

Public Workshop – Sustainability Management Criteria

January 18, 2023



Team Members



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GSP Project Approach

BUILD TRUST THROUGH CLARITY, CONSISTENCY, AND INVOLVEMENT

Complete

PHASE 1

FACT REPORTING
AND EDUCATION

- GSP Kickoff
- C& E Plan
- Plan Area and Basin Setting: Hydrogeologic Conceptual Model, Current Historical GW Conditions, and Water Budget
- Groundwater Model Update

March 2022 to
December 2022

In Progress

PHASE 2

SUSTAINABLE GOAL
SETTING

- Sustainable Management Criteria: Management Areas
- Sustainability Goal, Measurable Objectives, Minimum Threshold, and Undesired Results

January 2023 to
May 2023

Summer 2023

PHASE 3

PLAN TO
SUSTAINABILITY

- Projects and Management Actions to Achieve Sustainability: Projects and Management Actions
- Plan Implementation: Estimate Costs and Schedule

May 2023 to
September 2023

Fall 2023

PHASE 4

GSP
DOCUMENTATION

- Administrative Draft GSP
- Public Comment Period
- Final GSP
- GSP Adoption
- GSP submittal to DWR

September 2023 to
November 2023

DEFENSIBLE
PLAN

Sustainable Management Criteria Development Process

January 2023 GSC Public Workshop #3

- Draft Sustainability Goal
- Draft Representative Wells Identified
- Introduce SMCs, MO's, MT's for the sustainability indicators

February 2023 Public Workshop #4

- Background to SMC
- Alternatives for SMC for the 6 applicable Sustainability Indicators
- Slides will be posted to CGSA website for public comment.

March 2023 Public Workshop #5

- Discuss proposed SMCs to be included in the Draft Chapter 7 SMC with the GSC
- Goal is to reach consensus on SMC's to be included in Chapter 7
- Draft Chapter 8 –Monitoring Network released for comment

April 2023 Public Workshop #6

- Purpose is to release Draft Chapter 7 – SMC for public comment

Public workshops after SMC stakeholder input will address Projects and Management Action, and Implementation.



An Overview of Sustainable Management Criteria (SMCs)

Dave O'Rourke, GSI

In SMC Development, All Perspectives Must Be Heard and Considered

A Stakeholder-driven process

- Public water systems
- Agricultural interests
- Local land use planning agencies
- Environmental users
- Surface water users (none in Basin)
- Groundwater rights holders
- Disadvantaged communities
- Tribal communities



**SHARED
GOAL:**

**A sustainably
managed
groundwater basin
that supports our
way of life.**

SIX SUSTAINABILITY INDICATORS

Pathway to Sustainability



Seawater Intrusion



**Water Quality
Degradation**



**Chronic Lowering of
Groundwater Levels**



**Interconnected Surface
Water Depletions**









**Reduction of
Groundwater Storage**



Land Subsidence

Measuring SMCs

SUSTAINABILITY INDICATOR	 CHRONIC LOWERING OF GROUNDWATER LEVELS	 REDUCTION OF GROUNDWATER STORAGE	 WATER QUALITY DEGRADATION	 LAND SUBSIDENCE	 INTER-CONNECTED SURFACE WATER DEPLETIONS	 SEAWATER INTRUSION
METRIC(S) USED	Groundwater Elevation	Total Volume Groundwater Elevation	<ul style="list-style-type: none"> - Migration Plumes - # of Supply Wells - Volume - Location of Isocontour 	Rate and extent of land subsidence	Volume or rate of surface water depletion Groundwater Elevation near creeks	Chloride Concentration Isocontour Groundwater Elevation along Coast



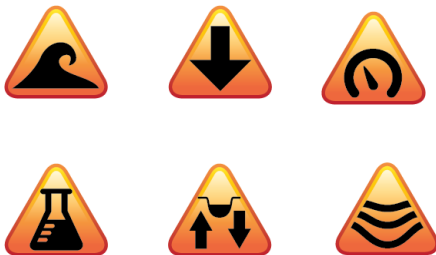
SGMA allows all indicators except the water quality sustainability indicator to be assessed using **WATER LEVELS** as a proxy metric for direct measurement.

SMC Definitions - 1

Pathway to Sustainability

Sustainability Indicator.

Any of the effects caused by groundwater conditions occurring throughout the basin that, when significant and unreasonable, cause undesirable results, as described in Water Code.



Undesirable Result.

Defined by GSA.

Undesirable results occur when conditions related to any of the six sustainability indicators become *significant and unreasonable*. Used by DWR to determine if the sustainability goal has been achieved in the basin.

Management area.

A subarea within a basin for which the Plan may identify different goals, projects or management based on differences in water use, water source, geology, aquifer characteristics, or other factors

SMC Definitions - 2

Pathway to Sustainability

Representative Monitoring Sites (RMS)

A subset of a basin's complete monitoring network, where minimum thresholds, measurable objectives, and interim milestones are set.

SMCs

Minimum Threshold (MT) -The value that represents groundwater conditions at an RMS that, when exceeded individually or in combination with minimum thresholds at other monitoring sites, may cause an *undesirable result(s)* in the basin.

Interim Milestone (IM) -A target value representing measurable groundwater conditions, in increments of five years, set by an Agency as part of a Plan

Measurable Objective (MO) - Measurable objectives are goals that reflect the basin's desired groundwater conditions and allow the GSA to achieve the sustainability goal within 20 years.

SMC Relationships



Sustainability Indicator



SMCs – Management Criteria



MOs – Measurable Objectives (Goals)

IMs – Interim Milestones

MTs – Minimum Thresholds (Triggers action)

Undesirable Results! – Triggers action (study, management action, etc.)



SMC Development Steps for Each Sustainability Indicator

1

1. Basin Conditions

Need a good understanding of basin conditions. Select representative wells.

2

2. Sustainability Goal

Qualitative statement that guides threshold setting process.

3

3. Undesirable Results

Quantitative set of conditions related to minimum thresholds that cause significant and unreasonable conditions.

4

4. Minimum Thresholds

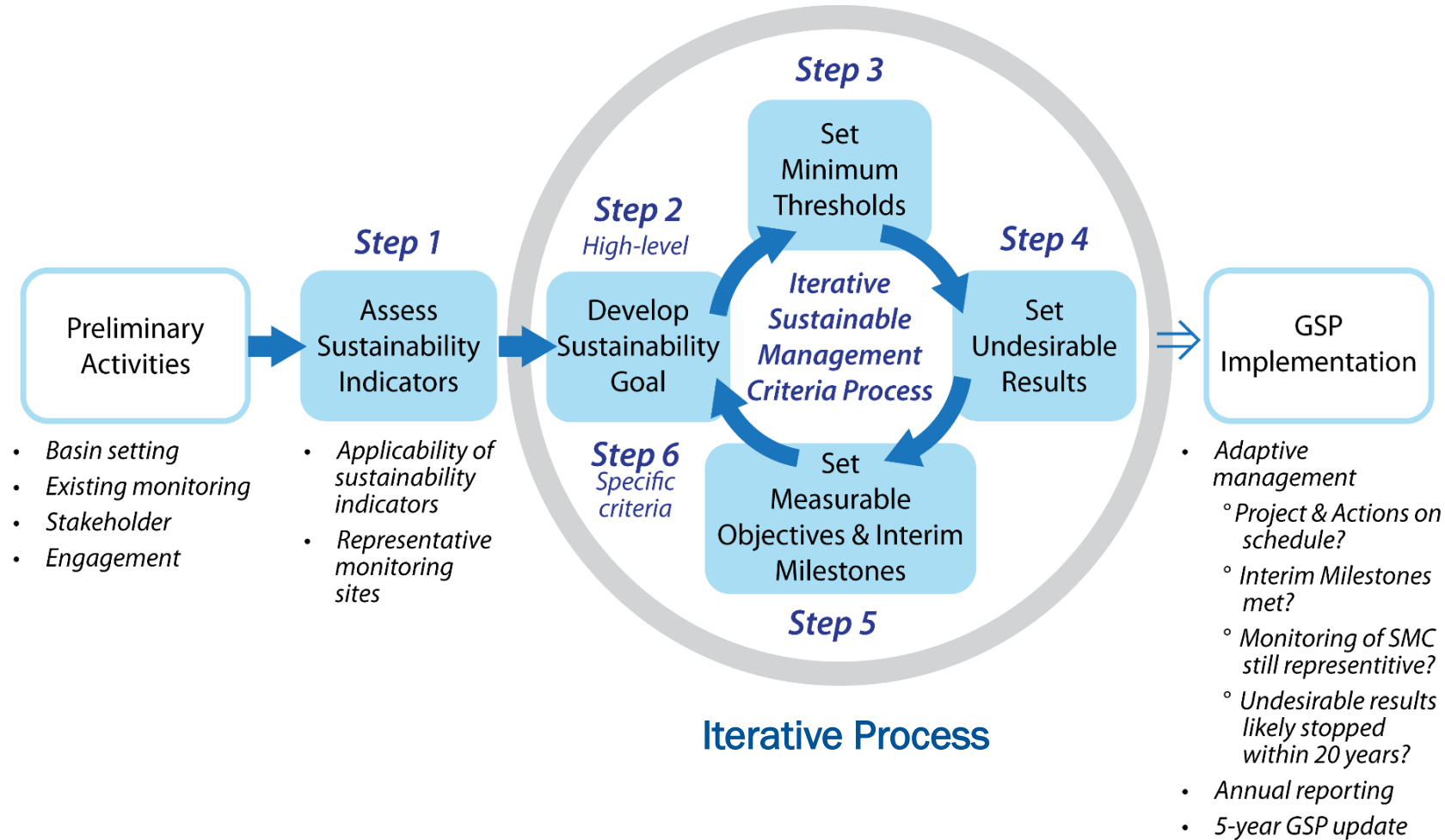
Numeric values for each sustainability indicator used to define undesirable results and sustainability.

5

5. Measurable Objectives

Quantifiable goals for the maintenance or improvement of specified groundwater conditions over 20 years

How to Establish SMCs



DWR Required Components of Analysis for Minimum Thresholds (MTs)

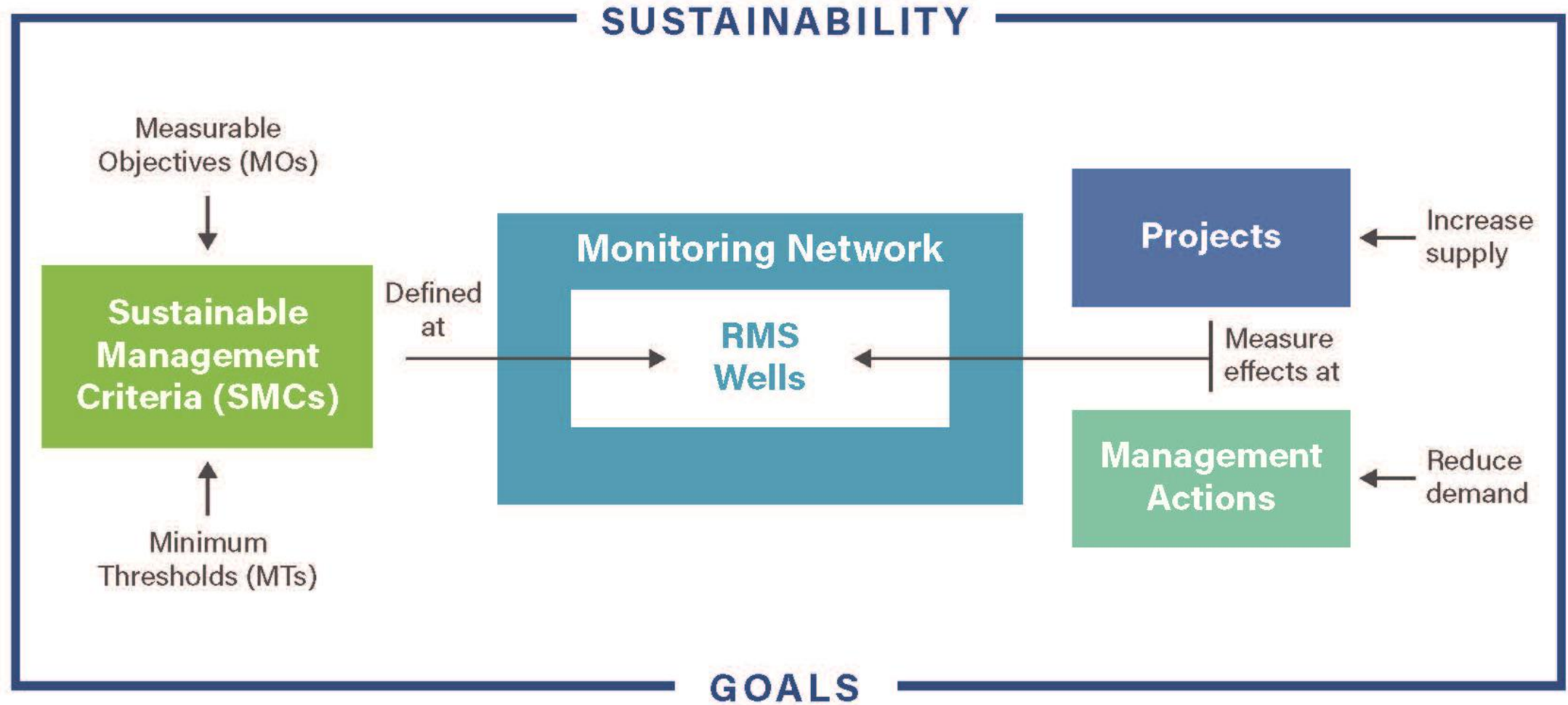
Pathway to Sustainability

1. Analysis of data and rationale
2. Describe the relationship between the MTs for each sustainability indicator
3. Describe how MTs will not cause undesirable results in adjacent basins
4. How MTs may affect groundwater users or property interests
5. Explain how State or Federal Standards relate to sustainability indicator
6. How each MT will be measured



Representative Monitoring Site (RMS) Wells and Sustainable Management Criteria

Getting to Sustainability – RMS Wells



RMS WELLS SELECTION CRITERIA

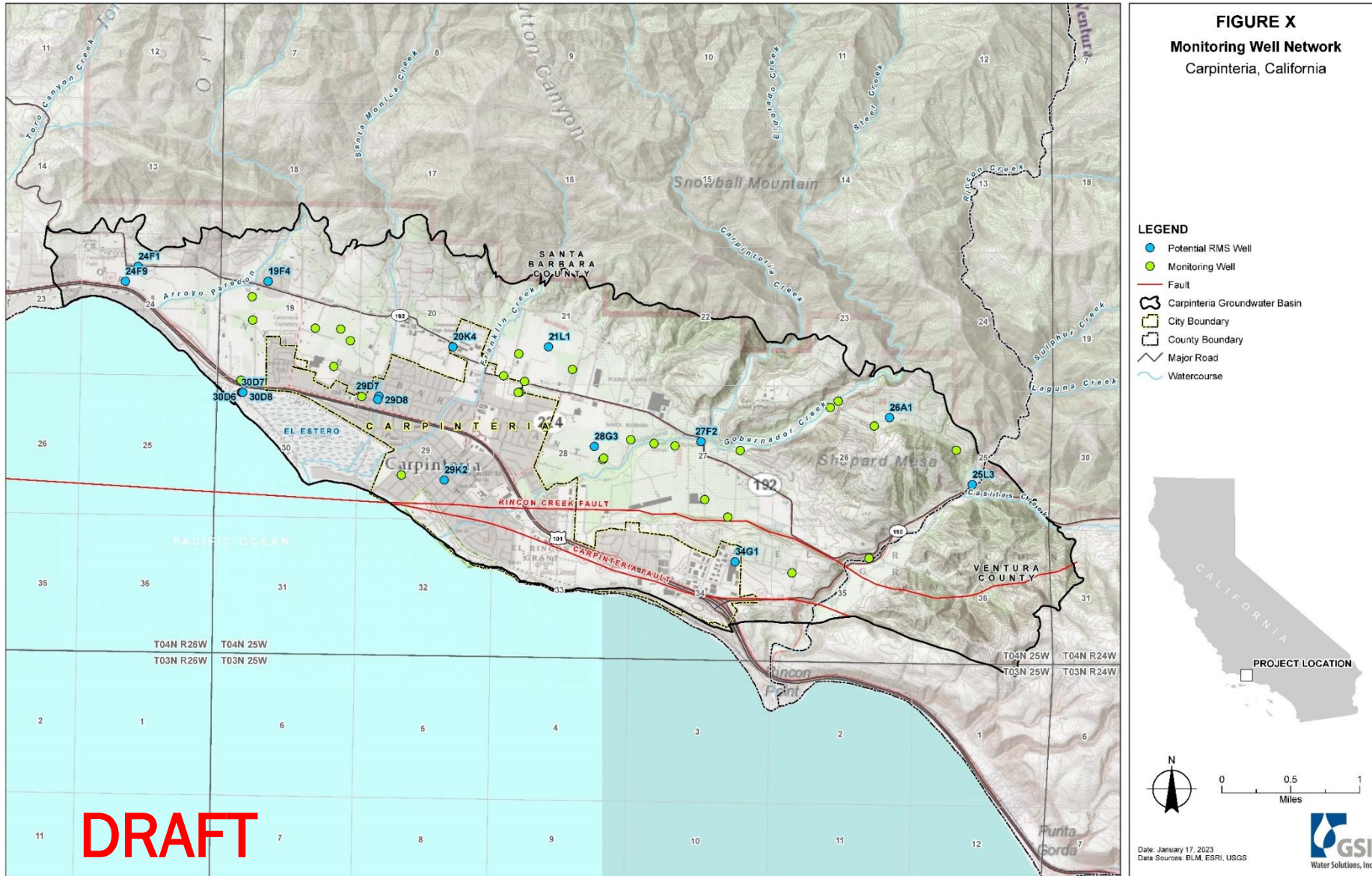
RMS Wells are a subset of Monitoring Network. SMCs are defined and measured at RMS wells.

- Carpinteria Basin has ~40 wells in monitoring network.
- About 10-15 will be considered as RMS wells.

Qualities *desired* for RMS wells.

- Located in areas of interest or data gaps
- Accessibility of well for measurements
- Long Period of Record
- Documented Well Construction Details (depth, screen, etc.)
- Dedicated Monitoring Well Preferred – i.e., No Pumping

POTENTIAL RMS WELL LOCATIONS





SEAWATER INTRUSION

EXAMPLES OF SEAWATER INTRUSION UNDESIRABLE RESULTS

- **Saline groundwater migrating inland from ocean and reaching agricultural production wells, impacting crops and agricultural economy.**
- **Saline water reaching municipal production wells, impacting water quality for potable supply source, requiring increased level of treatment to serve customer base.**

Seawater Intrusion SMCs – Chloride/TDS Concentration Contour Line

Metric- Chloride or TDS isocontour line.

Considerations for Analysis:

- **Location of line (Coast? Inland?)**
- **Location/Distance to receptor wells, or travel time of saline water to wells**
- **Existing WQ Data**
- **Logistics of Future Monitoring**





CHRONIC LOWERING OF
GROUNDWATER LEVELS &



REDUCTION OF
GROUNDWATER STORAGE

**Example
Undesirable
Results of
Lowered
GW Levels
&
Reduction
in Storage**

**Conditions causing undesirable results
must be significant and unreasonable**

- **Water levels falling below screen for Municipal production wells.**
- **Decline in yields of agricultural wells.**
- **Private domestic supply wells losing ability to supply water to homes.**

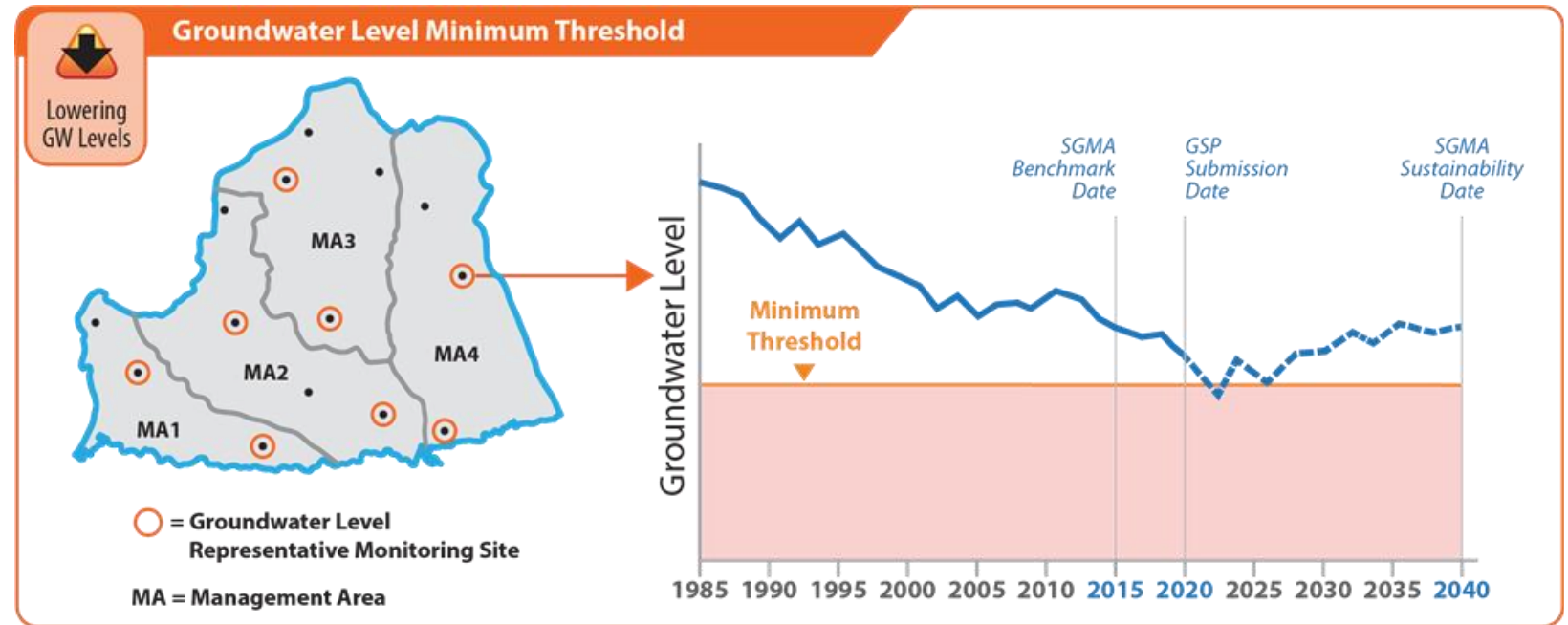
Types of data to be analyzed:

- **Well location**
- **Well depth**
- **Top of screened interval**
- **Pumping patterns**

Reduction in Storage SMCs may be, and commonly are, defined as water levels similar to the Water Level Decline SMCs.

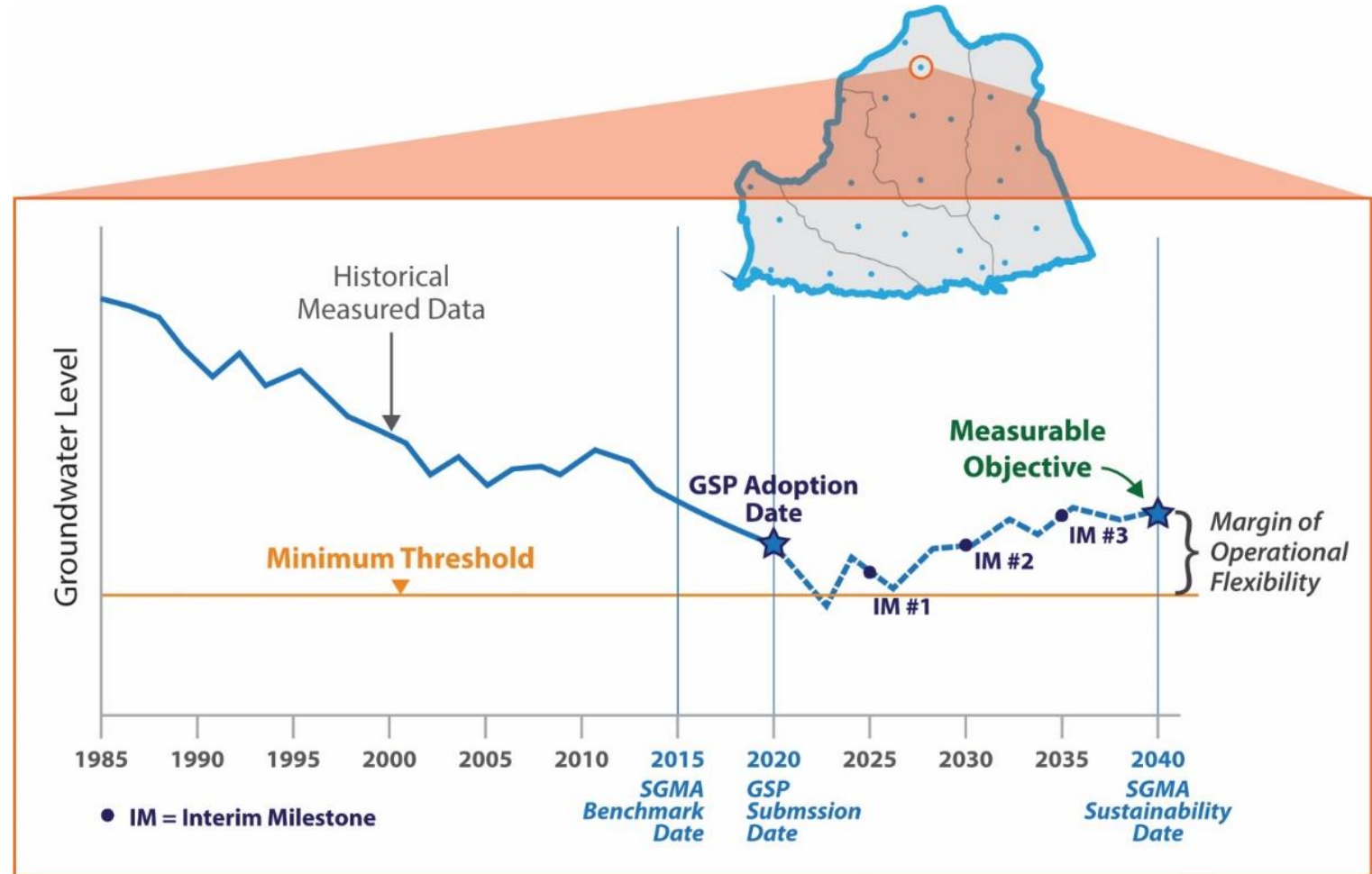
What is a groundwater level Minimum Threshold?

Example – Establish Minimum Thresholds (MTs)



What is a Measurable Objective?

Example – Establish Measurable Objectives (MOs)



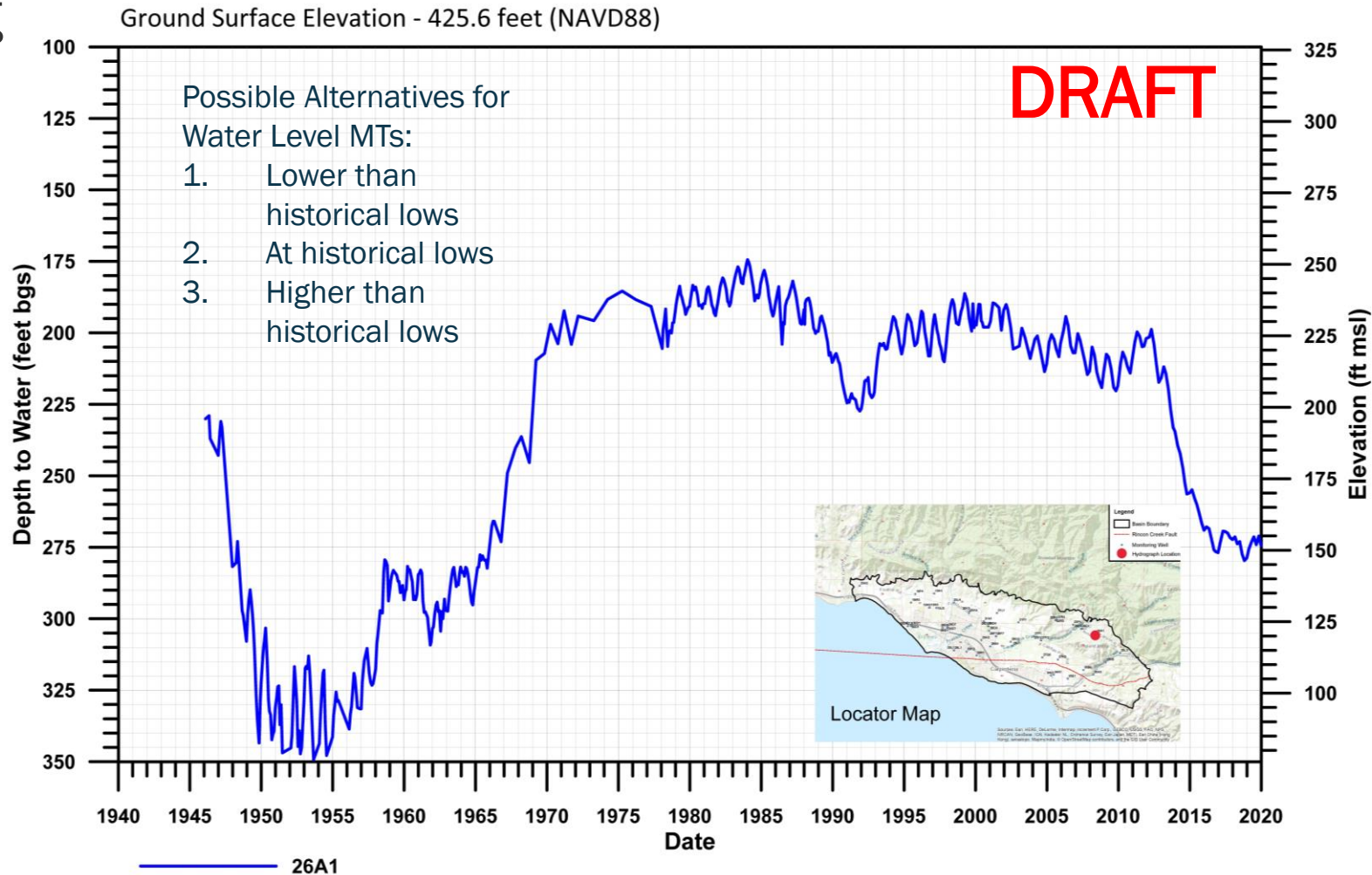


Defining SMCs

Evaluate historical trends



Chronic Lowering
of Groundwater
Levels



Reduction of
Groundwater
in Storage



SUBSIDENCE

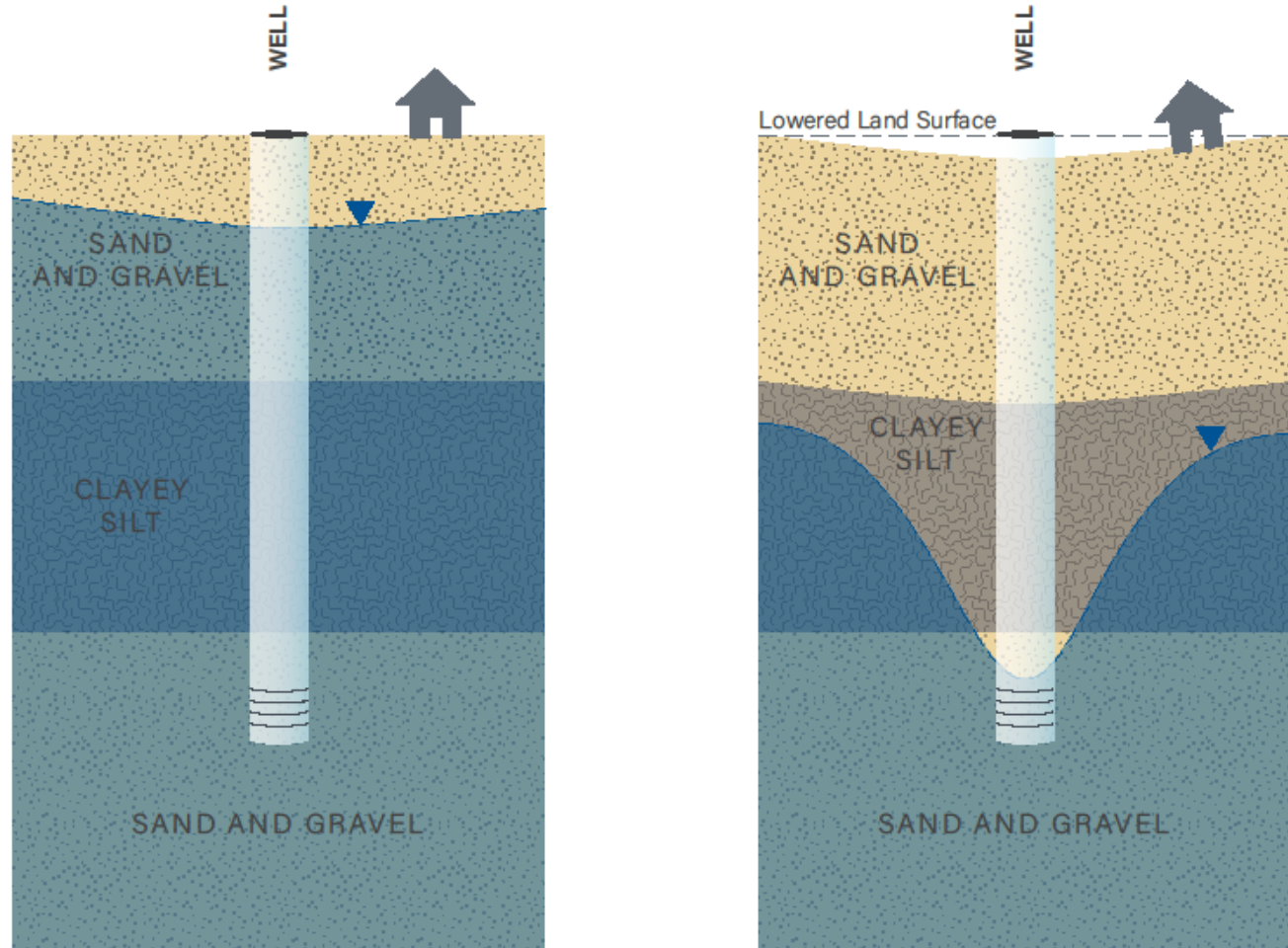
SUBSIDENCE



Reduction of Groundwater Levels can result in land subsidence through compression of clays.

Considerations for Analysis:

- **Documented historical subsidence?**
- **Sensitive infrastructure?**
- **DWR InSAR monitoring**



Conditions causing undesirable results must be significant and unreasonable

Example Undesirable Results of Subsidence

- **Subsidence causing damage to commercial or residential properties**
- **Subsidence causing damage to critical infrastructure (canals, pipelines, etc.)**

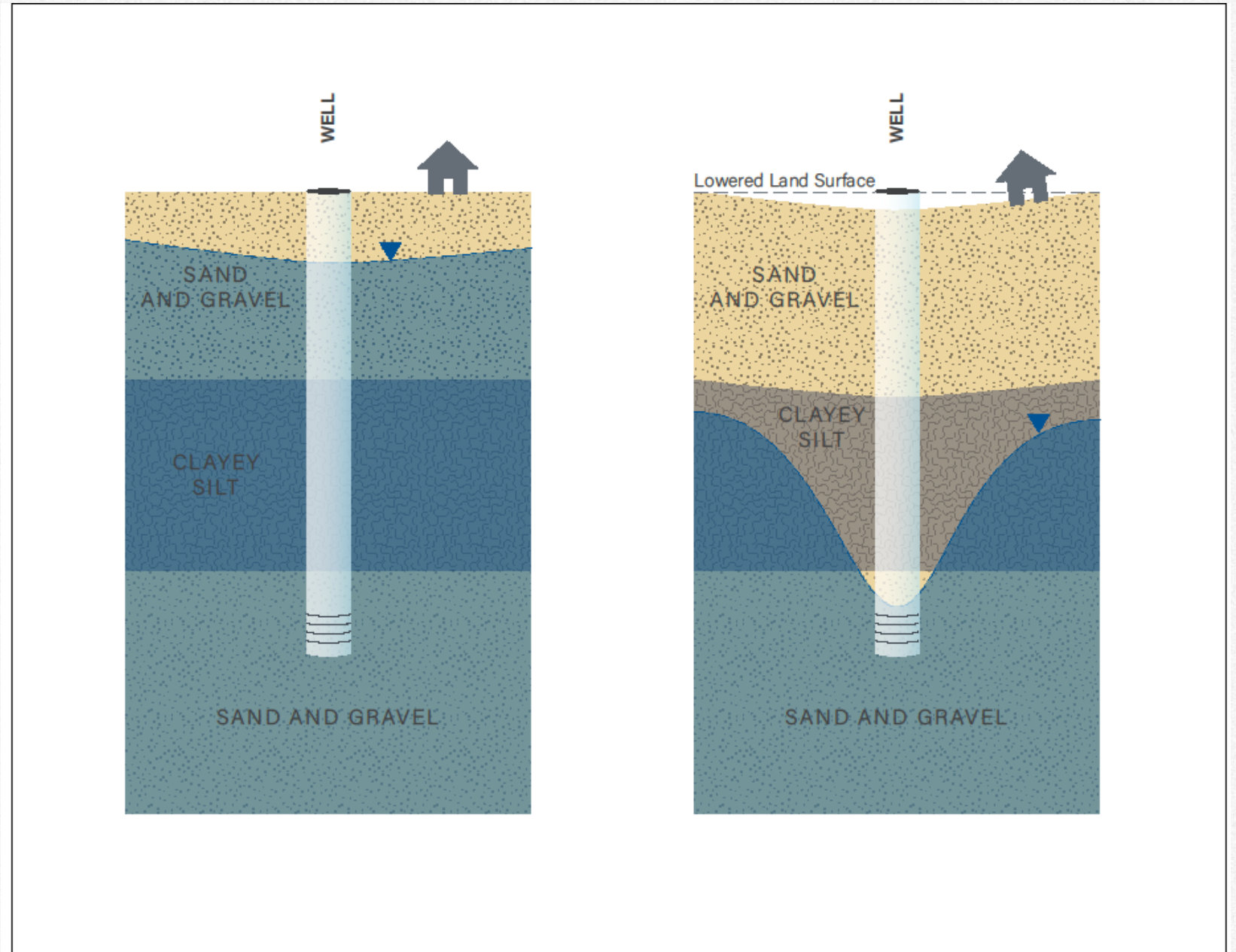
Subsidence has not historically been an issue in Carpinteria Basin.

SUBSIDENCE



Most GSPs have defined their Undesirable Results for Subsidence based on specific numerical criteria of published DWR InSAR data.

Undesirable results are specifically referenced to subsidence *caused as a groundwater management activities.*

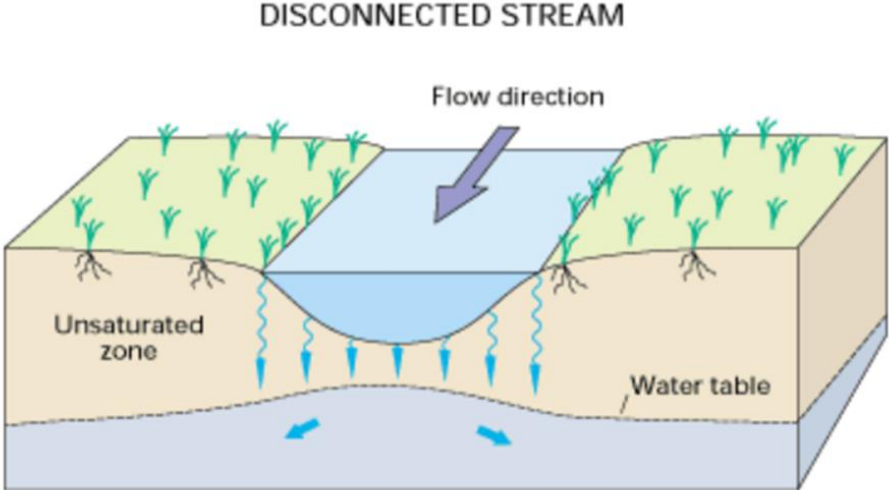
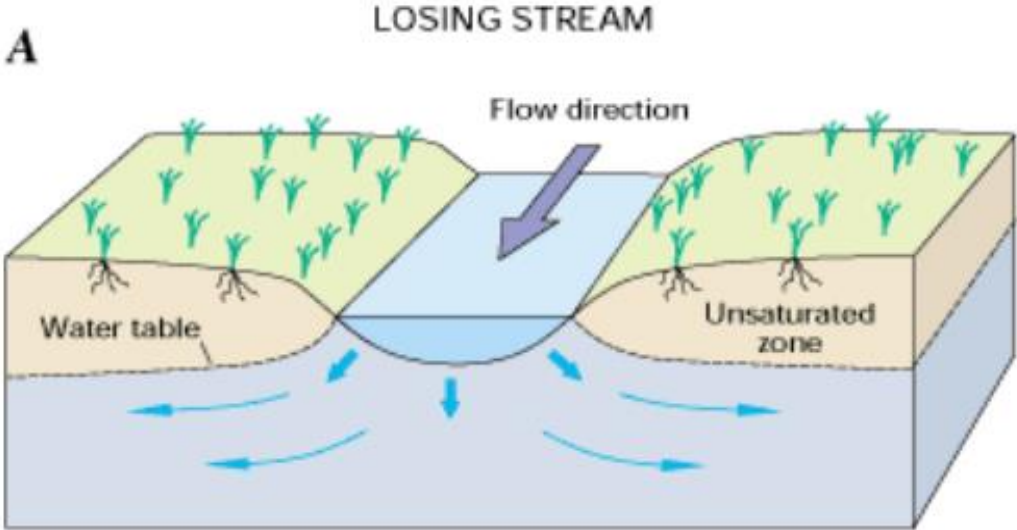
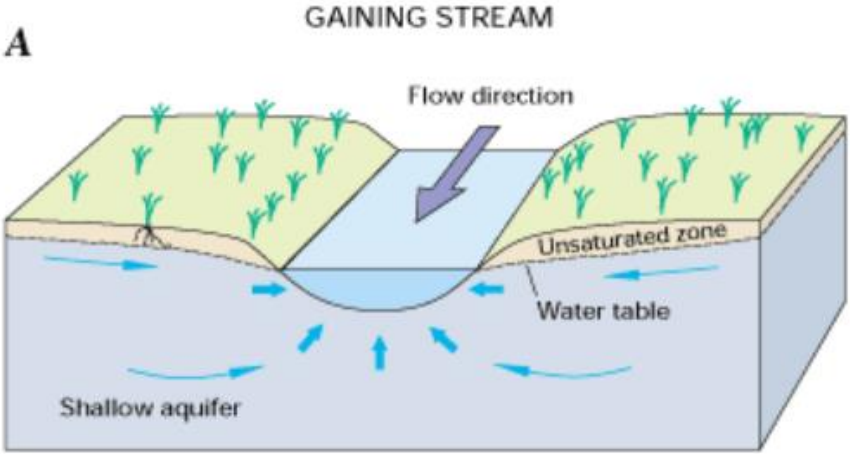




INTERCONNECTED SURFACE WATER DEPLETIONS

GROUNDWATER SURFACE WATER INTERACTION

Gaining and losing streams examples



Data and Stakeholder Considerations for Interconnected SW/GW Depletions SMC



Pathway to Sustainability

- Traditionally of greatest significance to wildlife stakeholders, (NMFS, fisheries interests, Sierra Club)
- Considerations when establishing minimum thresholds for depletions of interconnected surface water may include, but are not limited to:
 - Location of groundwater dependent ecosystems (GDEs) in the basin?
 - Historical rates of stream depletion (creeks are largely disconnected)
 - Uncertainty in streamflow depletion estimates from analytical and numerical tools? – High.
 - Proximity of pumping to streams?
 - What are the agricultural and municipal surface water needs in the basin? -None
 - What are the applicable State or federally mandated flow requirements? -None



WATER QUALITY

Water Quality Sustainability Indicator



SGMA is not designed to manage or improve Water Quality. The WQ sustainability indicator is designed to manage and monitor potential changes in WQ due to pumping.

MT metric for water quality sustainability indicator shall be WQ measurements that indicate **degradation** at the monitoring site.

Potential concerns

- Migration of contaminant plumes
- Number of impacted supply wells,
- Increasing trends of concentration of constituents of concern

Establishment of WQ Minimum Threshold

Potential Constituents of Concern

- TDS
- Chloride
- Nitrate
- Arsenic

Additional Concerns

- Known contaminant plumes (underground tanks, etc.)

MTs- Commonly based on Primary Drinking Water Maximum Contaminant Level (MCL) if defined

- TDS (1,000 mg/L)
- Nitrate (10 mg/L)
- Arsenic (10 μ g/L)

If no MCLs, Basin Objectives or Historical Maximum Concentrations may be referenced.

Water Quality Sustainability Indicator





WHAT'S NEXT

WHAT'S NEXT: Upcoming Public Workshops



PUBLIC WORKSHOP.

GSA Public Workshop
February 15 2023•
6:00pm-8:00pm



PUBLIC WORKSHOP.

GSA Public Workshop
March 15 2023•
6:00pm-8:00pm



PUBLIC WORKSHOP.

GSA Public Workshop
April 19 2023•
6:00pm-8:00pm



PUBLIC WORKSHOP.

GSA Public Workshop
May 17 2023•
6:00pm-8:00pm

Learn more or take action at

CarpGSA.org