COUNTY OF Placer®
COMMUNITY DEVELOPMENT RESOURCE AGENCY

MEMORANDUM

DATE: November 17, 2015

TO: Honorable Board of Supervisors

FROM: Michael J. Johnson, AICP, Agency Director

E.J. Ivaldi, Deputy Planning Director

BY: Brett Storey, Senior Management Analyst

SUBJECT: California Statewide Groundwater Elevation Monitoring Program

ACTION REQUESTED

1. Adopt a Resolution requesting that the State designate Placer County as a groundwater monitoring entity under the State's California Statewide Groundwater Elevation Monitoring Program.
2. Authorize the County to submit a notification to the Department of Water Resources to become a California Statewide Groundwater Elevation Monitoring entity.
3. Adopt a California Statewide Groundwater Elevation Monitoring Plan.
4. Authorize the Community Development Resource Agency Director or his designee to execute all associated California Statewide Groundwater Elevation Monitoring program documents.

BACKGROUND

The California State Groundwater Elevation Monitoring (CASGEM) program was developed by the Department of Water Resources (DWR) in response to the Water Code amendment SBx7-6 in 2009. The goal of the CASGEM program is to monitor and report groundwater levels to a publicly accessible database. A Monitoring Entity recognized by DWR is a designated entity that conducts or coordinates the monitoring of groundwater elevations for a basin or sub-basin. DWR began accepting Monitoring Entities in 2011; Placer County opted out of the program because of its limited groundwater interactions, limited staff and budget availability. There are two active Monitoring Entities within Placer County: the Placer County Water Agency (PCWA) for the Martis Valley Basin, and the City of Roseville for the North American Sub-Basin.

On April 1, 2015, Governor Brown issued a Drought Executive Order B-29-15, which stated, "Local water agencies in high and medium priority groundwater basins shall immediately implement all requirements of the CASGEM program pursuant to Water Code section 10933." Placer County has two groundwater basins that are categorized as high or medium priority sub-basins by DWR. They are the North American Sub-Basin (high) and the Martis Valley Basin (medium). The County's unmonitored areas are required to be included in a CASGEM program by December 2015. The County is

eligible to become a CASGEM Monitoring Entity according to the rules of the DWR program.

Because of the presence of two existing CASGEM Monitoring Entity programs that cover all of the Martis Valley Basin and a majority of the North American Sub-Basin, Placer County would only be responsible for managing the unmonitored portions of the County within the North American Sub-Basin. Attachment 2 includes a map to illustrate the existing monitoring entities' boundaries and the unmonitored portion of the County (represented as Placer County's proposed monitoring entity boundary in blue).

Placer County will collect groundwater level data from wells and will report data to the CASGEM program under the County's Monitoring Entity account. Groundwater levels are to be measured a minimum of two times per year to record the seasonal high (spring) and seasonal low (fall) groundwater levels. On September 1, 2015, staff hired a qualified consultant, GEI Consultants (Mr. Richard Shatz – Lead) to assist Placer County in gaining compliance with the DWR CASGEM program. Mr. Shatz has worked with staff to develop a Draft Placer County CASGEM Monitoring Plan to comply with DWR requirements that will be submitted as part of the County's CASGEM monitoring entity notification. In order to implement all of the aspects of the Plan, a one-time cost of $20,000 will be necessary to replace (modernize) a pump on one of the County's current wells, another estimated $2,500 for a video survey of an existing County well, approximately $5,000 to survey the elevations of all monitoring wells, and staff time costs of $6,100 to contract for and manage this work for an estimated total one-time costs of $33,600. Staff estimates approximately $13,000 in annual monitoring costs by staff and consultants to verify all well readings.

If approved, the County's CASGEM Monitoring Entity notification will be electronically submitted to the DWR for consideration. Upon receiving approval from DWR, staff will ensure that the wells are in proper operating order and begin to upload groundwater elevation data to the CASGEM database during the next season. The County's Monitoring Entity efforts are detailed in the CASGEM Monitoring Plan.

FISCAL IMPACT

Becoming CASGEM compliant allows the County, and local agencies within the County, to be eligible for future grants or loans administered by the State. The primary fiscal impact of this action includes an estimated $33,600 in one-time costs and $13,000 annually thereafter in ongoing monitoring and verification costs. There are sufficient monies in the Agency's FY 2015-16 budget to cover these costs.

Attachment 1 – Resolution
Attachment 2 - CASGEM Monitoring Entity Boundary Map
Attachment 3 - CASGEM Monitoring Entity Notification Letter
Attachment 4 - CASGEM Monitoring Plan

Before the Board of Supervisors
County of Placer, State of California

In the matter of: Resolution No.: _____

RESOLUTION AUTHORIZING THE SUBMISSION OF A REQUEST TO DESIGNATE PLACER COUNTY AS A GROUNDWATER MONITORING ENTITY UNDER THE CALIFORNIA STATEWIDE GROUNDWATER ELEVATION MONITORING (CASGEM) PROGRAM AND DESIGNATION OF THE COMMUNITY DEVELOPMENT RESOURCE AGENCY DIRECTOR OR HIS DESIGNEE AS OFFICIAL REPRESENTATIVE

The following Resolution was duly passed by the Board of Supervisors of the County of Placer at a regular meeting held _____ by the following vote on roll call:

Ayes:

Noes:

Absent:

Signed and approved by me after its passage.

_____
Chair, Board of Supervisors

Attest:

_____
Clerk of said Board

BE IT RESOLVED BY THE BOARD OF SUPERVISORS OF THE COUNTY OF PLACER, STATE OF CALIFORNIA, AS FOLLOWS:

WHEREAS, in November 2009, the California Legislature added Part 2.11 (Groundwater Monitoring) to Division 6 of the Water Code by Senate Bill 6 (7th Extraordinary Session) (SB 6); and

ATTACHMENT 1

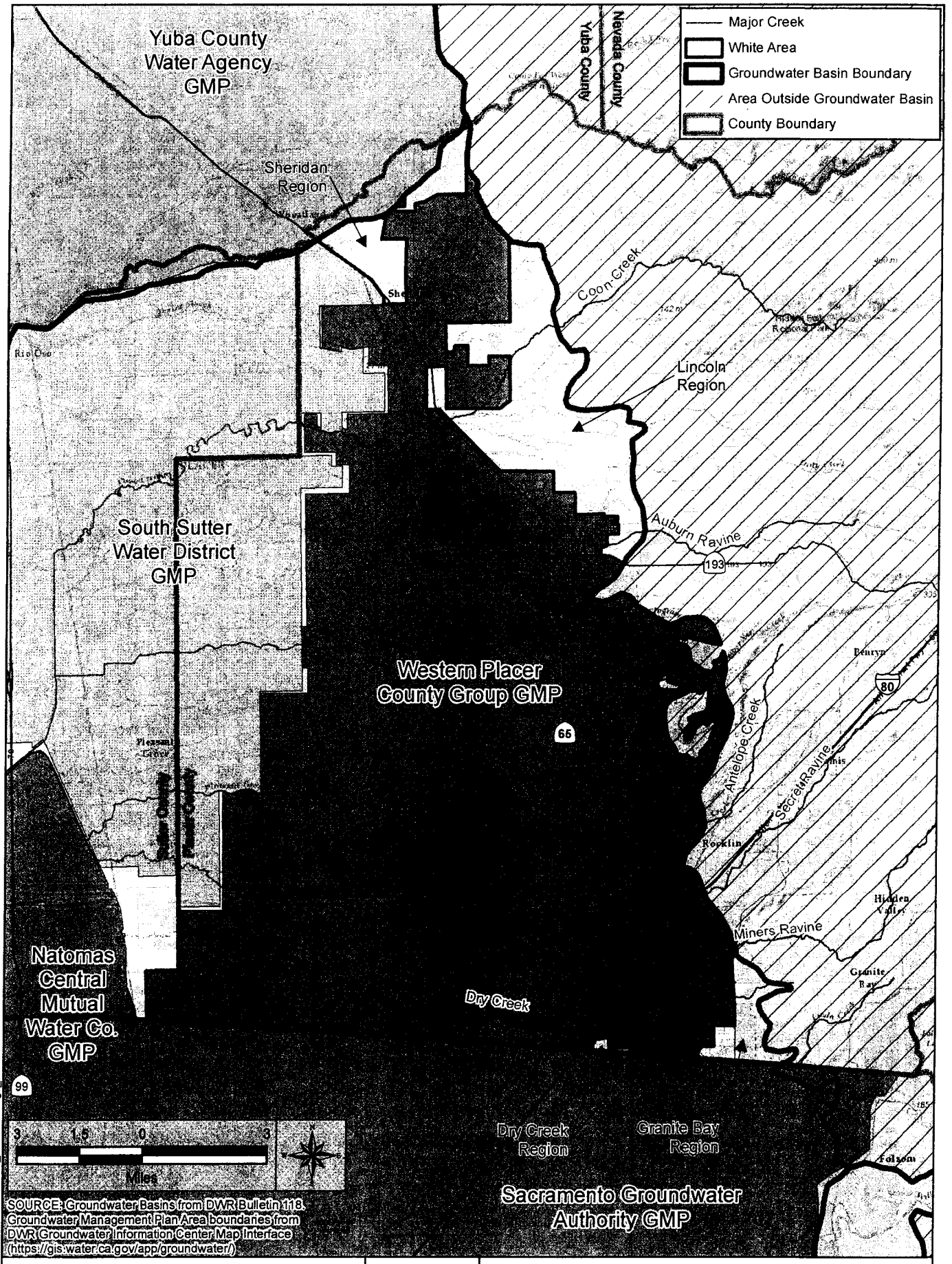
WHEREAS, the law directs that groundwater elevations in all basins and sub-basins in California be regularly and systematically monitored, preferably by local entities, with the goal of demonstrating seasonal and long-term trends in groundwater elevations through the California Statewide Groundwater Elevation Monitoring (CASGEM) Program; and

WHEREAS, on April 1, 2015, Executive Order B-29-15 requires local water agencies in high and medium priority groundwater basins to immediately implement all requirements of the CASGEM Program pursuant to Water Code section 10933, and requires the Department of Water Resources to refer noncompliant local water agencies within high and medium priority groundwater basins to the Water Board by December 31, 2015, which shall consider adopting regulations or take appropriate enforcement to promote compliance; and

WHEREAS, Placer County's two Basins: Martis Valley basin (a medium priority), and North American Sub-basin (a high priority), contains two existing CASGEM Monitoring Entities: the Placer County Water Agency, and City of Roseville. All areas outside the existing Monitoring Entity boundaries are considered unmonitored; and

WHEREAS, Placer County is authorized to assume monitoring entity responsibility for monitoring and reporting groundwater elevations as part of the CASGEM program, as a "County Not Managing Groundwater Basin or Sub-basin" authority type; and

NOW, THEREFORE, BE IT RESOLVED AND ORDERED that the County of Placer, State of California, will serve as the voluntary "Groundwater Monitoring Entity" for the purpose of monitoring groundwater elevations within portions of the North American Sub-basin as defined in the Placer County CASGEM Monitoring Plan and in accordance with the CASGEM program guidelines dated November 2015.



SOURCE: Groundwater Basins from DWR Bulletin 118. Groundwater Management Plan Area boundaries from DWR Groundwater Information Center Map Interface (https://gis.water.ca.gov/app/groundwater/)

CASGEM Monitoring Network Placer County, California	GEI Consultants	Western Placer County Unmanaged "White Areas"
Placer County		NOVEMBER 2015

29-Oct-2015 Z:\Projects\1511870_PlacerCo\Fig2_WhiteAreas.mxd RS

ATTACHMENT 2

COUNTY OF PLACER
Community Development/Resource Agency

Michael J. Johnson, AICP
Agency Director

PLANNING SERVICES DIVISION

E.J. Ivaldi, Deputy Director

MEMORANDUM

TO: Mr. Mark Souverville, PG
California Department of Water Resources
North Central Region
3500 Industrial Blvd
West Sacramento, CA 95691

FROM: Michael J. Johnson, AICP
Agency Director

DATE: November 17, 2015

SUBJECT: **Notification to Become a Monitoring Entity, California Statewide Groundwater Elevation Monitor by Placer County, California**

Dear Mr. Souverville:

Placer County has prepared this letter to request becoming the Monitoring Entity for the California Statewide Groundwater Elevation Monitoring (CASGEM) for portions of Western Placer County (WPC). **Figure 1** shows the Subbasin outline and county boundaries.
Figure 2 shows five white areas, near the edges of the Sub-basin, which include south of the Bear River as it emerges from the foothills; near the town of Sheridan; Coon Creek vicinity; southeastern corner of the WPC within a portion of San Juan Water District Service area; and along the southern edge of Placer County adjoining with Sacramento County within a portion of the Citrus Heights Water District service area. Placer County, by this letter and attached documents along with DWR approval, will become the monitoring entity for these five white areas.

Table 1 provides required information to become a Monitoring Entity. Placer County states that it:

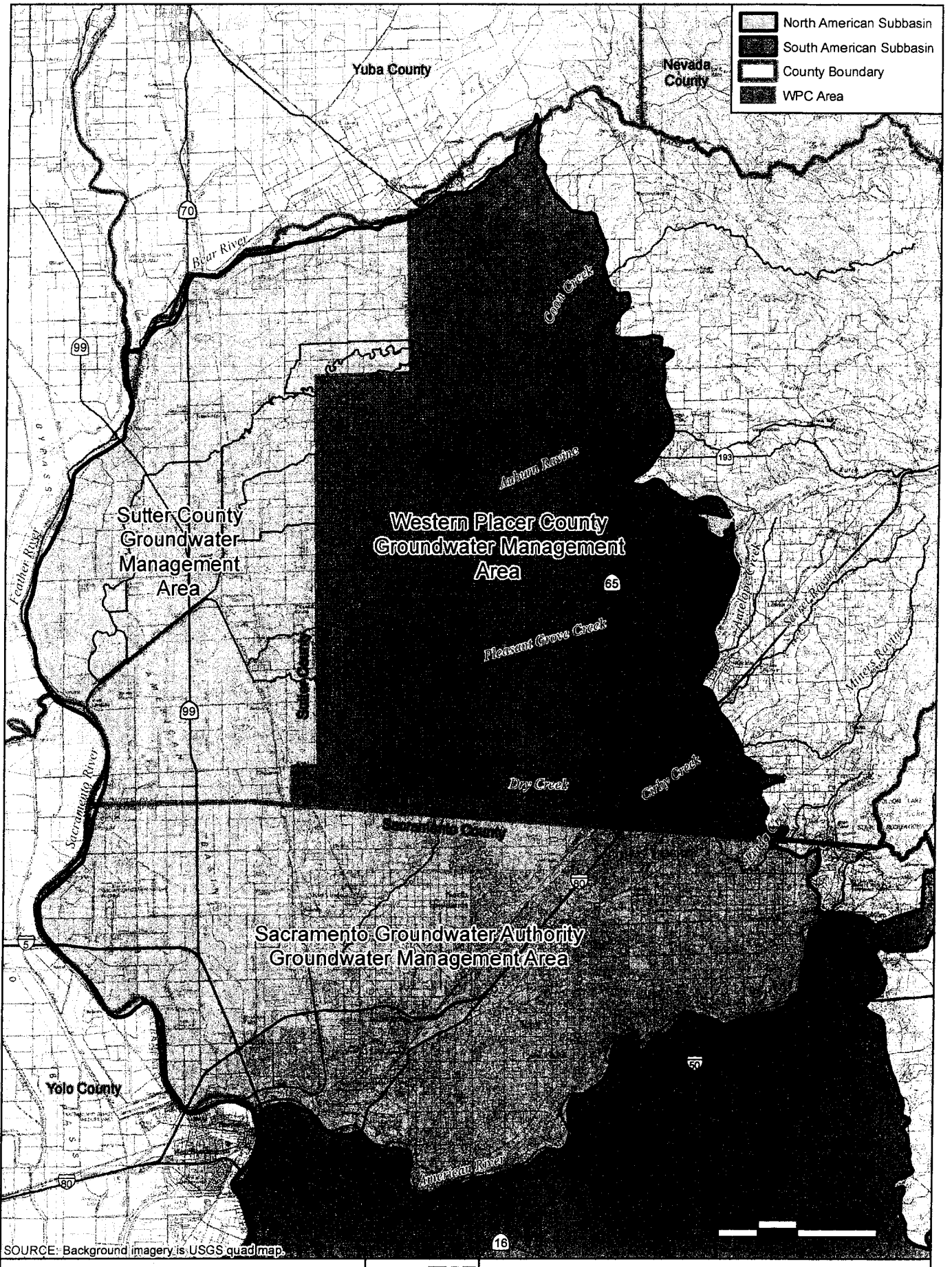
- Intends to comply with the requirements contained in Water Code Part 2.11.
- Has the ability to conduct the required groundwater monitoring functions. The County is currently listed as a Well Permitting Agency with the State of California.
- The County is eligible to be a monitoring entity. The County is not currently managing all or a part of a groundwater basin or sub-basin pursuant to a legally enforceable groundwater management plan, but is participating in the development of a Groundwater Sustainability Agency with a subsequent Groundwater Sustainability Plan.

Please call Brett Storey at (530) 745-3011 if you have any questions pertaining to this proposal.

Regards,

Michael J. Johnson, AICP, Agency Director

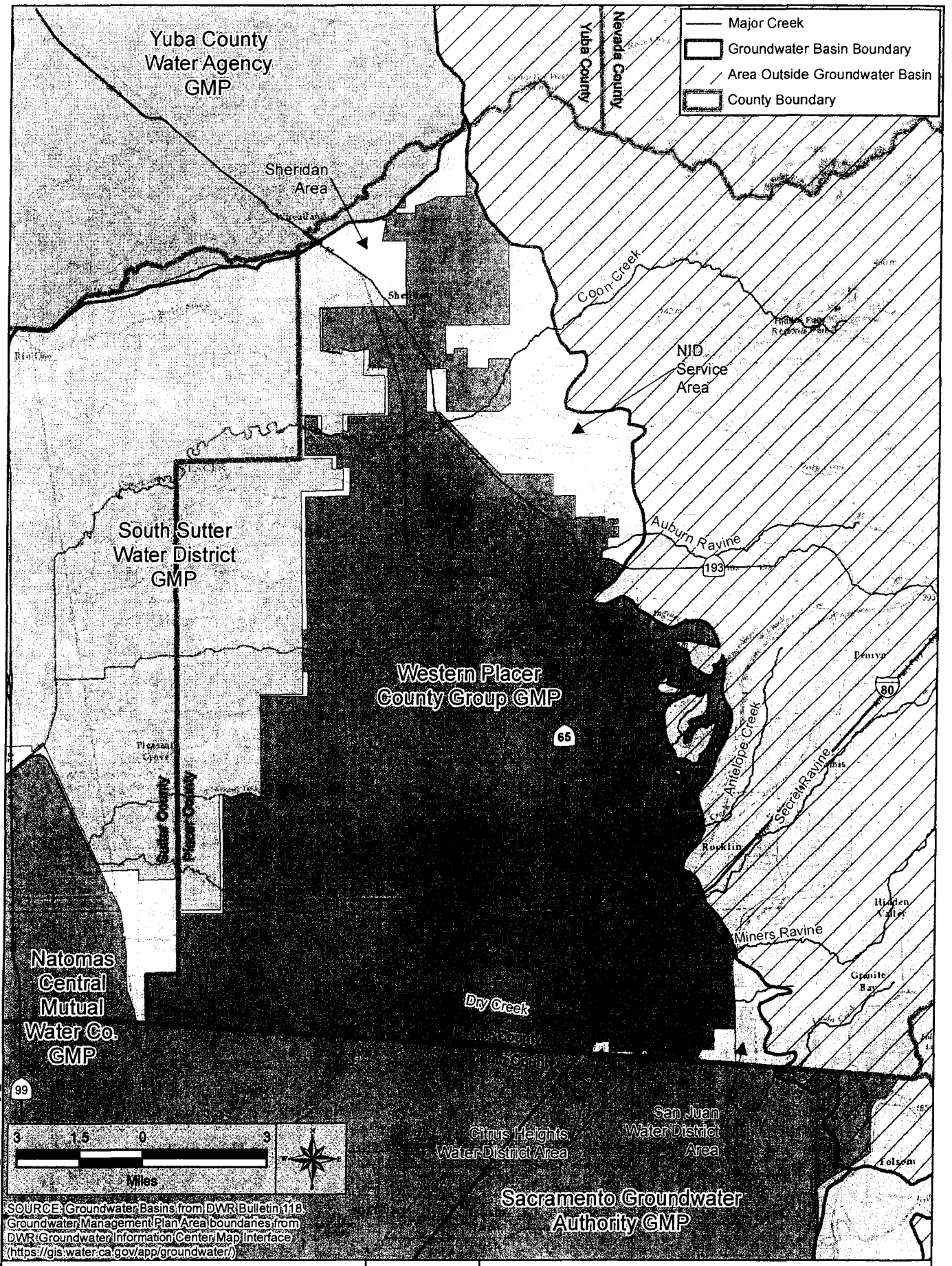
ATTACHMENT 3



SOURCE: Background imagery is USGS quad map.

CASGEM Monitoring Network Placer County, California	GEI Consultants	North American Groundwater Subbasin
Placer County	OCTOBER 2015	FIGURE 1

19-Oct-2015 Z:\Projects\1511870_PlacerCo\Fig1_NAmer_GWBasin.mxd RS



SOURCE: Groundwater Basins from DWR Bulletin 118; Groundwater Management Plan Area boundaries from DWR Groundwater Information Center Map Interface (https://gis.water.ca.gov/app/groundwater/)

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CASGEM Monitoring Network Placer County, California	GEI Consultants	Western Placer County Unmanaged "White Areas"
Placer County	OCTOBER 2015	FIGURE 2

DRAFT CASGEM Groundwater Monitoring Plan for Portions of Western Placer County

Submitted to:
Placer County

CASGEM Monitoring Entity

Placer County
Planning Department, Placer County
3091 County Center Drive
Auburn, CA 95603
Attention Mr. Brett Storey, Senior Management Analyst
Phone (530) 745-3011
Fax (530) 745-3080

Date: October 23, 2015
Project No: 1511870

ATTACHMENT 4

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Groundwater Monitoring Plan for Portions of Western Placer County

Certifications and Seals

This report and analysis were prepared by the following GEI Consultants Inc. professional geologists and certified hydrogeologists:

_____ Date:_____
David Fairman
California Certified Hydrogeologist No.1000

_____ Date:_____
Justin Crose
California Professional Geologist No. 9034

_____ Date:_____
Richard W. Shatz
California Certified Hydrogeologist No. 84

Introduction

This groundwater monitoring program was developed for portions of Western Placer County (WPC) not already covered by an existing groundwater monitoring entity (City of Roseville). This groundwater monitoring program describes the geologic conditions and the reason for monitoring, justification of the selected monitoring network, monitoring protocol, and monitoring frequency. These groundwater-level measurements will be used to assess the conditions of the commonly shared aquifers that extend from the Sierra Nevada foothills into the Sacramento Valley and are used by well owners in Placer, Sutter, and Sacramento counties. These aquifers are a resource that must be preserved for the long-term future of all parties.

1.1 Location

WPC lies within the North American Groundwater Subbasin (Subbasin) with a small portion in the Yuba Groundwater Subbasin. The Subbasin area is overlain by Sacramento, Placer, and Sutter counties. **Figure 1** shows the Subbasin outline and county boundaries. Groundwater in the Subbasin is being managed by the Sacramento Groundwater Authority (SGA), Sutter County, and the Western Placer County Groundwater Management Plan (WPCGMP) Partners, which includes the City of Roseville, the City of Lincoln, Placer County Water Agency (PCWA), and California American Water (Cal Am). South Sutter Water District (SSWD) also manages groundwater in the Subbasin although its service area lies in Sutter and Placer counties.

1.2 Background

On November 4, 2009, the California State Legislature amended the Water Code with SBx7-6, which mandates a statewide groundwater elevation monitoring program to track seasonal and long-term trends in groundwater elevations in California's groundwater basins. To achieve that goal, the amendment requires collaboration between local monitoring entities and the Department of Water Resources (DWR) to collect groundwater elevation data. Collection and evaluation of such data on a statewide scale is a fundamental step toward improving management of California's groundwater resources.

In accordance with this amendment to the Water Code, DWR developed the California Statewide Groundwater Elevation Monitoring (CASGEM) program. The intent of the CASGEM program is to establish a permanent, locally-managed program of regular and systematic monitoring in all of California's alluvial groundwater basins. The CASGEM program will rely and build on the many established, local long-term groundwater monitoring and management programs. DWR's role is to coordinate the CASGEM program, to work cooperatively with local entities, and to maintain the collected elevation data in a

readily and widely available public database. DWR will also continue its current network of groundwater monitoring as funding allows.

The law anticipates that the monitoring of groundwater elevations required by the enacted legislation will be done by local entities. The law requires local entities to notify DWR in writing by January 1, 2011, if the local agency or party seeks to assume groundwater monitoring functions in accordance with the law. The City of Roseville submitted its notification to DWR and became the CASGEM monitoring entity for most of Western Placer County.

In early 2014, DWR contacted the Western Placer County Groundwater Management Plan Partners and advised them that there are portions of WPC ("white areas") where groundwater monitoring needs to occur. **Figure 2** shows five white areas, near the edges of the Subbasin, which include: south of the Bear River as it emerges from the foothills; near the town of Sheridan; Coon Creek vicinity; southeastern corner of the WPC within a portion of San Juan Water District Service area; and along the southern edge of Placer County adjoining with Sacramento County within a portion of the Citrus Heights Water District service area. DWR informed the City of Roseville (the CASGEM monitoring entity for the WPCGMP area) that not having all of the area monitored could affect future grant funding for all agencies within Placer County. The City of Roseville discussed this issue with Placer County (County) and the County decided to become the reporting entity for these "white areas".

1.3 Goals and Objectives

The goal of this Groundwater Monitoring Plan is to provide DWR with sufficient information to allow them to approve Placer County as a monitoring entity for those portions of Placer County not currently within an existing plan's "white areas."

The objectives of this monitoring plan are to establish a groundwater monitoring network that will be used to characterize groundwater occurrence, flow direction, and recharge areas, and to provide a sound technical foundation for managing groundwater in the Subbasin. This plan will provide the necessary tools and procedures for Placer County to monitor groundwater levels in the "white areas."

2 Monitoring Network

The following sections describe the rationale for the selection of monitoring points to be included in the monitoring network.

2.1 Rationale

Groundwater within the Subbasin is influenced by groundwater pumping, subsurface inflow and outflow, recharge from deep percolation of irrigation water, and the rivers. Development of the monitoring network is intended to quantify the occurrence, level, gradient, and relationships of each aquifer. It is possible that some of the aquifers may be locally interconnected. The following sections describe the rationale for selecting the monitoring network by first describing the geologic conditions, definition of aquifers, and water quality.

2.1.1 Hydrogeology

The Sacramento Valley is a trough that is filled with layers of sediments. WPC overlies a small portion of the valley, along its eastern edge. The sediments depict a regional change in the depositional environments, from one dominated initially by marine to that of continental sedimentary processes. The deepest portions of the basin are filled with marine sedimentary rocks that still contain ancient sea water. These marine deposits (Central Valley Formation and Chico Formation) are typically not exposed at ground surface within WPC, but are locally present in the subsurface and underlie younger geologic formations. The marine sediments are overlain by younger, continentally derived sediments that have been grouped into the Younger Alluvium, Riverbank, Turlock Lake/Laguna, and Mehrten formations. These formations for the most part contain fresh (potable) water. During the transition from marine to continental environments, the Valley Springs and Ione formations sediments were deposited, which contain fresh and brackish water. Figure 3 shows the surficial distribution of these formations.

The following sections describe these formations (from youngest to oldest or shallowest to deepest). **Figures 3 through 8** show the surficial extent of these formations, geologic profiles, and the approximate extent of subsurface formations.

2.1.1.1 Younger Alluvium

The Younger Alluvium consists of stream channel deposits, undivided alluvium, and fan deposits. These deposits include flood basin deposits and recent stream channel deposits. The stream channel deposits include sediments deposited in the channels of active streams as well as overbank deposits of those streams. Stream channel deposits are present along Bear River, Coon Creek, and Doty Ravine. Well logs along Coon Creek show the alluvium to be a

maximum of 34 feet just after the creek enters the groundwater basin (Jones & Stokes, 2001). The alluvial aquifers are unconfined and highly permeable.

Along Bear River, "historical" deposits, those deposited since 1849, are present (URS 2009). It appears these deposits are mining debris that were washed out of the Sierra Nevada Mountains during hydraulic placer mining. These sediments are quartz rich and may be up to 9 feet thick near the Highway 65 crossing of Bear River. Dredge tailings are present along Coon Creek and Doty Ravine near the edge of the Subbasin.

2.1.1.2 Riverbank Formation

The Riverbank Formation is comprised of alluvial fan deposits composed of Sierra Nevada Mountain (Sierran) sourced loosely consolidated gravel, sand, and silts. The Riverbank Formation has an estimated thickness of 50 to 200 feet (DWR, 2006). For most of WPC these deposits are predominately fine grained in the western portion of the area and are coarser grained in the eastern portion of the basin. For the most part, groundwater in these sediments is not used for water supply due to their low yields.

As shown on **Figure 3** the Riverbank Formation is exposed throughout most of the northern "white areas"; however, as shown on **Figures 4 and 5** the Riverbank Formation may rest directly on the Ione Formation.

2.1.1.3 Turlock Lake/Laguna Formation

The Turlock Lake/Laguna Formation is also comprised of Sierran sourced, consolidated alluvial deposited gravel, sand, and silts, which consists of predominantly reworked granitic and metamorphic rocks. Estimates of formation thickness in outcrop range from 125 feet to 200 feet in Sacramento County (DWR, 1974). The Turlock Lake/Laguna Formation is characterized as being moderately consolidated and being poor-to-moderately cemented. Because of this, the formation generally has a low-to-moderate permeability. Wells that have been completed in this formation have been observed to yield only moderate quantities of water (DWR, 2006). These aquifers are generally considered to be unconfined in the eastern portions of WPC and transition to semi-confined in the west.

Near the base of this formation there is a relatively thick clay bed that thickens to the west and thins to the east. In the eastern portion of WPC the bed is absent.

The lower portion of the Turlock Lake/Laguna Formation is a gradational contact with the underlying Mehrten Formation. This zone has been named the Laguna/Mehrten Transition Zone (Schlemon, 1967) or for purposes of this report the Transition Zone. In this zone, volcanic sediments of the Mehrten Formation are interbedded with the non-volcanic Turlock Lake/Laguna Formation sediments. These sediments typically result in moderate-to-high yielding wells.

2.1.1.4 Mehrten Formation

The Mehrten Formation consists of a sequence of volcanic rocks. In the subsurface, the Mehrten Formation ranges in thickness from 200 to 1,200 feet along the axis of the Sacramento Valley (DWR, 2006). The Mehrten Formation is comprised of two distinct geologic units, the Upper Mehrten Formation and the Lower Mehrten Formation.

The Upper Mehrten Formation consists of gravels and well sorted black andesitic sands, reported by well drillers as "black sands," and interbedded blue-to-brown silts and clays (DWR, 1974). The sands and gravels are highly permeable and wells constructed within this unit can produce 1,000 gallons per minute (gpm) or more (DWR, 2003).

The Lower Mehrten Formation, which is present in the "white areas" consists of dense volcanic tuff breccias with interbedded conglomerates and sandstones. These consolidated and cemented materials may act as confining layers to the underlying sand intervals. The underlying sand and gravel portions of this unit are highly permeable and wells constructed within this unit have been observed to produce yields exceeding 2,000 gpm.

Both the Upper and Lower Mehrten Formation coarse-grained sediments (aquifers) are unconfined to semi-confined in the eastern portions of WPC and transition to semi-confined to confined in the western portions of the area. The Upper Mehrten Formation aquifer appears to be locally semi-confined to confined due to the presence of clayey sediments in the basal portions of the Laguna and Upper Mehrten formations. The Lower Mehrten Formation aquifer appears to be more confined due to the presence of consolidated and cemented volcanic flows. Regionally, the aquifers are likely more confined to the west as the clay layer and cemented volcanic flows thickness increases.

Mehrten Formation sediments are present near Highway 65 just south of the Coon Creek vicinity "white area," as shown on **Figure 3**, and appear to be the lower portion of the formation as Ione sediments are present in the nearby mine pits of Gladding McBean. Mehrten Formation sediments were identified from well logs to be present at depth beneath Sheridan and continuing to near the groundwater basin boundary near Bear River. **Figure 4** shows the dipping relationship of the Mehrten formation and **Figure 7** shows the approximate extent of the Mehrten Formation in the subsurface.

2.1.1.5 Valley Springs Formation

The Valley Springs Formation consists largely of white to olive, stream-laid tuff, sand and beds of clay (DWR, 1978). Yields from wells are generally low. The formation is relatively thin and has only been identified at a few locations in WPC. For the most part, it appears to have been eroded away by the Mehrten Formation sediments allowing the Mehrten Formation to rest directly on top of the Ione Formation.

2.1.1.6 Ione Formation

The Ione Formation typically contains brackish water, but locally it may have been flushed and can contain fresh water. This formation is important because groundwater in the Ione Formation is typically at higher heads than the overlying Mehrten Formation and could up-well and degrade water quality in the overlying fresh water formations.

The Ione Formation underlies the Mehrten Formation and is exposed north of Lincoln (in the mine pits of Gladding McBean) and along the upper reaches of Coon Creek "white area" in small exposures that do not show on the geologic map presented on **Figure 3**. In the southeastern "white area" the Ione Formation has a large enough exposure to be shown on the geologic map of this area, as shown on **Figure 8**. Geologic sections shown on **Figures 4, 5, and 6** show the locations of the Ione Formation exposures, but it should be noted that the outcrops within the northeast "white areas" are not shown, generally because of the small size of the exposure and the scale of the map.

The Ione Formation is divisible into three distinct members, only the upper two of which are exposed in the valley. The uppermost member of the formation is composed principally of white, medium to coarse-grained quartz sandstone. The second member is a thick, white clay of ceramic quality. The lower member is a blue to gray clay with occasional seams of brown coal. The base of the formation is frequently a zone of gravel composed of quartz and metamorphic fragments. Wells penetrating into this formation typically yield water with high chloride and total dissolved solids (TDS) concentrations. In the eastern portion of the valley where the Ione was deposited under near-shore or on-shore conditions the formation yields fresh-to-brackish water to wells. Yields to wells are low.

2.1.1.7 Older Marine Sediments

Underlying the Ione Formation is the Chico Formation. The Chico Formation consists of consolidated claystone and siltstone marine sediments may locally contain fossiliferous beds. It is not considered to produce economic quantities of groundwater. Chico Formation has been identified beneath the northeastern portions of the "white area" near Coon Creek and is shown in **Figures 4 and 5** (Jones & Stokes, 2001). An east-west trending subsurface ridge of these sediments appears to be present just south of Wise Road, as interpreted from well logs as shown in **Figure 6**. These older marine sediments are not exposed at ground surface, but underlie the soils in this area.

2.1.1.8 Bedrock

Bedrock in the area consists of Copper Hill volcanic and granitic rocks. These rocks produce limited quantities of groundwater. The bedrock is exposed in the Sierra Nevada foothills to the east of the Subbasin and underlie the Subbasin. In the Coon Creek "white area" many irrigation and domestic wells were drilled through the overlying unsaturated Riverbank, Turlock Lake/Laguna formations and through the Ione Formation to obtain water from the

granites. In the southeast "white area" the granitic rocks are exposed at ground surface within the Subbasin and extend beneath the Subbasin to the west.

2.1.2 Aquifers

Sand and gravel beds are generally grouped together to form aquifers that may display similar characteristics. The aquifers may be separated by single or multiple clay layers (or aquitards) that can slow or prevent vertical movement of groundwater between aquifers. Near the fringes of the basin, as covered by this plan, they may be interconnected. As they extend to the west the aquifers may become more confined and separated by clay layers.

In the northern portion of WPC, Younger Alluvial sediments associated with the Bear River and Coon Creek are capable of transmitting and conveying groundwater into the underlying permeable coarse-grained sediments of the Riverbank, Tulare Lake/Laguna, and Mehrten Formations; however, for the most part Coon Creek is incised into the Ione that does not readily convey water. It is not until about one mile east of old Highway 65 that the Riverbank, Tulare Lake/Laguna, and Mehrten Formation sediments are present where Coon Creek can recharge these formations as shown on **Figure 4**.

A detailed study of the Coon Creek area showed the creek has incised through the Riverbank Formation so that is above the invert of the creek. In the vicinity of Coon Creek starting about one-mile east of Highway 65 the Riverbank Formation is unsaturated or may contain perched water. Seeps are common at the contact of the Riverbank and Ione formations due to deep percolation of water applied for crops and from septic systems through the Riverbank Formation (Jones & Stokes, 2001).

Therefore, monitoring of groundwater levels in the northern "white areas" more than one mile east of old Highway 65 are likely to detect perched groundwater on top of the Ione or Older Marine formations. **Figure 8** shows the approximate subsurface contact of the Ione and Mehrten formations, where to the east of the contact the Riverbank, Tulare Lake/Laguna will likely contain perched water and where to the west of the contact saturated Riverbank, Tulare Lake/Laguna and Mehrten Formation sediments (aquifers) may be present and be representative of groundwater conditions in the Subbasin. Therefore, monitoring of groundwater levels east of the contact is not recommended as they would not be representative of groundwater conditions within the Subbasin.

2.1.3 Groundwater Quality

Groundwater in the Younger Alluvial, Riverbank, Tulare Lake, Laguna, and Mehrten Formation aquifers typically contain groundwater that is good quality and meets most drinking water standards (GEI, 2015 unpublished). The Ione Formation underlying these aquifers may locally contain fresh water with total dissolved salt (TDS) concentrations ranging from as little as 300 mg/L TDS to as high as 3,400 mg/L. Sour odors from the groundwater have been reported from groundwater in this formation. Because some portions

of the Ione Formation contains fresh water it is likely connected to the Mehrten Formation and flow-through has allowed the flushing of the brackish water and replacement with fresh water. North of Lincoln, wells often have higher TDS concentrations when they have been drilled close to or have encountered this formation. Ione Formation is also present in the southeastern "white area" area, but its water quality is unknown.

2.2 Monitoring Network

Four of the "white areas" (three northeastern areas, southeastern area) are located around the fringes of the Subbasin where the sediments are the thinnest and the underlying older marine and bedrock are near surface. In general, the Younger Alluvium is present along Bear River and Coon Creek and could recharge aquifers that extend westward into the Subbasin. Alluvium in these creeks should be monitored, especially west of the subsurface contact with the Mehrten Formation as shown on **Figure 7** to assess surface water/groundwater interaction. The Riverbank, Turlock Lake/Laguna, and Mehrten formations are the predominate water bearing formations within WPC and need to be monitored. The Ione Formation has variable water quality and at many locations contains high salt concentrations that makes the water unusable without treatment. The Ione Formation because it is in hydraulic communication with the predominant aquifers that can be a source of poor quality water to these otherwise high-quality water containing aquifers and should be monitored. The southern "white area" is within the Subbasin where greater thickness of the Riverbank, Turlock Lake/Laguna, and Mehrten formations are present. The following sections describe the selection of wells in each of these five "white areas" to establish the Placer County CASGEM monitoring network.

The most desirable wells to be included in the monitoring network are wells with short screen intervals completed within a single aquifer system. However, some wells with longer screen intervals may need to be included initially in the network to provide regional representation of the groundwater level and water quality. Data obtained from the longer screen wells usually represent an aggregate of water quality from two or more aquifers. These wells with longer screen intervals should be replaced with wells with shorter screen intervals to improve the monitoring network.

A search for potential monitoring wells was performed by a review of: Placer County owned facilities including fire departments, cemetery districts, wastewater treatment plants, and municipal water supply systems (Sheridan); Geotracker website; DWR well logs acquired in 2007; the Water Data Library for historically monitored wells; Placer Land Trust properties, Final Environmental Impact Reports; levee investigations along the Bear River, and; Sacramento Groundwater Authority. Wells considered for monitoring purposes had to have a well log that allowed definition of the geologic formation where the groundwater was derived and be locatable. **Figures 9 and 10** show the wells considered to develop the County's CASGEM monitoring network.

The County owns several properties in the "white areas." A review of these properties was conducted to assess if wells were present, their condition for access to measure groundwater levels, and whether well logs were available for these wells. The County owns municipal water wells that serve the town of Sheridan. One older well (Old Well #2), is solely used for emergency water in the case of fires and therefore is rarely used. The well obtains water from the lower Laguna and Mehrten aquifers and could be used to assess effects of pumping for the town's water supply. This well was selected for monitoring. Placer County Cemetery District No. 1 has a well outside of the Sheridan "white area," but it would be useful to define the extent of any pumping depression associated with the municipal pumping in Sheridan. The well is only used to irrigate the cemetery twice per week. This well was selected for inclusion as a monitoring well **and the well log was located**. Monitoring wells were constructed for the County's Sheridan wastewater treatment plant and recycled water disposal area. MW-1 and MW-3 are located at the edge of the Sheridan "white area" and was selected to monitor the Riverbank Formation and to provide vertical gradients when associated with Old Well #2. No other County-owned wells were found within the "white areas."

The Placer Land Trust owns and maintains two ecologic preserves near the northern "white areas." One well is present near the edge of the Subbasin alongside of Doty Ravine. A well log could not be located for the Doty well. The Swainson well is located at the edge of the Coon Creek "white area" **and the well log was located**. Only the Swainson well was selected for monitoring as it is just west of the subsurface contact of the Mehrten Formation and would be representative of groundwater levels within the Subbasin.

Groundwater level monitoring is also being performed in the area due to the release of contaminants. These facilities area required to monitor groundwater levels and quality on a quarterly basis by the Central Valley Regional Water Quality Control Board (CVRWQCB). The Alpha Explosives facility is located on the north side of Coon Creek, within one mile of old Highway 65. However, most of these monitoring wells are outside of the "white areas" and were not considered further for monitoring. MW-16 is located at the edge of the Coon Creek "white area" and was selected for monitoring. One property (Walker) within the southeastern "white area," but the monitoring well was monitoring groundwater within decomposed granite. This well was no longer considered.

Investigation for wells in the southern "white areas" did not locate any County-owned properties or monitoring wells required by the CVRWQCB to be monitored. The Sacramento Groundwater Authority constructed a multi-level monitoring well adjacent to the southern area near Highway 80 and would be representative of groundwater conditions for this "white area." This well is planned to become part of the City of Roseville's CASGEM monitoring network. No wells are present in the southern area for Placer County to monitor.

The levee investigation along the Bear River did not construct any monitoring wells within the northern "white areas."

DWR has historically monitored groundwater levels in nine privately owned wells the "white area" in the northeastern portions of WPC; however, groundwater levels in only one well have been monitored since 2004 and most wells have not been measured since 1984 or earlier. A search for well logs to confirm their construction details and the formations monitored was performed to assess whether any of these wells could be viable for monitoring. The review found that no well logs were present for these wells and therefore they were not included as part of the County's monitoring network.

A review of Water Well Drillers Reports (well logs) showed about 30 wells that are locatable within the northern "white areas" as shown on **Figure 3**. The sediment were reviewed to attempt to assign geologic formations to the sediments encountered. Only four well logs were found in the northern "white areas" that could clearly be correlated to the potential formations and were progressed forward to speaking with the well owners to request permission to release their well construction details and to allow the County to measure groundwater levels. The Spencer and Thompson wells were selected to help limit the extent of any potential groundwater pumping depression associated with the town of Sheridan's municipal pumping from the Turlock Lake/Laguna and Mehrten Formations. The Carlson-Strawn well also was selected to monitor the Mehrten Formation near the edge of the subbasin. The Gove and Berry wells were selected to monitor the Ione Formation and assess the Ione Formation water quality. One well log was located in the southeastern "white area," but the well was constructed in 1945 to 45 feet and, based on a field canvas of the area, is no longer present. Sacramento Groundwater Authority has dedicated monitoring wells just south of this area which could be relied upon for this southeastern area.

Tables 1 and 2 identify groundwater wells selected for Placer County's CASGEM groundwater monitoring network and wells that could be incorporated into the network once land owner permission has been acquired. These tables also provide well construction details, locations, and the aquifer(s) monitored. **Figure 11** shows the location of the selected CASGEM monitoring wells and their relationship to other existing monitoring wells in Western Placer County. **Table 3** provides a sorting of monitoring wells by aquifer monitored for the entire Western Placer County.

If at any time in the future potentially important wells are discovered or constructed, the monitoring program should be updated to include such wells. Should additional wells become available, **Tables 1 and 2** should be updated.

2.3 Data Gaps

The groundwater monitoring network as it evolves should include additional monitoring wells to assess:

- Groundwater recharge from the Bear River. Ideally this would consist of two dedicated monitoring wells located along a line perpendicular to the river. The

monitoring wells should be separated by about 50 to 200 feet to assess the recharge mound height to develop a gradient. If at all possible, one of the monitoring wells would be a multi-level monitoring well, constructed to monitor groundwater levels in the recent sediments and one in the deeper sediments (potentially the Turlock Lake/Laguna or Mehrten Formation) to assess whether recharge is reaching these deeper aquifers.

Well logs for two of the proposed monitoring wells listed in the tables, the Cemetery and Swainson wells, have not been located. Attempts to locate these wells should continue. If they cannot be located new wells may have to be selected.

In addition to this information, water well drillers should be required as part of their Water Well Drillers Report submittal to provide the color of the sediments. This may help to assign formation names to the sediments encountered.

3 Monitoring and Reporting Frequency

The following sections describe the frequency for monitoring and reporting. Specific methods and procedures are described in Section 5.

3.1 Groundwater Levels

Groundwater levels from all wells listed in **Tables 1 and 2** shall be measured in March, September, and October. High groundwater levels in the area have historically been observed in March where the groundwater lows are typically present in August to September. For consistency purposes DWR typically requests monitoring in the spring and fall of each year, somewhat dependent on the type of water year and when highs and lows have been measured. In the last few years requests have been made to monitor in March and October to evaluate change in groundwater storage. Groundwater monitoring for regulatory purposes (MW-1, MW-3 and MW-16) is done quarterly, typically in March, June, September and December. If possible, the City should coordinate with other participating agencies to make groundwater level measurements on the same day, but at no time should the measurements be taken exceeding a one-week period. The frequency of monitoring may be more frequent due to special conditions or study requirements.

3.2 Reporting

The County will post the groundwater level measurements to the CASGEM website by April 1 and November 1 of each year or as directed by DWR.

Because some of the groundwater level measurements are being taken for compliance purposes and that those measurements are not required to be reported to the regulatory agency until 30 days after the end of each quarter, some reporting of the measurements to DWR may not occur until three months after the monitoring has occurred. Also measurements may not occur specifically during the months requested by DWR.

The County shall be responsible for also sharing the groundwater level measurements with other stakeholders in the groundwater basin to develop a region-wide analysis of groundwater conditions.

The measurements will also be used to report to DWR on an annual basis for two years starting in 2022 and every five years thereafter to demonstrate the groundwater basin is being managed sustainably.

4 Project Organization and Responsibility

The designated contact for making decisions regarding the County's CASGEM monitoring network is Brett Storey, Senior Management Analyst, Planning Department, Placer County. The County will plan, organize, collect, and archive the groundwater level measurements. The following is a summary of the monitoring and reporting responsibilities under this plan.

The County's personnel are responsible for the following:

- Coordinating monitoring and sampling schedules so that all activities scheduled for a particular month occur within the same week.
- Scheduling equipment needed for monitoring.
- Measuring and recording groundwater levels.
- Reporting the measurements to the CASGEM website.
- Revising the groundwater monitoring network on the CASGEM website as additional monitoring wells become available.
- Oversight of quality assurance/quality control (QA/QC) sampling and monitoring methods and procedures.
- Distributing the results to the Groundwater Sustainability Agency, once it is formed, and other stakeholders in WPC.

5 Groundwater Level Monitoring

Groundwater levels shall be measured in all wells designated for groundwater level monitoring (**Tables 1 and 2**) in March, September, and October. This schedule is proposed to correlate with DWR requested monthly monitoring events and to provide complete coverage when private parties are required to monitor for compliance purposes. The August monitoring event is to correspond to the lowest groundwater levels within the County. County personnel should arrange to make groundwater level measurements on the same day, but at no time should the measurements be taken after a one-week period.

5.1 Preparation for Field Work

Prior to collecting groundwater level and conductivity measurements and before going to the field, sampling personnel shall clean, maintain, and test the water level sounder and calibrate the EC meter using appropriate standards.

The sampling personnel will assemble the following equipment and supplies:

- Copy of the Groundwater Level Measurements forms contained in **Appendix A**
- Copy of **Figure 11**, Monitoring Network Location map
- Electrical water level sounder
- Crescent wrenches for gaining access to the well
- Ballpoint pen and clipboard
- Paper towels
- Bleach
- Spray bottles
- Distilled water

Prior to collecting groundwater level and before going to the field, sampling personnel shall clean, maintain, and test the water level sounder.

5.2 Monitoring Procedures

The following procedures shall be used to measure the depth to water at each designated monitoring well. Water levels measurements will be collected to assess the groundwater flow direction to develop trends that can lead to improved management of the groundwater resources.

5.2.1 Groundwater Level Measurements

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.

Each well has been assigned a unique identification number and a common name. The numbers and names for each well to be monitored are listed on **Tables 1 and 2**. The Groundwater Level Measurement forms (Forms) contained in Appendix A will be used to record all groundwater level measurements.

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 either a beeping sound or light, depending on the type of signal installed for that particular model. At this point, the sampling personnel will note the depth to water (to the nearest 0.01 foot) 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 Forms, 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).

Should access to the well to measure groundwater levels be prevented, use the codes listed on the bottom of the forms to provide a reason why the measurement could not be collected and/or the reason that the measurement may be questionable. Insert these codes into the Comments portion of the Form.

6 Quality Assurance

After field personnel have completed their work, they shall enter the data into an electronic spreadsheet or database. The managers shall review groundwater level measurements for accuracy within five days of obtaining the measurements. Should a measurement appear suspicious, a confirmation reading shall be obtained.

6.1.1 Groundwater Level Measurements

After field personnel have completed their work, they shall enter the data into an electronic spreadsheet or database. The managers shall review groundwater level measurements for accuracy within five days of obtaining the measurements. Should a measurement appear suspicious, a confirmation reading shall be obtained.

6.1.2 Annual Groundwater Level Sounder Calibration

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. The water level sounder shall be laid out and compared with a steel tape and the results documented annually. Alternatively, a new and factory calibrated water level sounder can be inserted into a well and groundwater level measuring devices used by other parties can be placed into the well and the measurements compared to assess if the water level sounders are producing similar measurements. Any differences in the measurements will be recorded and any measurements correct for the difference before entering into the CASGEM database. When calibration measurements show that the measurements are greater than 0.10 feet off in 100 feet, the cable shall be replaced.

7 References

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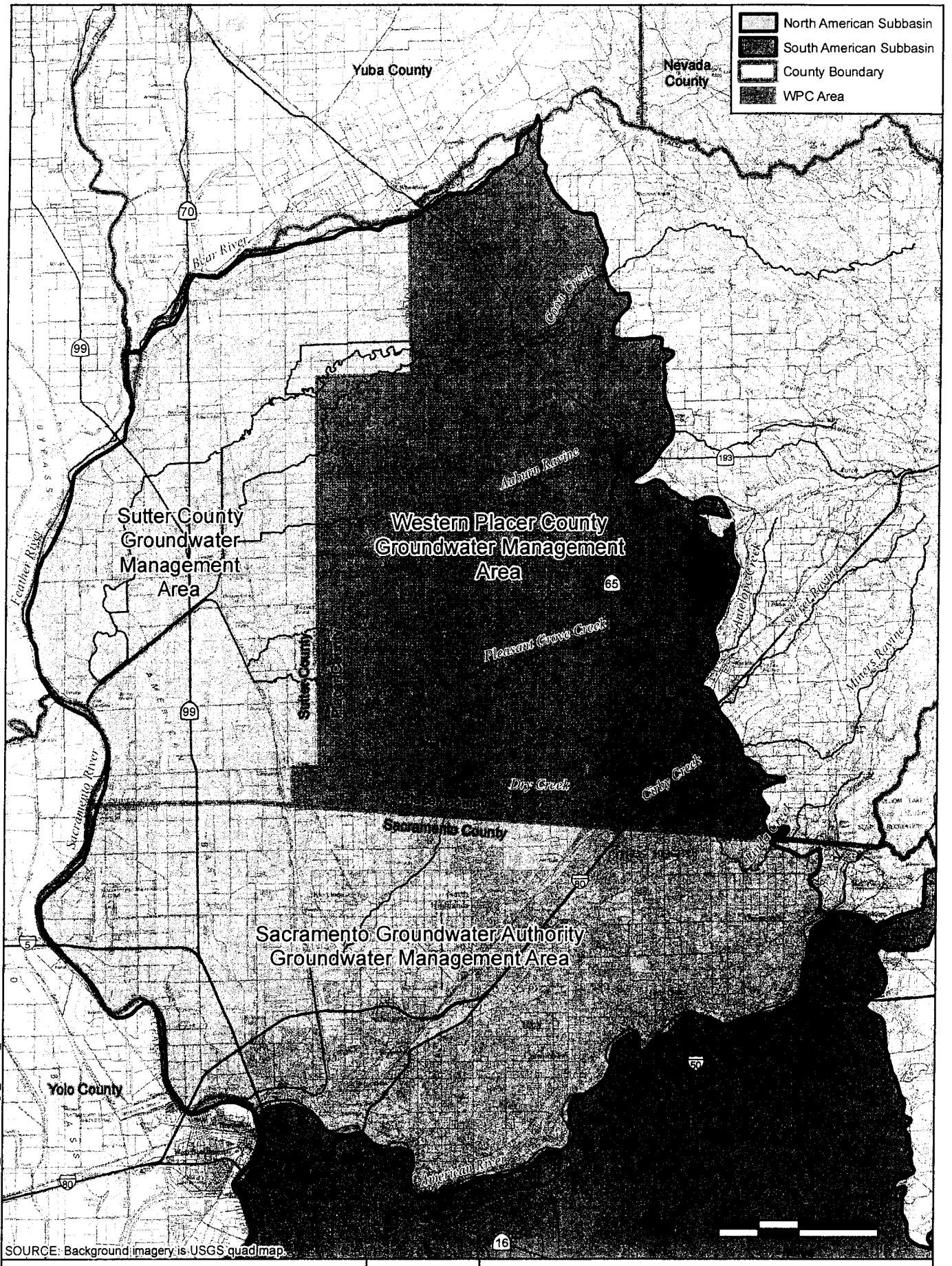
URS, 2009. North Non-Urban Levee Evaluations, Geotechnical Assessment Report, RD1001 Units 3 and 3A.

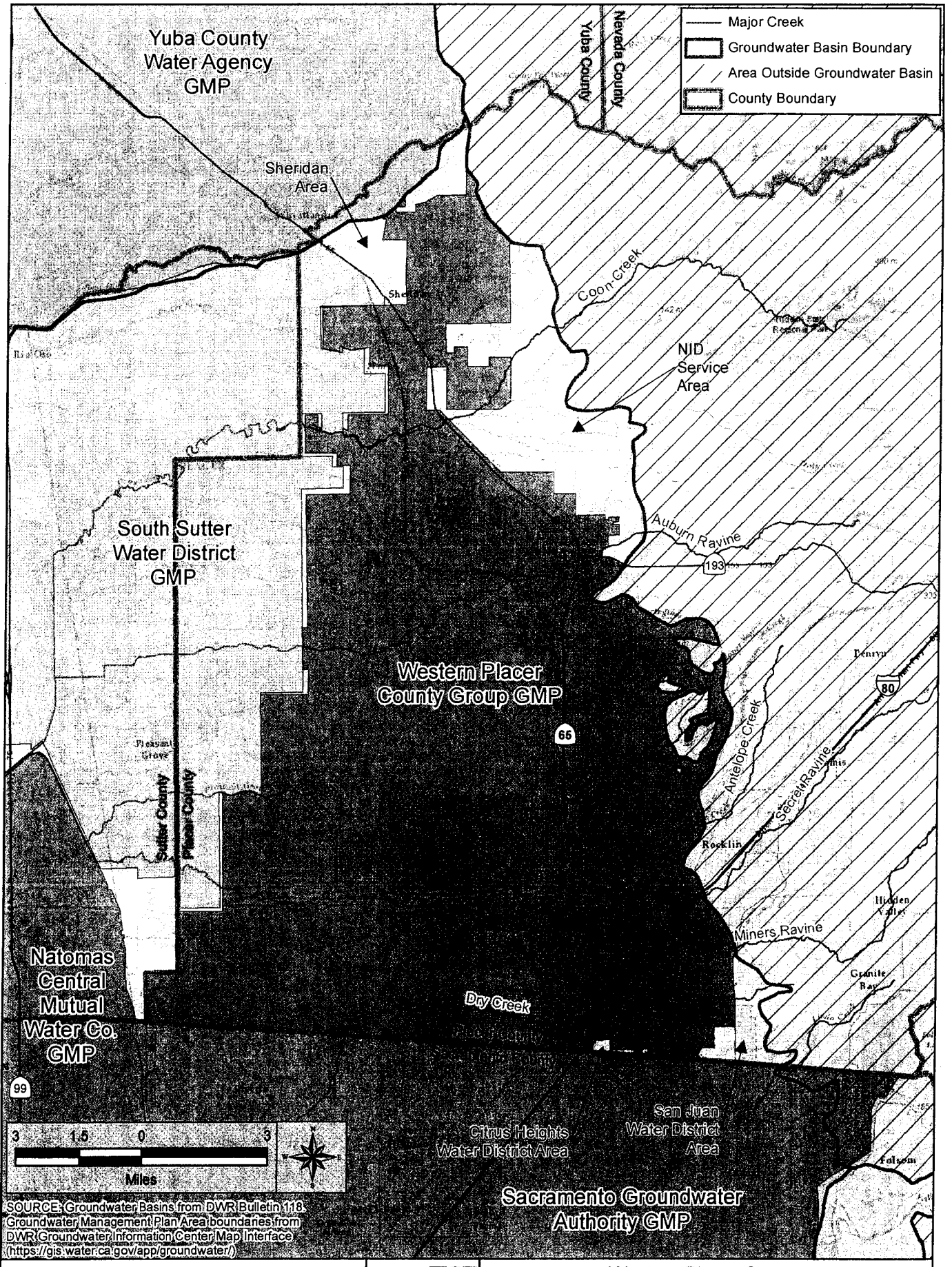
Figures



SOURCE: Background imagery is USGS quad map.

CASGEM Monitoring Network Placer County, California	GEI Consultants	North American Groundwater Subbasin
Placer County	OCTOBER 2015	FIGURE 1

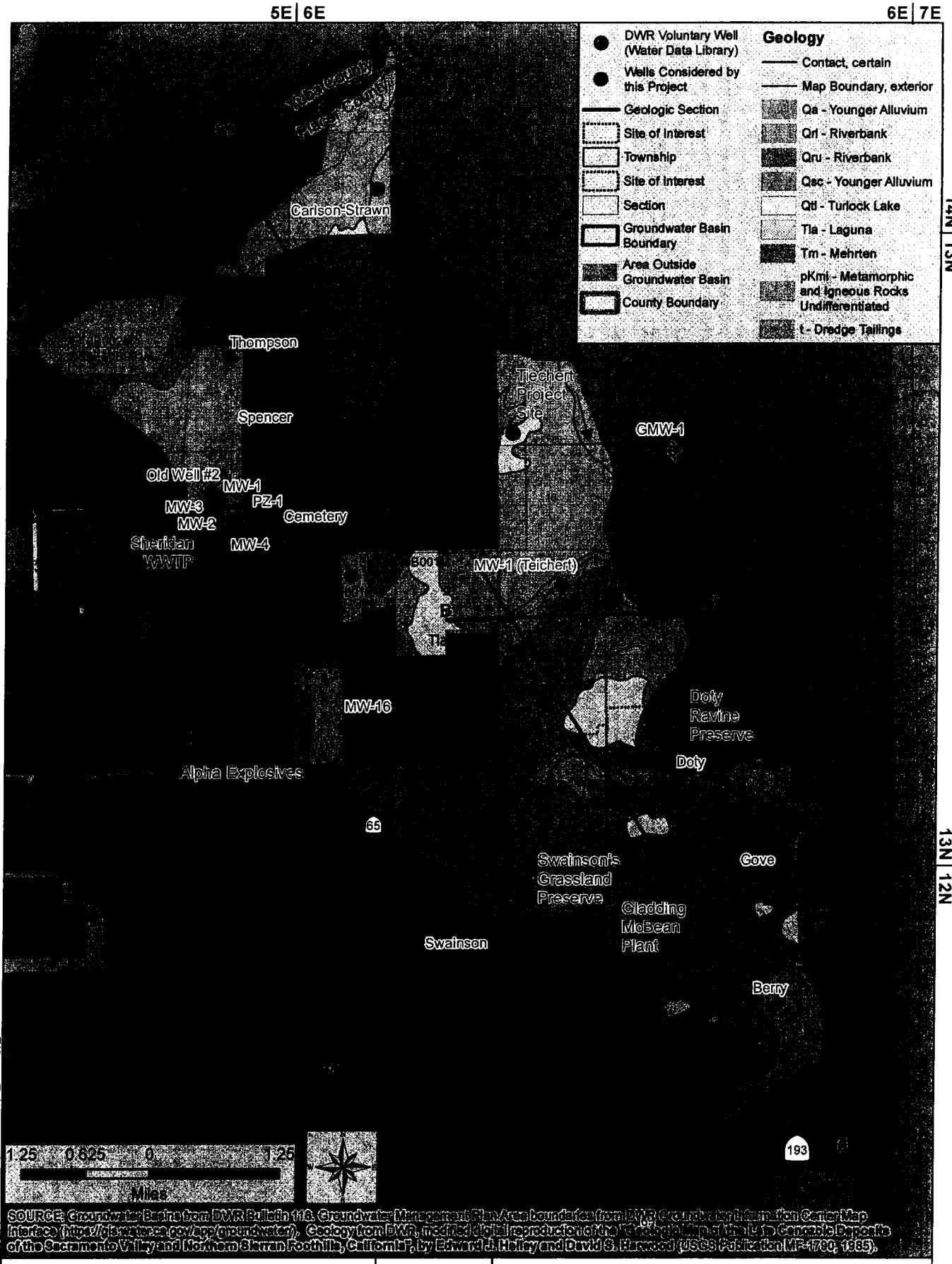
19-Oct-2015 Z:\Projects\15111870_PlacerCo\Fig1_NAmer_GWBasin.mxd RS



SOURCE: Groundwater Basins from DWR Bulletin 118. Groundwater Management Plan Area boundaries from DWR Groundwater Information Center Map Interface (https://gis.water.ca.gov/app/groundwater/)

CASGEM Monitoring Network Placer County, California	GEI Consultants	Western Placer County Unmanaged "White Areas"
Placer County	OCTOBER 2015	FIGURE 2

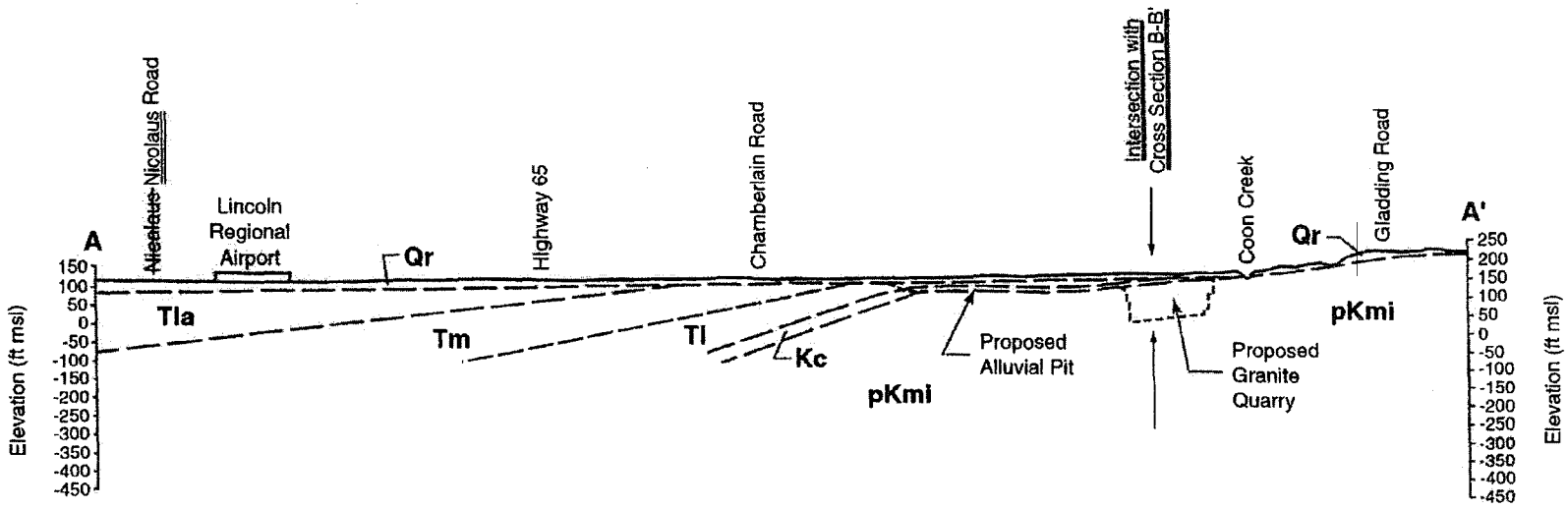
19-Oct-2015 Z:\Projects\1511870_PlacerCo\Fig2_WhiteAreas.mxd RS



SOURCE: Groundwater Basins from DWR Bulletin 118. Groundwater Management Plan Area boundaries from DWR Groundwater Information Center Map Interface (https://gis.water.ca.gov/app/groundwater). Geology from DWR, modified digital reproduction of the "Geologic Map of the Late Cenozoic Deposits of the Sacramento Valley and Northern Sierran Foothills, California", by Edward J. Helley and David S. Harwood (USGS Publication MF-1790, 1985).

CASGEM Monitoring Network Placer County, California	GEI Consultants	Geologic Setting for Northern "White Areas"
Placer County, California		OCTOBER 2015 FIGURE 3

19Oct2015 Z:\Projects\1511870_PlacerCo\Fig3_Geology_Northern.mxd RS



Hor: 1" = 5,000'
Vert: 1" = 500'
Scale in Feet

0 2,500 5,000 10,000

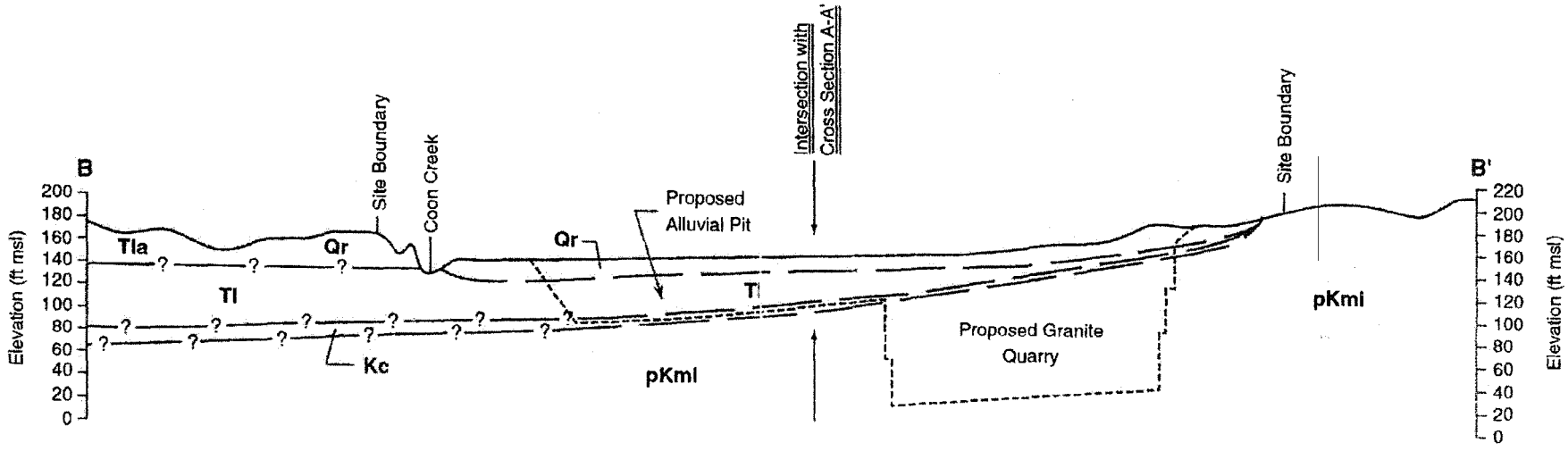
Vertical Exaggeration = 10 to 1

Legend

Qr	Riverbank Formation
Tla	Laguna Formation
Tm	Mehrten Formation
Tl	Ione Formation
Kc	Chico Formation
pKmi	Basement complex (Mesozoic granitic rock and Copper Hill Volcanics)

Source: Jones & Associates, Inc., 2001.

	Placer County CASGEM Monitoring Network	GEI Consultants	Geologic Cross Section A-A'
	Placer County		October 2015 Figure 4



Hor: 1" = 1,500'
Vert: 1" = 150'
Scale in Feet

0 750 1,500 3,000

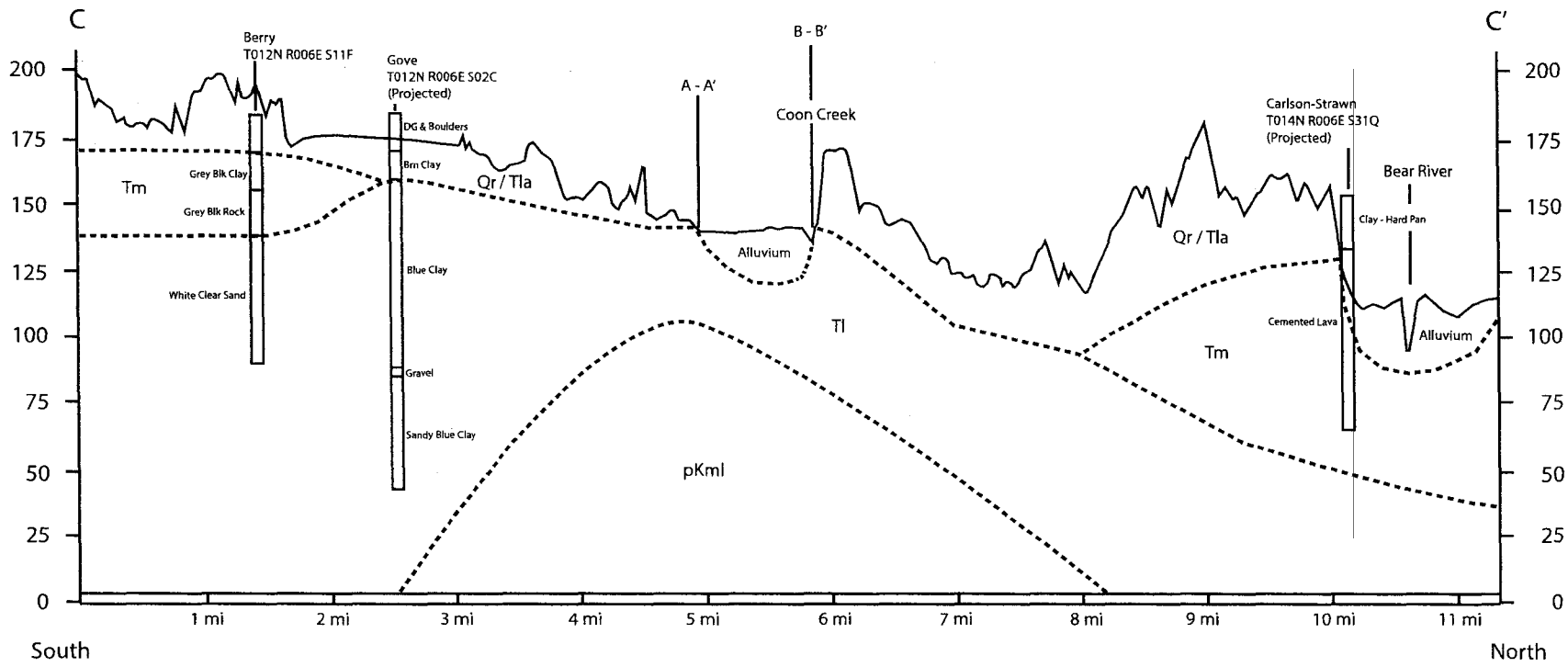
Vertical Exaggeration = 10 to 1

Legend

Qr	Riverbank Formation
Tla	Laguna Formation
Tl	Ione Formation
Kc	Chico Formation
pKml	Basement complex
— ? —	Assumed boundary

Source: Jones & Associates, Inc., 2001.

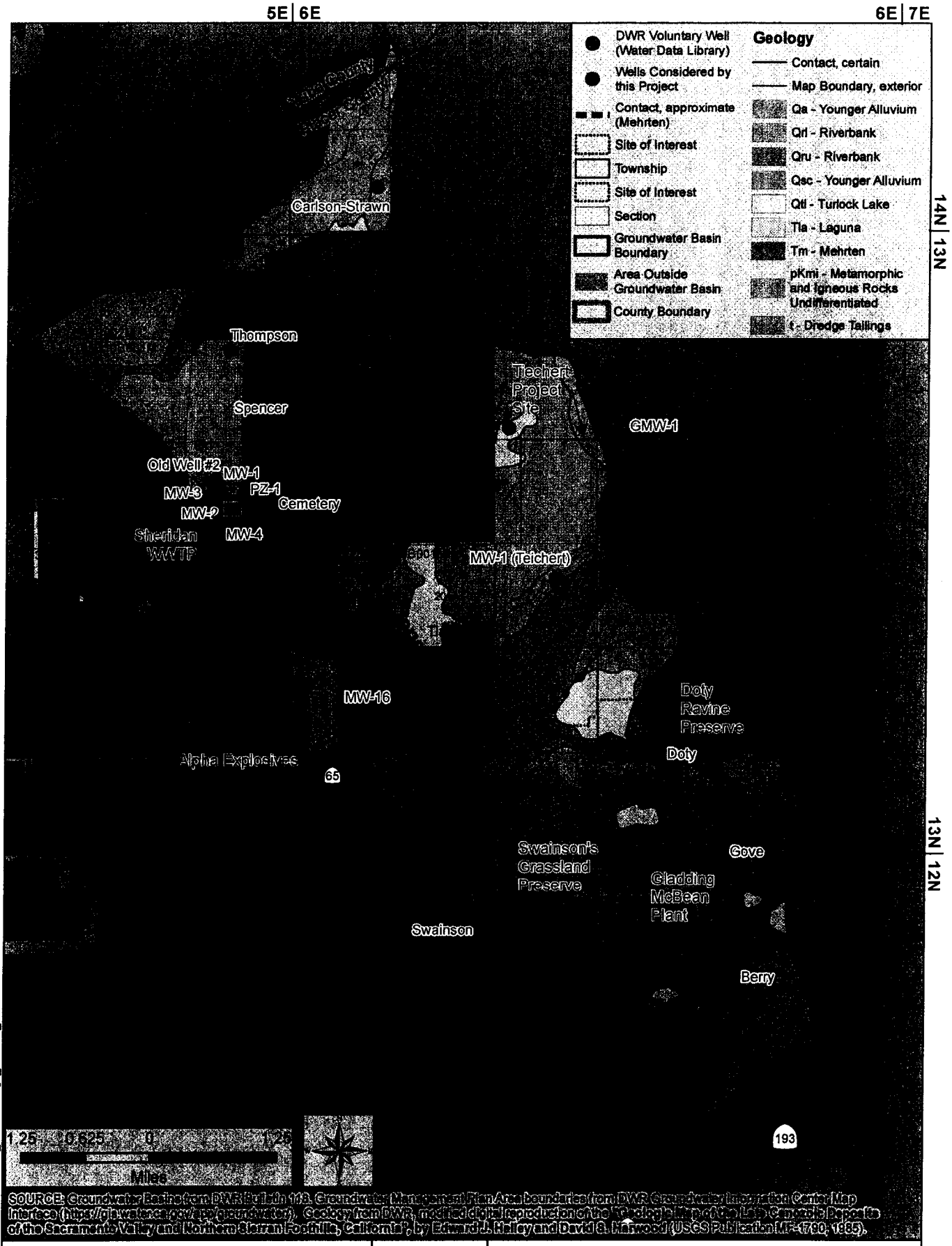
	Placer County CASGEM Monitoring Network	GEI Consultants	Geologic Cross Section B-B'
	Placer County		October 2015 Figure 5



Legend	
Qr	Riverbank Formation
Tla	Laguna Formation
Tm	Mehrten Formation
Tl	Ione Formation
Kc	Chico Formation
pKml	Basement complex (Mesozoic granitic rock and Copper Hill Volcanics)
* Chico Formation not shown due to limited data	

Note: Topo includes top of trees and buildings for elevations in some locations and may not necessarily represent ground surface.

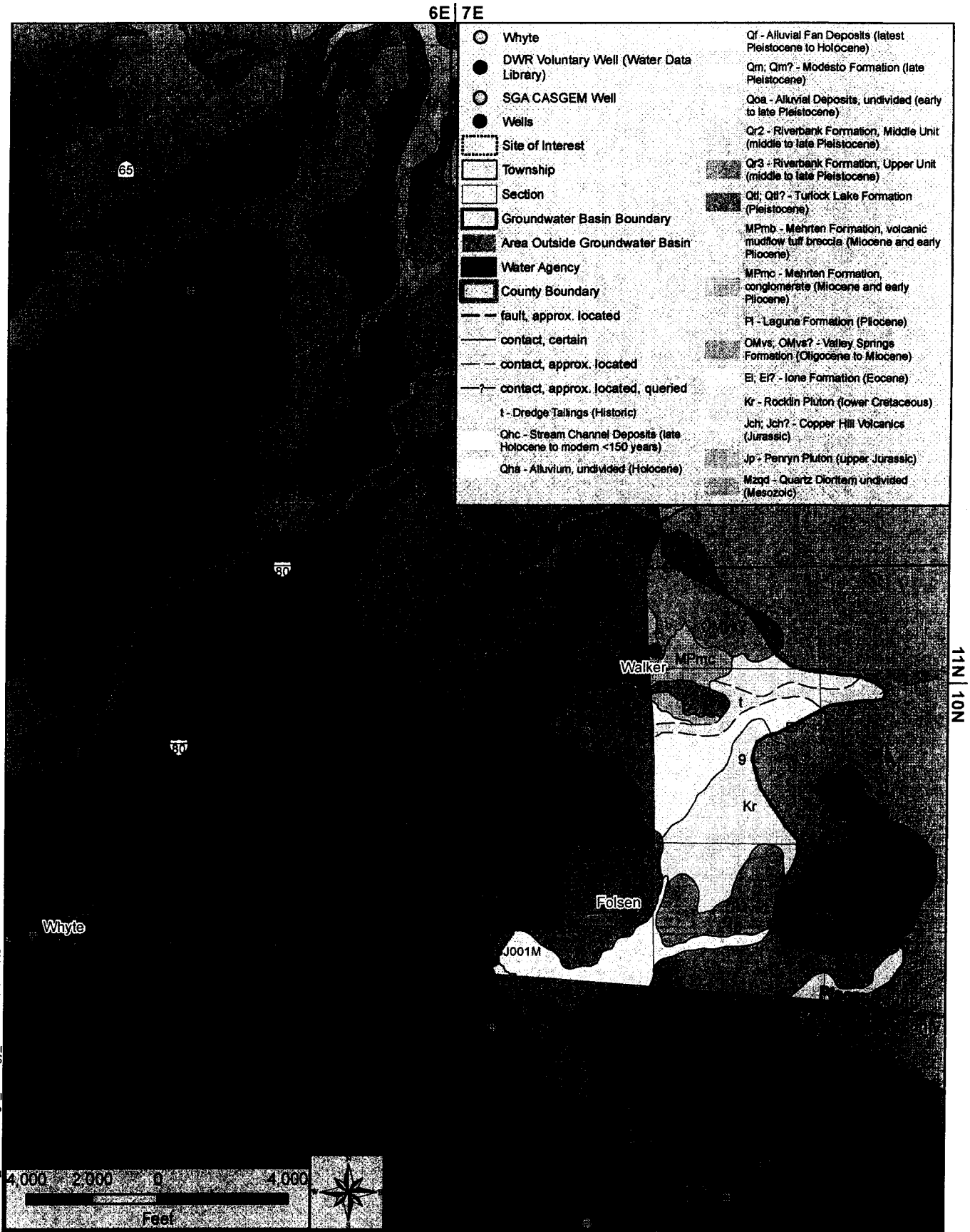
	Placer County CASGEM Monitoring Network	GEI Consultants	Geologic Cross Section C-C'
	Placer County		October 2015 Figure 6



SOURCE: Groundwater Basins from DWR Bulletin 118. Groundwater Management Plan Area boundaries from DWR Groundwater Information Center Map Interface (https://gis.water.ca.gov/app/gicmap/). Geology from DWR, modified digital reproduction of the "Geologic Map of the Lava Cap Mine Deposits of the Sacramento Valley and Northern Sierran Foothills, California", by Edward J. Harley and David S. Harwood (USGS Publication MF-1790, 1985).

CASGEM Monitoring Network Placer County, California	GEI Consultants	Approximate Subsurface Extent of Mehrten Formation
Placer County, California		OCTOBER 2015 — FIGURE 7

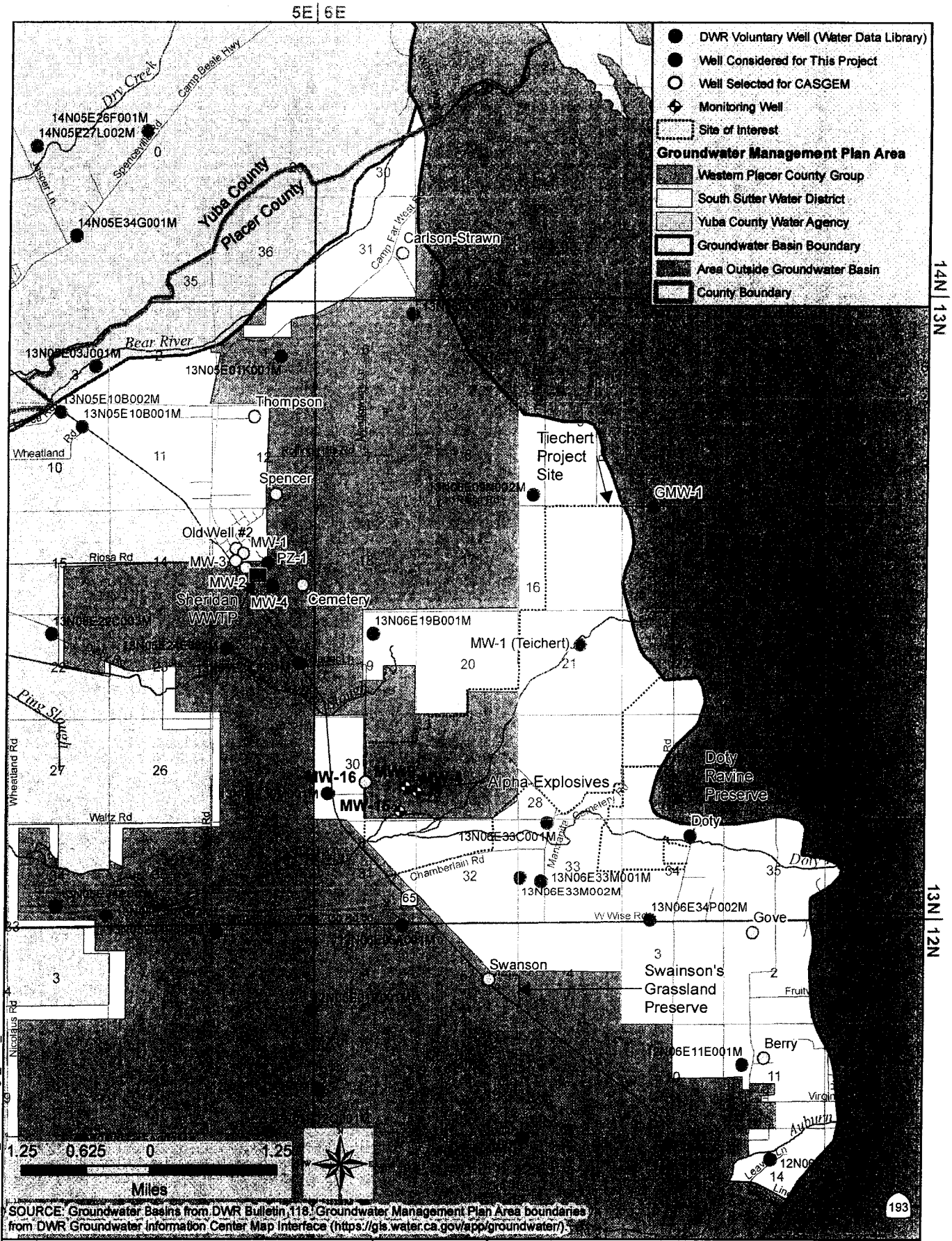
19Oct2015 Z:\Projects\1511870_PlacerCo\Fig7_Mehrten_v2.mxd RS



SOURCE: Groundwater Basins from DWR Bulletin 118. Groundwater Management Plan Area boundaries from DWR Groundwater Information Center Map Interface (https://gis.water.ca.gov/app/groundwater/). Geology from CGS, Sacramento 100k Digital GeoDatabase, 2011

CASGEM Monitoring Network Placer County, California	GEI Consultants	Geologic Setting for Southern "White Areas"
Placer County	OCTOBER 2015	FIGURE 8

19Oct2015 Z:\Projects\1511870_PlacerCo\Fig8_Geology_Southern.mxd RS



CASGEM Monitoring Network
Placer County, California

Placer County

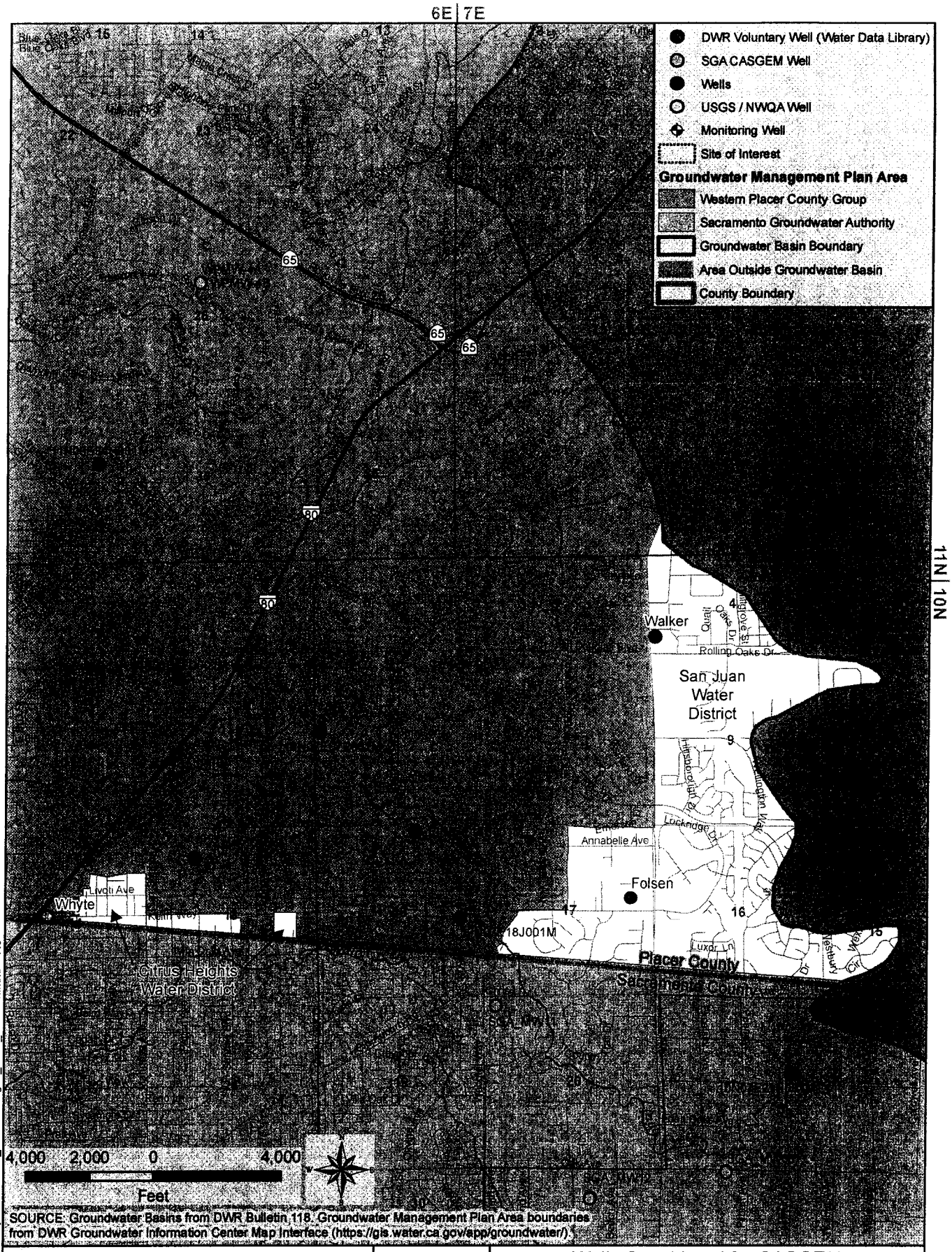
GEI Consultants

Wells Considered for CASGEM in Northern "White Areas"

OCTOBER 2015

FIGURE 9

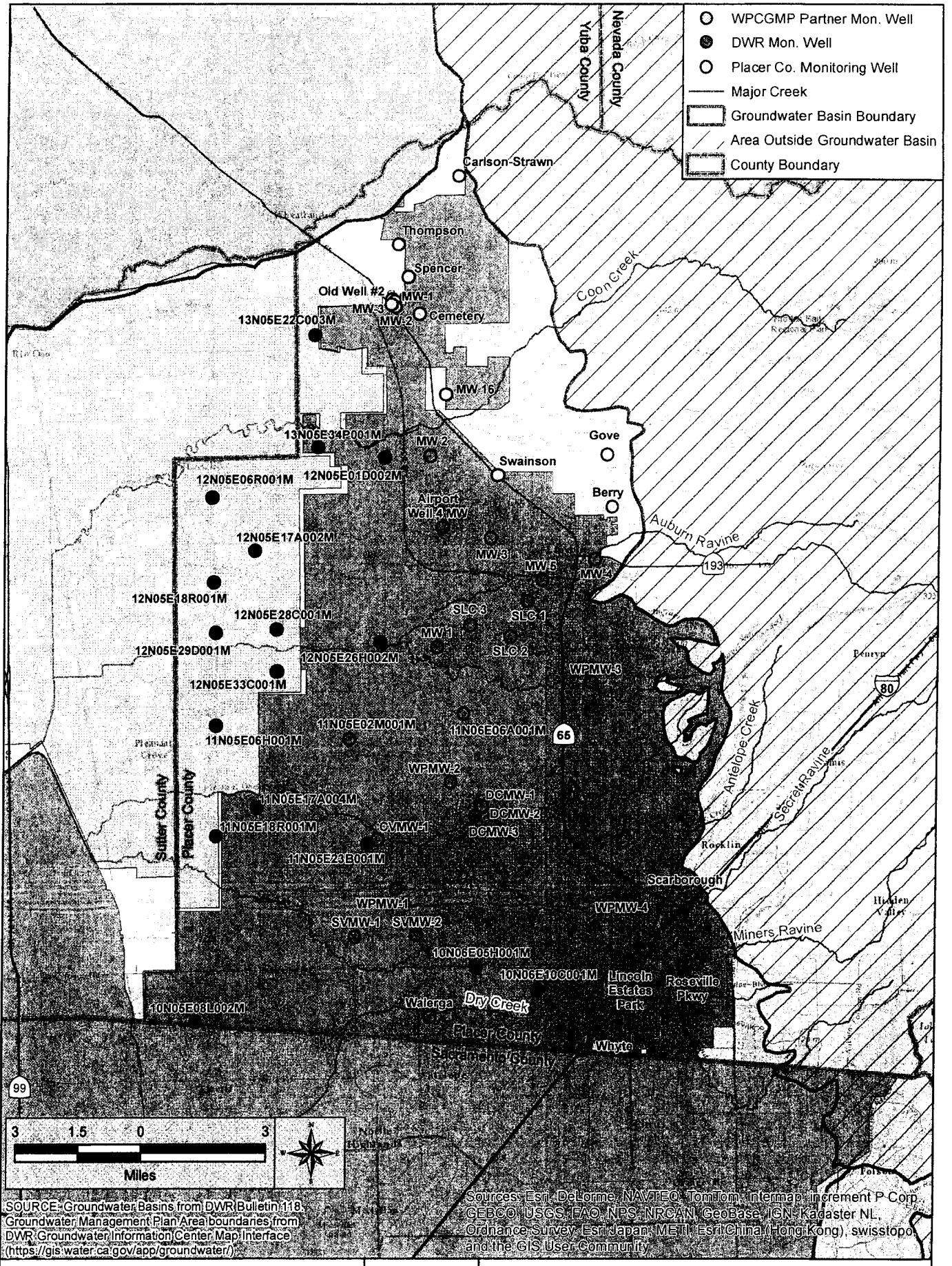
19Oct2015 Z:\Projects\1511870_PlacerCo\Fig9_Wells_Northern.mxd RS



SOURCE: Groundwater Basins from DWR Bulletin 118. Groundwater Management Plan Area boundaries from DWR Groundwater Information Center Map Interface (https://gis.water.ca.gov/app/groundwater/).

CASGEM Monitoring Network Placer County, California	GEI Consultants	Wells Considered for CASGEM in Southern "White Areas"
Placer County	OCTOBER 2015	FIGURE 10

19Oct2015 Z:\Projects\1511870_PlacerCo\Fig10_Wells_Southern.mxd RS



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19-Oct-2015

CASGEM Monitoring Network Placer County, California	GEI Consultants	Western Placer County CASGEM Monitoring Network
Placer County	OCTOBER 2015	FIGURE 11

Tables

Table 1
Well Locations
Western Placer County

Well Name	Date Constructed	Well Completion Report Number	Use of Well	Township Range Section	Latitude (NAD83)	Longitude (NAD83)	Reference Elevation
[illegible]							
Old Well #2	4/20/1970	6116	Emergency Fire Backup	13N/5E-13E	38.979133	-121.372694	107
Cemetery			Irrigation	13N/5E-13J	38.974027	-121.360615	135
Swainson			Inactive/Irrigation	12N/6E-5K	38.918461	-121.326842	140
MW-1	10/26/2004	NA	Monitoring	13N/5E-13K	38.978460	-121.371320	109.71
MW-2	10/26/2004	NA	Monitoring	13N/5E-13K	38.976427	-121.371001	113.69
MW-3	10/25/2004	NA	Monitoring	13N/5E-13K	38.977408	-121.372844	103.41
MW-16	10/24/2002	NA	Monitoring	13N/6E-30	38.946323	-121.349317	127.66
[illegible]							
Thompson	11/23/1977	121812	Domestic	13N/5E-12C	38.997664	-121.369352	142
Carlson/Strawn	6/3/1974	116945	Domestic	13N/6E-31Q1	39.02045	-121.342597	157
Spencer	8/28/1978	101157	Domestic	13N/5E-12Q2	38.986724	-121.365419	134
Berry	7/22/1976	144398	Domestic	12N/6E-11F	38.907059	-121.276867	187
Gove	10/26/1978	52327	Domestic	12N/6E-2C1	38.924861	-121.278877	188

Notes: Elevations provided to the nearest hundredths are surveyed. All others are based from USGS topographic maps.
Cemetery and Swainson well logs to be acquired. If not, these wells maybe removed from CASGEM well monitoring network

Table 2
Monitoring Well Construction Details
Western Placer County

Well	Date Constructed	Formation Monitored	Depth of Borehole (feet bgs)	Casing Diameter (inches)	Depth of Well Casing (feet bgs)	Screened Interval (feet bgs)	Slot Size (inches)	Grout (feet bgs)	Bentonite Seal (feet bgs)	Sand Pack (feet bgs)	Casing Material	Stick-up (feet)	TOC Elevation (feet msl)	Screen Elevations (feet msl)
Old Well #2	4/20/1970	Laguna/Lower Mehrten	209	12	144	Open hole	NA	50	NA	NA	Steel		107	
Cemetery		Likely Mehrten		10							Steel	0.28	135.28	
Swainson		Likely Mehrten		10							Steel	0.65	140.65	
MW-1	10/26/2004	Riverbank	40	2	40	29.5-39.5	0.020	25	25-28	28-40	Plastic	1.96	109.71	80.21 70.21
MW-2	10/26/2004	Riverbank	45	2	44.8	24.3-44.3	0.020	20	20-23	23-45	Plastic	-0.41	113.69	89.39 69.39
MW-3	10/25/2004	Riverbank	35	2	35	19.5-34.5	0.020	15	15-18	18-35	Plastic	3.0	103.41	83.91 68.91
MW-16	10/24/2002	Riverbank	46	2	45.5	25-40	0.010	0.5	0.5-22	22-46	Plastic	2.26	127.66	102.66 87.66
Thompson	11/23/1977	Lower Mehrten	100	6	100	64-84	Unk	20	NA	20-100	Steel		142	
Carlson/Strawn	6/3/1974	Lower Mehrten	114	6	114	54-114	3 x 1/8	35	NA	none	Unk		157	
Spencer	8/28/1978	Lower Mehrten	107	10	96	Open hole	NA	0	NA	NA	Steel		134	
Berry	7/22/1976	Ione	120	6	120	100-120	Unk	40	NA	Unk	Plastic		187	
Gove	10/26/1978	Ione	160	6	160	80-120 140-160	Unk	35		none	Plastic		188	

Notes: Potential CASGEM wells stick-up will be acquired after acquiring well owners permission.
Cemetery and Swainson well logs to be acquired. If not, these wells maybe removed from CASGEM well monitoring network

Table 3
Western Placer County Groundwater Monitoring Network

Alluvium - Dry Creek	Alluvium - Coon Creek	Alluvium - Bear River	Riverbank	Turlock Lake/Laguna	Transition Zone	Upper Mehrten	Lower Mehrten	Ione
[illegible]								
MW-9A	None	None	MW-1-4	CVMW 1A	CVMW 1B	WPMW-1B	WPMW-1C	WPMW-3B
MW-10A				WPMW-1A	SVMW-West-1B	SVMW-East-2B	WPMW-2B	WPMW-4B
				WPMW-2A		MW-10C	WPMW-3A	MW-2-1
				SVMW-West-1A			WPMW-4A	MW-5-1
				SVMW East-2A			CVMW-1C	MW-6A
				MW-1-3			SVMW West 1C	
				MW-1-2			SVMW East-2C	
				MW-2-3			MW-1-1	
				MW-3-2			MW-3-1	
				MW-10B			MW-2-2	
							MW-4	
							MW-5-2	
							SLC-1	
							MW-5A	
							MW-7A	
							MW-8A	
							MW-8B	
[illegible]								
			MW-1				Old Well #2	Berry
			MW-3				Thompson	Gove
			MW-16				Carlson/Strawn	
							Cemetery	
							Swanson	

Appendix A – Groundwater Level Monitoring Forms

Old Well #2

Cemetery

Date	Military Time	NM Code	QM Code	Depth to Water (feet below RP)	Measured By	Comments

NM = No Measurement Code Glossary

0 - Unable to reach well
1 - Pumping
2 - Pump house locked
3 - Tape hung up
4 - Can't get tape in casing
5 - Unable to locate well
6 - Well has been destroyed
7 - Special/Other
8 - Casing leaking or wet
9 - Temporarily inaccessible
D - Dry well
F - Flowing artesian well

NQ = Questionable Measurement Code Glossary

1 - Pumping
2 - Nearby pump operating
3 - Casing leaking or wet
4 - Pumped recently
5 - Air or pressure gauge measurement
6 - Other
7 - Recharge or surface water effects near well
8 - Oil or foreign substance in casing
9 - Acoustical sounder
E - Recently flowing
F - Flowing
G - Nearby flowing
H - Nearby recently flowing

Old Well #2

Well Name	Cemetery				Important notes:
Well Depth (ft)	144				
Screen Top					
Screen Bot					
Latitude	38.97913				
Longitude	-121.37269				
RP Elev					
GS Elev	107.00				

Location Description:

In the Town of Sheridan. Two block east of old Highway 65 on south side of F Street.

Map:

Site Photos:

Cemetery Well

Cemetery

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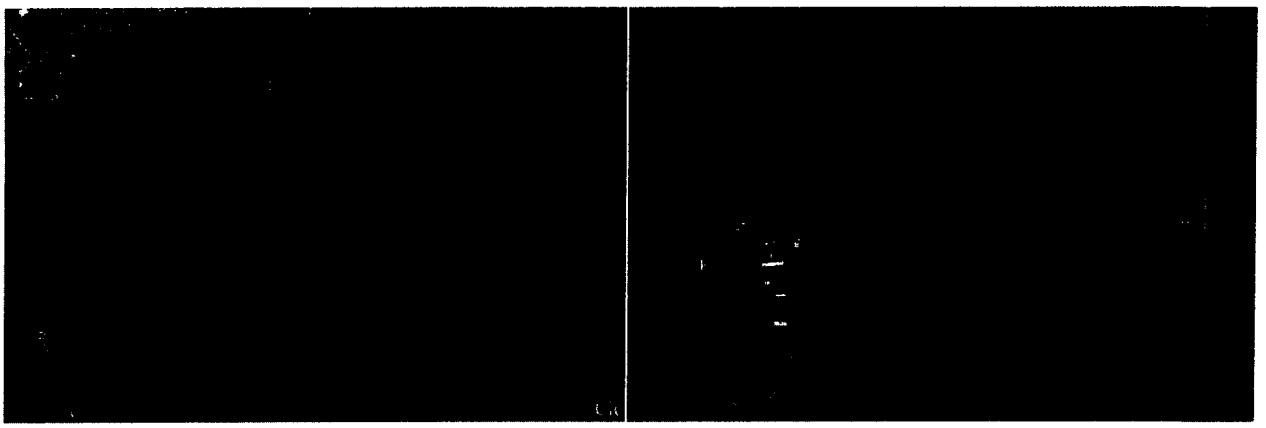
E - Recently flowing
F - Flowing
G - Nearby flowing
H - Nearby recently flowing

Cemetery Well

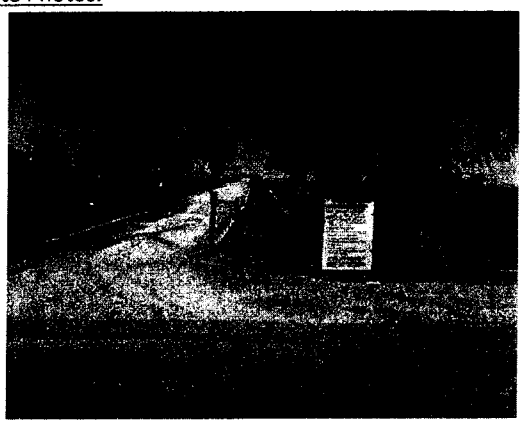
Well Name	Cemetery				Important notes:
Well Depth (ft)					
Screen Top					
Screen Bot					
Latitude	38.97403				
Longitude	-121.36062				
RP Elev					
GS Elev	135.00				

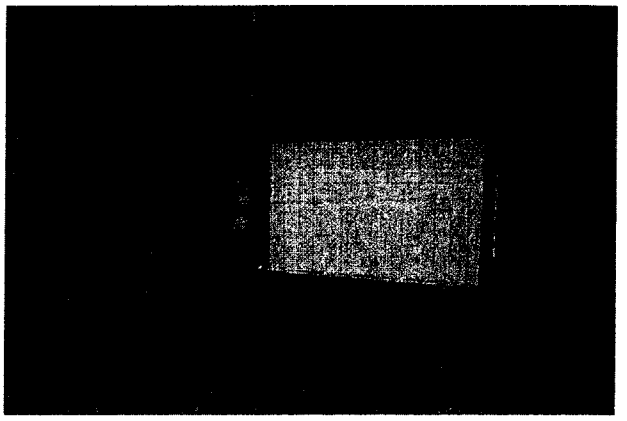
Location Description:

Map:



Site Photos:





Appendix B - Well Logs