

# Sustainable Management Criteria – Chronic lowering of groundwater levels

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# Today's Objective and Next Steps

1. **Today's Objective: Solicit your input/preferences on considerations and methodology for setting Preliminary SMCs for the first of six Sustainability Indicators we need to address for this basin: Chronic Lowering of Groundwater Levels.**
2. Report out at next GSA Board meeting on themes and range of input – solicit and integrate any Board input – revisit as necessary
3. Move on to setting Preliminary SMCs for next Sustainability Indicators
4. Integrate all Sustainability Indicators and evaluate future projections
5. Evaluate need, feasibility, and cost of Projects and Actions
6. Revise SMCs as appropriate
7. Recommendations on SMCs to the Board (with range of input and options)

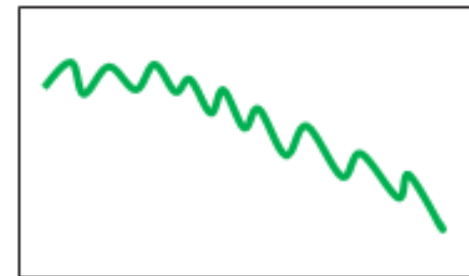
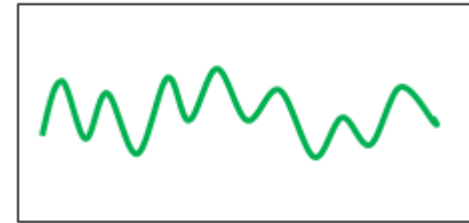
# Advisory Committee Input: Main Themes reflected in Today's Preliminary SMCs

- 1) For areas with stable trends, maintain groundwater levels within or near historical conditions while accounting for future droughts and climate variability.
- 2) For areas with declining trends, protect beneficial users that could be impacted by the declining groundwater levels and stabilize and reverse the declining trends.

# Identify General Patterns within Basin for Grouping Wells

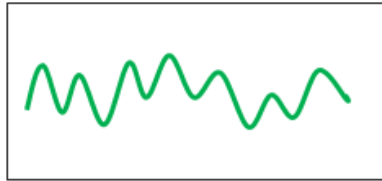
Different sets of methodology are proposed to address two general types of observed patterns in historical and recent groundwater-level trends:

- Wells with relatively stable long-term groundwater-levels (less than 0.5 foot per year decline with evidence of recovery following wet years);
- Wells with Declining Long-Term Groundwater-Level (greater than 0.5 feet per year decline with no or incomplete recovery in wet years).

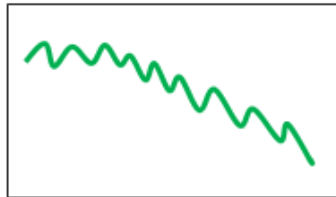


# Apply Methodologies for Preliminary SMCs for Each Observed Pattern

1. For wells with stable groundwater-level trends, **maintain groundwater levels within or near historical conditions while accounting for future droughts and climate variability.**



2. For wells with historical declining trends, **stabilize and reverse the declining trends and restore groundwater-levels to pre-2010 levels.**

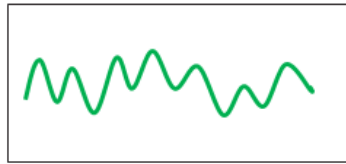


*Recommended methodology also incorporates considerations for protecting existing water supply wells.*

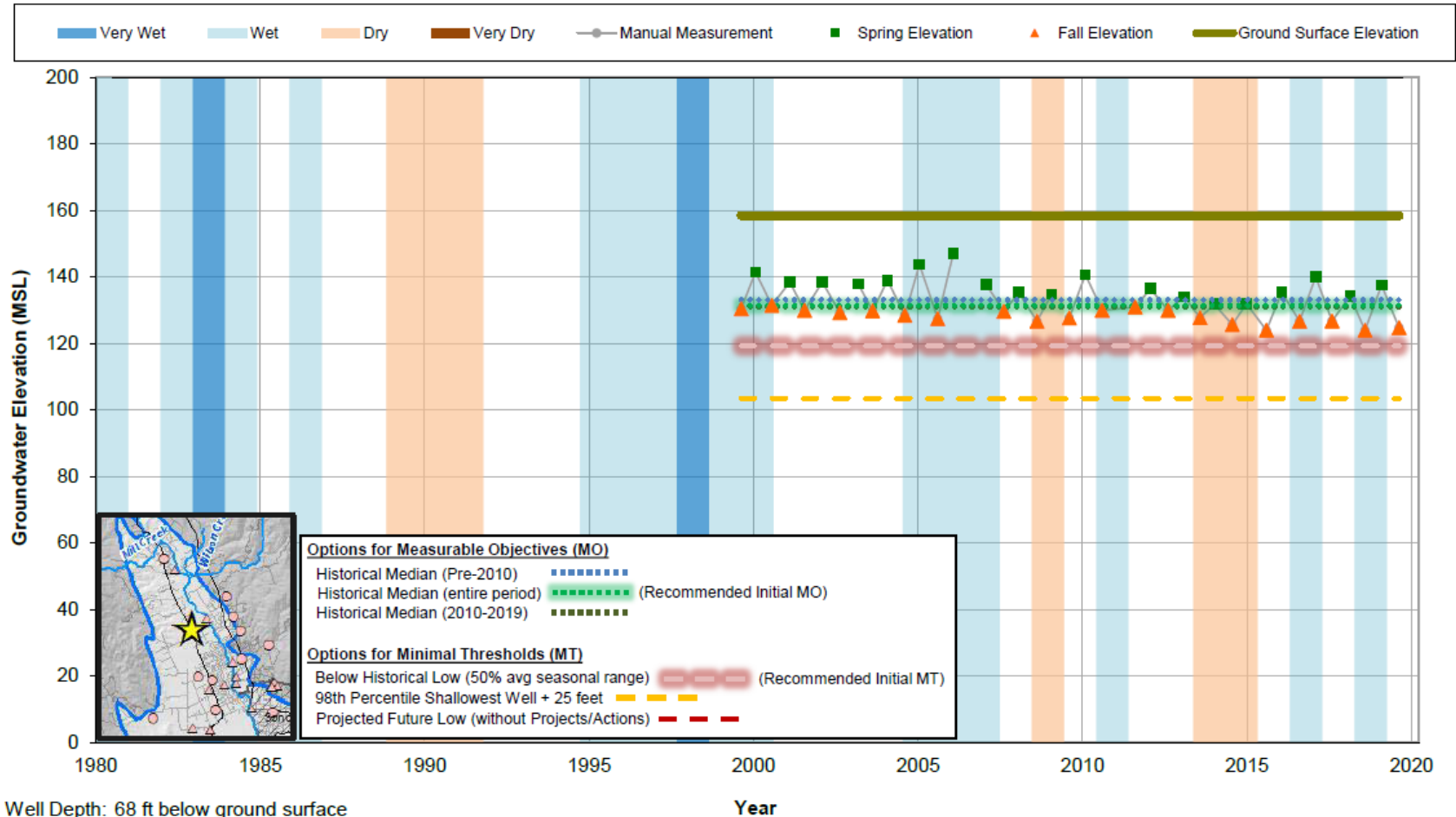
# Consider Potential Metrics for Minimum Threshold/Measurable Objective Determinations (based on initial ideas/AC input)

1. Water-supply well depths or production needs (MT)
    - 98<sup>th</sup> percentile shallowest well with operational factor
  2. Historical groundwater conditions
    - Lowest historical groundwater level (MT)
    - Some percentile of historical groundwater-levels (MO)
  3. Future projected (modeled) conditions with changing climate/demands
    - Future projected low without projects/actions (MT)
    - Future projected average with projects/actions (MO)
- *Estimated rooting depths of sensitive groundwater-dependent vegetation (shallow aquifer only – consider addressing as part of Surface Water Depletion where GDEs will be more fully evaluated)*

# Wells with Relatively Stable Long-term Groundwater-Levels



Son0069, SV-K11-01



Well Depth: 68 ft below ground surface  
 Screened Intervals: Unknown below ground surface  
 Type of Well: Domestic  
 Trend for Historical Record (ft/yr): -0.32  
 Recent Trend (ft/yr): -0.22

## Measurable Objective

### Approach

Maintain within historical observed ranges.

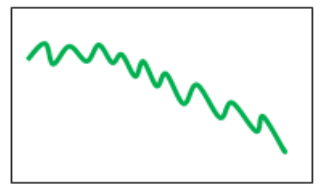
*Preliminary metric - Historical median groundwater elevation*

### Minimum Threshold Approach

Maintain near historical observed ranges while accounting for future droughts and climate variability.

*Preliminary metric - Historical low elevations minus 50% of seasonal range*

# Wells with Long-Term Declines



## Measurable Objective Approach

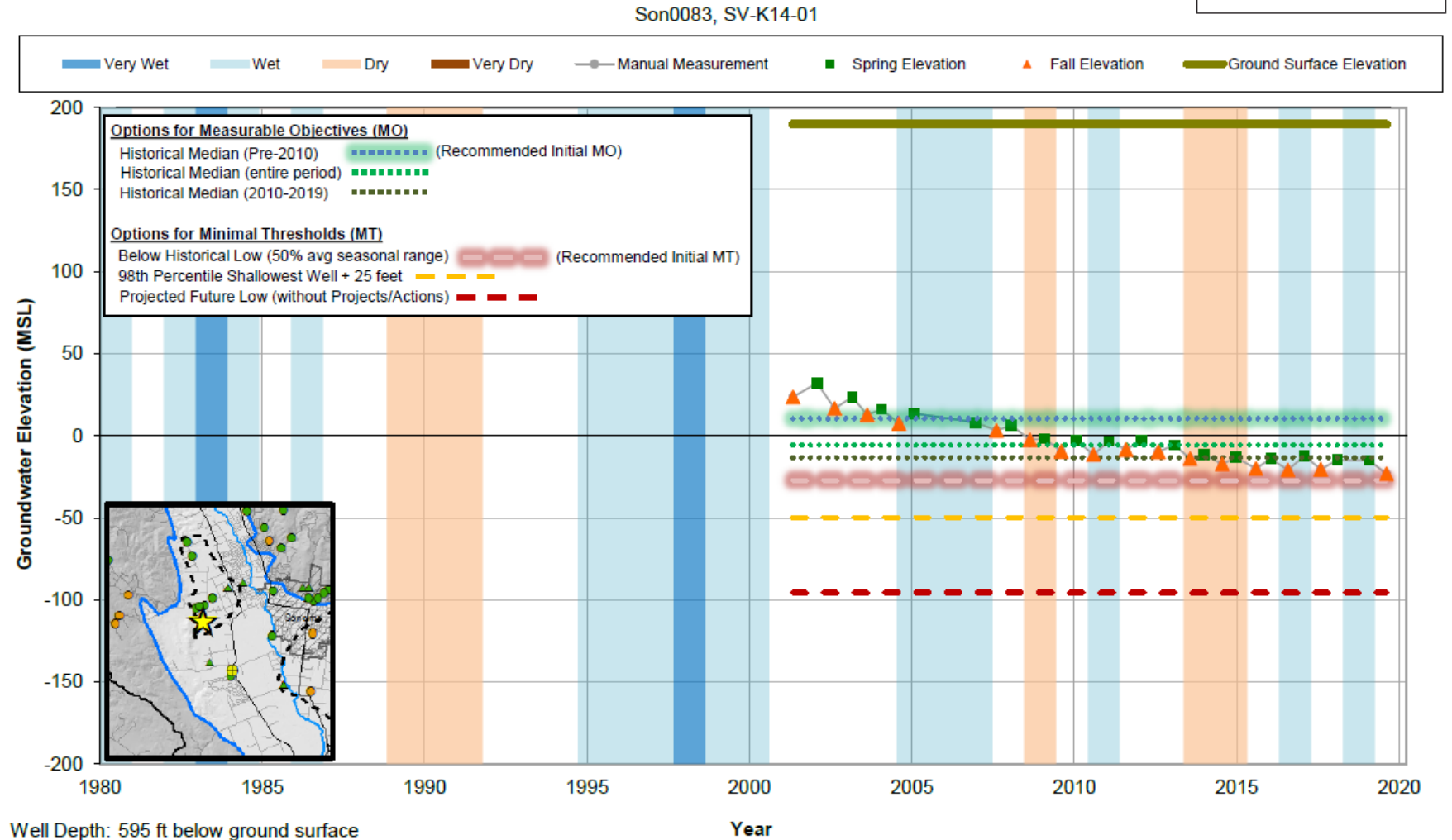
Recover groundwater-levels to historical groundwater elevations prior to 2010.

*Preliminary metric - Historical (pre-2010) median groundwater elevation*

## Minimum Threshold Approach

Maintain above historical low elevations and protect at least 98% of nearby water supply wells.

*Preliminary metric - Shallower (more protective) of historical low elevations or above the 98<sup>th</sup> percentile of nearby water supply well depths*

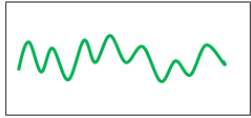


Well Depth: 595 ft below ground surface  
 Screened Intervals: 495-595 ft below ground surface  
 Type of Well: Domestic  
 Trend for Historical Record (ft/yr): -2.55  
 Recent Trend (ft/yr): -1.61

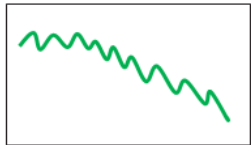


# Discussion

- **Do the two general approaches seem appropriate?**



1. For wells with stable groundwater-level trends, **maintain groundwater levels within or near historical conditions while accounting for future droughts and climate variability.**



2. For wells with historical declining trends, **stabilize and reverse the declining trends and restore groundwater-levels to pre-2010 levels.**

- **Do the considerations and preliminary metrics seem appropriate?**
  - Water Supply Well Depths
  - Historical Low Groundwater-Levels
  - Projected Future Groundwater-Levels
  - *Groundwater-Dependent Ecosystems (TBD)*

# Additional GSP-Required Considerations for Minimum Thresholds

- Is the Minimum Threshold justified and supported by available data?
- How will it be quantitatively measured?
- Affects to beneficial uses and users or land uses and property interests?
- Relationship of Minimum Thresholds to the other Sustainability Indicators?
- Affects to neighboring basins?
- Relation to relevant state, federal or local standards?

# Undesirable Results (Unacceptable Basin Condition)

- A Quantitative Description of the **combination of minimum threshold exceedances that cause significant and unreasonable effects** in the basin
- May be defined by minimum threshold exceedances at a single monitoring site, multiple monitoring sites, a portion of a basin, a management area, or an entire basin
- Must be eliminated within 20 years of GSP implementation

Avoiding Undesirable Results is how you demonstrate sustainability

# Next Steps

- Continue developing supporting data/information/materials for other Sustainability Indicators (GSP Team)
- Discuss options for defining Undesirable Results for Chronic Lowering of Groundwater Levels (AC and GSP Team – May meeting)
- Discuss options for additional Sustainability Indicators – Salt Water Intrusion, Land Surface Subsidence, Surface Water Depletion (AC and GSP Team – May and July meetings)
- Develop process for simulating potential Minimum Thresholds and Measurable Objectives using computer model (GSP Team)