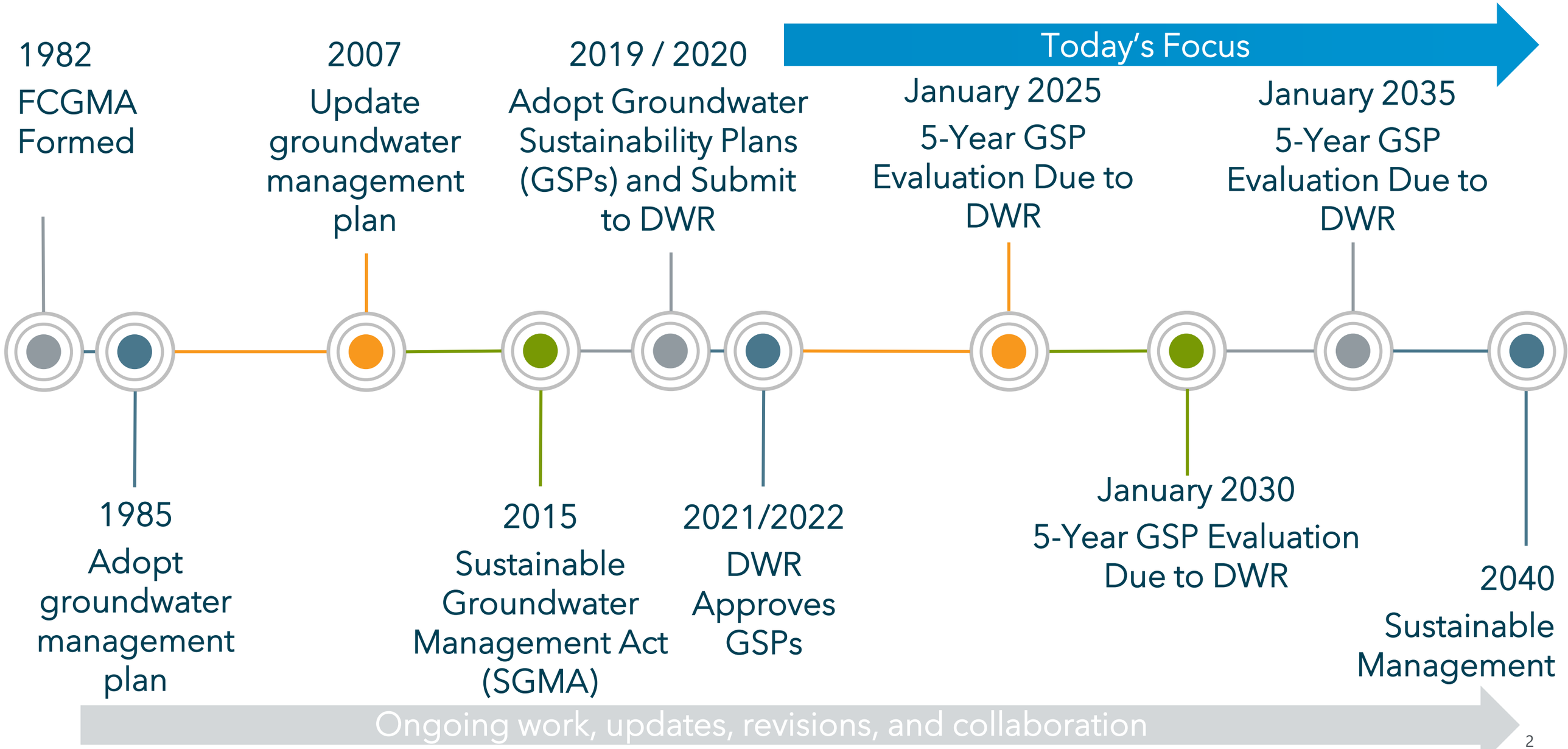
Fox Canyon Groundwater Management Agency

5-Year GSP Evaluation Kickoff Workshop

JILL WEINBERGER
DUDEK

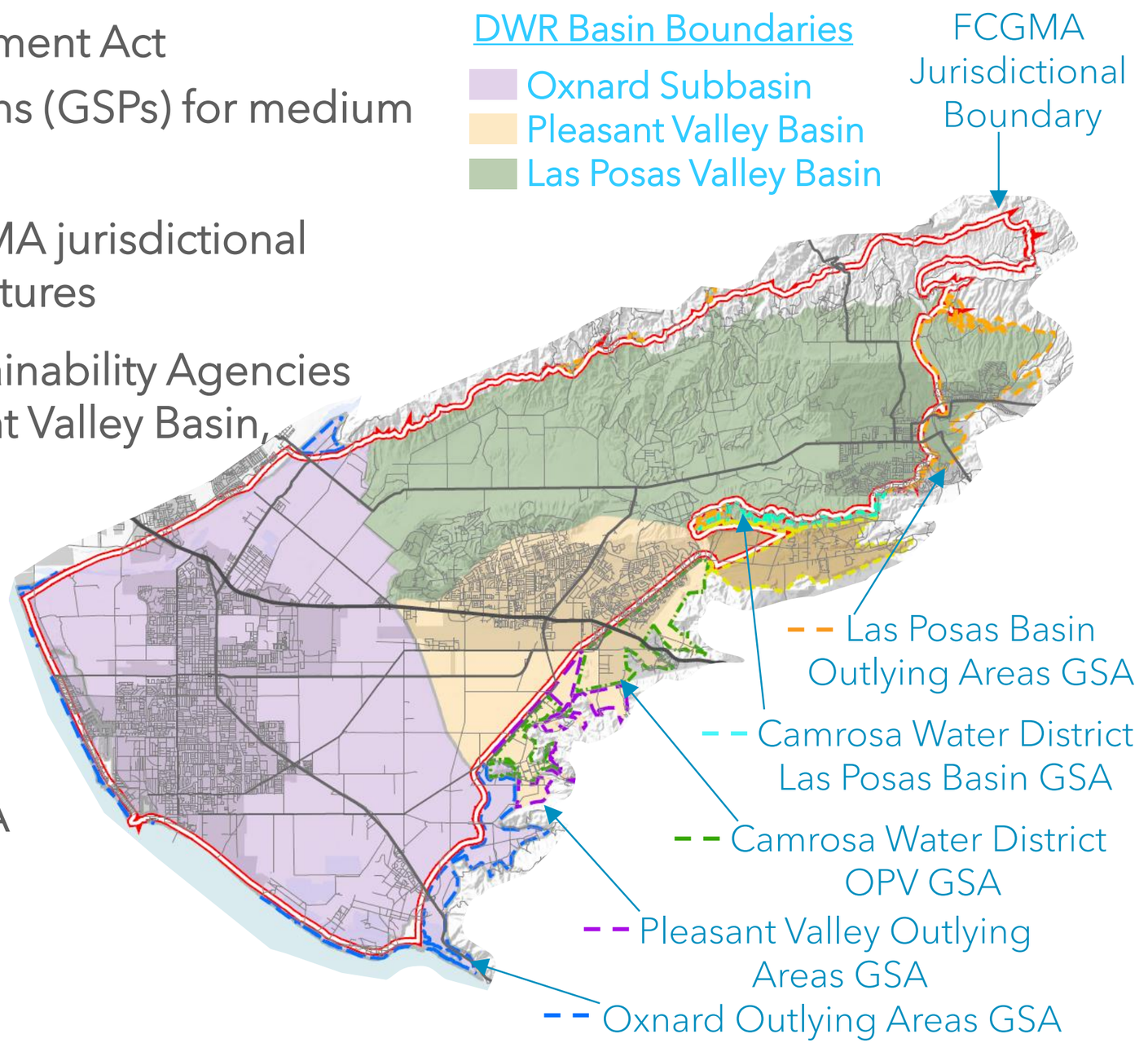
AUGUST 2023

Management Timeline



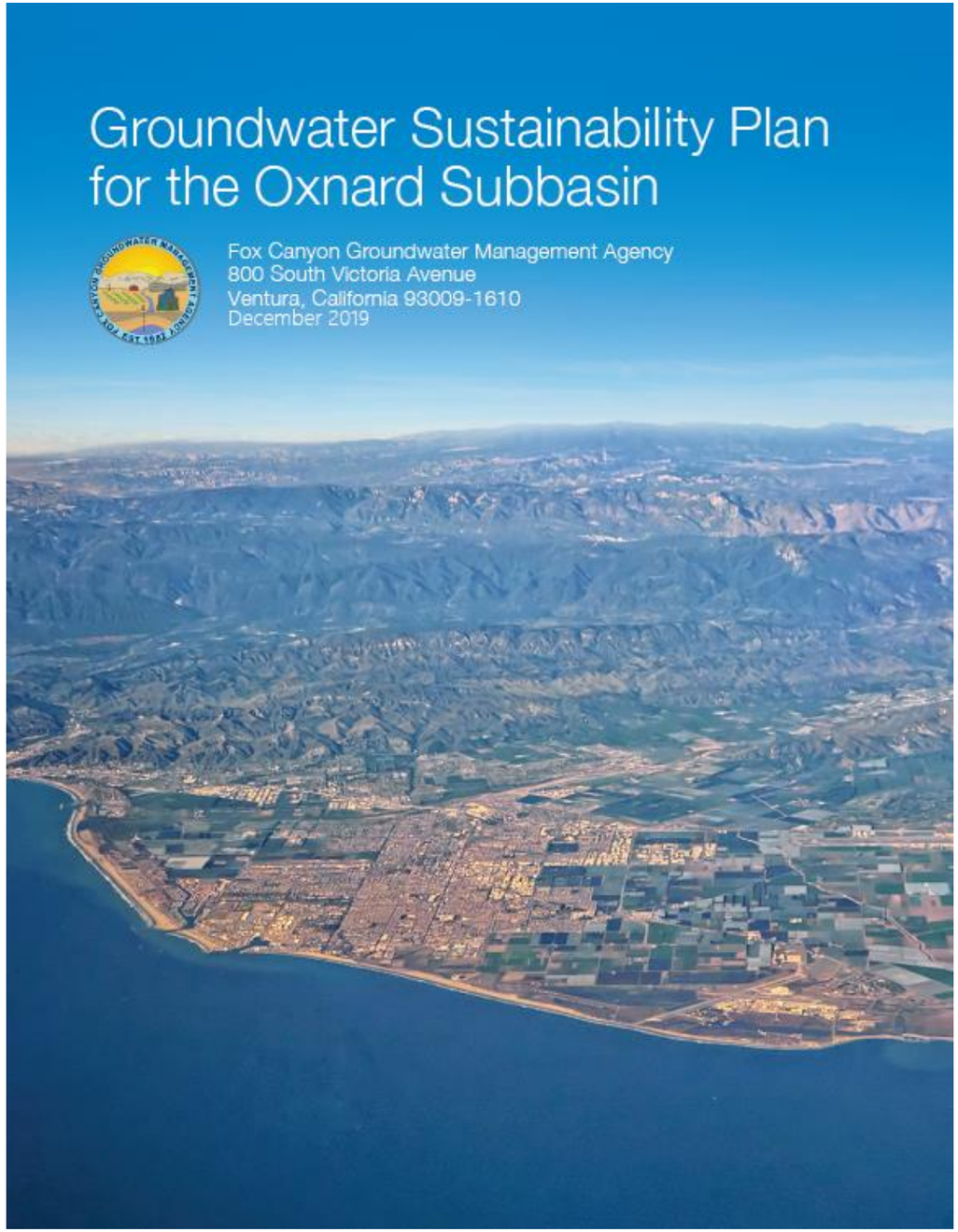
SGMA Background

- SGMA – Sustainable Groundwater Management Act
  - Requires Groundwater Sustainability Plans (GSPs) for medium and high priority basins
  - DWR basin boundaries differ from FCGMA jurisdictional boundaries and geologic subsurface features
  - FCGMA is one of six Groundwater Sustainability Agencies (GSAs) for the Oxnard Subbasin, Pleasant Valley Basin, and Las Posas Valley Basin
    - FCGMA
    - Oxnard / Pleasant Valley / Las Posas Valley Outlying Areas GSA
    - Camrosa Water District OPV GSA
    - Camrosa Water District Las Posas GSA
  - FCGMA prepared the GSPs for the Oxnard Subbasin, Pleasant Valley Basin, and Las Posas Valley Basin



What's in the GSP?

- Executive Summary
- Chapter 1 – Administrative Information
- Chapter 2 – Basin Setting
  - Hydrogeologic Conceptual Model
  - Groundwater Conditions
  - Water Budget – Current, Historical, Projected
  - Sustainable Yield Estimate
- Chapter 3 – Sustainable Management Criteria
  - Sustainability Goal
  - Undesirable Results
  - Minimum Thresholds
  - Measurable Objectives
- Chapter 4 – Monitoring Network
- Chapter 5 - Projects and Management Actions
- Technical Appendices



Undesirable Results - Oxnard

- Basin setting and conditions used to evaluate potential undesirable results

SUSTAINABILITY INDICATORS	UNDESIRABLE RESULT
 Groundwater Elevation	Groundwater elevations that result in net seawater intrusion over climate cycles of drought and recovery.
 Groundwater in Storage	Volume of groundwater produced exceeds the volume of freshwater recharge over cycles of drought and recovery
 Seawater Intrusion	Seawater intrusion that results in a net landward migration of the 2015 saline water impact front beyond the already impacted area west of Highway 1 and south of Hueneme Road after 2040
 Groundwater Quality	Net landward migration of the 2015 saline water impact front beyond the already impacted area west of Highway 1 and south of Hueneme Road after 2040
 Land Subsidence	Subsidence that substantially interferes with surface land uses
 Interconnected Surface Water and Groundwater	Loss of groundwater-dependent ecosystem (GDE) habitat

Undesirable Results – Pleasant Valley

SUSTAINABILITY INDICATORS	UNDESIRABLE RESULT
 Groundwater Elevation	• Groundwater levels do not recover to pre-drought conditions during multi-year periods of above-average precipitation • Groundwater levels prevent the Oxnard Subbasin from stopping 2015 saline water impact front beyond the already impacted area west of Highway 1 and south of Hueneme Road after 2040 • Brine migration is measurably increased
 Groundwater in Storage	Volume of groundwater produced exceeds the volume of freshwater recharge over cycles of drought and recovery
 Seawater Intrusion	Not applicable for direct seawater intrusion in Pleasant Valley
 Groundwater Quality	Groundwater gradient that causes expansion of the currently impacted areas
 Land Subsidence	Subsidence that substantially interferes with surface land uses
 Interconnected Surface Water and Groundwater	Loss of groundwater-dependent ecosystem (GDE) habitat

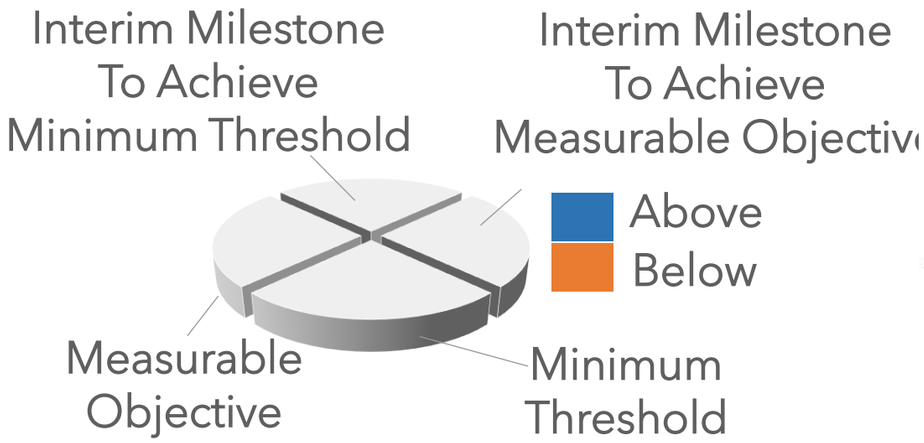
Undesirable Results – West Las Posas Management Area

SUSTAINABILITY INDICATORS	UNDESIRABLE RESULT
 Groundwater Elevation	• Groundwater levels do not recover to pre-drought conditions during multi-year periods of above-average precipitation • Groundwater levels prevent the Oxnard Subbasin from stopping 2015 saline water impact front beyond the already impacted area west of Highway 1 and south of Hueneme Road after 2040
 Groundwater in Storage	Volume of groundwater produced exceeds the volume of freshwater recharge over cycles of drought and recovery
 Seawater Intrusion	Not applicable for direct seawater intrusion in Las Posas Valley Basin
 Groundwater Quality	Groundwater gradient that causes expansion of the areas currently impacted by TDS, nitrate, sulfate, and boron
 Land Subsidence	Subsidence that substantially interferes with surface land uses
 Interconnected Surface Water and Groundwater	Loss of groundwater-dependent ecosystem (GDE) habitat* *NOTE – No GDEs were identified in the WLPMA

Undesirable Results – East Las Posas Management Area

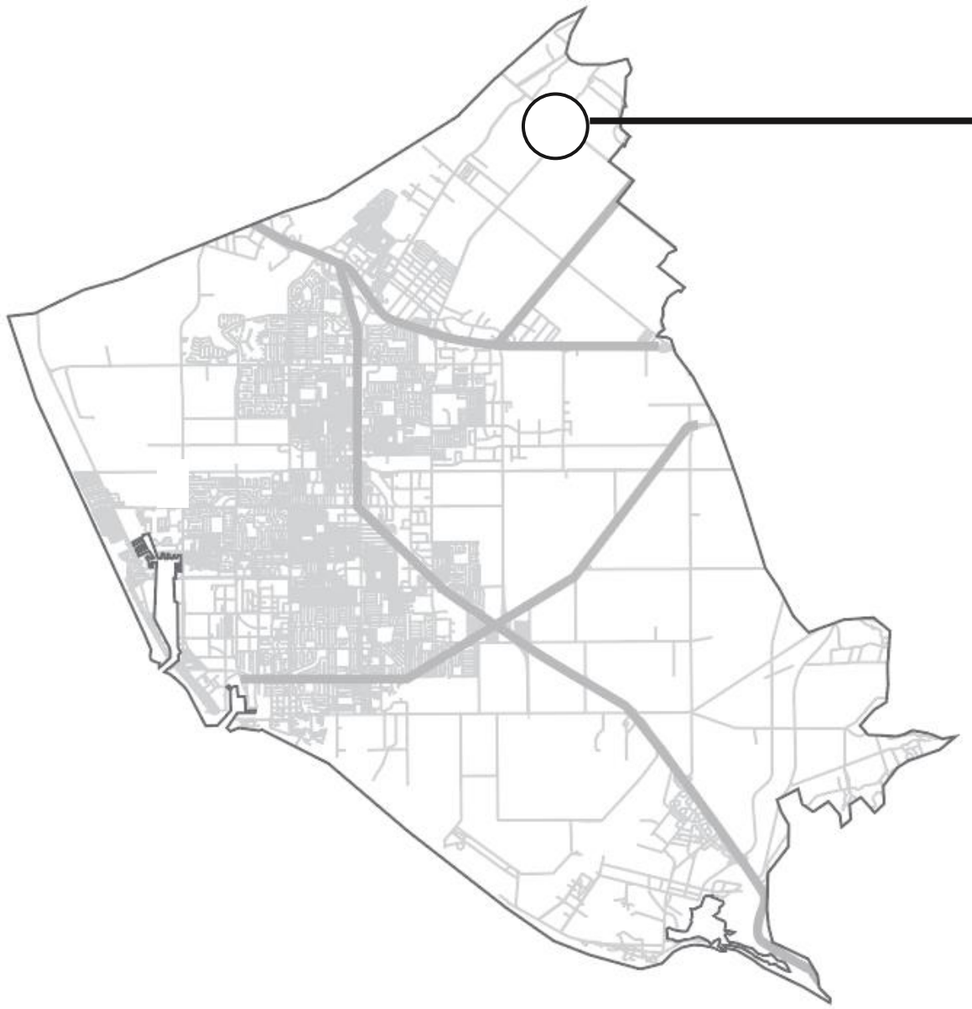
SUSTAINABILITY INDICATORS	UNDESIRABLE RESULT
 Groundwater Elevation	• Groundwater levels do not recover to pre-drought conditions during multi-year periods of above-average precipitation • Groundwater levels that indicate localized loss of storage in excess of 20% of the estimated 2015 groundwater storage
 Groundwater in Storage	Localized loss of storage in excess of 20% of the estimated 2015 groundwater storage
 Seawater Intrusion	Not applicable
 Groundwater Quality	Groundwater gradient that causes expansion of the areas currently impacted by TDS, nitrate, sulfate, and boron
 Land Subsidence	Subsidence that substantially interferes with surface land uses
 Interconnected Surface Water and Groundwater	Loss of groundwater-dependent ecosystem (GDE) habitat* *Arroyo Simi-Las Posas is a potential GDE, but vegetation is supported by surface water recharge not groundwater discharge

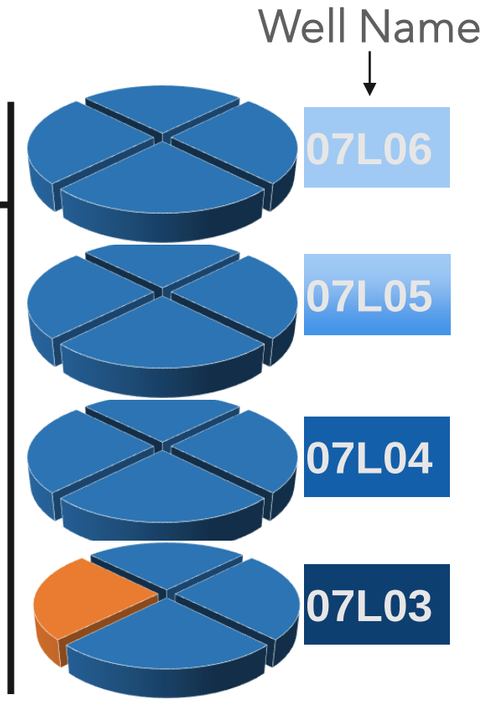
Oxnard 2023 Spring Groundwater Levels



AQUIFER

- Oxnard
- Mugu
- Hueneme
- Fox Canyon
- Grimes Canyon





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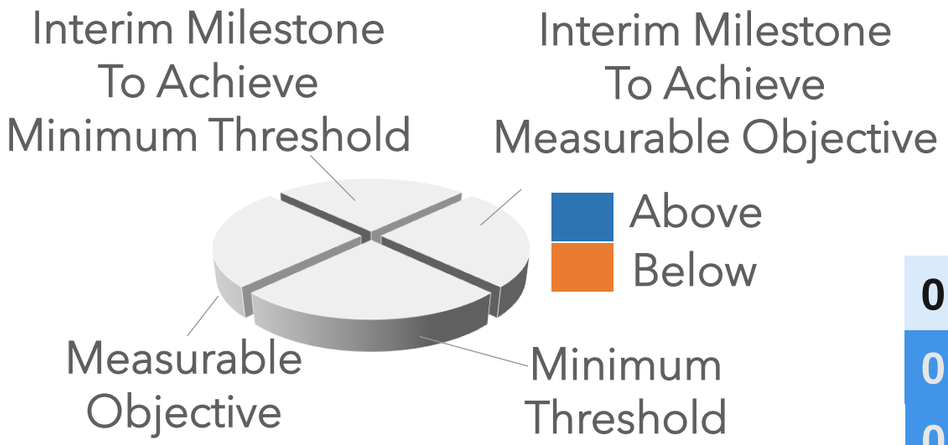

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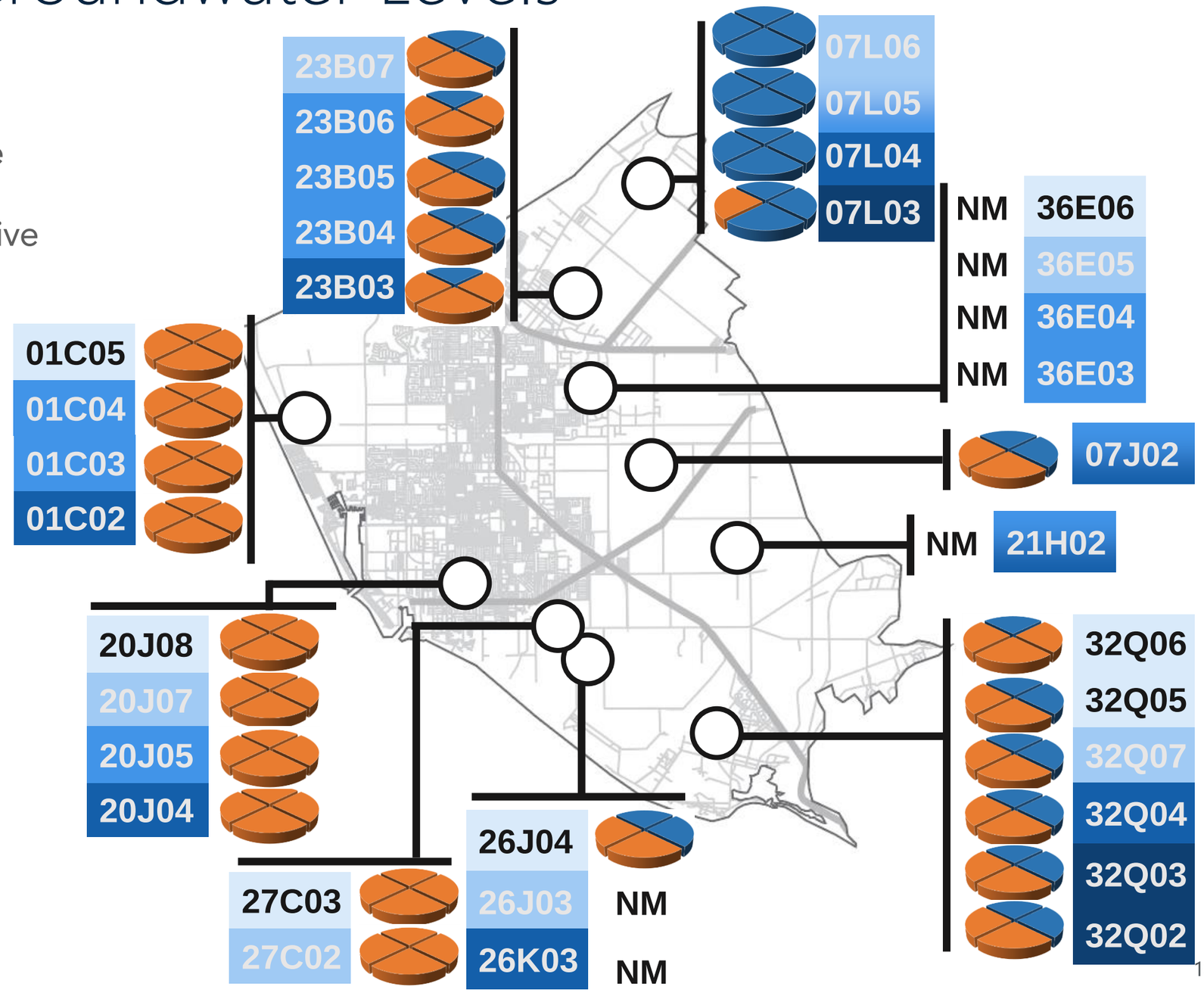
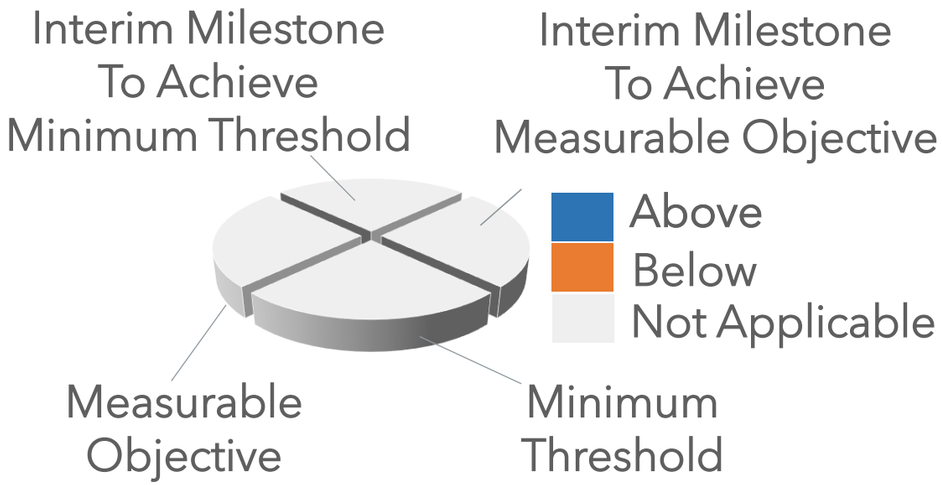
NM – Not Measured



Pleasant Valley 2023 Spring Groundwater Levels



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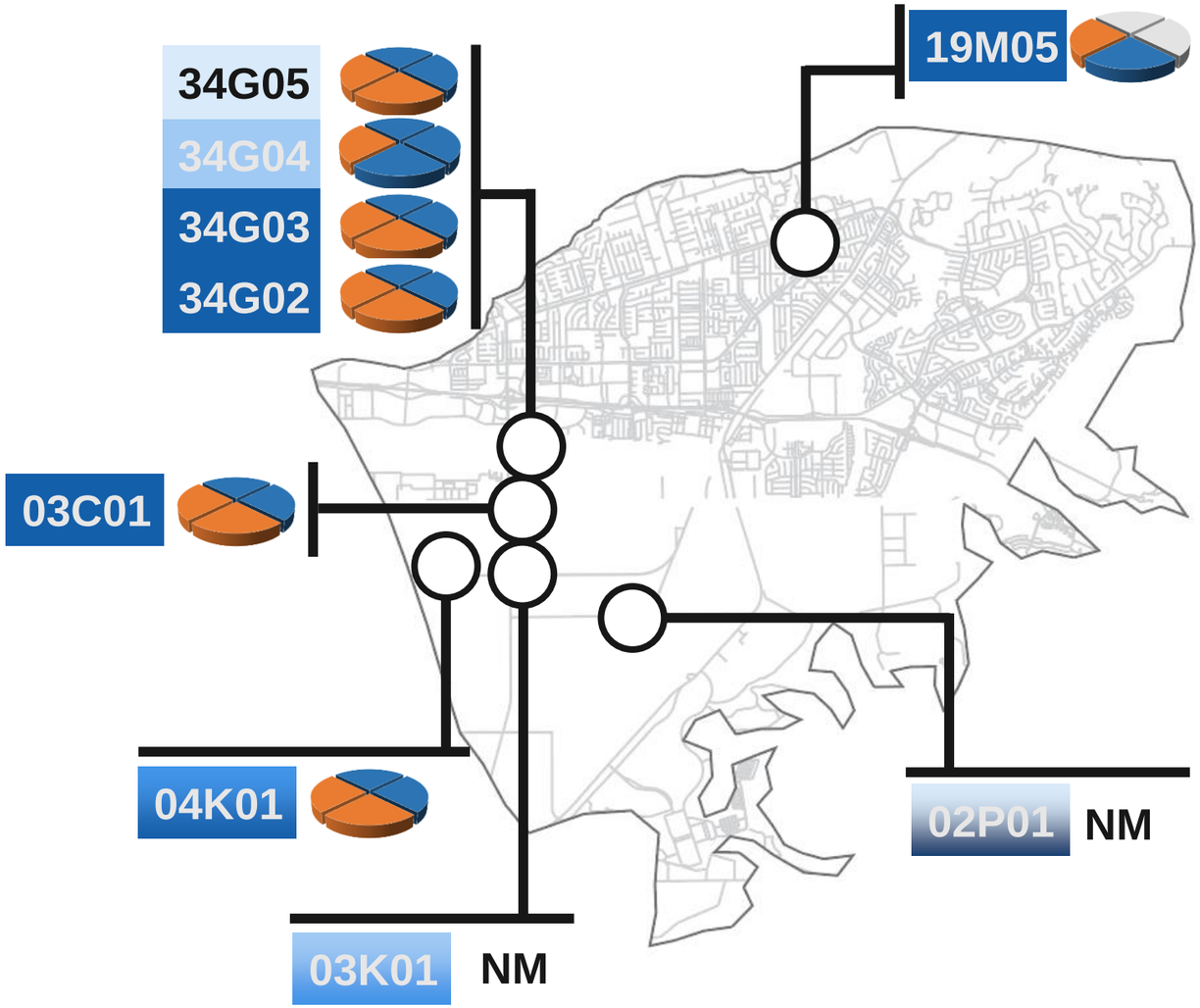

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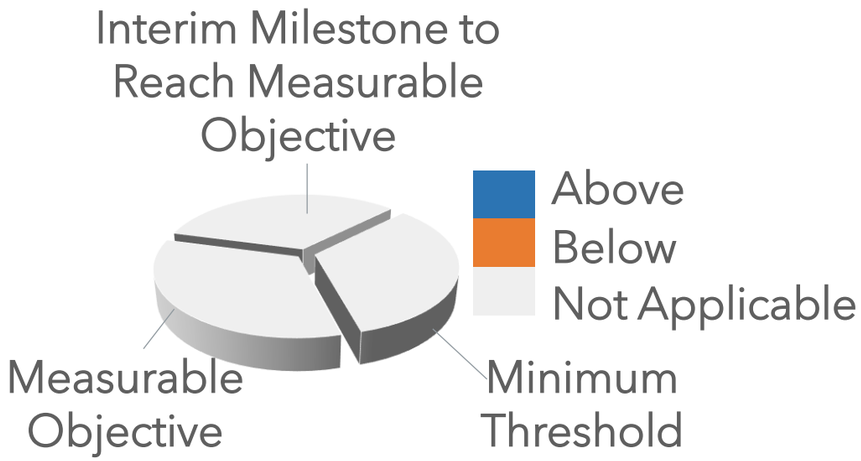
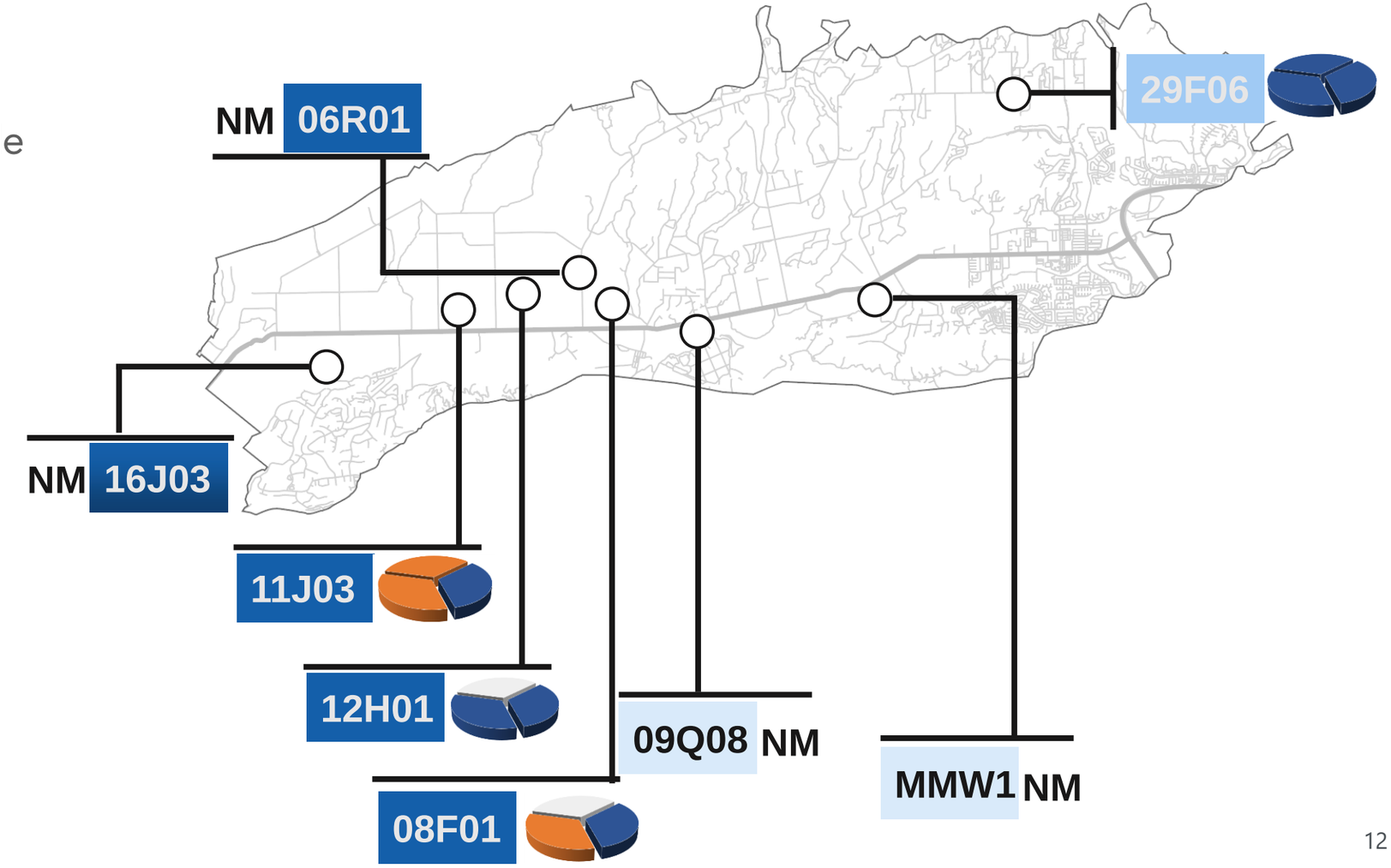
Las Posas Valley 2023 Spring Groundwater Levels



AQUIFER

- Shallow
- Epworth
- Upper San Pedro
- Fox Canyon
- Grimes Canyon



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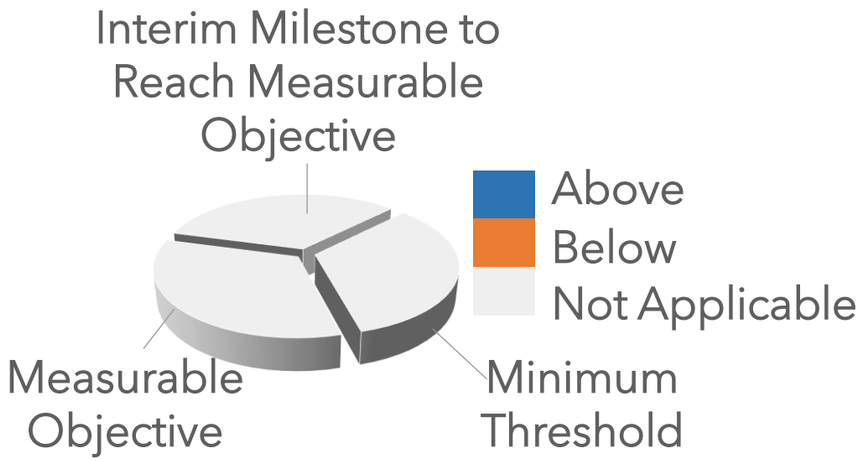
Las Posas Valley 2023 Spring Groundwater Levels



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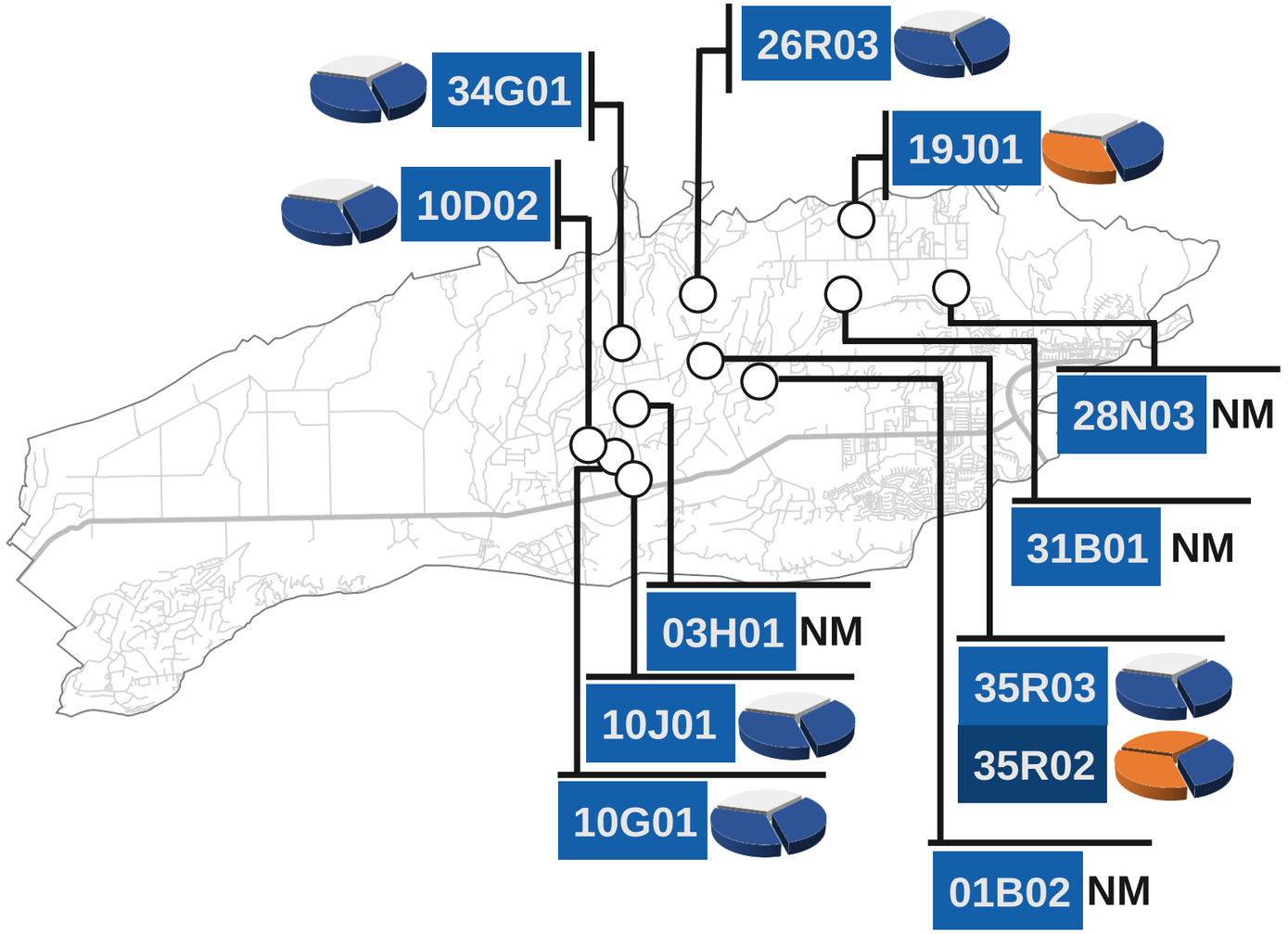

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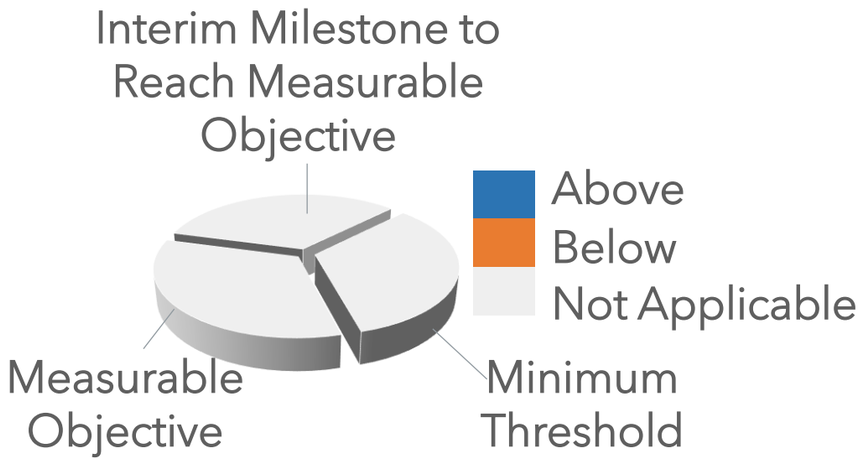

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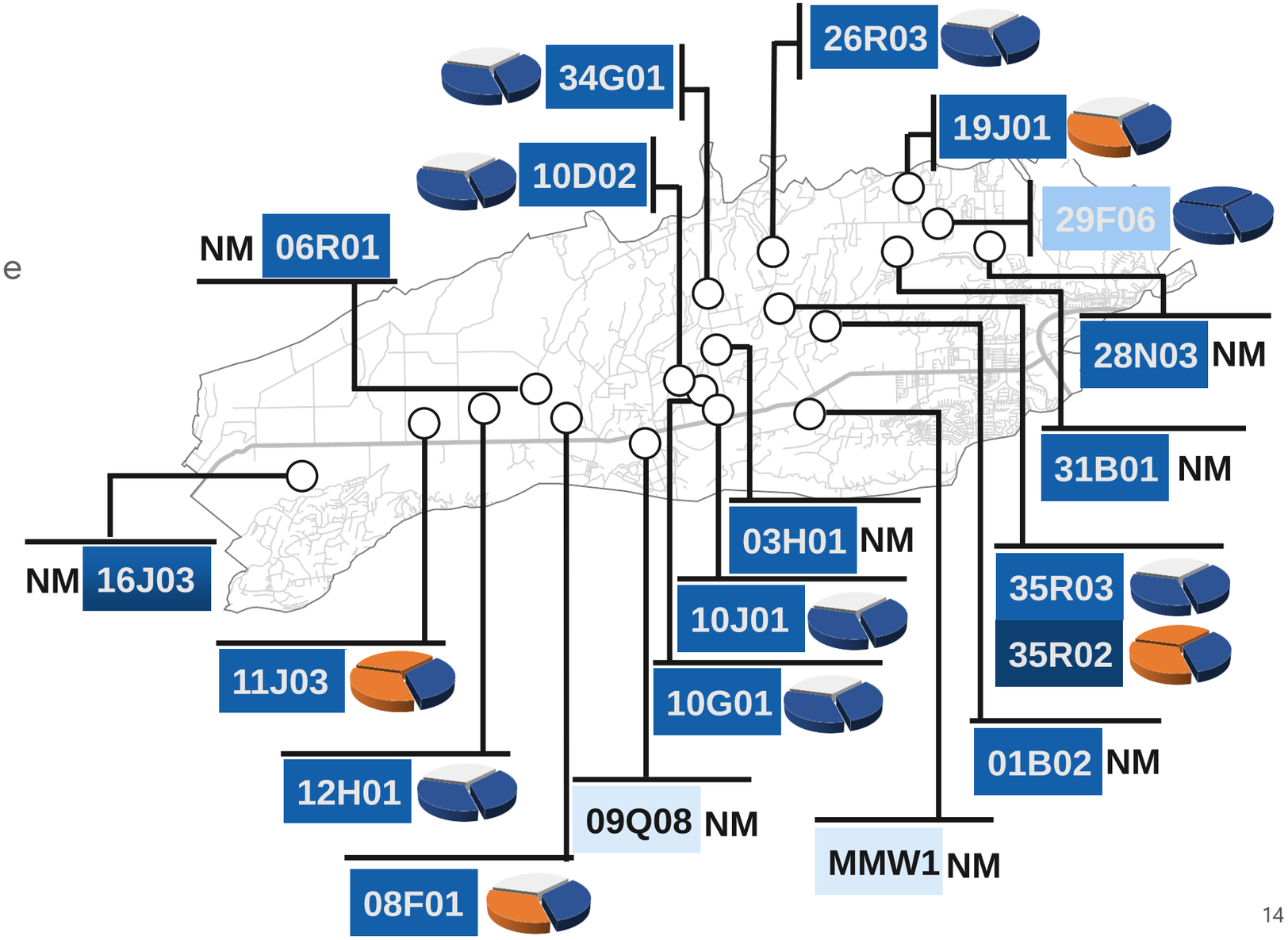


GSP Implementation: Projects

Oxnard

- 2022 Annual Report included list of 12 projects solicited from stakeholders
  - 8 projects evaluated for grant funding
  - 7 submitted for consideration
  - 5 received funding

Pleasant Valley

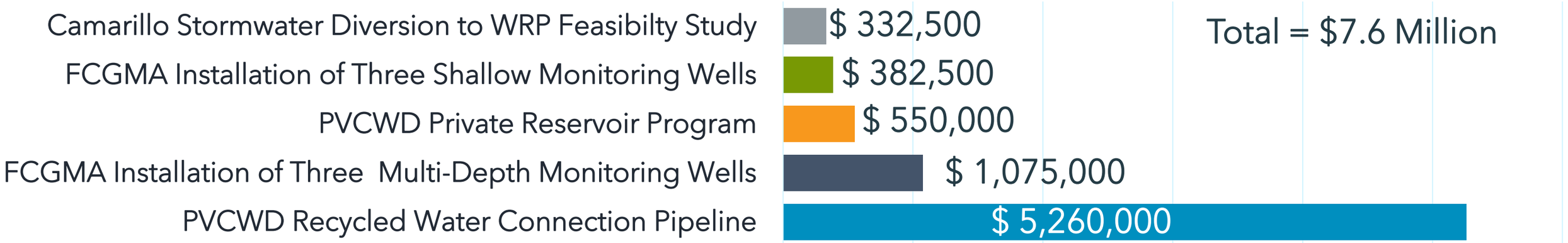
- 2022 Annual Report included list of 15 projects solicited from stakeholders
  - 11 projects evaluated for grant funding
  - 10 submitted for funding
  - 5 received funding

Las Posas Valley

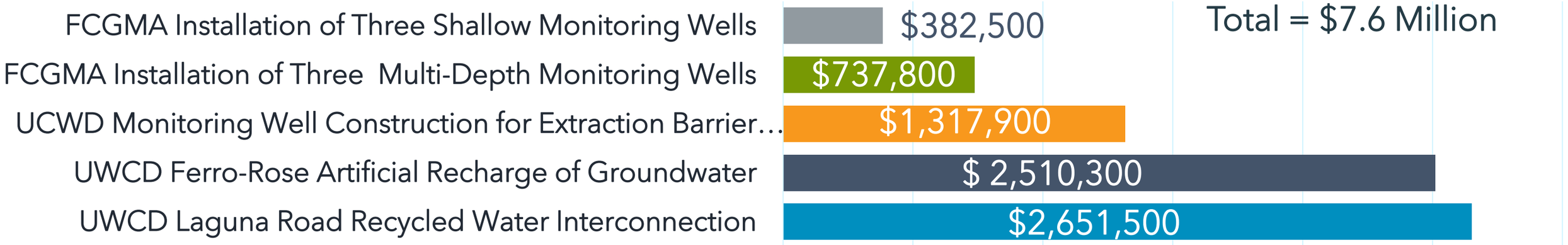
- 2022 Annual Report included list of 6 projects solicited from stakeholders
  - 6 projects evaluated for grant funding
  - 6 submitted for funding
  - No funding received

GSP Implementation: DWR SGM Grant Award

- PLEASANT VALLEY



- OXNARD

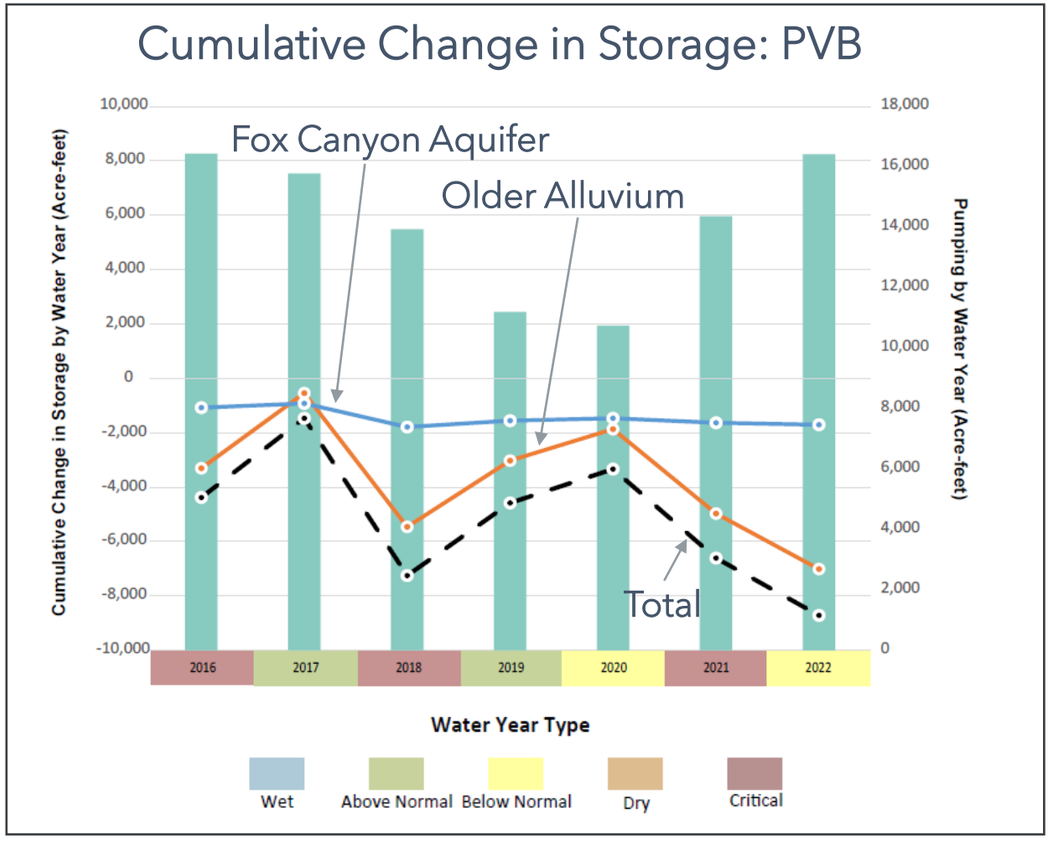


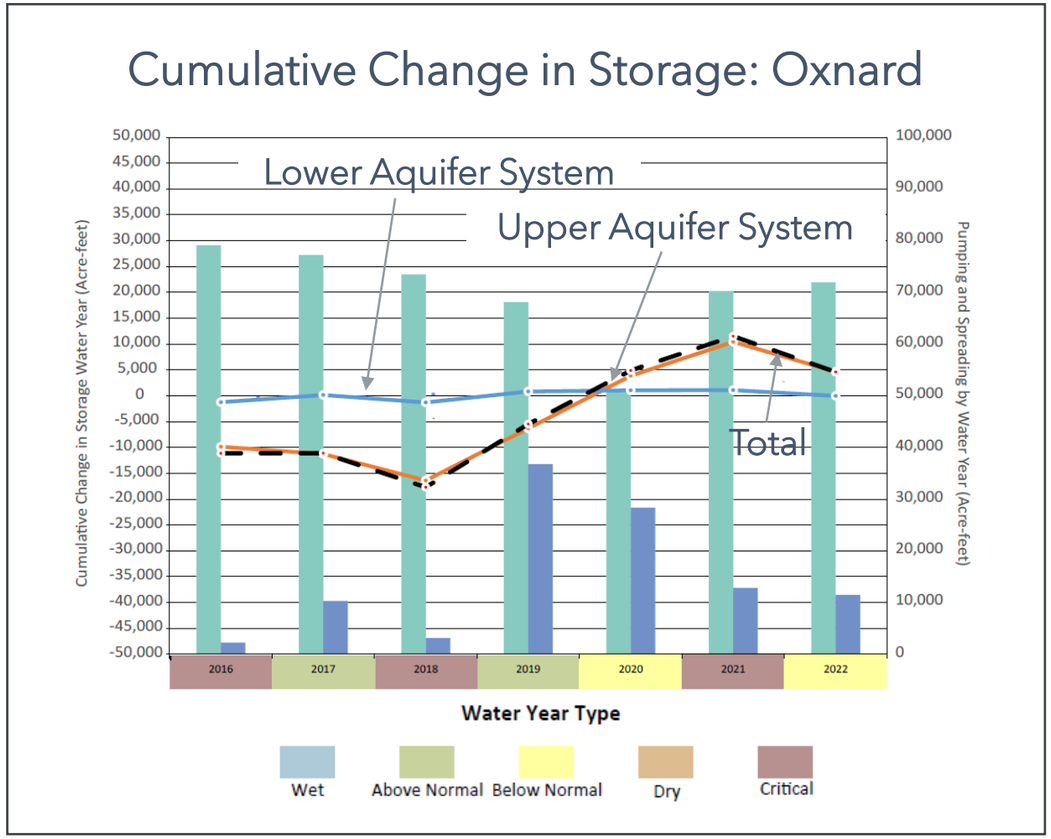
GSP Implementation: Management Actions and Planning

- Purchase of supplemental State Water Project Water in 2019 (before the GSP was submitted)
- Transition from calendar year to water year reporting
- Adoption of fixed-groundwater extraction allocation ordinances
- Updated data management system evaluation
- Evaluation of replenishment fee to fund projects
- Planning, scoping, and budgeting for the periodic evaluation of the GSPs
- Developed process and criteria for evaluating and ranking projects
  - Updated annually

GSP Implementation: Reporting

- Annual reporting: Groundwater Conditions
  - Elevations
  - Extractions
  - Change in Groundwater in Storage





- Annual reporting also includes:
  - Surface Water Supply
  - Total Water Available
  - GSP Implementation Progress
- Annual reports submitted for water years 2016 through 2022

GSP Implementation: Reporting

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  - Elevations
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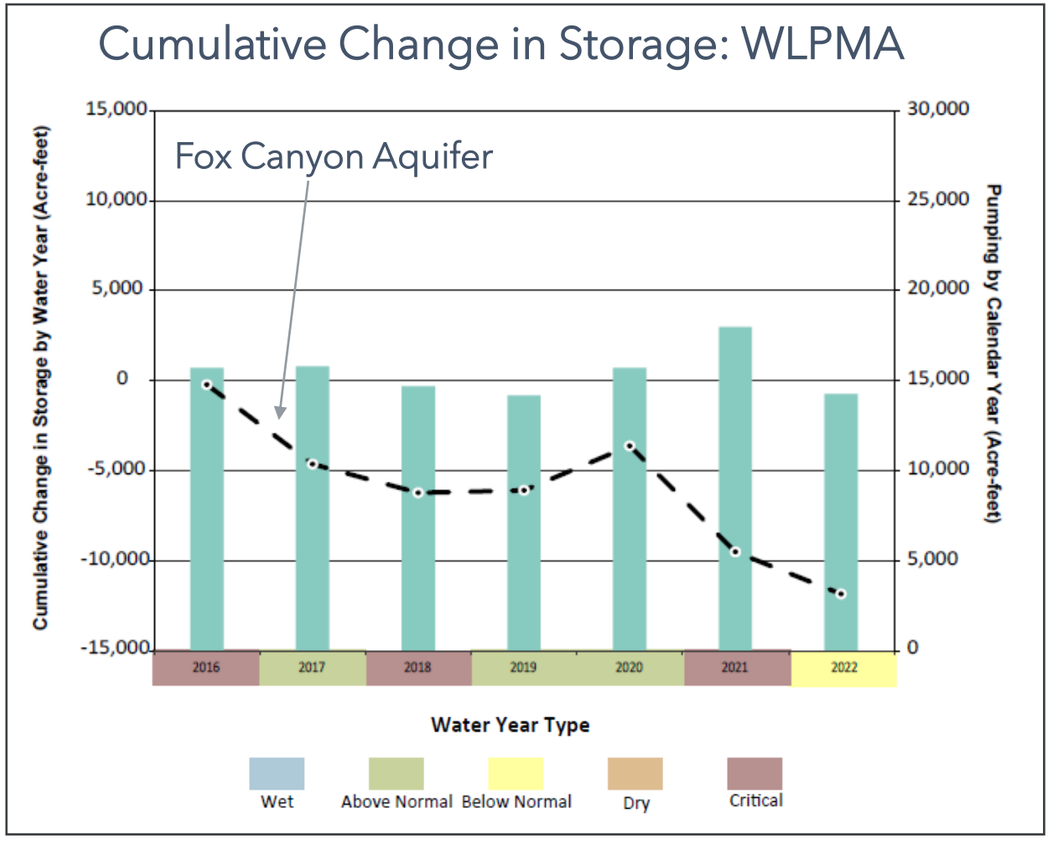
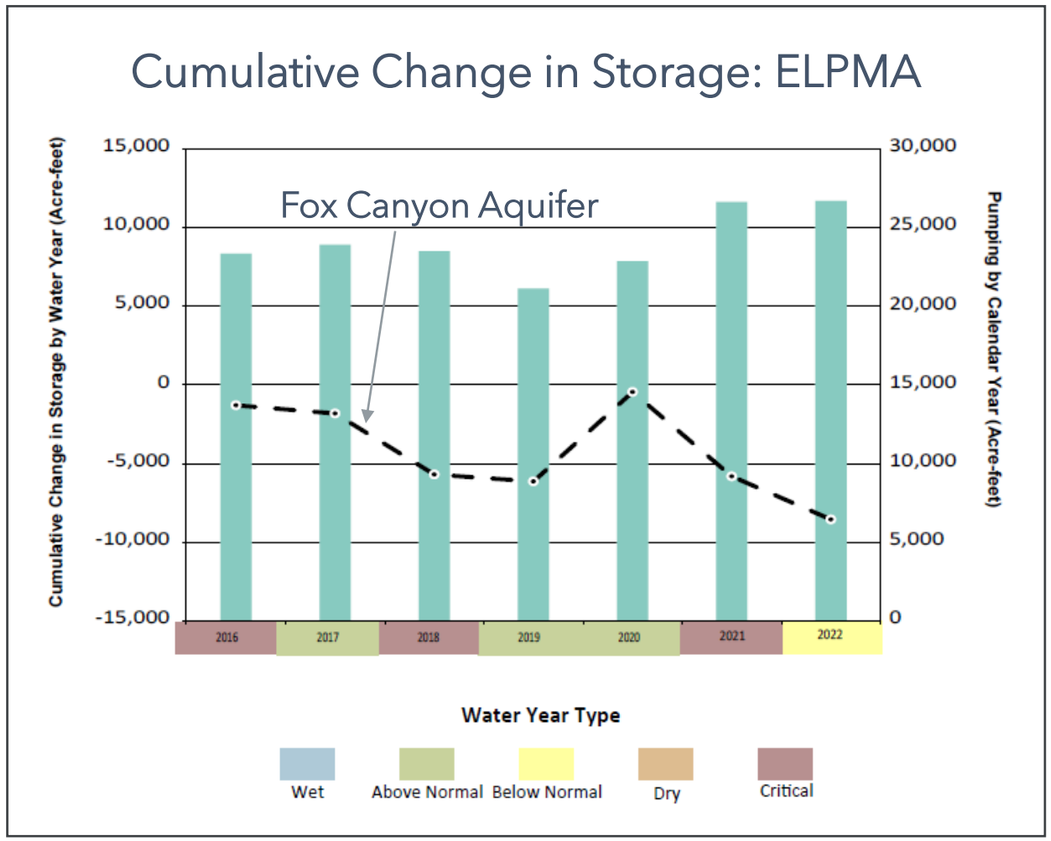
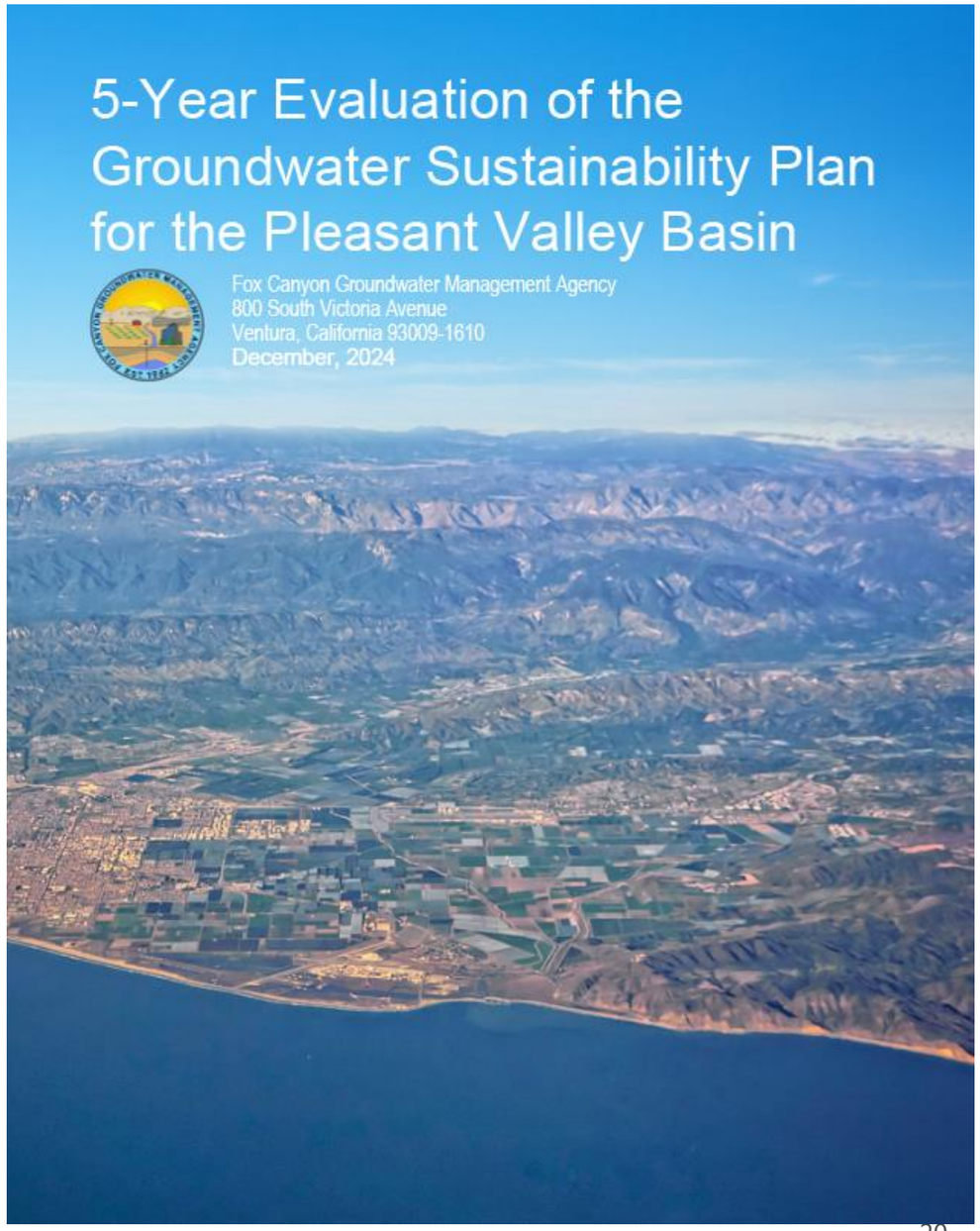




- Annual reporting also includes:
  - Surface Water Supply
  - Total Water Available
  - GSP Implementation Progress
- Annual reports submitted for water years 2016 through 2022

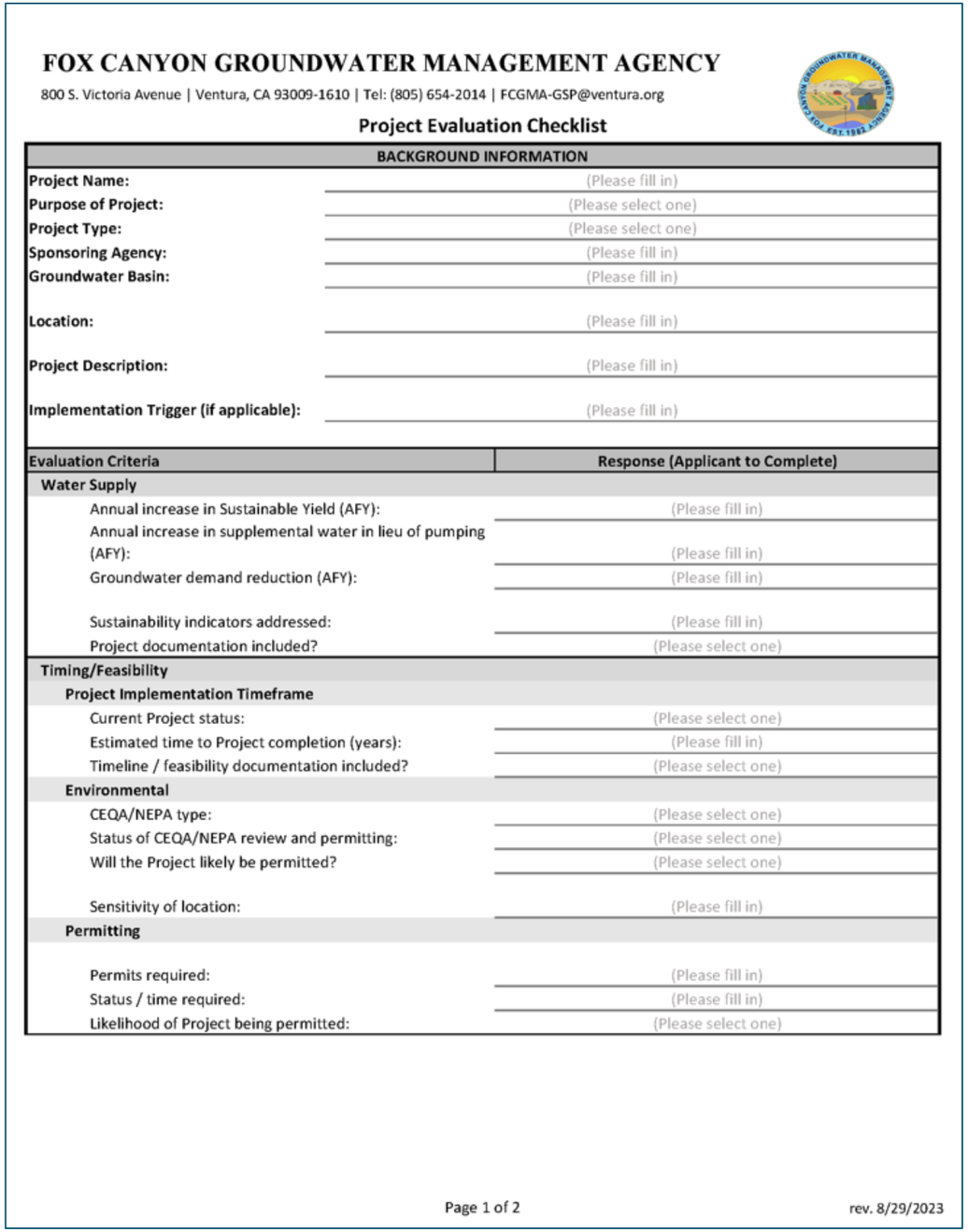
Re-evaluation: SGMA Content Requirements

- Plan Area and Background
- Current Groundwater Conditions for Each Applicable Sustainability Indicator
- GSP Implementation Progress
- Plan Element Review and Reconsideration
  - Basin Setting Evaluation with Significant New Information
  - Management Areas
  - Undesirable Results, Minimum Thresholds, Measurable Objectives
  - Monitoring Network Description and Data Gaps
- Actions Taken by FCGMA - Regulations and Ordinances
- Legal Actions, if taken
- Plan Amendments, if amended
- Coordination with Other Agencies in the Basin
- Any Other Appropriate Information



Re-evaluation: Projects

- Board adopted criteria for annual evaluation and ranking of projects
  - Additional projects can be submitted to the FCGMA for evaluation and inclusion in the GSP update process
  - Includes projects that were in the conceptual stage when the GSP was developed
- Projects must meet the feasibility criteria in the GSP regulations to be included in an analysis of the future sustainable yield



FOX CANYON GROUNDWATER MANAGEMENT AGENCY

800 S. Victoria Avenue | Ventura, CA 93009-1610 | Tel: (805) 654-2014 | FCGMA-GSP@ventura.org

Project Evaluation Checklist

BACKGROUND INFORMATION	
Project Name:	(Please fill in)
Purpose of Project:	(Please select one)
Project Type:	(Please select one)
Sponsoring Agency:	(Please fill in)
Groundwater Basin:	(Please fill in)
Location:	(Please fill in)
Project Description:	(Please fill in)
Implementation Trigger (if applicable):	(Please fill in)

Evaluation Criteria	Response (Applicant to Complete)
Water Supply	
Annual increase in Sustainable Yield (AFY):	(Please fill in)
Annual increase in supplemental water in lieu of pumping (AFY):	(Please fill in)
Groundwater demand reduction (AFY):	(Please fill in)
Sustainability indicators addressed:	(Please fill in)
Project documentation included?	(Please select one)
Timing/Feasibility	
Project Implementation Timeframe	
Current Project status:	(Please select one)
Estimated time to Project completion (years):	(Please fill in)
Timeline / feasibility documentation included?	(Please select one)
Environmental	
CEQA/NEPA type:	(Please select one)
Status of CEQA/NEPA review and permitting:	(Please select one)
Will the Project likely be permitted?	(Please select one)
Sensitivity of location:	(Please fill in)
Permitting	
Permits required:	(Please fill in)
Status / time required:	(Please fill in)
Likelihood of Project being permitted:	(Please select one)

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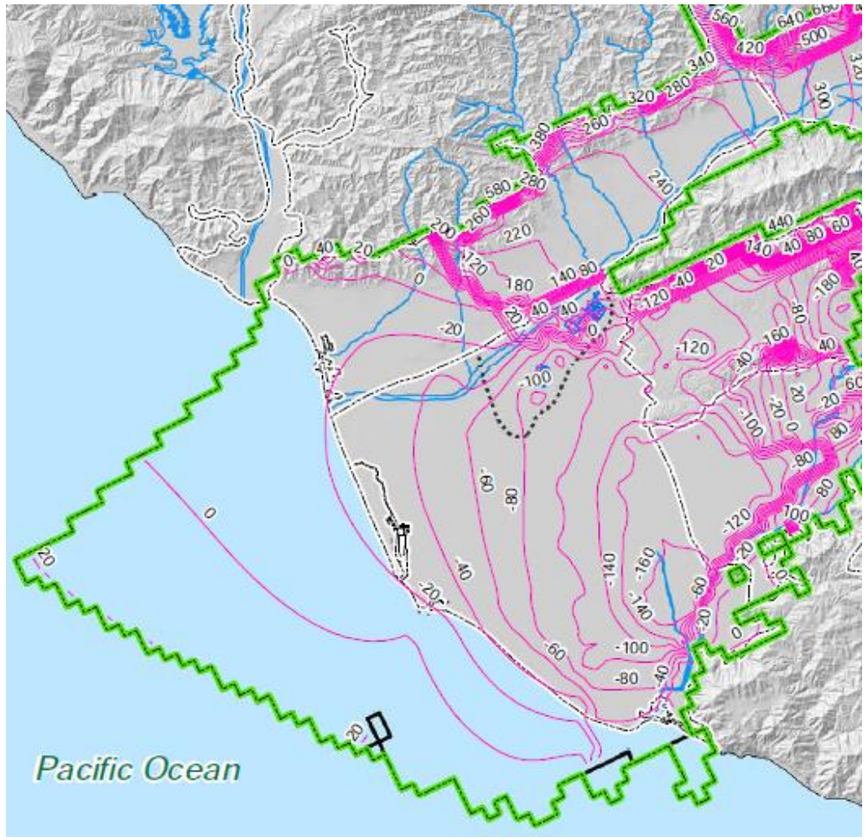
rev. 8/29/2023

Re-evaluation: Numerical Groundwater Modeling

- Develop model scenarios to review the impact of projects and management actions on groundwater conditions
  - Model scenarios
    - Future Baseline
    - Evaluation of pumping reductions if projects are not implemented
    - One or more scenarios with projects being implemented
    - Incorporate climate change and sea level rise
- Modeled groundwater conditions will assist with the reevaluation of the sustainable yield and sustainable management criteria



Re-evaluation: DWR Recommended Corrective Actions

- Oxnard
  - Investigate the hydraulic connectivity between surface water bodies and the principal aquifers
  - Discuss the impact of further seawater intrusion and associated loss of storage on beneficial uses and users under a dry climatic condition scenario
  - Incorporate periodic subsidence monitoring
  - Elaborate on how the groundwater level thresholds are adequate to assess the groundwater quality conditions in the Subbasin

CALIFORNIA DEPARTMENT OF WATER RESOURCES
SUSTAINABLE GROUNDWATER MANAGEMENT OFFICE
901 P Street, Room 313-B | Sacramento, CA 95814 | P.O. Box 942836 | Sacramento, CA 94236-0001

November 18, 2021

Kimball Loeb, Plan Manager
Fox Canyon Groundwater Management Agency
800 South Victoria Avenue
Ventura, CA 93009
kim.loeb@ventura.org

RE: Oxnard Subbasin – 2020 Groundwater Sustainability Plan

Dear Kimball Loeb,

The Department of Water Resources (Department) has evaluated the groundwater sustainability plan (GSP) submitted for the Oxnard Subbasin and has determined the GSP is approved. The approval is based on recommendations from the Staff Report, included as an exhibit to the attached Statement of Findings, which describes that the Oxnard Subbasin GSP satisfies the objectives of the Sustainable Groundwater Management Act (SGMA) and substantially complies with the GSP Regulations. The Staff Report also proposes recommended corrective actions that the Department believes will enhance the GSP and facilitate future evaluation by the Department. The Department strongly encourages the recommended corrective actions be given due consideration and suggests incorporating all resulting changes to the GSP in future updates.

Recognizing SGMA sets a long-term horizon for groundwater sustainability agencies (GSAs) to achieve their basin's sustainability goals, monitoring progress is fundamental for successful implementation. GSAs are required to evaluate their GSPs at least every five years and whenever the Plan is amended, and to provide a written assessment to the Department. Accordingly, the Department will evaluate approved GSPs and issue an assessment at least every five years. The Department will initiate the first five-year review of the Oxnard Subbasin GSP no later than January 13, 2025.

Please contact Sustainable Groundwater Management Office staff by emailing sgmps@water.ca.gov if you have any questions about the Department's assessment or implementation of your GSP.

Re-evaluation: DWR Recommended Corrective Actions

- Pleasant Valley
  - Investigate the groundwater conditions of the Grimes Canyon Aquifer
  - Investigate the hydraulic connectivity between surface water bodies and the principal aquifers
  - Evaluate how the sustainability goals for the dry climatic condition may affect the Oxnard Subbasin
  - Elaborate on how the groundwater level thresholds are adequate to assess the groundwater quality conditions in the Subbasin
  - Incorporate periodic subsidence monitoring

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November 18, 2021

Kimball Loeb, Plan Manager
Fox Canyon Groundwater Management Agency
800 South Victoria Avenue
Ventura, CA 93003
kim.loeb@ventura.org

RE: Pleasant Valley Basin – 2020 Groundwater Sustainability Plan

Dear Kimball Loeb,

The Department of Water Resources (Department) has evaluated the groundwater sustainability plan (GSP) submitted for the Pleasant Valley Basin and has determined the GSP is approved. The approval is based on recommendations from the Staff Report, included as an exhibit to the attached Statement of Findings, which describes that the Pleasant Valley Basin GSP satisfies the objectives of the Sustainable Groundwater Management Act (SGMA) and substantially complies with the GSP Regulations. The Staff Report also proposes recommended corrective actions that the Department believes will enhance the GSP and facilitate future evaluation by the Department. The Department strongly encourages the recommended corrective actions be given due consideration and suggests incorporating all resulting changes to the GSP in future updates.

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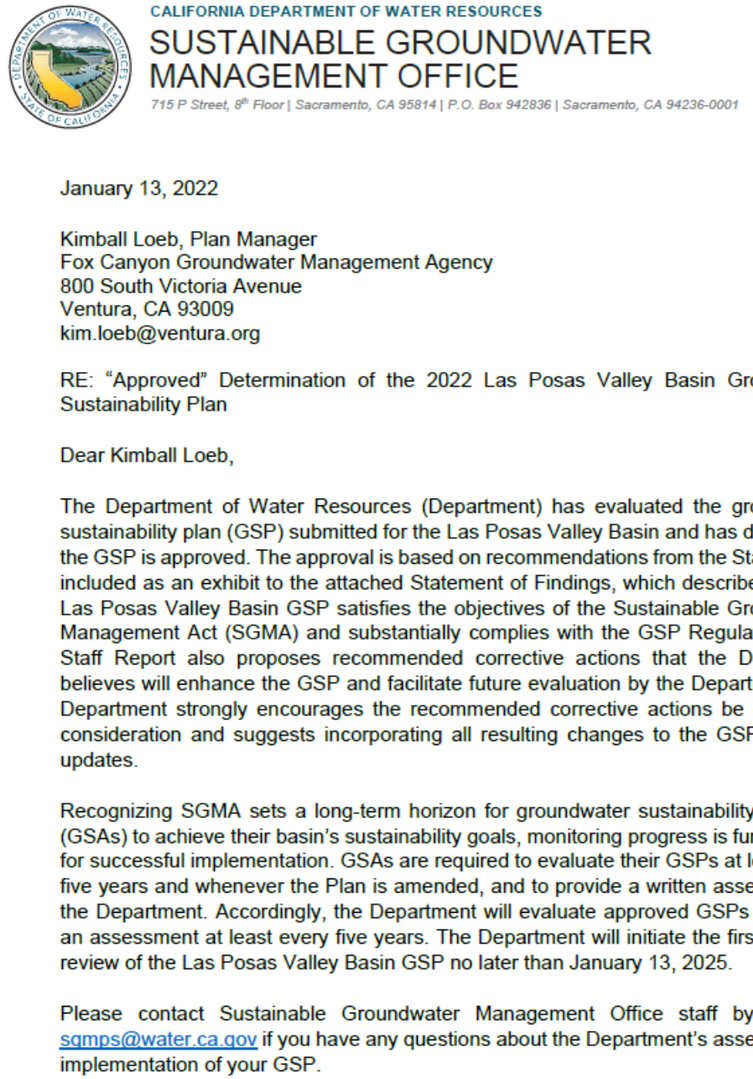
Re-evaluation: DWR Recommended Corrective Actions

- Las Posas Valley
  - Investigate the hydraulic connectivity of Arroyo Simi-Las Posas shallow aquifers and the principal aquifers to understand the water budget for the potential GDEs
  - Discuss the potential impacts of the minimum thresholds and measurable objectives on beneficial uses and users of groundwater is areas where levels will be maintained below 2015 water levels
  - Evaluate the connection between groundwater production and groundwater quality
  - Incorporate periodic subsidence monitoring
  - Develop a new project or management action to address how the Basin will achieve its sustainability goal if imported water is unavailable to use in lieu of groundwater production in the WLPMA



CALIFORNIA DEPARTMENT OF WATER RESOURCES
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715 P Street, 8th Floor | Sacramento, CA 95814 | P.O. Box 942836 | Sacramento, CA 94236-0001

January 13, 2022

Kimball Loeb, Plan Manager
Fox Canyon Groundwater Management Agency
800 South Victoria Avenue
Ventura, CA 93009
kim.loeb@ventura.org

RE: "Approved" Determination of the 2022 Las Posas Valley Basin Groundwater Sustainability Plan

Dear Kimball Loeb,

The Department of Water Resources (Department) has evaluated the groundwater sustainability plan (GSP) submitted for the Las Posas Valley Basin and has determined the GSP is approved. The approval is based on recommendations from the Staff Report, included as an exhibit to the attached Statement of Findings, which describes that the Las Posas Valley Basin GSP satisfies the objectives of the Sustainable Groundwater Management Act (SGMA) and substantially complies with the GSP Regulations. The Staff Report also proposes recommended corrective actions that the Department believes will enhance the GSP and facilitate future evaluation by the Department. The Department strongly encourages the recommended corrective actions be given due consideration and suggests incorporating all resulting changes to the GSP in future updates.

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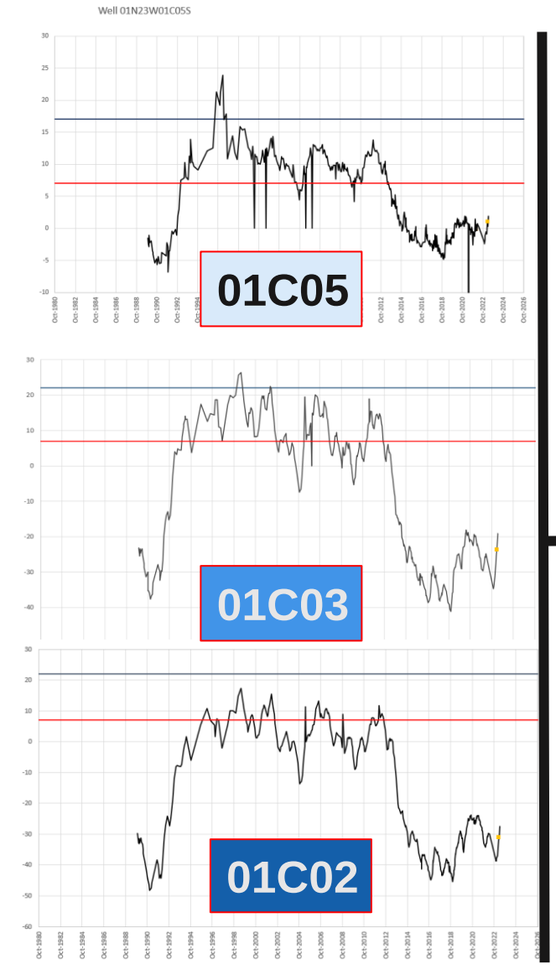
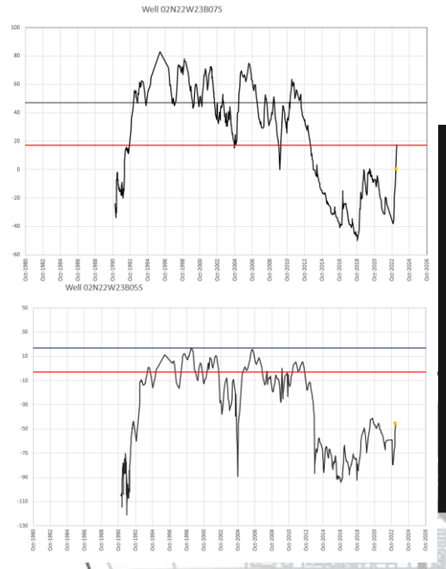
5-Year Evaluation Process: Stakeholder Involvement

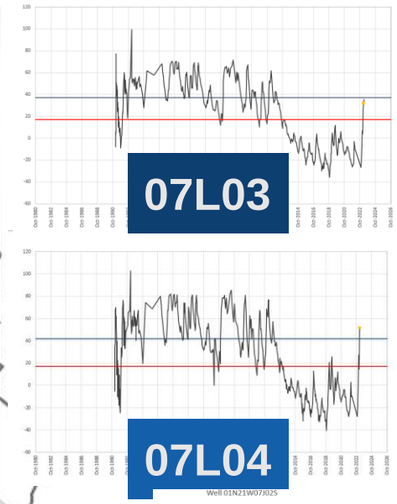
Questions & Answers

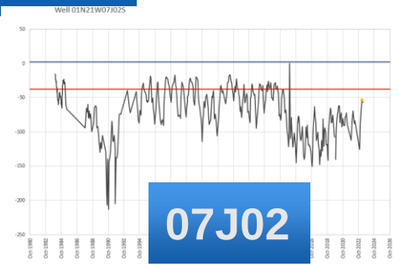
Optional Info

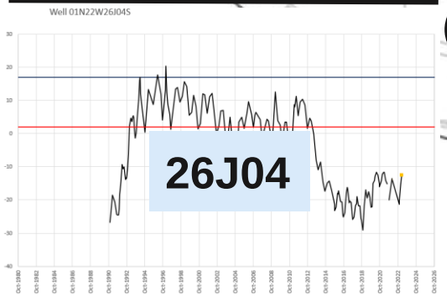
Oxnard Select Hydrographs

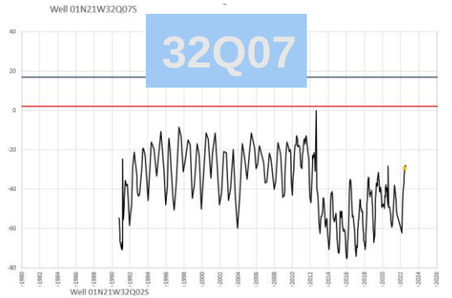


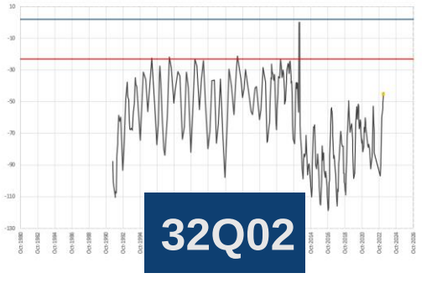




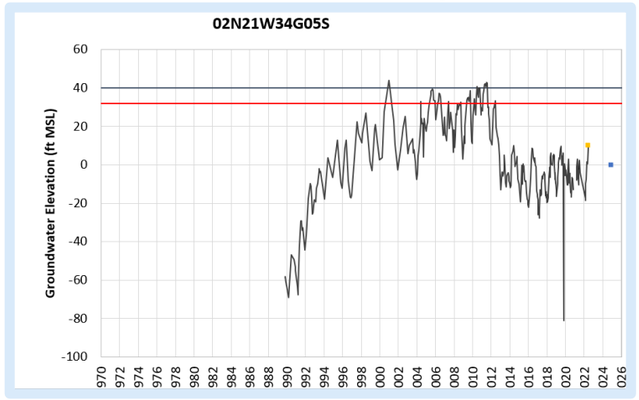


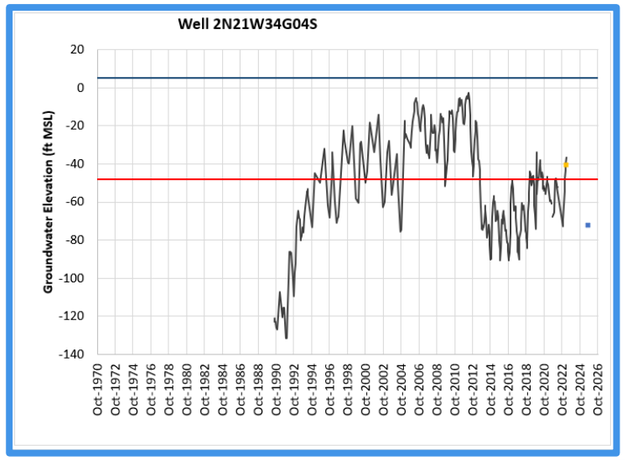


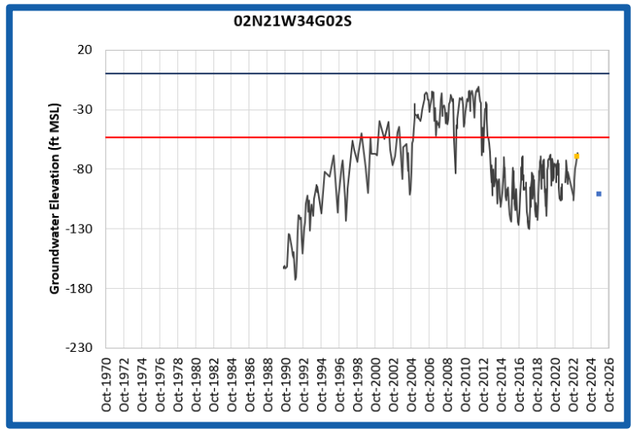


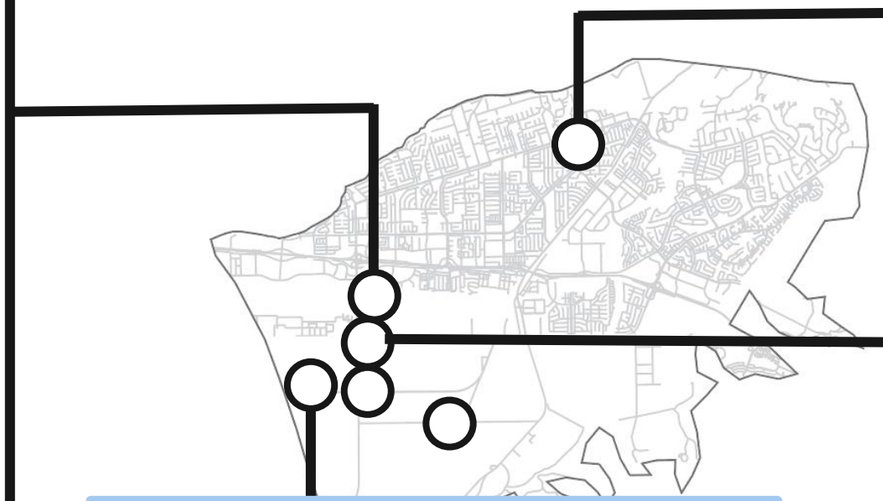


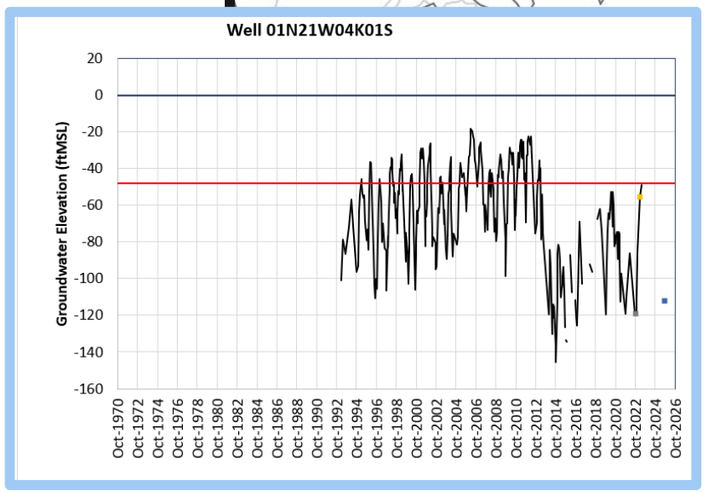
Pleasant Valley Select Hydrographs

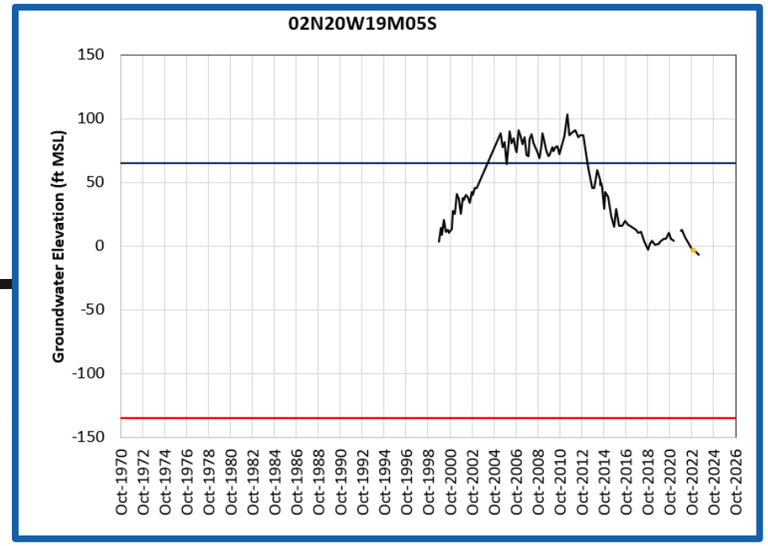


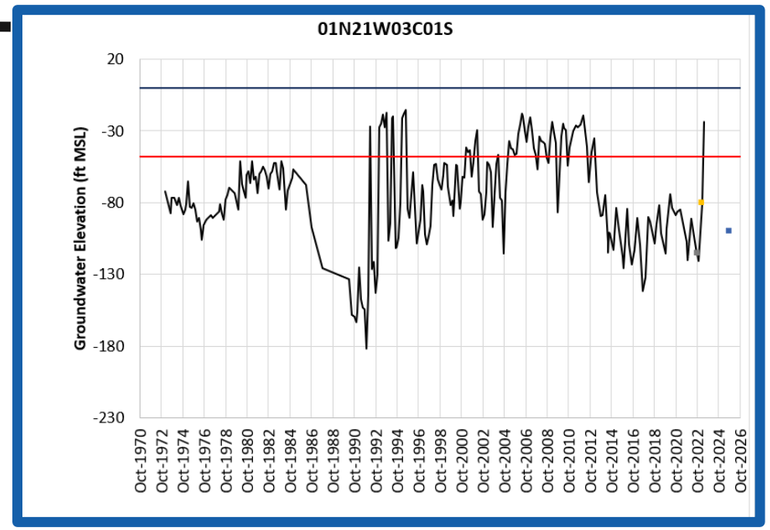




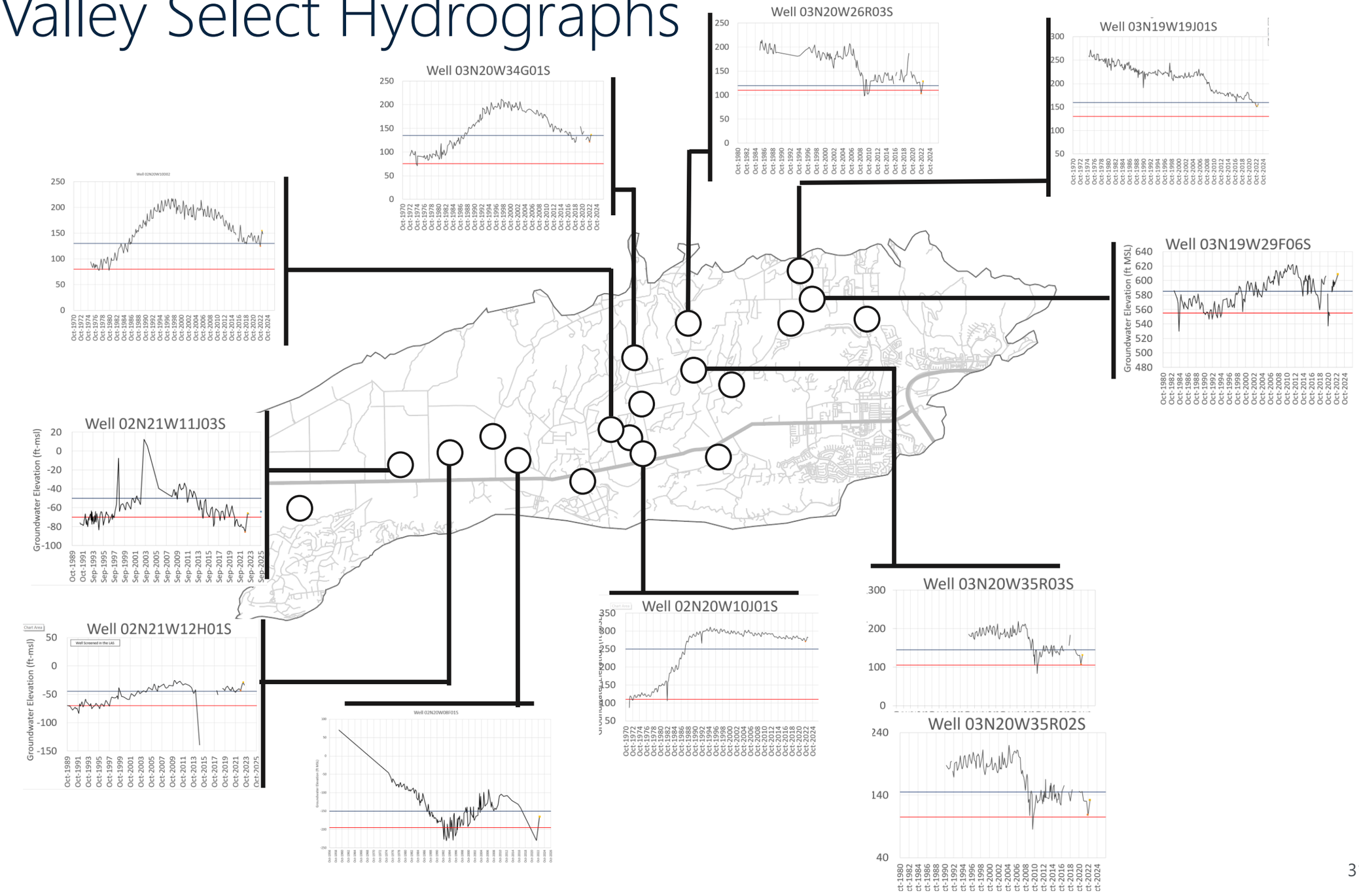






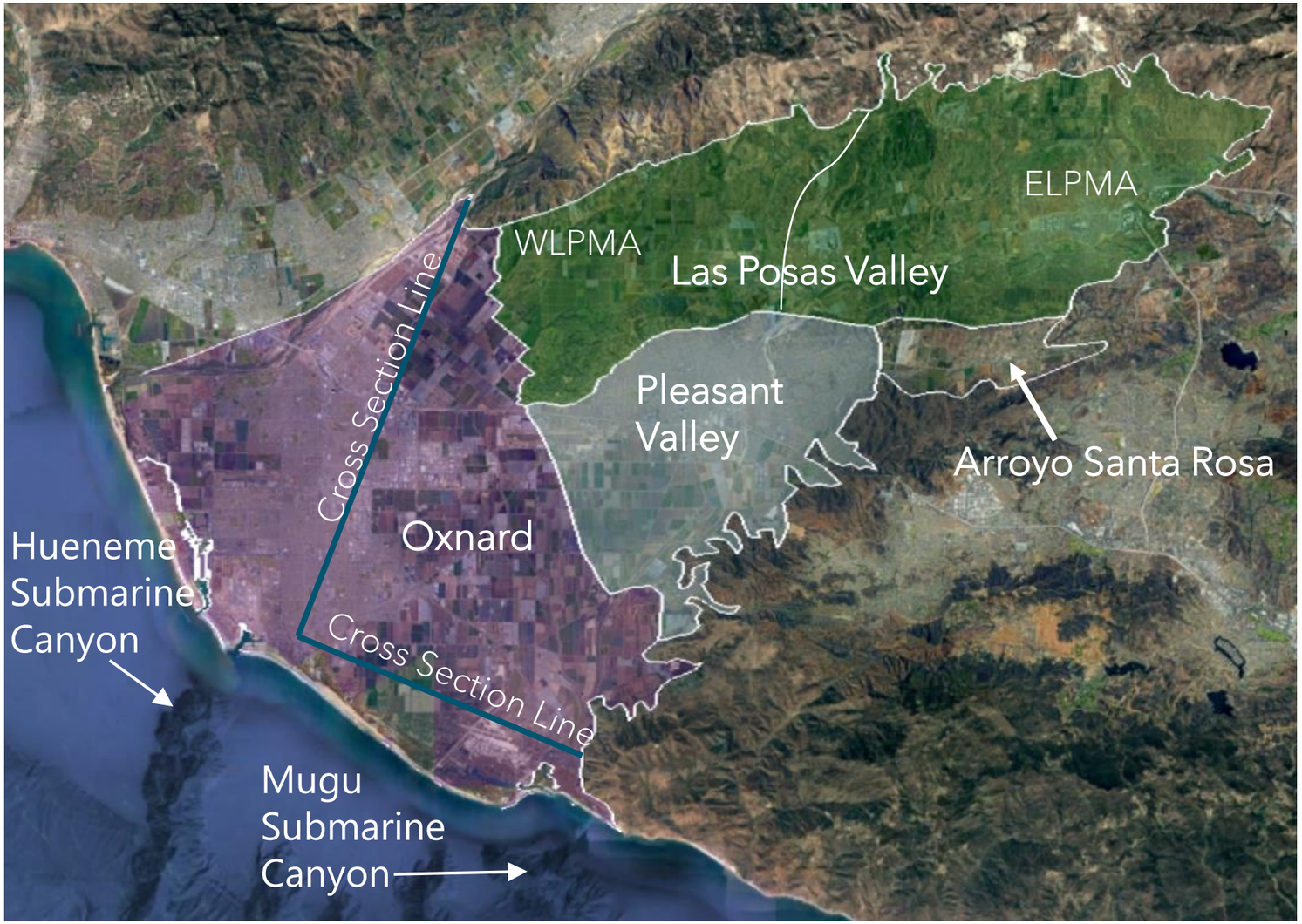


Las Posas Valley Select Hydrographs



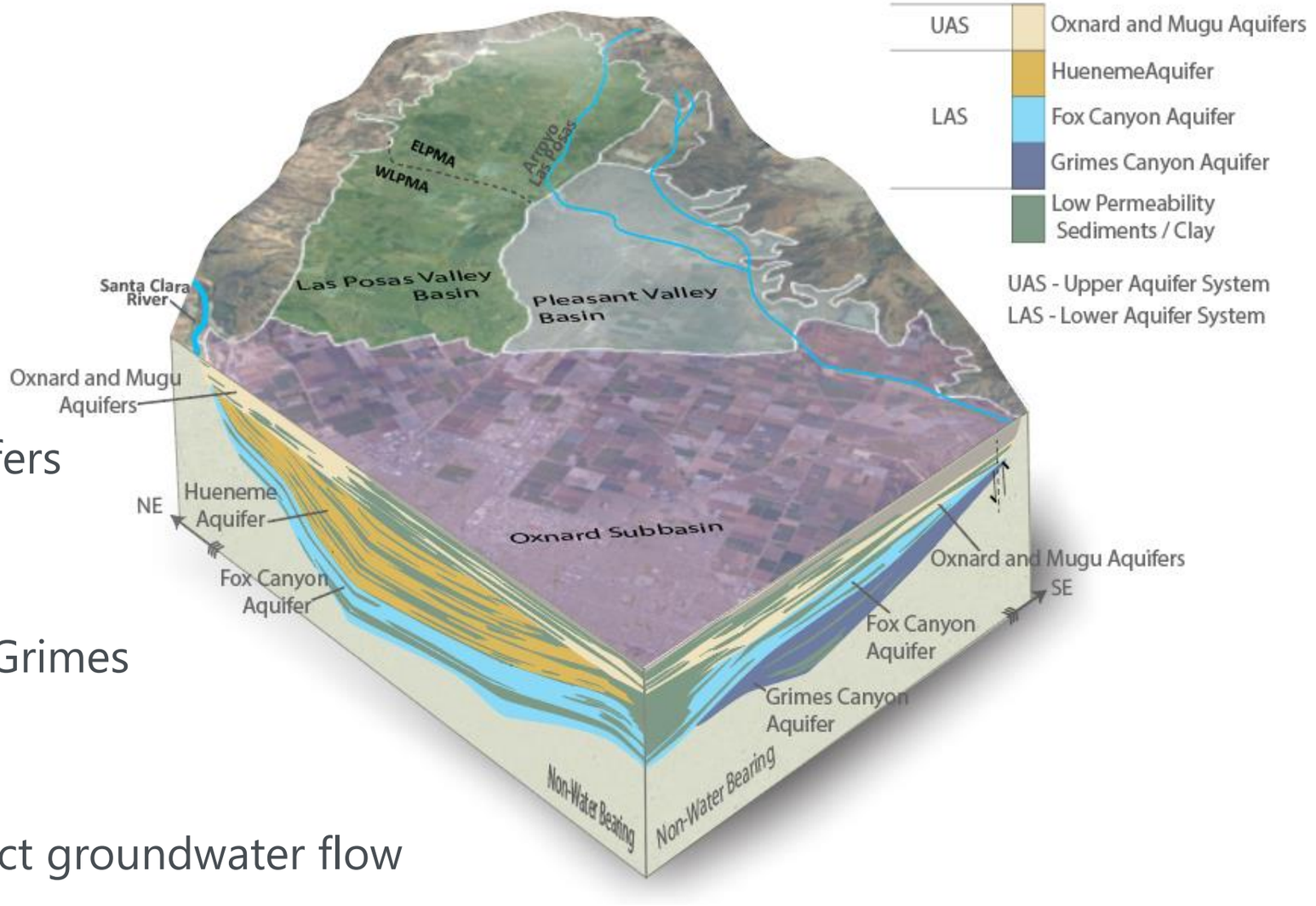
Interconnectedness of Basins – Surface and Subsurface

- Hydrogeology connects all the basins
- Surface flows
  - Santa Clara River
  - Arroyo Las Posas / Calleguas Creek
  - Conejo Creek
- Subsurface flows between:
  - Oxnard and Pleasant Valley
  - Oxnard and West Las Posas Management Area
  - East Las Posas Management Area and Pleasant Valley
  - West Las Posas Management Area and Pleasant Valley



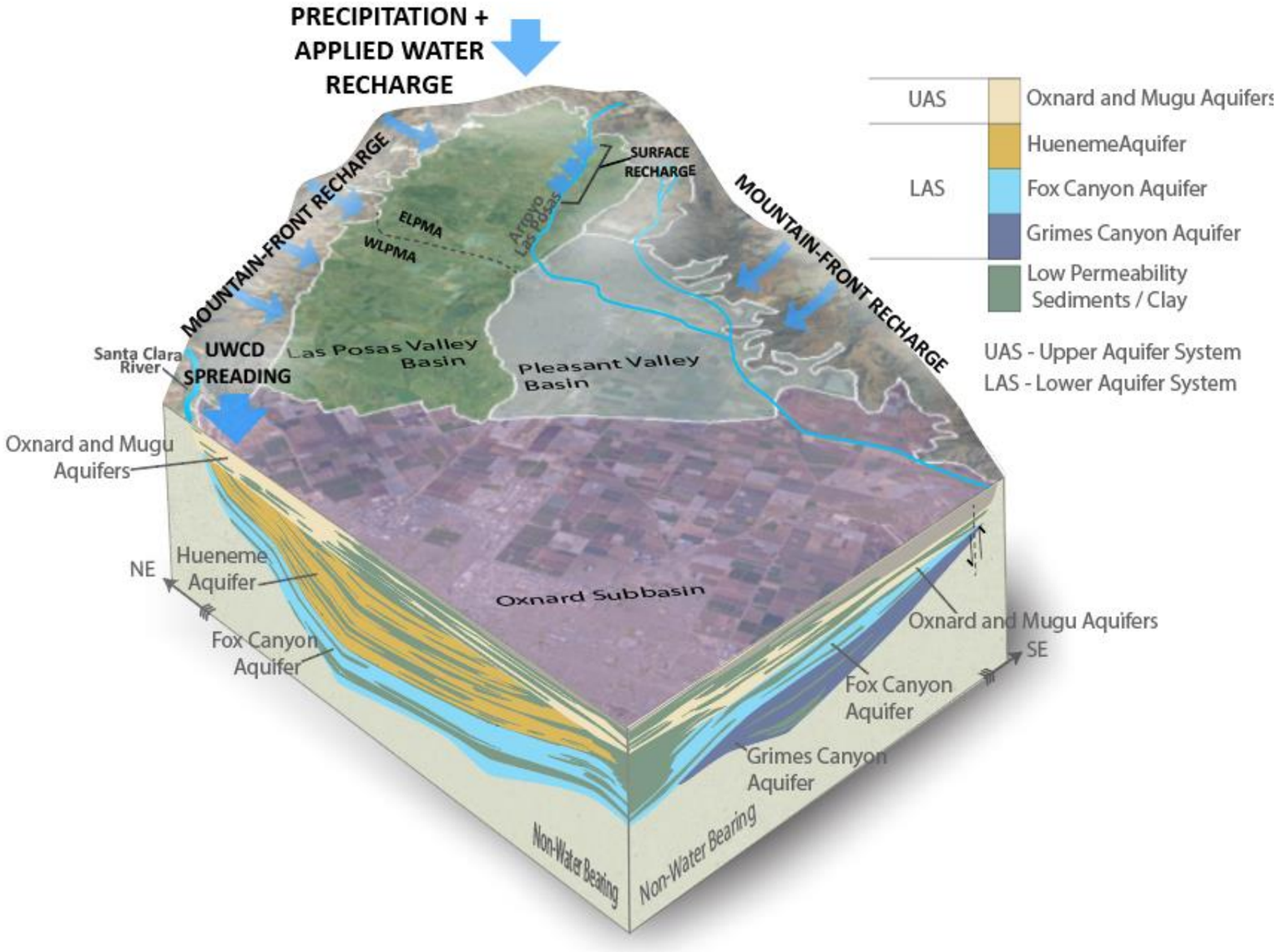
Building the Conceptual Model

- Conceptual Model - General Understanding of:
  - Subsurface hydrogeology
  - Recharge and discharge
  - Subsurface flow
- Subsurface aquifers
  - Upper Aquifer System
    - Shallow Subsurface
    - Oxnard and Mugu Aquifers
  - Lower Aquifer System
    - Deeper Subsurface
    - Hueneme, Fox Canyon, Grimes Canyon Aquifers
- Subsurface is complex
  - Changes in subsurface impact groundwater flow



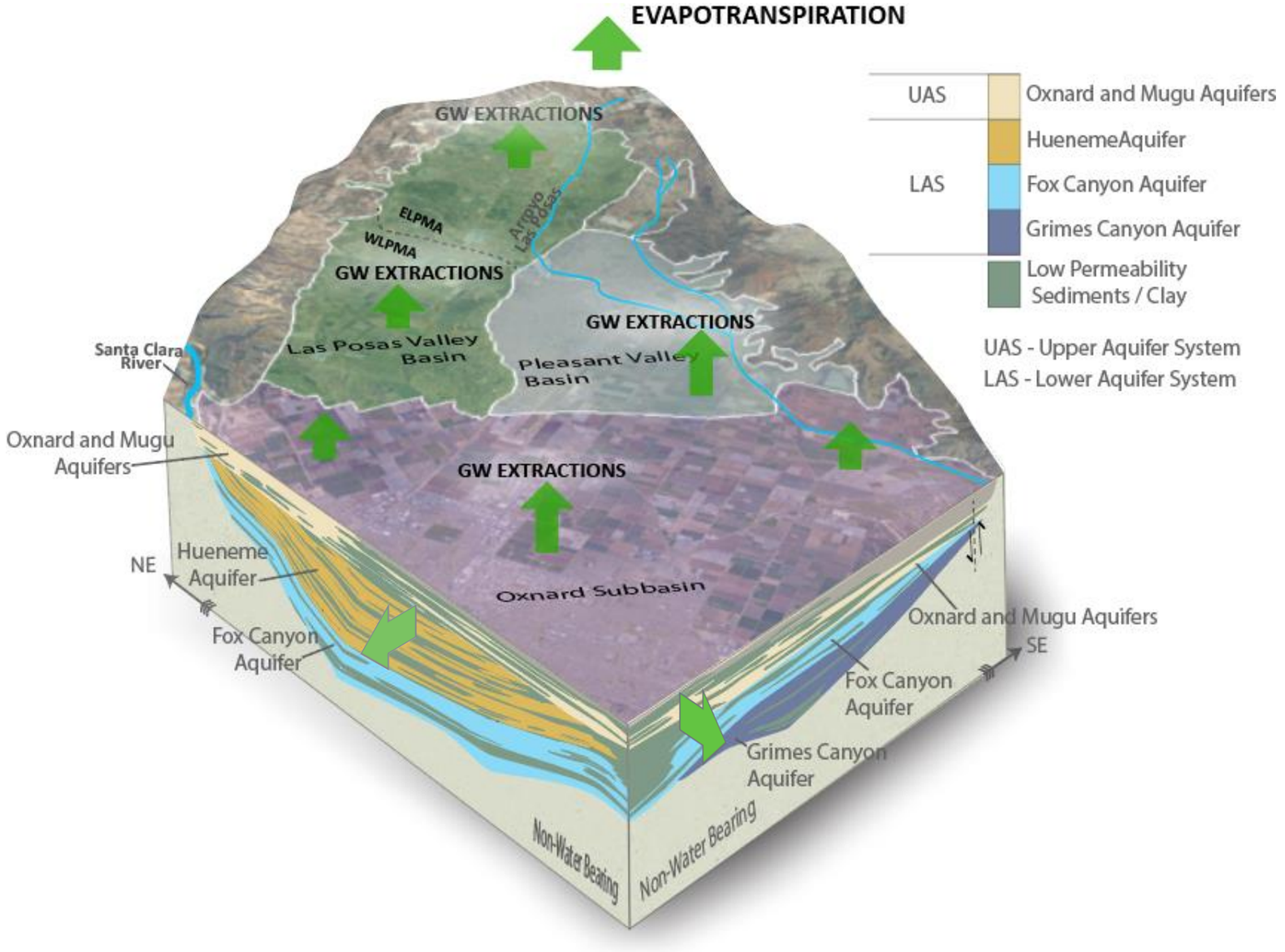
Building the Conceptual Model – Recharge

- Recharge
  - Surface flows
  - Precipitation
  - Applied Water
  - Spreading
  - Mountain-front recharge
  - Flows from adjacent basins / ocean



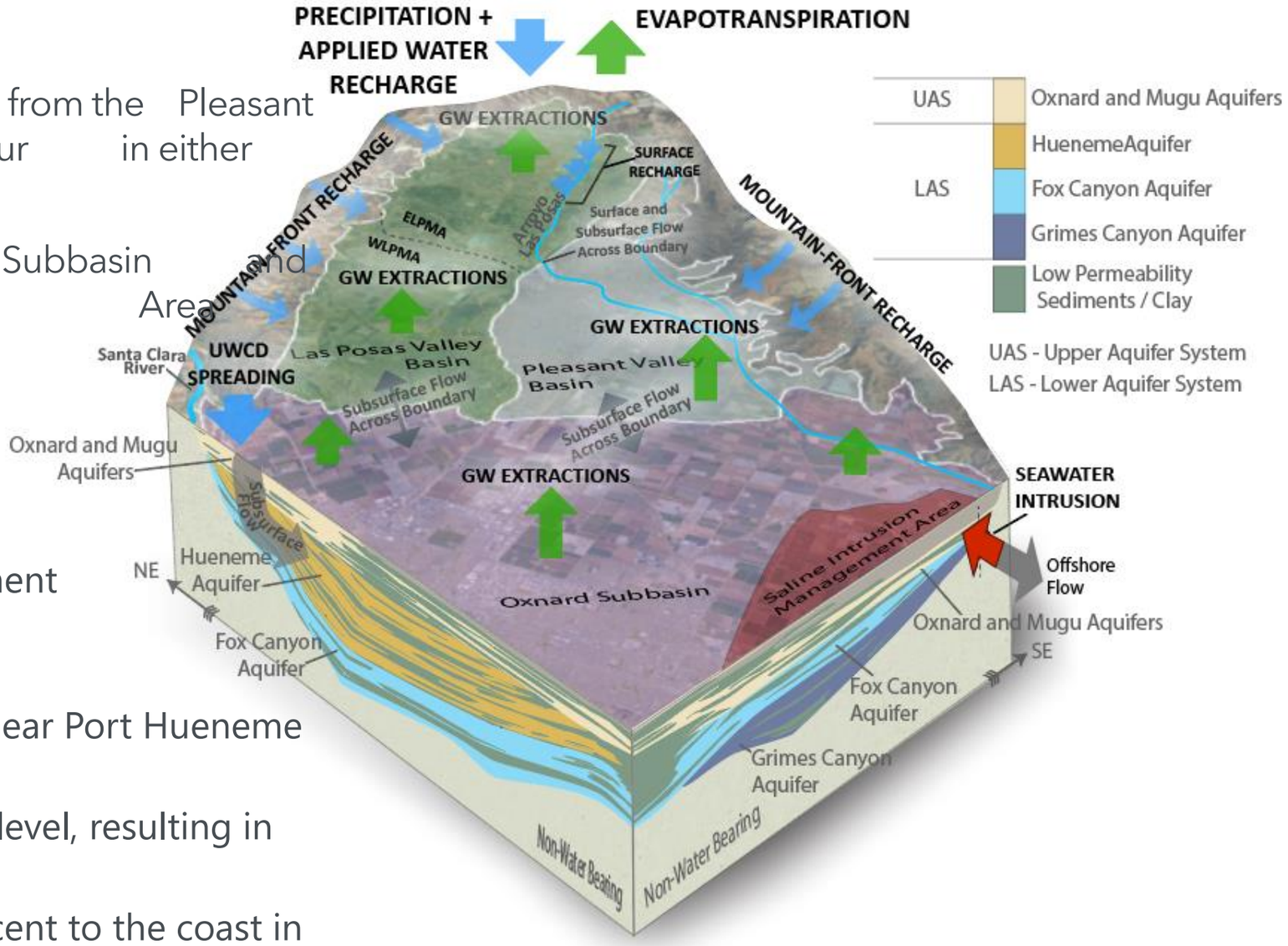
Building the Conceptual Model – Discharge

- Discharge
  - Evapotranspiration
  - Pumping
  - Flows to adjacent basins/ the ocean



Conceptual Model – Part 1

- Historically-
  - Net inflow to the Oxnard Subbasin from the Pleasant Valley Basin although flow can occur in either direction across this boundary
  - Variable flow between the Oxnard Subbasin and the West Las Posas Management Area (WLPMA)
    - Surface and subsurface flow from ELPMA to the Pleasant Valley Basin
    - Limited to no subsurface flow between East Las Posas Management Area (ELPMA) and WLPMA in Fox Canyon Aquifer
    - Seawater intrusion has occurred near Port Hueneme and Point Mugu because:
      - Aquifers pumped below sea level, resulting in net inflow of seawater
      - Submarine canyons are adjacent to the coast in these areas



Conceptual Model – Part 2

- Role of Surface and Imported Water
  - Annual groundwater demand varies based on surface water availability
  - Infrastructure delivers surface water to offset groundwater production
  - Pumping Trough Pipeline
    - Santa Clara River water and groundwater to agricultural users in Oxnard Subbasin
  - Pleasant Valley Pipeline
    - Santa Clara River water and groundwater to agricultural users in the Oxnard Subbasin and Pleasant Valley Basin
  - In-Lieu Deliveries
    - Calleguas Municipal Water District delivered surface water to West Las Posas Management area between 1995 and 2008