2027 Mission Creek Subbasin Alternative Plan Update

WORKSHOP #2

July 21, 2026

Agenda

- Setting the Stage
  - Alternative Plan Overview
  - Water Supply
- Planning for the Future
  - Population and Growth Estimates
  - Water Demand
- Understanding the Groundwater Basin
  - Hydrogeologic Conceptual model
  - Groundwater Model Overview
- Your Input/Next Steps
  - Public Comment

Introductions

Alternative Plan Update Team

MISSION CREEK SUBBASIN SGMA

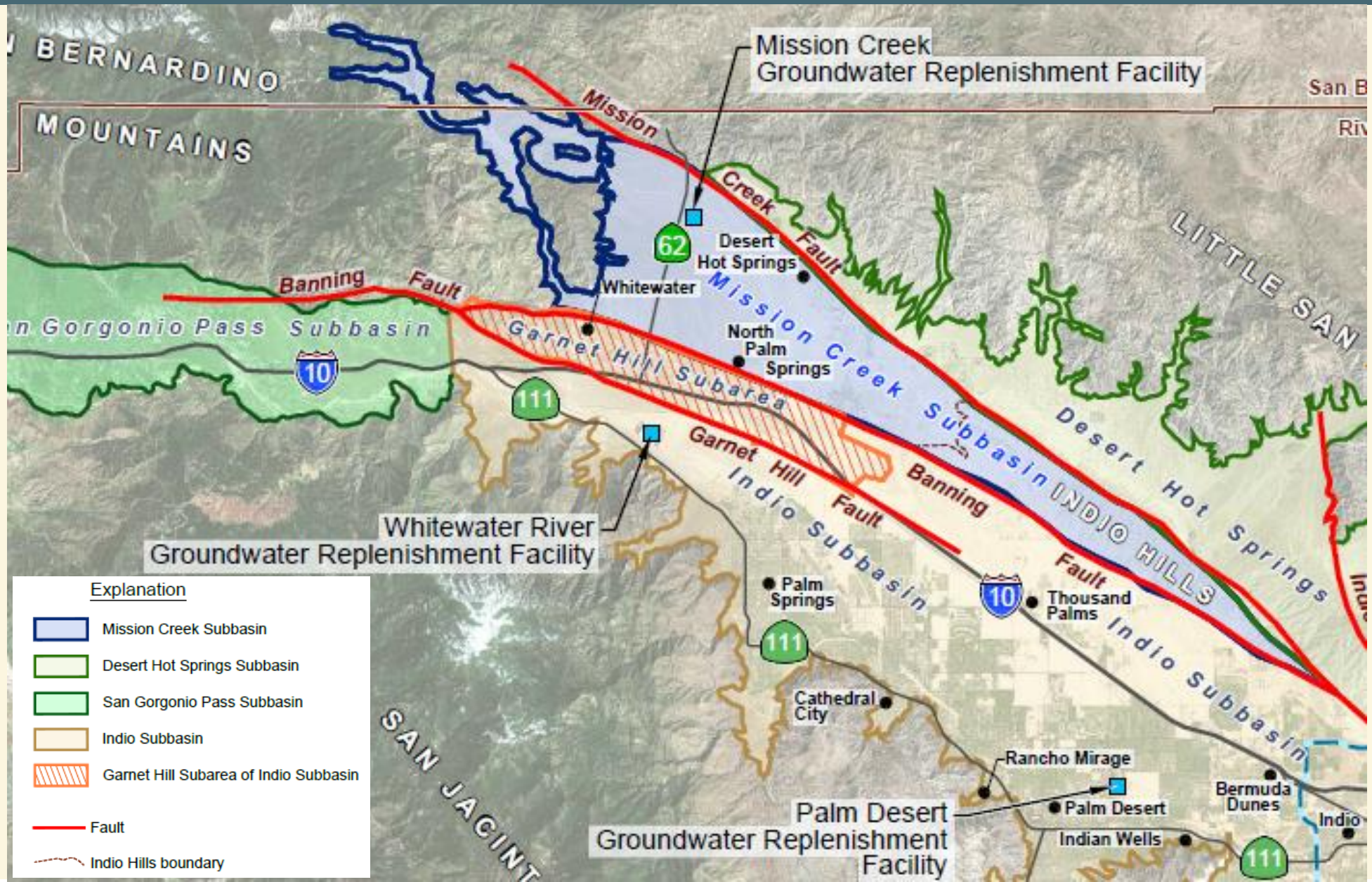
MCSB Management Committee

- Coachella Valley Water District (CVWD)
- Desert Water Agency (DWA)
- Mission Springs Water District (MSWD)

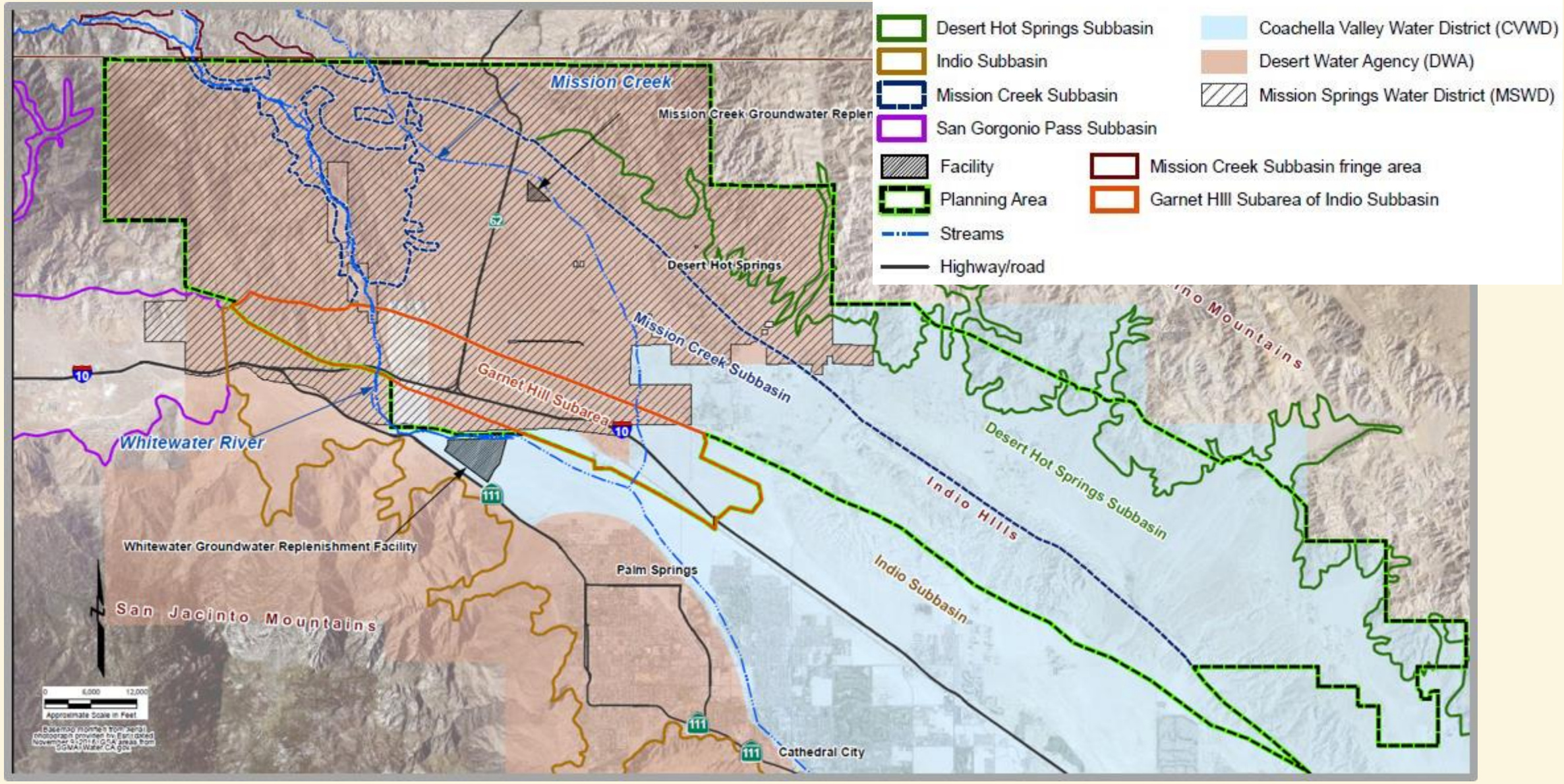
MCSB Consultant Team

- WSP USA Inc.
- Rincon Consultants, Inc.
- Maddaus Water Management Inc.

Mission Creek Subbasin



Mission Creek Subbasin



POLL Question #1

How familiar are you with the components in the Mission Creek Subbasin Alternative Plan?

- Very familiar
- Somewhat familiar
- Not familiar

Alternative Plan Overview

What is the Alternative Plan?

- **Assesses future growth, land use changes, and associated demands**
- **Simulates future groundwater conditions as a result of anticipated changes in water demand and supplies**
- **Identifies management actions needed to meet current and future water demands, while maintaining sustainable groundwater basin**
- **Establishes data collection and monitoring programs to track groundwater conditions**

Planning and Sustainable Management

Without Planning and Sustainable Management, Issues Can Arise…

Groundwater Level Declines

Groundwater Storage Reductions

Land Subsidence

Interconnected Surface Water Depletions
(Not Applicable in the Mission Creek Subbasin)

Seawater Intrusion
(Not Applicable in the Mission Creek Basin)

Water Quality Degradation

What Makes up the Alternative Plan?

Foundation

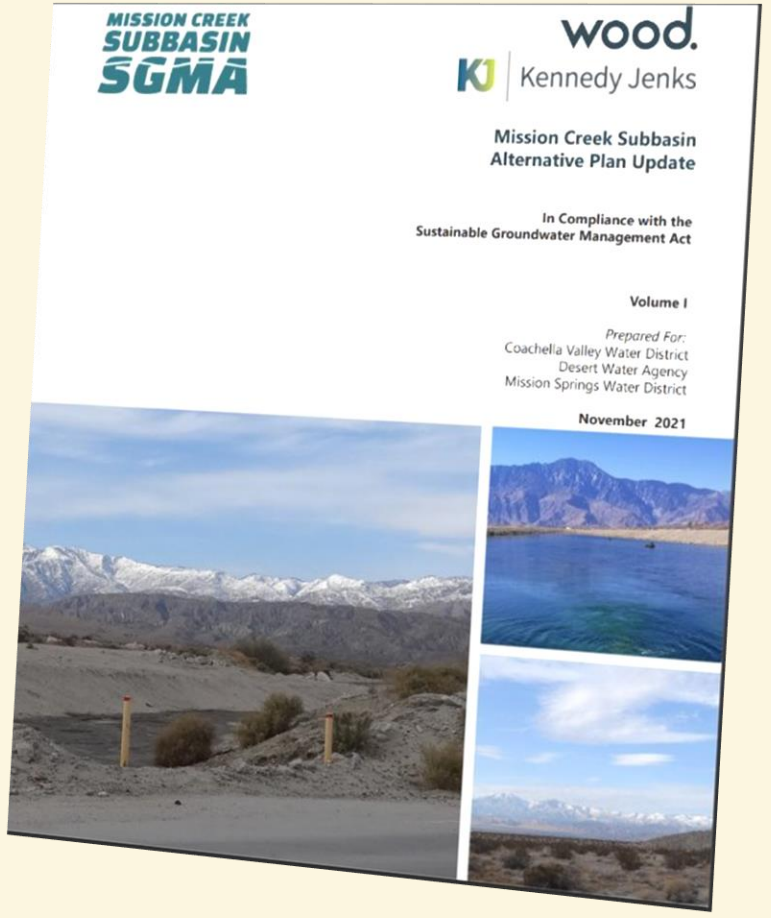
- Chapter 1 – Introduction & Objectives
- Chapter 2 – Plan Setting

Understanding Current and Future Water Conditions

- Chapter 3 – Demand Projections
- Chapter 4 – Water Resources
- Chapter 5 – Groundwater Model Update

Planning for Sustainability

- Chapter 6 – Sustainable Management Criteria
- Chapter 7 – Water Management Forecasting
- Chapter 8 – Projects and Management Actions



Poll Question #2

What components of the Alternative Plan are you most interested in?

- Water supplies and demand
- Groundwater conditions and modeling
- Long-term sustainability and management actions
- Other

Water Supplies

Water Sources in the Mission Creek Subbasin

Groundwater

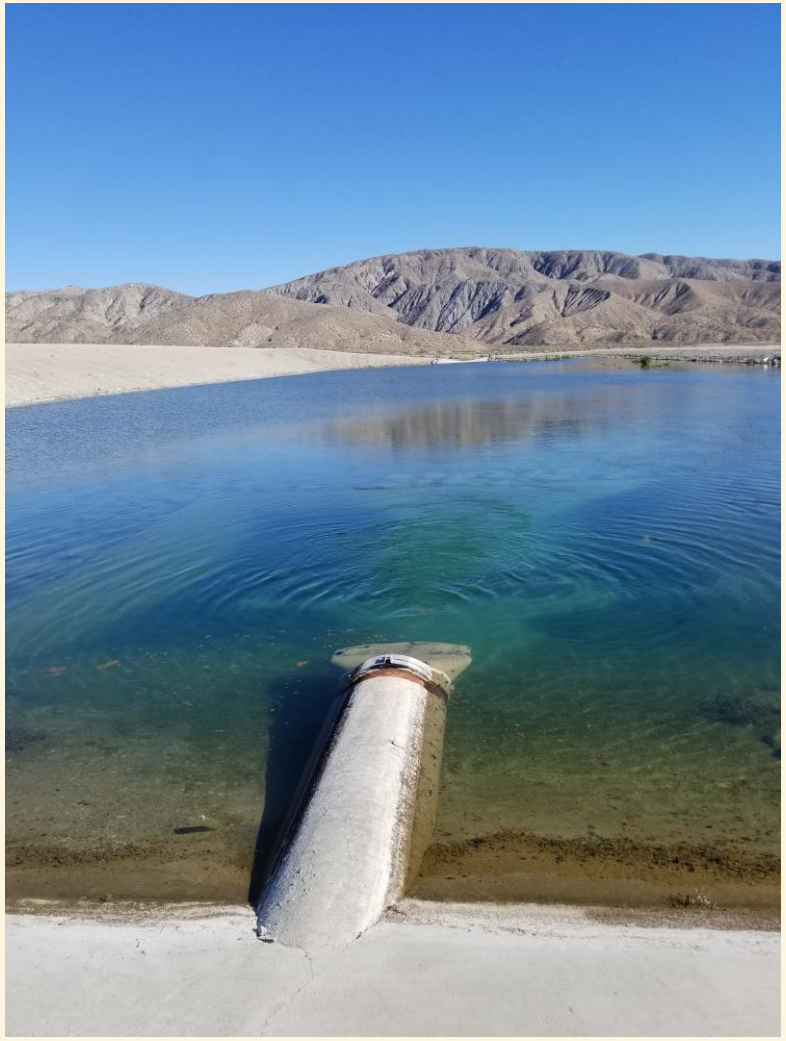
Local Surface Water

- Not used directly for supply
  - Instead contributes to groundwater recharge
- Originates from the surrounding mountain watersheds
- Mission Creek is the primary monitored stream
  - Average annual streamflow recently is approximately 1,776 AFY
- Recharge is highly variable

Mission Creek

Imported Water

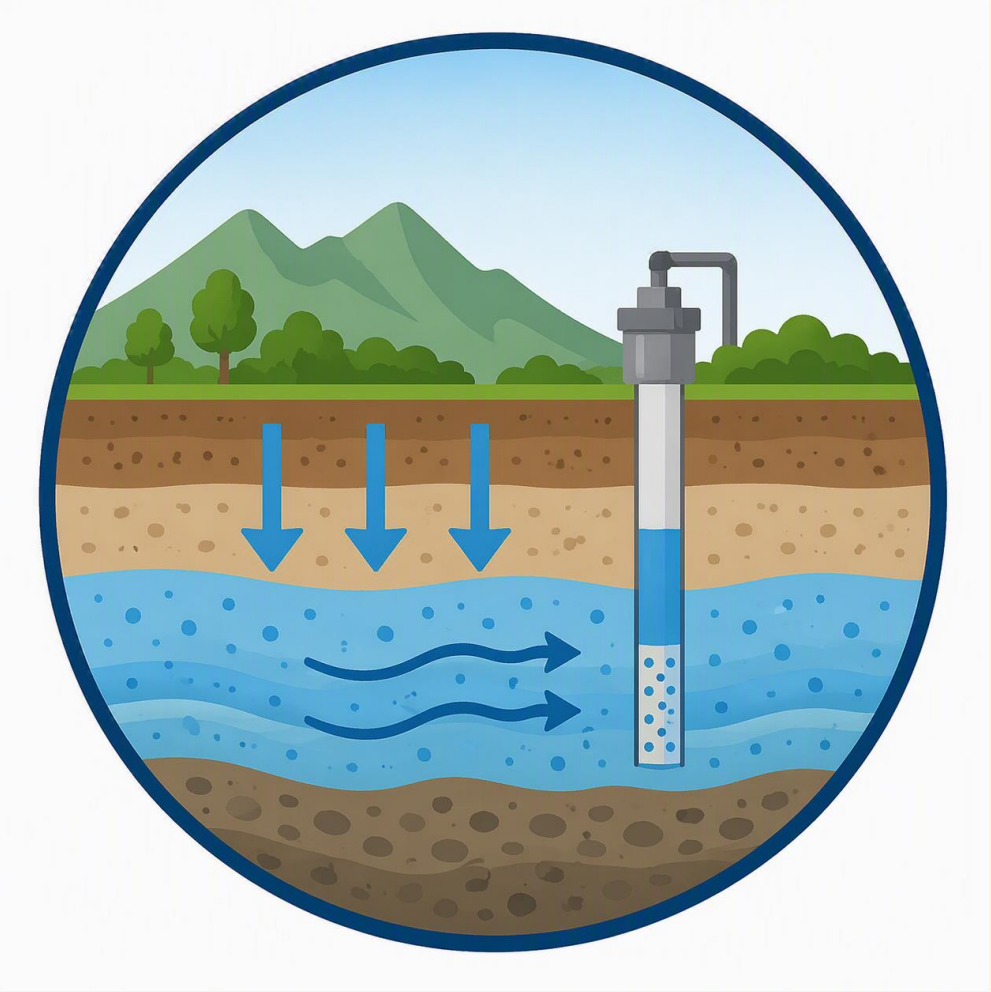
- Not used directly for supply
  - Instead contributes to groundwater recharge
- State Water Project (SWP) is managed by California DWR
  - CVWD and DWA have contracts for 194,100 AFY
- SWP does not have a physical connection in the Coachella Valley
  - CVWD and DWA exchange with Metropolitan for Colorado River water via the Colorado River Aqueduct
- Recharged at Mission Creek Groundwater Replenishment Facility (GRF)
- Future projects are anticipated to enhance reliability



Mission Creek GRF

Local Groundwater

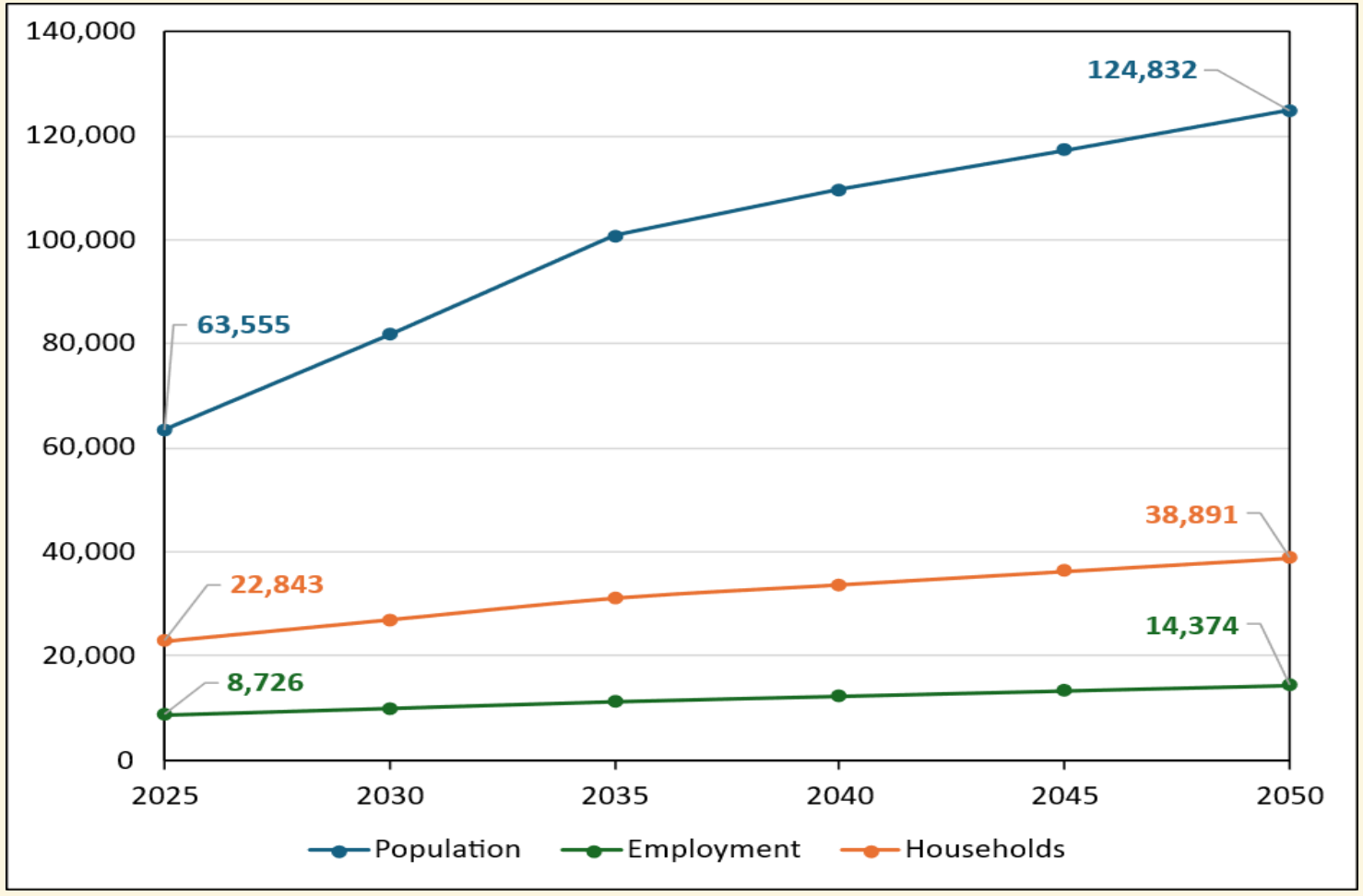
- Primary water supply source
- 177,750 acre feet of imported water has been recharged since 2002 at the Mission Creek GRF



Overview of the Future

Population Growth Estimates

Southern California Association of Governments (SCAG) demographic forecast used to project households, employees, and population into 2050



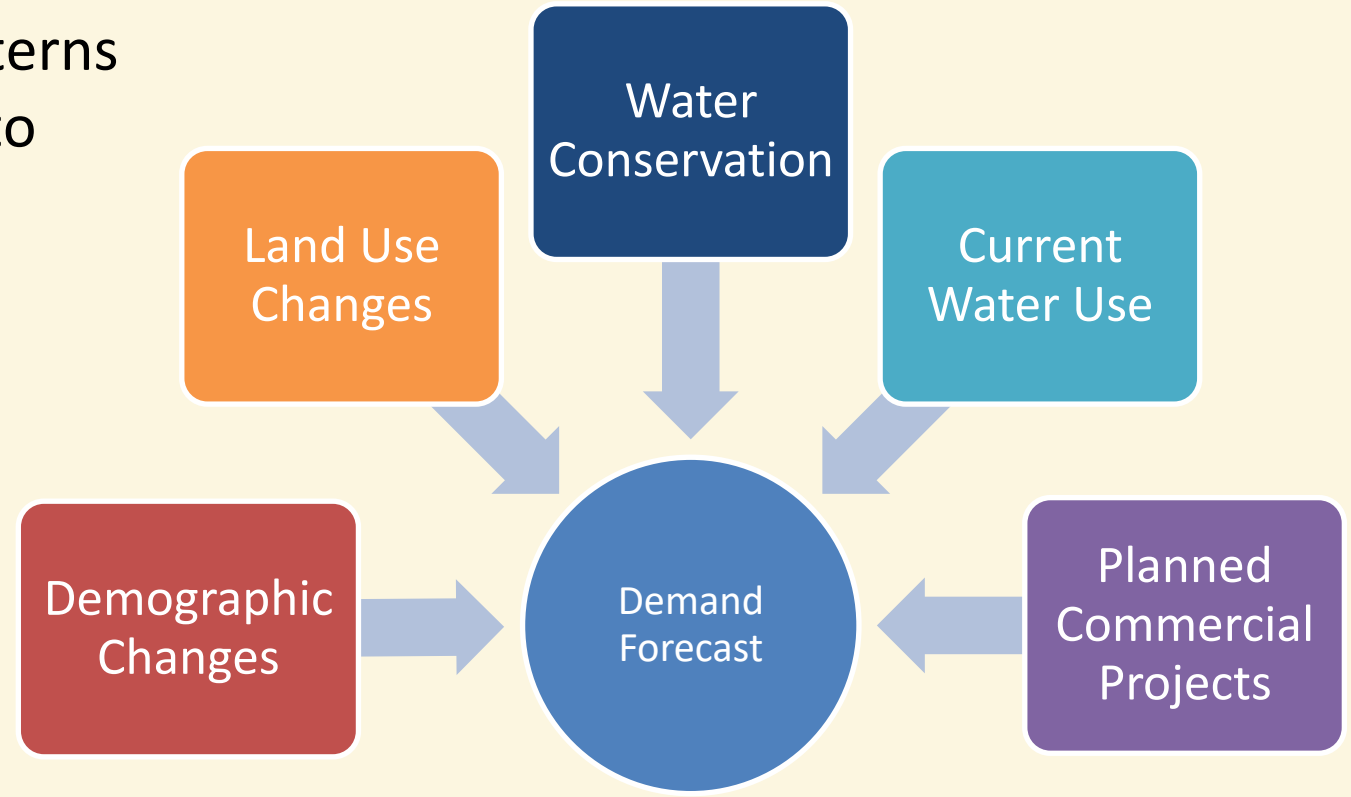
Population 96%

Households 70%

Employment 65%

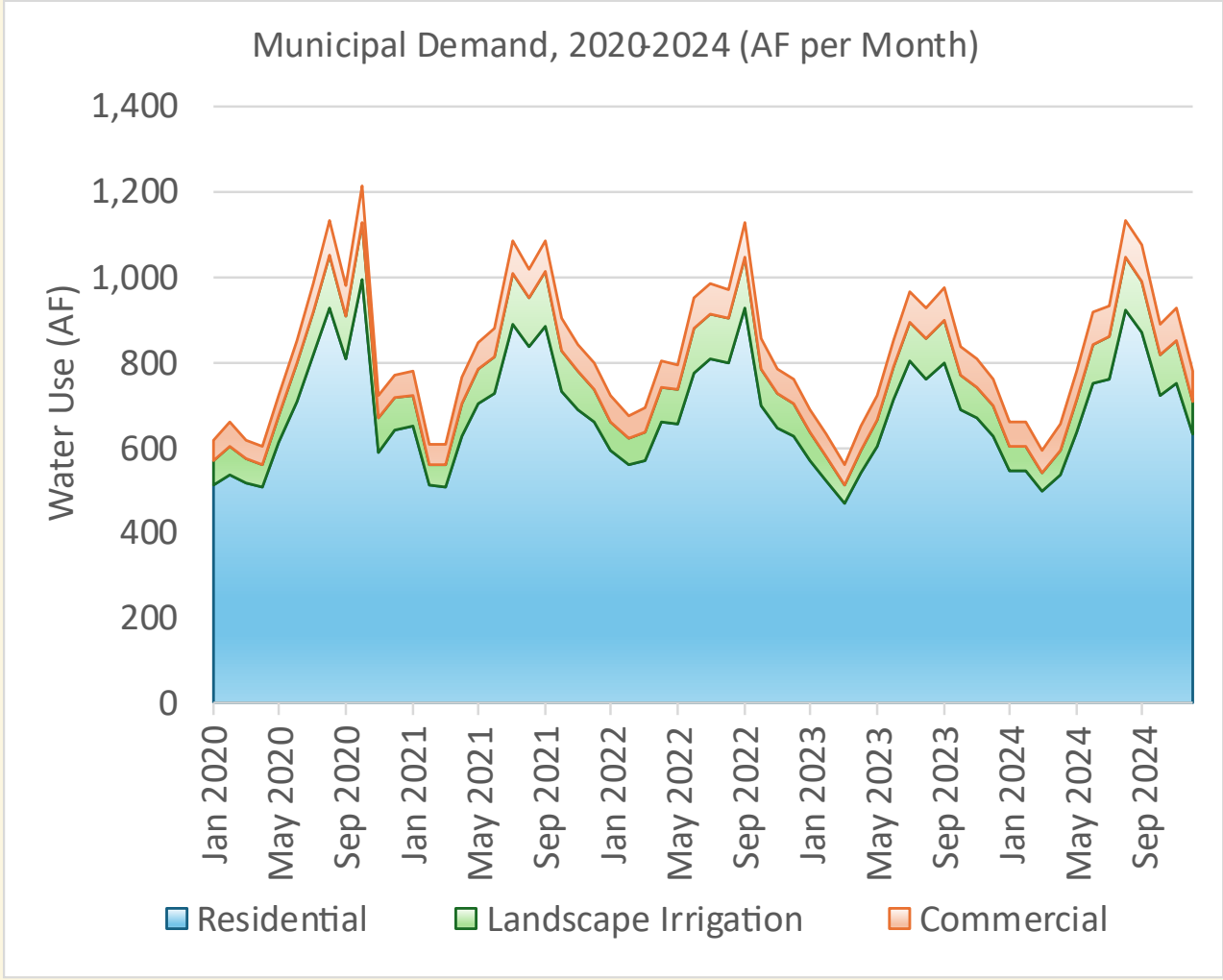
What is the Water Demand Forecast?

- Demand forecast estimates future water use in the Mission Creek Subbasin
- Consider both current water use patterns and how demand could change due to growth, land use changes, and water conservation efforts
- Demand components:
  - Municipal
  - Metered private groundwater production
  - Unmetered private wells



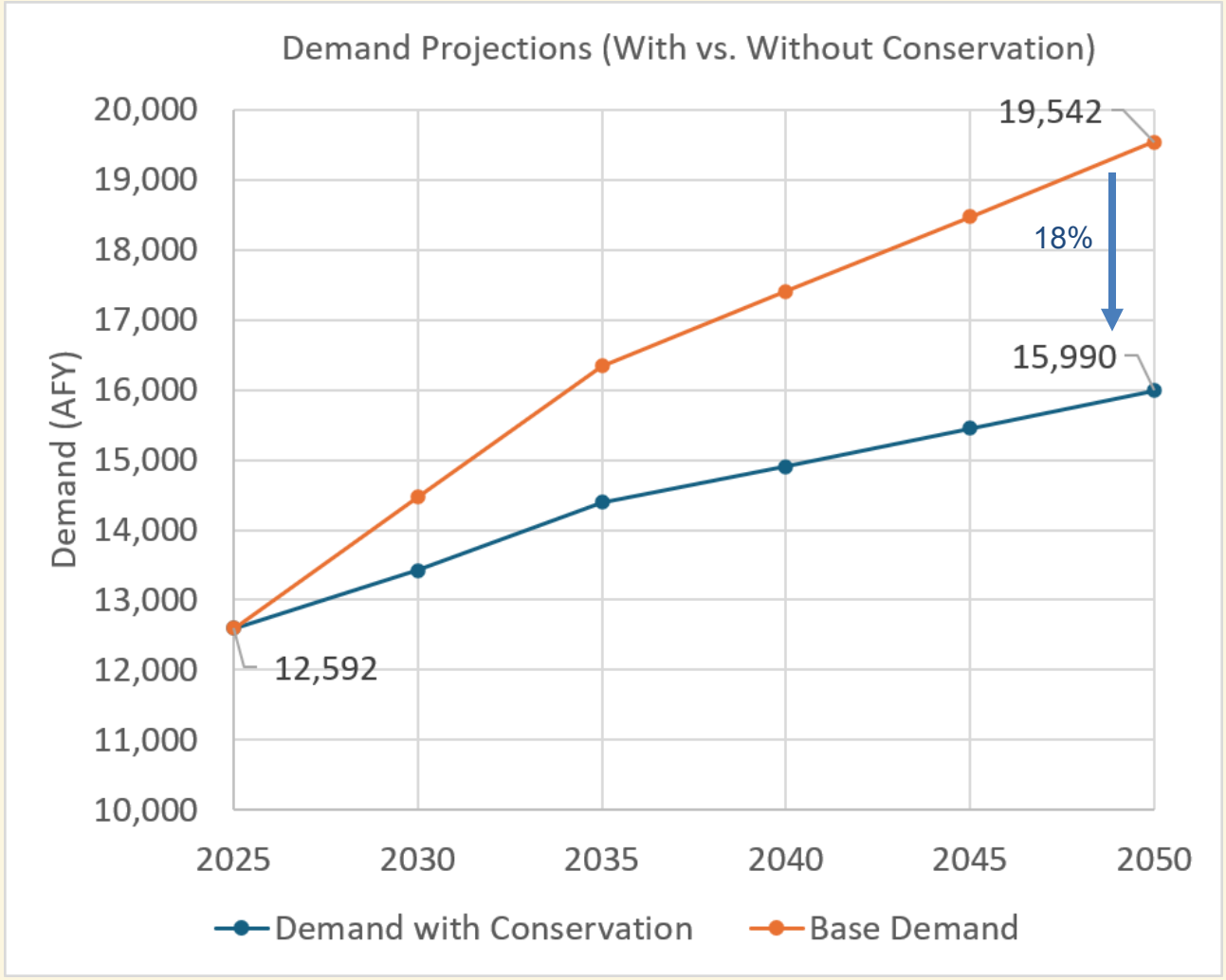
Municipal Demand

- **Total average annual water use 815 AF/month or 10,322 AFY**
- **Residential Uses**
  - Single family residential
  - Multi-family residential
  - Mobile/manufactured homes
- **Landscape Irrigation**
  - Dedicated irrigation meters
  - Parks
  - HOA/common areas
  - Streetscapes
- **Commercial**
  - Businesses/retail centers
  - Offices
  - Small industrial customers



Future Municipal Water Use

- Drivers:
  - Population growth
  - New housing development
  - Employment growth
- Conservation
  - Passive
    - Natural Appliance Turnover
    - MWELO
    - Non-Functional Turf Ban
  - Active
    - Water Saving Device Rebates
    - Turf Replacement

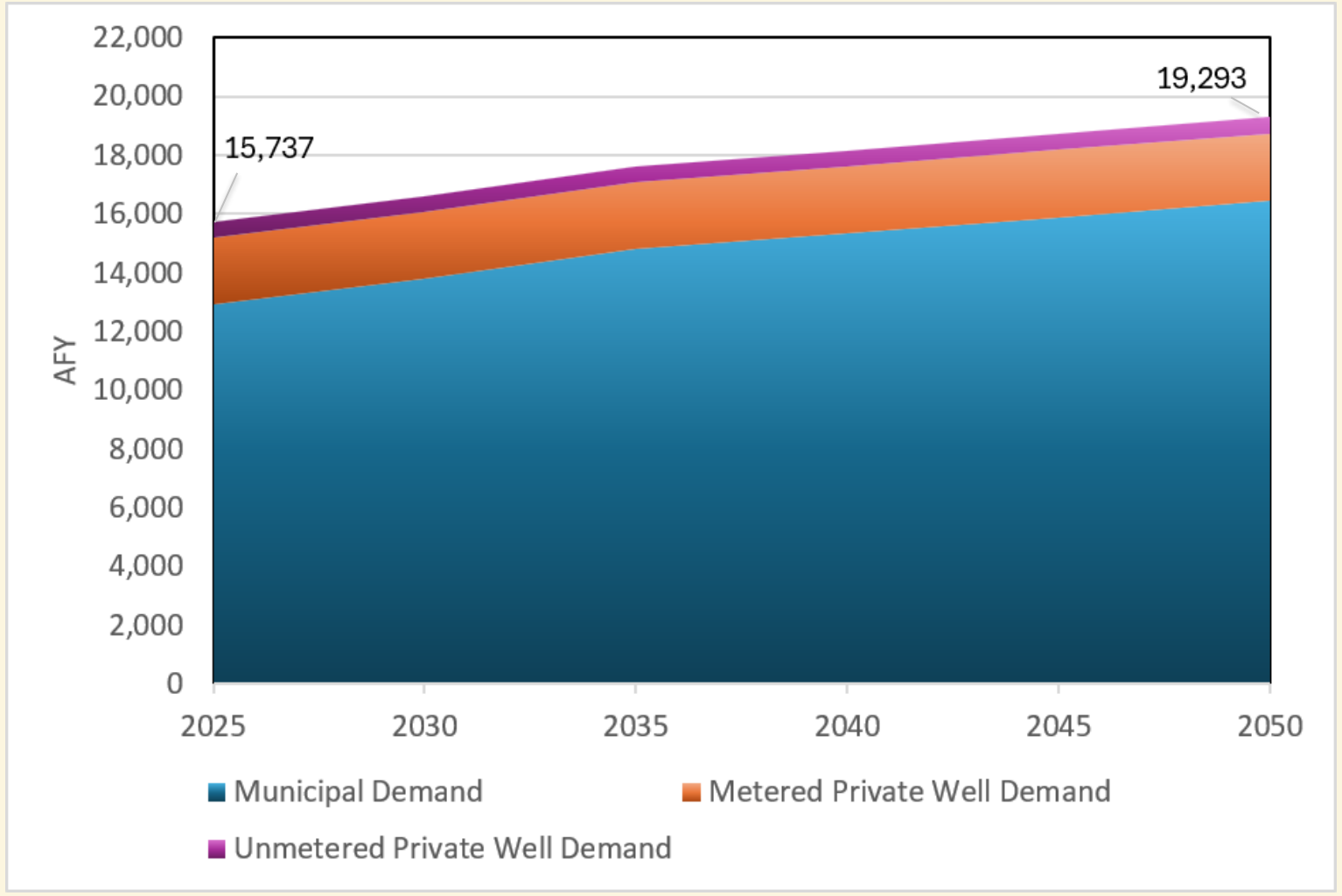


Non-Municipal Demand

- Groundwater pumped directly from private wells falls into two categories:
  - Metered Wells
    - Golf courses
    - Agricultural uses
    - Industrial facilities
    - Subject to groundwater reporting and Replenishment Assessment Charge (RAC) fees
  - Unmetered Wells
    - Small domestic wells
    - Below groundwater reporting thresholds

Demand Forecast - Overview

Overall, water demand in the Mission Creek Subbasin is projected to increase from approximately **15,700 AFY** to approximately **19,300 AFY** through 2050, as population growth is offset by continued water conservation

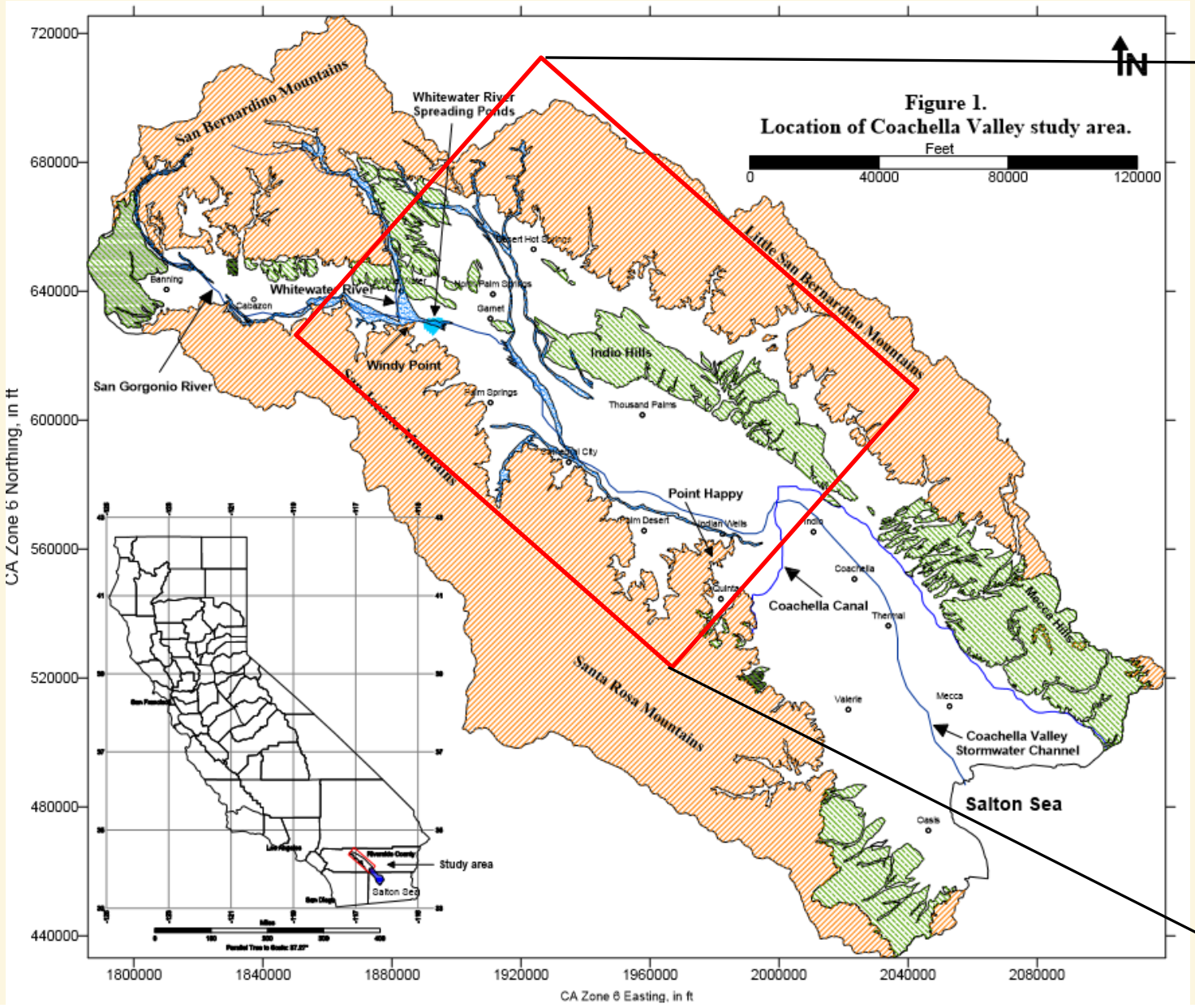


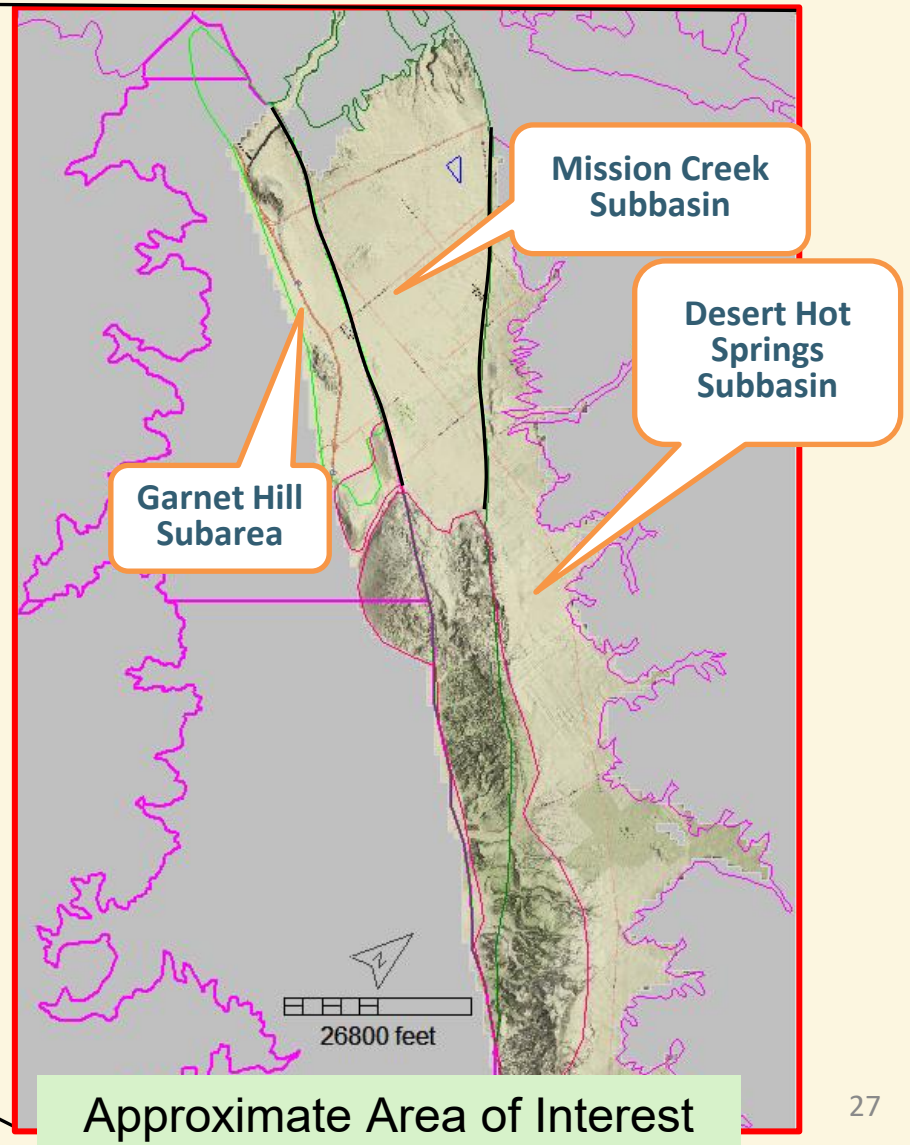
Hydrogeologic Conceptual Model

Hydrogeologic Conceptual Model

- A hydrogeologic conceptual model (HCM) is a simplified representation of the surface water / groundwater flow systems, frequently in the form of a block diagram or cross section (Anderson & Woessner, 1992).
- The purpose of the HCM is to establish an initial understanding of the surface water / groundwater systems and organizes the associated field data for more effective analysis.
- The HCM defines the dimensions of the numerical model, the design of the grid, the simulation period, and the number of stress periods utilized.
- The HCM also provides estimates the numerical model's inflows and outflows for each stress period of the simulation.

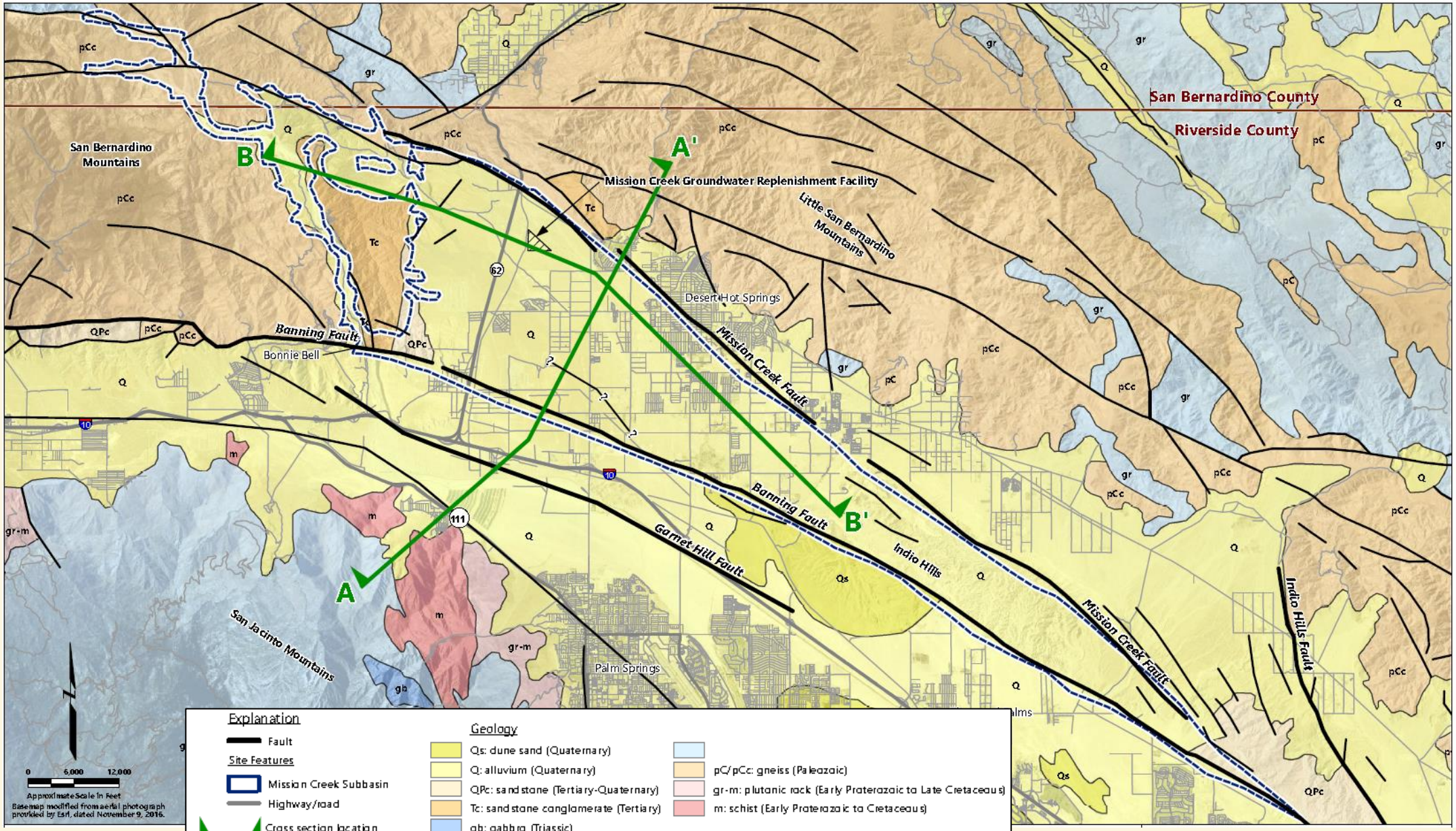
HCM – **Upper Coachella Valley Study Area**





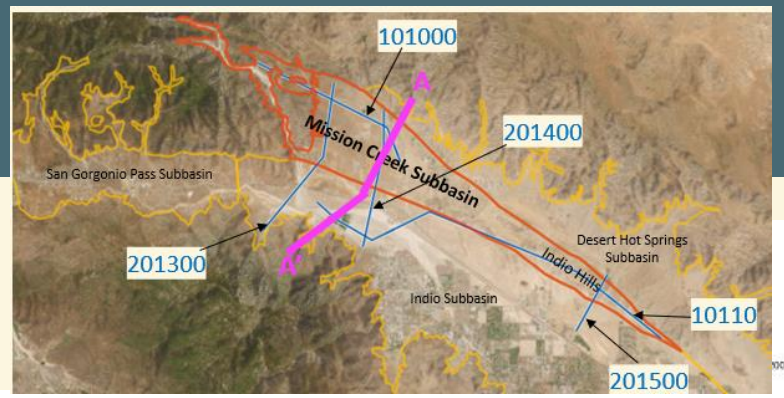
Approximate Area of Interest

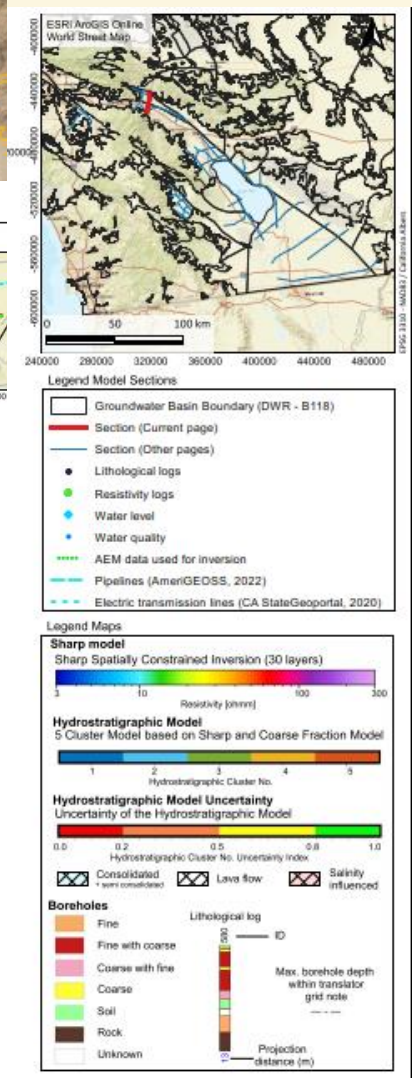
HCM – **Geology**

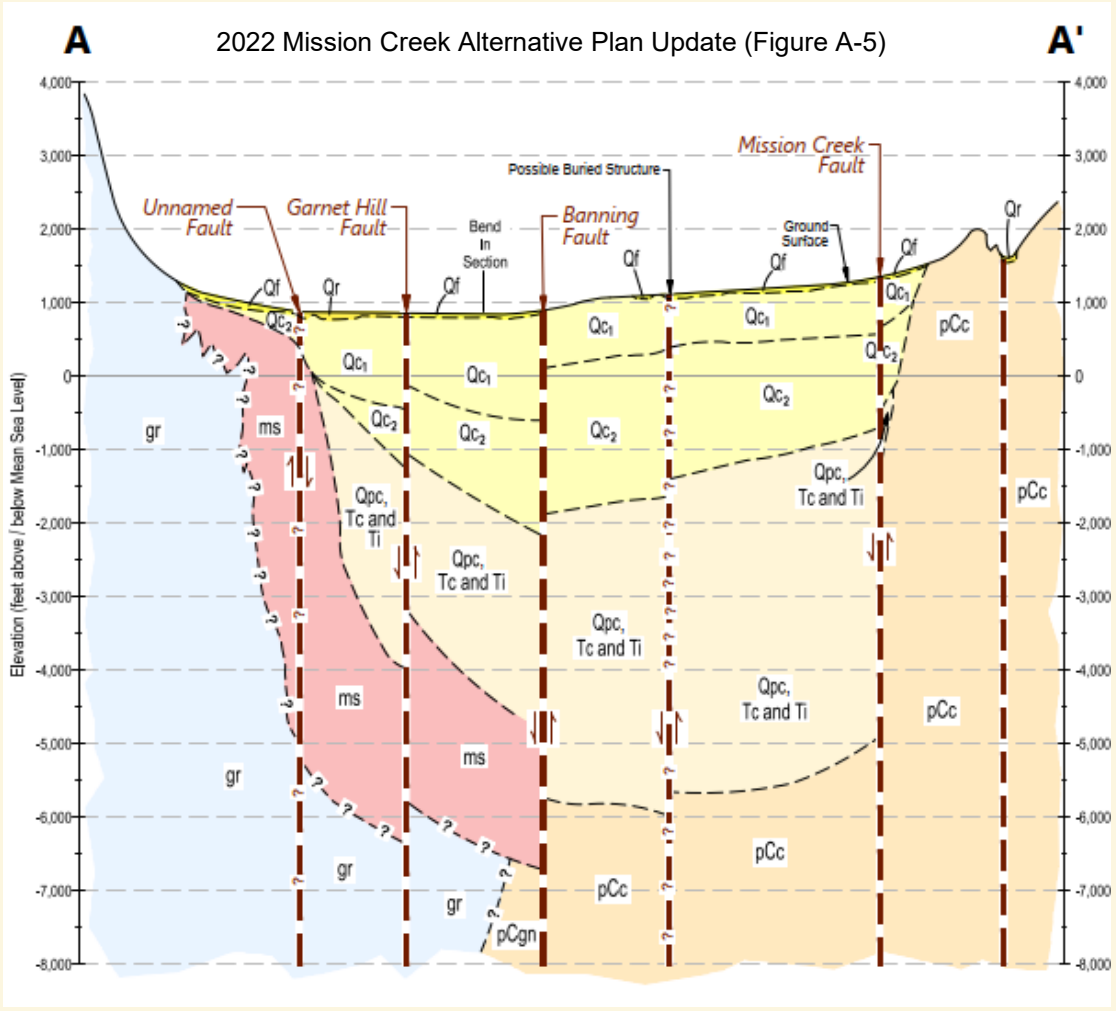

San Bernardino County
Riverside County
San Bernardino Mountains
Mission Creek Groundwater Replenishment Facility
Little San Bernardino Mountains
Desert Hot Springs
Banning Fault
Bonnie Bell
Mission Creek Fault
Garnet Hill Fault
Indio Hills
Indio Hills Fault
San Jacinto Mountains
Palm Springs
A
A'
B
B'
Explanation
Fault
Site Features
Mission Creek Subbasin
Highway/road
Cross section location
Geology
Qs: dune sand (Quaternary)
Q: alluvium (Quaternary)
QPc: sandstone (Tertiary-Quaternary)
Tc: sandstone conglomerate (Tertiary)
gb: gabbro (Triassic)
pC/pCc: gneiss (Paleozoic)
gr-m: plutonic rock (Early Proterozoic to Late Cretaceous)
m: schist (Early Proterozoic to Cretaceous)
0 6,000 12,000
Approximate Scale in Feet
Basemap modified from aerial photograph provided by Esri, dated November 9, 2016.

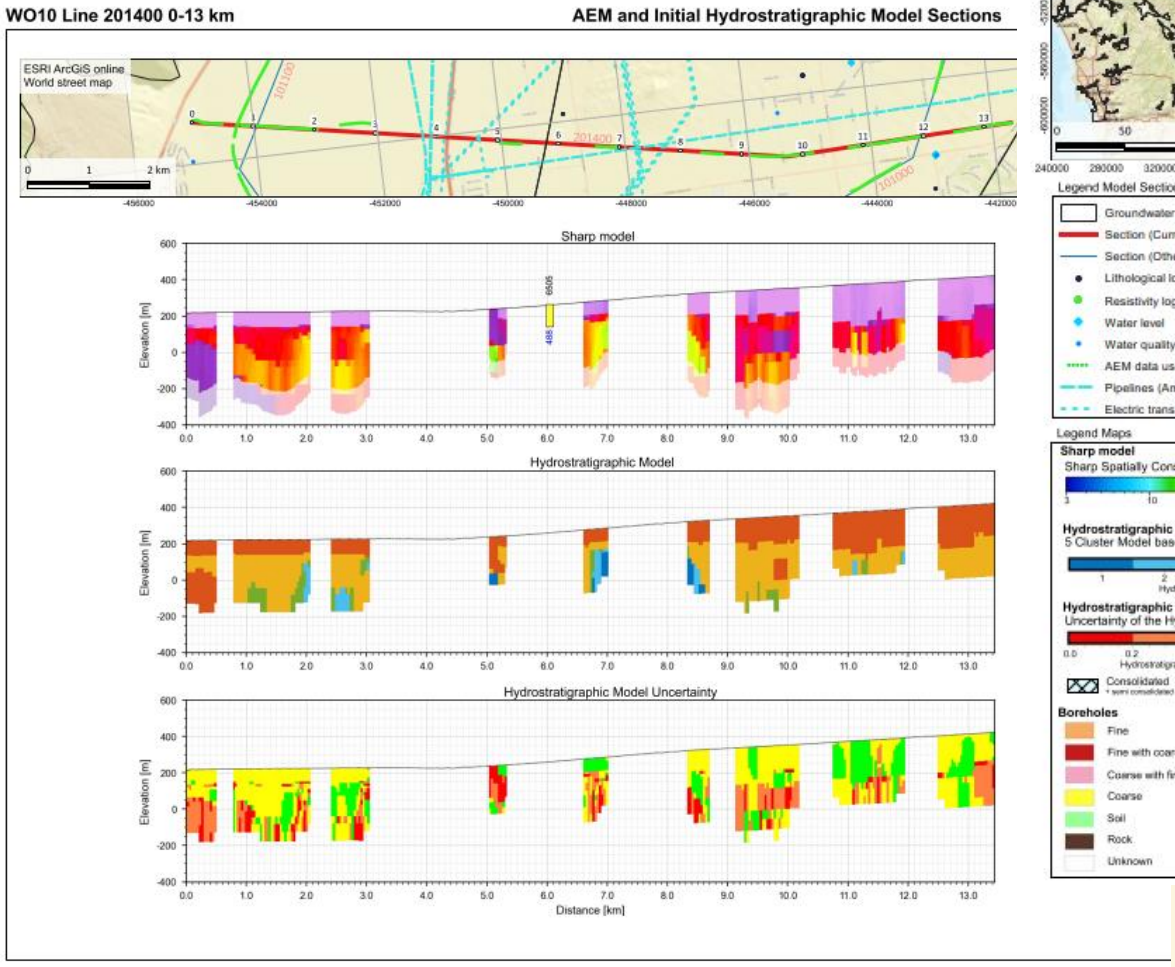
HCM Updates Lithology

- Gaps in AEM do not allow for confirmation of fault boundaries
- No changes to model layers or fault locations are proposed based on the data



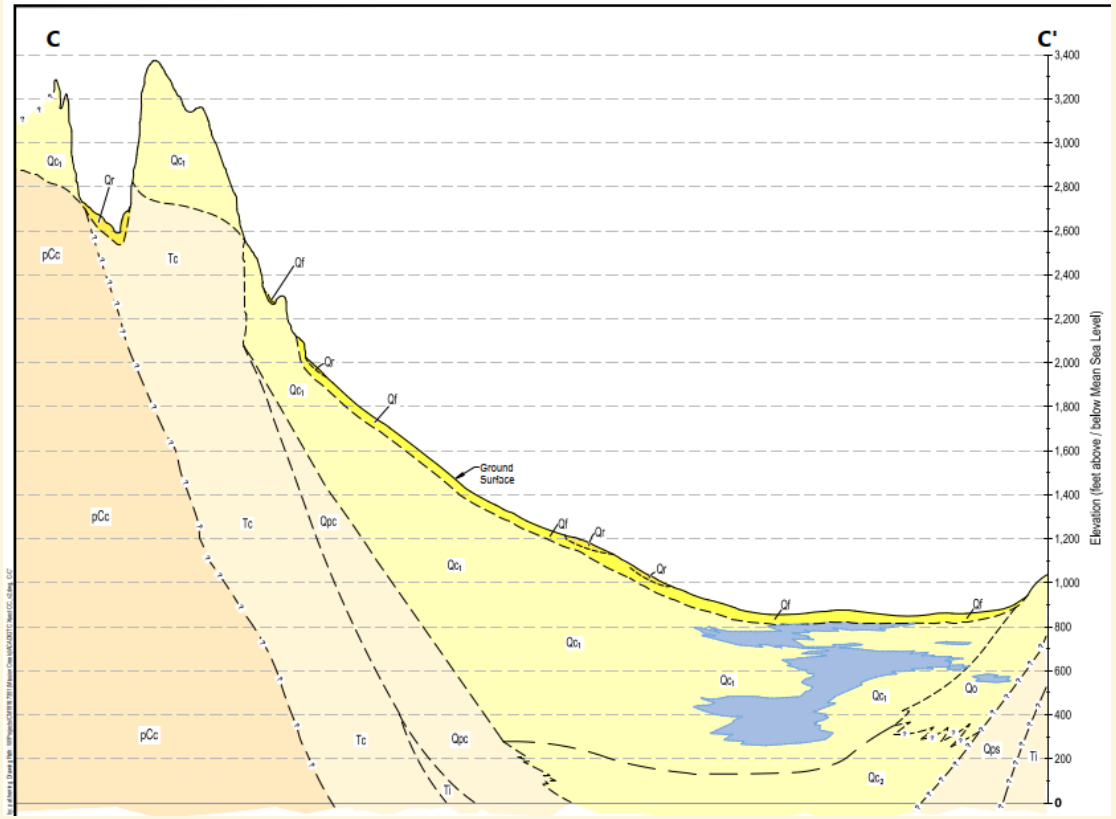


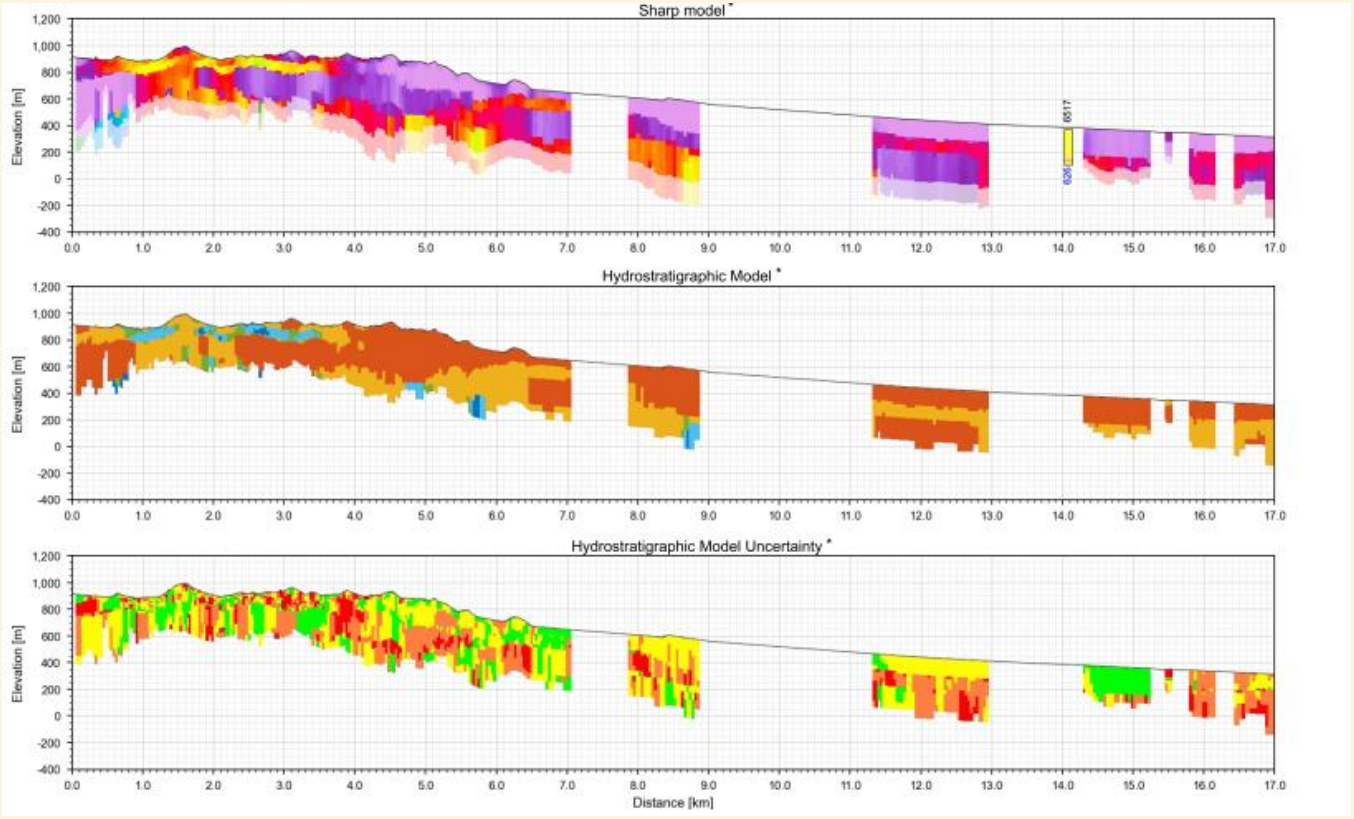




HCM Updates Lithology

Confirms current Hydrogeologic Conceptual Model (HCM) and could be used to refine the groundwater model in the future





Salton Sea

HCM – **Water Balance**

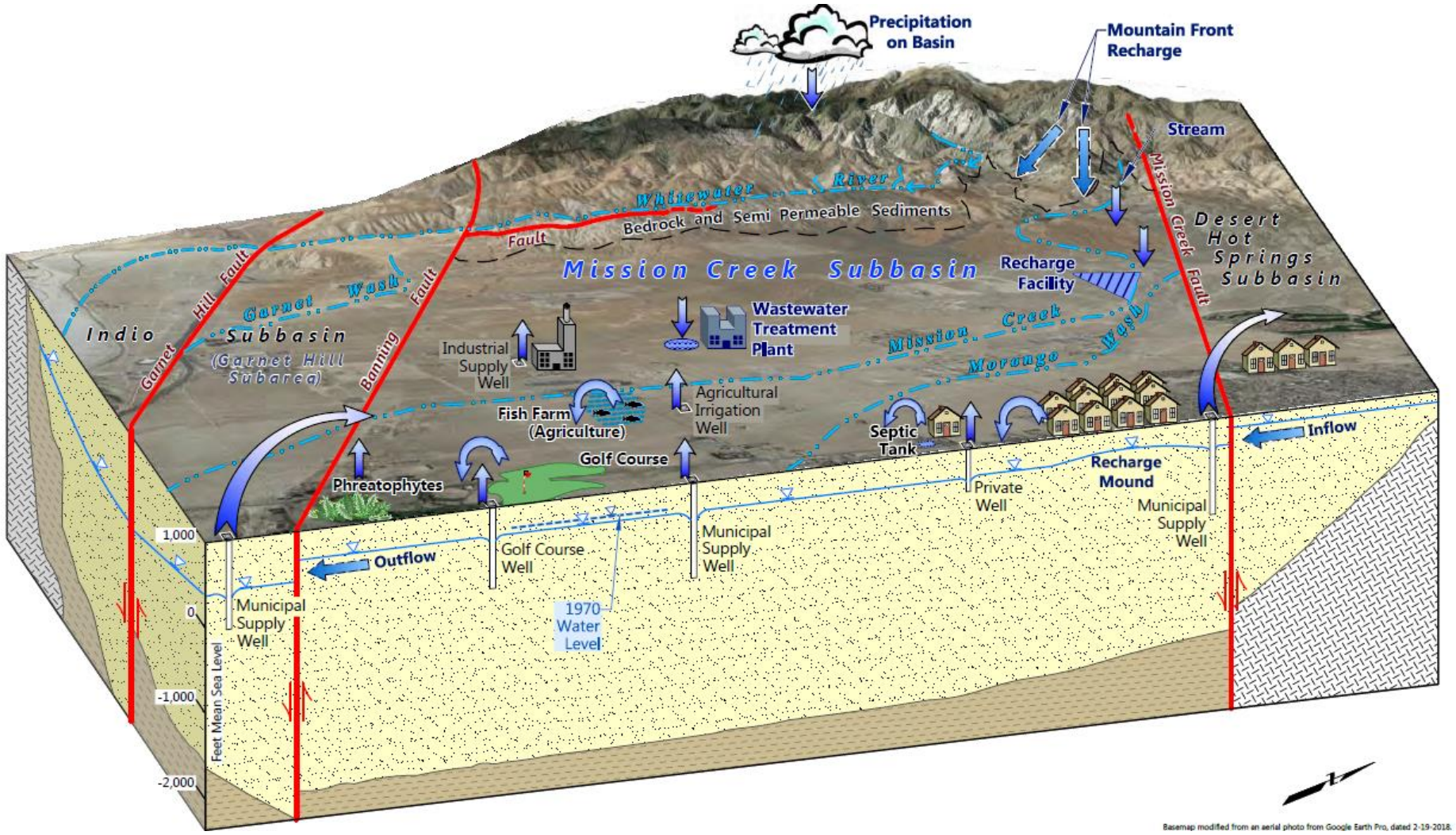
MISSION CREEK SUBBASIN SGMA

Inflows

- Precipitation
- Mountain Front Recharge
- Agricultural Return Flows
- WWTP Percolation
- Septic Percolation
- Artificial Recharge
- Inter-basin Underflow

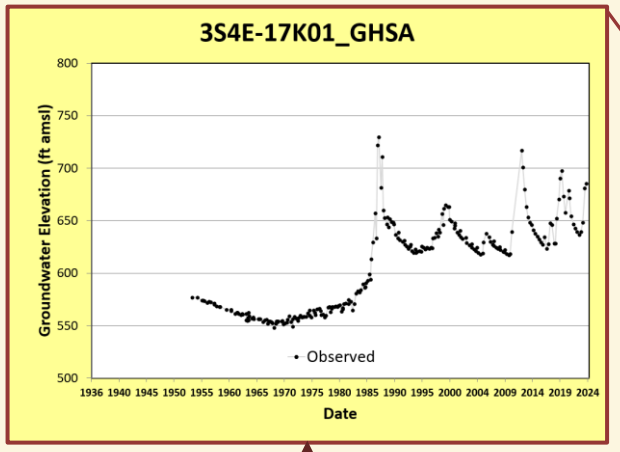
Outflows

- Evapotranspiration
- Bare Soil Evaporation
- Groundwater Pumping
- Inter-basin Underflow

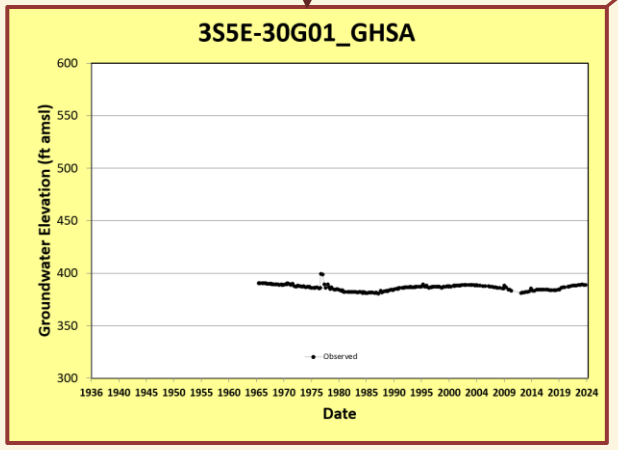


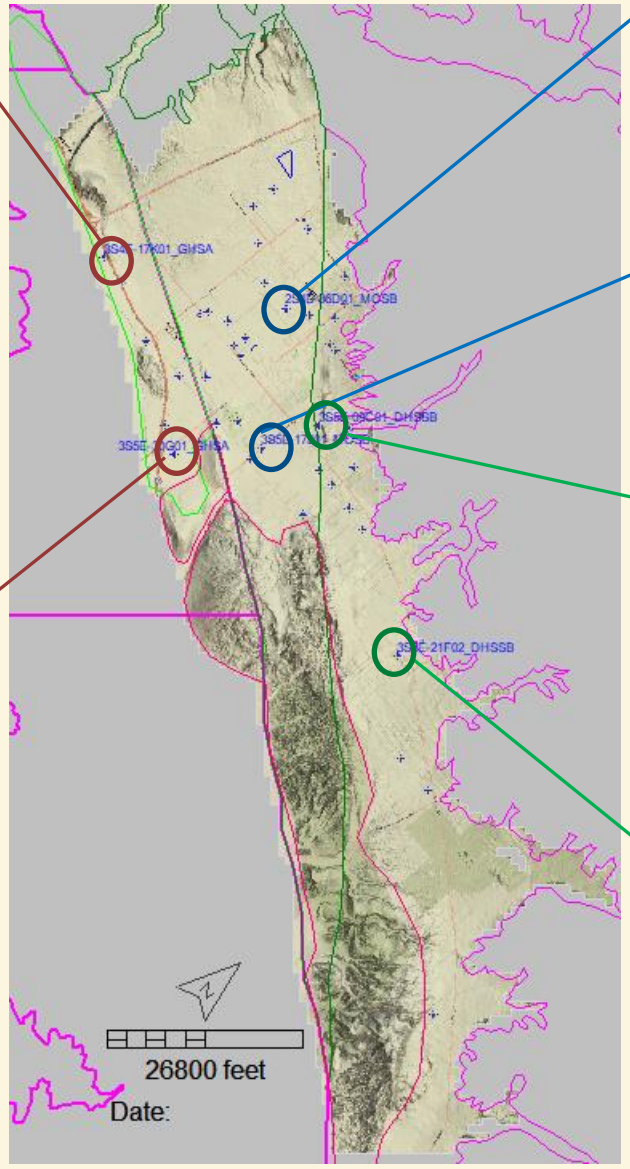
Inflows – Outflows = Change in Storage = Change in Water Levels

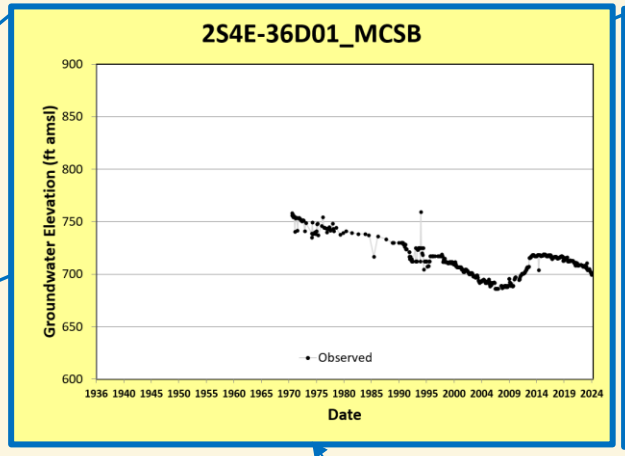
HCM – **Observed Groundwater Levels**

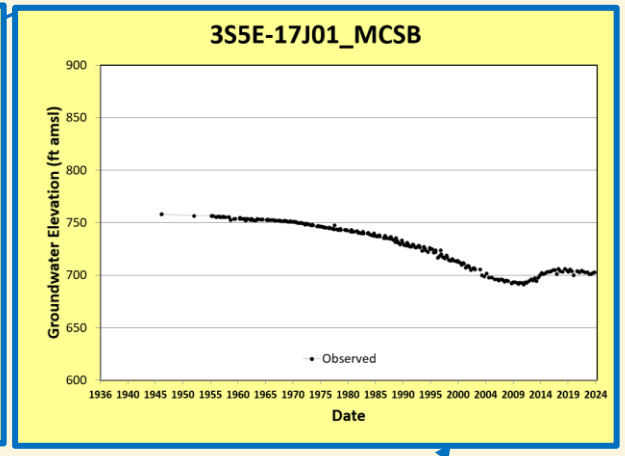


Garnet Hills Subarea Wells

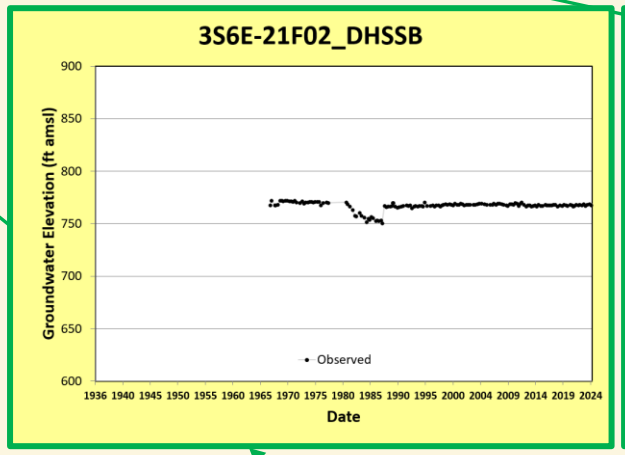


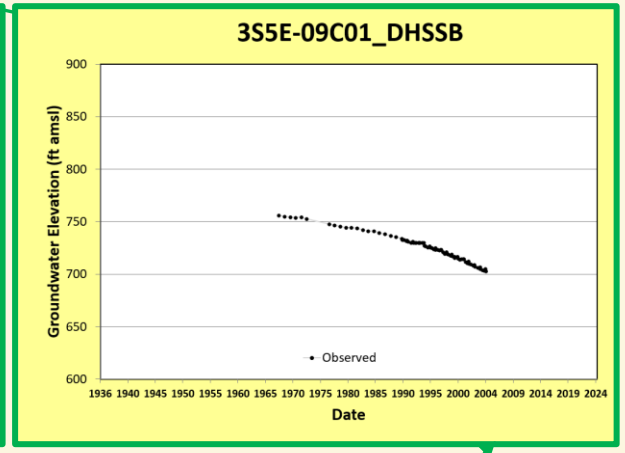






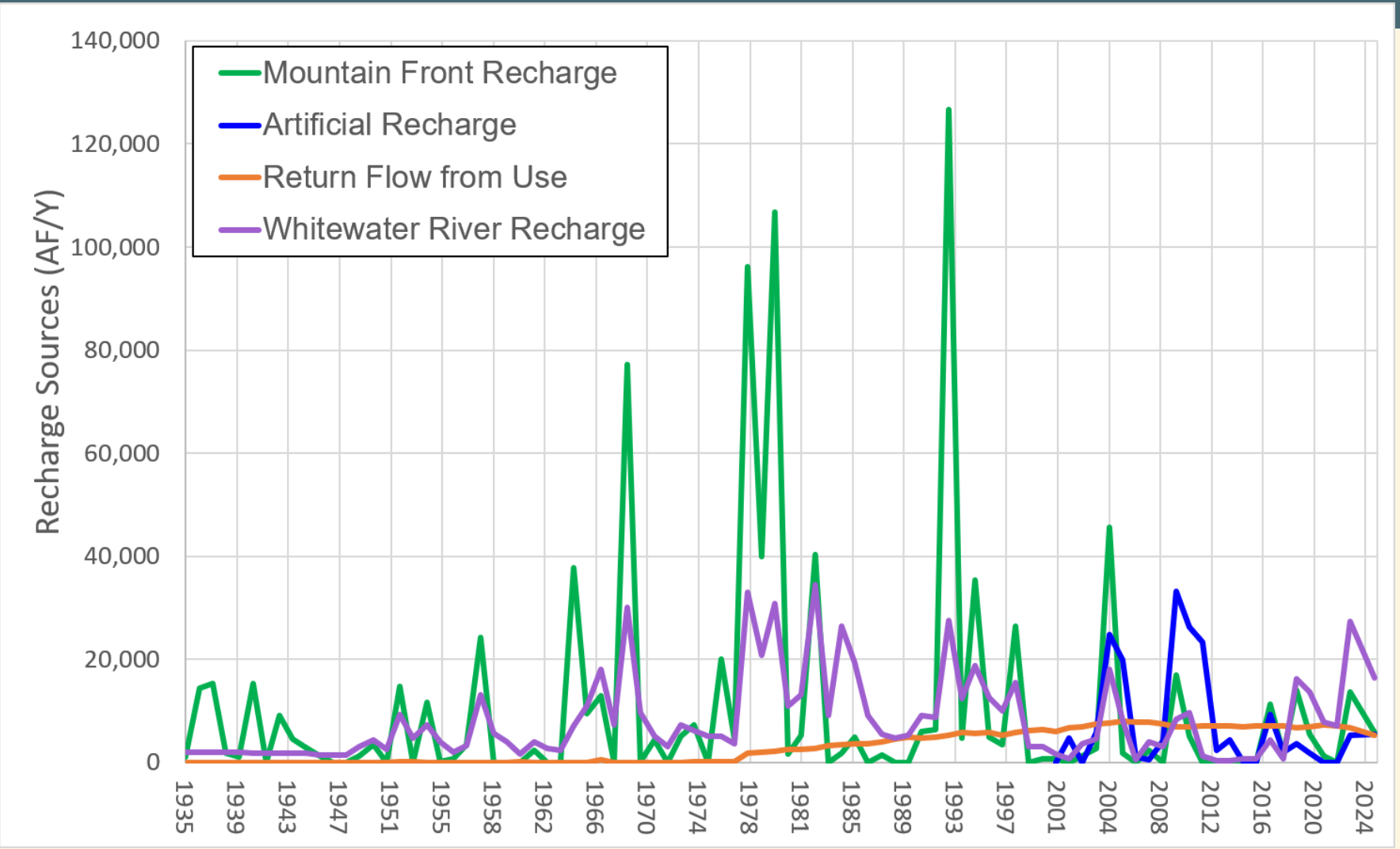
Mission Creek Subbasin Wells





Desert Hot Springs Subbasin Wells

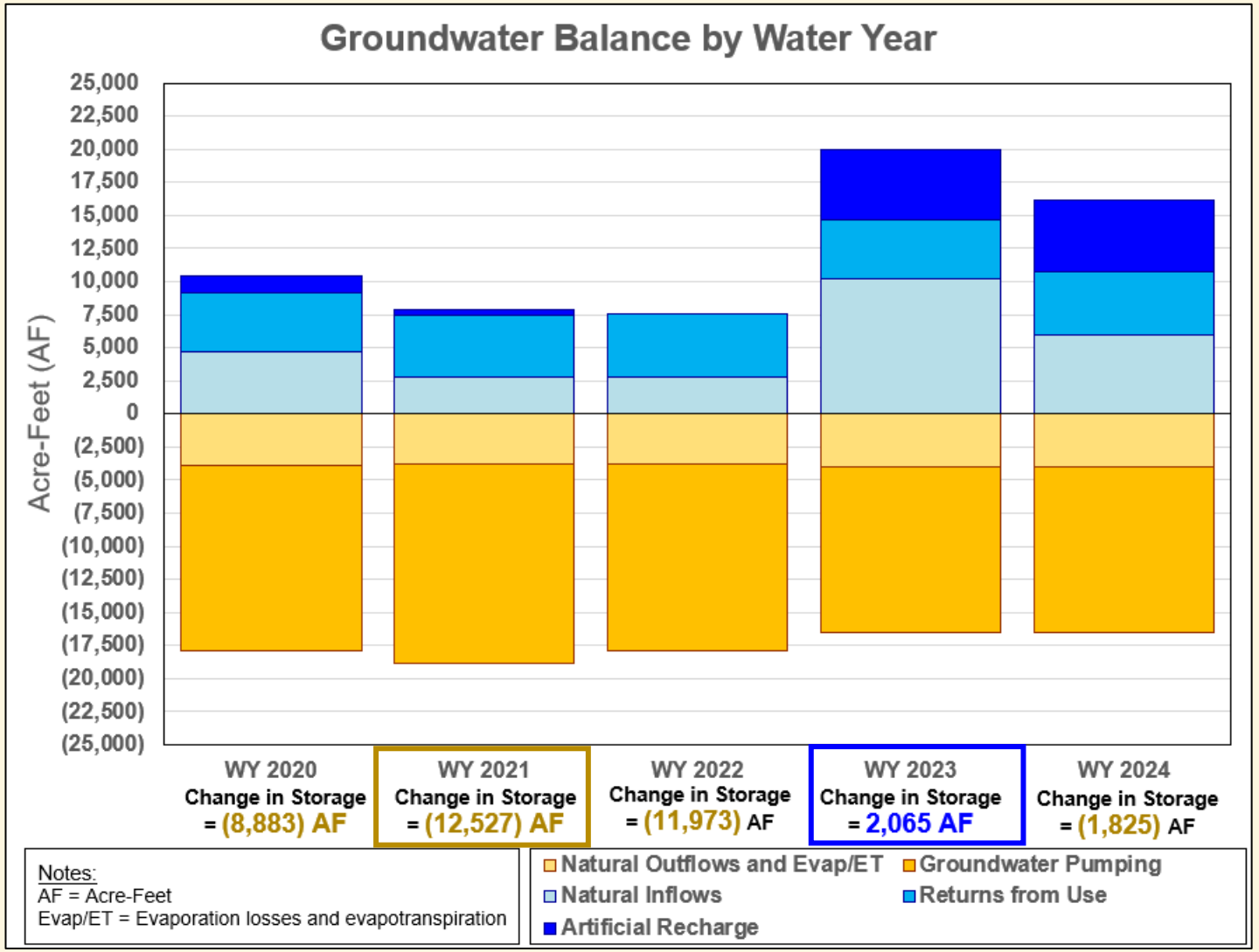
HCM – **Recharge Sources**



1) Mountain Front Recharge estimated from USGS Basin Characterization Model (BCM).
2) Artificial recharge as summarized in Engineer's Reports on Water Supply and Replenishment Assessment and Mission Creek Subbasin Annual Reports.
3) Return flow from Use based on water use and return flow factors provided in CVWD Engineer's Reports on Water Supply and Replenishment Assessment and Mission Creek Subbasin Annual Reports for Water Years.
4) Whitewater River Recharge is the combined recharge from the Whitewater Headwater and Riverbed Recharge Sources provided by Todd Groundwater. The Whitewater riverbed does not contribute recharge after 1991.

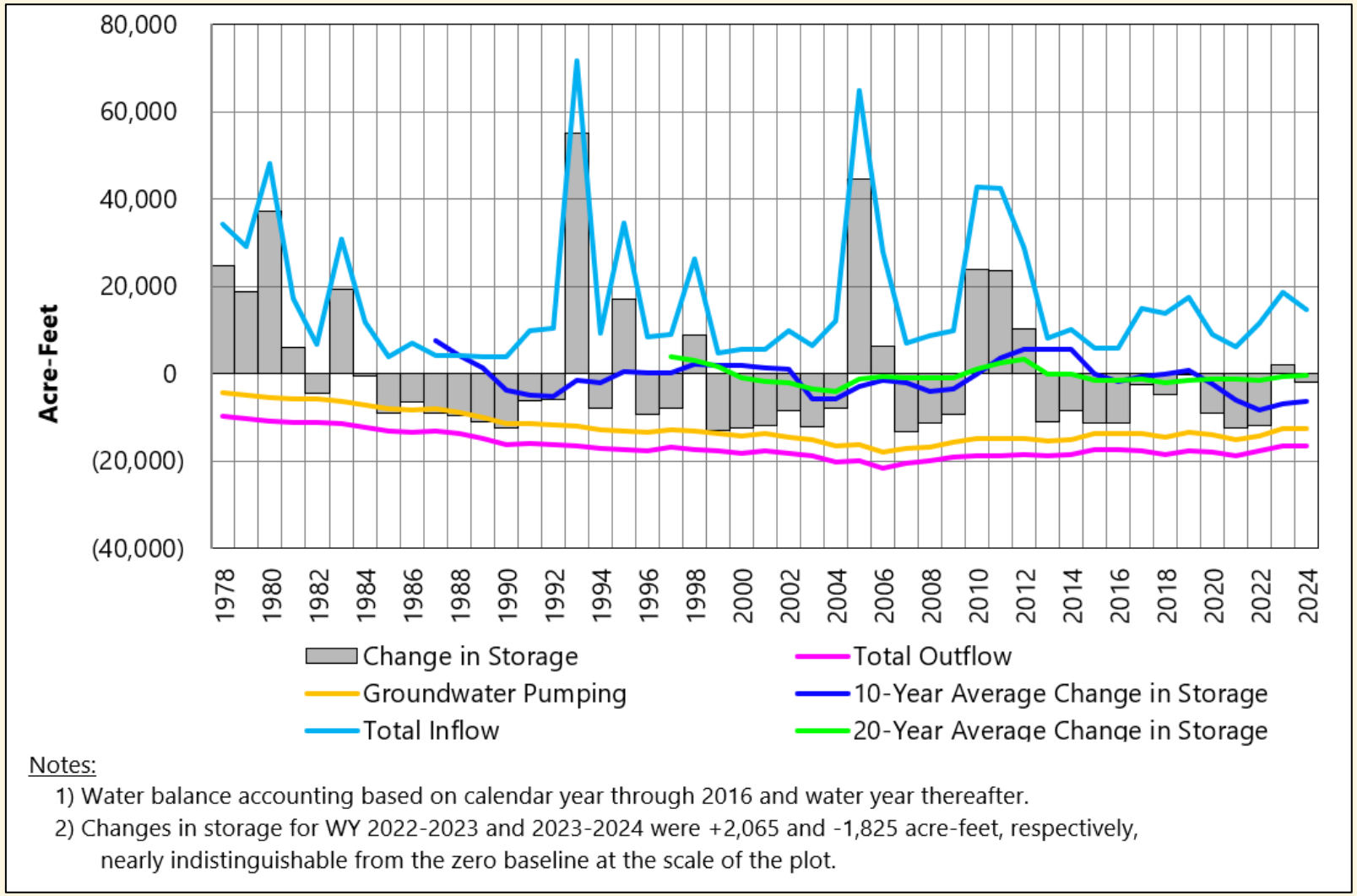
HCM – **Water Balance**

- Inflows – Outflows = Change in Storage. Water levels rise with increases in storage and fall with decreases in storage
- Inflow components include natural inflows (surface and subsurface), return flow from use, and artificial recharge
- Outflow components include natural outflows, evaporation/ evapotranspiration and groundwater pumping
- Change in storage varies each year – ranging from **-12,527 AF** in WY 2021 to **+2,065 AF** in WY 2023



HCM - **10- and 20-Year Average Change in Storage**

- Between 1978 and 2012, combined periods of large inflow exceed total outflows.
- Between 2013 and 2024 outflows exceed inflows.
- Between 2020 to 2024:
  - 10-year average change in storage decreases.
  - 20-year average change in storage remains neutral.



Notes:

1) Water balance accounting based on calendar year through 2016 and water year thereafter.
2) Changes in storage for WY 2022-2023 and 2023-2024 were +2,065 and -1,825 acre-feet, respectively, nearly indistinguishable from the zero baseline at the scale of the plot.

POLL Question #3

How confident are you in your understanding of the Hydrogeologic Conceptual Model?

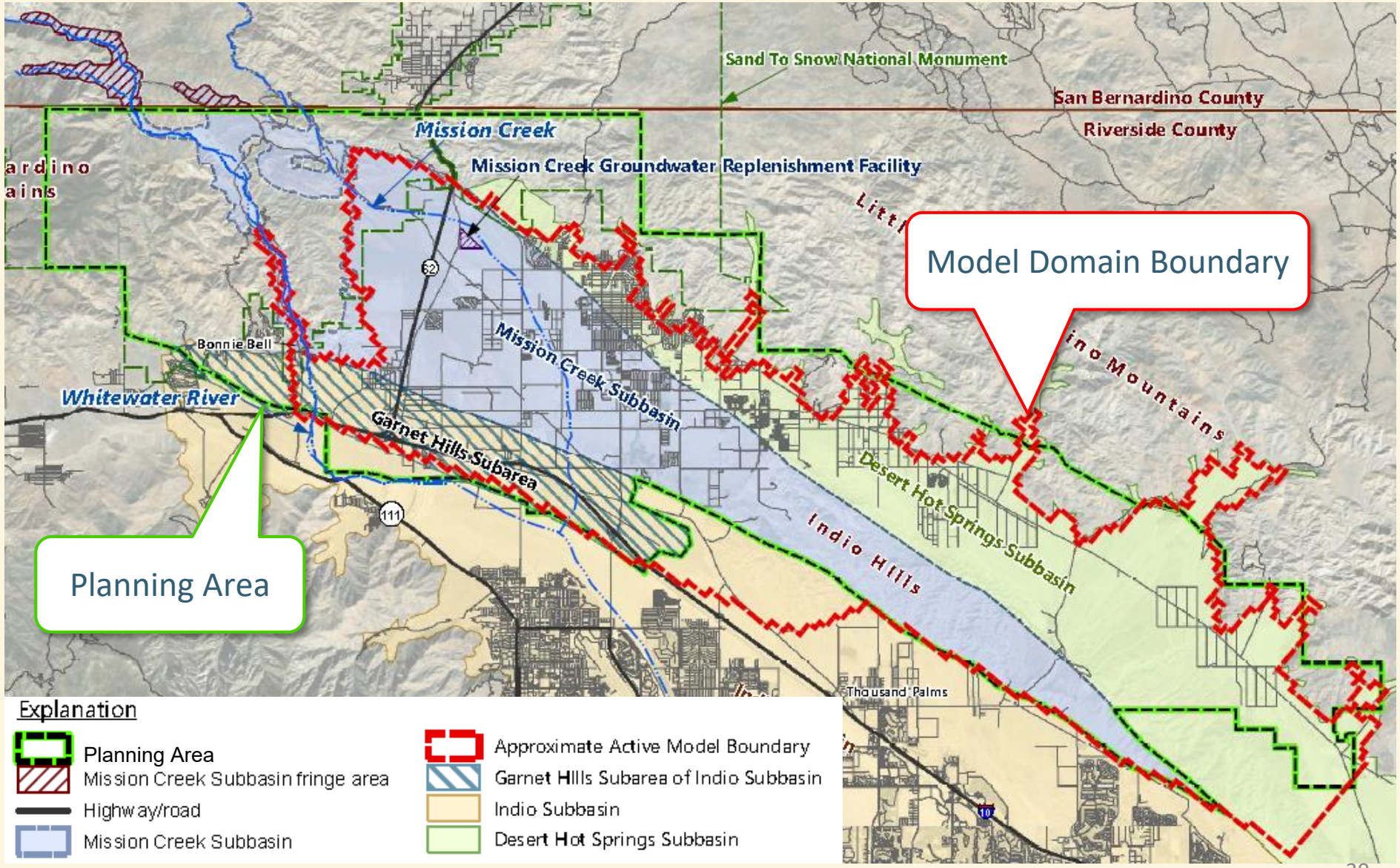
- Very confident
- Somewhat confident
- Not confident yet

Questions?

Groundwater Model Overview

Mission Creek Subbasin Model Domain and Planning Area

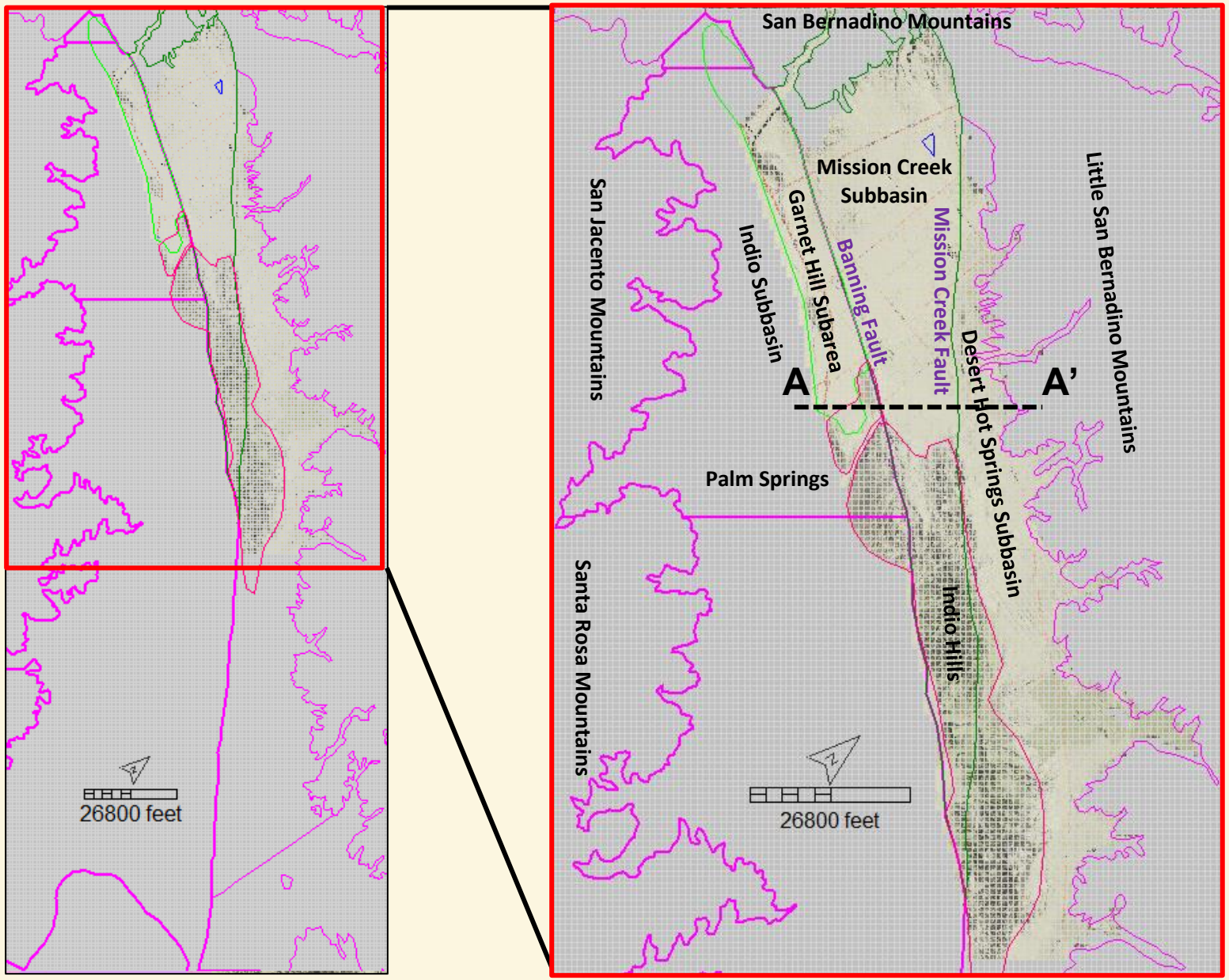
- Planning Area is focused on current and potential future water use
- Model Domain is focused on inflow and outflow components within the Planning Area
- Groundwater flow between adjacent subbasins/subareas are simulated with faults and/or flux boundary conditions



MCSB Groundwater Model — **Objectives**

- Utilize and update existing Mission Creek Subbasin (SB) groundwater flow model developed and documented in the 2022 Mission Creek SB Alternative Plan Update (Wood, 2021).
- Modeling efforts focused on Mission Creek SB and Desert Hot Springs SB, and the Garnet Hill Subarea (SA) of the Indio SB.
- Update the inter-basin flow across Garnet Hill Fault boundary with Indio provided flux terms – reduces effort in Indio SB that will be applied to the other SBs (MCSB and DHSSB).
- Maintain compatibility (Grid size, layers, stress periods, etc.) with Coachella Valley Groundwater Model as much as possible.
- Update estimated recharge and production values through 2024 based on available records.

MCSB Groundwater Model - **Domain**



- MCSB model domain is a subset of the larger Coachella Valley Groundwater model develop in 2000 (Fogg, 2000).
- No changes were made since last update.

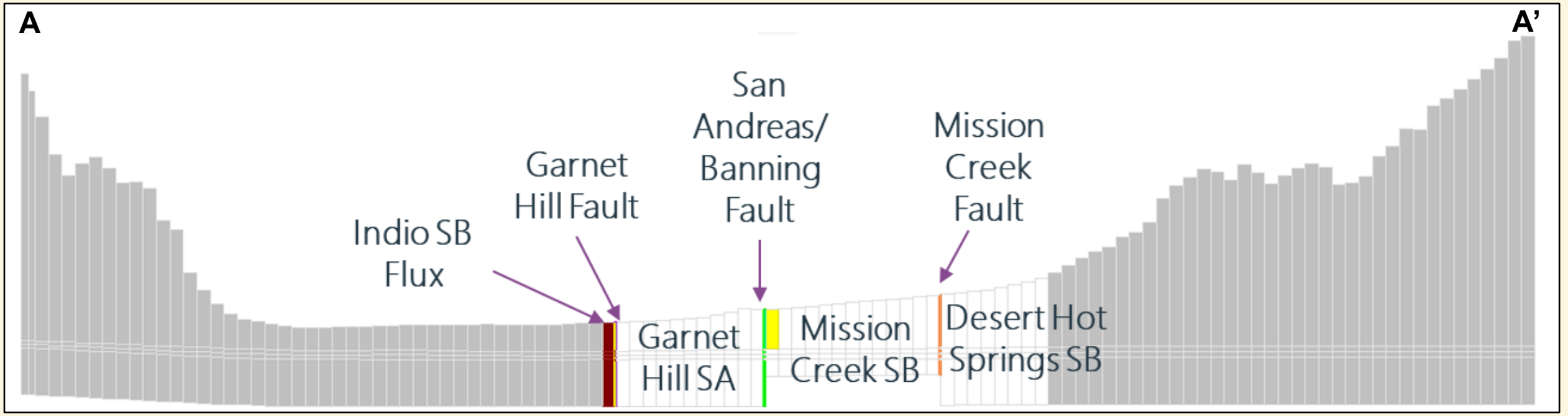
MCSB Model Grid consists of:

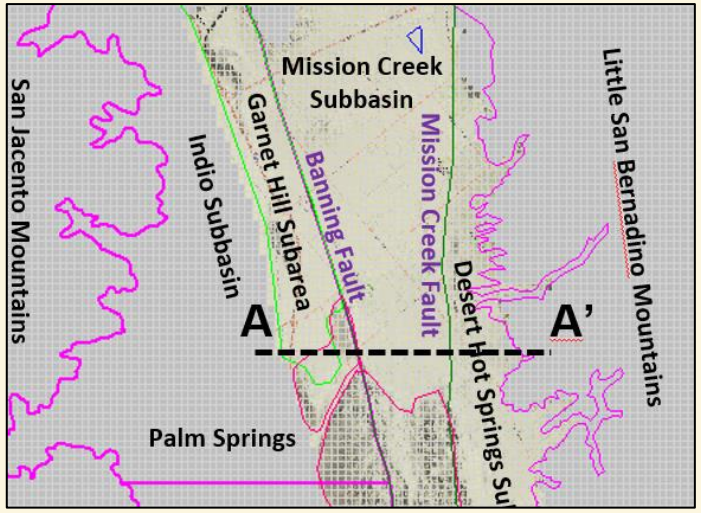
- 159 Rows/113 Columns
- 1000 x 1000 feet
- 4 Layers
- 126,560 Total Cells
- 18,172 Active cells
- 14.3% of Total
- 104,293 acres
- 162.96 sq. miles

Simulates the years:

- 1936-1945 using 5-year SPs
- 1946-1948 using 3-year SP
- 1949-1989 using Annual SPs
- 1990-2024 using Quarterly SPs
- 183 Total Stress Periods

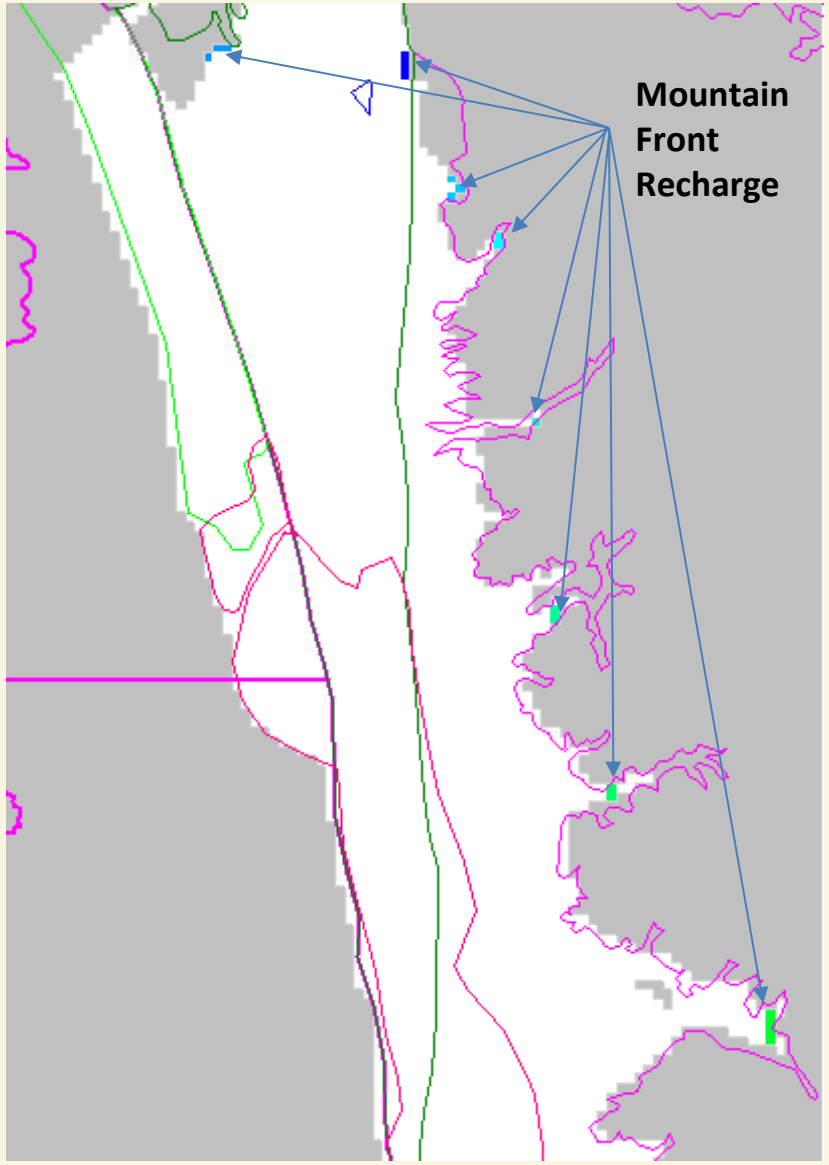
MCSB Groundwater Model — **Cross-Section**

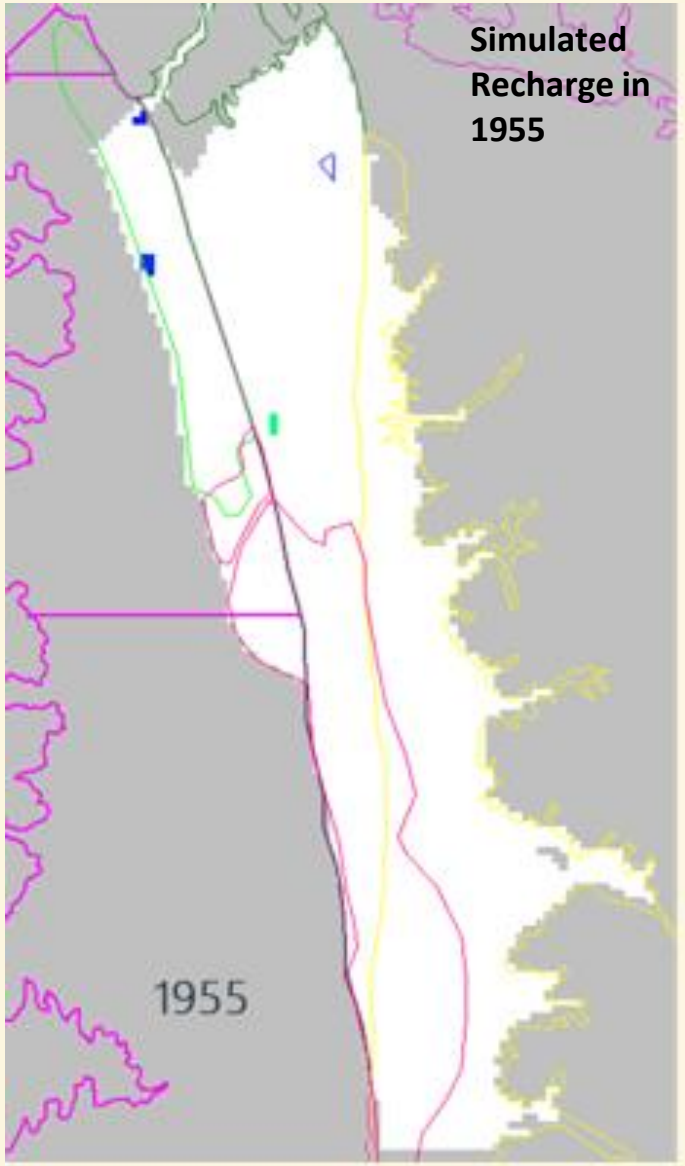


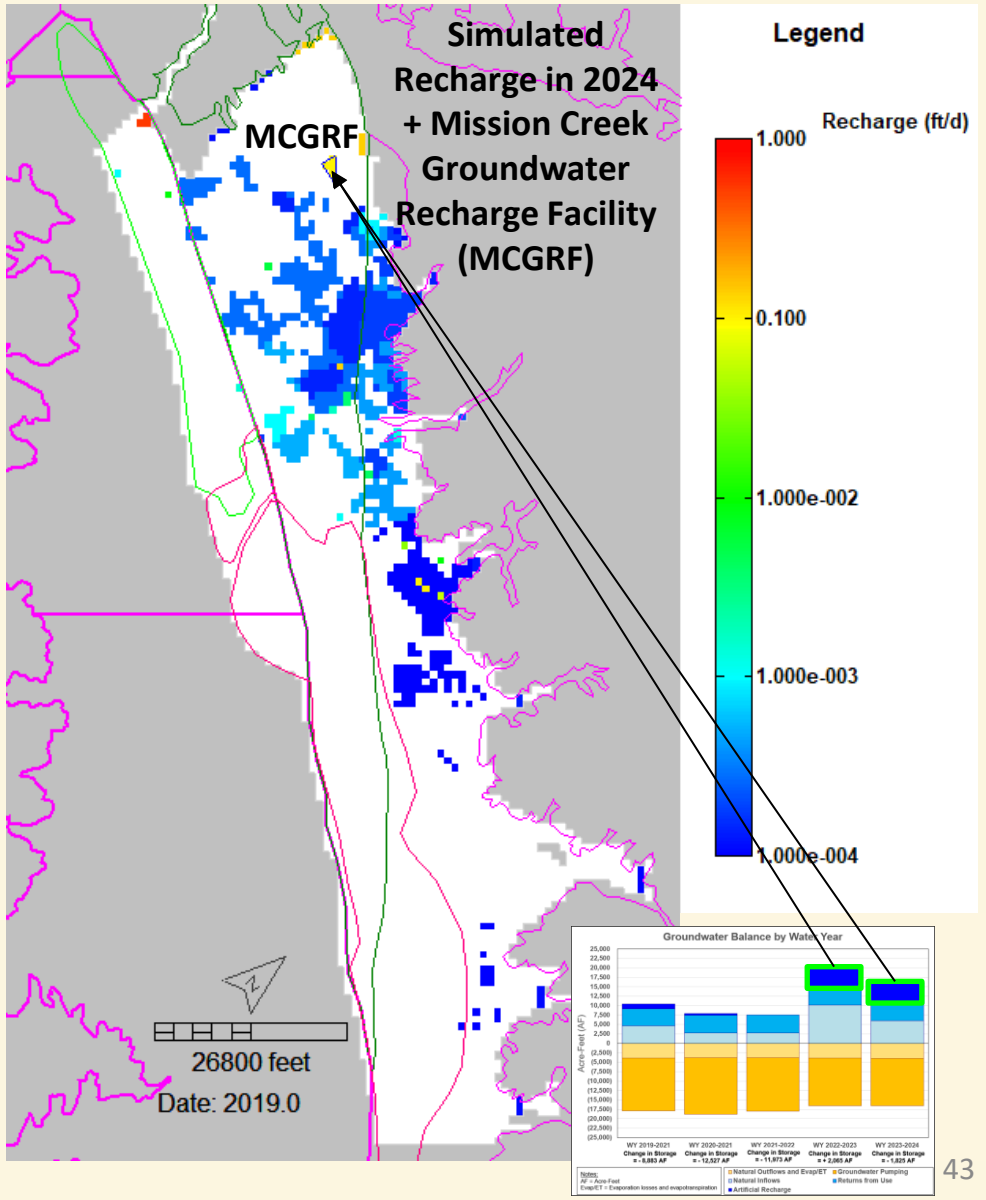


MCSB Groundwater Model – **Recharge Areas**

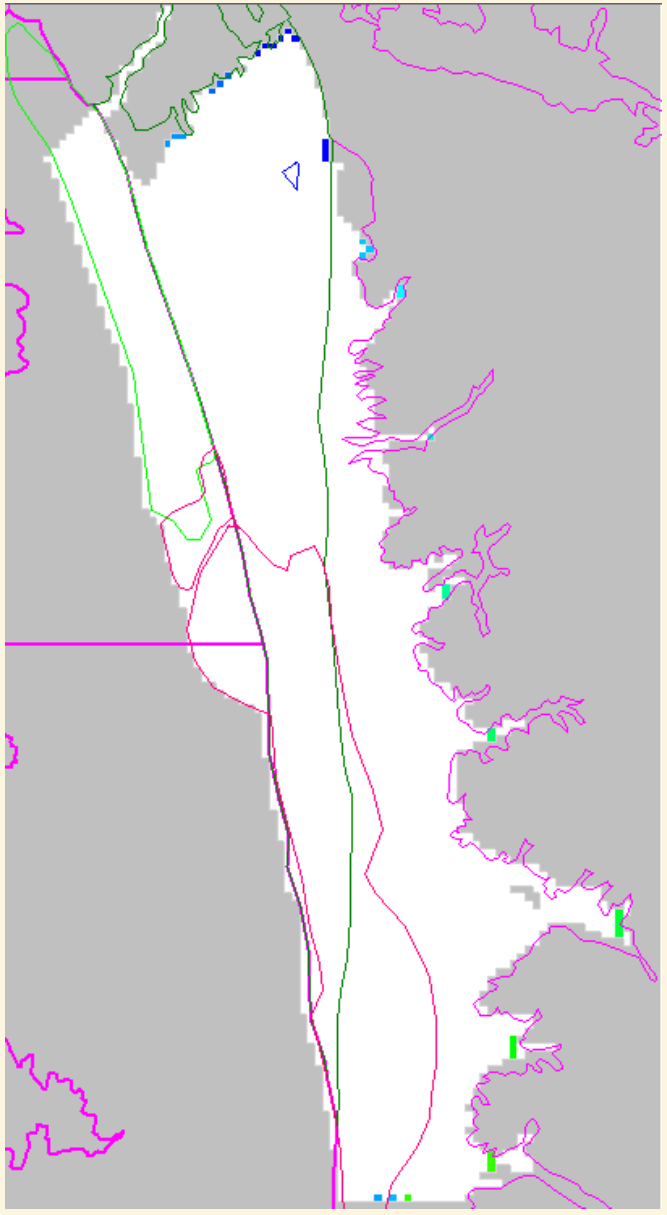
MISSION CREEK SUBBASIN SGMA

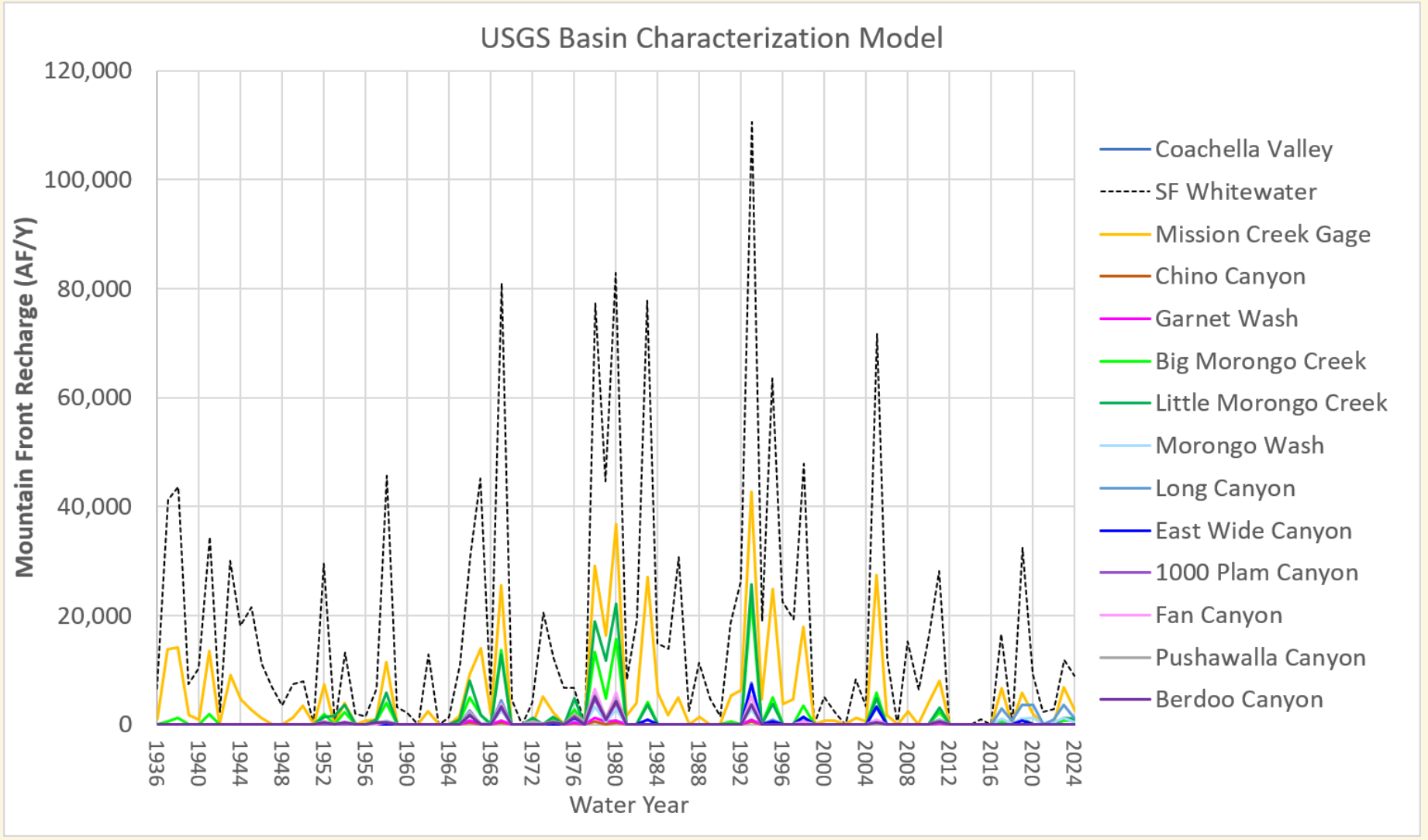




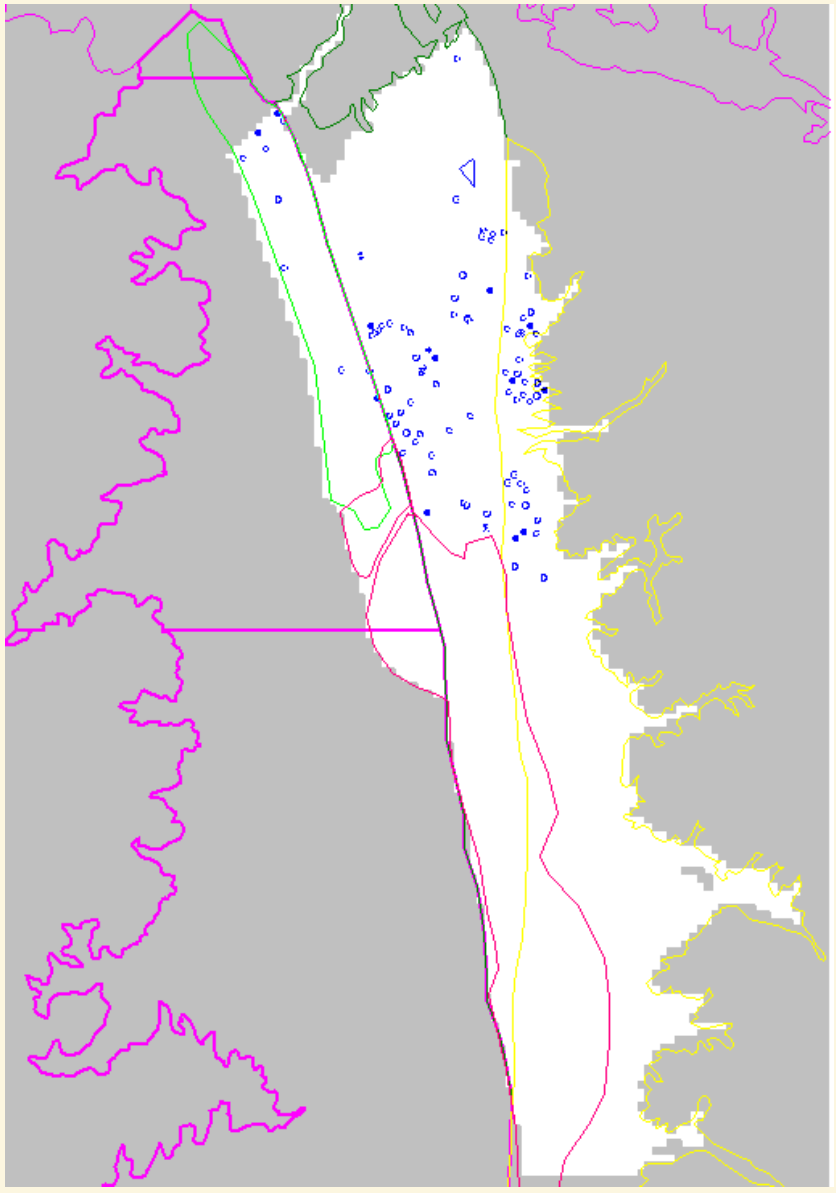


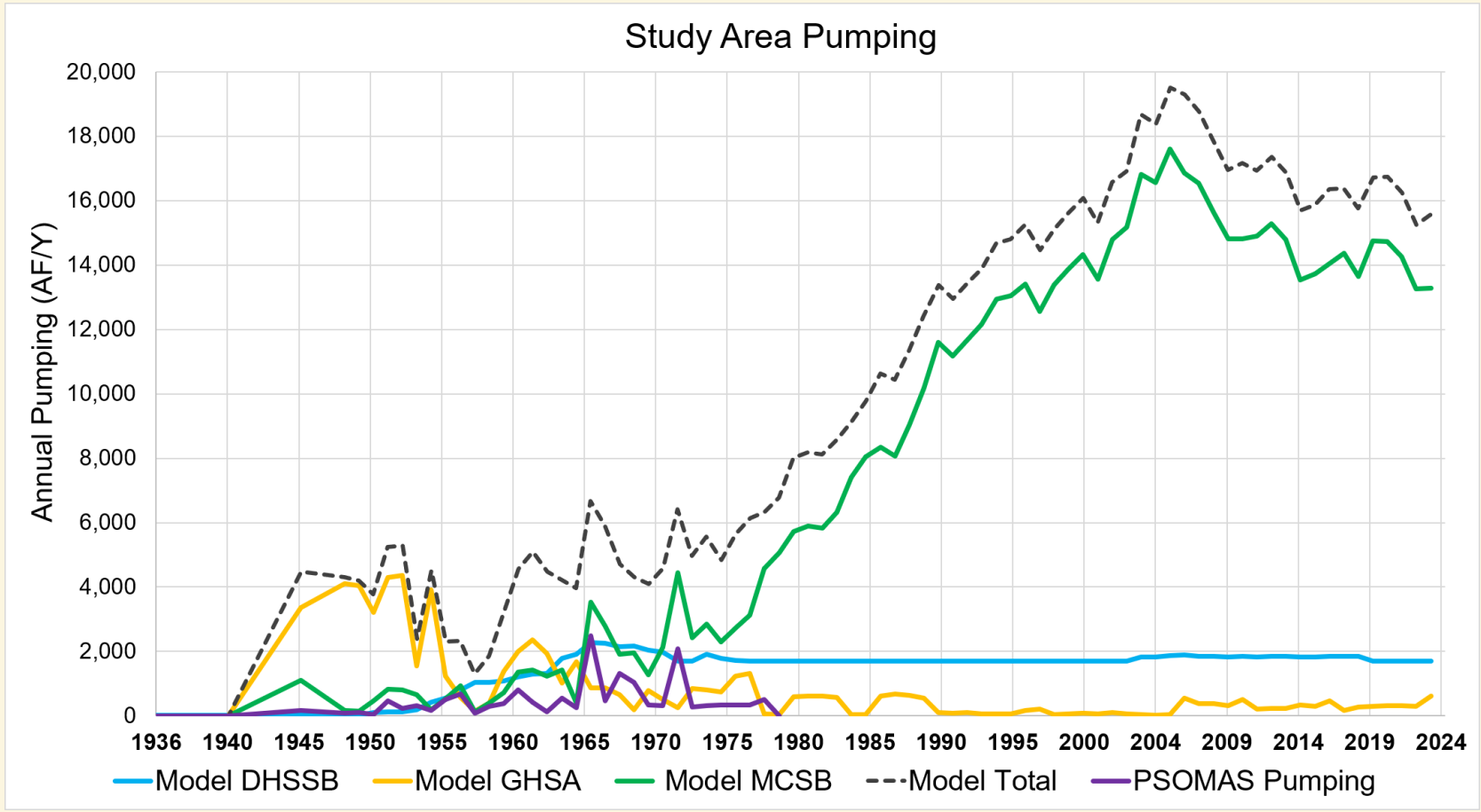
MCSB Groundwater Model — **Mountain Front Recharge**





MCSB Groundwater Model – **Groundwater Pumping**

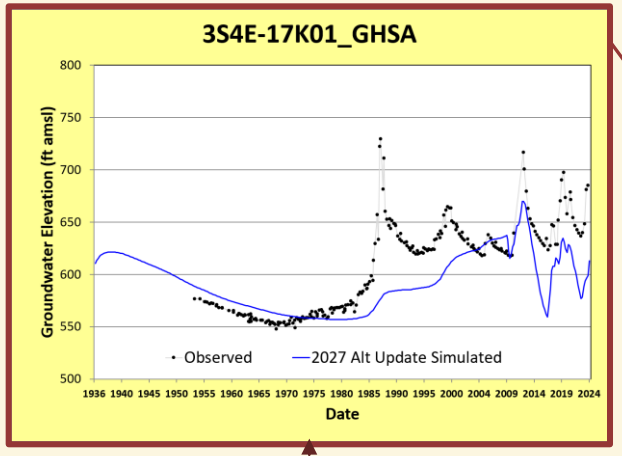




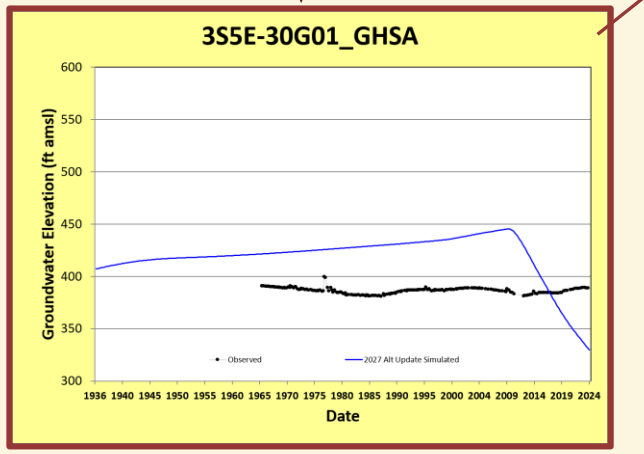
Model simulates pumping from 95 wells, most in Mission Creek SB

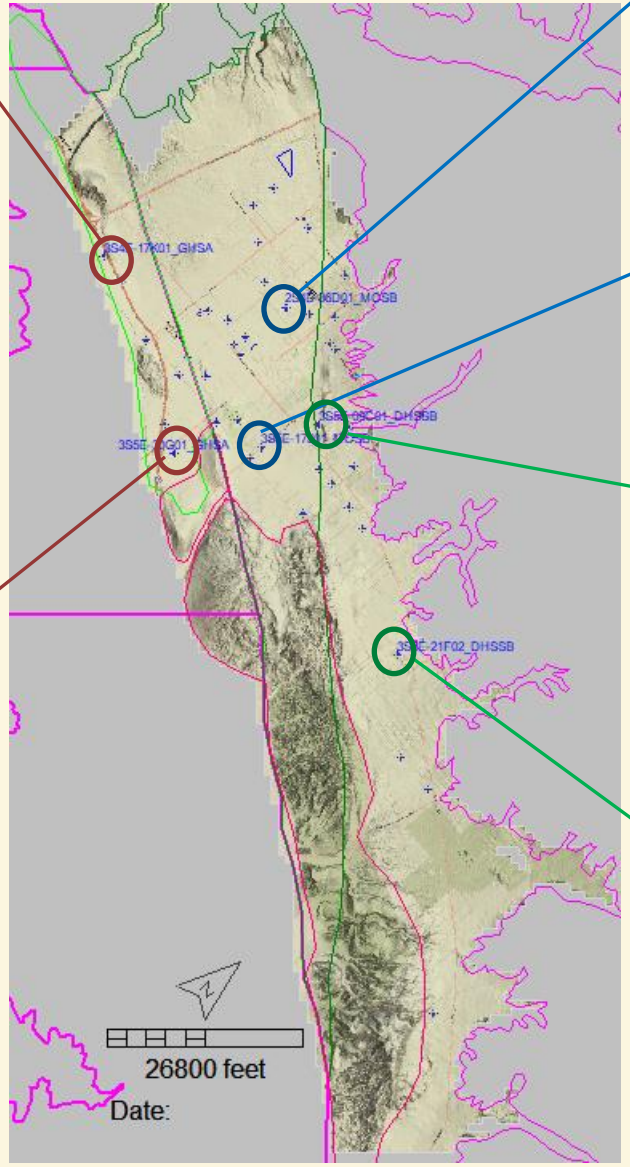
Pumping estimates prior to 1978 from PSOMAS model estimates
Pumping estimates from 1978 to present based on Agency records
Pumping from DHSSB is private pumping and is estimated from Mayer et al., 2007

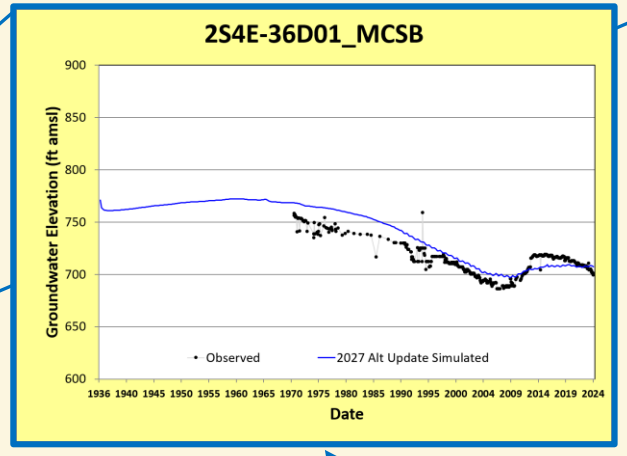
MCSB Groundwater Model – **Simulation Results**

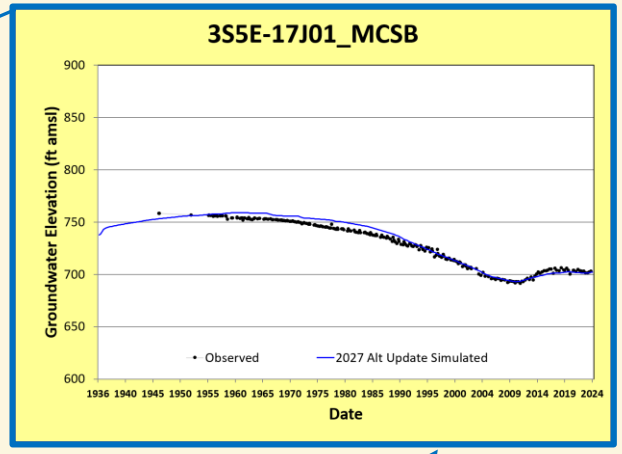


Garnet Hills Subarea Wells

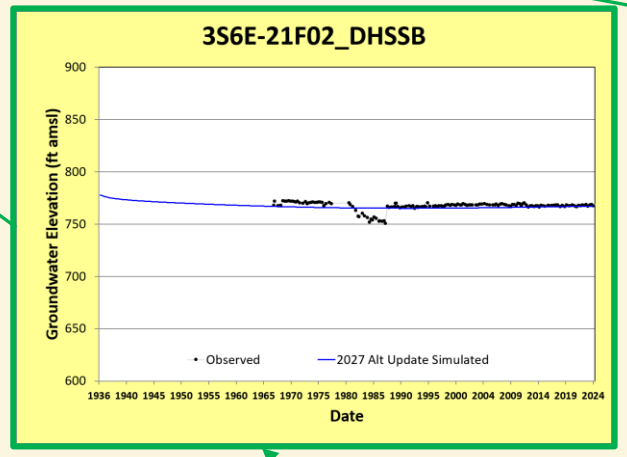


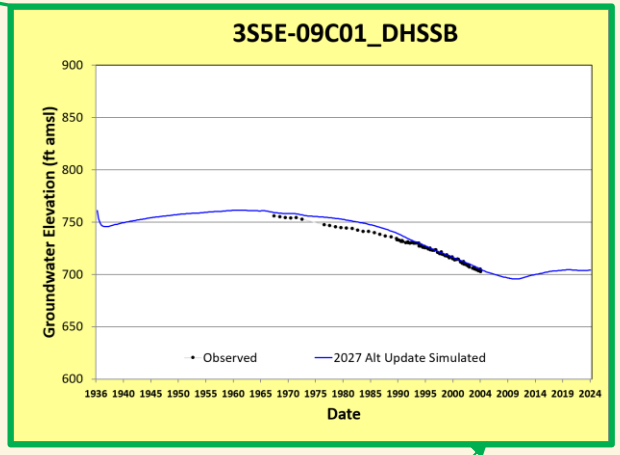






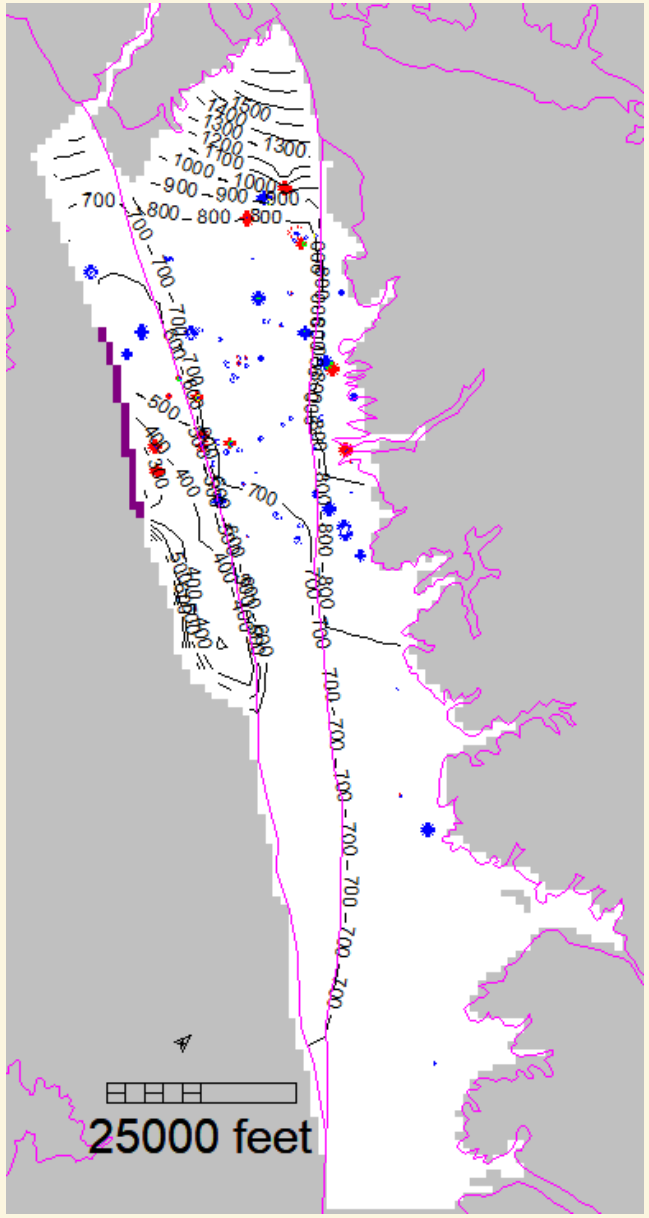
Mission Creek Subbasin Wells



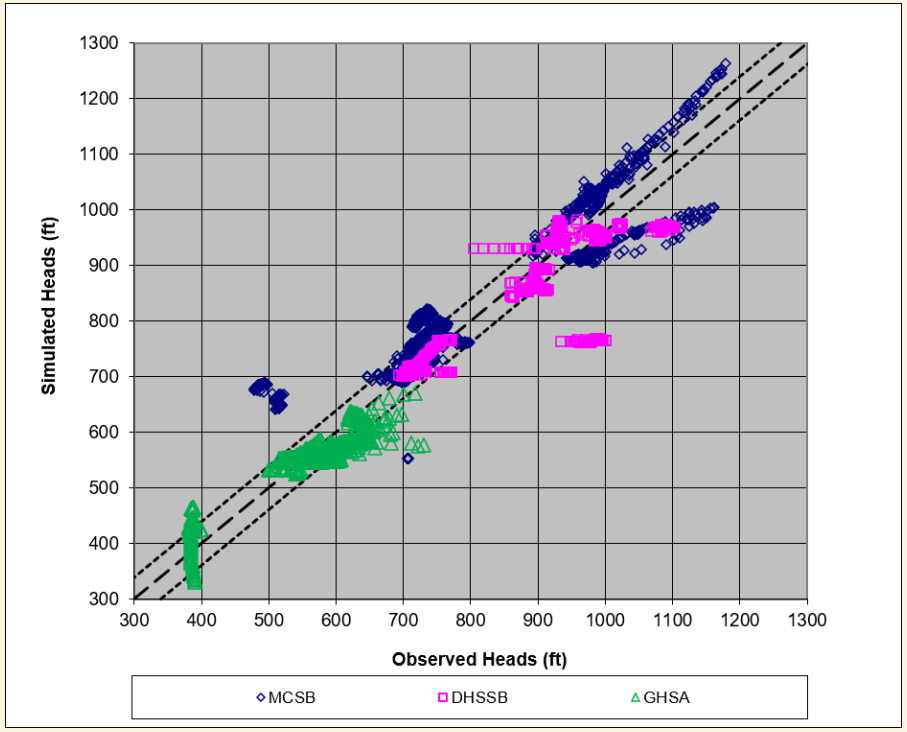


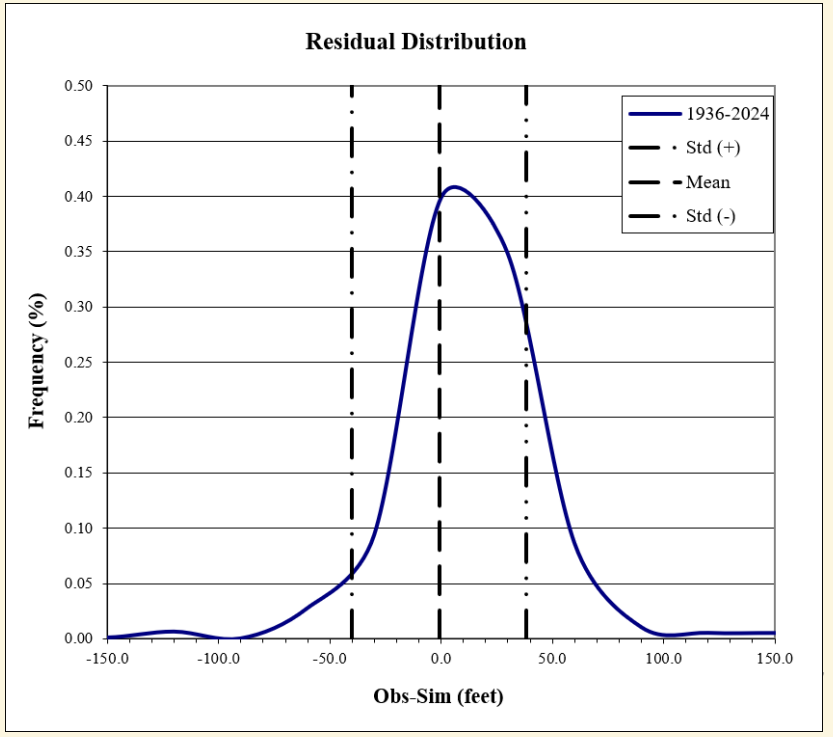
Desert Hot Springs Subbasin Wells

MCSB Groundwater Model – **Calibration Results**



- Refined the model calibration with data through 2024 and new Indio inputs.
- Calibrated to 8,566 observed WLE measurements across 64 wells.
- Scaled RMS error is 4.92 % (<10% which is considered a good fit).
- Observed vs Simulated values show most targets fall along the 45° line of equivalency.
- Some observation appear as outliers, are difficult to simulate.





Questions?

Next Steps

Stakeholder and Public Outreach

- **Workshops Planned to:**
  - Share results/findings
  - Receive input and feedback
  - Next Workshop Fall 2026

- **Public Comment on Reports:**
  - Draft report: 45 days to review
  - Final report: DWR to post for minimum 60 days public comment following January 1, 2027 Submittal

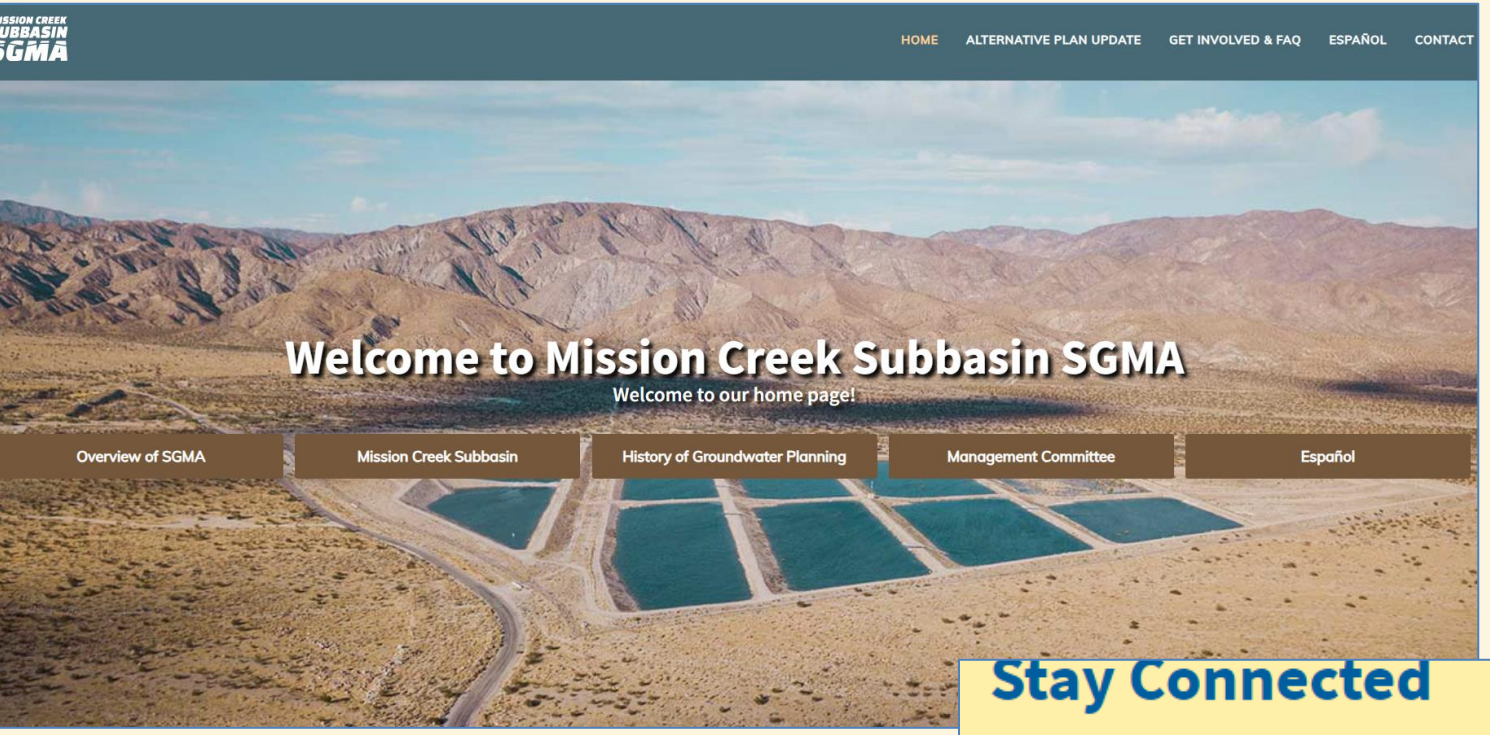
Topics for Workshop #3

Workshop #3 in Fall 2026

- Overview of the Draft Alternative Plan Update
- Share findings and conclusions
- Answer questions

Get Involved

www.missioncreeksubbasinsgma.org/get-involved-faq



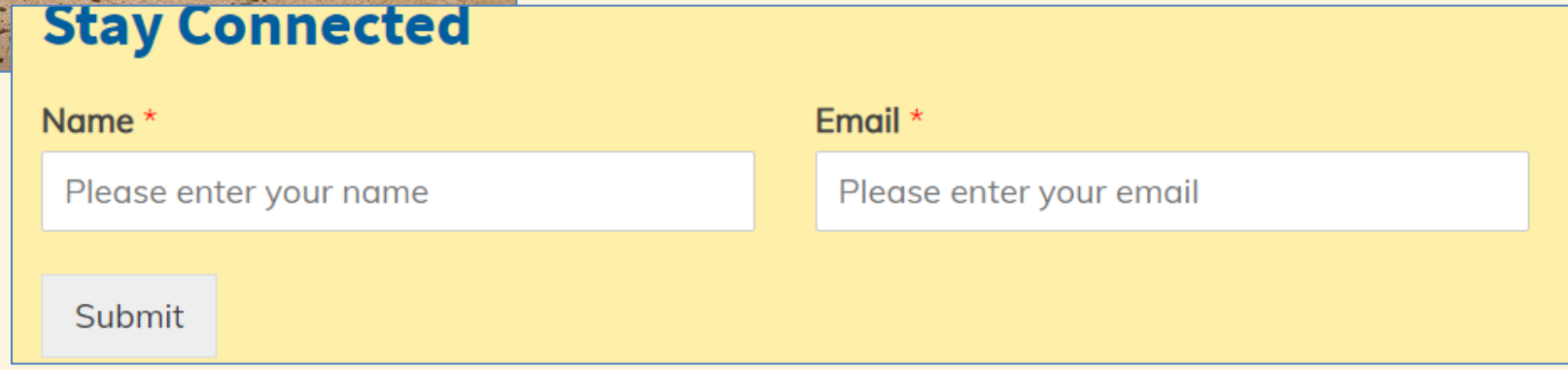
- **For additional information, please contact:**

  Rick Rees

  Principal Hydrogeologist, WSP

  richard.rees@wsp.com

info@missioncreeksubbasinsgma.org



Open Discussion

Questions?

Public Comment

Thanks for joining us!