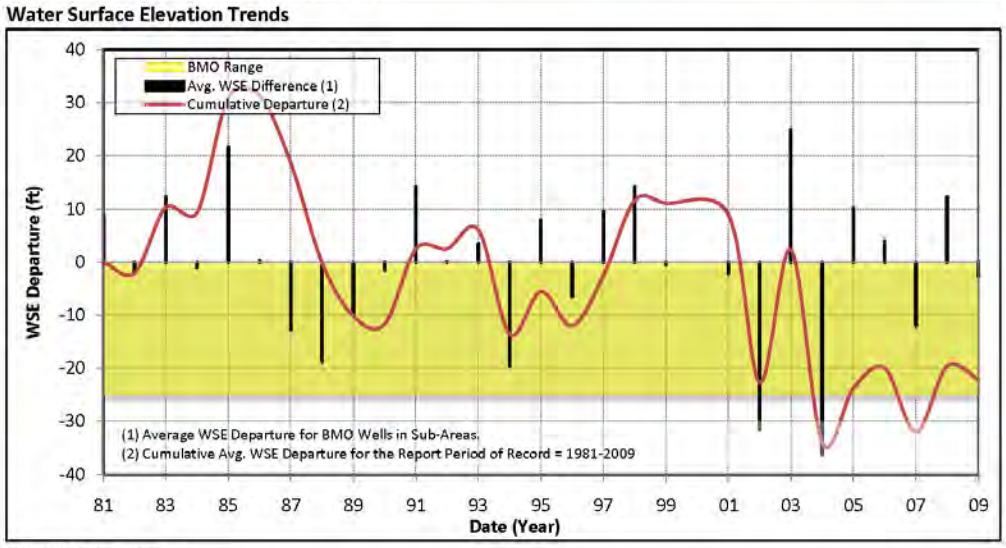
Report Information	
Report Start Year	1981
Period of Record	1981-2009

Raingage Information	
Raingage Name	Atas. Mutual Water # 34
Raingage Elev.	835.00 ft

Raingage Records	
Period of Record	1960-2009
Average Precip.	17.64 in

Trend Analysis Results	
BMO Departure[1]	(25.00 ft)
2009 Departure	(22.24 ft)

NOTES: 1) BMO Cumulative Departure Since 1981



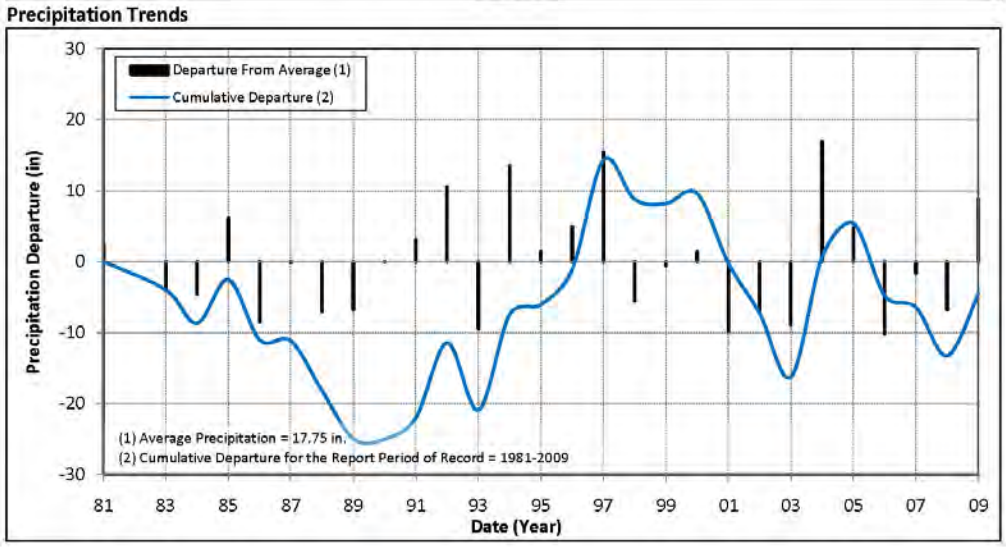


Table 3-5 presents the changes in BMO groundwater levels in the San Juan Subarea since 2008. In 2008, the composite BMO groundwater level decreased by 12.4 feet resulting in a cumulative groundwater level decline of 19.6 feet since 1981 (5.4 feet above the BMO level). In 2009, the composite BMO groundwater level decreased by 2.6 feet resulting in a cumulative groundwater level decline of 22.2 feet since 1981 (2.8 feet above the BMO level).

Since 2004, groundwater levels in the San Juan Subarea are near the established BMO level, but are not on a declining trend.

Table 3-5. Changes BMO Groundwater Levels for the San Juan Subarea

Period	Annual Change (feet)	Cumulative Change Since 1981 (feet)	Comparison of Cumulative Change to BMO Level (feet)
BMO Groundwater Level			**-25**
2008 Observed Level	12.4	-19.6	+5.4
2009 Observed Level	-2.6	-22.2	+2.8

3.7 Shandon Subarea

The location of the four wells identified to be representative of changes in groundwater level conditions in the Shandon Subarea is shown of Figure 3-1. The composite hydrograph showing the annual change and cumulative change in the average groundwater levels during the 1981 to 2009 period in the Shandon Subarea is included in Figure 3-6, which shows average groundwater levels in the Shandon Subarea declined by about 65 feet (about 2.3 feet per year), in response to a combination of increasing water demands that are met by groundwater.

Figure 3-6. Shandon Subarea Composite Hydrograph and Annual Precipitation

Sub-Area Information	
Sub-Area	Shandon
Basin Name	Paso Robles

Sub-Area Well Records	
Period of Record	1967-2009
Num. BMO Wells	4

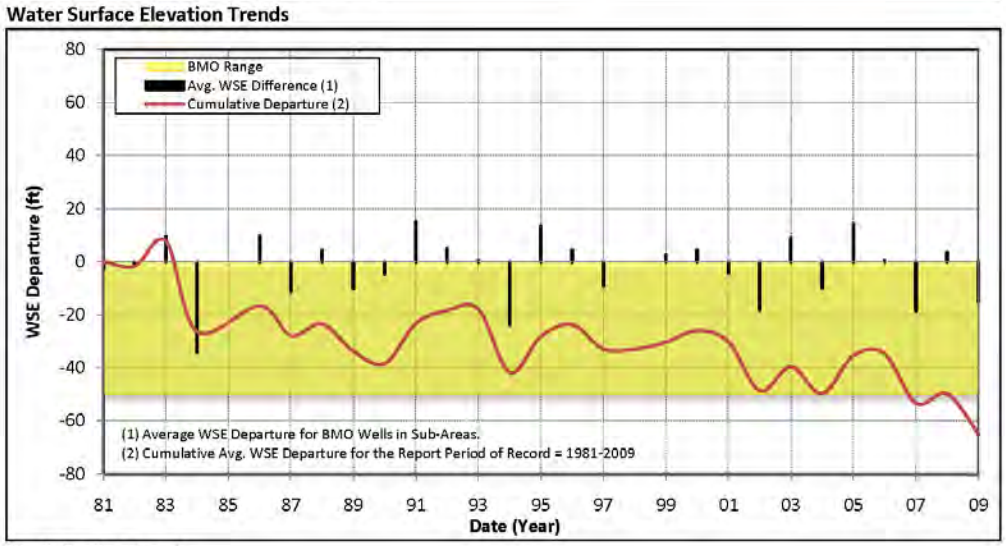
Report Information	
Report Start Year	1981
Period of Record	1981-2009

Raingage Information	
Raingage Name	Atas. Mutual Water # 34
Raingage Elev.	835.00 ft

Raingage Records	
Period of Record	1967-2009
Average Precip.	17.64 in

Trend Analysis Results	
BMO Departure[1]	(50.00 ft)
2009 Departure	(64.99 ft)

NOTES: 1) BMO Cumulative Departure Since 1981



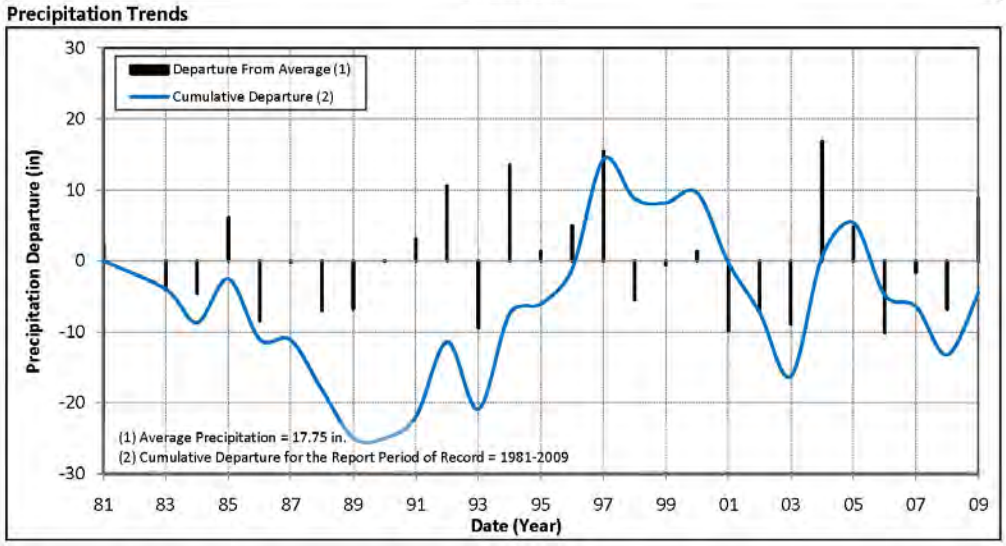


Table 3-6 presents the changes in BMO groundwater levels in the Shandon Subarea since 2008. In 2008, the composite BMO groundwater level increased by 3.6 feet resulting in a cumulative groundwater level decline of 49.7 feet since 1981 (0.3 feet above the BMO level). In 2009, the composite BMO groundwater level decreased by 15.2 feet resulting in a

cumulative groundwater level decline of 64.9 feet since 1981 (14.9 feet below the BMO level).

At this time, groundwater levels in the San Juan Subarea are below the established BMO level, and appear to be on a declining trend.

Table 3-6. Changes BMO Groundwater Levels in the Shandon Subarea

Period	Annual Change (feet)	Cumulative Change Since 1981 (feet)	Comparison of Cumulative Change to BMO Level (feet)
BMO Groundwater Level			**-50**
2008 Observed Level	3.6	-49.7	+0.3
2009 Observed Level	-15.2	-64.9	-14.9

3.8 South Gabilan Subarea

There is limited groundwater level data available, and no data that could be used to represent average groundwater levels in the subarea. Additionally, there are no identified groundwater problems or issues that have been presented to the Groundwater Advisory Committee.

Due to the limited available data and identification of groundwater issues in the subarea, it is not practical to identify BMOs that can be measured at present.

4 Status of Groundwater Management Activities

The Paso Robles Groundwater Management Plan identified over 70 Groundwater Management Activities (GMAs) that may be implemented over time to help meet the identified Basin Management Objectives. The complete list of GMAs is included in the Plan (see Table 7-1). Table 4-1 identifies the currently active GMAs. It includes the GMAs that were developed or active during the development of the Plan and identifies the activities that are anticipated to be undertaken in calendar year 2011.

The Plan included a variety of actions that are required by the Water Code, recommended by DWR Bulletin 118 California's Groundwater (DWR, 2003), and identified as optional programs under the Water Code. In the Plan, these actions are grouped into the following groundwater management components.

1. Stakeholder Involvement and Coordination
2. Groundwater Monitoring and Data Collection
3. Groundwater Resource Protection
4. Groundwater Sustainability
5. Water Management

The GMAs listed on Table 4-1 are identified by number corresponding to the groundwater management components identified in the Plan.

Table 4-1. Current Groundwater Management Activities

Groundwater Management Activity	Accomplishments during Development of Groundwater Management Plan	Anticipated Activities for Calendar Year 2011
1.2 - Formation of Implementation GAC	Formed Steering Committee to direct implementation of Groundwater Management Plan	Develop Steering Committee Meeting schedule for 2011 and Plan implementation
1.3 – Coordinate with Resource Capacity Study	Resource Capacity Study for Paso Robles Basin Certified by San Luis Obispo County Board of Supervisors in February 2011	• The San Luis Obispo County Planning Department is expected to develop schedule for implementing the land use actions identified in RCS
2.1 – Groundwater Elevation Monitoring	• San Luis Obispo County Flood Control and Water Conservation District was identified as monitoring entity for groundwater basins in County for the California Statewide Groundwater Elevation (CASGEMs) Program • Groundwater level data through 2009 used to support development of the Plan and the Basin Management Objectives	• Report 2011 groundwater levels to DWR as part of CASGEMs Program • Prepare Annual Monitoring Report for Calendar Year 2010 • Identify opportunities to expand groundwater level monitoring network • Identify opportunities to begin development of a dedicated groundwater level monitoring network • Identify new wells to become part of groundwater level monitoring program (as needed)
2.2– Groundwater Quality Monitoring	Groundwater quality data for the basin is provided to San Luis Obispo County Department of Public Works by water system operators within the County.	Continue to monitor water quality trends in the Basin.
2.4– Data Management System	• Develop tool to extract and present groundwater level data from County groundwater level database	
2.5– Project Reporting	• Prepare Annual Monitoring Report for Calendar Year 2009 • Establish annual reporting format	• Prepare Annual Monitoring Report for Calendar Year 2010
4.1 – Replenishment of Groundwater	• Continue efforts to deliver Nacimiento Project Water to the water users in the Paso Robles Groundwater Basin	• Continue efforts to deliver Nacimiento Project Water to the water users in the Paso Robles Groundwater Basin • Explore opportunities for unassigned Nacimiento Project Water

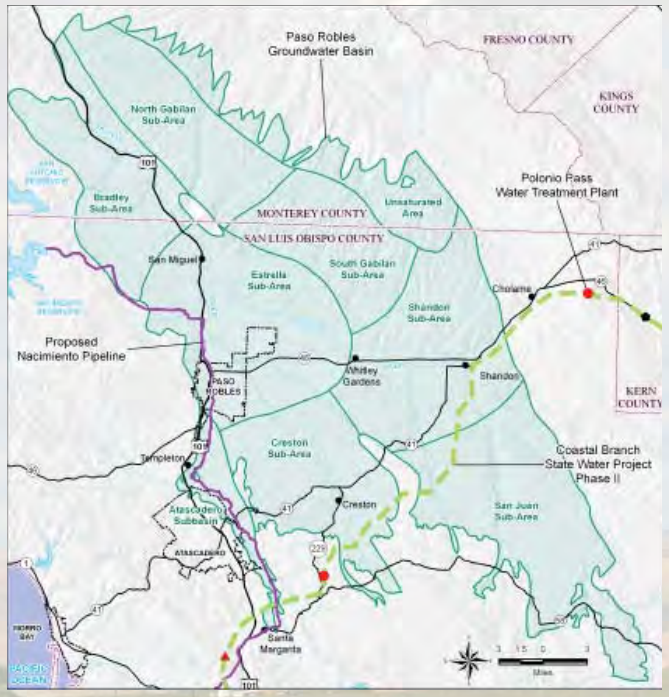
5.1 – Agricultural Water Management Practices	• Continuation of the UC Extension Study on vineyard irrigation practices • Paso Robles Wine Country Alliance (PRWCA) represents member vineyard during development of GMP, including serving on the Steering Committee for Plan implementation	• Continuation of the UC Extension Study on vineyard irrigation practices • Continue to encourage implementation of best management practices amount vineyard owners • Ensure new wineries use best management practices consist with BMP's identified in RCS
5.2 – Urban Water Management Practices	• Urban water purveyors continue to implement water conservation BMPs	• Continue to implement water conservation and demand management programs
5.3 – Rural Residential Water Management Practices	• Rural residential stakeholders participate in development of Groundwater Management Plan	• Revise Growth Management Ordinance to limit yearly non-agricultural development in rural areas of the Basin • County will develop a landscape ordinance to limit the amount of turf and other high-water use features on parcels.

Appendix G Stakeholder Involvement Documentation

Introducing

The Paso Robles Groundwater Basin Management Plan

San Luis Obispo County recently completed an Integrated Regional Water Management Plan. The plan contains groundwater monitoring and management objectives for the groundwater basins in the County, including the Paso Robles Groundwater Basin. In response to these objectives, The City of Paso Robles and San Luis Obispo County are leading the preparation of a groundwater management plan (GMP) for the Paso Robles Groundwater Basin. The GMP will address groundwater conditions, identify local and basin-wide groundwater issues, and outline measures to protect groundwater resources within the plan area (shown at right).



A Project Kickoff Meeting will be held:

Thursday, January 15, 2009
5 p.m. — 7 p.m
City of Paso Robles
Emergency Operations Center
900 Park Street

The meeting will include a review of the project purpose, approach, and schedule. Additionally, the formation of the Groundwater Advisory Committee will be discussed. The purpose of the Groundwater Advisory Committee is to assist in developing the GMP. The draft GMP is scheduled to be released in July 2009, with the final GMP due December 2009.

Parties interested in the GMP are encouraged to participate in the planning process by attending public meetings scheduled by the Groundwater Advisory Committee.

Paso Robles Groundwater Basin Management Plan

Groundwater Advisory Committee

Meeting No. 1 - January 15, 2009

Name	Affiliation/ Group	Sub-area	Interested as Sub-area Representative (yes/no)	Phone Number	Email
John Neil	Atascadero Mutual Water Co.		yes	805 461 7217 x 21	jneil@amwc.us
JAY SHORT	TEMPLETON CSD		YES	805-434-4907	UTILITIES@TEMPLETONCSD.ORG
ROBERT JOHNSON	MONTEREY COUNTY WATER RESOURCES AGENCY		YES	831.755.4860	johnsonr@co.monterey.ca.us
Jeremy Howard				805.226.9984	jahoward@alumni.calpoly.edu
Duane Picanco	Paso Robles City		yes	805-227-7212	drpicanco@pncity.com
Joy Fitzhugh	SLO Co Farm Bureau		Yes	805-543-3654	joy@sloofarmbureau.org
RAY ALLEN	SLO Co CATTLEMEN	ESTRELLA	YES	805-239-2540	TAYANDMIKE@q-mail.com
Steve Sinta	PRIOR	San Juan	Yes	238-9495	sjsinta@earthlink.net
Paul Sorensen	Fugro	—	—	805-542-0797	psorensen@fugro.com
Shayna Bailey	HS-LT RCD			434-0396 x4	shaynarcd@hotmail.com
BLAIR ZAJAC	IGGPRA			226-9010	bZAJAC@TCSN.NET
Walt Hee				239-2228	
Bob Roos	North County Water Forum		Yes	466-6561	broos@fix.net
Mike Kelley	Green River MWC	Shandon	Yes	805 423 2026	mkelleyp@sbcglobal.net
Mike Steinbock	" "	"	"	805 434-3142	h2omike7158@hotmail.com
DENNIS BOWMAN	GREEN RIVER MWC	SHANDON	YES	805 670 8338	DLBOWMAN@TCSN.NET
Michael Stephens	AMWC		NO	805 461 7217 x 31	mstephens@amwc.us

Paso Robles Groundwater Basin Management Plan

Groundwater Advisory Committee

Meeting No. 1 - January 15, 2009

Name	Affiliation/ Group	Sub-area	Interested as Sub-area Representative (yes/no)	Phone Number	Email
KATHY BARNETT	RESIDENT PASO ROBLES				
Sue Luft	WRAC	Creston	yes	227-4785	asluft@wildblue.net
Sheila Lyons	Creston Advisory Body (CAB)	Creston	—	—	salyons@airspeedwireless.net
David Lyons	CAB	Creston	—	—	delyon@airspeedwireless.net
Della Barrett	Private	South Atascadero	?	461-1420	mustang4della@aol.com
Kathy Sweet	Private	South Atascadero	—	466-2959	—
Dave + Debra Compton	Private	Estrella	Yes	467-3158	debraCompton@gmail.com
Steve Ela	"	"	?	226-8806	swela@calinet.com
JAIME LIEN	ATASCADERO MUTUAL WATER CO	ATASCADERO		461-7217x17	jlien@amwc.us
Eric Greening	WRAC	Atascadero		462-3434	elguadrillo@charter.net
Ed Steinbeck	City of Paso			227-7216	esteinbeck@prcity.com
John Hamon	City of PR				jhamon@prcity.com
Nick Gilman	" "			238-3432	NGILMAN@PRCITY.COM
Ken Bornholdt	KMTG			786-4302	kbornholdt@KMTG.com
Randy Diffenbaugh	Shandon A.C.	Shandon?	Y	748-6500	rdiffeyahoo.com
CREIGHTON MACDONALD	PRIVATE	ESTRELLA	NO	441-7133	mac@treana.com

Paso Robles Groundwater Basin Management Plan

Groundwater Advisory Committee

Meeting No. 1 - January 15, 2009

Name	Affiliation/ Group	Sub-area	Interested as Sub-area Representative (yes/no)	Phone Number	Email
Willy Wahra	Sunview Shardon	San Juan	Yes	805-239-0555	willy c @ Sunview Vineyards.com
S. CRANOR	SLO CA	N/A	N/A	781 5252	SCRANOR@SLO.CO.CA.US

Paso Robles Groundw. r Basin Management Plan

Kickoff Meeting

Meeting No. 2 - November 12, 2009

Name	Affiliation/ Group	Sub-area	Interested as Sub-area Representative (yes/no)	Phone Number	Email
Richard Laurel	IGC PRA	out of sub areas	yes	805-467-3778	Saurelline@Gmail.com
DAN O'GRADY	DIST 5 REP	ATASCADERO	YES	805-462-2734	dogrady@dishmail.net
DAN BLACKBURN				805.423.1203	DJBlackburn@charter.net
Duane Picanco	PR Council	Estrella	yes	238-2123	dwpicanco@msn.com
Willy Cunha	Sunview	San Juan ~~Shandon~~	Yes	239-0555 674-0730	willyc@sunviewshandon
DAVID BARTHOLOMEW		TEMPLETON	GAP	805-238-9817	DEBARBAR@AOL
ELNOR BARBAR		"		"	
MARK BATTANY	UNIV. CA	N.A.	No	781-5748	mcbattany@ucdavis.edu
Della Barrett	public	South Atascadero	yes	461-1420	mustang4della@aol.com
Bob Roos	Public	Atas. S.S. basin	yes	466.6561	broose fix.net
Steve Johns	SLO County Cattlemens Assoc	Estrella Shandon	yes	227-4686	bicky.johns@ATT.NET
Karl + Sue Luft	landowners Sue-WRAC	Creston	yes	227-4785	asluft@wildblue.net
Thomas A. Tinch	concerned citizen	Paso Robles	No	239-5779	tinch@gmail.com
Russ Thompson	City of Atascadero	Atascadero	yes	470-3180	rthompson@atascadero.org
Carrie Jones	—	Atascadero	yes	202-9937	x_viola@nym.hush.com

Paso Robles Groundw. .r Basin Management Plan

Kickoff Meeting

Meeting No. 2 - November 12, 2009

Name	Affiliation/ Group	Sub-area	Interested as Sub-area Representative (yes/no)	Phone Number	Email
Kate Twisselman	Shandon advisory	Shandon	NO	805-238-2352	katetwisselman@yahoo.com
Raymond Twisselman	—	—	—	805-238-2352	none
Bob Hartzell	self	46 W	Yes	650 722 1186	Rhartzell@AOL.com
Kathryn Sweet	Public	South Atascadero	yes ~~no~~	2466-2959	—
ERIC TWISSELMAN	SELF	SHANDON	NO	238-7786	
Nick Gilman	PR	PR	No	238-3432	NGILMAN@PRCITY.com
Mike Steinbock	Green River Inc (Cathy Graham)	~~Green~~ Shandon?	~~No~~ Yes	712-7827	h2omike7143@hotmail.com
Jeremy Cook	Ecovine	SLO?	YES	543-4775 ~~215~~	jc@ecovinesolutions.com
Alex Villicana	PRWCA			239-9456	alexvillicana@earthlink.net
Steve El.	transition Paso	Paso	No	226-8806	swelne@calinet.com
Gordon Heady	SLO Coastkeeper			781 9992	coastkeeper@epicenterconline.org
Jim App	City of PR		~~No~~	237 3888	japp@prcity.com
Jerry Reaugh	PRWCA			239-4400	jerry@reaughj.com
~~JAIME~~ LIEN	AMWC	ATAS	MEMBER	461-7217 x17	jlien@amwc.us
Stacie Jacob	PRWCA			805-239-8463	Sjacob@pasowine.com

Paso Robles Groundw. .r Basin Management Plan

Kickoff Meeting

Meeting No. 2 - November 12, 2009

Name	Affiliation/ Group	Sub-area	Interested as Sub-area Representative (yes/no)	Phone Number	Email
LARRY LYNCH	PASO Citizen	Paso Water	Estrella ?	237-0916	llynch2547@sbcglobal.net
DENNIS BOWMAN	GREEN RIVER MUTUAL WATER GRMW	WHITLEY GARDENS	YES	610 833 8	DLBOWMAN@TCSN.NET
ROBERT JOHNSON	MCWRA			831.755.4845	johnsonr@co.monterey.ca.us
CLAUDIA ENGEL	CAB	CRESTON		239-9626	Claudia@Thunderhead Ranch
Joy Sprague	I am also a County test well!	Estrella	also YES advisory	237-0369	
John BORST	Citizen	Paso Water	YES.	237-9979	paso218@mac.com

Paso Robles Groundw. r Basin Management Plan

Kickoff Meeting

Meeting No. 2 - November 12, 2009

Name	Affiliation/ Group	Sub-area	Interested as Sub-area Representative (yes/no)	Phone Number	Email
Kim McDaniel	—	Cambria			sync@nym.hush.com
David Lyons	—	Creston	—	—	—
Sheila Lyons	Creston Advisory	Creston	yes	237-0917	salyons@airspeedwireless.net
Gary Eberle		Estrella	Yes	238-9607	gary@eberlewinery.com
Karen Reed				237-1155	karen@petersonlaws.com

Paso Robles Groundw. Basin Management Plan

Groundwater Advisory Committee

Meeting No. 3- February 25, 2010

Name	Affiliation/ Group	Sub-area	Interested as Sub-area Representative (yes/no)	Phone Number	Email
JAMES W. Magill		ATASCADERO	yes	805-975-5949	jackiemagill@sbcglobal.net
Steve Johns	SLO Cattlemens Ass.	Estrella		805 440-1072	
JAMES W. BABCOCK	MALCOLM PIRNIE,	EAC	PASO RESIDENT	510-301-5063	jbabcock@pirnie.com
Della Barrett	—	South Atascadero	yes	805-461-1420	mustang4della@aol.com
Bob Roos		Nacimiento	yes	466.654	broos@fix.net
ROBERT JOHNSON	MCWRA	NORTH/SOUTH CAB BRADLEY	yes	831.755.4860	johnsonr@co.monterey.ca.us
Ed Steinbeck.	City Council			591.5250	ed@edsteinbeck.com
Sheila Lyons	CAB	Creston	yes	239-0917	salyons@airspeedwireless.net
David Lyons	—	Creston	no	—	delyons@airspeedwireless.net
Karl & Sue Luft	WRAC (Sue)	Creston	yes (Sue)	227-4785	asluft@wildblue.net
Raymond R. Zwiesselman		Shandon		238-2352	
Tim Boatman		PASO ROBLES	YES	238-1177	tboatman@farmsupplycompany.com
Joy Sprague		P. RESTRILLA	yes	2370369	Joy-sprague@hotmail.com
TIM MCRA	Alternative	RCSD Templeton	yes	—	—
NICK GELMAN	PASO	PASO	No	239-3432	

Paso Robles Groundw. . Basin Management Plan

Groundwater Advisory Committee

Meeting No. 3- February 25, 2010

Name	Affiliation/ Group	Sub-area	Interested as Sub-area Representative (yes/no)	Phone Number	Email
Tom Zenner	Wallace Group	Estrella		544-4011	Tomzenner@wallacegroup.us
Dorothy Jennings	—	Templeton		434-5603	djennings@tcsn.net
Dennis Bowman	Green River			239 3110	dlbowman@tcsn.net
Steve Ek		Estrella ~~Paso Robles~~		226-8360	sweek@calwat.com
Jaime Lien	AMWC	Atascadero	Yes - sub	461-7217x17	jlien@amwc.us
Steve Sinton	PRIOR	S Juan	Yes	238-9495	
Lowell Zelinski	Precision Ag	Templeton	yes	286-6544	lowell@precisionaginc.com
Fritz Helzer	Mesa Vineyard	Creston, Shandon, Templeton	yes	434-4100	fhelzer@mesavineyard.com
John R Hollenbeck	—	Atascadero	yes	781-1288	JHollenbeck@co.slo.ca.us
Christina Halley	TJ Cross Eng			305-0159	cmhalley@tjcross.com
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Paso Robles Groundwater Basin Management Plan

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North Gabilan Subarea

Name	Affiliation/ Group	Sub-area	Phone Number	Email
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Paso Robles Groundwater Basin Management Plan

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Bradley Subarea

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Paso Robles Groundwater Basin Management Plan

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San Juan Subarea

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Shandon Subarea

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Shandon Subarea

Name	Affiliation/ Group	Sub-area	Phone Number	Email
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Raymond Twisselman	Shandon Resident	"	"	NONE
Les Diffenbaugh	Shandon Resident	"	661-797-2515	—
Fritz Helzer	Shandon Hills Vineyard	Shandon	835-1442	fhelzer@thevineyard.com

Paso Robles Groundwater Basin Management Plan

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Stakeholders

Name	Affiliation/ Group	Sub-area	Phone Number	Email
William C. Cunha		Shandon	239.0559	willyc@sunvineyards.com
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Paso Robles Groundwater Basin Management Plan

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Estrella Subarea

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Pam Finley	TAAG		434-1683	
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Holly Naylor	—	—	543-4832	
Walt Heer		Estrella	239-2238	
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Lisa Bodrogi	PRWCA	Estrella	937-8474	lbodrogi@pasowine.com
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Paso Robles Groundwater Basin Management Plan
Workshop on Basin Management Objectives and Management Activities
Stakeholder Participation Sheet
(April 19, 2010)

Sub-Area Workgroup: Estrella

Workshop Participants

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Chuck Pritchard	DISTRICT	237 9155	[illegible]
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Lisa Bodrogi	PRWCA	931-8474	lbodrogi@pusowin.com
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Paso Robles Groundwater Basin Management Plan

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Paso Robles Groundwater Basin Management Plan

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Creston Subarea

Name	Affiliation/ Group	Sub-area	Phone Number	Email
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Paso Robles Groundw . Basin Management Plan

Groundwater Advisory Committee

Meeting No. 4 - August 2, 2010

Name	Affiliation/ Group	Sub-area	Interested as Sub-area Representative (yes/no)	Phone Number	Email
James Caruso	SLO County			781-5702	JCaruso@co.slo.ca.us
Fred Strong	PR City Council			238-5400	fstrong@prcity.com
FRANK MECHAM	SLO COUNTY			781-4491	fmecham@co.slo.ca.us
Tony Domingos	PRWCA Water Committee			391-3711	Tony@tdfarming.ca
Karl + Sue Luft	WRAC-Sue ag/rural	Creston	yes	227-4785	asluft@wildblue.net
Bob Ruos	Self	Nos.	yes	466-6561	broose@fix.net
Jim Patterson	SLO County	Creston Atascadero		781-5450	
Tim Cleath	Cleath-Harris Ld.			543-1413	tcleath@sbcglobal.net
John Wallace	SMCSD	Paso	yes	544-4011	johnw@wallacegroups.us
Sheila Lyons	CAB	Creston	yes	239-0917	salyons@airspeedwireless.net
David Lyons	Citizen	Creston	no	—	—
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Kate White	Todd Engrs	Atascadero "	no		
Courtney Howard	SLO County	NA			
Lisa Bodrogi	PRWCA	Estrella		937-8474	lbodrogi@pasowine.com

Paso Robles Groundw : Basin Management Plan

Groundwater Advisory Committee

Meeting No. 4 - August 2, 2010

Name	Affiliation/ Group	Sub-area	Interested as Sub-area Representative (yes/no)	Phone Number	Email
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Will & Lois-ele Olsen	PR			238-1861	Nolsenrealty@tcsw.net
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ROBERT JOHNSON	MCWRA			831.755.4860	
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Russ Thompson	City of Atascadero			470-3180	
NICK GEILMANN	P.F.			239-5432	
Sylla Barrett	WRAC	Atascadero		461-1420	
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Steve Sutton	PRIOR	San Juan			

Paso Robles Groundw : Basin Management Plan

Groundwater Advisory Committee

Meeting No. 4 - August 2, 2010

Name	Affiliation/ Group	Sub-area	Interested as Sub-area Representative (yes/no)	Phone Number	Email
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Susan Litteral	NRCS	Atas	Yes	434-0396	susan.litteral@ca.usda.gov

Paso Robles Groundwater Basin Management Plan

Groundwater Advisory Committee

Meeting No. 5- December 2, 2010

Name	Affiliation/ Group	Sub-area	Phone Number	Email
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Bob Roos		Atas	466-4561	broar@fix.net
Steve Ek		Estrella	226-3202	swek@cal.net.com
Duane Picanco	City Council		227-7215	
Kent Gilmore		Creston		K.Gilmore7@SBCglobal.net
~~Kathy Sweet~~				
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Bella Swett		So Atas	401-1420	mustangdella@aol.com
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Sue + Karl Luft	WRAC/Rural Res.	Creston	227-4785	asluft@wildblue.net
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Paso Robles Groundwater Basin Management Plan

Groundwater Advisory Committee

Meeting No. 5- December 2, 2010

Name	Affiliation/ Group	Sub-area	Phone Number	Email
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[redacted]			[redacted]	
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Willy Guhr	Sunview	Shand/San J.	239-0555	you got
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DENNIS BOWMAN	GREEN RIVER W.C.	SHANDON	6108338	dlbowman@tcsn.net

Paso Robles Groundwater Basin Management Plan

Groundwater Advisory Committee

Meeting No. 5- December 2, 2010

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Paso Robles Groundwater Basin Management Plan
Groundwater Advisory Committee
February 10, 2011

Name	Affiliation/Group	Sub-area	Intersted as Steering Committee Agency or at-Large Representative	Phone Number	Email
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Kathy Sweet	Public	ATAS.			
~~Willy Cunha~~	~~Sunview~~	~~Shandon~~	—	464-3959	—
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Paso Robles Groundwater Basin Management Plan

Groundwater Advisory Committee

February 10, 2011

Name	Affiliation/Group	Sub-area	Intersted as Steering Committee Agency or at-Large Representative	Phone Number	Email
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Bob Roos		Atascadero	Yes	466 5561	broose@fix.net
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