Draft:
Paso Robles Area (3-004.06)/Upper Valley Aquifer (3-004.05) Basin Boundary Modification Application

B. Description of Proposed Boundary Modification

B1. Short Description

The Salinas Valley Basin Groundwater Sustainability Agency (SVBGSA) requests a jurisdictional modification of the boundary between the Salinas Valley Upper Valley Aquifer and Salinas Valley Paso Robles Area subbasins. The internal boundary revision would adjust the border to coincide with the Monterey/San Luis Obispo County line.

B2. Type of basin boundary revision

Jurisdictional modification: internal boundary revision

B3. Provide a narrative overview of the boundary modification request and how the resulting modification would affect the likelihood of sustainable management

SVBGSA requests a jurisdictional modification of the border between the Upper Valley Aquifer and Paso Robles Area subbasins. Currently, the border is located north of the Monterey/San Luis Obispo county line and the Paso Robles Area subbasin lies in both Monterey and San Luis Obispo counties. The proposed internal boundary revision adjusts the border to coincide with the county line, placing the Paso Robles Area subbasin entirely within San Luis Obispo County and expanding the Upper Valley Aquifer subbasin south to the County Line.

This modification makes the border between the subbasins consistent with both County and existing GSA jurisdictions. SVBGSA's jurisdictional area lies entirely within Monterey County. Five other GSAs lie entirely in San Luis Obispo County, including the County of San Luis Obispo – Paso Basin GSA, Shandon-San Juan GSA, City of Paso Robles, Heritage Ranch Community Service District, and San Miguel Community Service District. These five GSAs have agreed to work together on a GSP for the San Luis Obispo County portion of the existing Paso Robles Area subbasin. This modification will simplify implementation of management projects and help both subbasins achieve sustainability by aligning the basin boundaries with the established GSA boundaries.

The 2016 Bulletin 118 Interim Update identified the Paso Robles Area Basin as critically overdrafted. The 2011 Paso Robles Groundwater Basin Management Plan (attached in Part L1) stated that critically declining groundwater levels and overdraft conditions occur primarily in San Luis Obispo County. This modification would

therefore remove Monterey County from managing the overdrafted portion of the Paso Robles Basin. Reducing the number of GSAs involved with managing the critically overdrafted Paso Robles Basin will expedite management of the overdraft.

B4. List the existing basin(s)/subbasin(s) to be modified by this request

3-004.05 Salinas Valley - Upper Valley Aquifer, 3-004.06 Salinas Valley - Paso Robles Area

B5. Provide the proposed name for the new basin(s) or subbbasin(s)

Not applicable.

C. Initial Notification and Combination of Requests

C1. Was an initial notification submitted to the Department? List of submitted initial notifications for the selected basin(s)/subbasin(s).

Yes, an initial notification was submitted by the SVBGSA on 5/1/2018. As of 4/25/2018, there is one other initial notification for modification to Basin 3-004.06 (Paso Robles Area), which was submitted by Heritage Ranch Community Services District. This other initial notification is for a scientific boundary modification to exclude the portion of the Nacimiento River Valley west of the Rinconada Fault from the Paso Robles Area subbasin. This only affects the Paso Robles Area subbasin south of the county line.

C2. Does this application include a combination of requests?

No. Although there are two pending requests that affect the basin boundaries in the Paso Robles subbasin, they are completely independent of each other. This request is a jurisdictional request to move an existing internal basin boundary south to the County line. The Heritage Ranch request is a scientific request to modify the external basin boundary south of the county line by removing a small arm from the Paso Robles subbasin. Neither request is dependent on the other. Should both requests be granted, we will supply DWR with a revised basin boundary map and description that reflect the approved requests.

D. Required Documents for All Modifications

D1. A copy of the statutory or other legal authority under which the requesting agency was created with specific citations to the provisions setting forth the duties and responsibilities of the agency.

Attach SVBGSA JPA.

D2. A copy of the signed resolution adopted by the requesting agency formally initiating the boundary modification request process.

Attach SVBGSA Resolution.

D3. A map of adequate scale (no greater than 1:24,000; e.g., 1:10,000 is not acceptable) showing the proposed modified basin boundary in relation to the existing Bulletin-118 basin boundary and the local agencies that are within or bordering the existing and proposed basin.

See Appendix A: Maps

D4. A GIS shapefile of the proposed modified groundwater basin boundaries.

Attach shapefile.

The existing Upper Valley Aquifer and Paso Robles Area Bulletin 118 Basin Boundary shapefiles were clipped or merged based on the San Luis Obispo County boundary shapefile downloaded from DWR's Water Management Planning Tool.

D5. A GIS shapefile of the political boundaries of any affected or adjacent local agency.

Attach shapefile.

D6. Any information, if necessary, to enable DWR to satisfy the requirements of a responsible agency pursuant to the California Environmental Quality Act.

The SVBGSA has determined that this basin boundary modification request does not constitute a project under CEQA and will not have a significant effect on the environment.

E. General Information

E1. Describe the lateral boundaries of the alluvial aquifer or aquifers that form the groundwater basin and the definable bottom of the basin. The description must be in terms that are clear, definite, and sufficiently detailed to allow an authoritative map of the proposed basin boundaries to be plotted using the given description.

Because most of the subbasin boundaries are identical to the boundaries in the existing Bulletin 118, the following descriptions of the modified subbasin boundaries are simply modifications of the descriptions in the existing Bulletin 118.

The modified Upper Valley Aquifer subbasin occupies the upper portion of the Salinas Valley and extends from approximately three miles south of Greenfield to six miles south of the town of San Ardo. The subbasin is bounded to the west by the contact of the Quaternary Paso Robles Formation or Quaternary terrace deposits with middle Miocene marine sedimentary rocks (Monterey Shale) of the Sierra de Salinas. To the east, the boundary is the contact of the Paso Robles Formation or of the

Quaternary terrace deposits or alluvium with the Early to Middle Pliocene Pancho Rico Formation of the Gabilan Range. The northern boundary is shared with the Salinas Valley – Forebay Aquifer subbasin and generally represents the southern limit of confining conditions above the 400-Foot Aquifer. This boundary also represents a constriction of the Valley floor due to encroachment from the west by the composite alluvial fan of Arroyo Seco and Monroe Creek. The southern boundary is the Monterey/San Luis Obispo county line, shared with the Salinas Valley – Paso Robles Area subbasin.

The northern boundary of the modified Paso Robles Area subbasin is the Monterey - San Luis Obispo county line, shared with the Salinas Valley –Upper Valley Aquifer subbasin. The Paso Robles Area subbasin is bounded to the east by the Temblor Range, to the south by the La Panza Range, and to the west by the Santa Lucia Range. The San Andreas fault zone bounds the basin on the northeast. The San Marcos-Rinconada fault system traverses the western part of the basin. The Red Hill, San Juan, and White Canyon faults form the eastern boundary of the subbasin.

F. Notice and Consultation

F1. List all local agencies and public water systems affected by the basin(s) modification request.

See Appendix B: Affected Agencies and Systems.

F2. Explain the methods used to identify interested local agencies and public water systems in the affected basin(s):

All GSAs that overlap SVBGSA's jurisdiction or have jurisdiction in the Paso Robles Area subbasin are included as interested agencies and were identified using DWR's GSA spatial data. Interested agencies and water systems were identified using DWR's Water Agency shapefile and the existing basin boundaries; any agency with a boundary that intersects either affected subbasin was notified about the modification request. Additional agencies and systems were identified using shapefiles from the County of San Luis Obispo's Open Data site; any agency in this dataset with a boundary that intersects either affected subbasin was notified about the modification request.

F3. Provide information regarding the nature of consultations with affected or interested agencies. Attach and cite any copies of correspondences with local agencies and public water systems and/or any other persons or entities consulted.

A letter describing the proposed boundary modification was sent to all local agencies and public water systems in or near the Upper Valley Aquifer subbasin and the Paso Robles subbasin. Every local agency or public water system listed on in item

F1 received a copy of this letter. A copy of the letter is attached. The letter requested comments and support from each local agency and public water system.

Attach notice and include correspondence from SVBGSA.

F4. Provide a summary of all public meetings at which the proposed boundary modification was discussed or considered by the requesting agency. Attach and cite any copies of agendas and notices published.

A public meeting to discuss the proposed boundary modification was held on May 30, 2018 at the King City Council Chambers, 212 S. Vanderhurst Ave., King City, CA. The affected and interested agencies identified in F1 were notified of the meeting via mail (F4_05-30-18 PUBLIC MEETING NOTICE, Paso Robles Basin Boundary Modif Notice.pdf). SVBGSA posted notice of the meeting on its website (https://svbgsa.org/meetings/) and mail server. Notice of the meeting was also sent to the Salinas Californian, King City Rustler, Paso Robles Daily, and San Luis Obispo Tribune for publication (F4_05-30-18 mtg. newspaper notice of Paso Robles Basin Boundary Modification.pdf). Copies of the public notice are attached.

F5. Attach a copy of all comments regarding the proposed boundary modification received by the requesting agency and a summary of any responses made by the requesting agency.

Get documents from SVBGSA.

G. General Existing Groundwater Management

G1. Explain how sustainable groundwater management exists or could likely be achieved in the basin

Sustainable groundwater management could likely be achieved in the modified Upper Valley Aquifer and Paso Robles Area subbasins by implementing projects to reduce groundwater extraction, promote groundwater recharge, and maintain or increase groundwater levels. Examples of projects that will contribute to sustainable management include:

- Capital projects such as municipal water system leak detection and repair, municipal wastewater treatment and groundwater injection, and municipal stormwater capture and treatment
- Incentives for water-intensive industrial facilities (typically wineries, produce producers, and breweries in these subbasins) to collect, process, and recycle wastewater and stormwater onsite
- Increased use of recycled water to irrigate vineyards
- Implementing a recharge net metering program similar to the program being implemented in Pajaro Valley.

- Additional education and outreach efforts for the CA Industrial Stormwater Program, with enforcement by municipalities for violators
- Private well groundwater level monitoring
- Groundwater pumping reductions and incentives for termination of groundwater wells
- Environmental projects such as the Salinas River Arundo Eradication Project, implemented by the Resource Conservation District of Monterey County to enhance streamflow and reduce water consumption by removing Arundo, an invasive giant reed. Phases I and II treated the area surrounding the Salinas River in the existing Upper Valley Aquifer and Paso Robles Area subbasins; Phase III is in progress and will treat additional areas farther downstream.

G2. Explain how the proposed boundary modification would affect the ability of adjacent groundwater basins to sustainably manage groundwater in those groundwater basins.

This modification will simplify the funding, governance, and implementation of sustainable management projects. Given limited resources and statutory deadlines, it will facilitate sustainable management for SVBGSA to focus on Monterey County and for the San Luis Obispo County GSAs to focus on San Luis Obispo County.

Two significant subbasins adjoin the two affected subbasins: the Salinas Valley - Forebay subbasin adjoins the Upper Valley subbasin, and the Salinas Valley - Atascadero subbasin adjoins the Paso Robles subbasin. While the effect on adjoining subbasins will be minimal, this boundary modification will provide some benefits to the adjoining subbasins. The main benefit will be from developing regional consistency in which GSAs manage local areas. For example, both the City of Paso Robles and the County of San Luis Obispo are GSAs in both the Paso Robles subbasin and the adjoining Atascadero subbasin. This basin boundary modification will allow these GSAs to develop complementary GSPs for the two subbasins without requiring approval from the Salinas Valley Basin GSA, which has no interest in the Atascadero subbasin. Similarly, the Salinas Valley Basin GSA will be able to develop complementary GSPs for the Upper Valley and Forebay subbasins without requiring approval from San Luis Obispo County GSAs.

G3. Provide a historical summary of the sustainable management of groundwater levels in the proposed basin(s) or subbasin(s).

Groundwater in the Upper Valley Aquifer subbasin has been managed by the Monterey County Water Resources Agency since 1947. Groundwater levels have been maintained in the Upper Valley through a series of projects and actions including installation and operation of the Nacimiento and San Antonio Dams. The groundwater

management activities have resulted in relatively stable groundwater levels in the Upper Valley Aquifer subbasin. Figure 3-11 of the 2016 State of the Basin report shows hydrographs from the Upper Valley Aquifer subbasin (see attachment G3:_Upper_Valley_Hydrographs.pdf). These hydrographs demonstrate that groundwater levels in the Upper Valley Aquifer subbasin have not declined since at least 1973.

Since 1998, local stakeholders and agencies, including the Monterey County Water Resources Agency, the City of Paso Robles, and the San Luis Obispo County Flood Control and Water Conservation District have worked with pumpers to form an organized approach to groundwater management in the Paso Robles Area subbasin. A 2007 monitoring report (Todd) found that the Basin was being operated below the safe yield, although some areas were experiencing significant declines in groundwater elevations. A 2009 study found that groundwater pumping was approaching the safe yield of the Basin, which led to the recommendation to create a groundwater management plan (GMP) (GEI, 2011, attached in Part L1).

For the GMP, the Paso Robles Basin was divided into eight subareas. The North Gabilan, South Gabilan, and Bradley subareas lie entirely or partially in Monterey County, and represent the area of the existing Paso Robles Area subbasin that will be included in the Upper Valley Aquifer subbasin under the proposed modification. For all three subareas, the recommended Basin Management Objective was to maintain groundwater levels. There is limited available groundwater data and low overall water demand and groundwater use in the North and South Gabilan subareas. The single hydrograph for the Bradley subarea indicates that flow from the Salinas River, along with releases from Nacimiento Reservoir, help maintain groundwater levels in the subarea; there is no evidence that suggests that groundwater levels are declining to the point of causing problems for local groundwater users. For the Bradley subarea, the GMP recommended continued and improved monitoring of groundwater conditions. Critical conditions of overdraft do not occur in the Monterey County area that will become part of the Upper Valley subbasin as part of this modification. The modification is therefore consistent with the current listing of the Upper Valley subbasin as not critically overdrafted while the Paso Robles Area subbasin is subject to critical conditions of overdraft. The GMP also recommended potential reestablishment of the cloud-seeding program in the Nacimiento and San Antonio watersheds, which is estimated to have increased inflow into the Nacimiento and San Antonio reservoirs by about 20 percent.

Attach hydrographs.

G4. Discuss potential impacts to state programs resulting from the proposed boundary modification, including, but not limited to, the California Statewide Groundwater Elevation Monitoring (CASGEM), Groundwater Management Plans developed pursuant to AB 3030, Groundwater Sustainability Plans developed pursuant to the Sustainable Groundwater Management Act, any applicable state or regional board plans, and other water management and land use programs.

The Monterey County Water Resources Agency reports CASGEM data for the Monterey County portion of the Paso Robles Area subbasin. The San Luis Obispo County Flood Control & Water Conservation District reports CASGEM data for the San Luis Obispo County portion of the subbasin. Because the proposed modification will adjust the subbasin boundary to coincide with the county line, each agency's monitoring and reporting area will not be affected.

The modification will likely enhance CASGEM reporting. Currently, multiple agencies are responsible for CASGEM reporting for the Paso Robles subbasin. After this basin boundary modification is enacted, a single reporting CASGEM agency will be in charge of reporting for each subbasin, simplifying and coordinating the data collection in each subbasin.

The modified area will require management under a Groundwater Sustainability Plan adopted by January 2022 as part of the Upper Valley subbasin. If the modified area remained in the Paso Robles subbasin, it would be managed under a Plan adopted by January 2020. The portion of the Paso Robles subbasin north of the county line is not critically overdrafted; the 2022 deadline is more appropriate for managing conditions in the modified area.

H. Local Support

H1. Provide any evidence that sufficient information was provided to affected agencies and systems regarding the proposed boundary modification.

Attach notices.

H2. Provide a list of all affected agencies and affected systems that submitted comments and/or documents in support or opposition to the proposed boundary. The agency submitting their support or opposition for a boundary modification must provide a copy of a resolution formally adopted by the decision-making body of the affected agency or system or a letter signed by an executive officer or other official with appropriate delegated authority who represents the agency or system. Attach copies of the resolution and/or signed letter detailing the support or opposition submitted.

Get responses from SVBGSA. They have received letters of support from several Paso Robles Area GSAs.

H3. Provide any evidence that rebuts any opposition to the proposed boundary modification.

If needed.

I. Hydrogeologic Conceptual Model

Requests for boundary modification, must include a document or text to a clearly defined hydrogeologic conceptual model demonstrating each of the following:

1. Principal aquifer units within requested basin.

2. Lateral boundaries of the proposed basin, including:

a. Geologic features that significantly impede or impact groundwater flow.

b. Aquifer characteristics that significantly impede or impact groundwater flow.

c. Significant geologic and hydrologic features and conditions of the principle aquifer units, as appropriate, including information regarding the confined or unconfined nature of the aquifer, facies changes, truncation of units, the presence of faults or folds that impede groundwater flow, or other groundwater flow restricting features.

d. Key surface water bodies, groundwater divides and significant recharge sources.

3. Recharge and discharge areas within the basin.

4. Definable bottom of the basin or subbasin.

The department may waive this requirement for an internal boundary modification if the requesting agency is able to demonstrate that the proposed boundary modification is unlikely to affect sustainable groundwater management.

See Appendix C: Hydrogeologic Conceptual Model

L. Technical Studies for All Jurisdictional Modifications

Requests for a jurisdictional boundary must attach or provide a URL or upload a file for the following:

1. A water management plan that covers or is in the immediate vicinity of the proposed basin or portion of the proposed basin and satisfies the requirement of Water Code sections 10753.7(a) or 10727 by attaching one of the following:

a. An adopted groundwater management plan, a basin wide management plan, or other integrated regional water management program or plan.

b. Management pursuant to an adjudication action.

c. One or more technical studies that cover the relevant portion of a basin or subbasin and adjacent areas.

Two technical reports are attached. The Paso Robles Basin Groundwater management plan covers the entire existing Paso Robles Basin on both sides of the Monterey – San Luis Obispo county line. The Salinas Valley State of the Basin report covers the entire Salinas Valley up to the Monterey – San Luis Obispo county line.

Attach Paso Robles Basin Groundwater Management Plan and State of the Salinas River Groundwater Basin.

2. A statement of the existing and planned coordination of sustainable groundwater management activities and responsibilities where required.

The Salinas Valley Basin GSA will be responsible for sustainable groundwater management in the expanded Upper Valley Aquifer subbasin. The five coordinated GSAs in the San Luis Obispo County portion of the existing Paso Robles Basin have agreed to develop a single GSP for the basin, and will jointly be responsible for sustainable groundwater management in the remaining area of the Paso Robles Area subbasin, south of the Monterey – San Luis Obispo county line. The two sets of GSAs have been in close contact during this basin boundary modification process, and are committed to interbasin coordination. GSAs are committed to interbasin coordination. The Paso Robles Basin GSAs are developing a list of important outreach points for interbasin coordination.

Appendix A: Maps

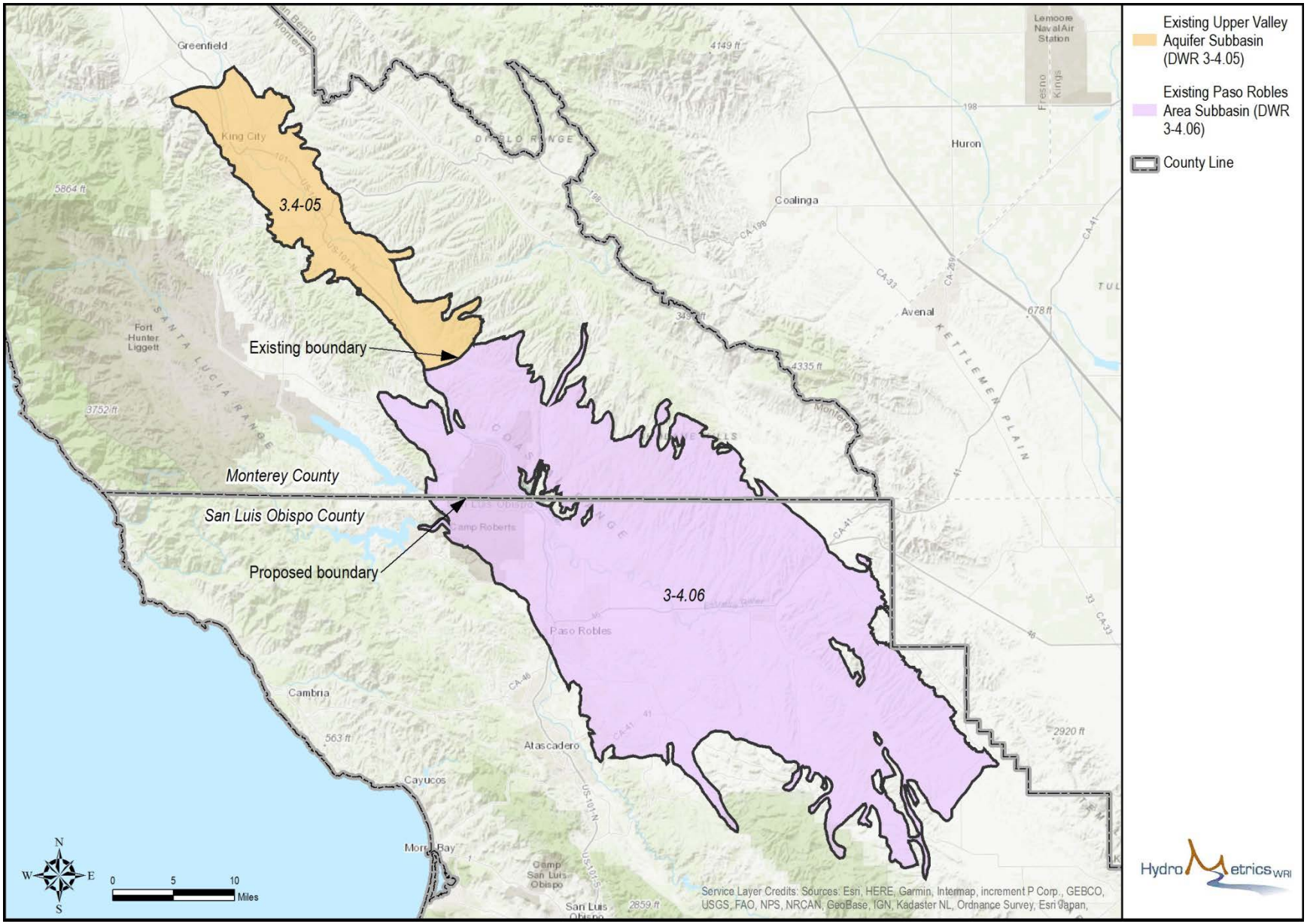

Figure 1: Existing subbasin Boundaries

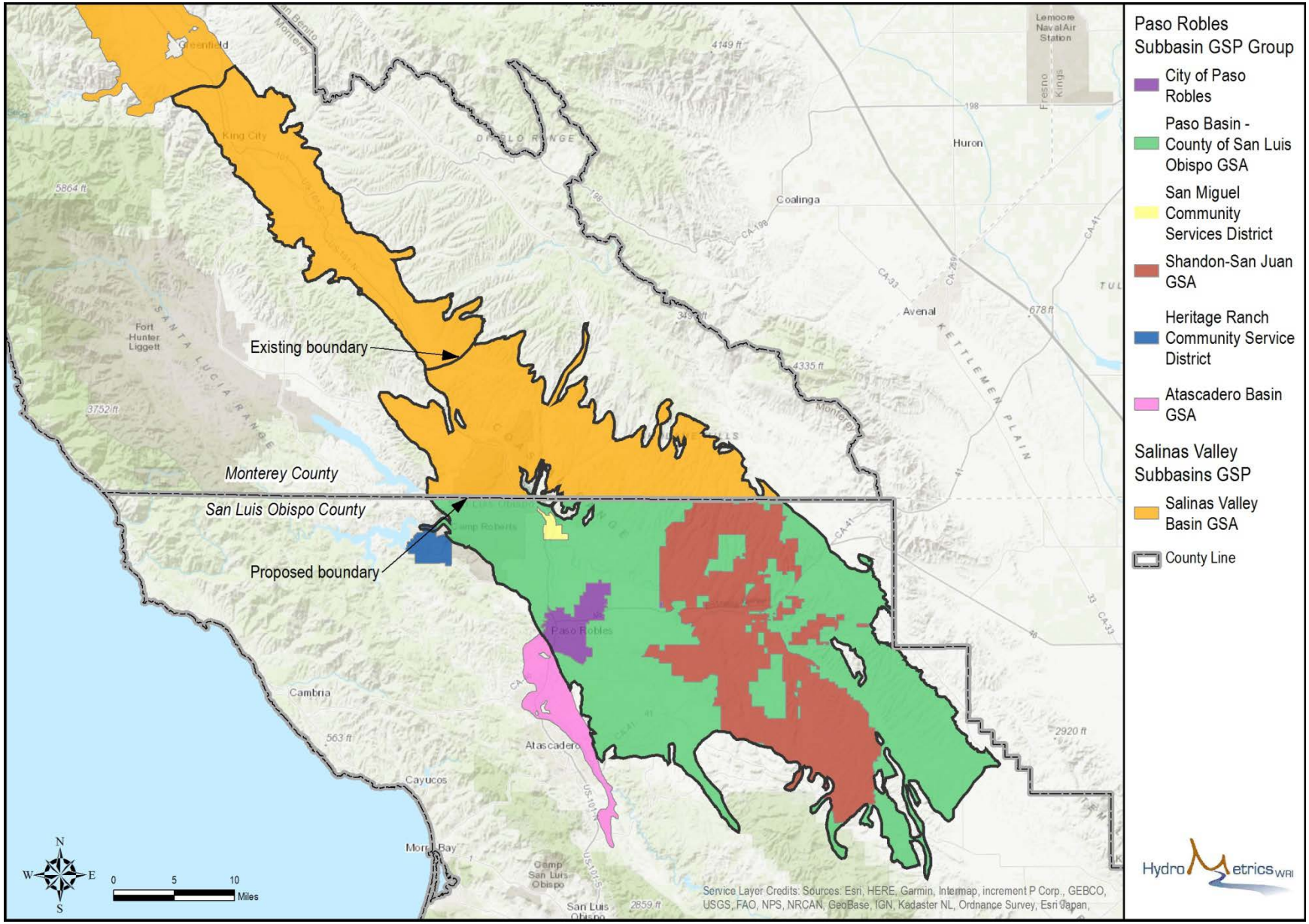

Figure 2: Jurisdictional boundaries of agencies involved in GSP development

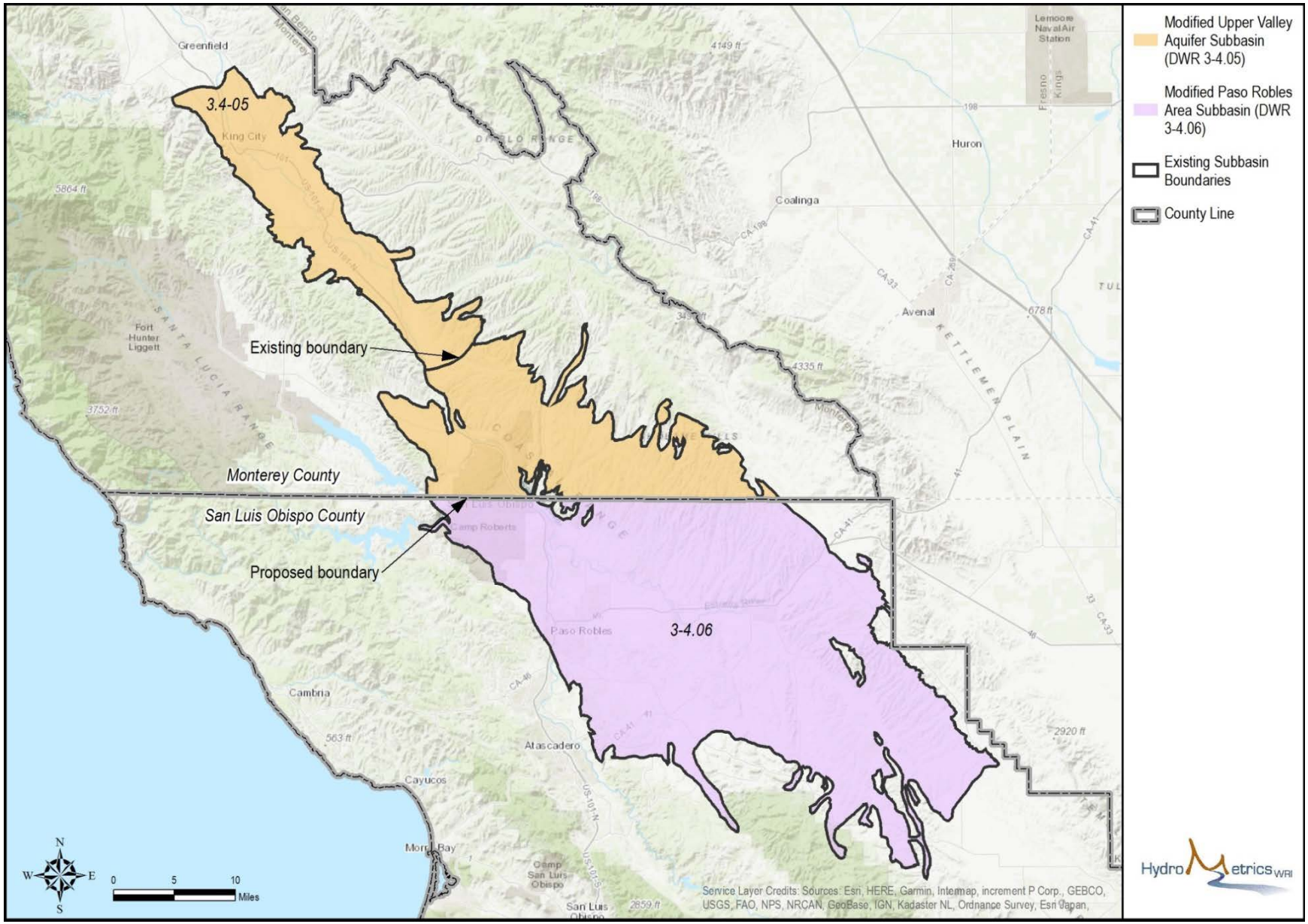

Figure 3: Subbasin boundaries under proposed modification

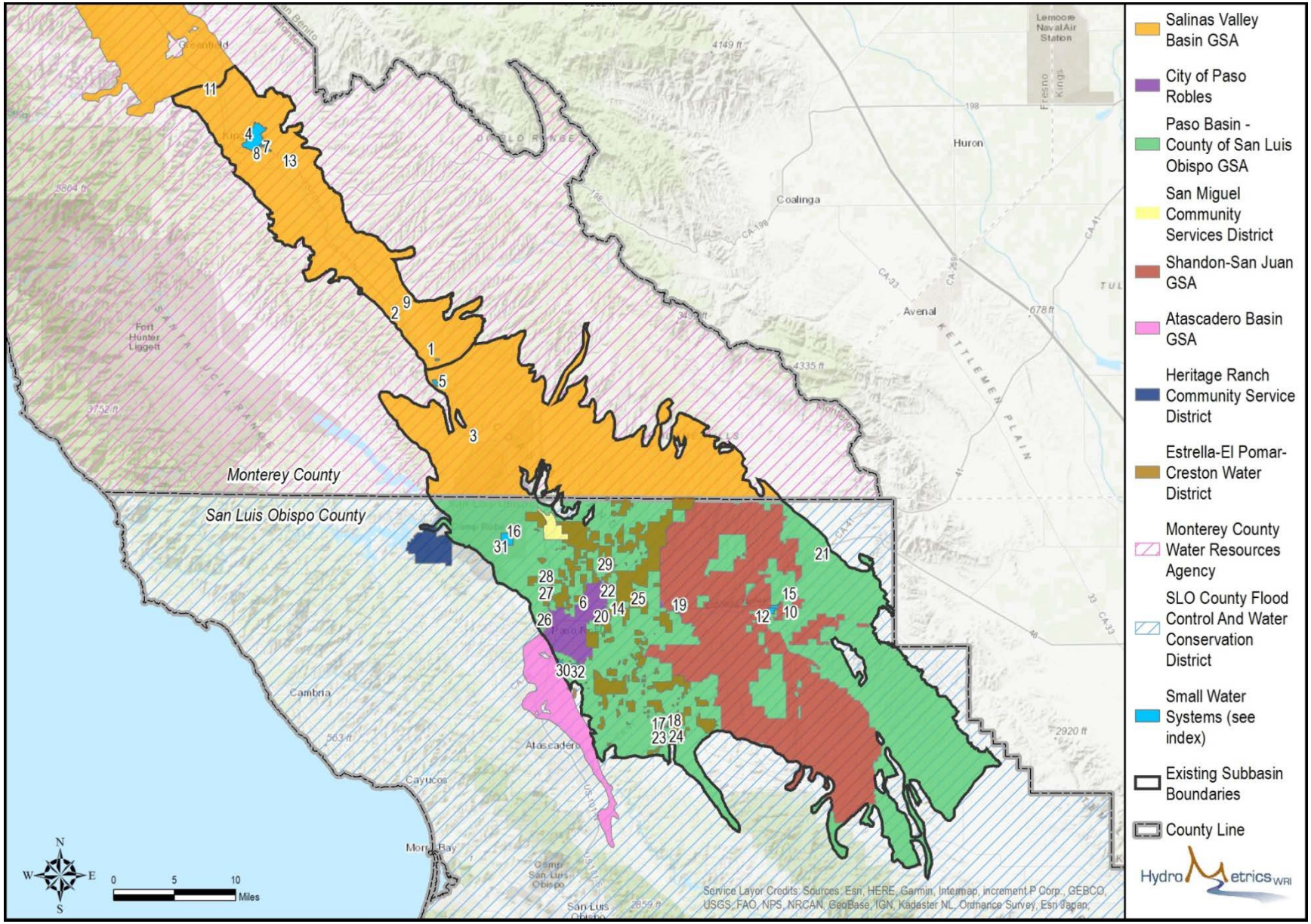

Figure 4: All agencies and water systems in affected subbasins

INDEX OF SMALL WATER SYSTEMS

Number on map	System/Agency Name
1	Aera Energy
2	Bernardo Road Water System No 02
3	Bradley Union School Water System
4	California Water Service Company - King City
5	Chevron Oil Field Water System
6	Estrella Correctional Facility
7	Lomas Del Sol Mutual Water System
8	Queen Motel Water System
9	San Ardo Water District
10	San Luis Obispo County Service Area 16
11	Scheid Vineyard Water System
12	Shandon County Service Area No 16
13	Wildhorse Cafe Water System
14	Arciero Winery
15	Cal Trans Shandon Rest Stop
16	Camp Roberts
17	Creston Country Store
18	Creston Elementary School
19	Green River Mutual Water Company
20	Hunter Ranch Golf Course
21	Jack Ranch Cafe
22	Links At Lista Del Hombre
23	Loading Chute
24	Longbranch Saloon
25	Meridian Vineyard
26	Mustang Springs Mutual Water Company
27	Paso Robles RV Ranch
28	Paso Robles Truck Plaza (San Paso)
29	Pleasant Valley Elementary
30	Santa Ysabel Ranch Mutual Water Company
31	SATCOM
32	Spanish Lakes Mutual Water Company

Appendix B: Affected Agencies and Systems

Agency Name	Current Subbasin(s)	Modified Subbasin(s)
Aera Energy Chevron Oil Field Water System	Upper Valley	Upper Valley
Almira Water Association	Paso Robles	Paso Robles
Arciero Vineyards	Paso Robles	Paso Robles
Bradley Union School Water System	Paso Robles	Upper Valley
California Water Service Company – King City	Upper Valley	Upper Valley
CalTrans – Shandon Rest Stop	Paso Robles	Paso Robles
City of Paso Robles	Paso Robles	Paso Robles
County of San Luis Obispo	Paso Robles	Paso Robles
Creston Country Store	Paso Robles	Paso Robles
Creston Elementary School	Paso Robles	Paso Robles
Estrella-El Pomar-Creston (EPC) Water District	Paso Robles	Paso Robles
Estrella Correctional Facility	Paso Robles	Paso Robles
Green River Mutual Water Company	Paso Robles	Paso Robles
Heritage Ranch Community Services District	Paso Robles	Paso Robles
Hunter Ranch Golf Course	Paso Robles	Paso Robles
Jack Ranch Café	Paso Robles	Paso Robles
The Links at Vista Del Hombre	Paso Robles	Paso Robles
Loading Chute	Paso Robles	Paso Robles
The Longbranch Saloon	Paso Robles	Paso Robles
Meridian Vineyards	Paso Robles	Paso Robles
Monterey County Water Resources Agency	Upper Valley, Paso Robles	Upper Valley
Mustang Springs Mutual Water Company	Paso Robles	Paso Robles
Paso Robles RV Ranch	Paso Robles	Paso Robles
Pleasant Valley Elementary	Paso Robles	Paso Robles
San Ardo Water District	Upper Valley	Upper Valley
San Luis Obispo County Of	Paso Robles	Paso Robles
San Luis Obispo County Flood	Paso Robles	Paso Robles

Control And Water Conservation District		
San Miguel Community Services District	Paso Robles	Paso Robles
San Paso Truck Stop	Paso Robles	Paso Robles
Santa Ysabel Ranch Mutual Water Company	Paso Robles	Paso Robles
SATCOM Water Supply – Camp Roberts	Paso Robles	Paso Robles
Scheid Vineyard Water System	Upper Valley	Upper Valley
Shandon-San Juan Water District	Paso Robles	Paso Robles
Spanish Lakes Mutual Water Company	Paso Robles	Paso Robles
Wildhorse Cafe Water System	Upper Valley	Upper Valley
Shandon County Service Area No 16	Paso Robles	Paso Robles
San Luis Obispo County Service Area No 16	Paso Robles	Paso Robles
Queen Motel Water System	Upper Valley	Upper Valley
Lomas Del Sol Mutual Water System	Upper Valley	Upper Valley
Chevron Oil Field Water System	Paso Robles	Upper Valley
Bernardo Road Water System No 02	Upper Valley	Upper Valley
GSA Name	**Original Subbasin(s)**	**Modified Subbasin(s)**
Arroyo Seco GSA	Salinas Valley Forebay Aquifer	Salinas Valley Forebay Aquifer
Marina Coast Water District GSA	Salinas Valley Monterey	Salinas Valley Monterey
Monterey Peninsula Water Management District	Salinas Valley Seaside, Salinas Valley Monterey	Salinas Valley Seaside, Salinas Valley Monterey
City of San Luis Obispo GSA	Paso Robles	Paso Robles
Paso Basin - County of San Luis Obispo GSA	Paso Robles	Paso Robles
Shandon - San Juan GSA	Paso Robles	Paso Robles

Appendix C: Hydrogeologic Conceptual Model

HYDROGEOLOGIC CONCEPTUAL MODEL (§ 344.12)

This section summarizes the hydrogeologic conceptual models for the affected subbasins in boundary revision: the Paso Robles Area (DWR 3-4.06) and the Upper Valley Aquifer (DWR 3-4.05).

PRINCIPAL AQUIFER UNITS WITHIN REQUESTED BASIN (§ 344.12 (A) (1))

Paso Robles Area

Groundwater in the Paso Robles Area subbasin is primarily found in Holocene-age alluvium and the underlying Pleistocene-age Paso Robles Formation. These units are shown in map view on Figure 1. The area affected by the proposed modification is the area of the Paso Robles subbasin north of the county line. Figure 2 shows a cross-section through the Bradley Area (A-A' in Figure 1), located north of the Monterey/San Luis Obispo county line in the current Paso Robles Area subbasin. 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 (bgs) or less and are typically comprised of coarse sand and gravel. The alluvium is generally coarser than the Paso Robles Formation sediments, with higher permeability that results in well production capability that often exceeds 1,000 gpm. The Paso Robles Groundwater Basin is comprised predominantly of Paso Robles Formation sedimentary layers that extend from the ground surface to more than 2,000 feet below sea level in some areas (resulting in basin sediments with a thickness of more than 2,500 feet. Throughout most of the basin, however, the water-bearing sediments have a thickness of 700 to 1,200 feet (with the base of the sediments more or less at sea level) (Fugro 2002)

Upper Valley Aquifer

The primary aquifer in this Upper Valley Aquifer area is reported to be unconfined and generally considered a single unit. This aquifer consists of unconsolidated to semi-consolidated and interbedded gravel, sand, and silt of the Paso Robles Formation, alluvial fan, and river deposits. Deposits west of the Salinas River tend to be coarser grained than those to the east. These deposits represent the lateral equivalents of the P-180 and P-400 Aquifers found in the lower Salinas Valley. However, no aquitard comparable to those separating the aquifers in the lower Salinas Valley Pressure Subarea exists in the sedimentary sequence of the Upper Valley Subarea. The Deep Aquifer is not present in the Upper Valley Subarea due to the southward shallowing of the basement complex (DWR 2003).

LATERAL BOUNDARIES (§ 344.12 (A) (2))

The lateral boundaries of the subbasins are described below.

Paso Robles Area

A) *Geologic features that significantly impede or impact groundwater flow*:
- The lateral extent of the Paso Robles Area subbasin is generally defined by the contact of water-bearing unconsolidated aquifer sediments with older geologic units (Fugro, 2002).
- The subbasin is downstream of and hydraulically connected by alluvial deposits to the Pozo Groundwater Basin to the south and the Cholame Groundwater Basin to the northeast (Fugro, 2002).
- The Rinconada fault defines the western boundary of the Paso Robles subbasin. Between Atascadero and Creston, the fault juxtaposes less permeable Monterey Formation shale 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. In this area, the fault zone is believed to form a leaky barrier that restricts flow between the Paso Robles Basin and the adjacent Atascadero Basin (Fugro, 2002).
- The entire eastern boundary of the basin is defined by the Red Hill, San Juan, and White Canyon faults (Fugro, 2002).
- Older, less permeable geologic units that underlie the basin crop out along the basin border, as shown on Figures 1 and 2. In general, the geologic units underlying the basin include Tertiary-age consolidated sedimentary beds, Cretaceous-age metamorphic rocks, and granitic rock (Fugro, 2002).

B) *Aquifer characteristics that significantly impede GW flow*:
- Uplifting and folding of the Paso Robles Formation sediments on both sides of the White Canyon fault restricts groundwater flow, forming a hydraulic boundary that defines the eastern edge of the subbasin in the White Canyon area (Fugro, 2002).
- East of Shandon, the Red Hill fault displaces the Paso Robles formation, restricting flow through the unit and defining the eastern edge of the subbasin in this region (Fugro, 2002).

C) *Significant geologic and hydrologic features and conditions*:
- Internally, the Paso Robles Area subbasin consists of two deep structural northwest-trending troughs separated by bedrock highs extending from the area east of the Salinas River at Camp Roberts, through the San Miguel Dome, to the Creston anticlinorium in the southern part of the basin. While the basin sediments overlying this feature are relatively thin,

the basement high does not extend far enough northward to create an effective barrier to flow. Figure 3 shows a contour map of the base of the permeable Paso Robles Formation sediments (Fugro, 2002).

D) *Key surface water bodies, groundwater divides, and recharge sources*:
- The projection of the Sargent Creek drainage across the Salinas Valley defines the existing boundary between the Paso Robles Area and the Upper Valley Aquifer to the north (Brown and Caldwell, 2005).
- The Salinas and Estrella rivers and San Juan, Shedd, and Huerhuero creeks drain the subbasin (Fugro, 2002).
- The Nacimiento and San Antonio reservoirs are located northwest of the subbasin. Water stored in these reservoirs reaches the Salinas River via the Nacimiento and San Antonio rivers in the northern part of the subbasin (Fugro, 2002).
- Infiltration of precipitation, seepage from streams, and return flow from irrigation are the primary sources of recharge (Fugro, 2002).

Upper Valley Aquifer

A) *Geologic features that significantly impede or impact groundwater flow*:
- The Upper Valley Area subbasin is bounded to the west by the contact of the Quaternary Paso Robles Formation or Quaternary terrace deposits with the middle Miocene marine sedimentary rocks (Monterey Shale) of the Santa Lucia Range (Brown and Caldwell, 2005).
- The eastern Subarea boundary is formed by the contact between the Paso Robles Formation, Quaternary terrace deposits, or Quaternary alluvium with the Pancho Rico Formation of the Gabilan Range (Brown and Caldwell, 2005).

B) *Aquifer characteristics that significantly impede GW flow*:
- The alluvial fan of the Arroyo Seco and Monroe Creek encroaches on the aquifer at the eastern subbasin boundary, constricting the aquifer in this area (Brown and Caldwell, 2005).

C) *Significant geologic and hydrologic features and conditions*:
- The Salinas Valley floor is constricted at both the northern and southern boundaries of the subbasin (Brown and Caldwell, 2005)

D) *Key surface water bodies, groundwater divides, and recharge sources*:
- The projection of the Sargent Creek drainage across the Salinas Valley defines the existing boundary between the Upper Valley Aquifer and the Paso Robles Area to the south (Brown and Caldwell, 2005).
- Intermittent streams such as Pine and Pancho Rico Creeks and perennial San Lorenzo Creek drain the western slopes of the Gabilan Range and flow westward across the subbasin toward the Salinas River (DWR, 2003).

- Surface recharge is primarily from percolation through the channel deposits surrounding the Salinas River and its tributary drainages. A lesser volume of recharge results from percolation of precipitation along valley margins and from applied irrigation water. Subsurface flow from precipitation recharged through the Pancho Rico Formation east of the Subbasin and minimal subsurface flows from drainage along the Salinas River account for the remainder of recharge (DWR, 2003).

RECHARGE AND DISCHARGE AREAS (§ 344.12 (A) (3))

Paso Robles Area

The principal areas of groundwater recharge to the subbasin occur where the shallow alluvial sand and gravel beds are in direct contact with the Paso Robles Formation. Natural recharge in the subbasin is derived from infiltration of precipitation, seepage from streams, and return flow from irrigation and other uses. These areas roughly coincide with the surface exposure of the alluvial deposits, as shown on Figure 1. 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. 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 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.

Groundwater flow generally moves northwesterly across the basin toward the Estrella area (north of the City of Paso Robles and south of the county line) and then follows the Salinas River drainage northward. Groundwater discharge occurs primarily at the subbasin outlet, northwest of and downstream of Bradley, where Salinas River alluvial deposits form a hydraulic connection between the Paso Robles Area subbasin and the Salinas Upper Valley Aquifer subbasin (GEI, 2011).

Upper Valley Aquifer

Similar to the Paso Robles Area subbasin, the principal source of groundwater recharge to the subbasin is infiltration of precipitation and irrigation return flow. The areas associated with the highest infiltration coincide with the surface exposure of the shallow alluvial deposits, mostly along the Salinas River and tributaries (DWR, 2003). Groundwater inflow from the Paso Robles Area subbasin occurs at the southern end of the Upper Valley Aquifer.

Groundwater flow in the subbasin generally moves down the Salinas River Valley to the northwest, discharging into the adjacent Forebay Aquifer (DWR, 2003)

DEFINABLE BOTTOM OF BASIN (§ 344.12 (A) (4))

Paso Robles Area

The bottom of the Paso Robles Area subbasin, defined generally as the base of the Paso Robles Formation, is a reflection of the folding, faulting, and erosion that formed the highly variable surface upon which the nonmarine Paso Robles Formation sediments were deposited. The basin is underlain by Tertiary-age consolidated sedimentary formations, including the Pancho Rico Formation, an unnamed clastic unit, the Santa Margarita formation, the Monterey Formation, the Obispo Formation, and the Vaqueros Formation. Figure 3 shows a contour map of the base of the permeable Paso Robles Formation sediments (Fugro, 2002).

Upper Valley Aquifer

The bottom of the Upper Valley Aquifer subbasin is similarly defined as contact between the base of the Paso Robles Formation and the underlying impermeable sedimentary units. The depth to the bottom of the basin ranges from approximately 1,000 feet in the northern subbasin to 200 feet at the southern margin, with a sharp rise from about 800 to 300 feet at the center of the subbasin (DWR, 2003).

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GEI Consultants with Fugro West, Inc. and CHG (March 2011), *Paso Robles Groundwater Basin Management Plan, prepared for the Paso Robles Groundwater Basin Groundwater Advisory Committee.*

Project No. 98-71-1137

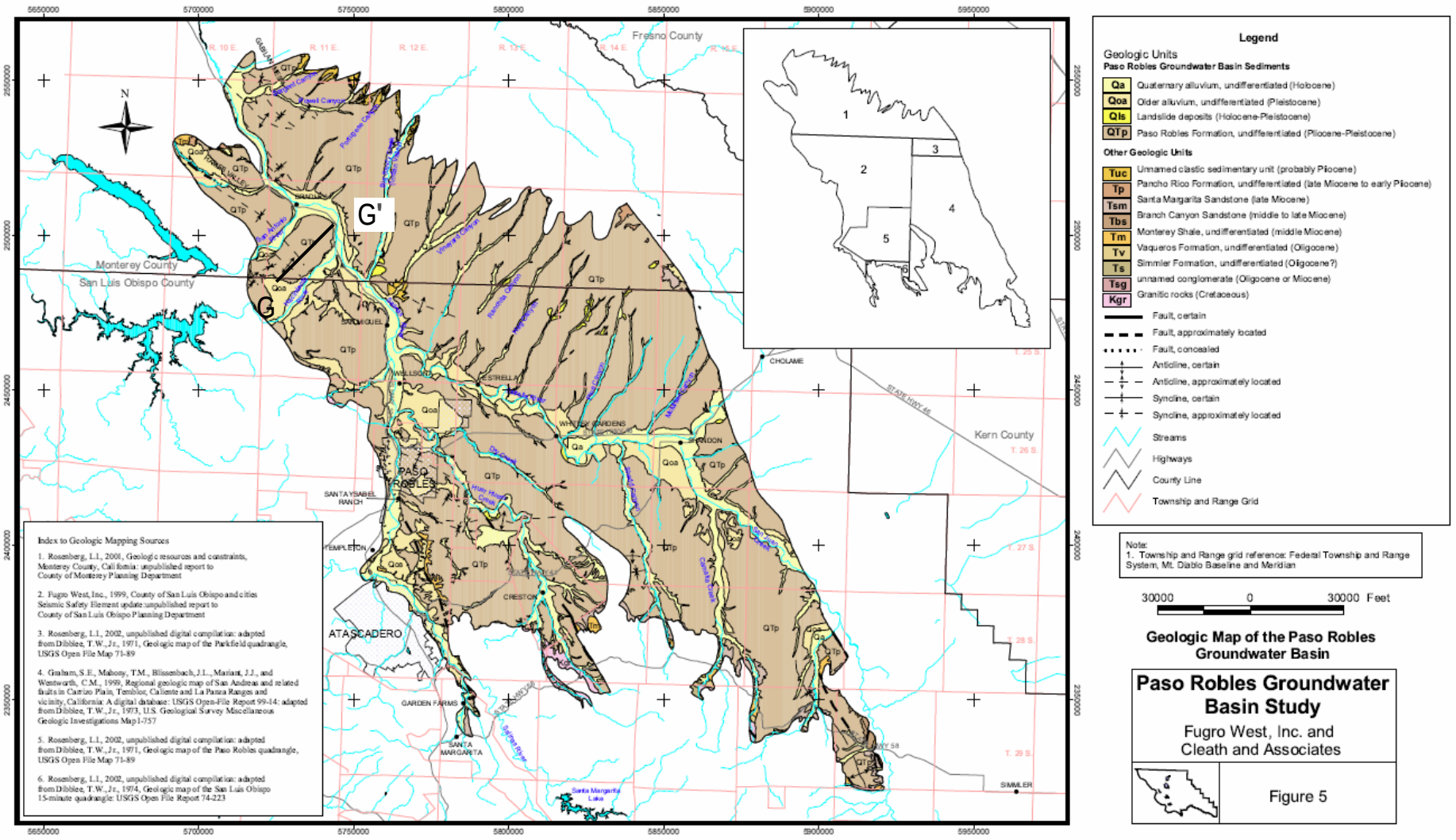

Figure 1: Geologic Map of the Paso Robles Basin. Modified from Fugro, 2002.

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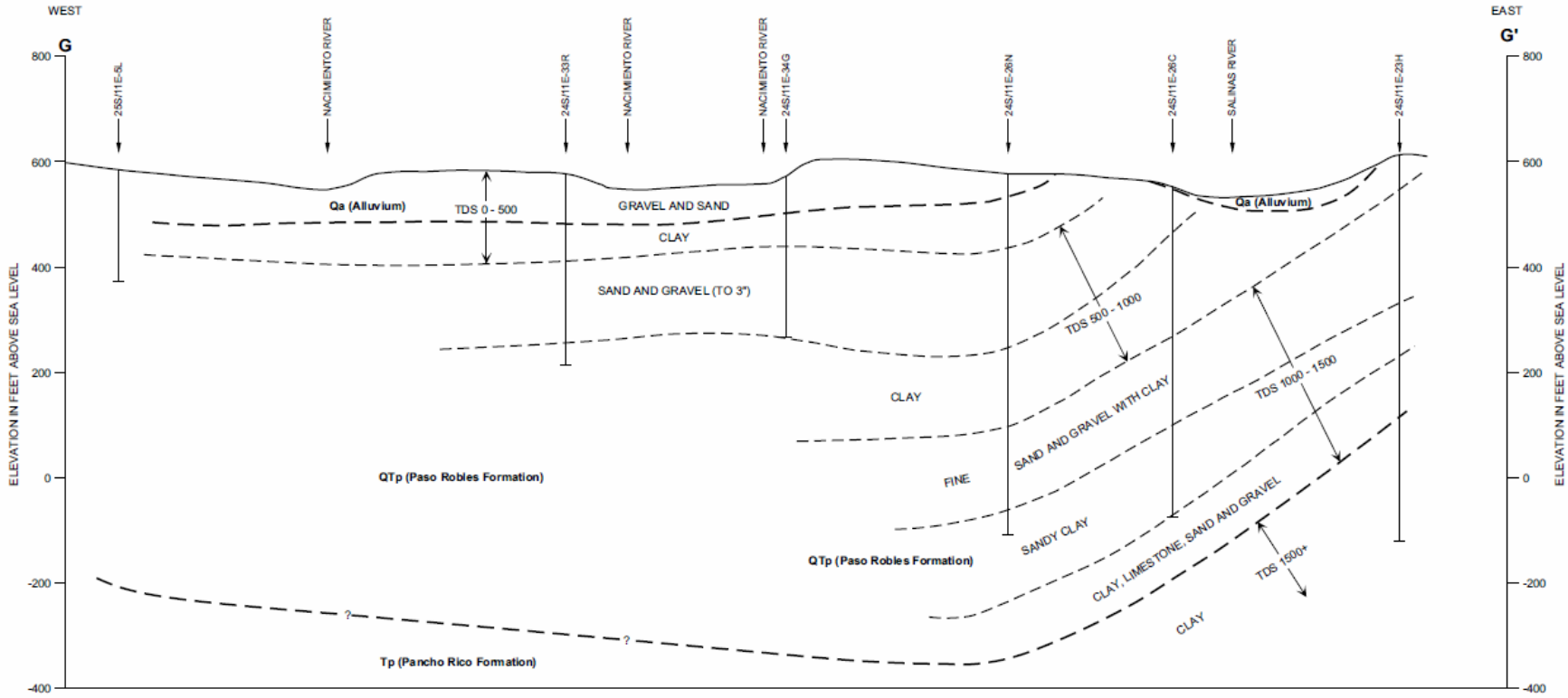

Figure 2: G-G′ Cross-Section. From Fugro, 2002.

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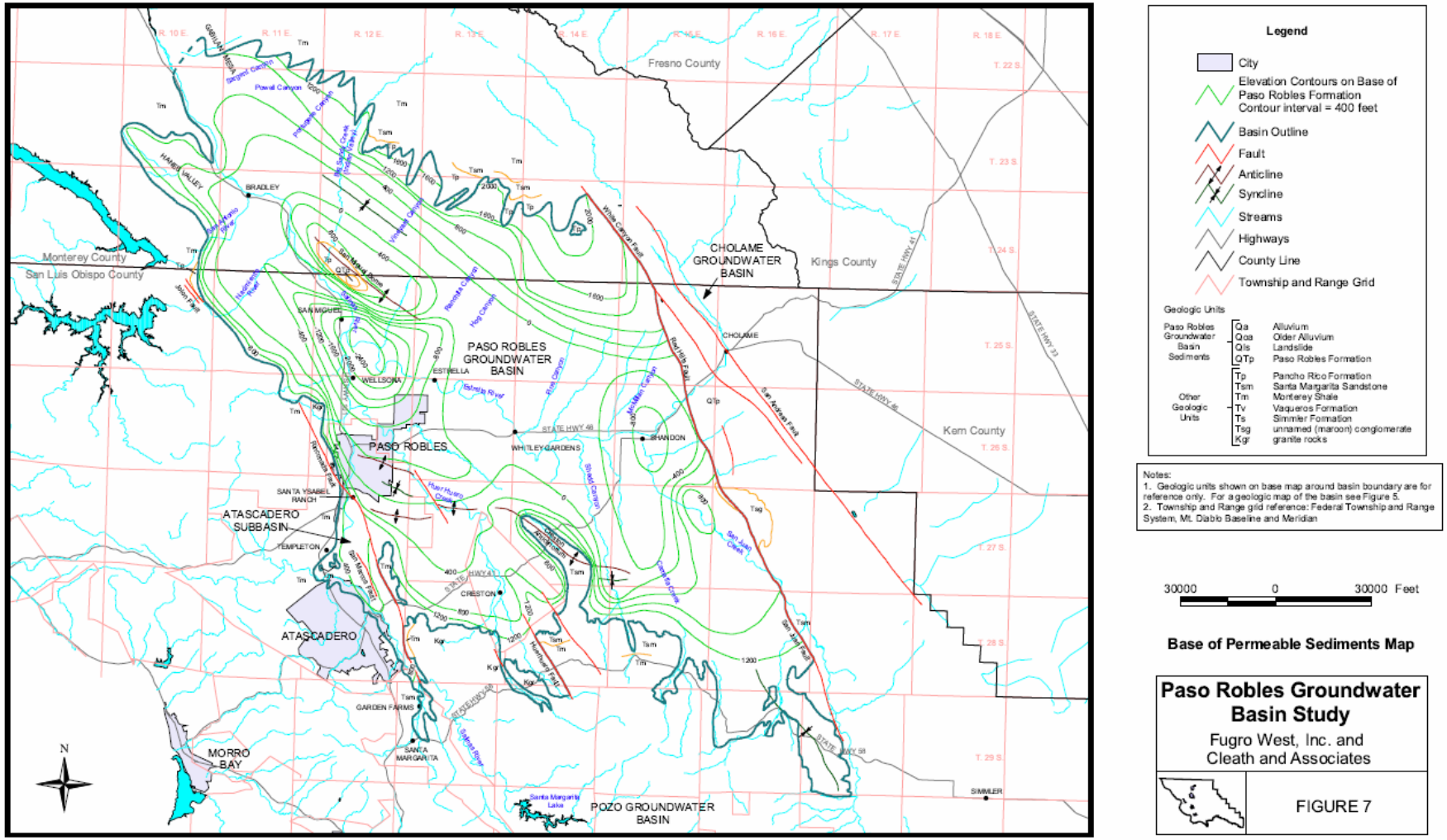

Figure 3: Contour Map of Base of Paso Robles Formation. From Fugro, 2002.

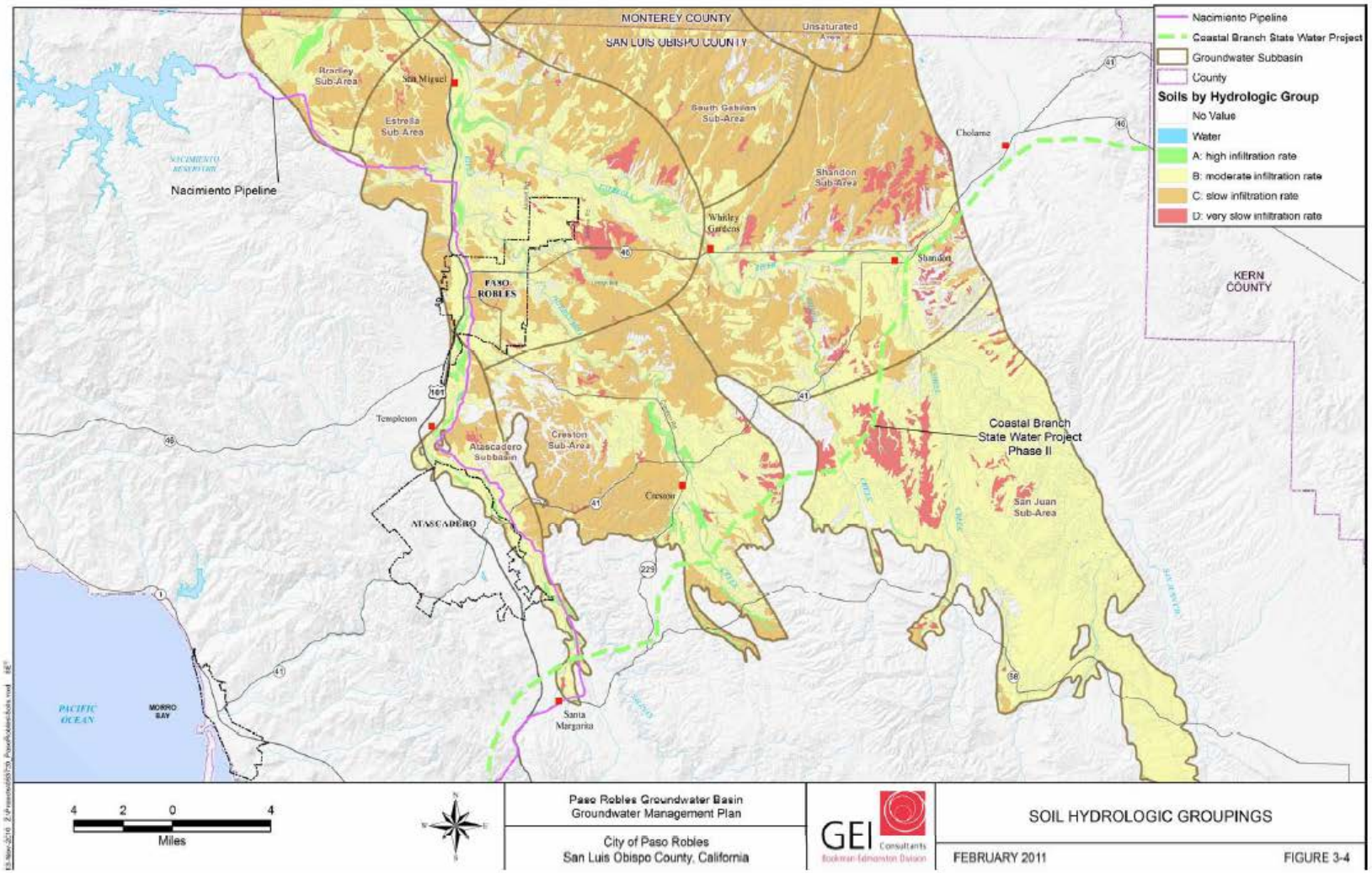

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Figure 4: Map of soil infiltration rates. From GEI, 2011.