

# San Pasqual Valley Groundwater Sustainability Plan (GSP) Stakeholder Workshop

Management Action No 7 – Initial Surface Water Recharge Evaluation

Task 1 – Development of Evaluation Criteria



June 8, 2022





# Stakeholder Input Format

- This is a stakeholder workshop and anyone is welcome to ask questions or provide comments
- Public comment will take place at the end of each agenda item
- Those wishing to speak should place their name and organization in the **Chat**; participants will be called on in the order received
- Follow-up comments and questions can be sent to **Staci Domasco (SDomasco@sandiego.gov)**



# Meeting Agenda

1. Welcome and Introductions
2. Scope of Initial Surface Water Recharge Evaluation
3. Potential Recharge Strategies
4. Proposed Evaluation Criteria
5. Criterion Values Activity
6. Public Comment
7. Next Steps and Closing Remarks

# San Pasqual Valley GSP Stakeholder Workshop

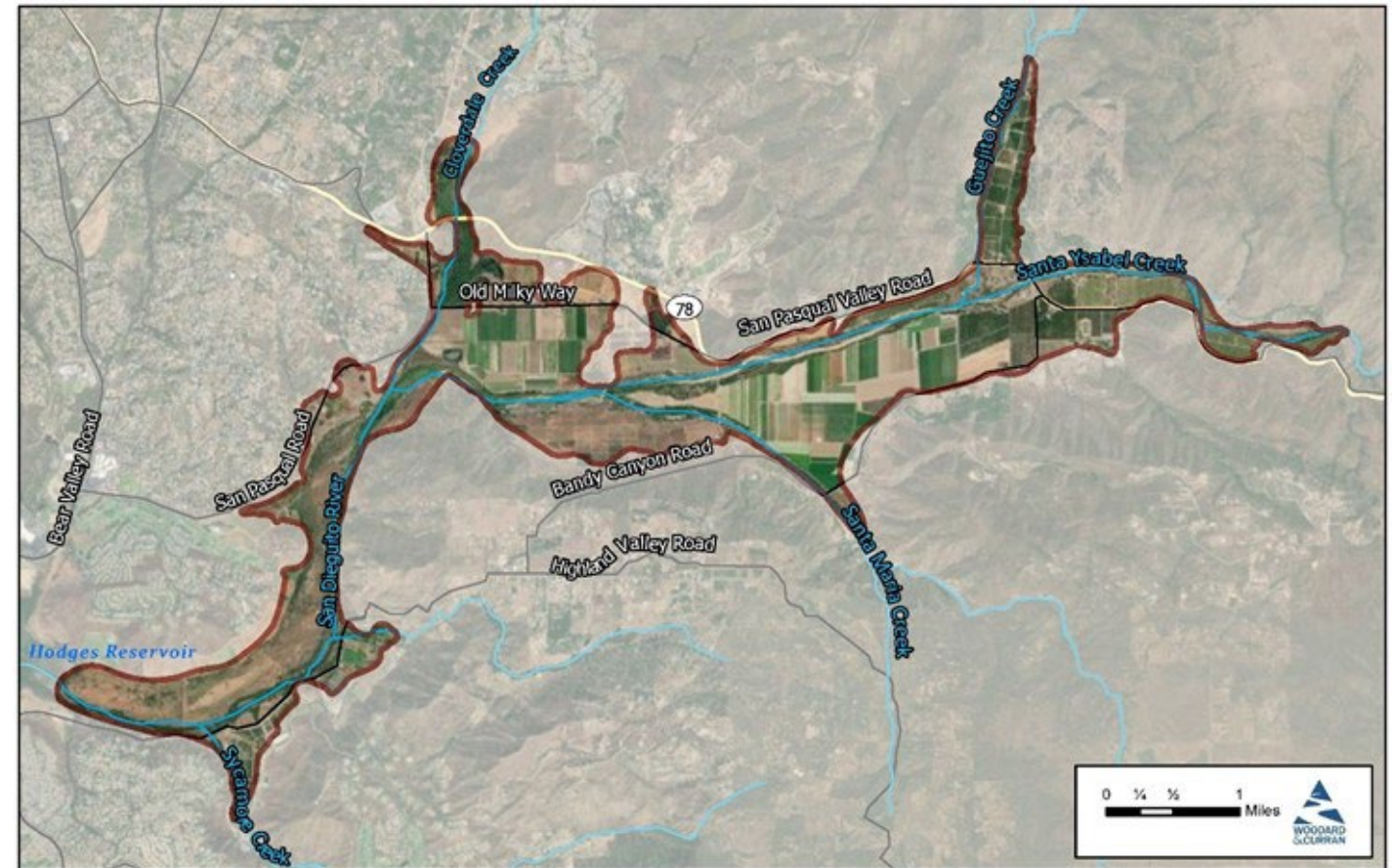
## Scope of Initial Surface Water Recharge Evaluation



A *Preliminary Feasibility Study* will be developed to summarize surface water recharge opportunities in San Pasqual Valley.

The *Preliminary Feasibility Study* will include the following sections:

- Evaluation Criteria and Ranking Process (**Task 1**)
- Streambed Investigation (**Task 2**)
- Water Sources for Recharge (**Task 3**)
- Potential Recharge Strategies (**Task 4**)
- Modeling Approach and Results (**Task 5**)
- Potential Benefits to GDEs (**Task 6**)





# Surface Water Recharge Evaluation

| Scope Task                                       |  | 2022 |     |     |     |     |     |     |     |     |     |     |     | 2023 |     |     |     |     |     |     |     |     |     |     |     | 2024 |  |
|--|--|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|--|
|  |  | Mar  | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar  | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb |      |  |
| <b>Planning and Management Action No. 7</b>      |  |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |     |     |     |     |     |     |     |     |      |  |
| <b>Initial Surface Water Recharge Evaluation</b> |  |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |     |     |     |     |     |     |     |     |      |  |
| <i>Task 1</i>                                    | <i>Development of Evaluation Criteria</i>              |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |     |     |     |     |     |     |     |     |      |  |
|  | Develop draft evaluation criteria and scoring          |      |     |     | Δ   |     |     |     |     |     |     |     |     |      |     |     |     |     |     |     |     |     |     |     |     |      |  |
| <i>Task 2</i>                                    | <i>Reevaluate Streambed Characteristics</i>            |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |     |     |     |     |     |     |     |     |      |  |
|  | Oversee streambed infiltration testing at 15 locations |      |     |     |     |     |     | Δ   |     |     |     |     |     |      |     |     |     |     |     |     |     |     |     |     |     |      |  |
| <i>Task 3</i>                                    | <i>Water Sources for Potential Recharge Projects</i>   |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |     |     |     |     |     |     |     |     |      |  |
|  | Evaluate reservoir operations                          |      |     |     |     |     |     | Δ   |     |     |     |     |     |      |     |     |     |     |     |     |     |     |     |     |     |      |  |
| <i>Task 4</i>                                    | <i>Potential Recharge Strategies</i>                   |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |     |     |     |     |     |     |     |     |      |  |
|  | Develop potential recharge strategies                  |      |     |     |     |     |     |     |     |     |     |     | Δ   |      |     |     |     |     |     |     |     |     |     |     |     |      |  |
| <i>Task 5</i>                                    | <i>Model Simulations</i>                               |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |     |     |     |     |     |     |     |     |      |  |
|  | Conduct SPV GSP Model simulations                      |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |     |     |     |     |     |     |     |     |      |  |
| <i>Task 6</i>                                    | <i>Evaluate Benefits to GDEs</i>                       |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |     |     |     |     |     |     |     |     |      |  |
|  | Assessment of GDE benefits for recharge alternatives   |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |     |     |     |     |     |     |     |     |      |  |
| <i>Task 7</i>                                    | <i>Preliminary Feasibility Study Report</i>            |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |     |     |     |     |     |     |     |     |      |  |
|  | Prepare draft Feasibility Study Report                 |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |     |     |     |     |     |     |     |     |      |  |
|  | Public Review (45 days)                                |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |     |     |     |     |     |     |     |     |      |  |
|  | Revised Feasibility Study + Responses (30 days)        |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |     |     |     |     |     |     |     |     |      |  |
|  | Prepare final Feasibility Study Report                 |      |     |     |     |     |     |     |     |     |     |     |     |      |     |     |     |     |     |     |     |     |     |     |     |      |  |

Δ Stakeholder Workshop

# San Pasqual Valley GSP Stakeholder Workshop

## Potential Recharge Strategies



- Surface Water Recharge Evaluation will consider up to four strategies, which may include:
  1. Forecast-informed, preemptive releases from Sutherland Reservoir
  2. Stormwater detention in small drainages
  3. Check dams in selected tributary creeks
  4. Stream channel modifications to increase infiltration capacity
- Strategies will be defined in more detail in **Task 4** (Potential Recharge Strategies)
- Concepts are presented here to support development of evaluation criteria and metrics





## Strategy 1: Forecast-informed Releases from Sutherland Reservoir

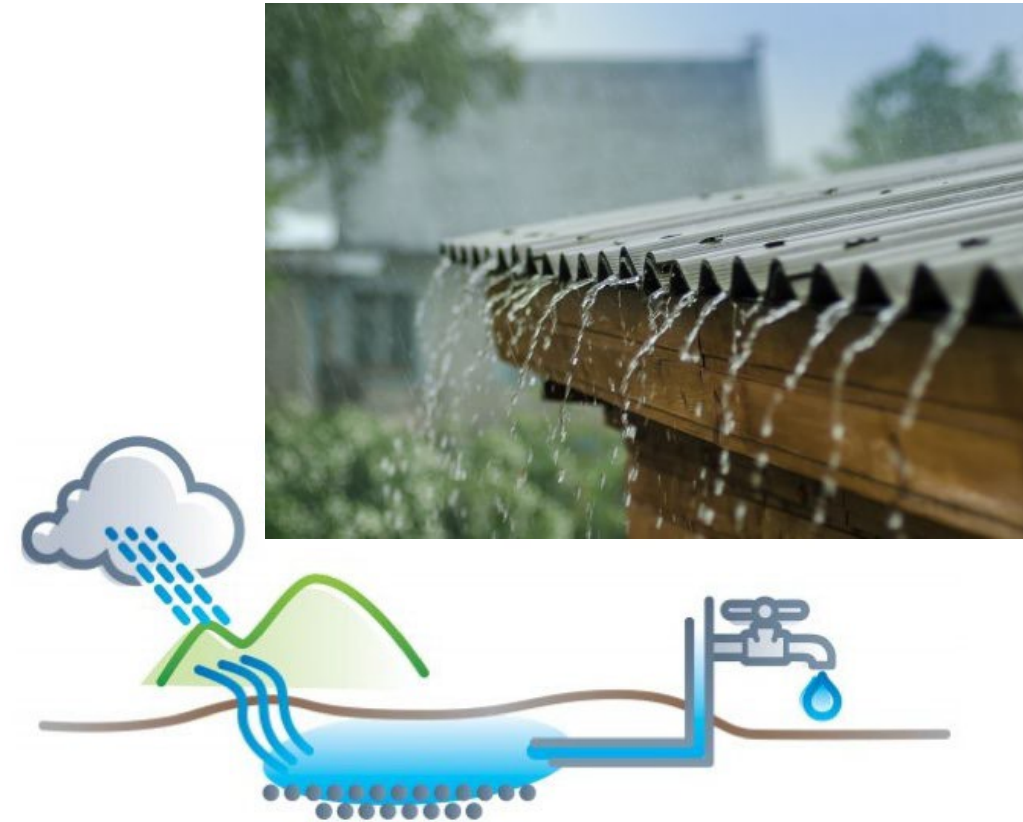
- Proposes tracking and adjusting the timing and quantity of releases from Sutherland Reservoir
- May use FIRO (Forecast Informed Reservoir Operations) to track and forecast large storm events
- Capture larger surpluses of storm flow with timed releases to maximize opportunity for groundwater (GW) recharge



- DEFINED BY: evaluating historical data & simulations on Sutherland Reservoir operations & releases, considering possibility of FIRO approach, should this strategy be retained for further evaluation

## Strategy 2: Stormwater Detention in Small Drainages

- Retain water from peak flow events downgradient from small drainages
  - Extended releases from upgradient areas could potentially improve GW availability in downgradient areas of Basin
  - Developing subcatchments to pool excess stormwater would improve stormwater management & allow more surface area for GW recharge
- DEFINED BY: evaluating stormwater flows at suitable locations for detention structures and subcatchments



## Strategy 3: Check Dams in Selected Tributary Creeks

- Check dams constructed in selected creeks would decrease flow velocity during storm events
- Would provide more opportunity for surface water infiltration
- Utilizes monitoring data (USGS) stream gauges during low flow and peak flow events



- DEFINED BY: evaluating streamflow at USGS stream gages and evaluating potential benefits from increased surface water retention in upgradient areas of Basin and **SPV GSP Model\*** domain

\*Integrated Groundwater/Surface Water Flow Model used to support development of the SPV GSP

## Strategy 4: Stream Channel Modifications to Increase Infiltration

- Channel scouring
- Replacing lower permeability streambed materials with higher permeability sands & gravels to encourage recharge
- Slowing streamflow
- Widening and/or extending meanders



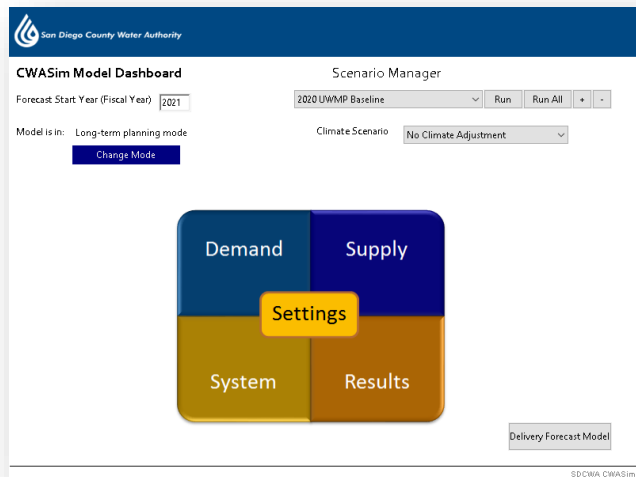
- DEFINED BY: evaluating streamflow at USGS stream gages, information acquired from **Task 2** (Streambed Investigation), and an updated version of SPV GSP Model

# San Pasqual Valley GSP Stakeholder Workshop

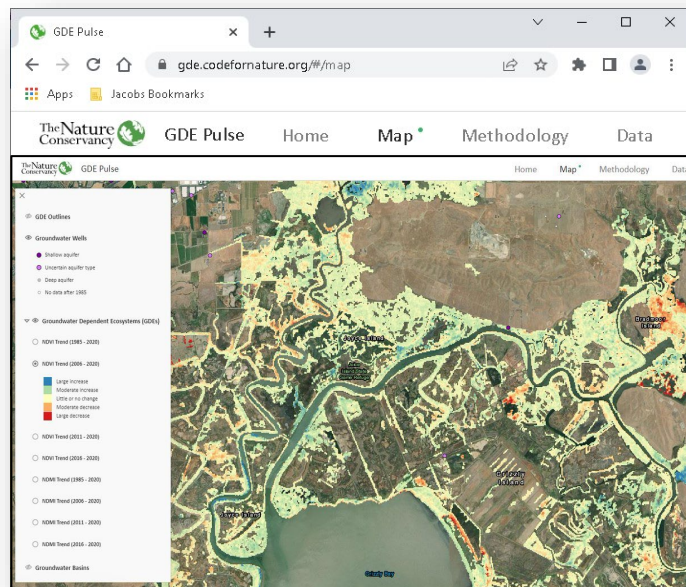
## Proposed Evaluation Criteria



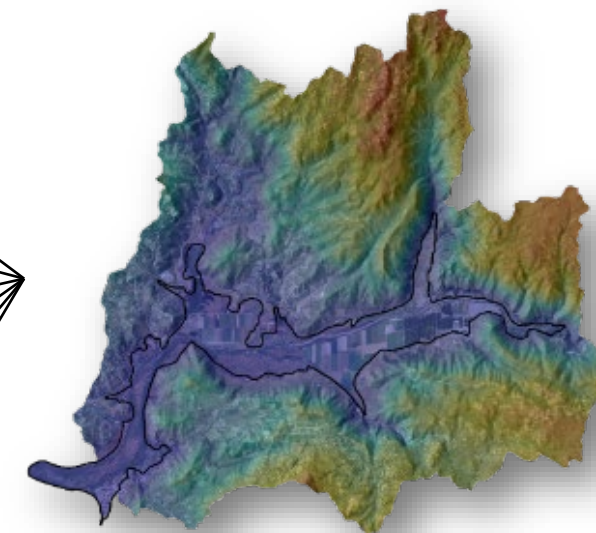
## CWASim



## GDE Pulse



## SPV GSP Model



**Criterion 1:** Reduction of Modeled Deficit in Cumulative GW Storage

**Criterion 2:** Maintenance of Shallower GW Levels in the Basin

**Criterion 3:** Reduction of Projected GW Levels Below MTs

**Criterion 4:** Efficiency of Recharge

**Criterion 5:** Improvements in GW Quality

**Criterion 6:** Benefits to GDEs

**Criterion 7:** Cost of Implementation & Maintenance

**Criterion 8:** Feasibility of Implementation and Maintenance



**Forced Rank** – when range of values are distributed along similar scale

e.g., 1 = smallest, 4 = largest

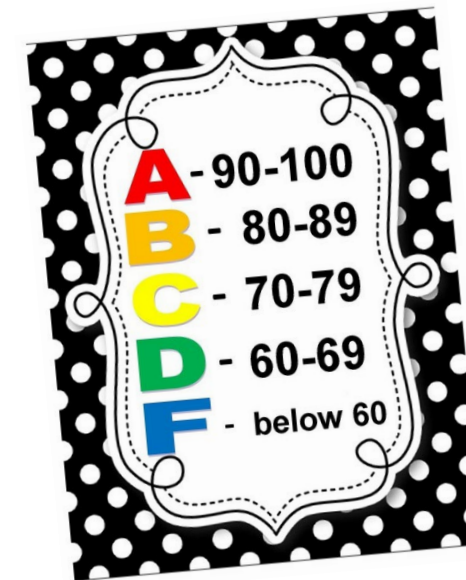
*Think Russian Nesting Dolls*



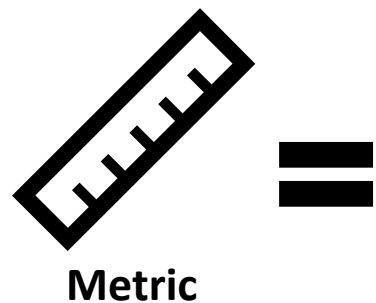
**Category Rank** – when range of values varies widely

e.g., 1 for <500 AFY, 2 for 500 – 1,000 AFY, etc.

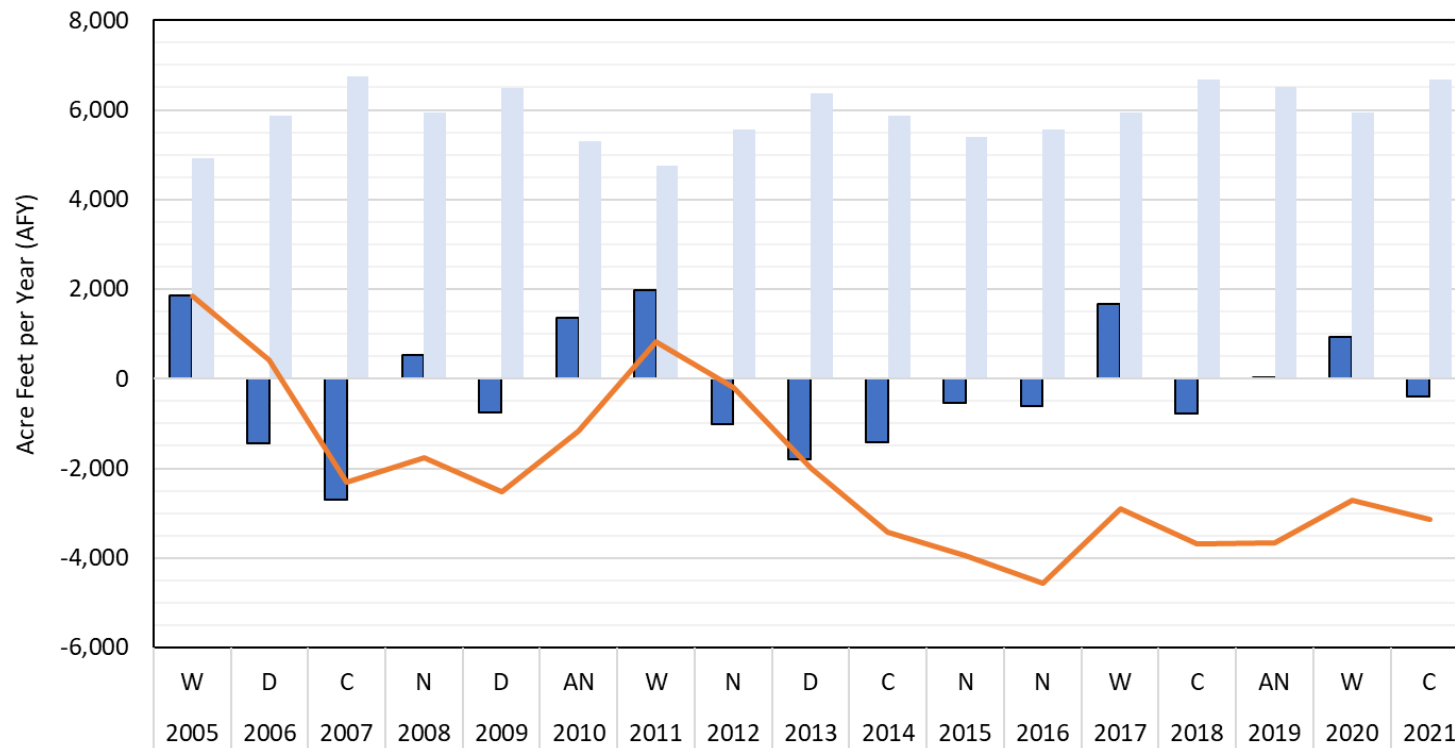
*Think letter grades in school*



# 1. Reduction of Modeled Deficit in Cumulative Storage



Cumulative change in GW storage

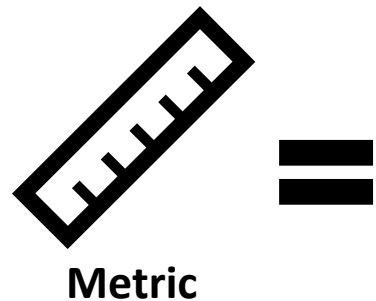


■ Annual Change in Groundwater Storage  
■ Annual Groundwater Use  
— Cumulative Change in Storage

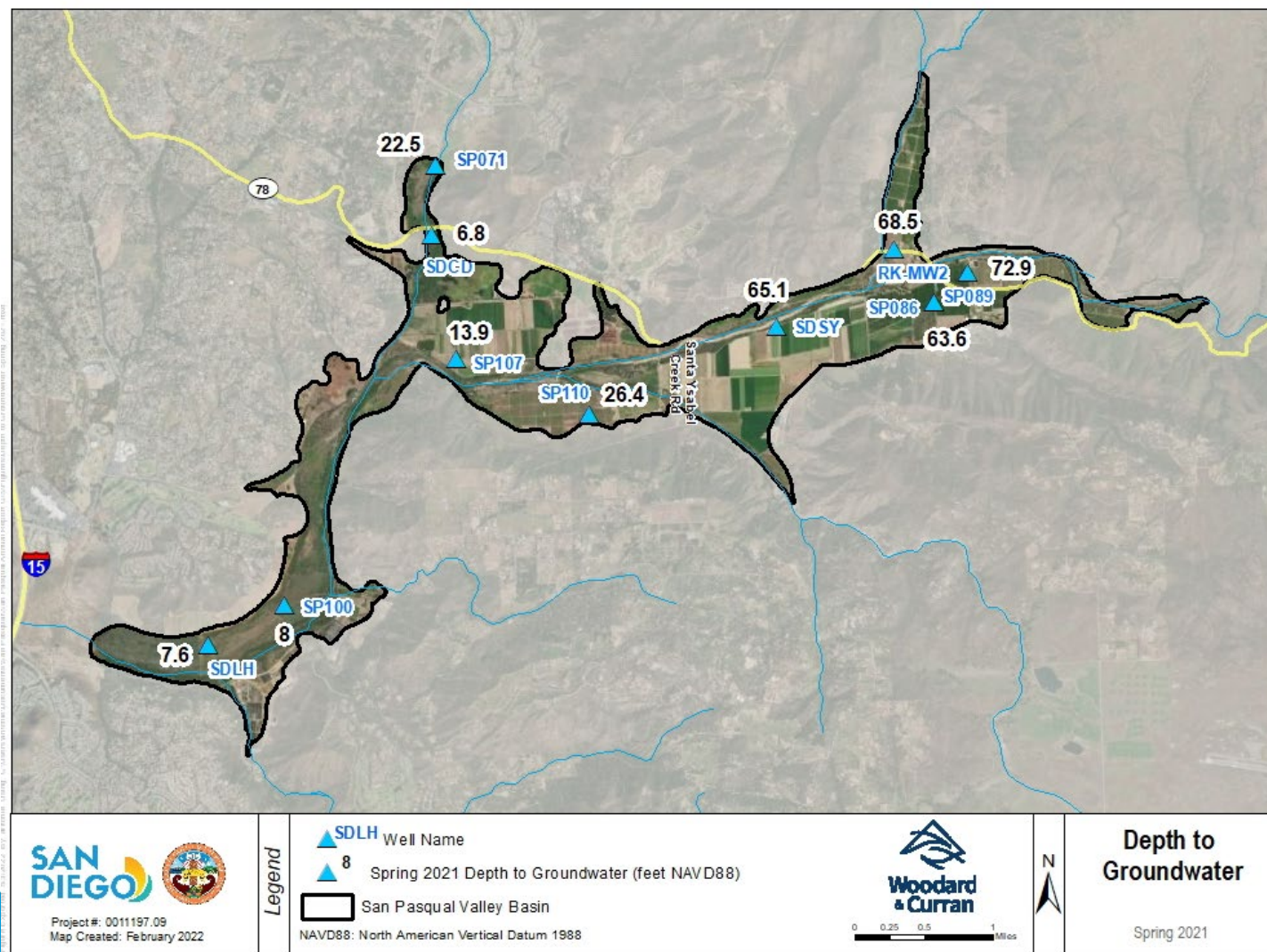
Water Year Types:  
 W—Wet  
 AN—Above normal  
 N—Normal  
 D—Dry  
 C—Critically dry



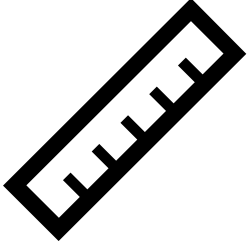
# 2. Maintenance of Shallower Groundwater Levels

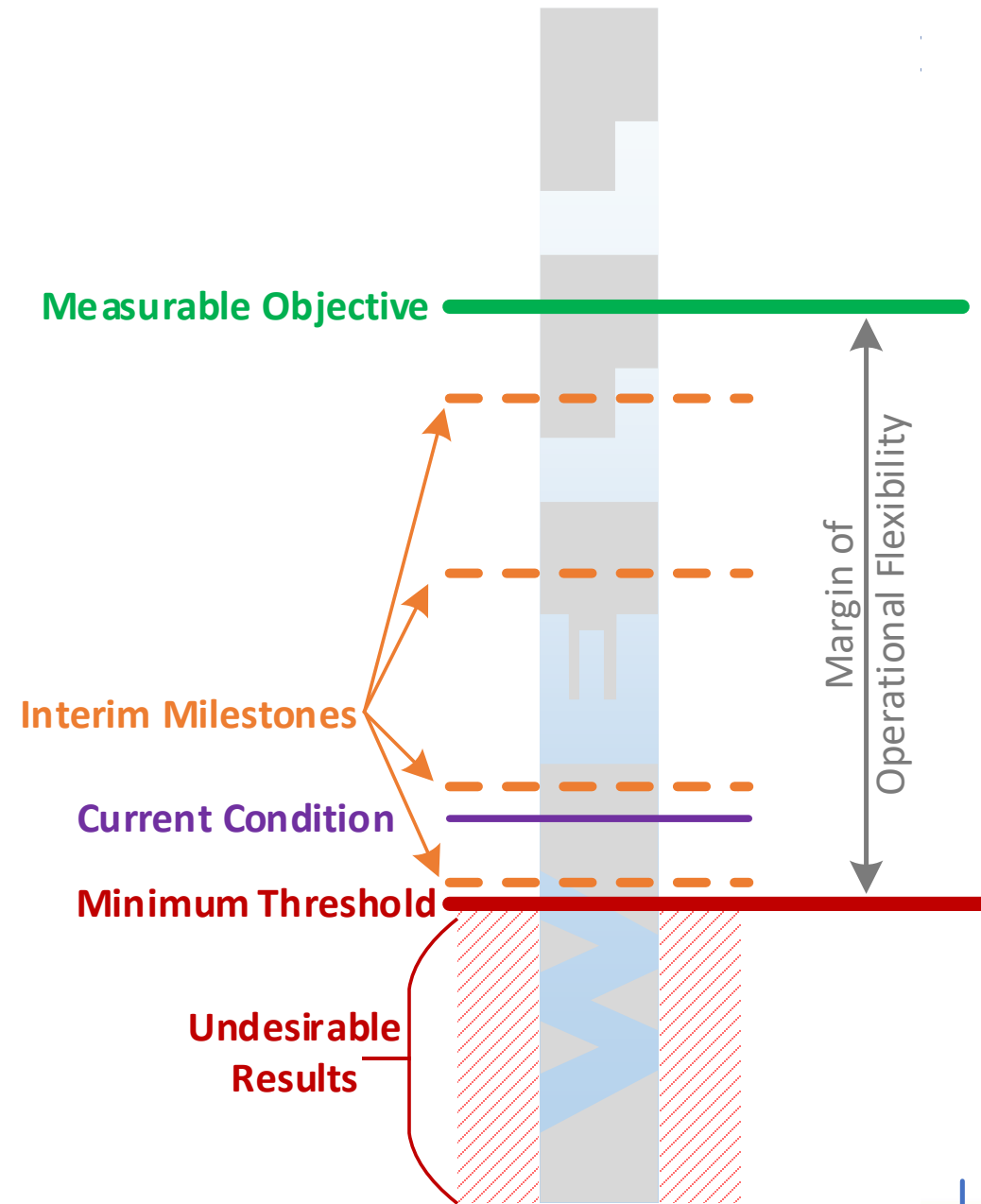


Depth to GW at representative monitoring wells

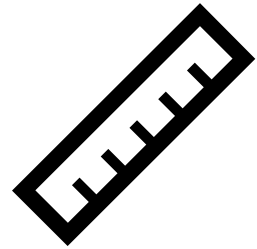


# 3. Reduction of Projected Groundwater Declines to MTs

 = Avoidance of GW levels below MTs  
Metric



# 4. Efficiency of Recharge



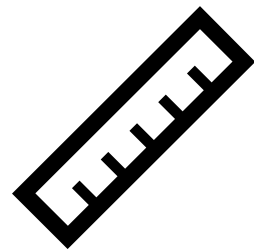
Metric



Ratio of cumulative change in  
GW storage (CCGS) to cumulative  
volume of surface water (CVSW)  
used for recharge



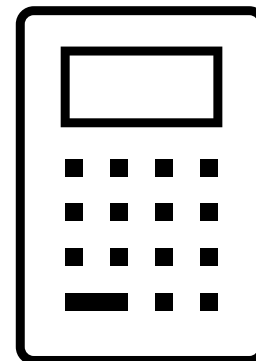
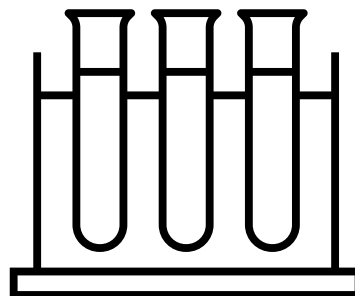
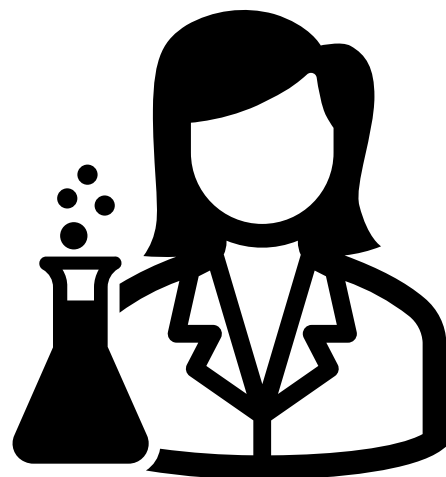
# 5. Improvements in Groundwater Quality



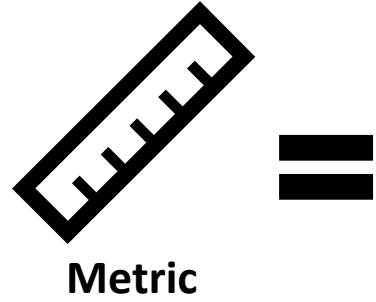
Metric



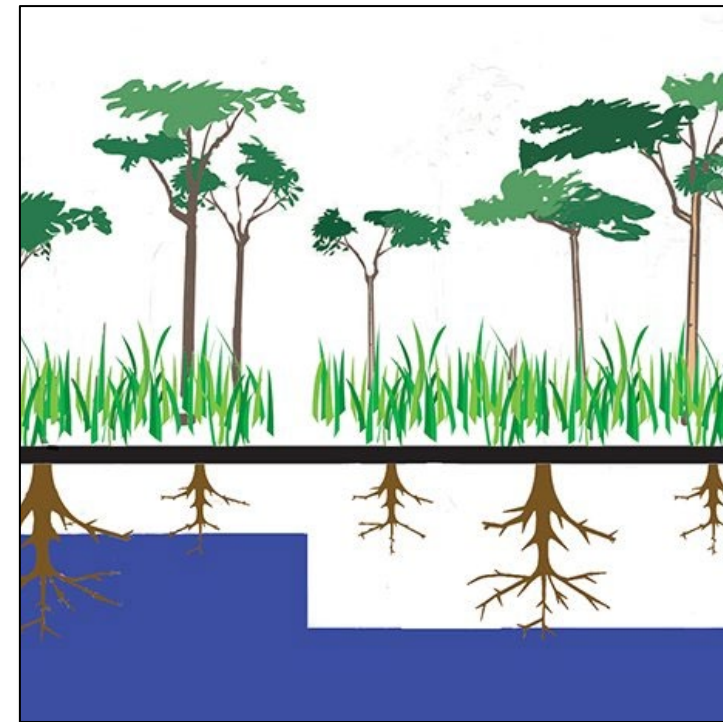
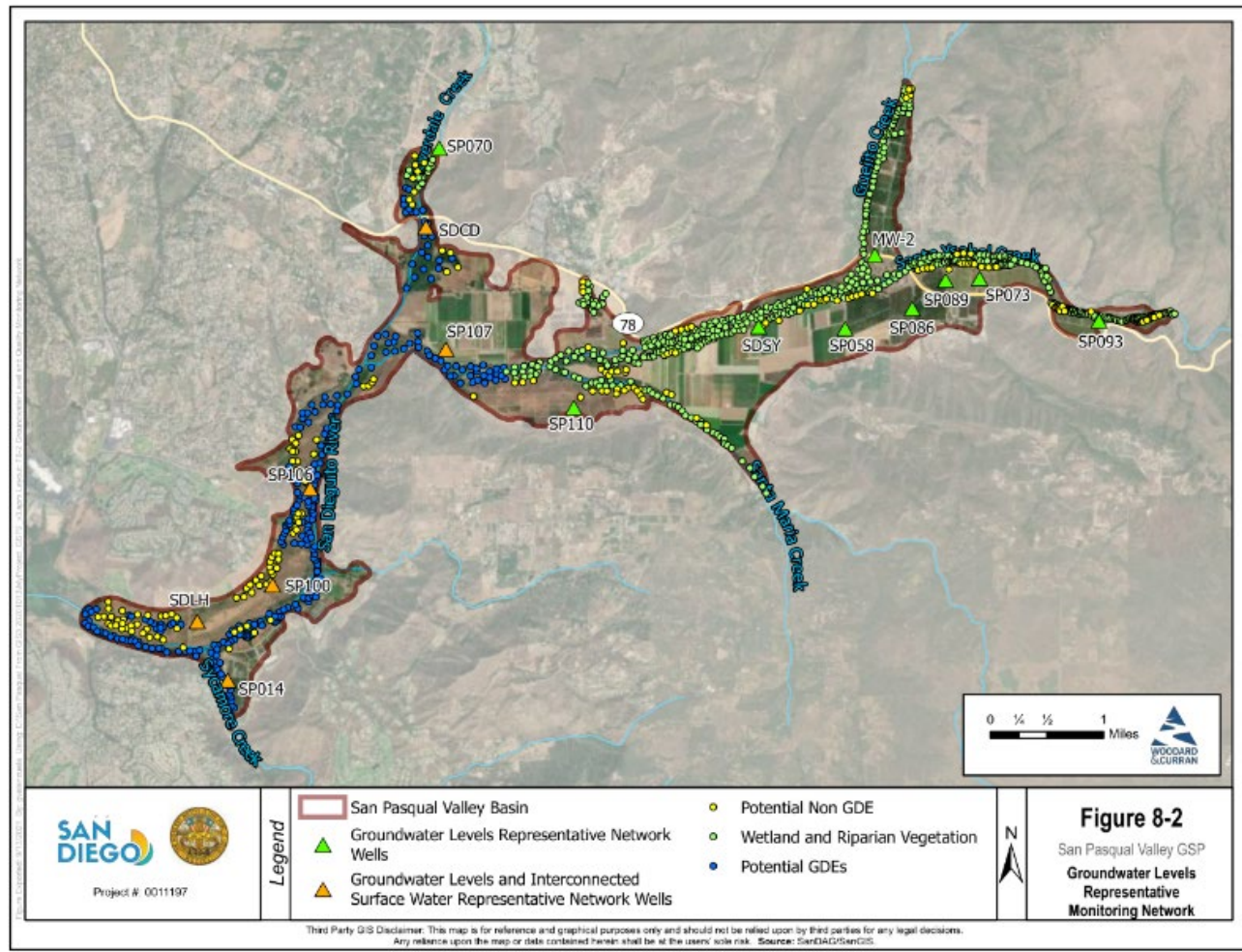
Flow-weighted average concentration of total dissolved solids (TDS) and nitrate as nitrogen (NO<sub>3</sub>-N) in Basin



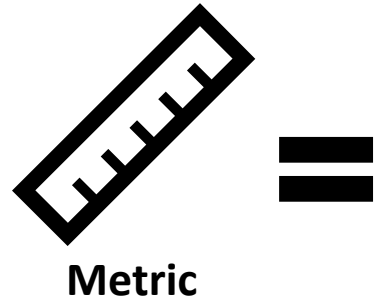
# 6. Potential Benefits to GDEs



Depth to GW at representative monitoring wells compared to rooting depth of GDEs

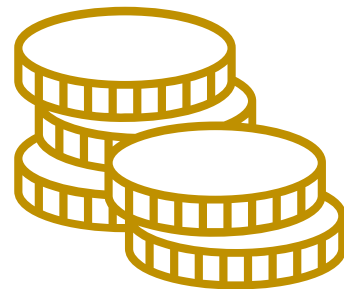


# 7. Cost of Implementation and Maintenance

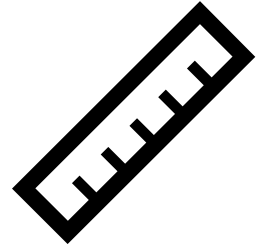


=

Estimated unit cost (per acre-foot)  
of capital and O&M



# 8. Feasibility of Implementation and Maintenance



Metric



Qualitative assessment of feasibility



- Number and difficulty of permits
- Institutional challenges
- Schedule / timeline

# San Pasqual Valley GSP Stakeholder Workshop

## Criterion Values Activity





- We want to know what is important to you!
- Please click on the link in the CHAT to access Menti

Mentimeter

## Instructions

Go to  
**[www.menti.com](https://www.menti.com)**

Enter the code  
**1316 5271**



Or use QR code

# San Pasqual Valley GSP Stakeholder Workshop

## PUBLIC COMMENT



# San Pasqual Valley GSP Stakeholder Workshop

## NEXT STEPS & CLOSING REMARKS



## Status of Management Action (MA) Implementation:

- **MA 3** – Support Water Quality Improvement Plan (WQIP) Actions – *Continuous*
- **MA 4** – Coordinate/Collaborate Regionally with Other Entities to Perform Monitoring & Implement Regional Projects – *Continuous*
- **MA 5** – Education & Outreach for TDS & Nitrate – *Underway!*
- **MA 6** – Coordinate with City on Hodges Watershed Improvement Project – *Continuous*
- **MA 7** – Initial Surface Water Recharge Evaluation – *Underway!*
- **MA 8** – Study GDEs\*, Phase I Desktop Study – *Planned for 2022*

\*GDEs = Groundwater Dependent Ecosystems

Fieldwork is planned at five transect locations, as follows:

- Stream channel surveying
- Streambed infiltration testing
- Photographic surveys after selected rainfall events

### Infiltration Testing at 3 Points Along Each Stream Profile

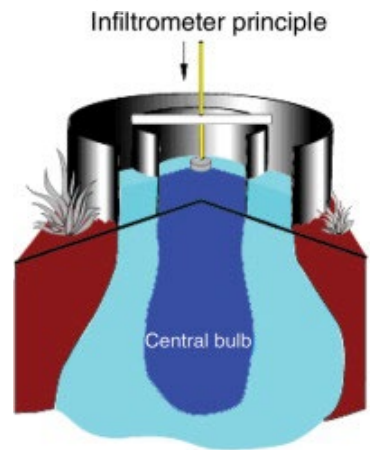
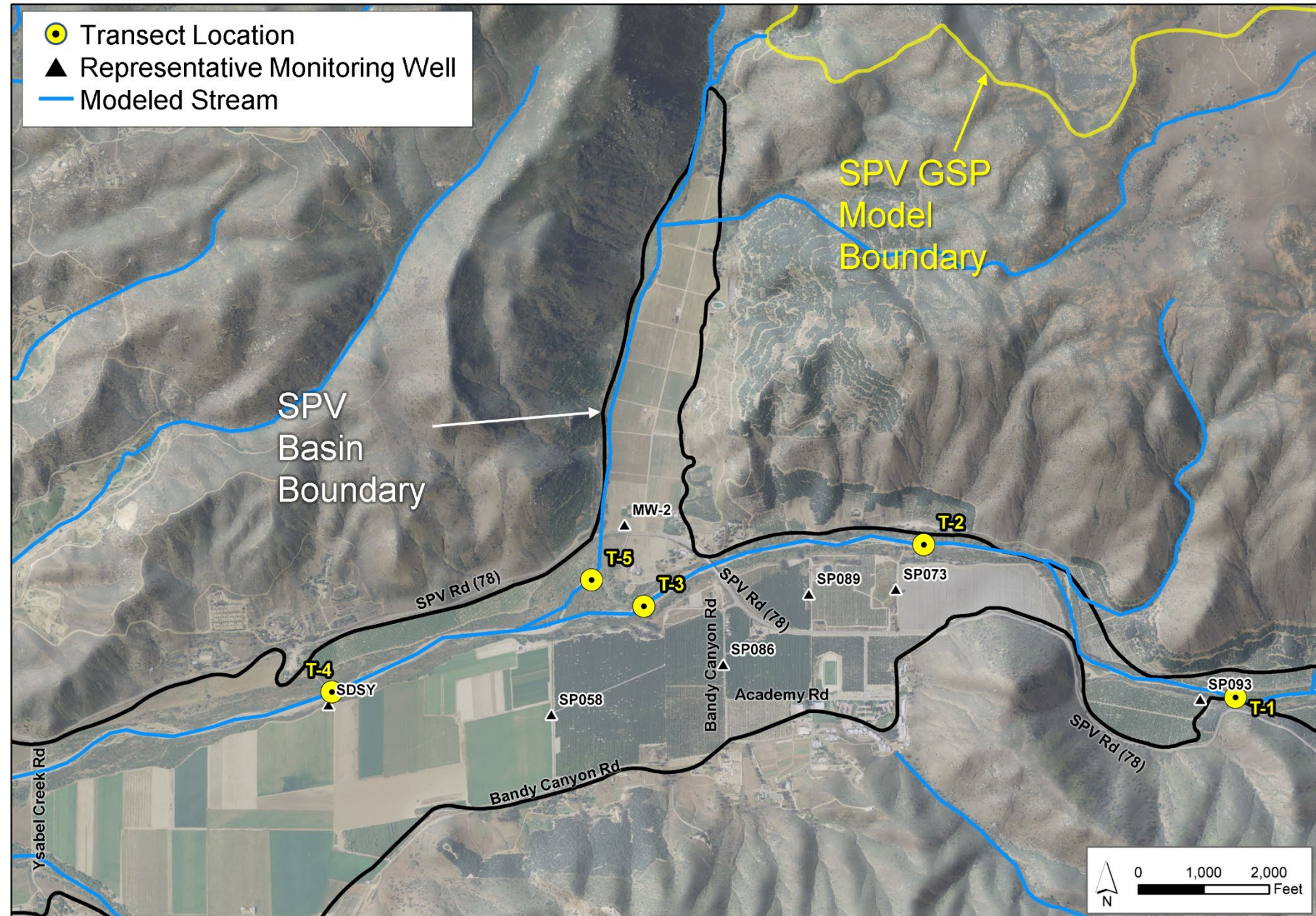


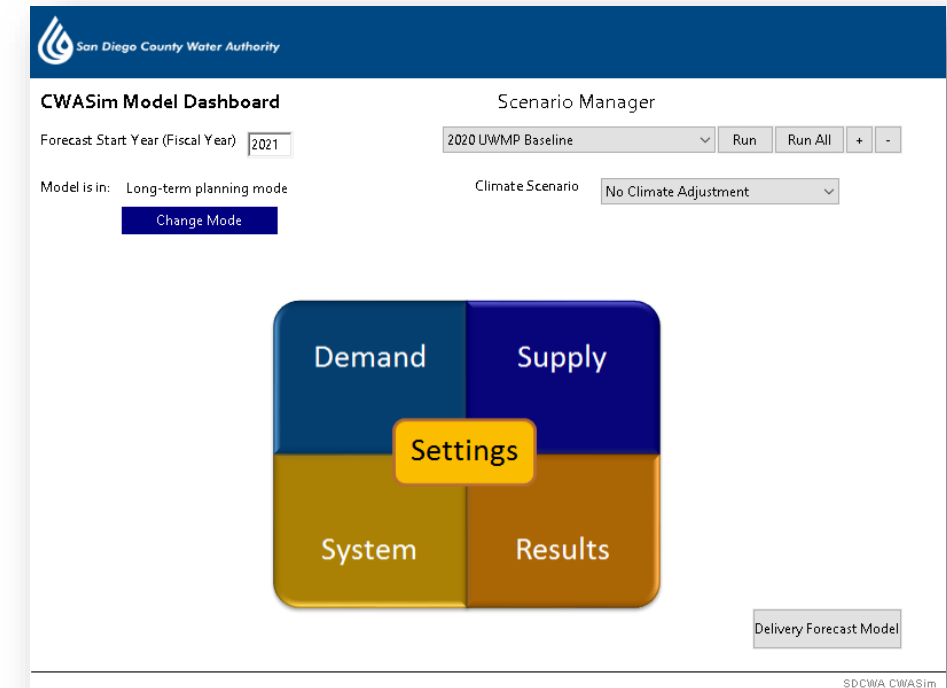
Image Source  
<https://www.sciencedirect.com/topics/earth-and-planetary-sciences/infiltrometer>

### Surveyed Points Along Each Transect



- Assess releases from Sutherland Reservoir and stormwater runoff within the Basin at daily time scales
- Use CWASim as the foundation for the surface reservoir and hydrology
- Consider Sutherland Reservoir operational rules, existing commitments/agreements, and priority setting

## CWASim



- San Pasqual Valley GSP Website
  - <https://www.sandiegocounty.gov/content/sdc/pds/SGMA/san-pasqual-valley.html>
- San Pasqual Valley GSP
  - <https://sgma.water.ca.gov/portal/gsp/preview/75>
- Annual Report for Water Years 2020 and 2021
  - <https://sgma.water.ca.gov/portal/gspar/preview/140>
- San Pasqual Valley GSP Data Management System (Opti)
  - <https://opti.woodardcurran.com/sanpasqual/login.php>



# Next Stakeholder Workshop

- PMA No 7 - Initial Surface Water Recharge Evaluation
  - Task 2 Technical Memo on stream investigations
  - Task 3 Technical Memo on water sources

Save the date:  
Thursday September 22, 2022  
at 1-3pm



# San Pasqual Valley GSP Stakeholder Workshop

## BACK UP SLIDES

