# Public Review Draft
# Five Year Update to the
# Alternative Groundwater Sustainability Plan

November 18, 2021


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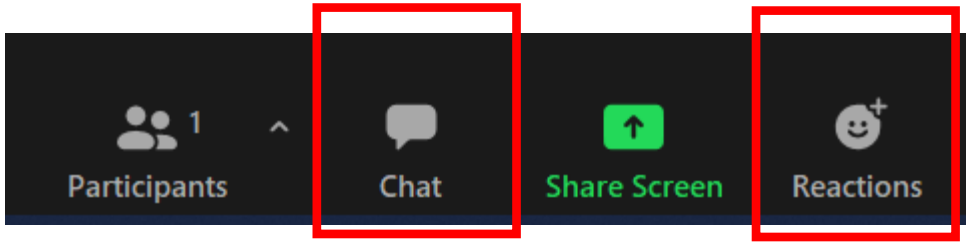
EKI Environmental

# To Ask Questions

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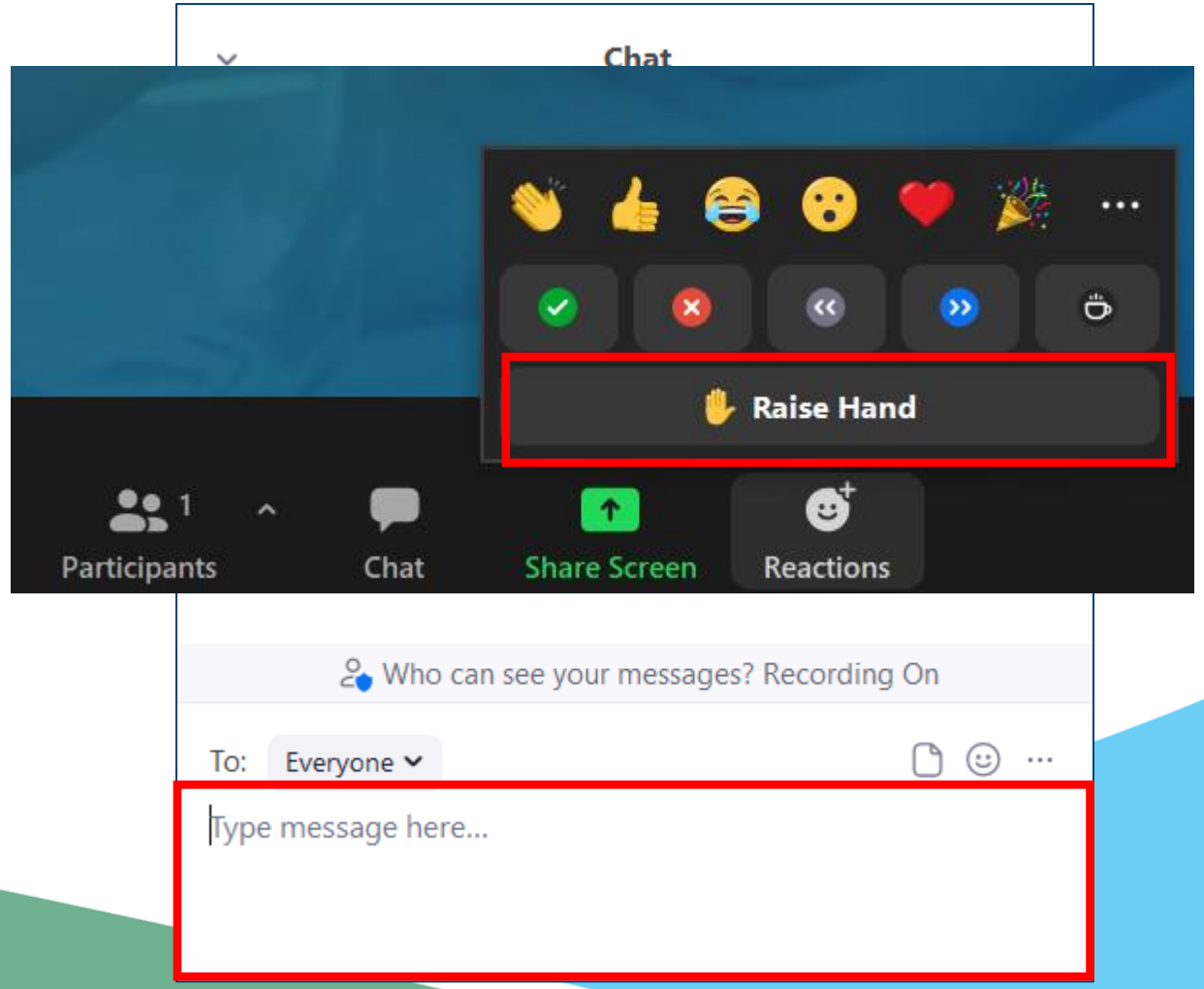
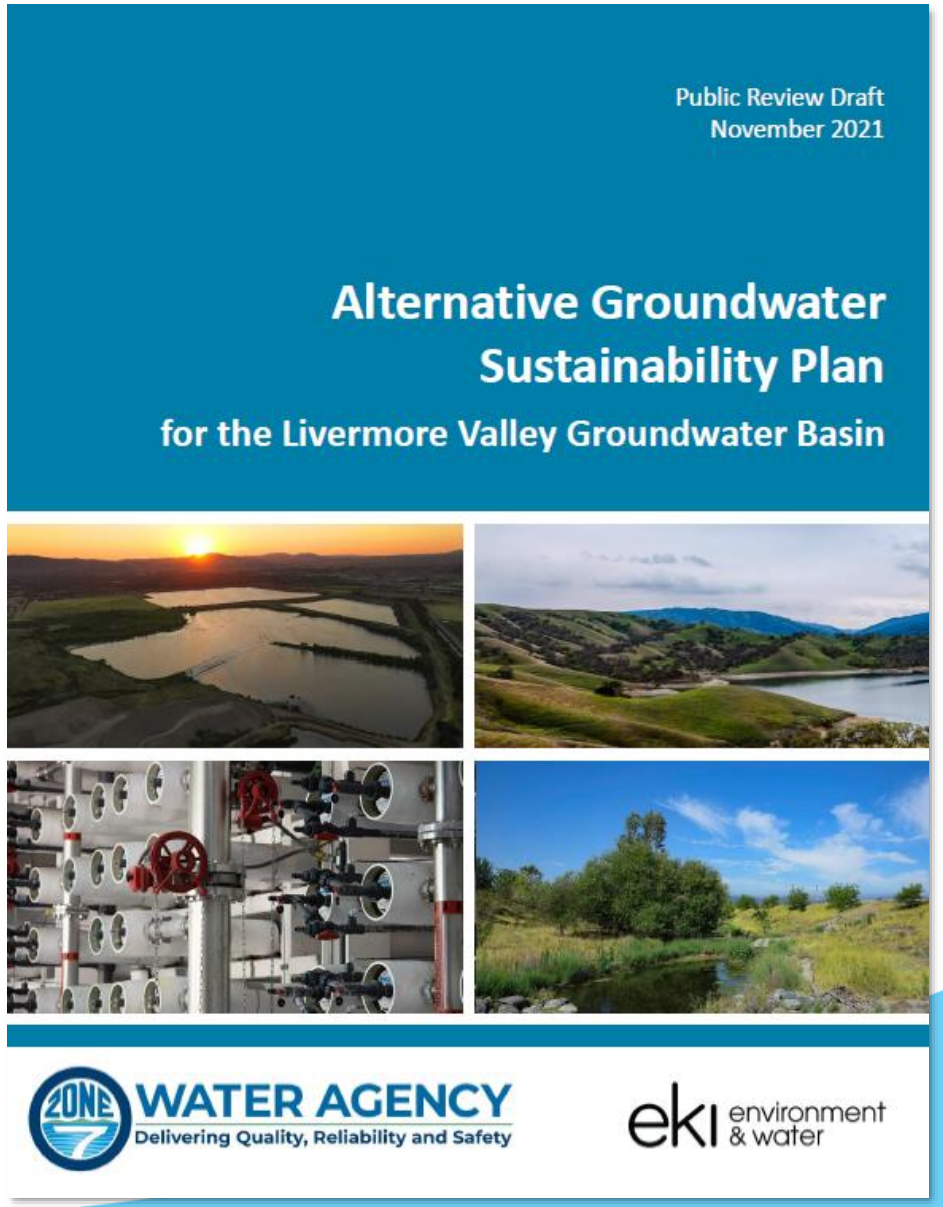
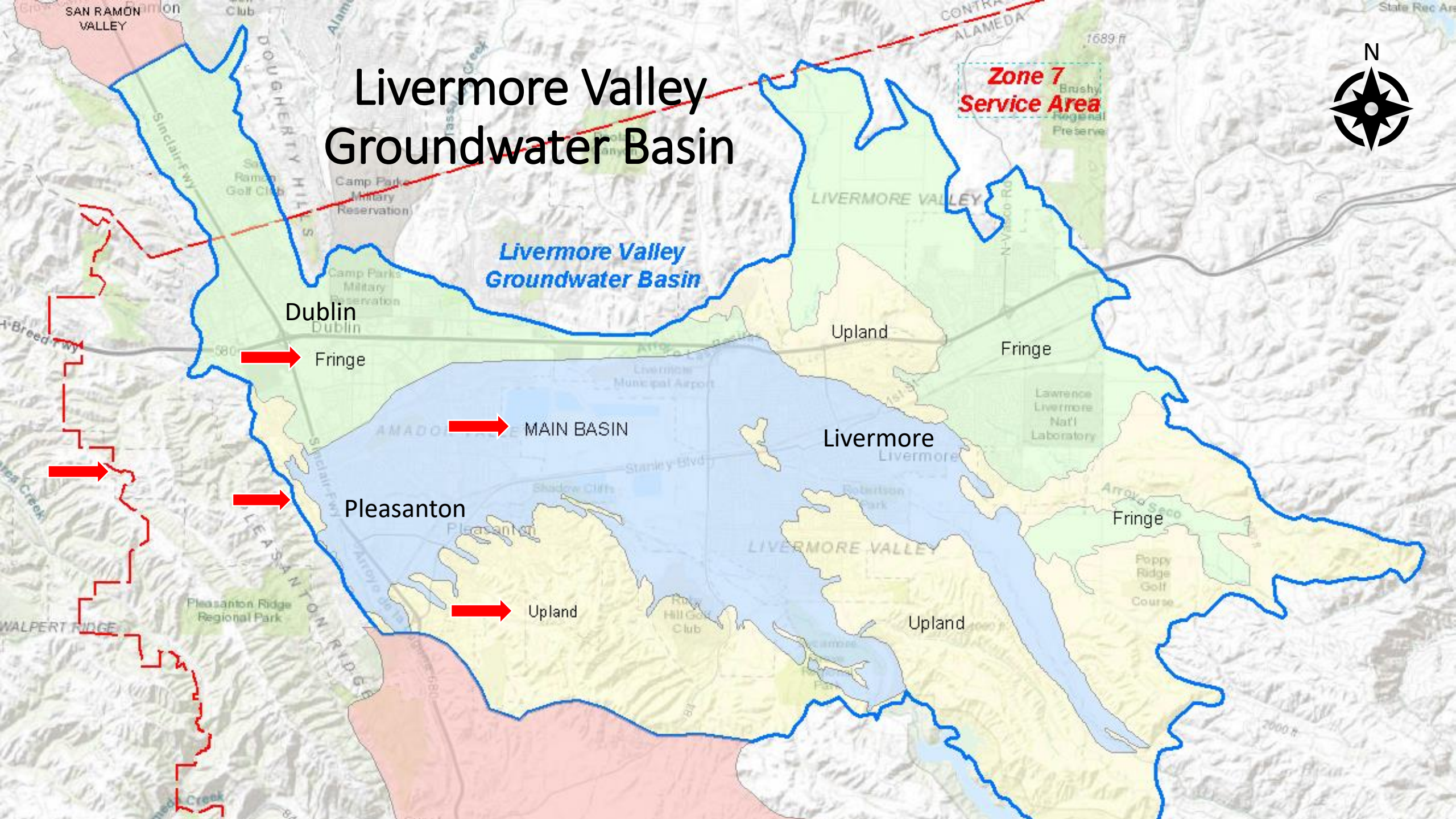



ZONE 7 WATER AGENCY

# OUTLINE

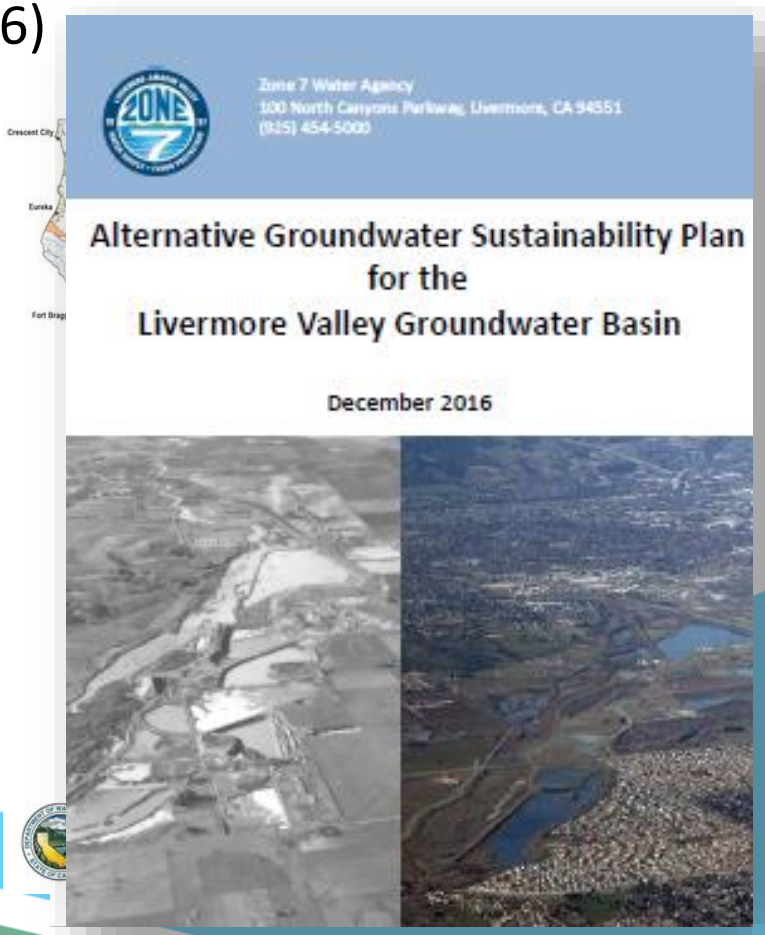
- Background
- 2021 Alternative Groundwater Sustainability Plan (Alt GSP)
  - Goals
  - Program Updates
    - Groundwater Levels Program
    - Groundwater Storage Program
    - Land Subsidence Program
    - Groundwater Quality Program
    - Interconnected Surface Water (ICSW)
- Sustainable Management Criteria (SMCs)
  - Definitions
  - Program SMCs
- Key Take-Aways and Next Steps




Livermore Valley
Groundwater Basin
Zone 7
Service Area
Livermore Valley
Groundwater Basin
Dublin
Fringe
MAIN BASIN
Pleasanton
Upland
Upland
Fringe
Livermore
Fringe
Upland
N
SAN RAMON
VALLEY
DOUGHERTY HILLS
Sinclair Fwy
Camp Parks
Military
Reservation
LIVERMORE VALLEY
Livermore
Municipal Airport
Lawrence
Livermore
Nat'l
Laboratory
Stanley Blvd
Shadow Cliffs
Pleasanton
Arroyo Seco
Poppy
Ridge
Golf
Course
Pleasanton Ridge
Regional Park
WALPERT RIDGE
PLEASANTON RIDGE
Brushy
Peak
Regional
Preserve
1689 ft
2000 ft

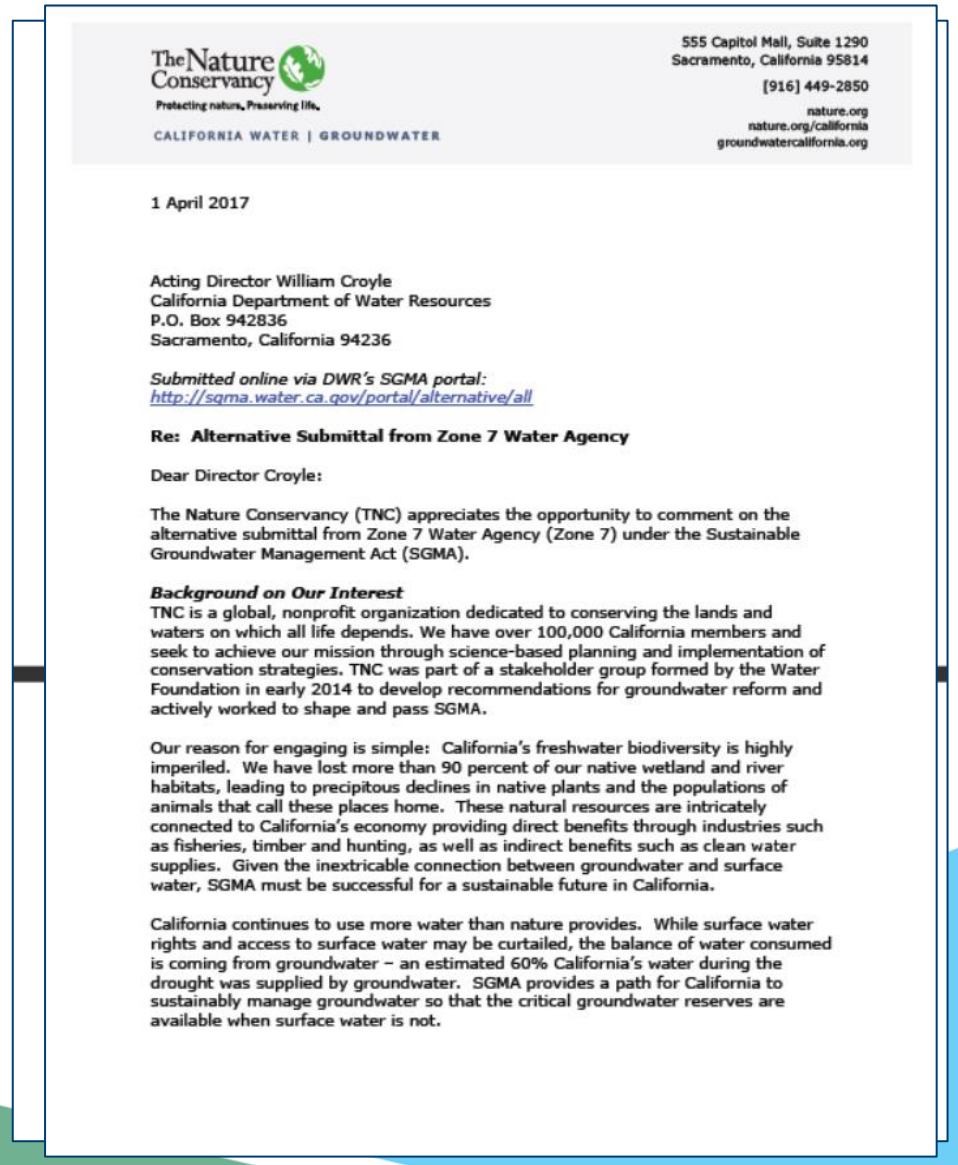
# Background

- Sustainable Groundwater Management Act (SGMA, 2014)
  - Zone 7 “Exclusive Groundwater Sustainability Agency (GSA)”
  - All CA Basins – Groundwater Sustainability Plan (GSP) by 2020 or 2022
  - If Already Sustainable, can submit an “Alternative” to a GSP (2016)
- Alternative Groundwater Sustainability Plan (2016)
- Response to Alt GSP
  - DWR Approved with 4 recommendations
  - The Nature Conservancy (TNC) letter
- Five Year Update of Alt GSP
  - Due January 1, 2022
  - Secured Grant for $500K (DWR Proposition 68)



# Goals for this Alternative GSP Update (Part 1)

- Address DWR Recommendations
  - Main Basin
    - Identify Specific Wells w/ Minimum Thresholds (MTs)
  - Fringe and Upland Areas
    - Develop Minimum Thresholds for GW Levels
    - Develop Minimum Thresholds for GW Storage
    - Add wells in the Upland
- Address TNC Recommendations
  - Groundwater Dependent Ecosystems (GDEs)



The Nature Conservancy
Protecting nature. Preserving life.
CALIFORNIA WATER | GROUNDWATER

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groundwatercalifornia.org

1 April 2017

Acting Director William Croyle
California Department of Water Resources
P.O. Box 942836
Sacramento, California 94236

*Submitted online via DWR's SGMA portal:*
*http://sgma.water.ca.gov/portal/alternative/all*

**Re: Alternative Submittal from Zone 7 Water Agency**

Dear Director Croyle:

The Nature Conservancy (TNC) appreciates the opportunity to comment on the alternative submittal from Zone 7 Water Agency (Zone 7) under the Sustainable Groundwater Management Act (SGMA).

***Background on Our Interest***
TNC is a global, nonprofit organization dedicated to conserving the lands and waters on which all life depends. We have over 100,000 California members and seek to achieve our mission through science-based planning and implementation of conservation strategies. TNC was part of a stakeholder group formed by the Water Foundation in early 2014 to develop recommendations for groundwater reform and actively worked to shape and pass SGMA.

Our reason for engaging is simple: California's freshwater biodiversity is highly imperiled. We have lost more than 90 percent of our native wetland and river habitats, leading to precipitous declines in native plants and the populations of animals that call these places home. These natural resources are intricately connected to California's economy providing direct benefits through industries such as fisheries, timber and hunting, as well as indirect benefits such as clean water supplies. Given the inextricable connection between groundwater and surface water, SGMA must be successful for a sustainable future in California.

California continues to use more water than nature provides. While surface water rights and access to surface water may be curtailed, the balance of water consumed is coming from groundwater – an estimated 60% California's water during the drought was supplied by groundwater. SGMA provides a path for California to sustainably manage groundwater so that the critical groundwater reserves are available when surface water is not.

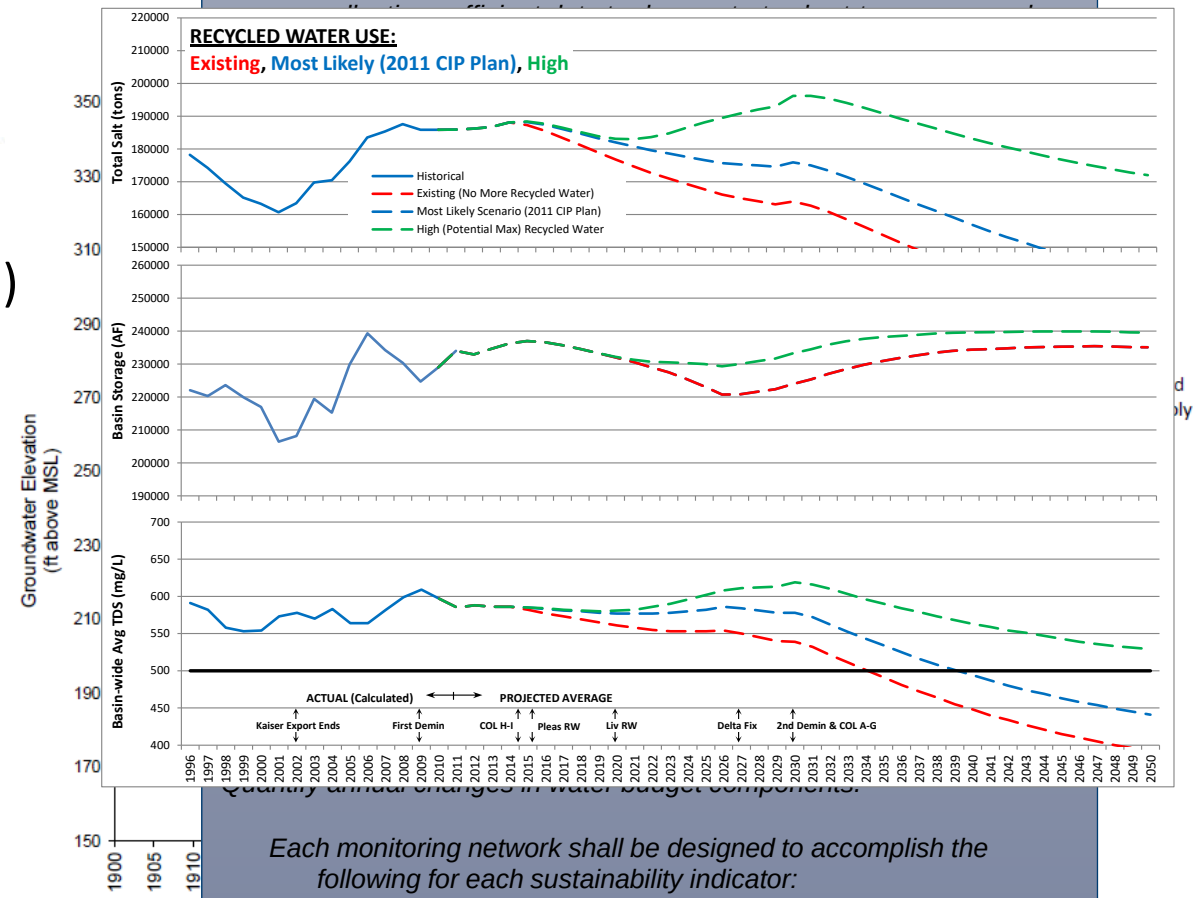
ZONE 7 WATER AGENCY

# Goals for this Alternative GSP Update (Part 2)

- Meet GSP Requirements
  - Sustainable Management Criteria (SMCs)
  - Reorganize to Match GSP Regulations
- Address Zone 7's Goals
  - Expand Hydrogeologic Conceptual Model (HCM)
  - Update Areal Recharge Model (ARM)
  - Update Salt/Nutrient Calculations
  - Further Evaluate InSAR (satellite) Technology
    - Interferometric Synthetic Aperture Radar
- Demonstrate Continued Sustainability

*§ 354.34. Monitoring Network*

*Each Agency shall develop a monitoring network capable of*



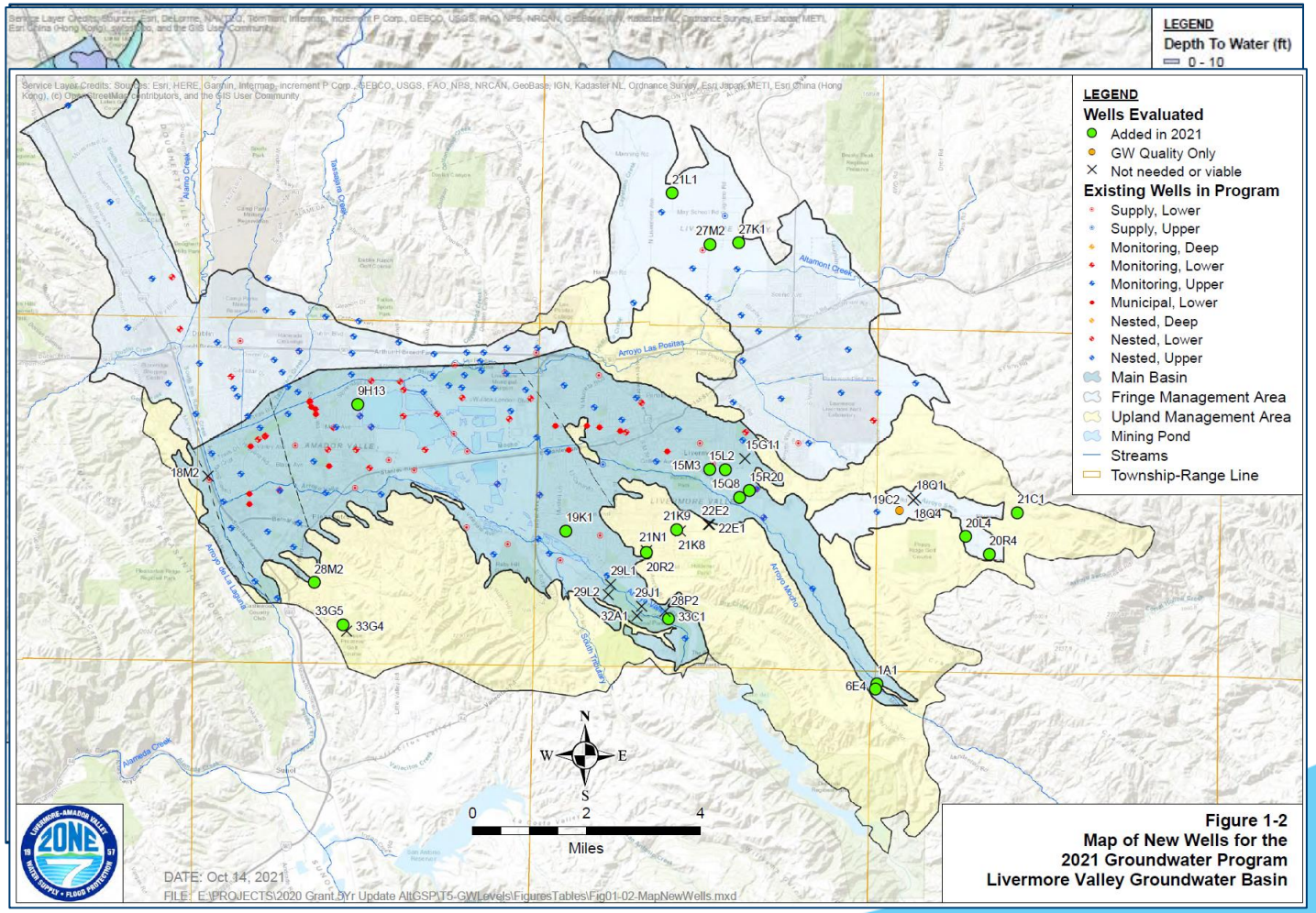

*Each monitoring network shall be designed to accomplish the following for each sustainability indicator:*

*Chronic Lowering of Groundwater Levels. Demonstrate groundwater occurrence, flow directions, and hydraulic gradients between principal aquifers and surface water features by the following methods:*

* 23 CCR Sections 352.6, 354.8, 30; www.water.ca.gov/groundwater/sgm/sgp.cfm

# Groundwater Levels Program Update

- Existing Program
  - 200+ Wells
  - Focus is on Main Basin
- Completed for Alt GSP Update
  - Added 20 Wells Fringe & Upland
  - Updated Depth to Water Map
  - Updated Historic Low Map
  - Developed SMCs

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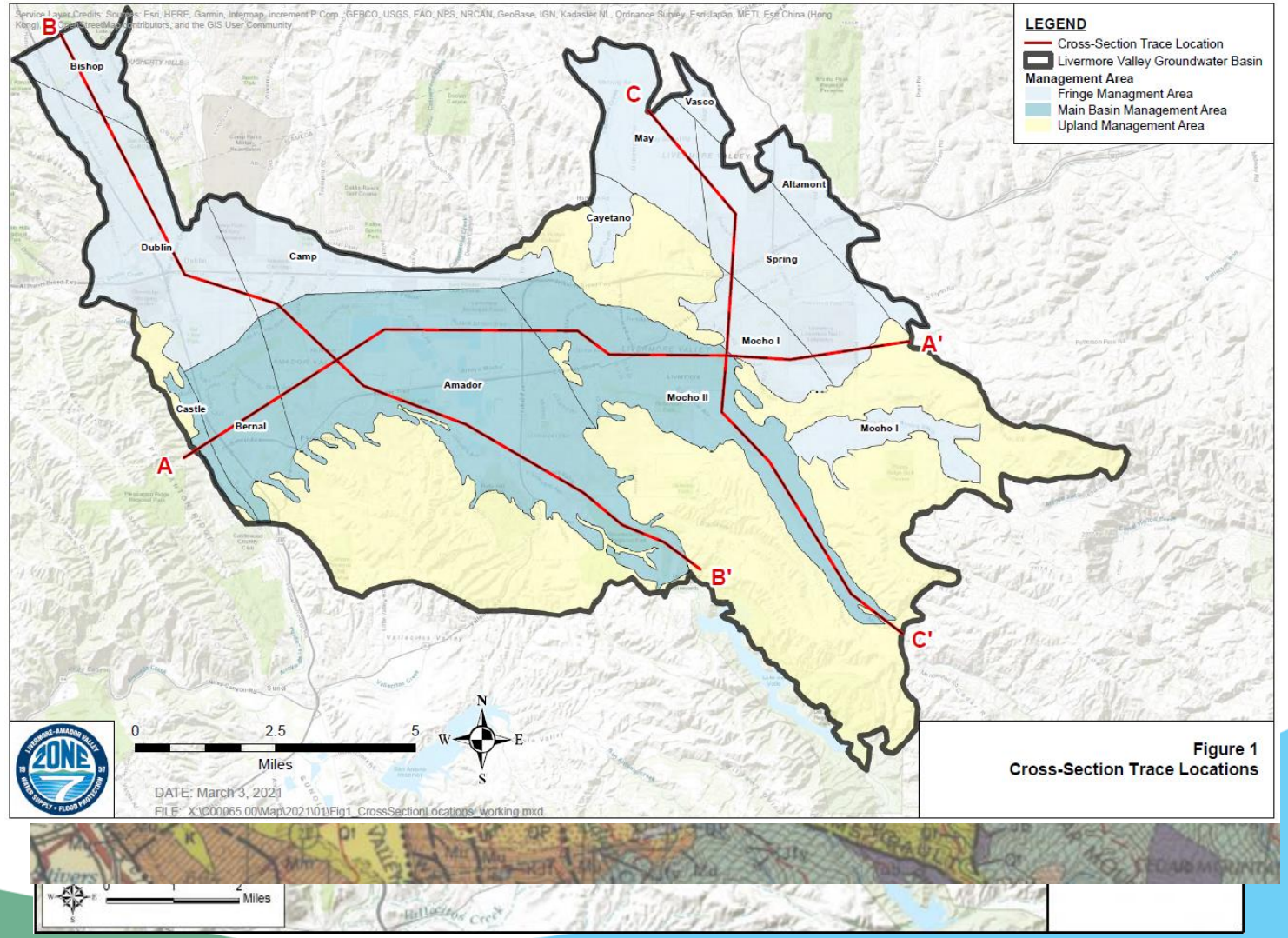
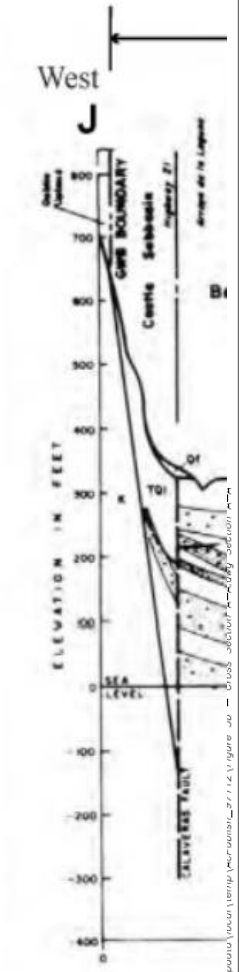
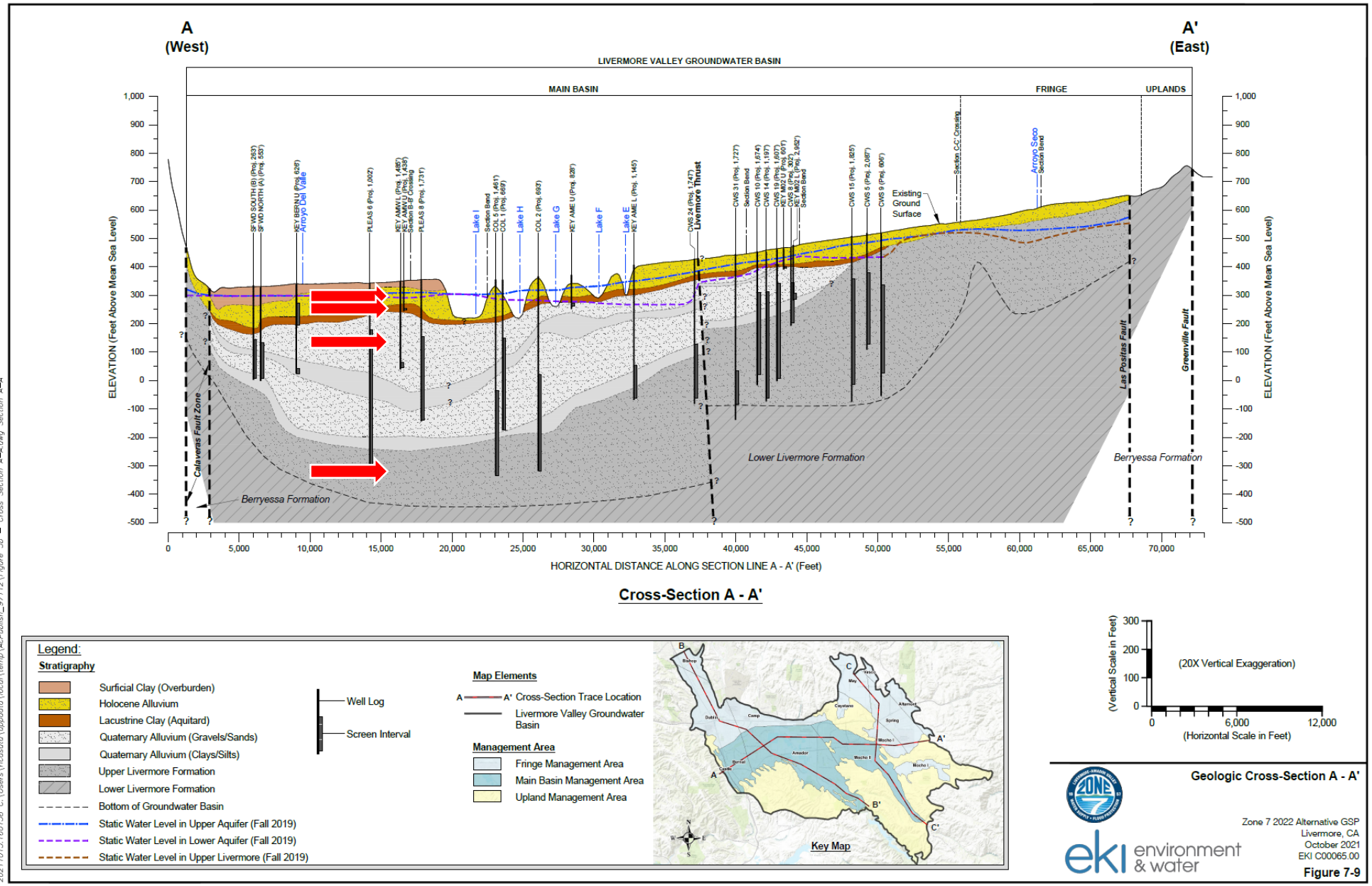
# Groundwater Storage Program

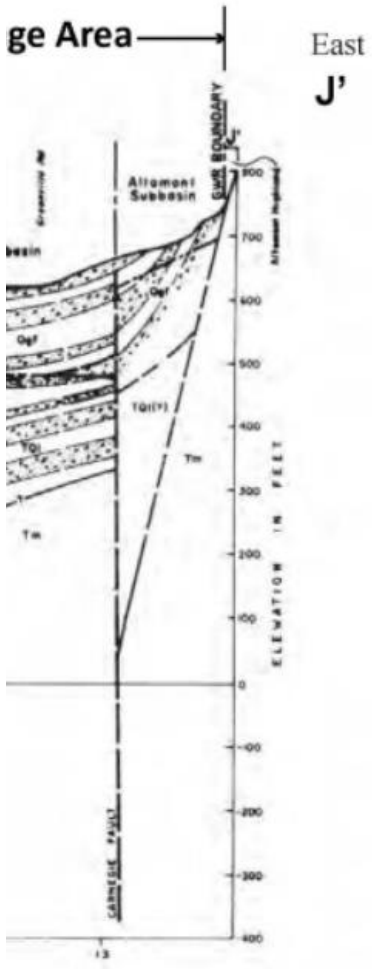
- Existing Program
  - Cross Sections Focus on Main Basin
  - Areal Recharge Model (ARM)
    - Complicated Excel Program
    - Main & Northwest Fringe Basin Only
- Completed for Alt GSP Update
  - Migrated Geo Data to Rockworks
  - Three New Cross Sections
  - Updated ARM
    - Converted to DWR's IDC Software
      - Integrated Water Flow Model Demand Calculator
    - Extended to Cover Entire Basin
  - Developed SMCs



# Example: East/West Cross-Section



# Land Subsidence

- Existing Program
  - Land Surface Elevation Surveys
  - 2016 InSAR Study
- Completed for Alt GSP Update
  - Evaluated Using InSAR Annually
    - Concluded Sound Technology
    - Provided Free by DWR
  - Developed SMCs

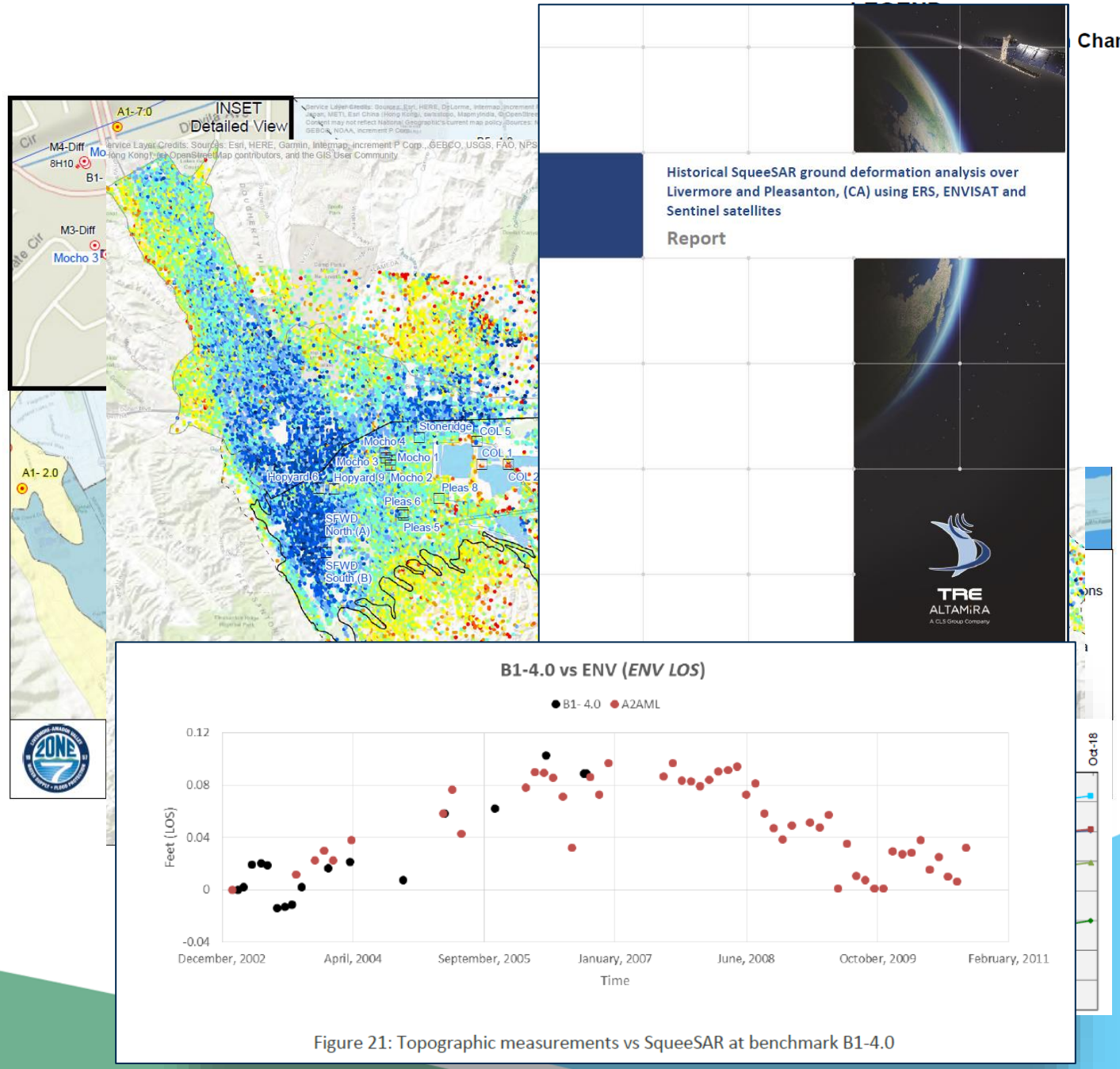
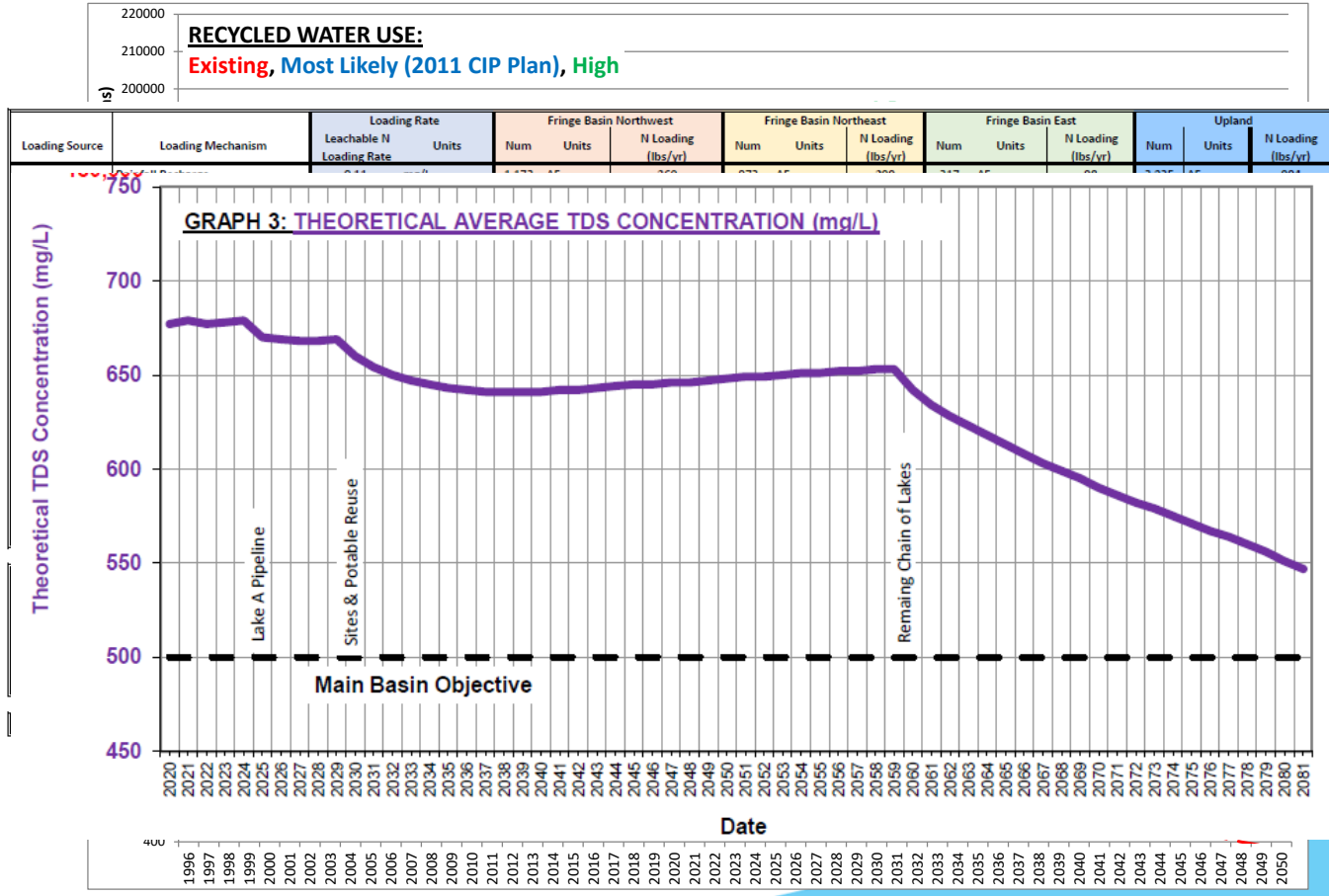


Figure 21: Topographic measurements vs SqueeSAR at benchmark B1-4.0

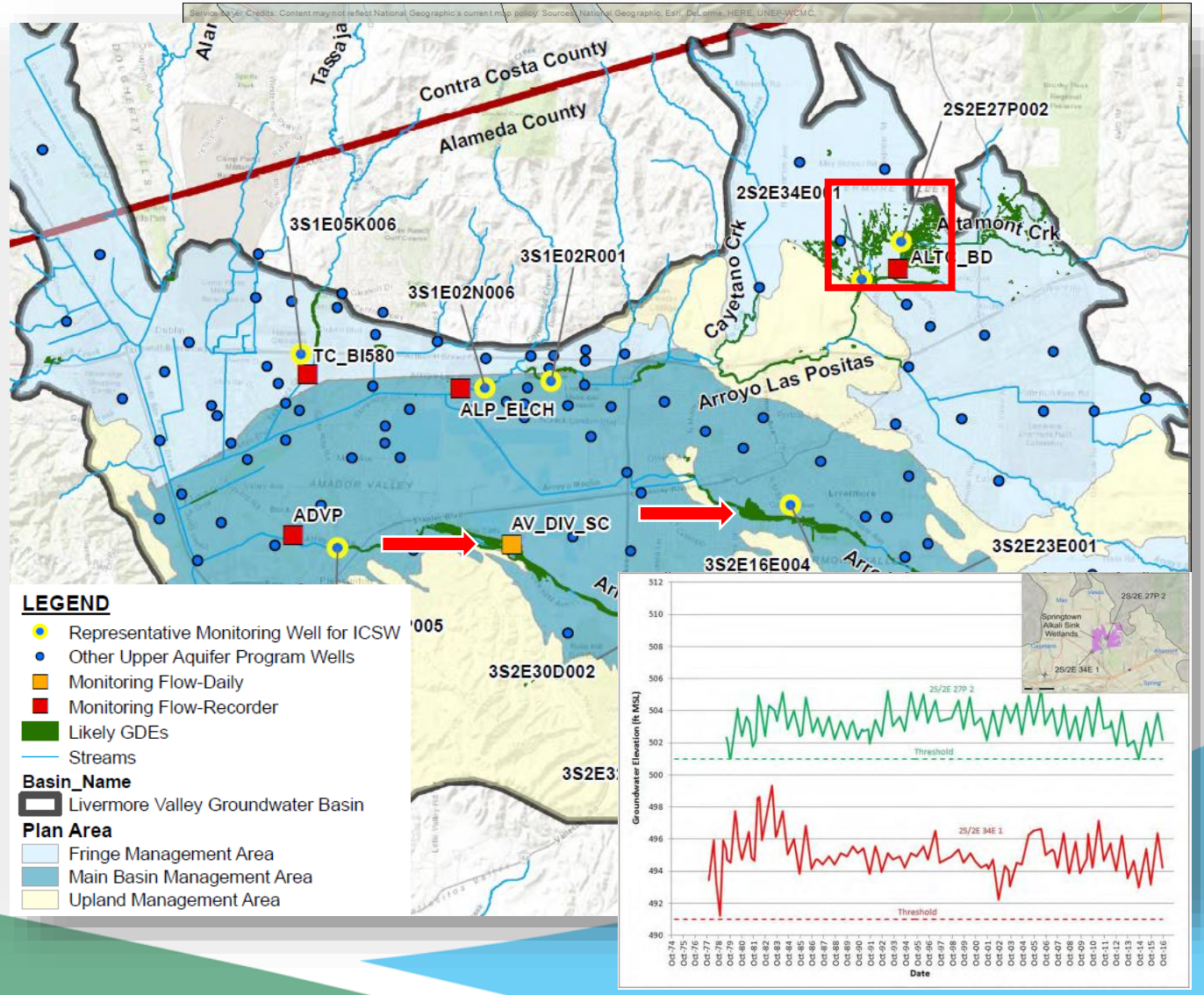
# Groundwater Quality Program

- Existing Program
  - Future Salt Loading 2013
  - Nitrate Loading Update 2015
- Completed for Alt GSP Update
  - Updated Future Salt Graphs
  - Updated Nitrate Loading Calcs
  - PFAS Compounds
    - Per- and Polyfluoroalkyl Substances
  - Developed SMCs



# Interconnected Surface Water (ICSW) Program

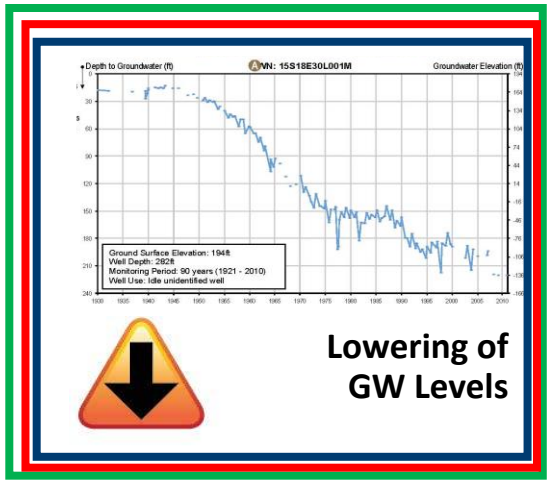
- Existing Program
  - Springtown Alkali Sink as GDE
- Completed for Alt GSP Update
  - Identified Other GDEs
  - Monitoring Recommendations
    - Wells (yellow)
    - Surface Water Gauges (red)
  - Developed SMCs



# SMCs - Sustainability Indicators

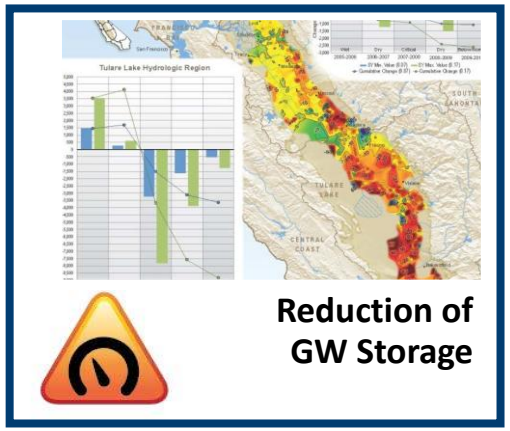
***Sustainable Management Criteria (SMCs)***
Criteria for managing a groundwater basin sustainably

***Sustainability indicators*** **(SIs)**
Six effects that, when **significant and unreasonable**, become undesirable results

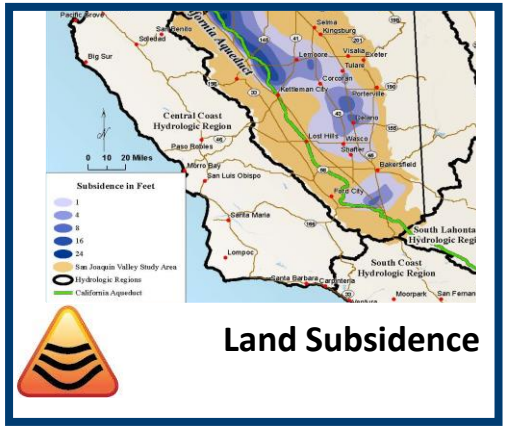



**Lowering of GW Levels**

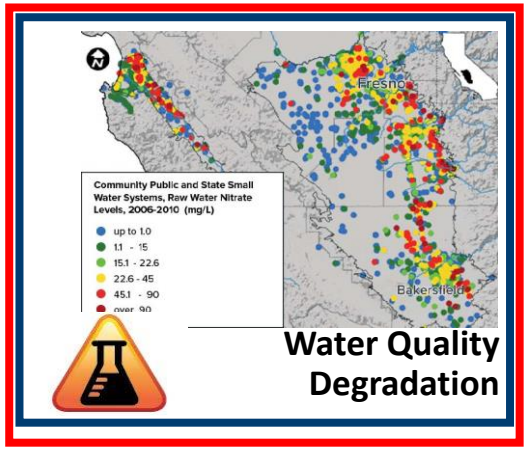
**Water Level as a Proxy**



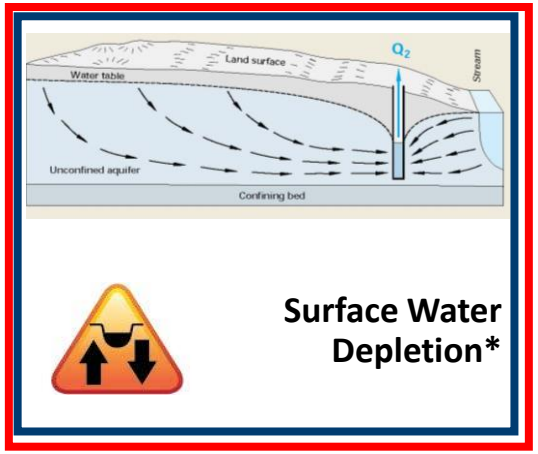

**Reduction of GW Storage**



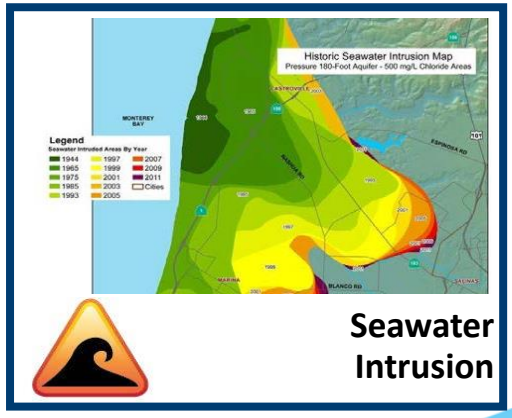

**Land Subsidence**




**Water Quality Degradation**




**Surface Water Depletion***



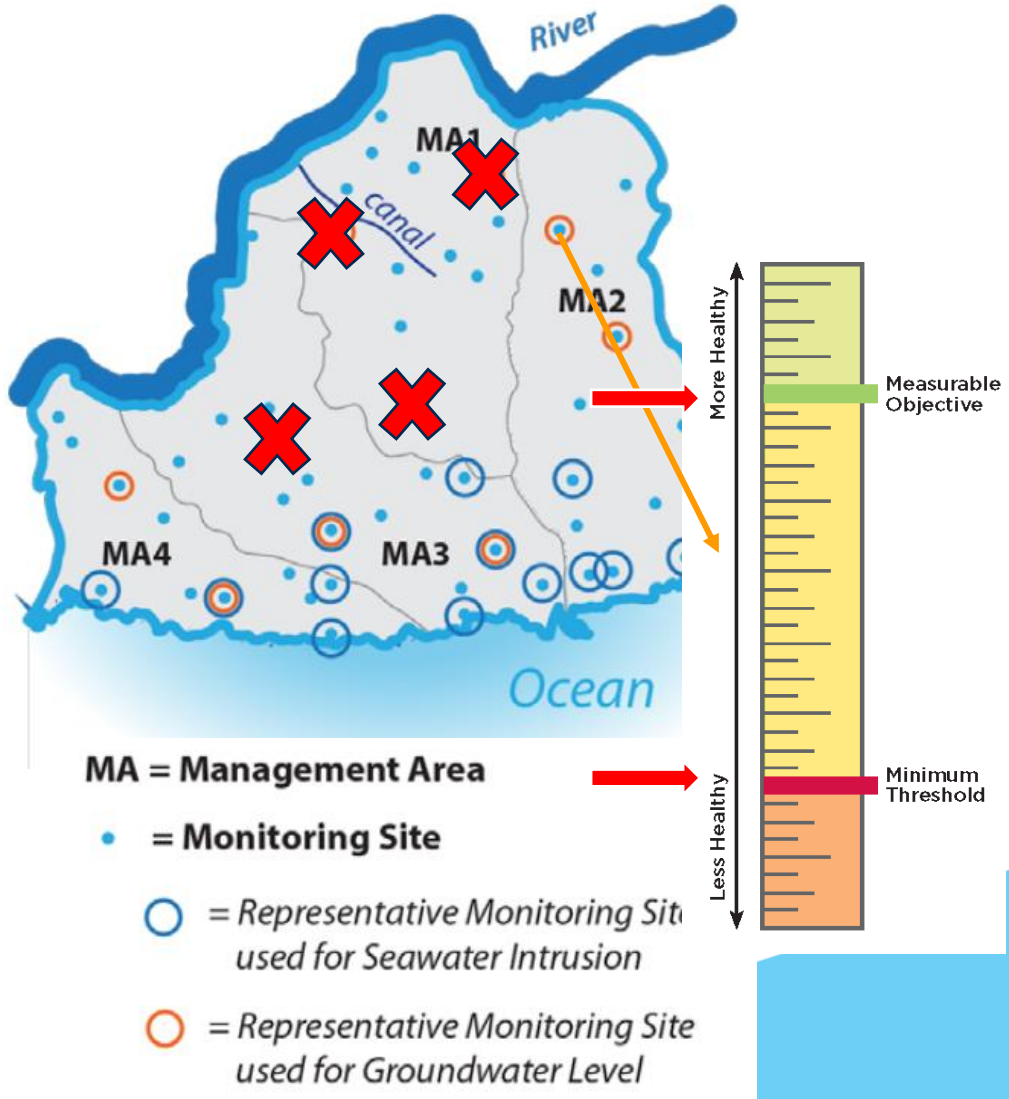

**Seawater Intrusion**

*including GDEs

DWR CWP 2013
Winter et al 1998

# SMCs - Avoiding Undesirable Results (URs)

- ***Representative Monitoring Sites (RMS)*** - subset of a monitoring network where minimum thresholds, measurable objectives are set
- ***Measurable Objectives (MOs)*** - quantitative goals at RMS that reflect the basin's desired conditions
- ***Minimum thresholds (MTs)*** - quantitative values at RMS that, when exceeded, may cause an undesirable result(s)
- ***Undesirable Results (URs)*** - when conditions become significant and unreasonable throughout the basin




DWR SMC BMP, 2017

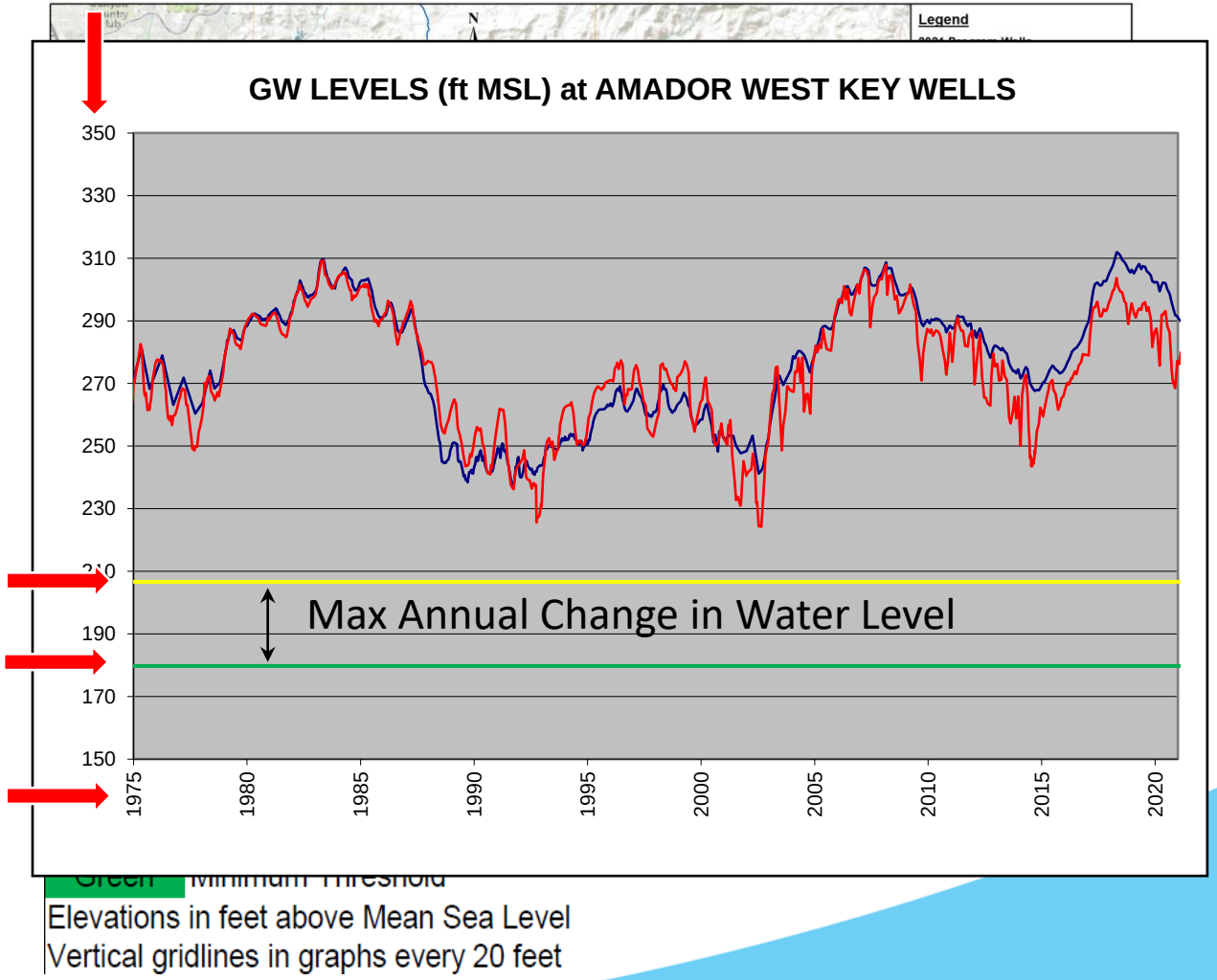
# Chronic Lowering of Groundwater Level SMC

**RMS**
- 12 Groundwater Wells (RMS-WL)

**MO**
- Historical Low

**MT**
- Historical Low Minus Max Annual GW Change

**UR**
- >25% of the RMS-WLs exceed MTs for 2 consecutive non-drought years

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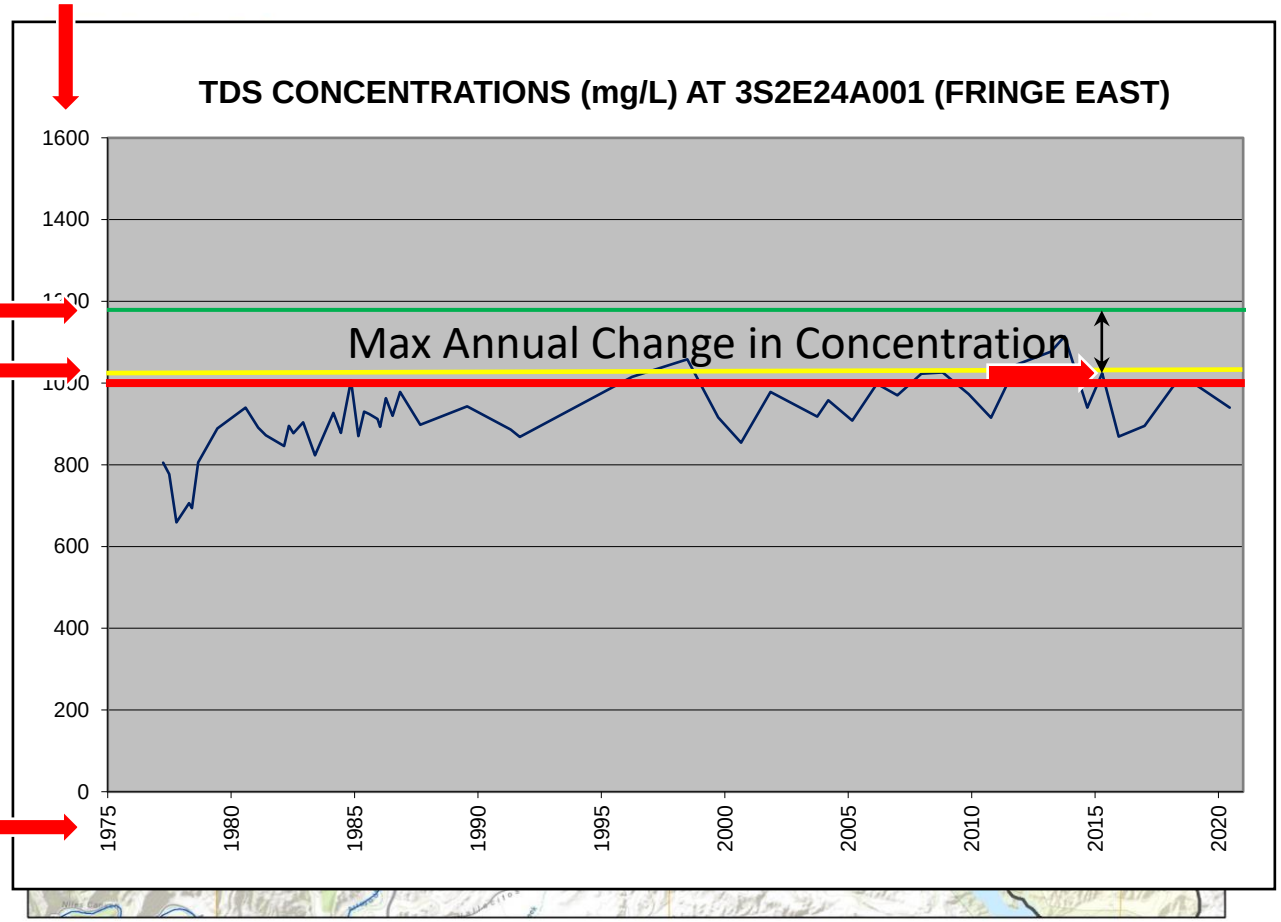
# Degraded Water Quality SMC

**RMS**
- 12 Groundwater Wells (RMS-WQ)a=

**MO**
- Basin Objective or 2015 concentration

**MT**
- Basin Objective or 2015 concentration plus maximum historical annual change

**UR**
- >25% RMS-WQs exceed MTs for 2 non-drought years from recharge/pump

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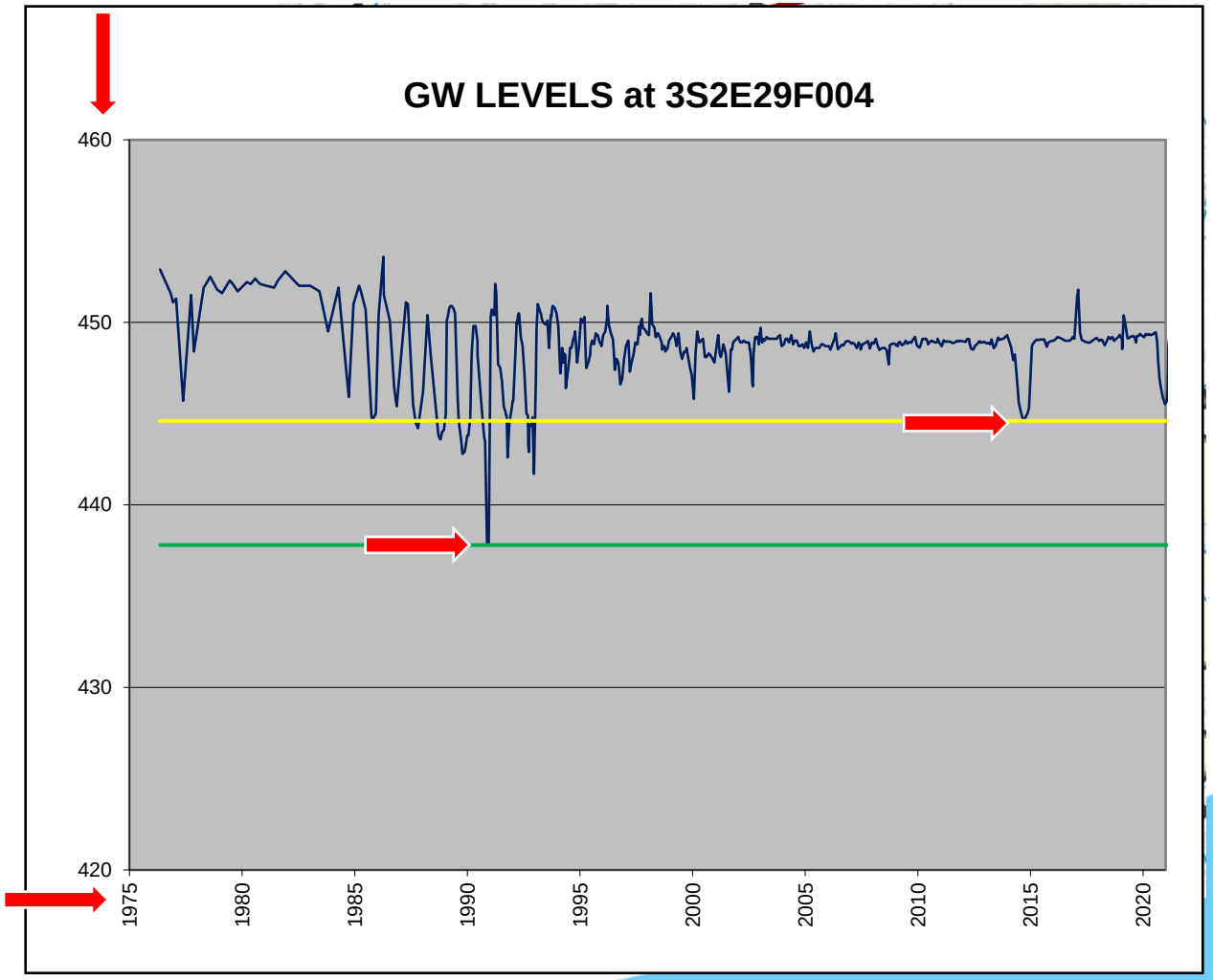
# Depletions of Interconnected Surface Water SMC

**RMS**
- 24 Total RMS-ICSWs
  14 wells and 10 streamflow gauging sites

**MO**
- Minimum between 2014 and 2020

**MT**
- Historical Low water level

**UR**
- >40% of RMS-ICSWs wells below MT for 2 non-drought years from GW extraction




ZONE 7 WATER AGENCY

# Summary and Key Take-Aways

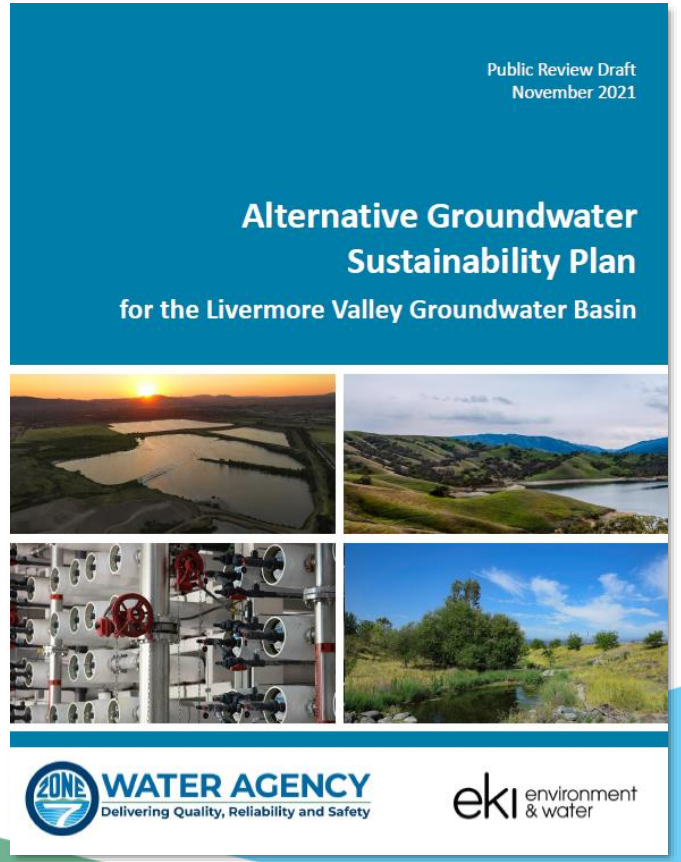
- Addressed DWR and TNC Recommendations
  - Identified Specific Wells and Minimum Thresholds (MTs) for Main Basin
  - Extended Programs and Sustainable Management Criteria (SMCs) into Fringe and Upland
  - Expanded Evaluation of Groundwater Dependent Ecosystems (GDEs)
- SMCs Redefined to Meet DWR Regulations/Standards
  - Still Maintain Sustainability, but Allow Greater Operational Flexibility
- Updated our Hydrogeologic Conceptual Model (HCM)
  - Rockworks – New Cross Sections
  - Expanded and Improved our Areal Recharge Model
- Basin Continues to Be Managed Sustainably

ZONE 7 WATER AGENCY

# Status and Next Steps

- Adopt Alternative GSP 2021 Update
  - Draft Alt GSP Posted for Public Review
    - Tech Memos - Sep 2021
    - Full Draft – Nov 3, 2021
    - https://www.zone7water.com/alternative-groundwater-sustainability-plan-and-updates
  - Emails to Stakeholders
    - Sep to Nov 2021
  - Three Stakeholder Meetings
    - Nov 2021
  - Public Comments Due Friday Dec 3rd, 2021
  - Public Hearing and Adoption
    - Zone 7 Board Meeting on Dec 15, 2021
  - Submission to DWR by Jan 1, 2022
  - 90 Day Public Review Period

- Future Grant Projects Using This Work
  - Upgrade GW Model
  - Update Well Master Plan
  - Update Groundwater Storage Calculations



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