Calaveras County Groundwater Management and Future Considerations

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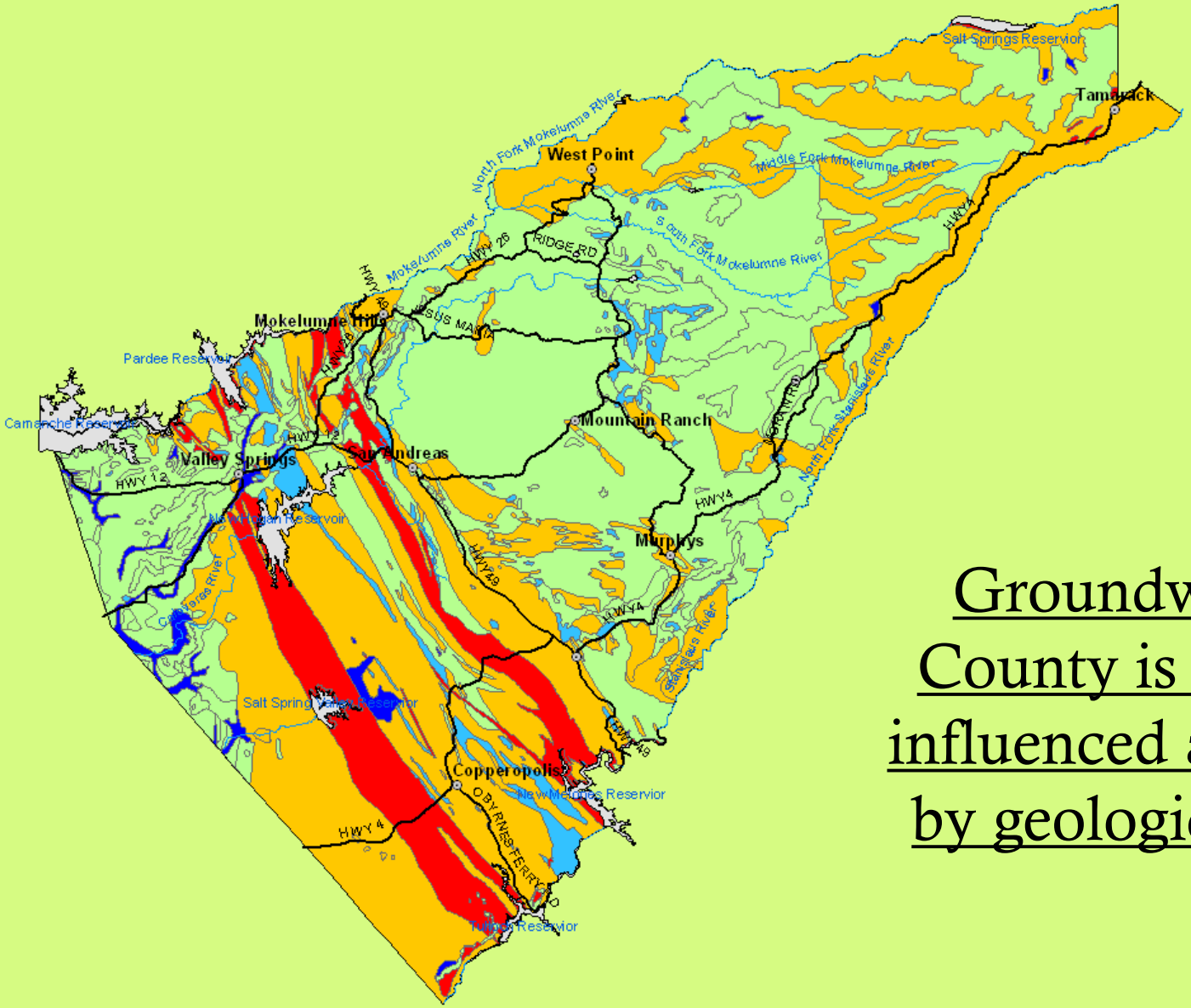
Eastern San Joaquin GBA
SGMA Workgroup

Today's Presentation

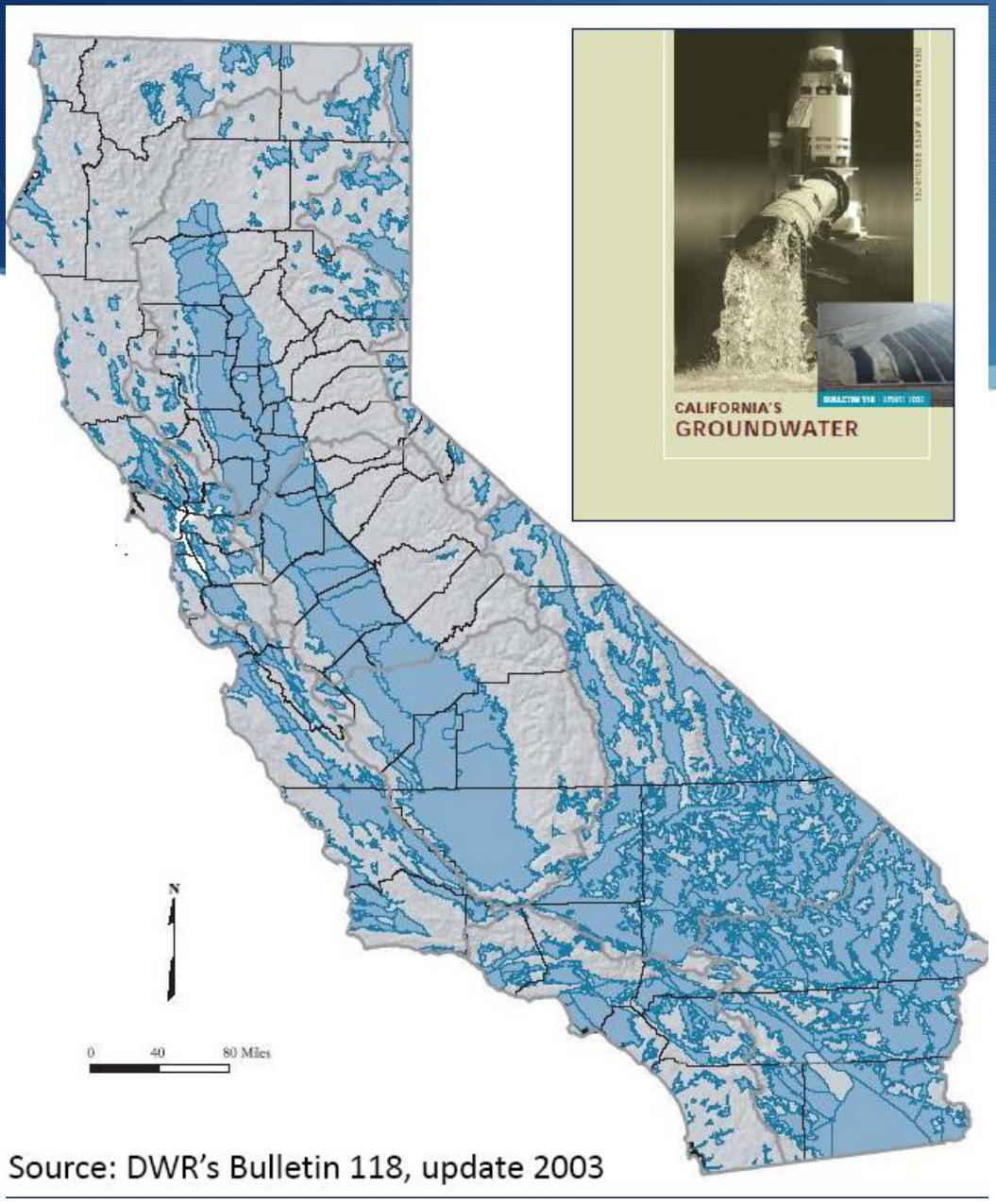
- Groundwater in Calaveras County
- Local Groundwater – Management Roles
- Highlight groundwater quality and quantity investigations in Calaveras County
- Future investigations?



Groundwater in the County is significantly influenced and governed by geologic formations

Source: Calaveras County Environmental Health Department

Groundwater in California Foothills



Source: DWR's Bulletin 118, update 2003

- Foothill Counties have largely remained outside of the discussion on groundwater overdraft in the past
- SGMA brings us into a regional solution/ partnership with those in the region

Calaveras County Groundwater

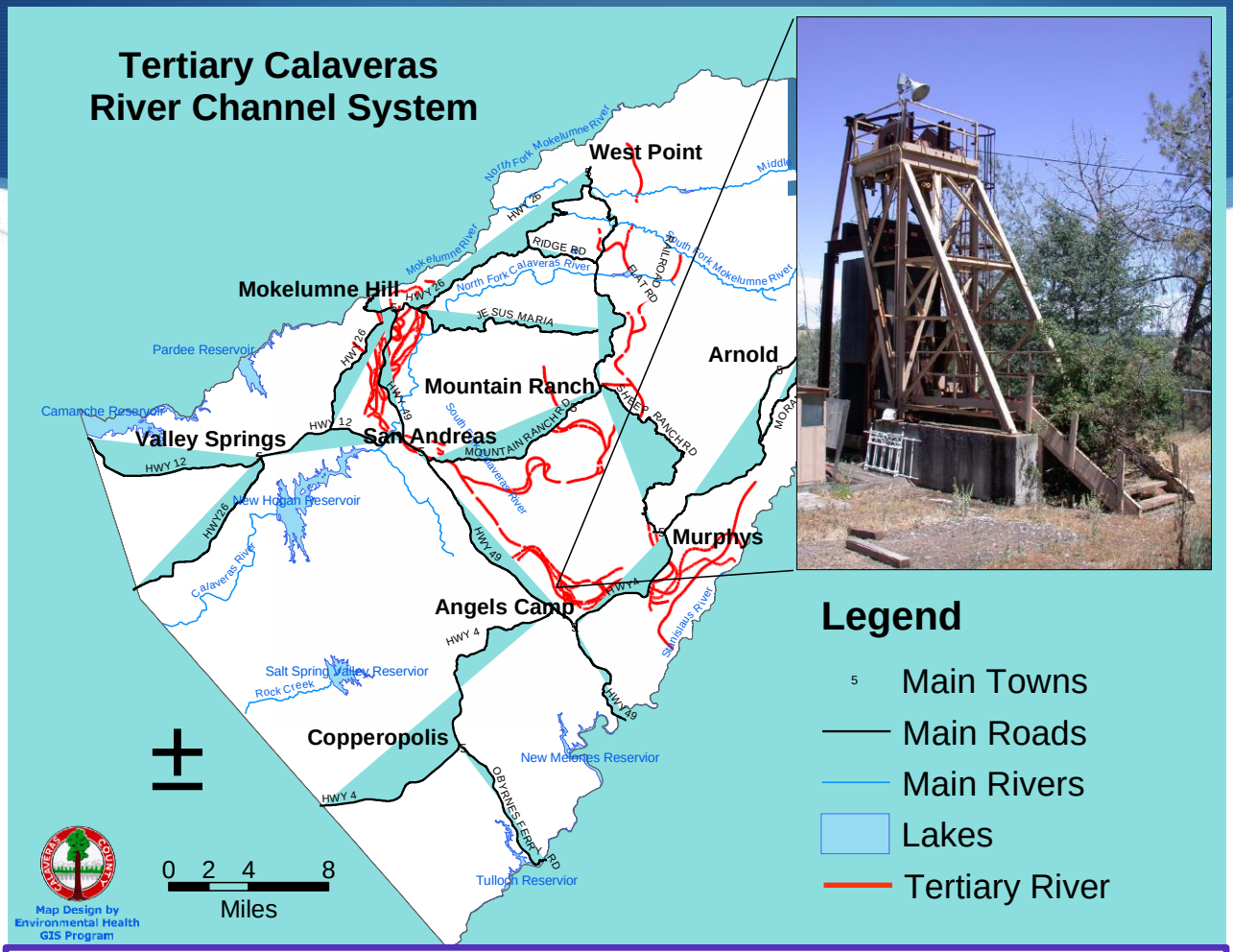
- Calaveras, not unlike other mountain counties and rural jurisdictions in California secures a significant amount of its potable water from groundwater.
- Numerous isolated private domestic wells
- Slow creep/expansion of agricultural use in western portion of Calaveras County

Calaveras County Groundwater

In Calaveras County groundwater is found in:

- “fractured” bedrock fissures;
- Tertiary Channel System (buried rivers);
- East San Joaquin Groundwater Sub-Basin

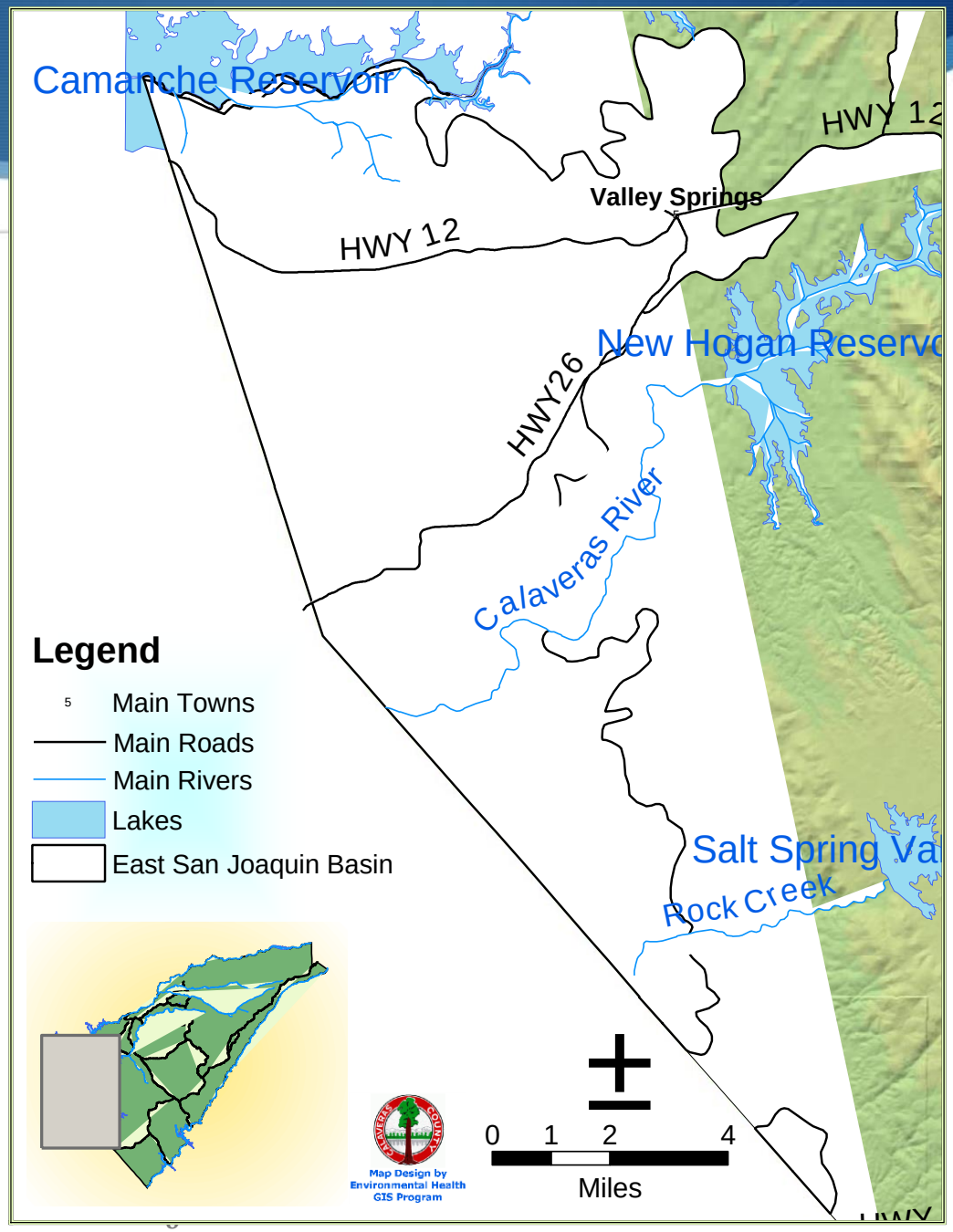
Calaveras County Groundwater Overview



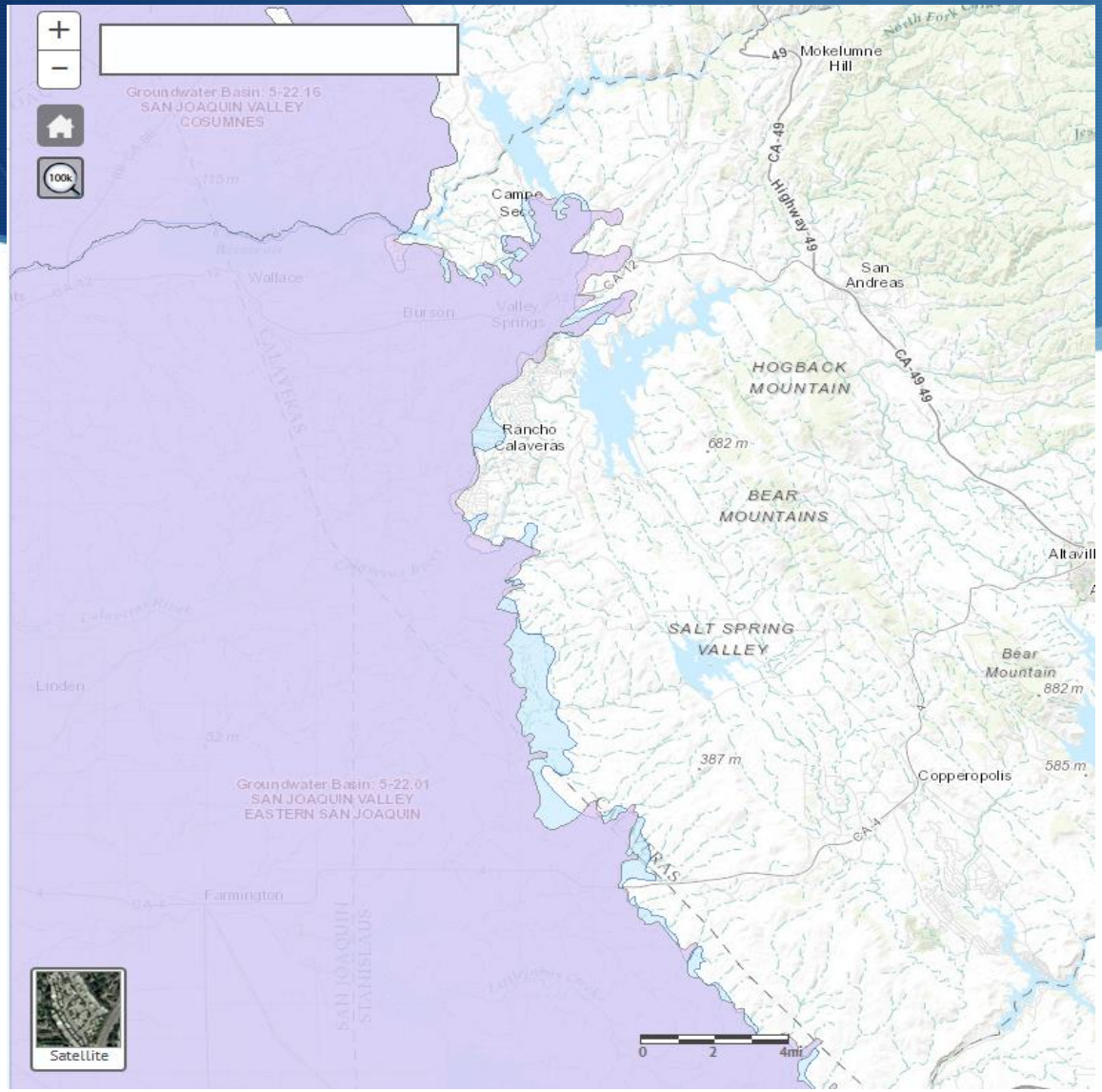
Gold mine shaft intersecting the Tertiary Channel System 500,000 gal/day /30 days (off-basin) with unpredictable yields

Source: Calaveras County Environmental Health Department

Calaveras County ESJ Sub-basin



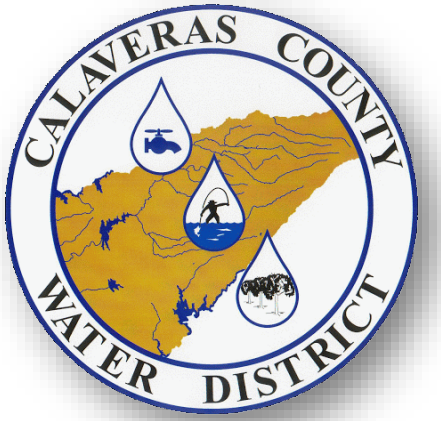
Source: Calaveras County Environmental Health Department



DWR Administrative Basin Boundary Modifications forthcoming

Blue (Old) /Purple (New)

Local Groundwater Management Roles



Calaveras County Water District

- CCWD is the designated Groundwater Management Agency with an approved Groundwater Management Plan in place
  - CCWD adopts AB 3030 Plan - 2001
  - Phase II Update - 2007
- CASGEM Monitoring Entity
- Has municipal customers within the ESJ Subbasin ~100 connections (Wallace)
- Multiple Investigations into Groundwater Recharge Opportunities

Calaveras County Environmental Health Dept

CCWD interacts regularly with Calaveras County Environmental Health Department staff (CCEHD) on groundwater management issues region-wide. CCEHD has groundwater management responsibilities and many programs within the county including :

- Adoption and implementation of a County Water Well Construction Ordinance;
- Adoption and implementation of the County Proof of Groundwater Ordinance;
- Adoption and implementation of the Local Agency Groundwater Protection Program in 2004 (County and Federal-EPA, Region IX Project);
- Adoption and implementation of a Groundwater Management Ordinance; and
- Geographic Information System Program (GIS Program).

Technical Evaluations of Interest

Calaveras County
California

CALAVERAS COUNTY WATER DISTRICT

Calaveras County Water District

June 2013 - ***Groundwater Characteristics and Recharge Implications Near Lake Camanche and Valley Springs, CA***

Prepared by Dunn Environmental (now NV5)

Dunn ENVIRONMENTAL, INC.

NV5 BEYOND ENGINEERING

CALAVERAS COUNTY WATER DISTRICT

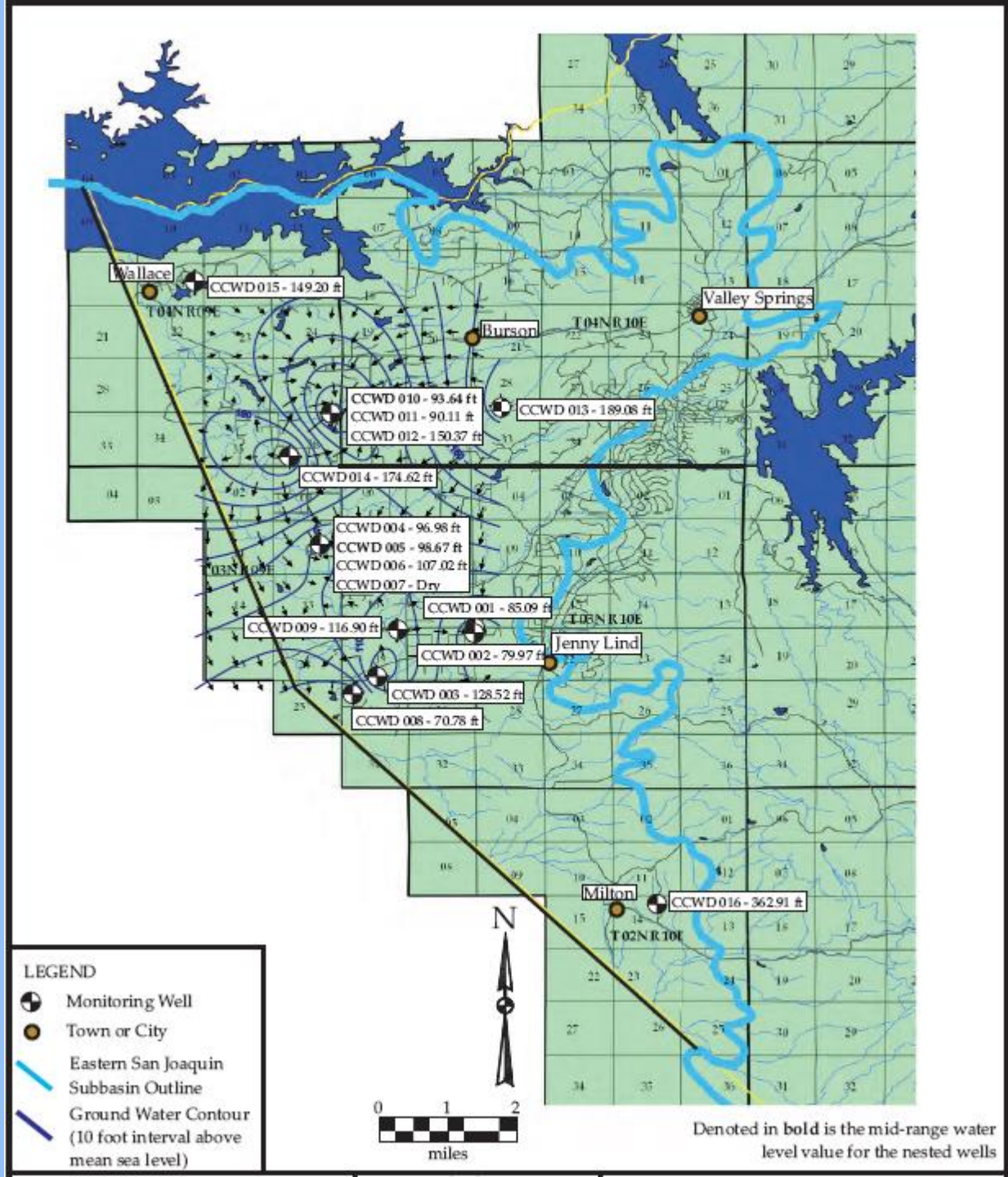
CCWD has a valuable CASGEM Monitoring Program and Completed several GW Recharge Investigations –
Pat Dunn M.S., P.G., C.Hg.

15 Nested wells in portion of ESJ Sub-Basin in Calaveras County

With the assistance of Grants from USGS, DWR

Dunn
ENVIRONMENTAL, INC.

NV5
BEYOND ENGINEERING



Calaveras County – ESJ Sub-Basin

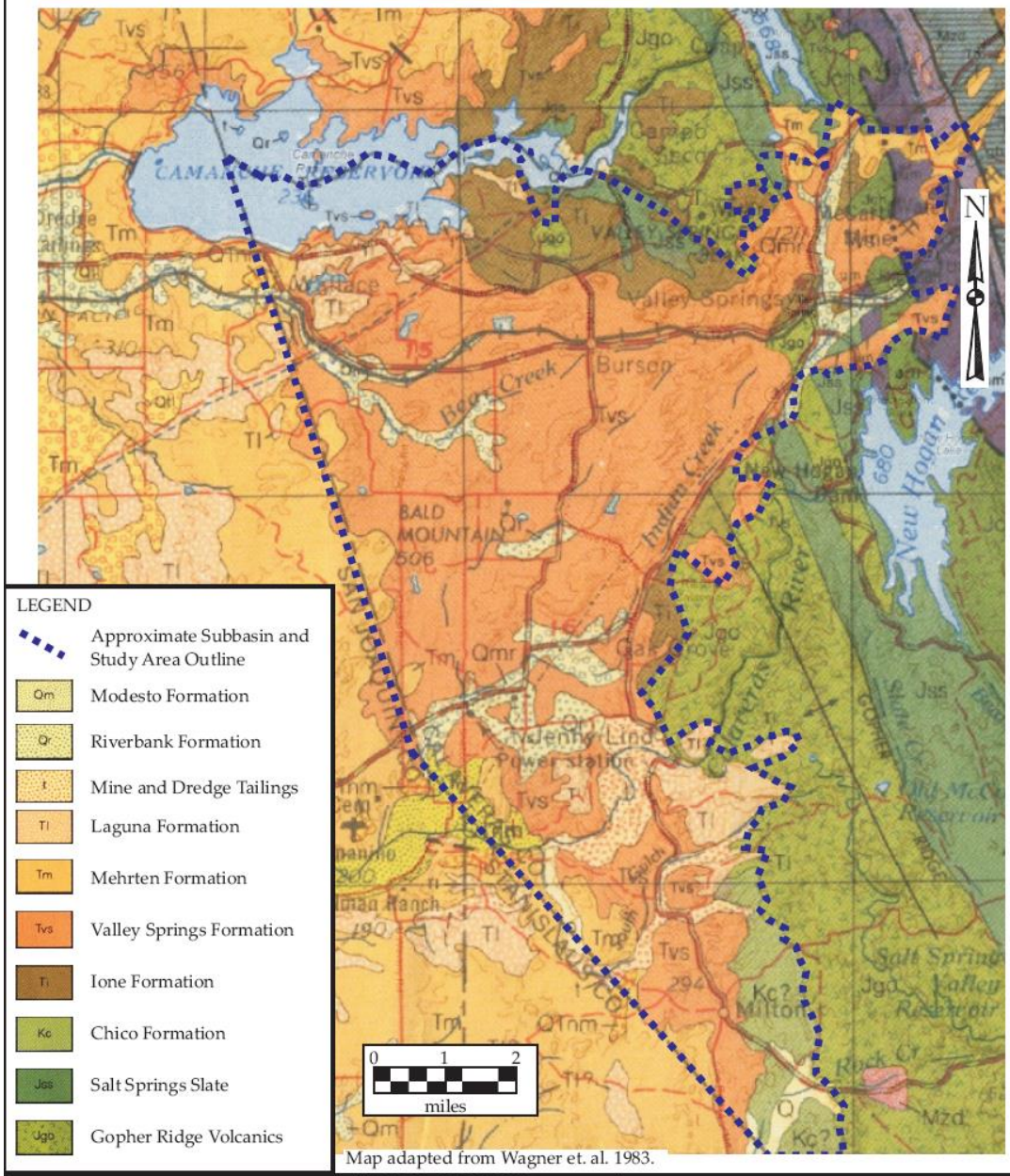
- Declining water levels and groundwater overdraft is an ongoing concern within the Study Area of Calaveras County
- While declining levels are not on the same magnitude of the Eastern San Joaquin Groundwater Sub-basin in San Joaquin County, does reflect on the basin as a whole.
- Within the Calaveras County, declining water levels may also reflect limited local groundwater recharge, less surface water.

2013 Technical Memo Findings –Dunn Environmental

- Existing geologic conditions in the Study Area do not generally favor deep percolation of surface water for recharge. However, small target areas could be investigated further where Tertiary age sands and gravels persist in the subsurface to support expectations for feasible managed aquifer recharge on a local scale.

- Surface water conjunctive use options could be investigated to assess potential for aquifer storage and recovery via direct supply well injection. Additional alternative recharge projects, such as injection wells, may be viable. Stored water injected into high yield areas…could be explored.

- "Low recharge rates and hydraulic permeability may be due to the indurated (welded) nature of some tuff beds of the Valley Springs Formation."
- "The ability to use wide scale surface recharge methods to achieve deep percolation of groundwater may be limited by these tuff units, especially in the absence of fracturing in the units."
- The Valley Springs Formation may only provide localized aquifer recharge and storage opportunities



Dunn ENVIRONMENTAL, INC.

DATE:	05/06/2013
SCALE:	1":8,450'
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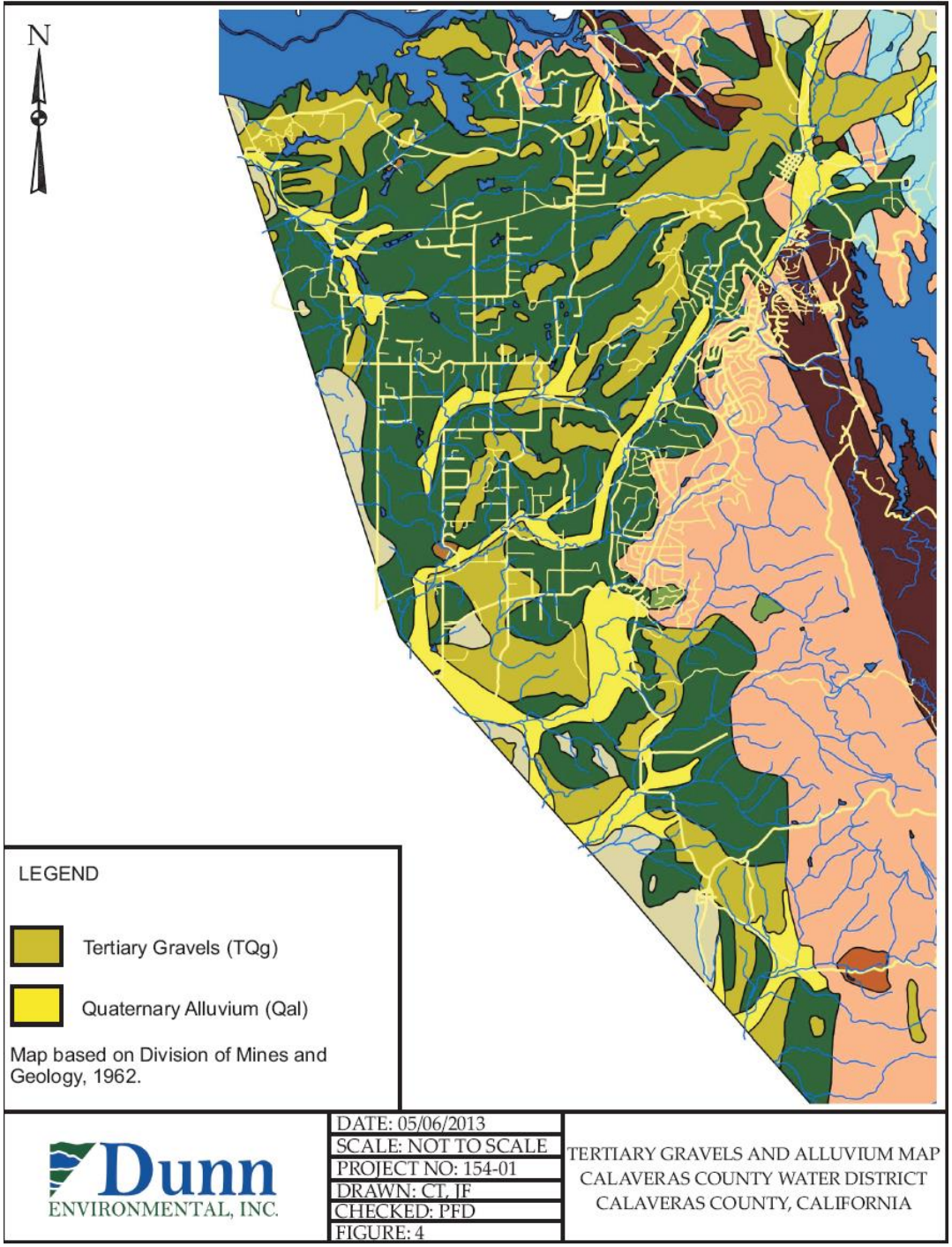
FIGURE:	3

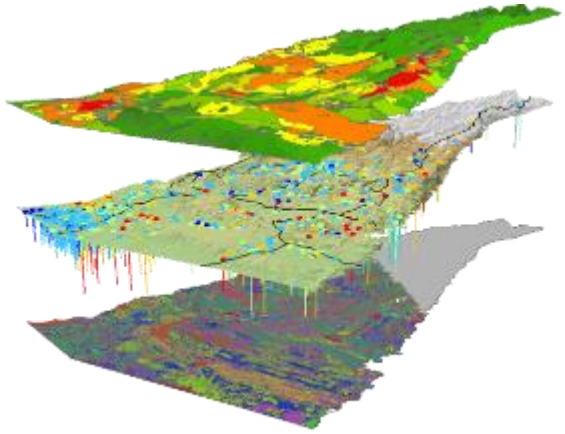
GEOLOGIC MAP
CALAVERAS COUNTY WATER DISTRICT
CALAVERAS COUNTY, CALIFORNIA

- Managed groundwater recharge efforts could be focused on areas where vertical interconnection of sand and gravel units of alluvial deposits with those of the Valley Springs Formation is present due to cross-cutting Tertiary age or younger stream channel deposits.

- This focused approach could achieve better recharge pond infiltration rates and overall performance.

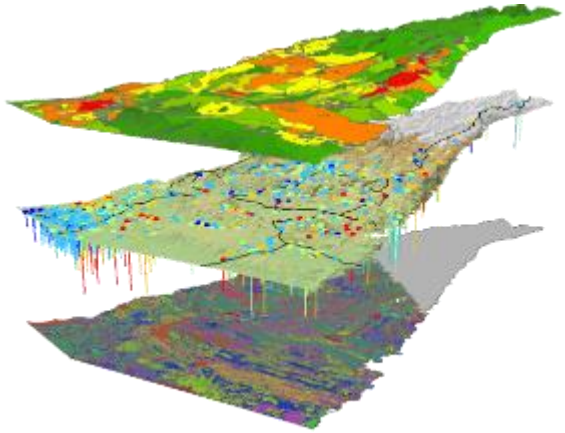


Calaveras County Environmental Health Department



Calaveras County
California

CCEHD - GIS Development



In 2004, CCEHD began the development of a Comprehensive Geographic Information System (GIS) program that allowed the department to:

- Track and identify ground water resources throughout the county;
- Track and identify possible threats to groundwater quality;
- Track and identify possible threats to public health and safety and the environment as a result of contaminated ground water

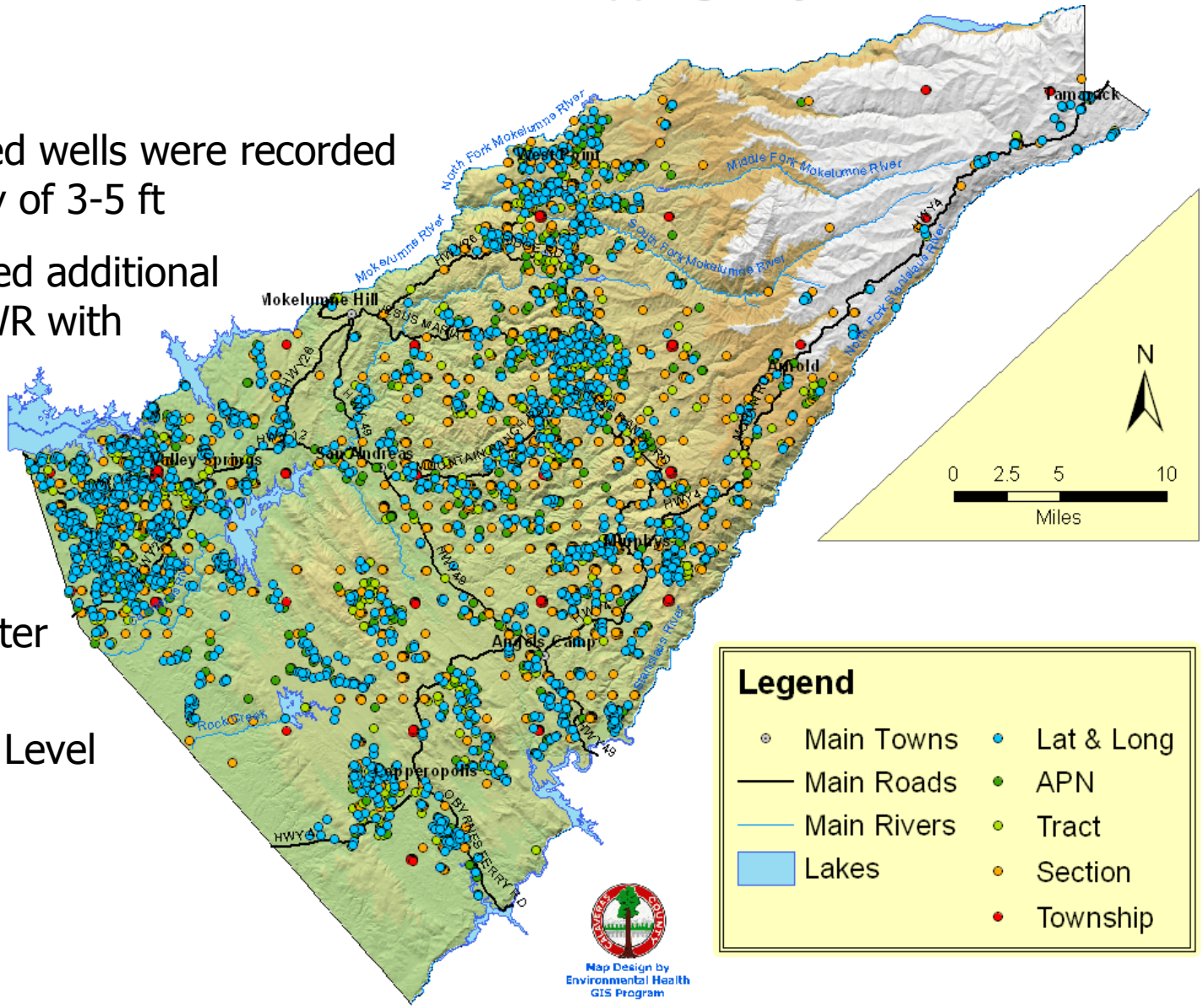
Calaveras County Environmental Health Department

Domestic Water Wells - GIS Mapping Project

- Nineteen hundred wells were recorded with an accuracy of 3-5 ft
- Forty five hundred additional records from DWR with various spatial references

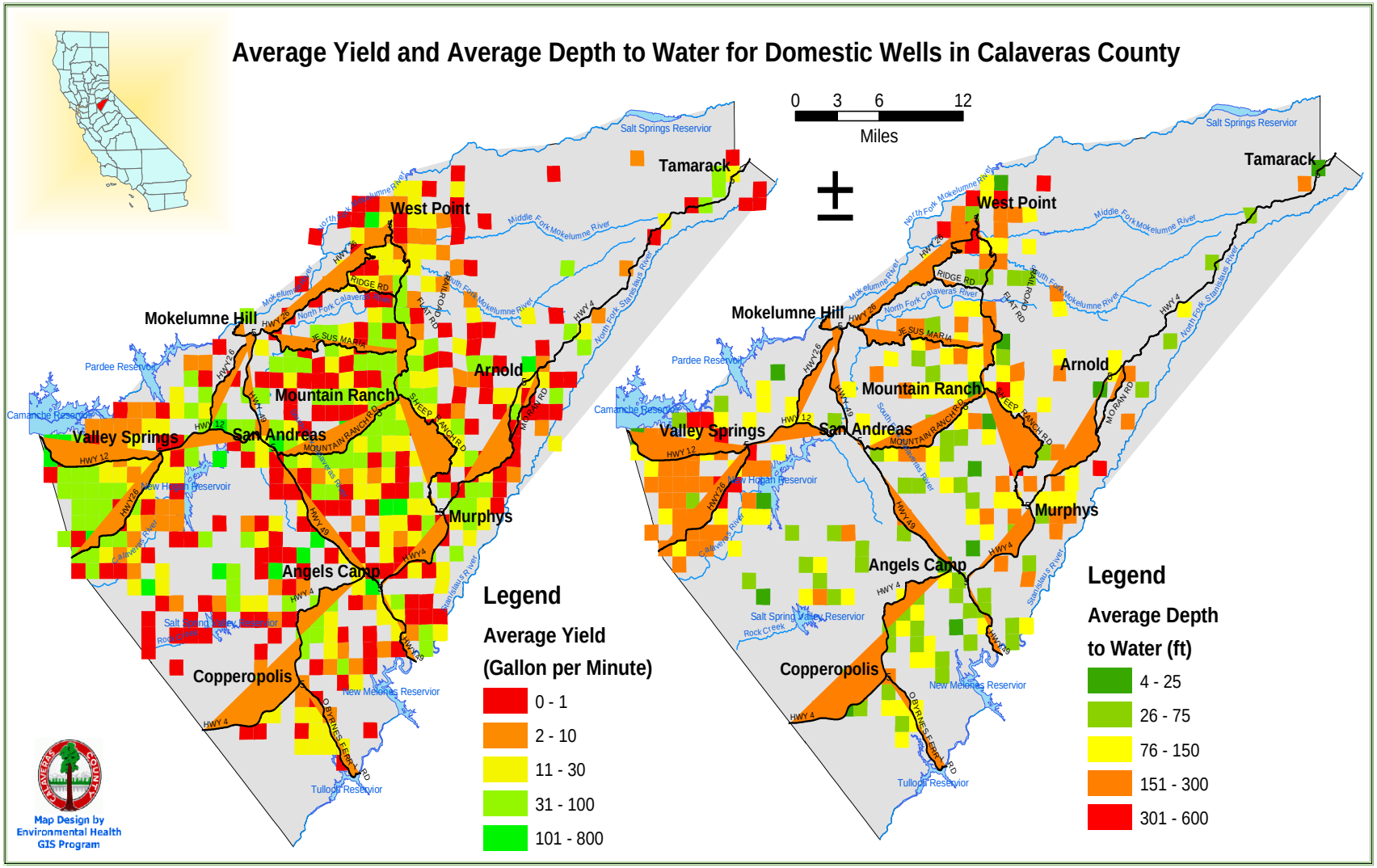
Attributes:

- Total Depth
- Depth to Water
- Yield (gpm)
- Static Water Level
- Etc.



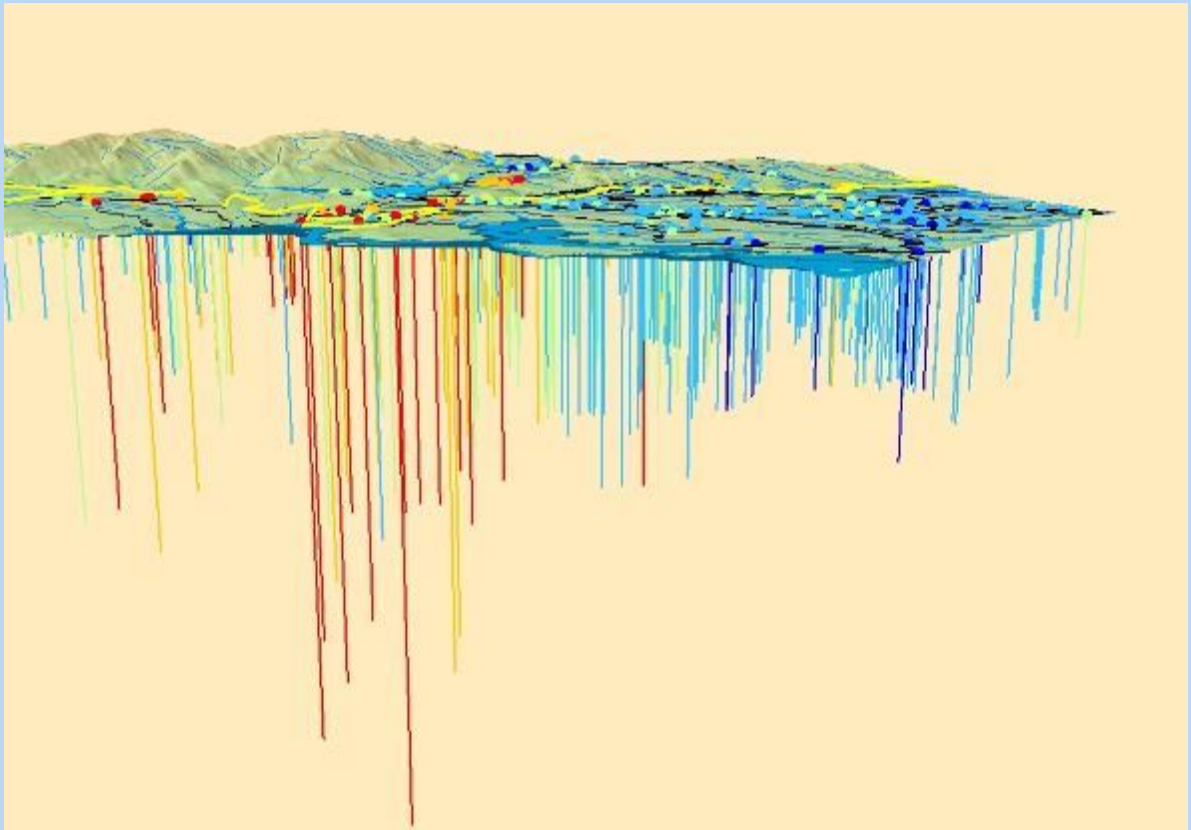
Calaveras County Environmental Health Department

GIS Mapping Project



Calaveras County Environmental Health Department
GIS Mapping Project

A 3-dimensional view of the wells in Calaveras County reveals the differences regarding well depth and yield between the hard rock area, where yields and depth may change drastically within few feet, and the more homogenous area where the Eastern San Joaquin Groundwater Basin reaches into the county.



Eastern San Joaquin Ground Water Basin

Future Considerations

"Water available for replenishment"

As part of the SGMA legislation, Water Code (WC) 10729§(c) instructs:

"The department shall prepare and publish a report by December 31, 2016, on its Internet Web site that presents the department's best estimate, based on available information, of water available for replenishment of groundwater in the state."

"Water available for replenishment"

In addition, the legislation requires that GSAs with high and medium priority basins prepare a Groundwater Sustainability Plan (GSP) that includes (among other things):

"A description of surface water supply used or available for use for groundwater recharge or in-lieu use (WC 10727.2§(d)(5)).

Report Outline

Chapter 1: Introduction and Purpose

- Introduction: Conjunctive Water Management in California
- Overview of the Sustainable Groundwater Management Program
- How this report connects to SGMP
- Description of consistency with GSP regulations

Chapter 2: How to Use this Report

- Suggested planning process for GSA is presented to achieve replenishment objective
- Uncertainty in the estimates and information
- Description of remainder of the report

Chapter 3: Description of Water Available for Replenishment

- Potential sources
- Types of replenishment
- Guidance for hydrologic variability, climate change, and integrated planning

Chapter 4: Water Available Information and Estimates by Hydrologic Region

- Background Information associated with water availability
- Regional estimates of water available by source type
- Regional considerations for replenishment of water available

Chapter 5: State Water Project and Central Valley Project

- Description of the SWP and CVP in the context of water available
- Current water available at various location of the Central Valley
- Potential water available from WaterFix and new storage

Chapter 6:Water Available Roadmap by Source

Step by step water availability analysis roadmaps with project-specific examples for:

- Surface water
- Conservation
- Recycling
- Desalination
- Water transfers
- Others

Chapter 7: Replenishment Roadmap by Replenishment Method

Step by step replenishment analysis roadmaps with project-specific examples for:

- In-lieu
- Active Recharge

Chapter 8: Next Steps

- How GSAs can support their sustainability planning process with information from this report
- Data gaps, permitting and regulatory requirements, and uncertainties
- How to move from regional estimates to project-specific analysis to project implementation

Future Investigations

- Calaveras County – GIS Mapping
  - Additional data necessary to fully evaluate new well owners (many non-domestic) in ESJ Sub-basin
- CCWD ESJ Sub-basin Recharge Opportunities –Data Gaps
  - Data gaps exist for the CASGEM monitoring well network
    - (more volunteers?)
  - The NRCS is in the process of mapping soils in the study area
    - Opportunities to expand upon 2013 Tech Memo (vertical interconnectivity of geologic formations)

Questions?