

Needs and Opportunities for Groundwater Recharge

Presentation Outline

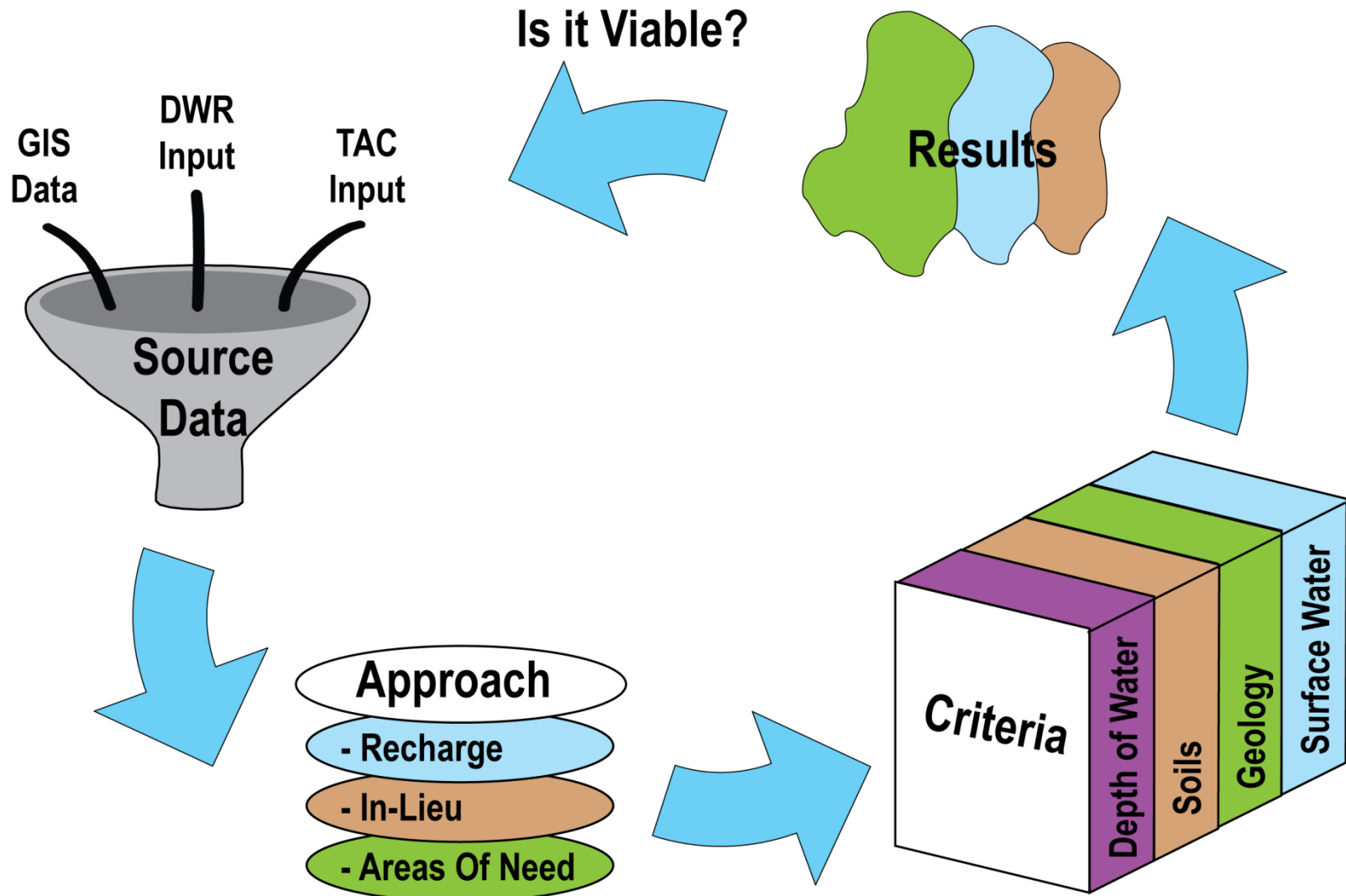
- Background
- Tehama County Groundwater Recharge
 - Data
 - Project Approach
 - Results
- Glenn County Sub-Area 8 Recharge
 - Data
 - Results
- Discussion
- Next Steps

Why Perform These Studies?

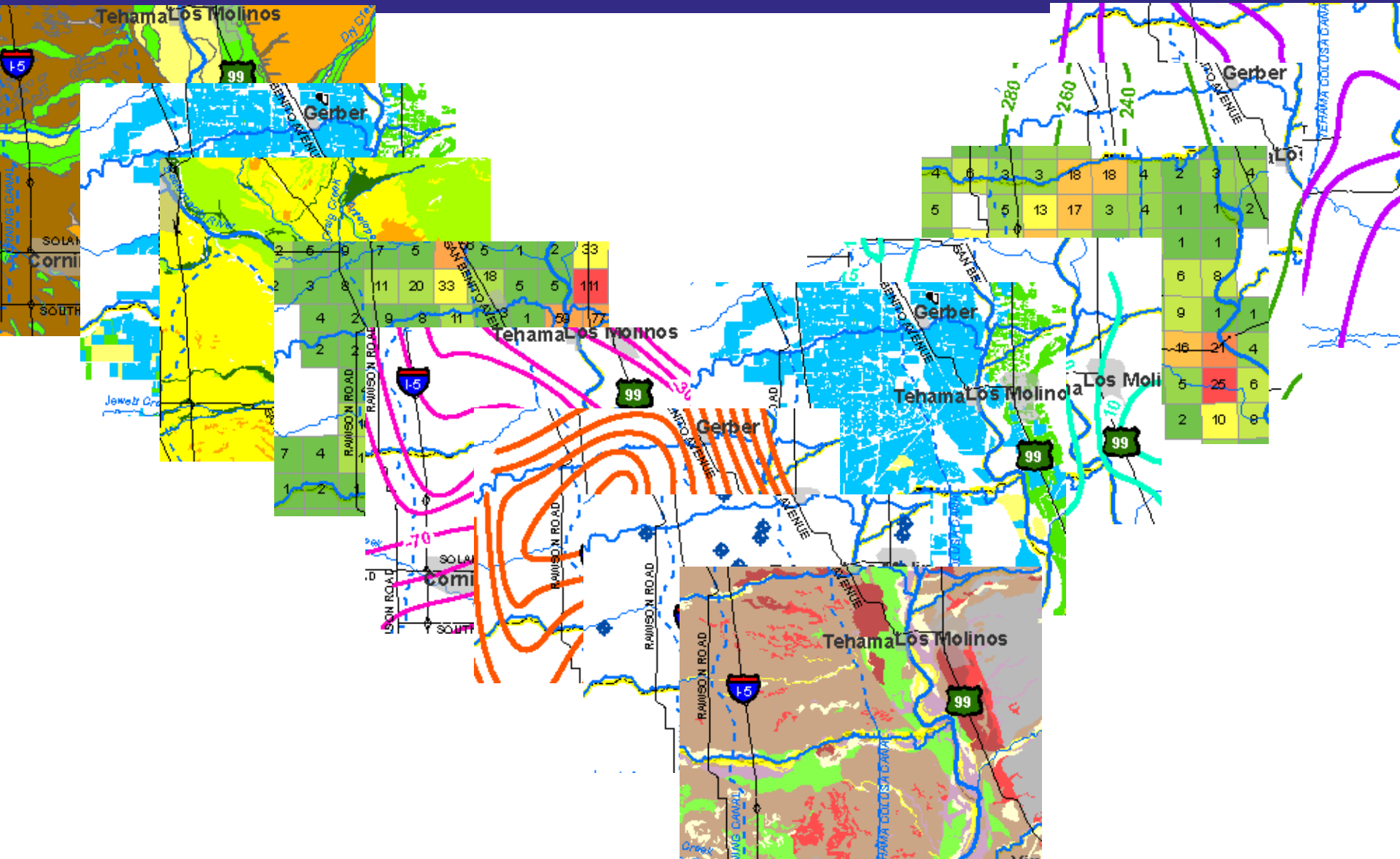
- Identify areas for future detailed investigation of groundwater recharge potential
- Set the stage for further discussion of enhanced recharge and investigation with the Sacramento Valley Integrated Regional Water Management Plan
- Be **proactive** by preparing to be in a position to advance enhanced groundwater recharge in the future

- Tehama County
 - AB3030 Plan - Trigger Levels / Basin Management Objectives
 - Land use changes
 - Groundwater elevation changes
- Glenn County
 - Part of the In-lieu feasibility study
 - Identifies areas that may benefit from surface water
 - Identifies methods to deliver surface water
 - Considers artificial recharge in addition to in-lieu recharge

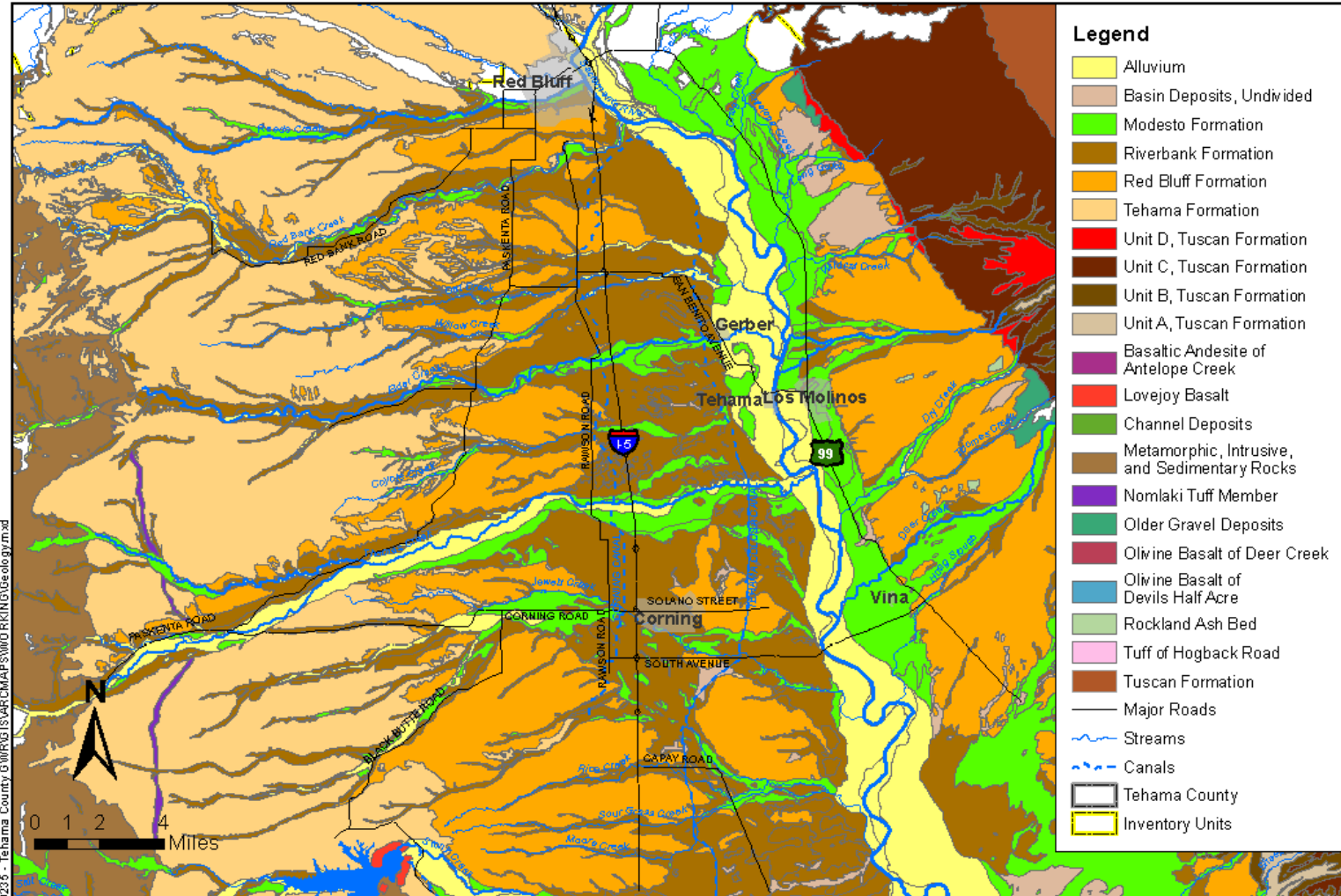
Project Approach: Summary



Data



Source Data - Geology



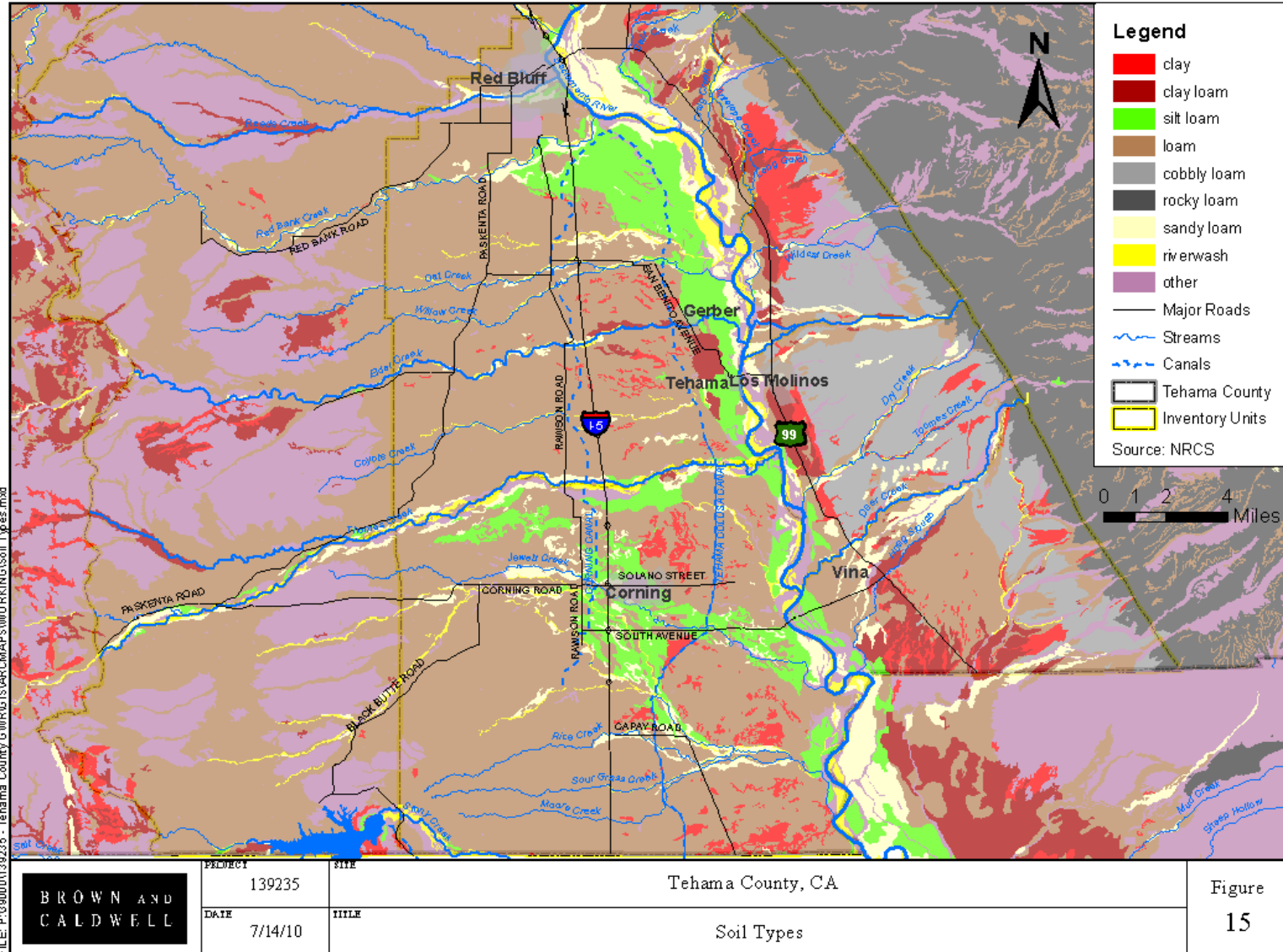
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BROWN AND CALDWELL

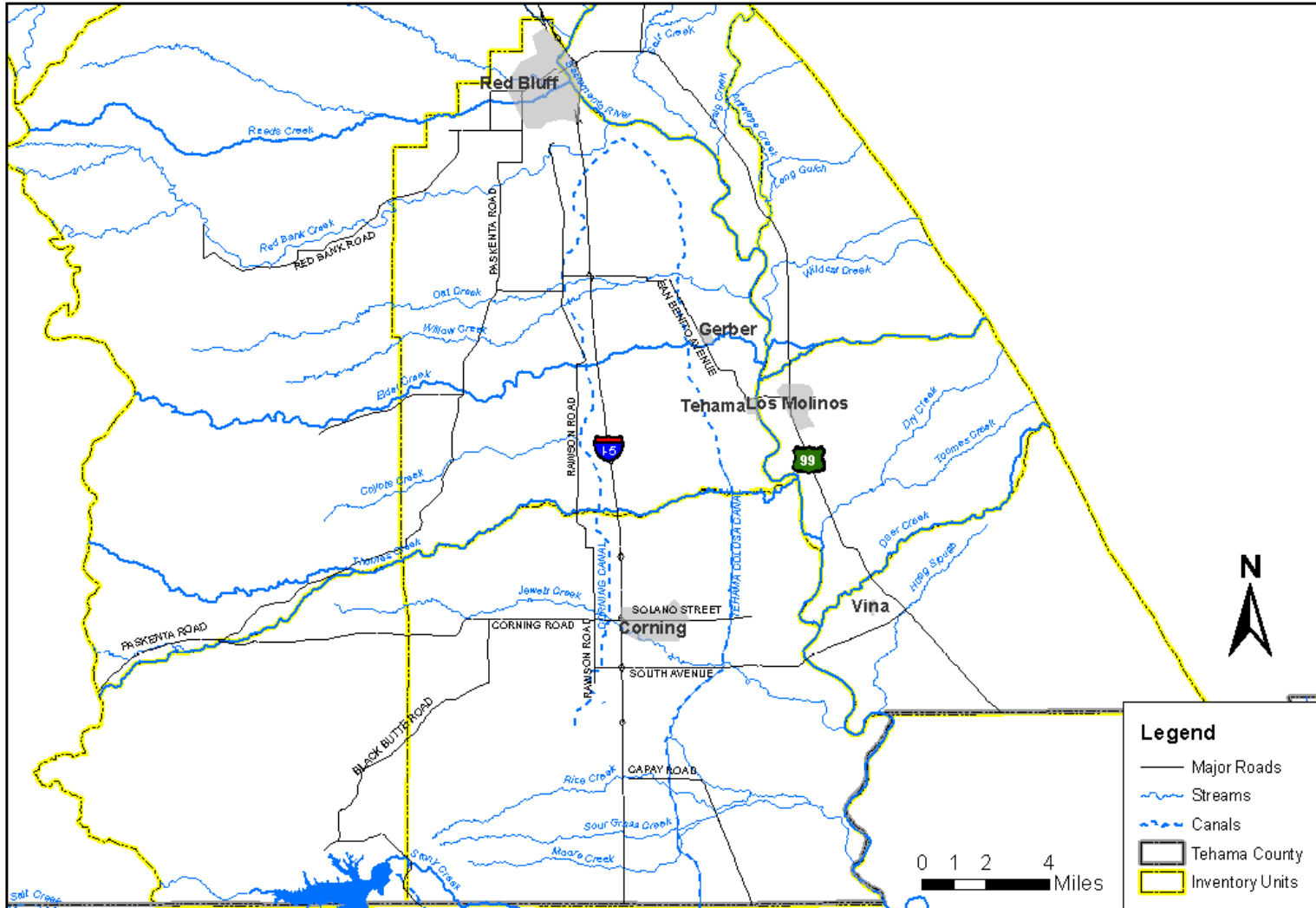
PROJECT	139235	SITE	Tehama County, CA
DATE	7/14/10	TITLE	Geology Data

Figure
14

Source Data - Soils

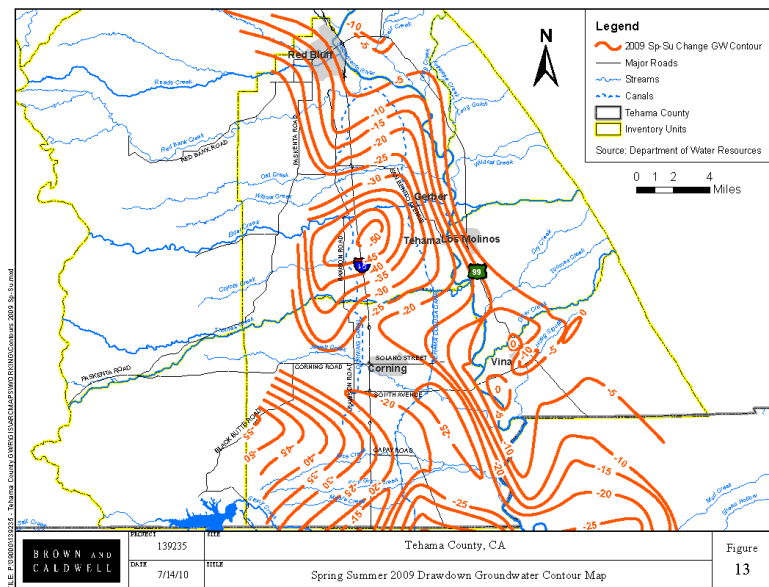
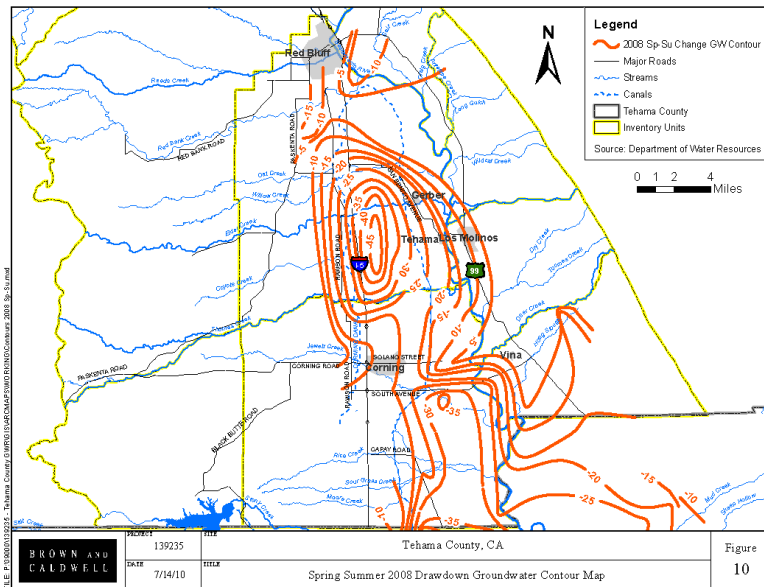
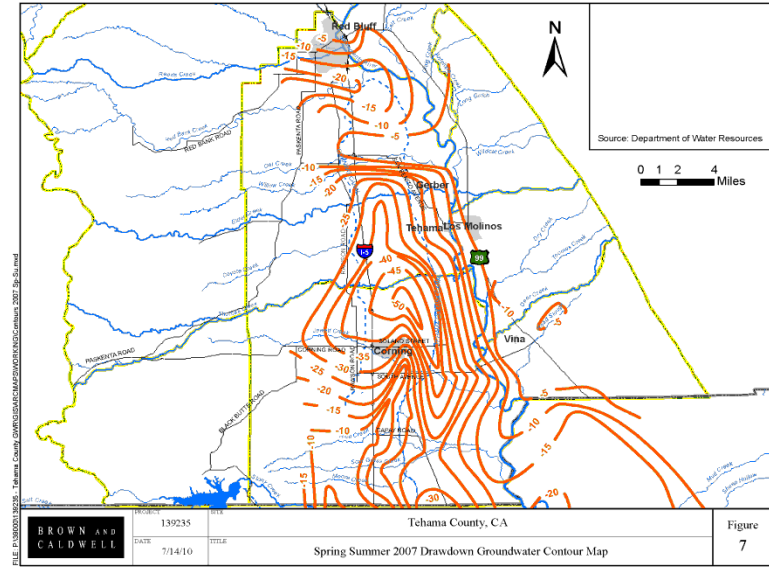
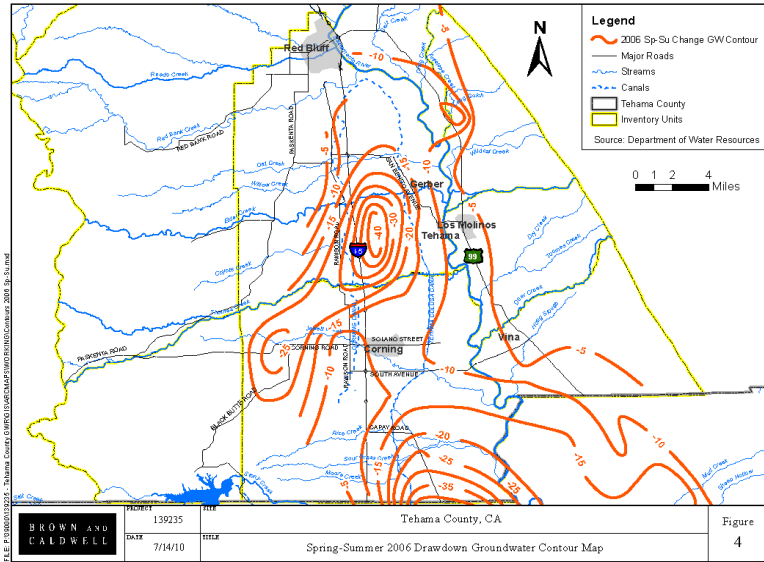


Source Data – Streams and Canals

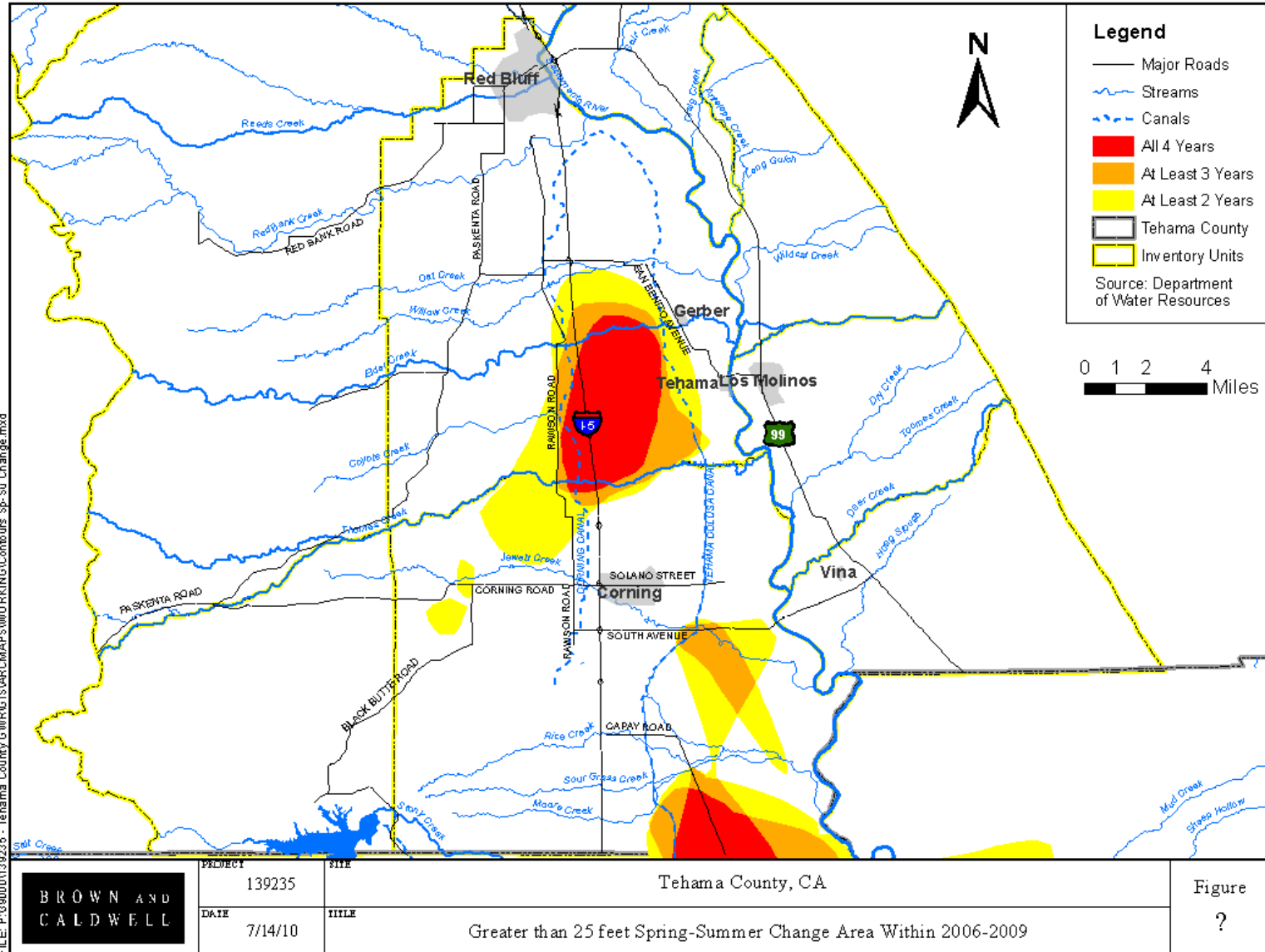


	PROJECT	139235	SITE	Tehama County, CA	Figure 1
	DATE	7/14/10	TITLE	Soil Permeability based on K _{Sat} Values	

Source Data - Spring – Summer Drawdown

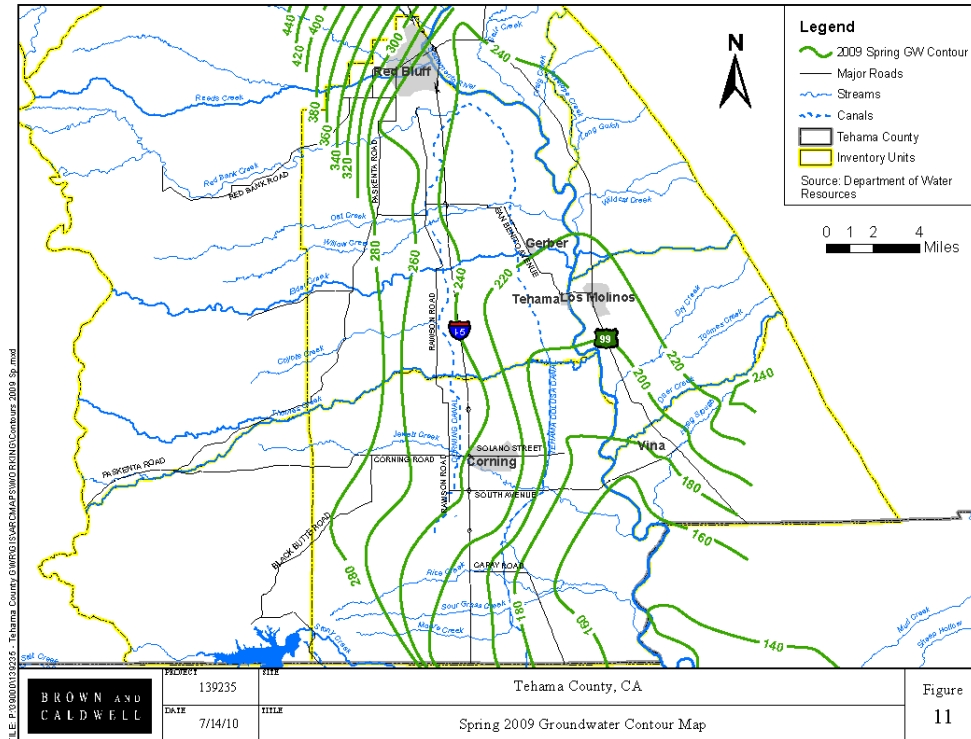
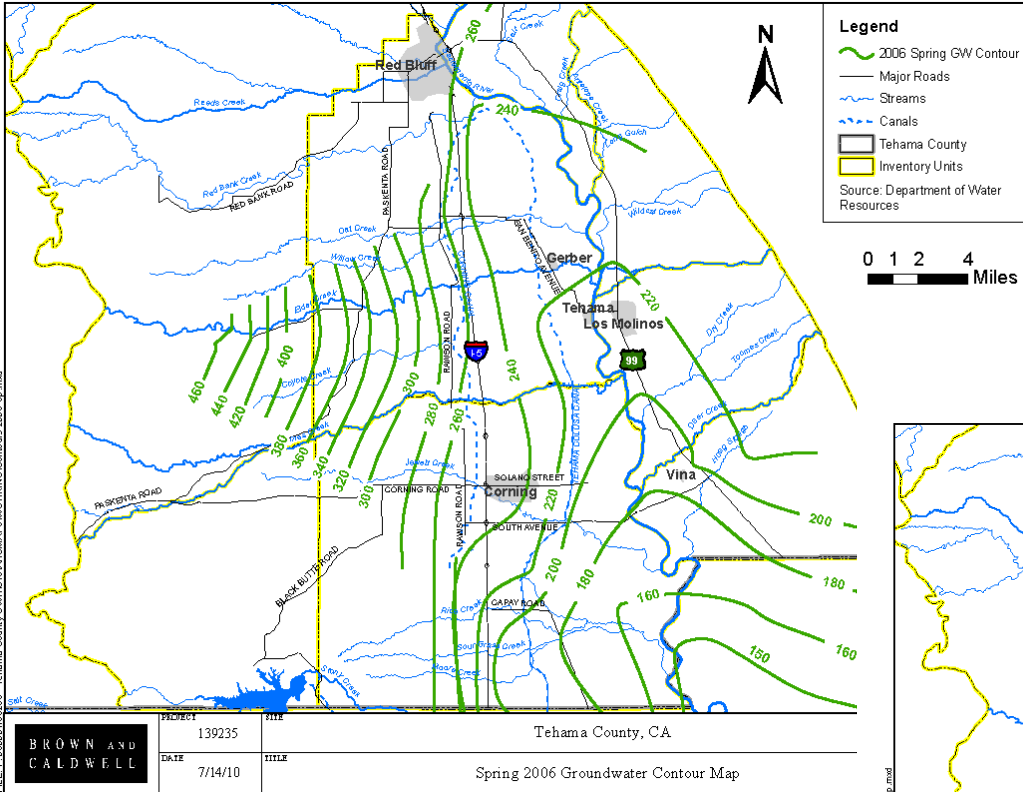


Source Data - Spring - Summer Drawdown

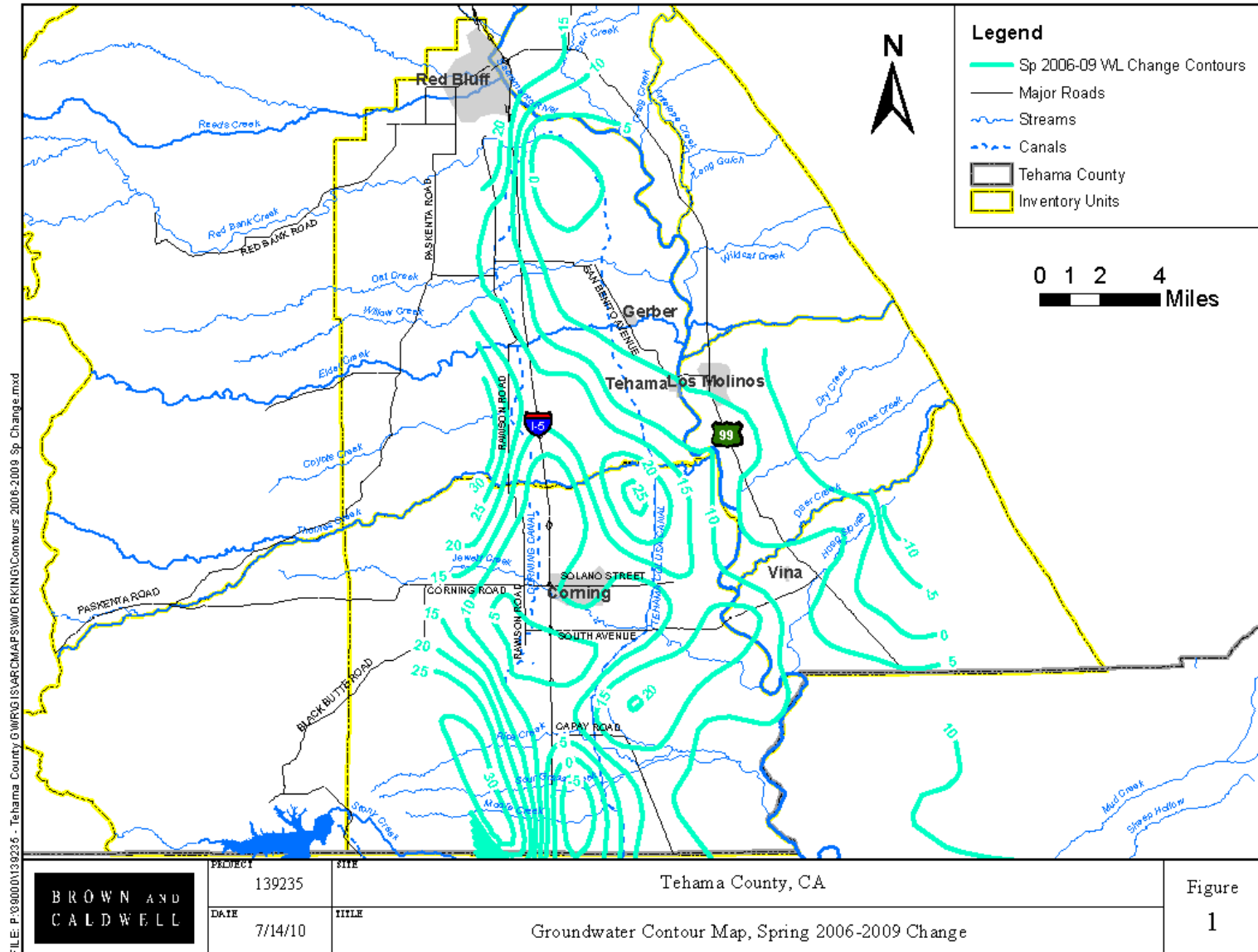


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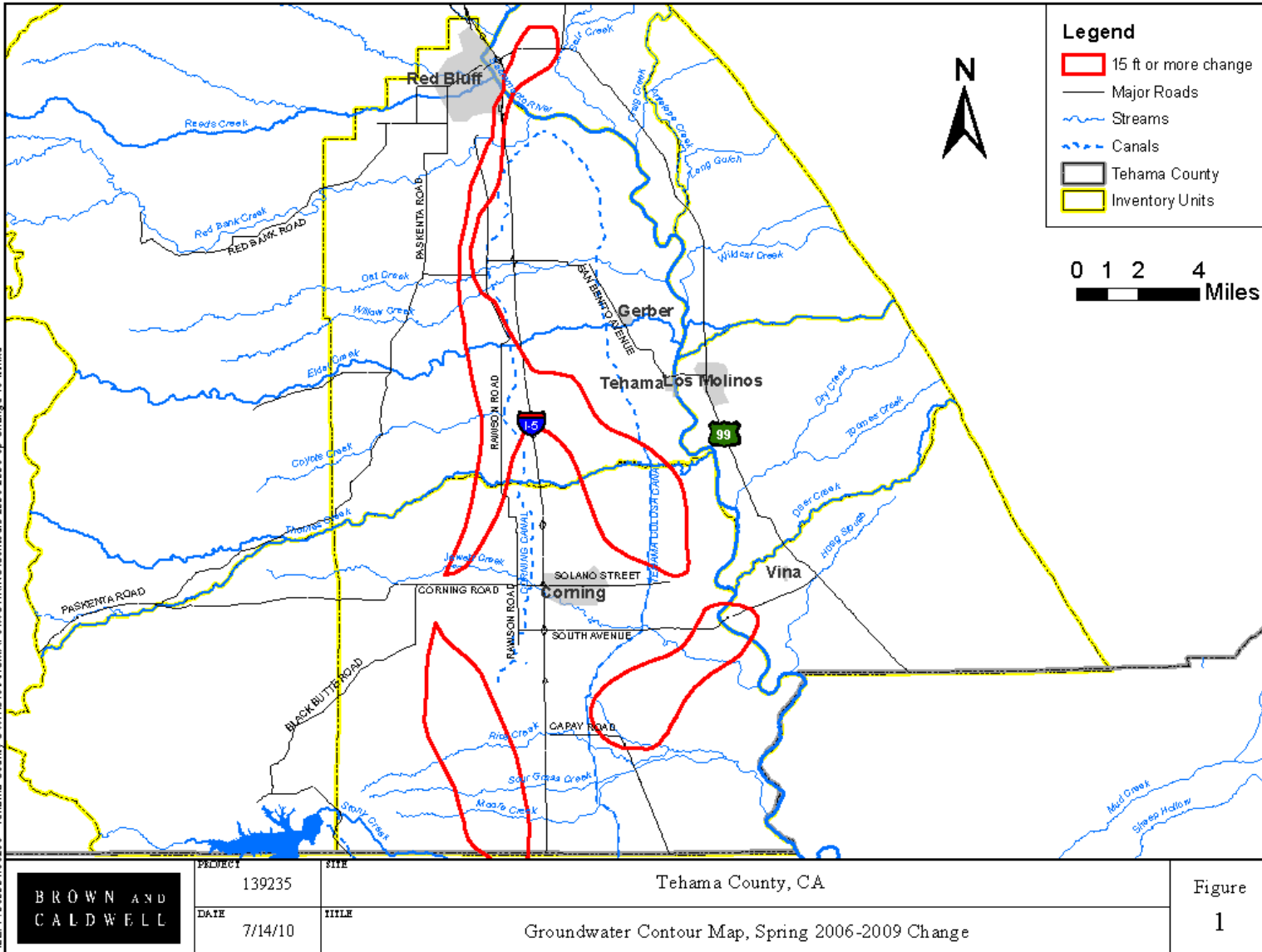
Source Data – Spring Contours



Source Data – Spring 2006 to Spring 2009

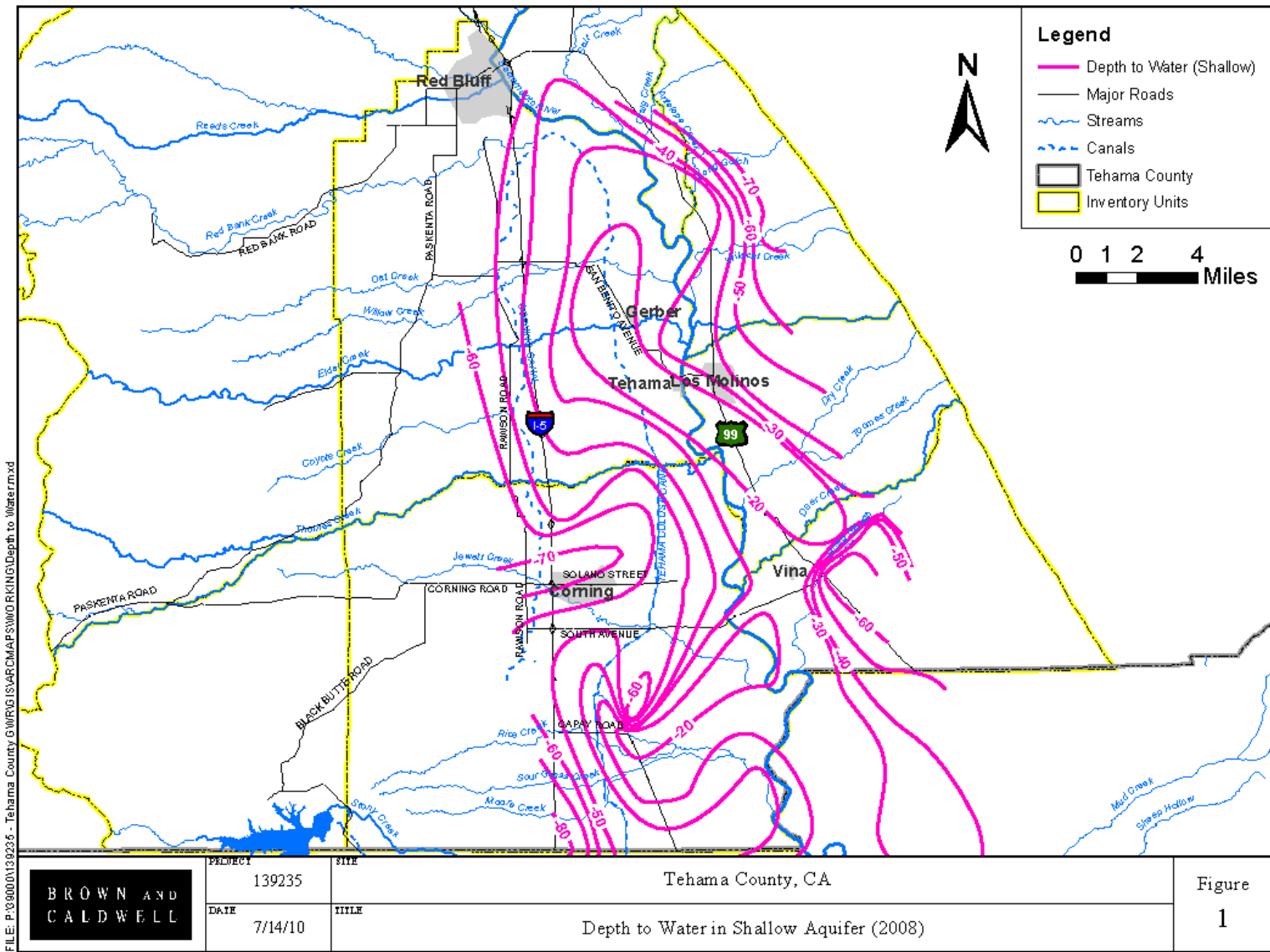


Source Data – Spring 2006 to Spring 2009



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Source Data – Depth to Water in Wells Less Than 150 Feet Deep

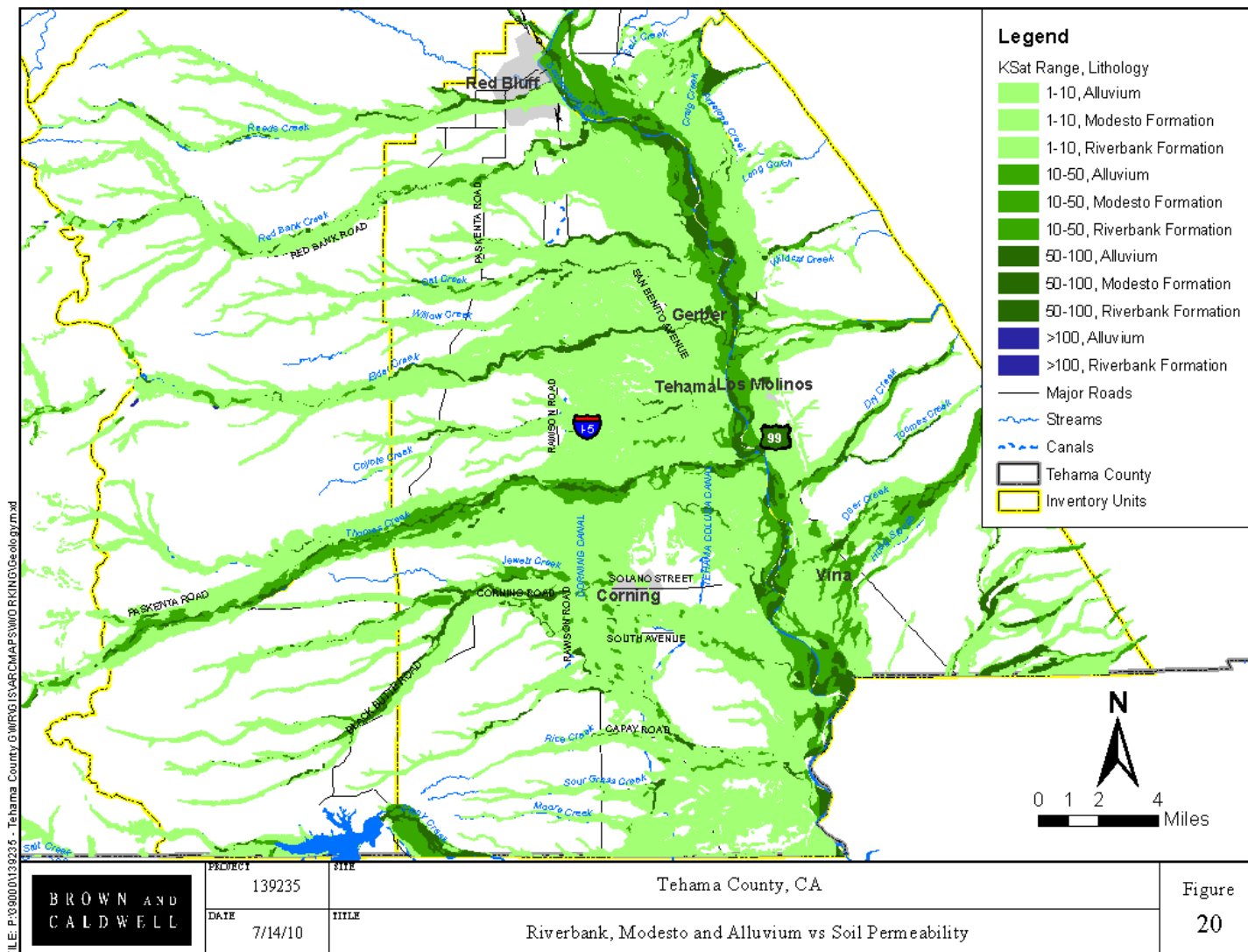


Project Approach: Determine Selection of Criteria

- Enhanced Recharge Area,
- In-Lieu Recharge
- Areas of Need
- Soil types
- Geology formations
- Proximity to water
- Land use types
- Spring to summer drawdown
- Change in storage
- DWR well density maps

Criteria: Soil and Geology

- Riverbank and Modesto Formations
- Loam, Sandy Loam, and Riverwash soils



Criteria: Geology, Soil, and Proximity to a Water Source

- Riverbank and Modesto Formations
- Loam, Sandy Loam, and Riverwash soils
- Within 2000 feet of a canal or 1000 feet of a stream

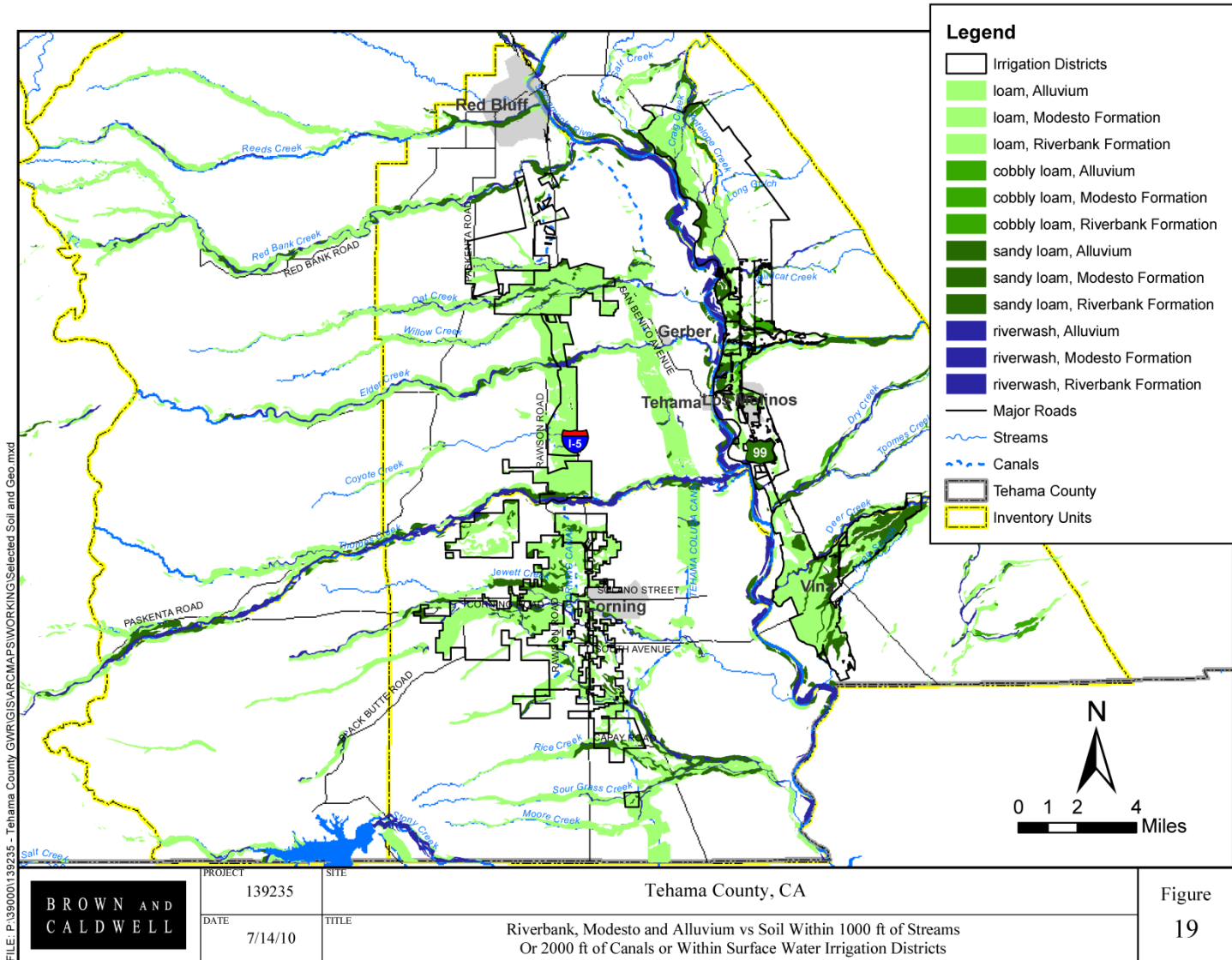


Figure
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Criteria: Geology, Soil, Surface Water, and Drawdown

- Riverbank and Modesto Formations
- Loam, Sandy Loam, and Riverwash soils
- Areas within 1-2000 feet of streams/canals
- Areas with either >25 spring-summer DD or >15 2006-2009 spring DD

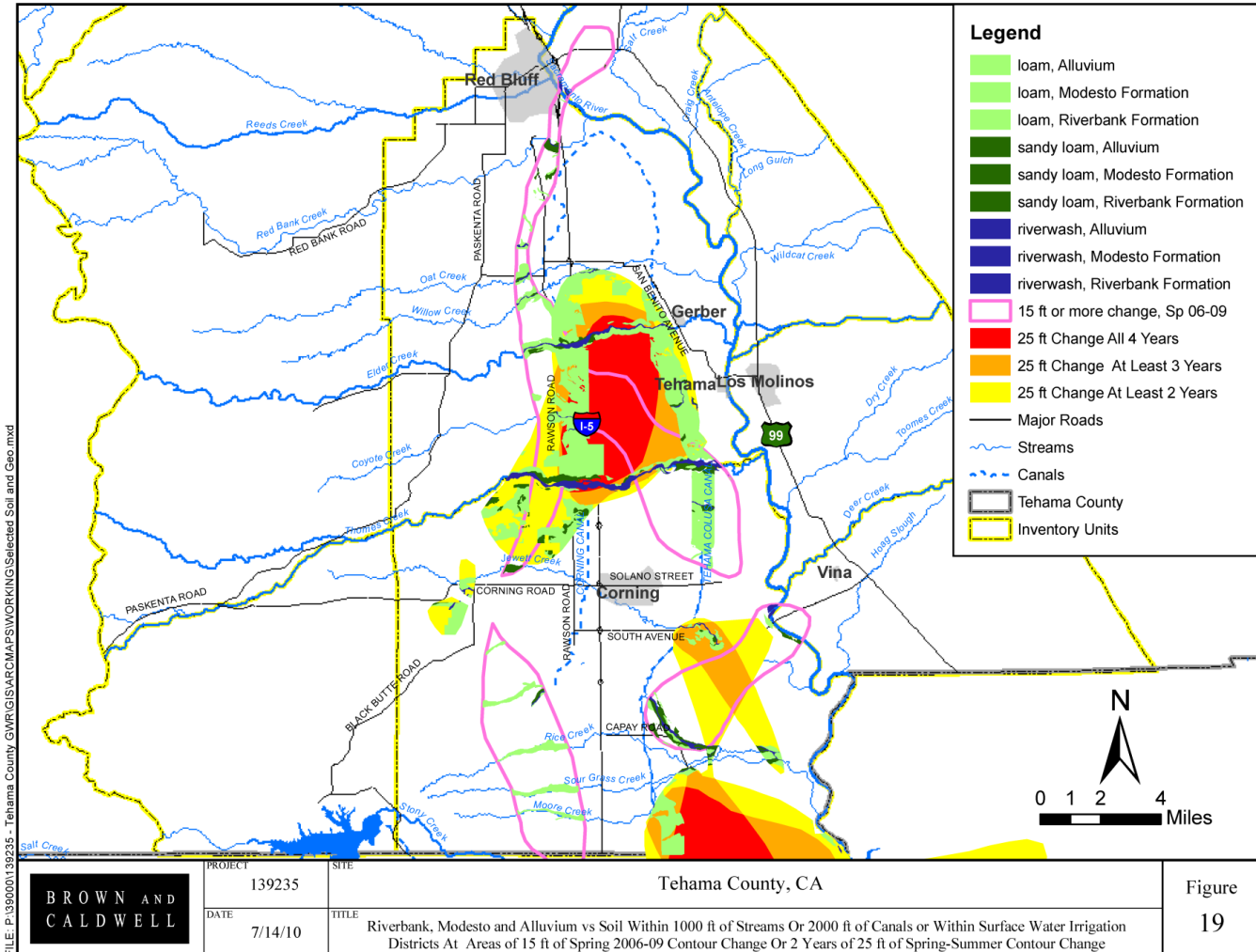
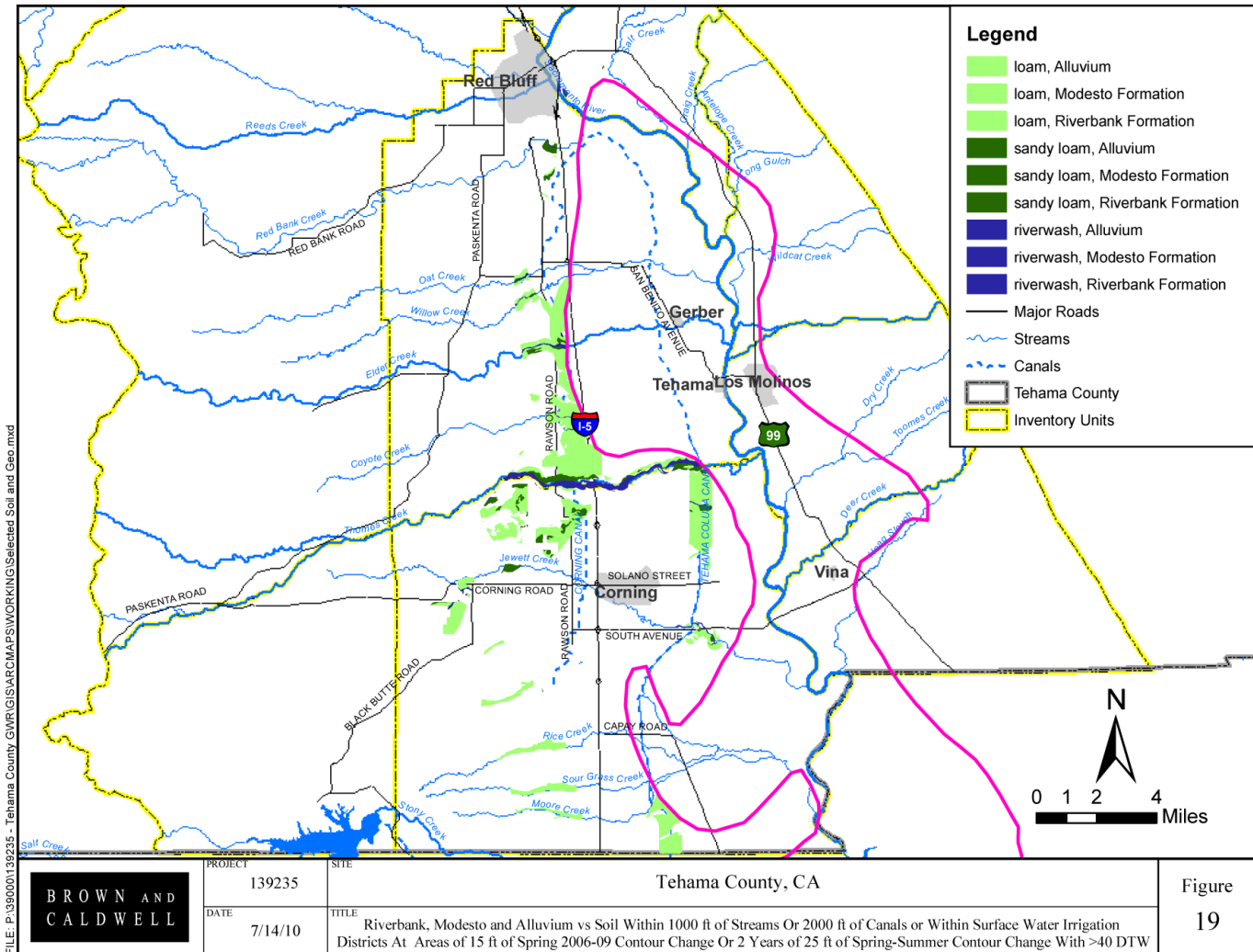


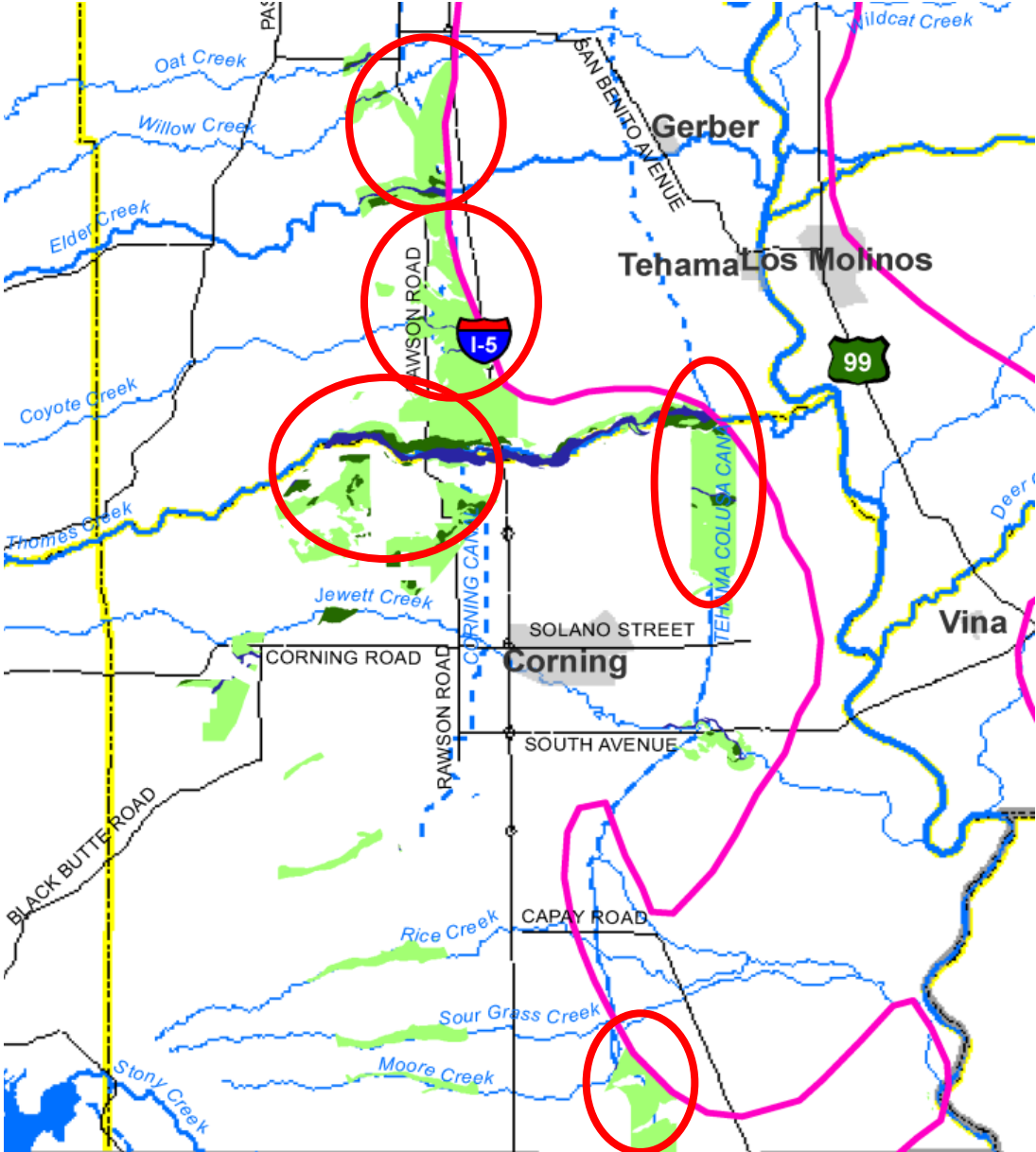
Figure
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Criteria: Geology, Soil, Surface Water, Drawdown and Depth to Water

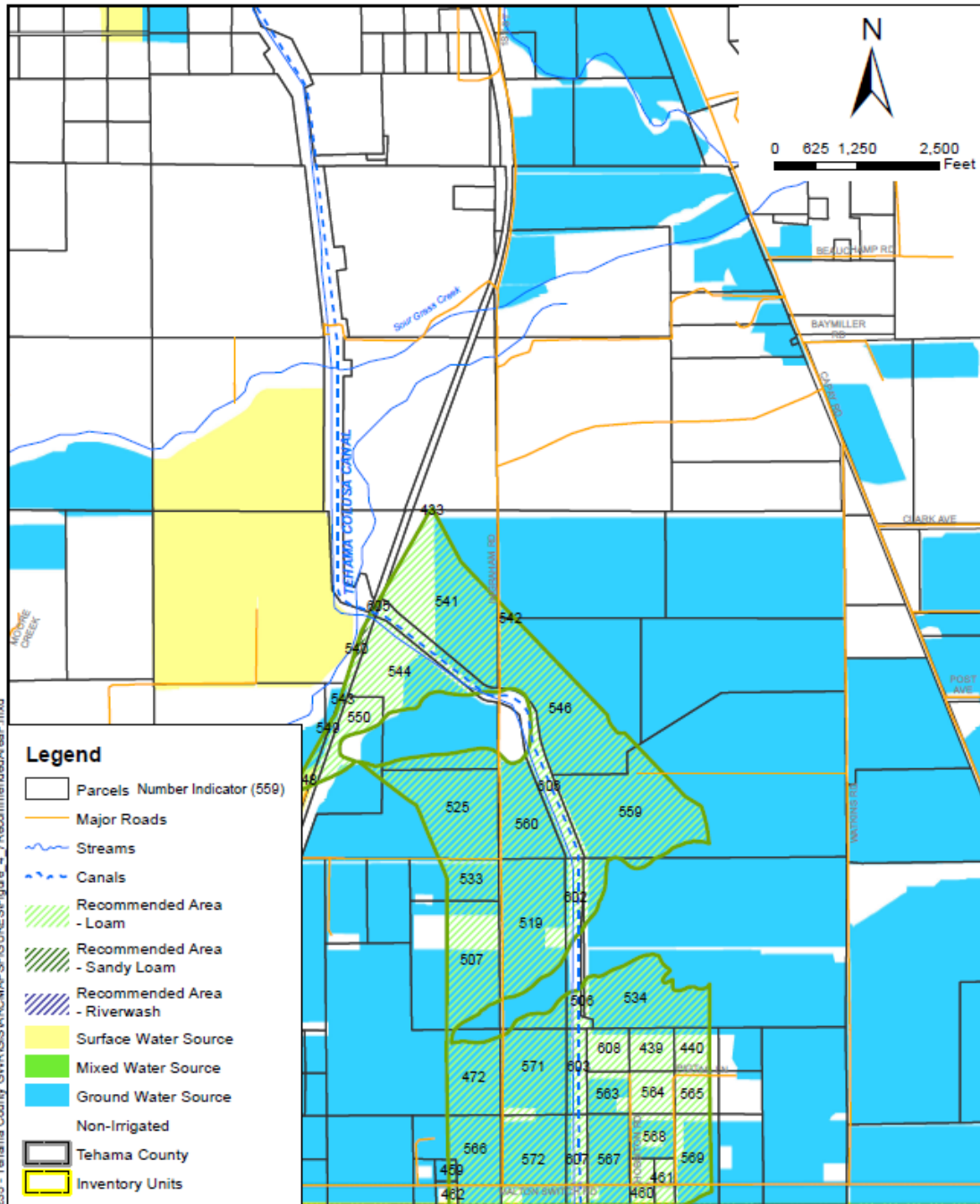
- Riverbank and Modesto Formations
- Loam, Sandy Loam, and Riverwash soils
- Areas within 1-2000 feet of streams/canals
- Areas with either >25 spring-summer DD or >15 2006-2009 spring DD
- DTW > 40 feet



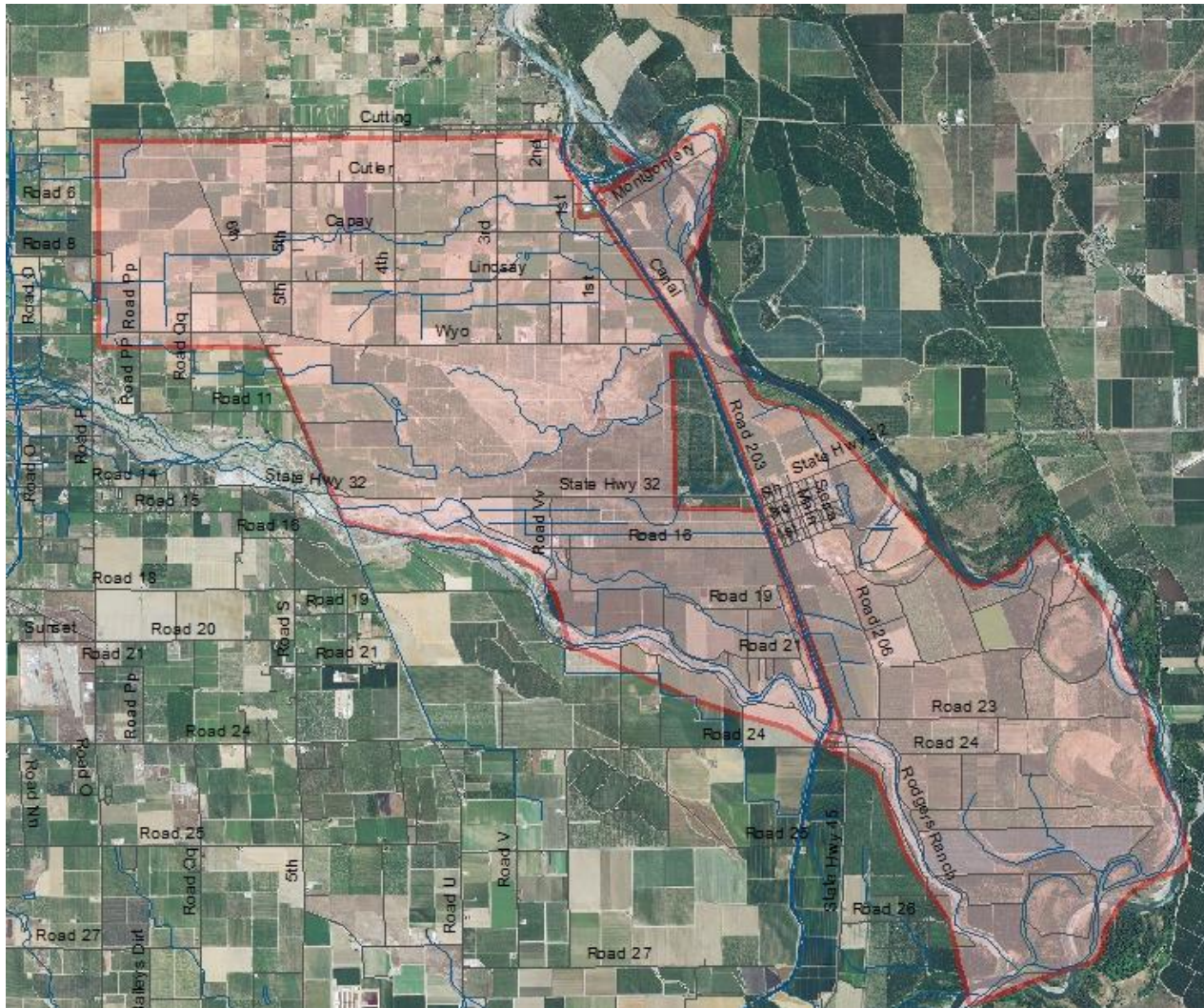
Results



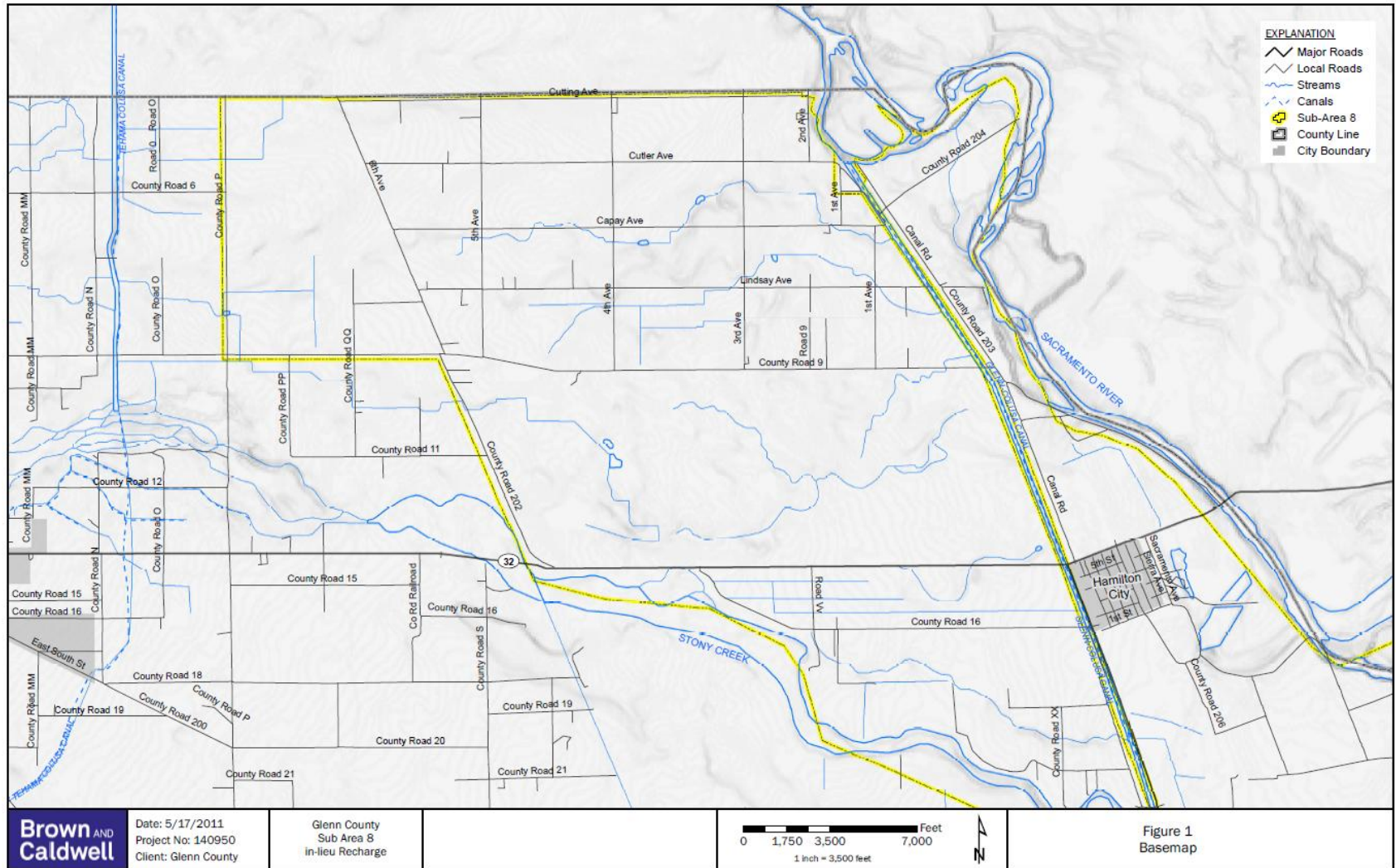
Results



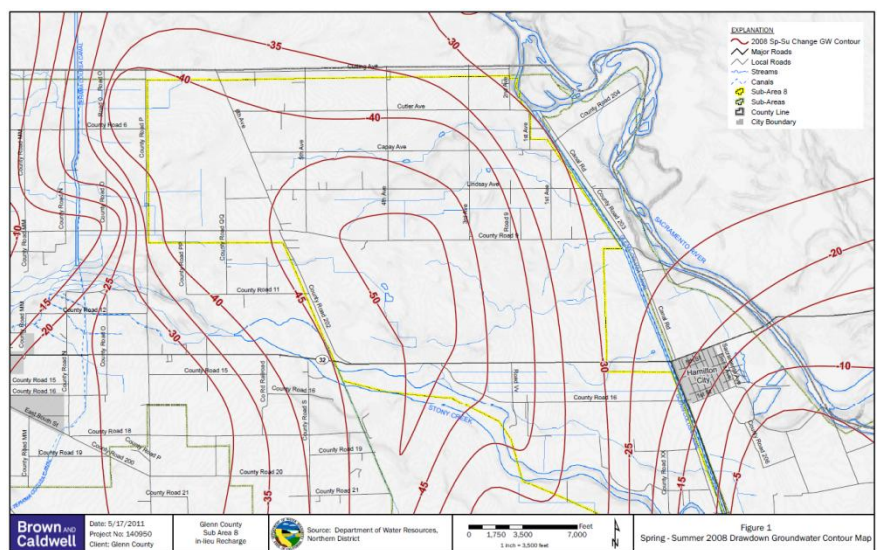
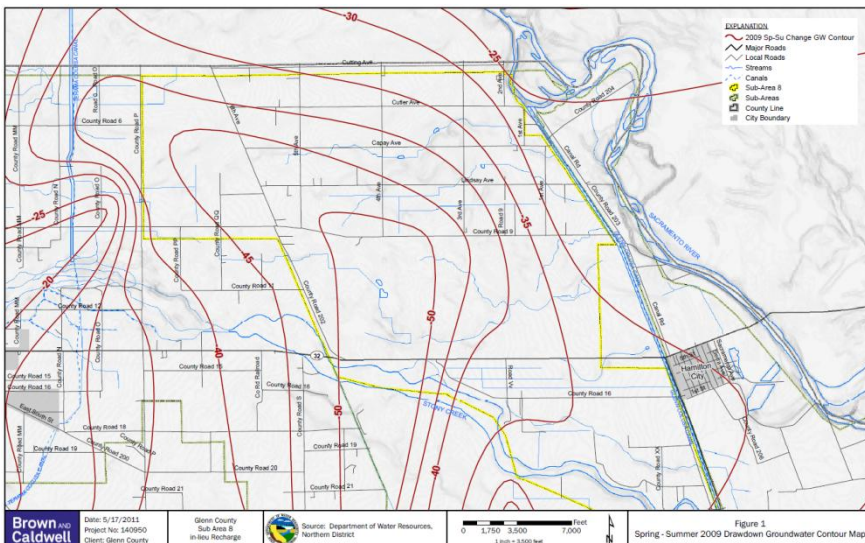
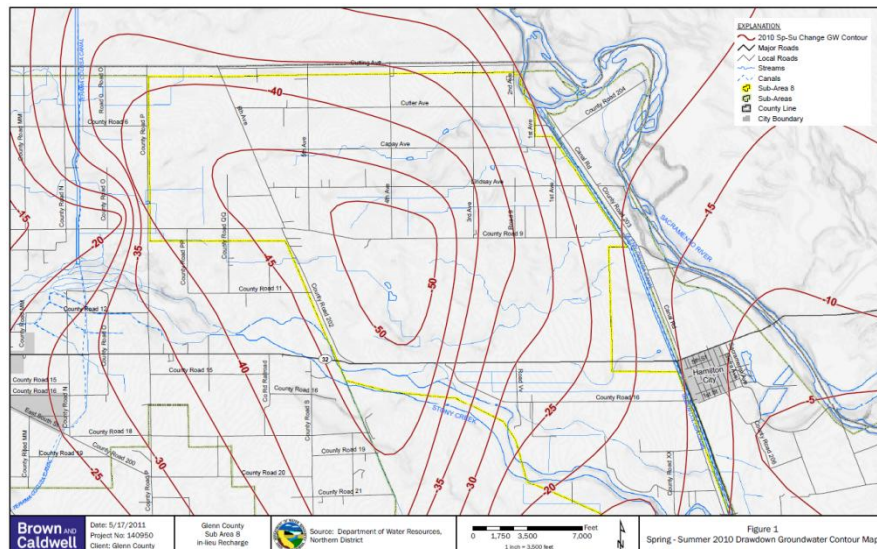
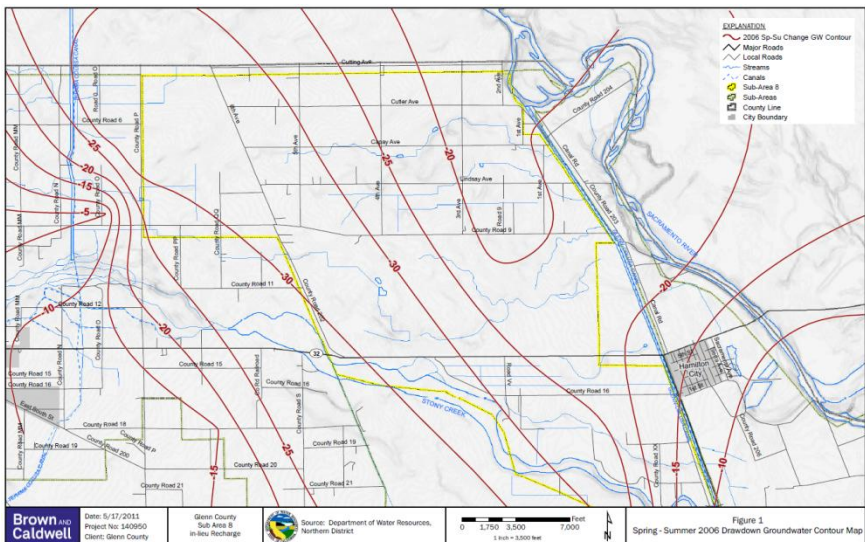
Glenn County Sub-Area 8



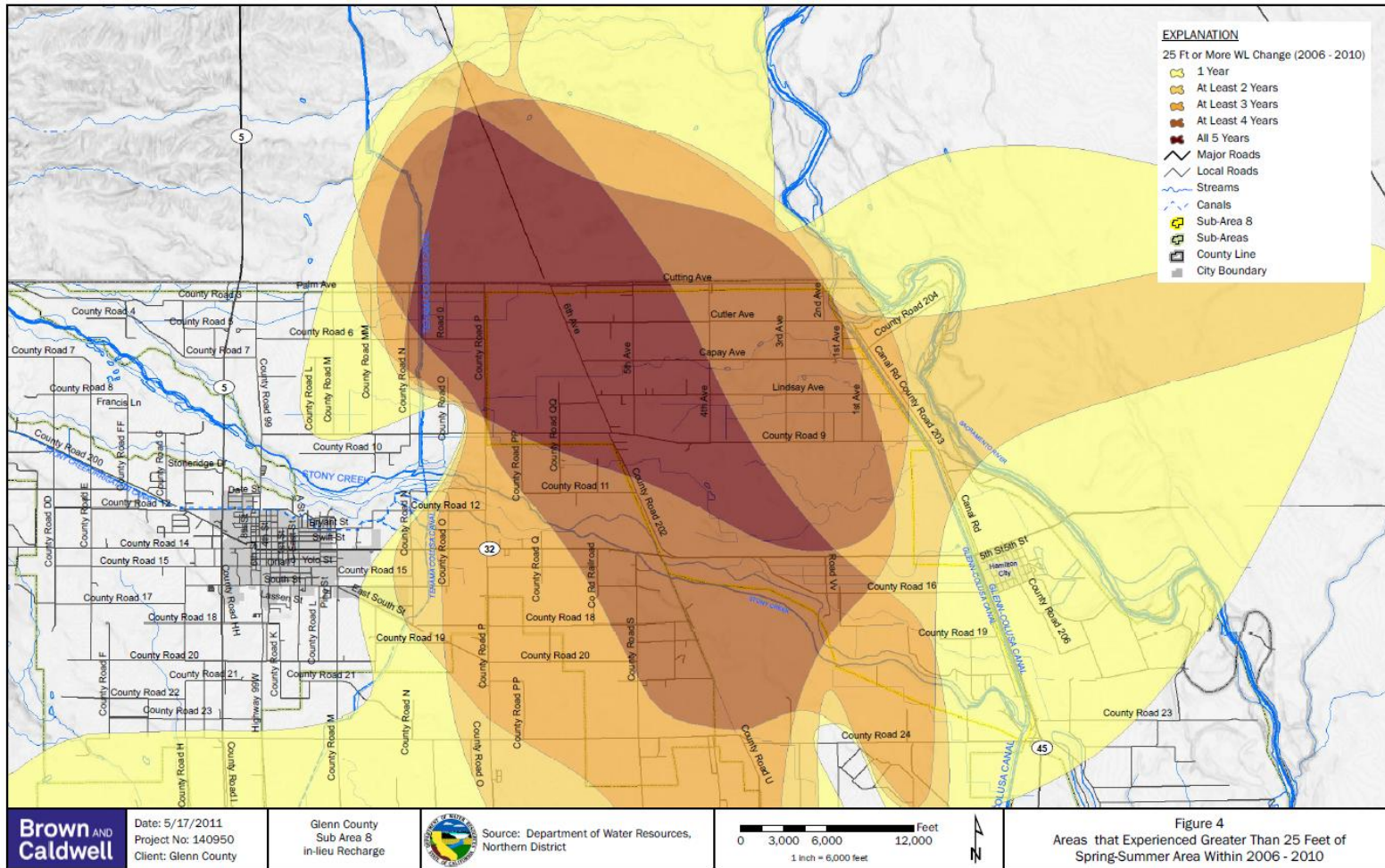
Study Area



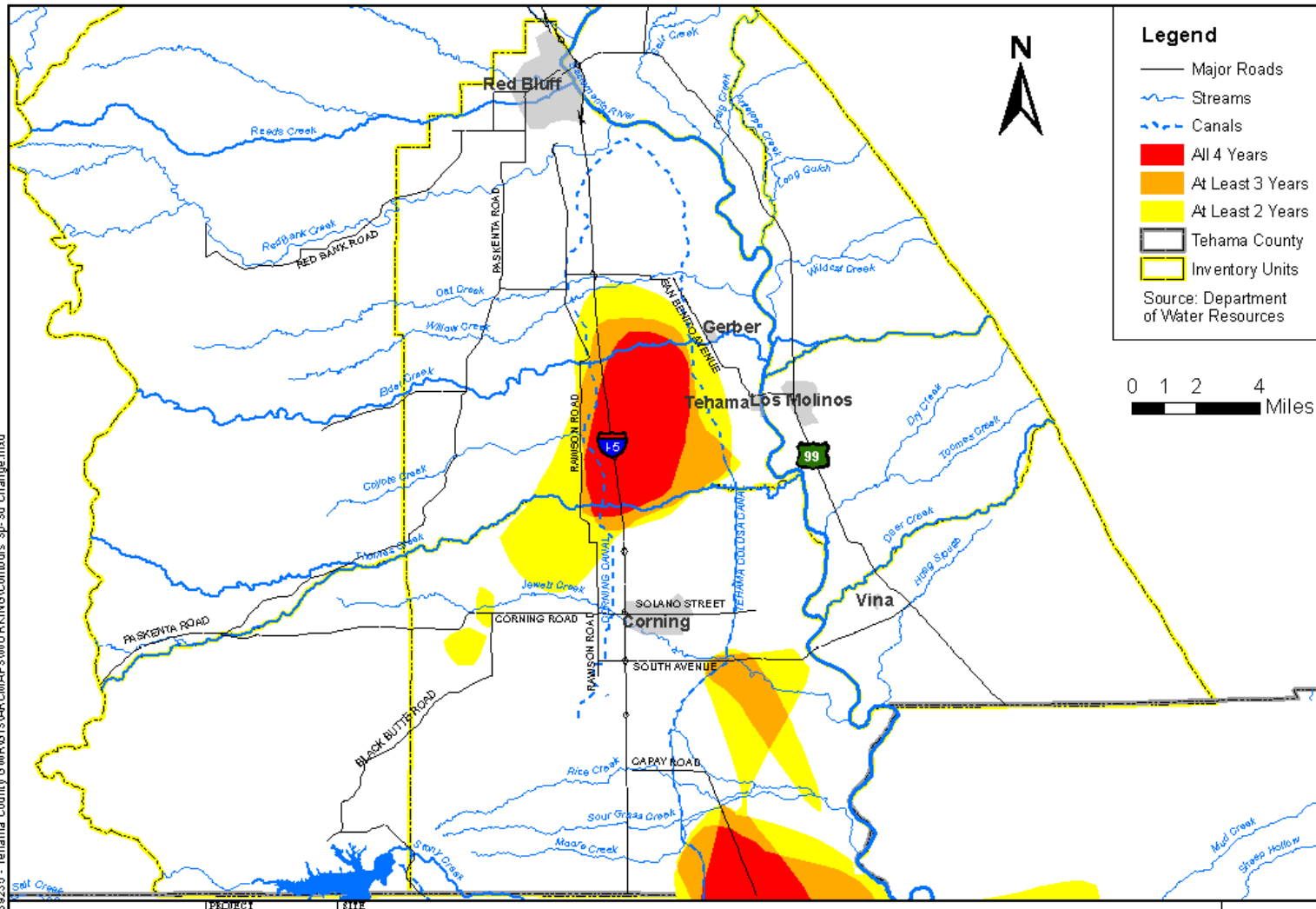
Spring to Summer Drawdown



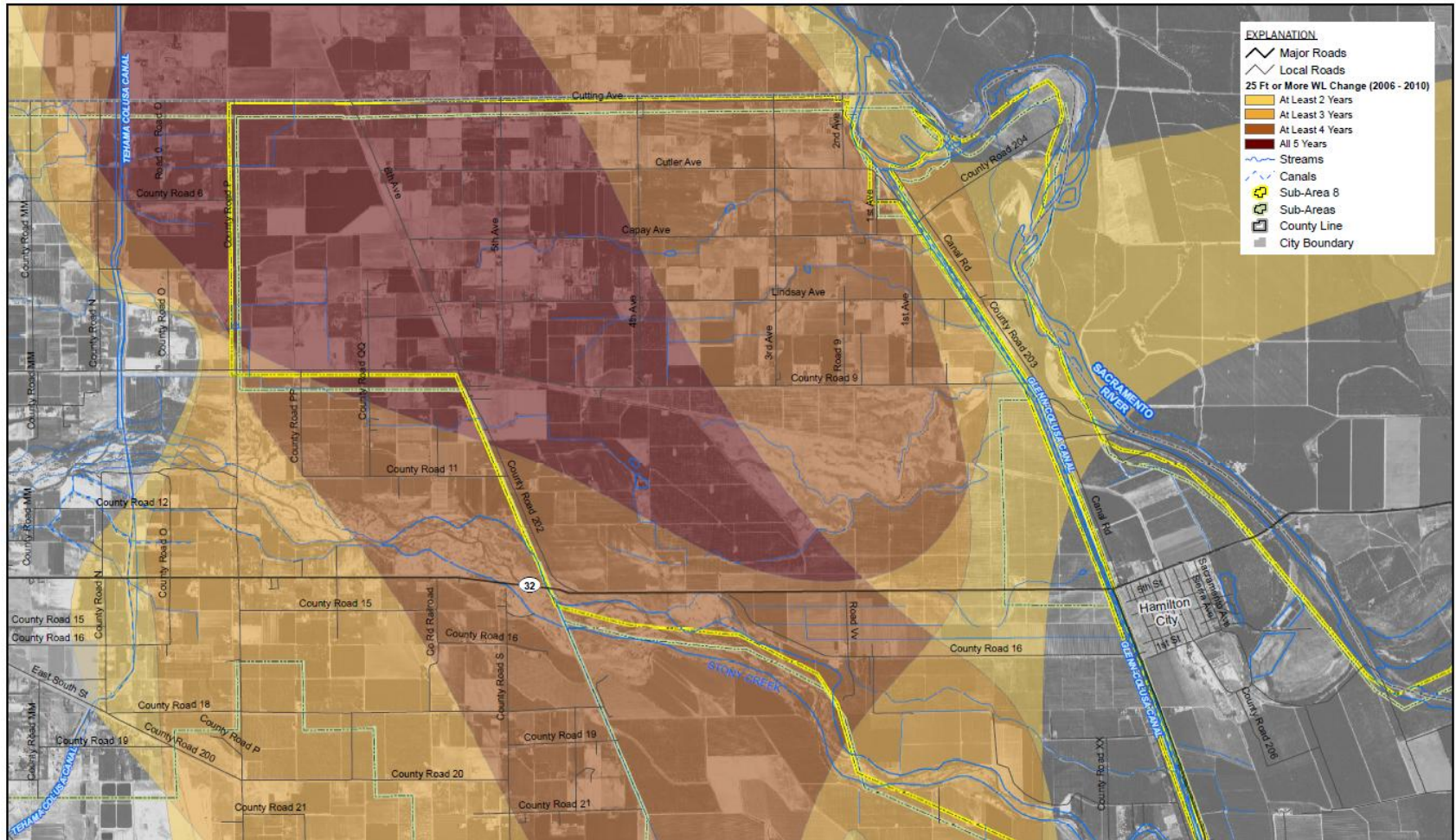
Spring to Summer Drawdown



Spring to Summer Drawdown



Spring to Summer Drawdown



Brown AND Caldwell

Date: 12/06/2011
 Project No: 140950
 Client: Glenn County

Glenn County
 Sub Area 8
 in-lieu Recharge

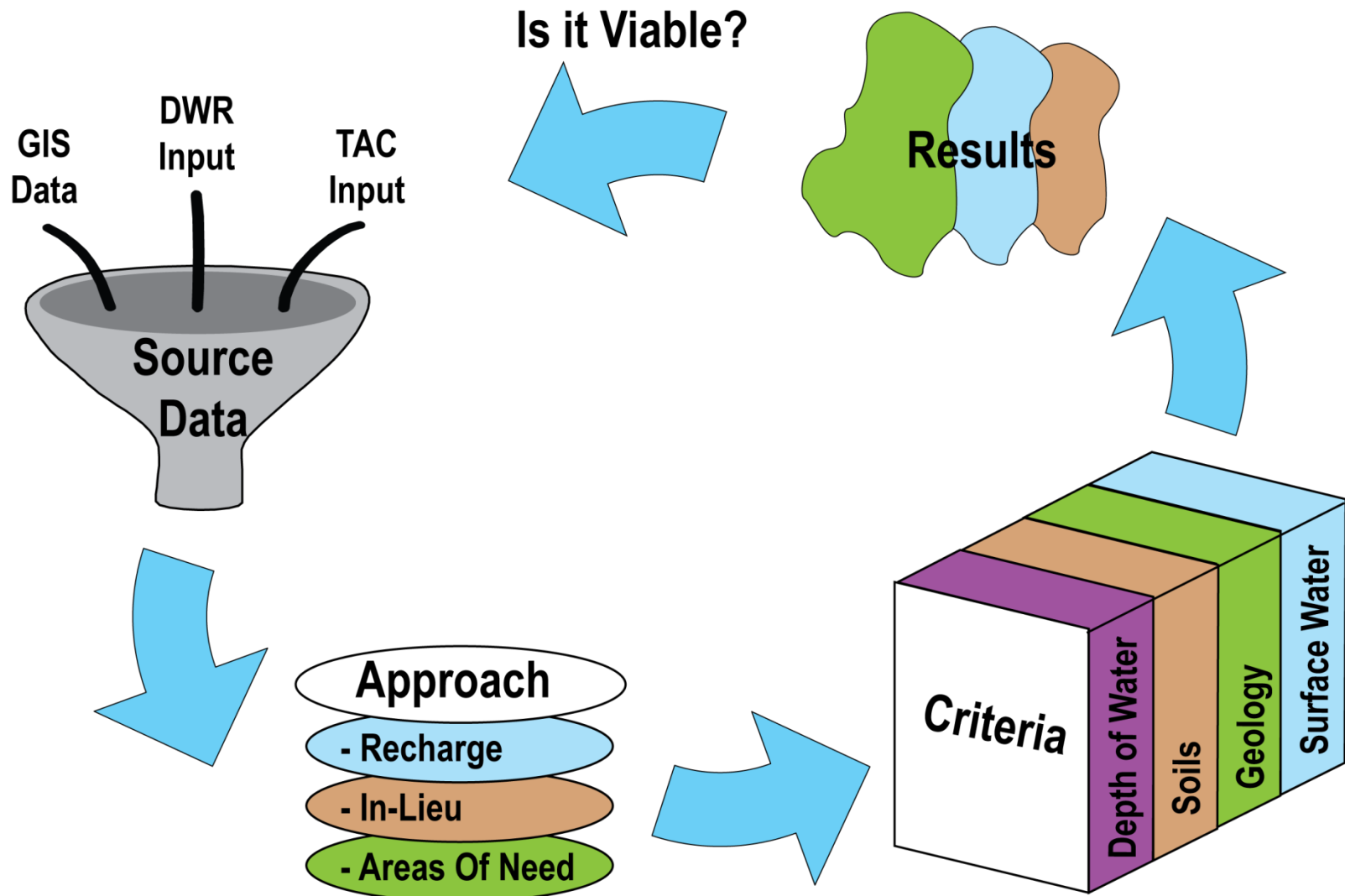


Source: Department of Water Resources,
 Northern District

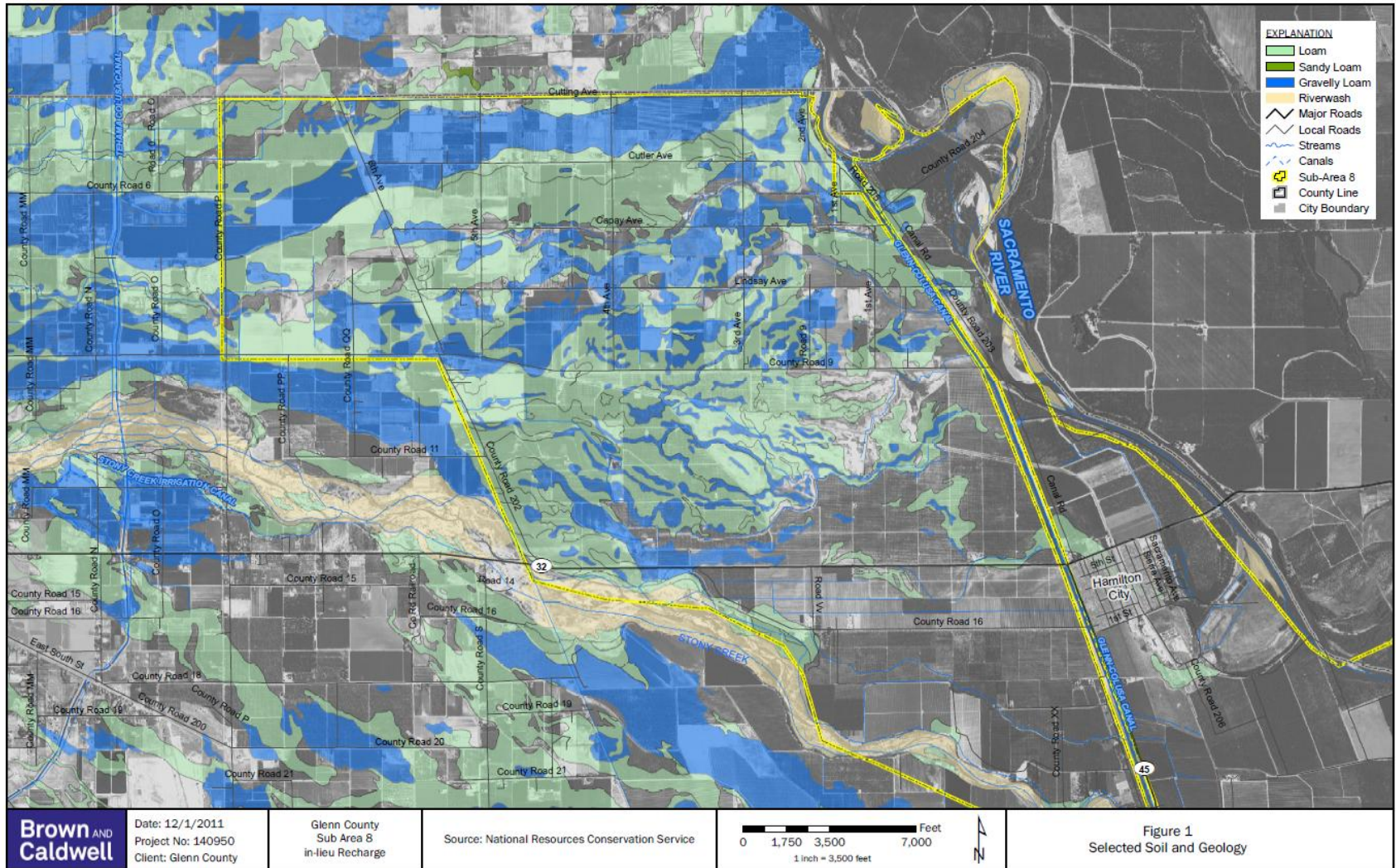


Figure 4
 Areas that Experienced Greater Than 25 Feet of
 Spring-Summer Area Within 2006 - 2010

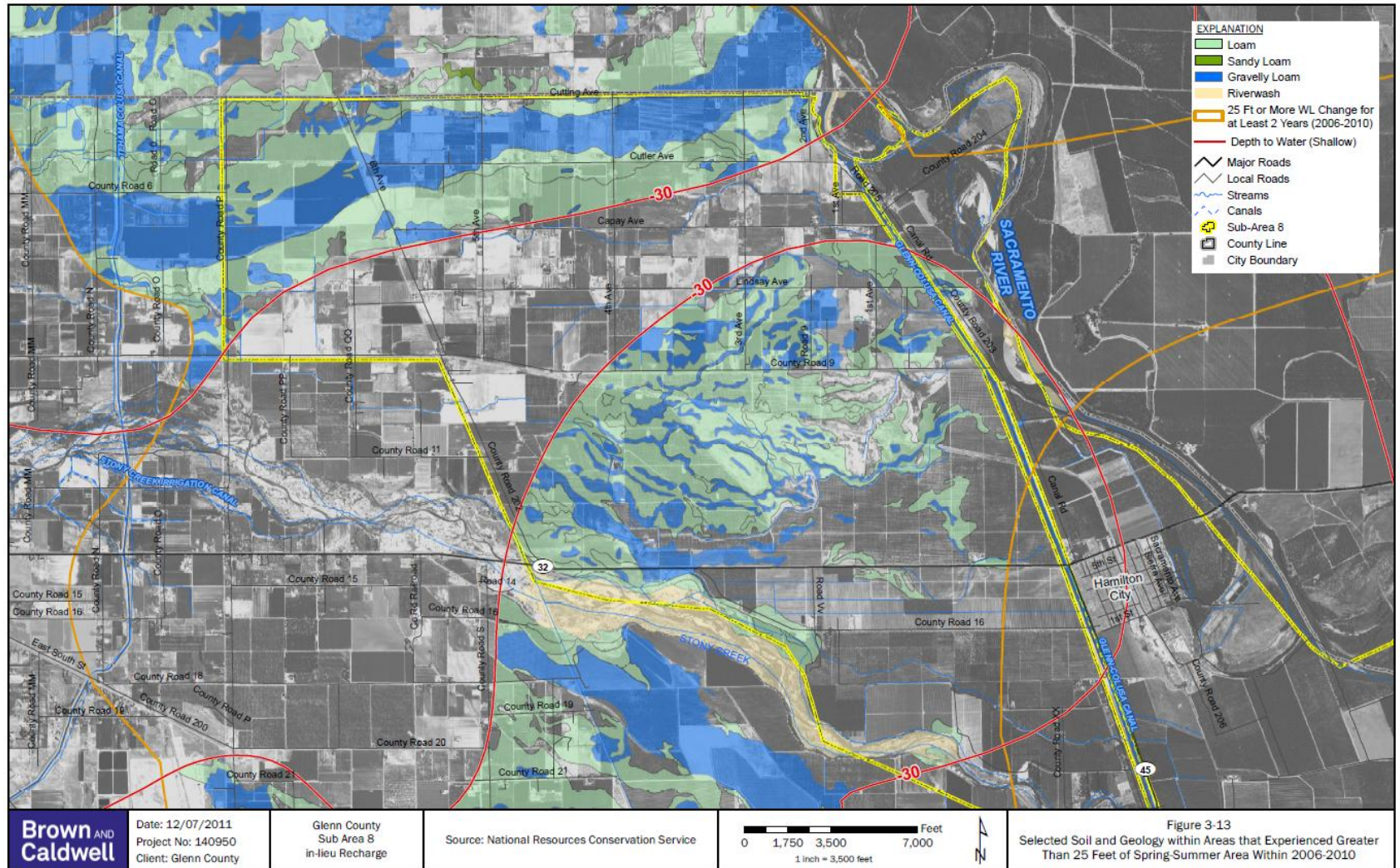
Project Approach: Summary



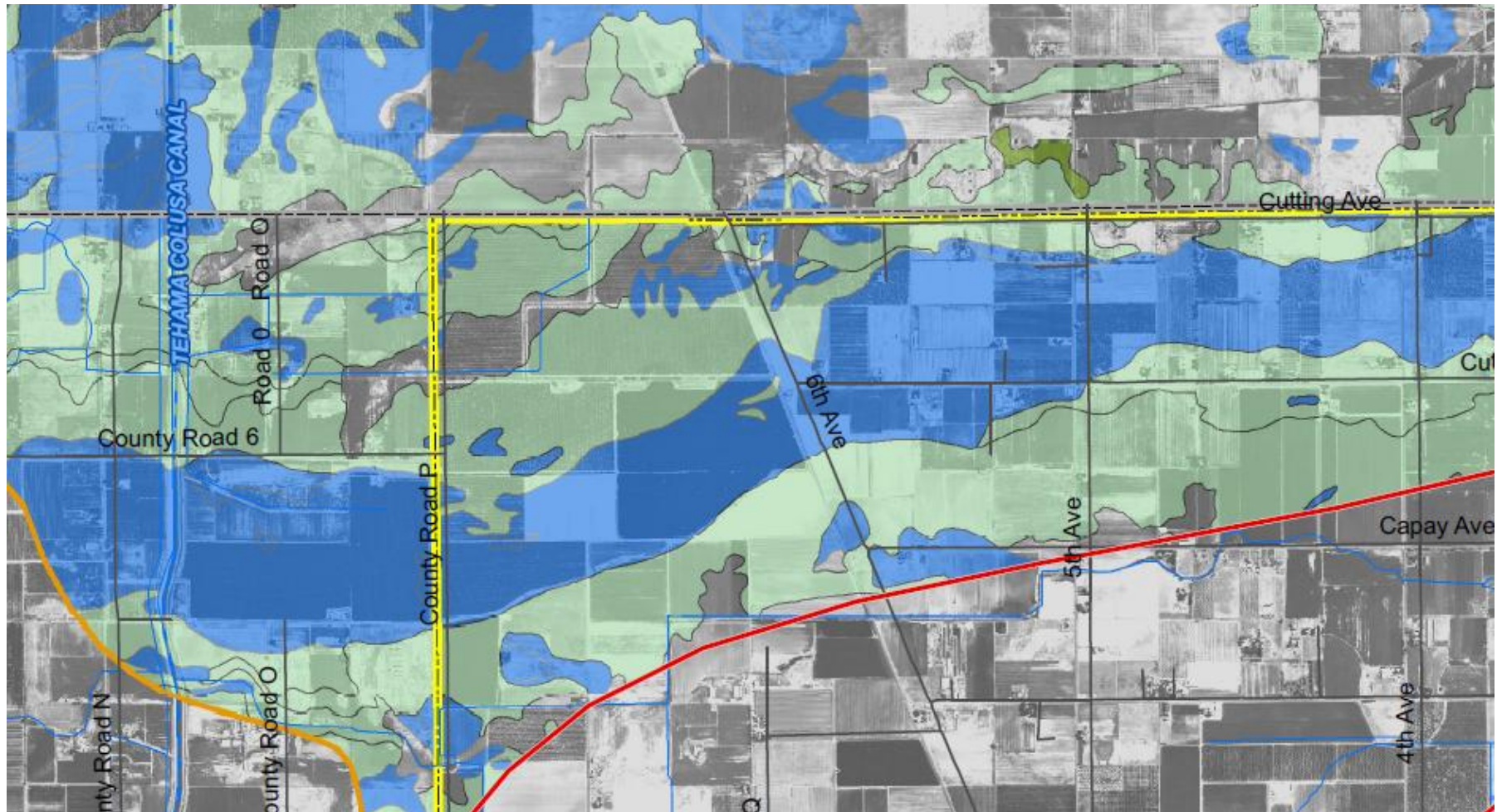
Geology and Soils



Geology, Soils, Areas of Need, and Depth to Water



Glenn County Sub-Area 8



Challenges

- Access to water
- Landowner participation
- Recharge methodology
- Financing

Next Steps

- Select appropriate recharge methods
- Continue interaction with willing landowners
- Identify potential water supplies and conveyance
- Perform feasibility studies on specific sites



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