

# San Pasqual Valley Groundwater Basin Sustainable Groundwater Management Act Technical Peer Review Meeting

Numerical Model Update  
Monitoring Networks  
Sustainable Management Criteria



October 8, 2020

Draft Work Product

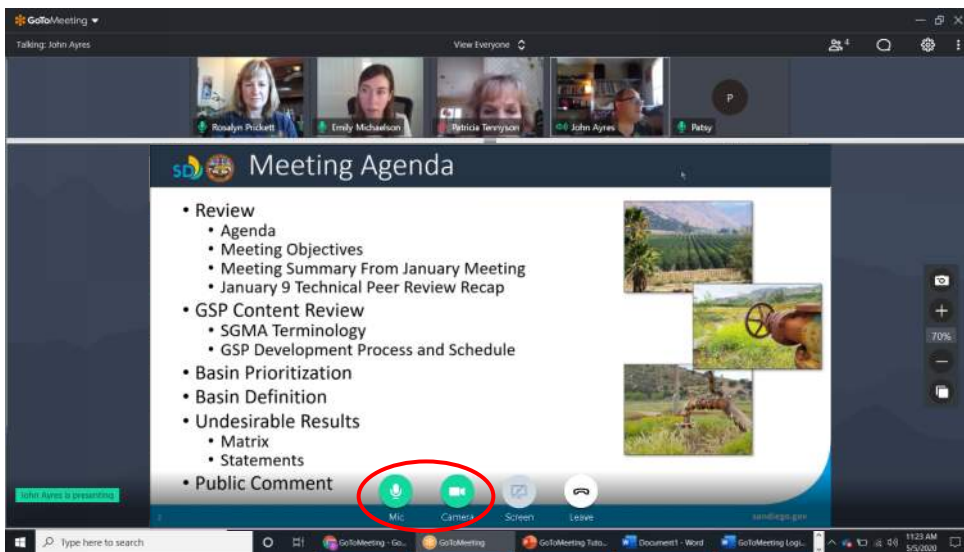


1

1

## GoToMeeting – Quick How To

• Your screen should look like this:



- Turn on/off your Mic (mute) and Camera (video) using the controls along the bottom
- During the meeting, you may need to wiggle your mouse to make the controls appear

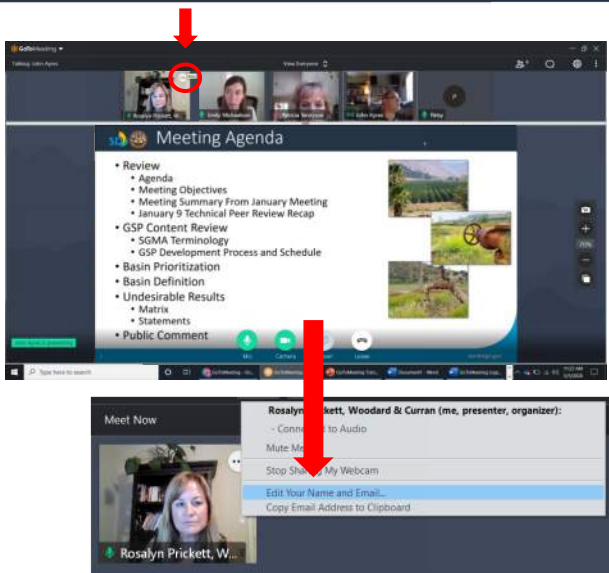
2

Draft Work Product

sandiego.gov

2

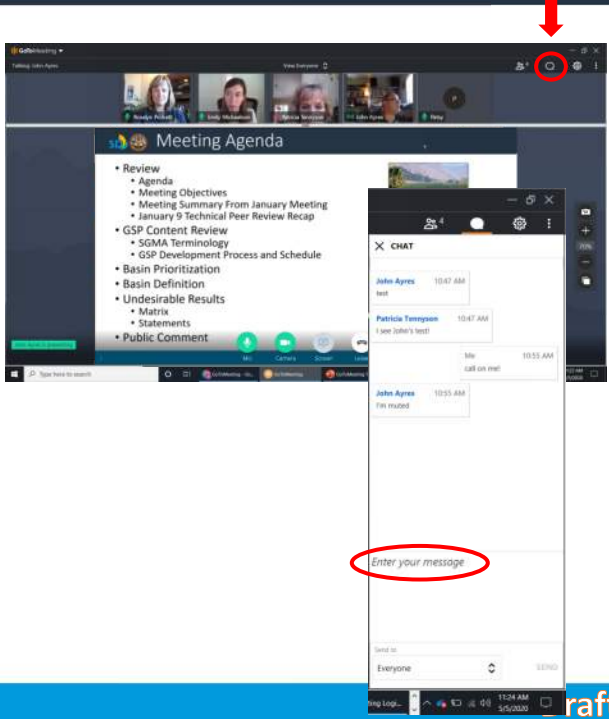
# GoToMeeting – Please Enter Your Name



- Please identify yourself with your full name and organization
- Hover over your photo and click on the 3 dots, then *Edit Your Name and Email*
  - TPR members – please include “TPR – Name, Entity”
  - AC members – please include “AC – Name, Entity”
  - All other participants – please include “Name, Entity”

3

# GoToMeeting – How to Comment



- Our facilitator will mute everyone at the beginning of the meeting
- Let us know you have a comment or question by clicking the **Chat** icon in the top right
  - Click on *Enter your message*, type your name and organization and hit SEND
- Wait until our facilitator calls on you:
  - Our facilitator will unmute you to relay your question or comment
  - Please also check your phone/computer to make sure you’re not muted there too

4

# San Pasqual Valley GSP Technical Peer Review Meeting

## REVIEW

5

Draft Work Product



5

### SD Meeting Agenda

1. Roll Call and Introductions
2. Review
  - Agenda
  - Meeting Objectives
  - Meeting Summary
  - Comments Received
  - Public Comment Format
3. Technical Input on Approach
  - Groundwater Model
  - Projects and Management Actions
  - Management Areas
4. Preliminary Analysis Results
  - Groundwater Model
5. Refined Analysis
  - Groundwater Model
6. Field Program Update
7. Public Comments
8. Next Steps & Closing Remarks



6

Draft Work Product

sandiego.gov

6



## Meeting Objectives, Summary, and Comments Received

- Meeting Objectives
  - Share and discuss modeling approach, progress, and updates
  - Share and discuss draft projects and management actions
- Meeting Summary
  - See Handout 1
- Summary of Comments Received
  - See Handout 2

7

Draft Work Product

sandiego.gov

7



## Updated Public Comment Format

- All public comment will be summarized in the meeting summary
- Those wishing to comment should place their name and organization in the **Chat**; participants will be called on in the order received
- Public comment will take place at the conclusion of all TPR discussion; members of the Core Team and the TPR will not engage in dialogue with those making public comment
- If TPR or AC members have responses to public comment, they should be e-mailed to Sandra Carlson
- Any comments or concerns made between meetings must be directed to Sandra Carlson; please do not reply-all to the TPR group

8

Draft Work Product

sandiego.gov

8

# San Pasqual Valley GSP Technical Peer Review Meeting

## TPR COMMENT REVIEW

9

Draft Work Product



The City of  
**SAN  
DIEGO**

9



### TPR Comments Received - Overview

1. Discussion about nitrate and TDS levels and potential sources
  1. Summaries of subsequent communication included in minutes
2. Basin characterization model's runoff bias – discussed in detail today
3. GDE location support, shallow groundwater, small map corrections
4. Comments provided that were used to improve accuracy of the well to parcel map and land use maps

10

Draft Work Product

sandiego.gov

10

San Pasqual Valley GSP  
Technical Peer Review Meeting  
**TPR COMMENT REVIEW**  
**AC COMMENTS**

11

Draft Work Product



11

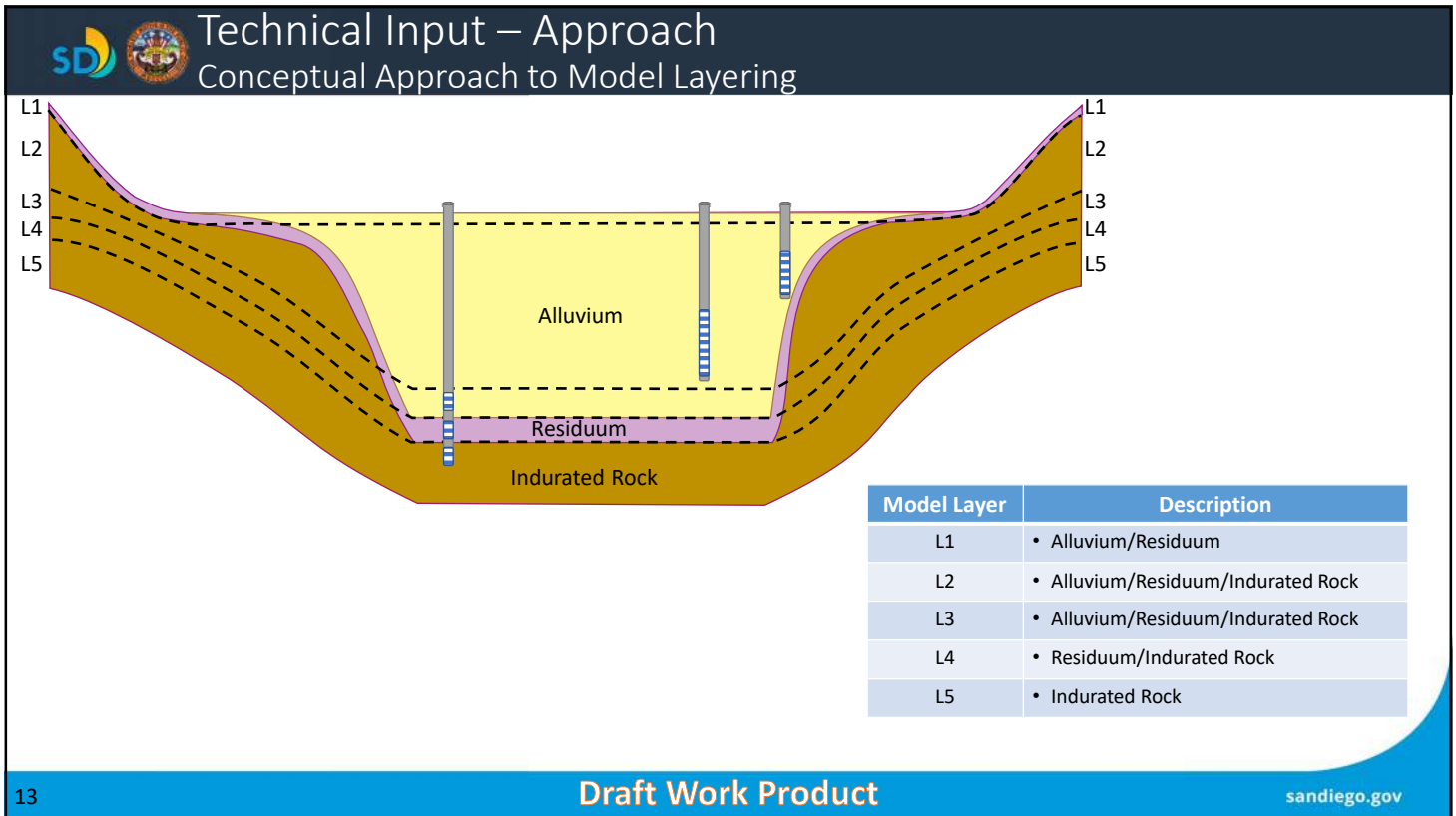
San Pasqual Valley GSP  
Technical Peer Review Meeting  
**TECHNICAL INPUT – APPROACH**  
**Groundwater Model**

12

Draft Work Product



12

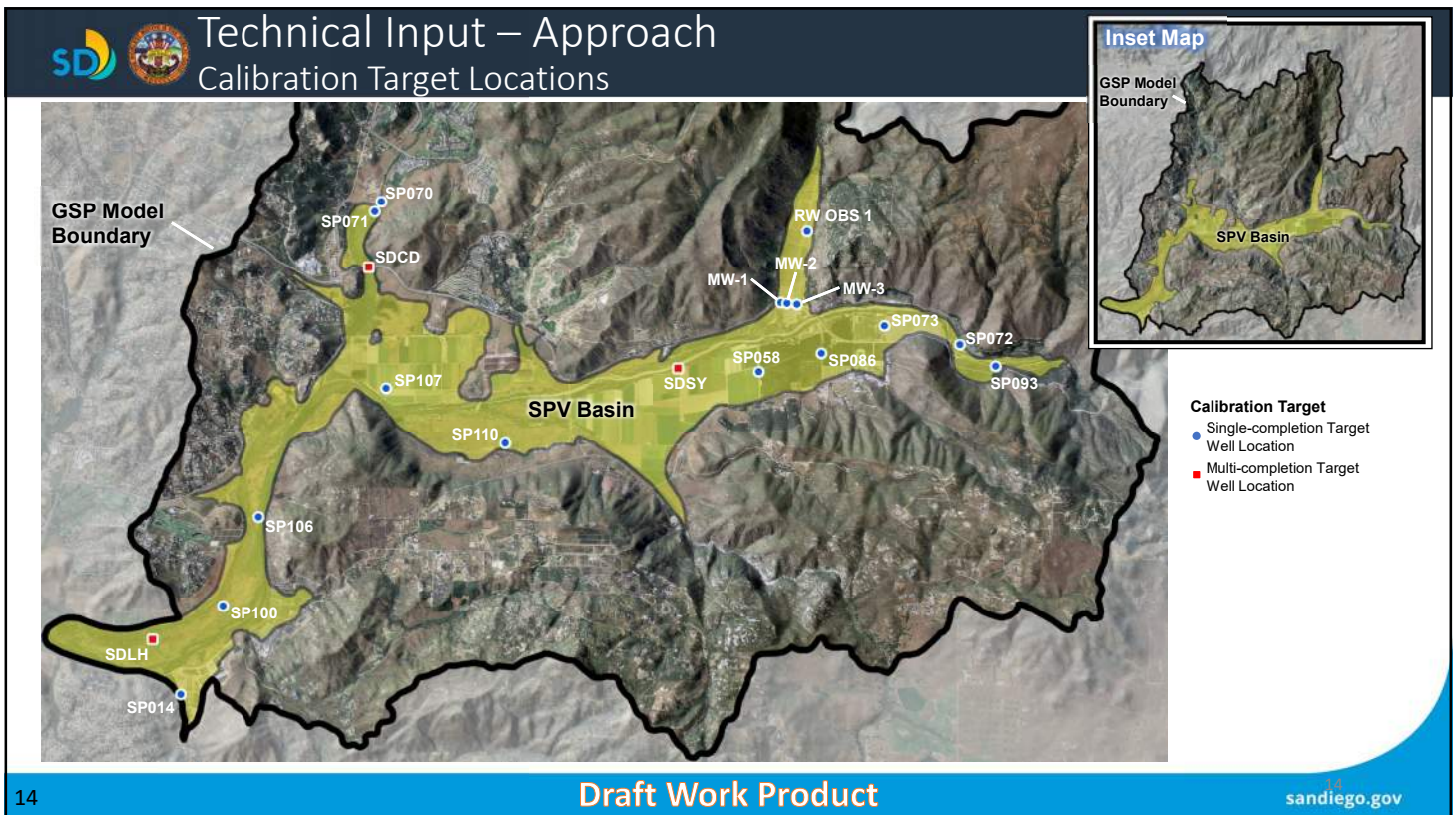


13

Draft Work Product

sandiego.gov

13



14

Draft Work Product


sandiego.gov

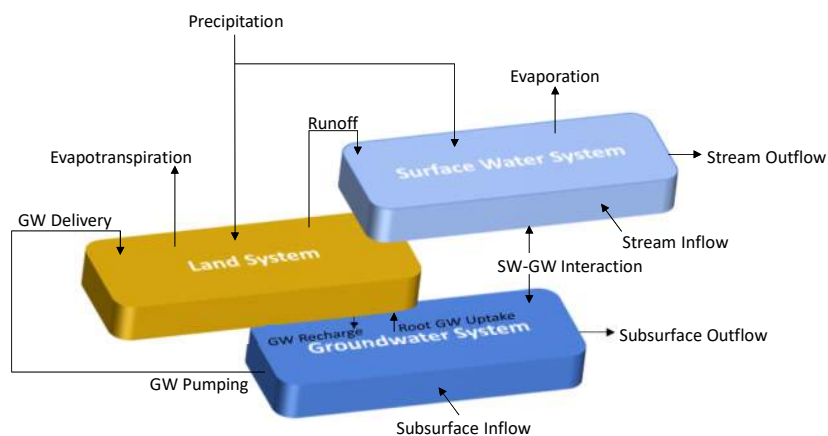
14

**SD**  **Technical Input – Approach**  
 Calibration Approach Summary

- Calibration period
  - WY 2005 thru WY 2019 (15 years) with monthly stress periods
- Quantitative calibration targets
  - Use GW elevations (heads) measured at 16 single-completion well locations and three multi-completion well locations
  - Calibration statistics will be computed using industry standards
- Qualitative calibration targets
  - Use vertical head differences, computed from GW-level measurements at three multi-completion monitoring well locations

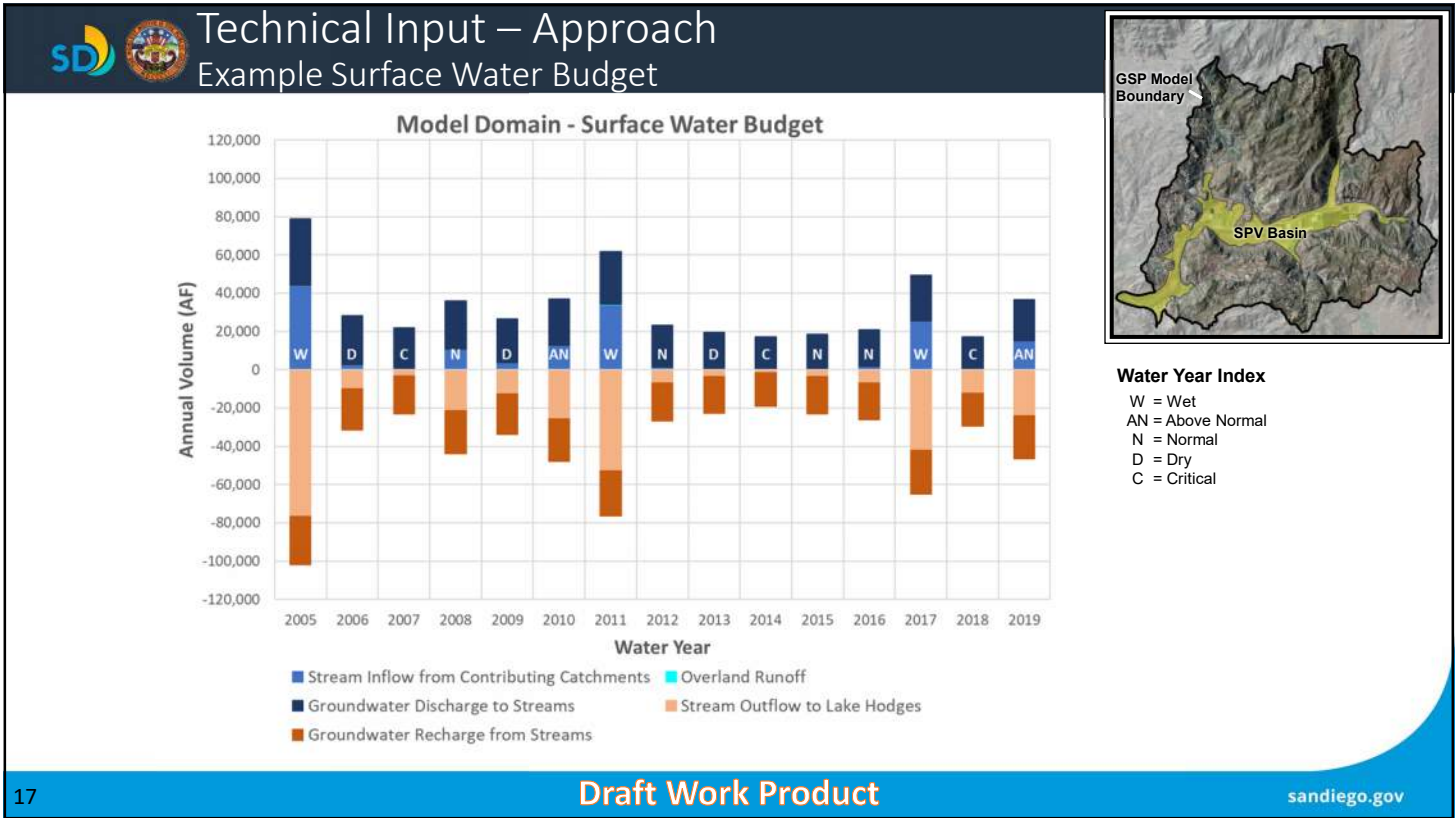
15

**SD**  **Technical Input – Approach**  
 Water Budgeting for Surface Water, Land, and Groundwater Systems Under SGMA

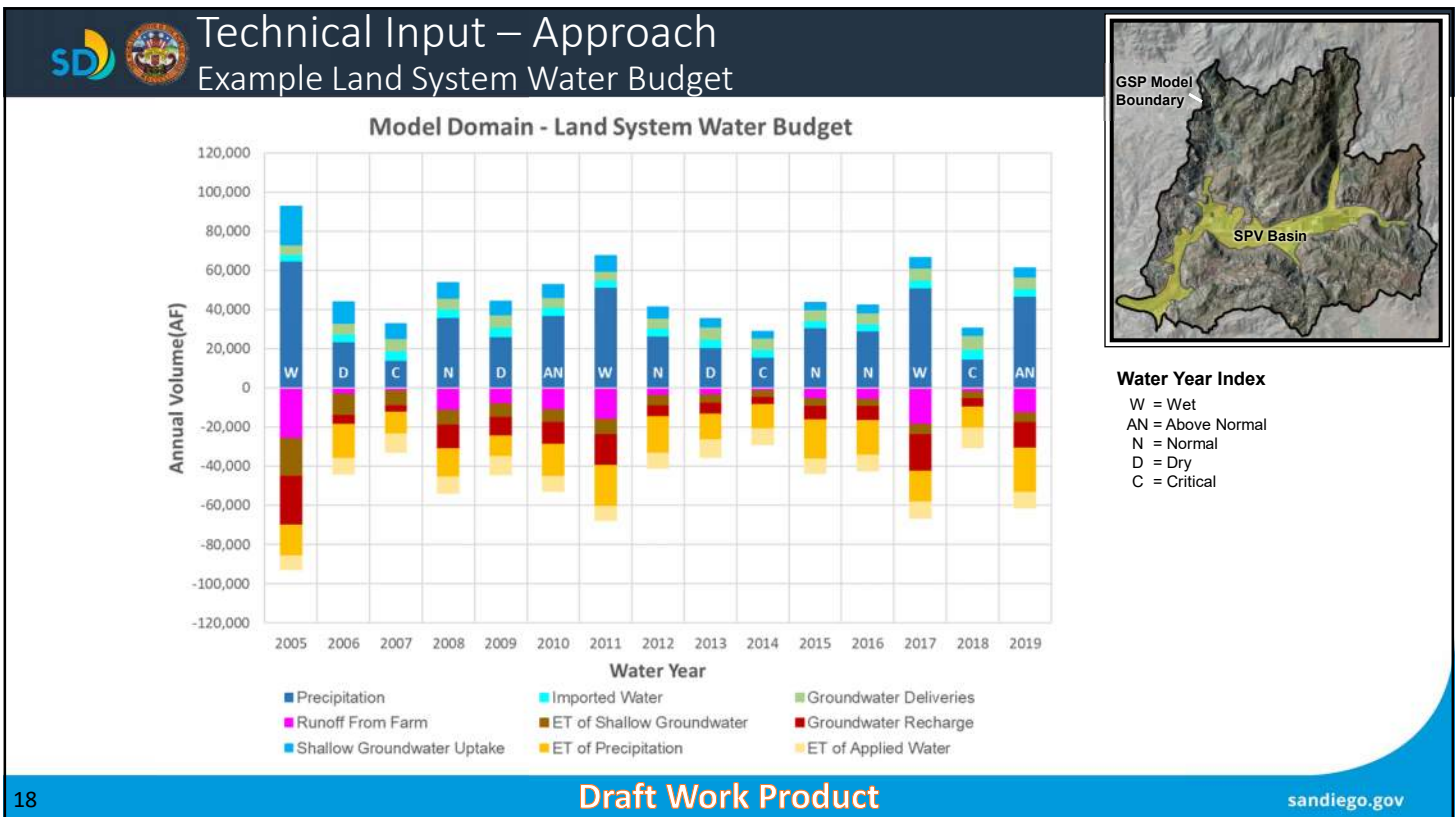


16

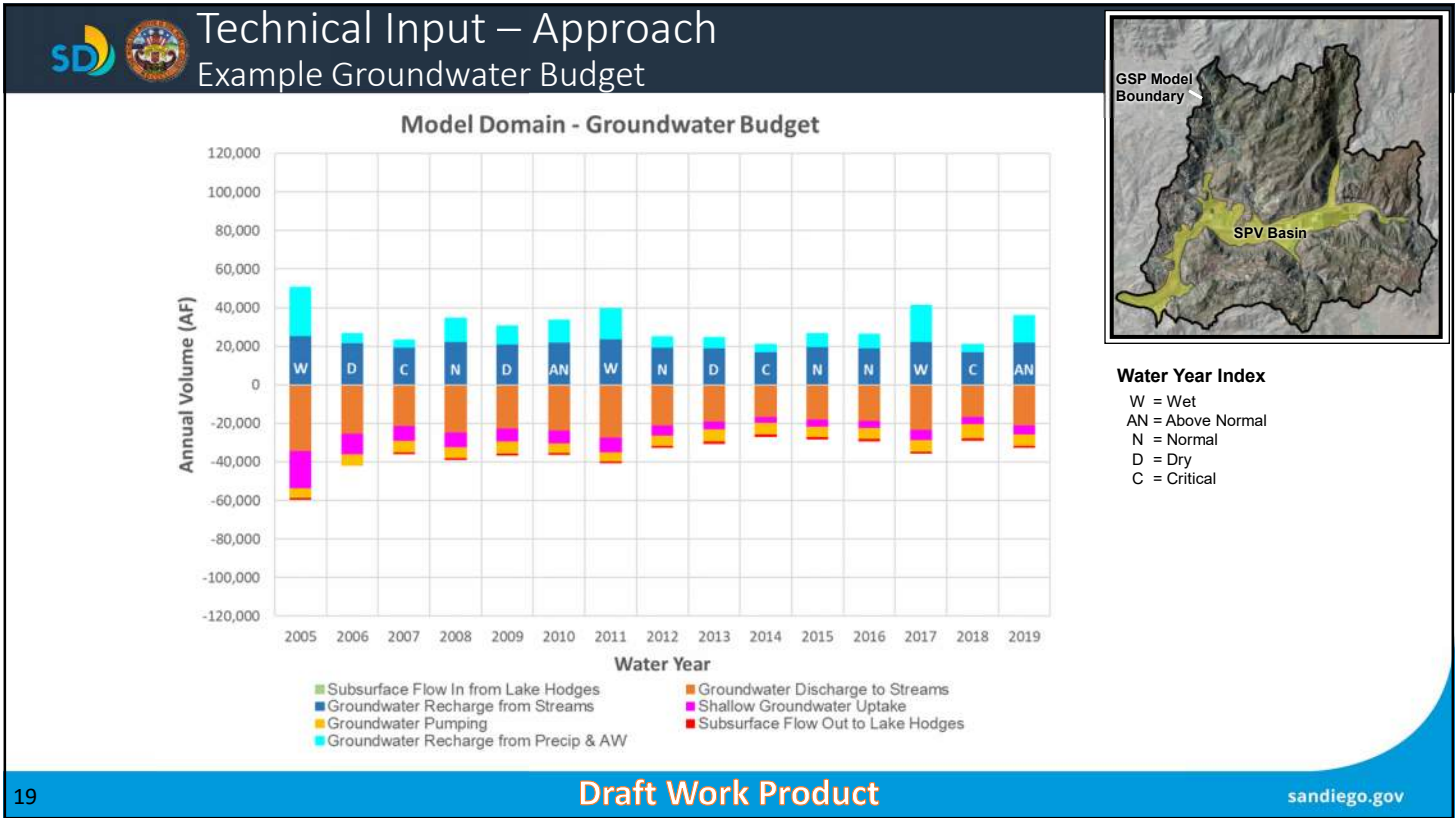




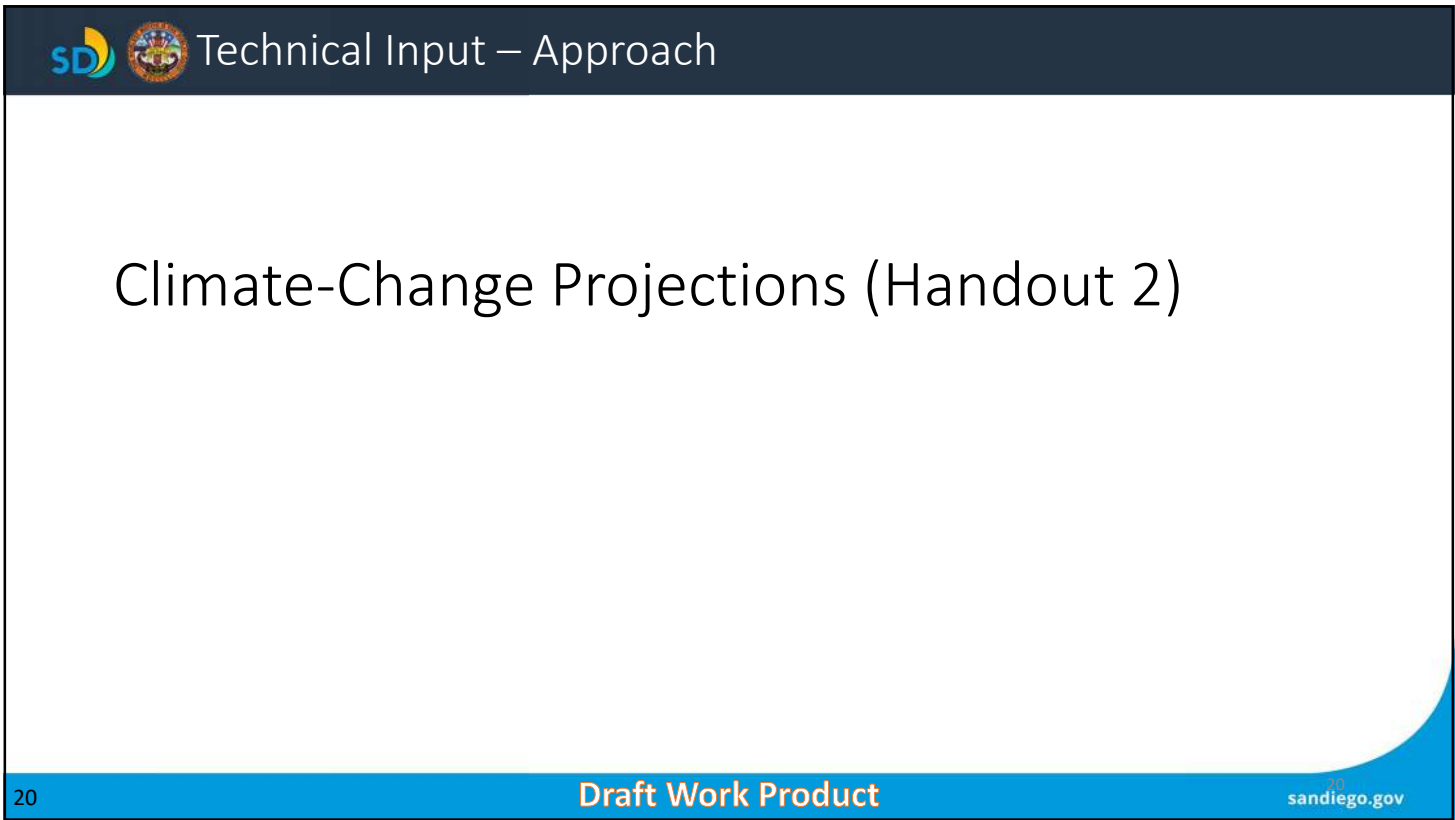
17



18



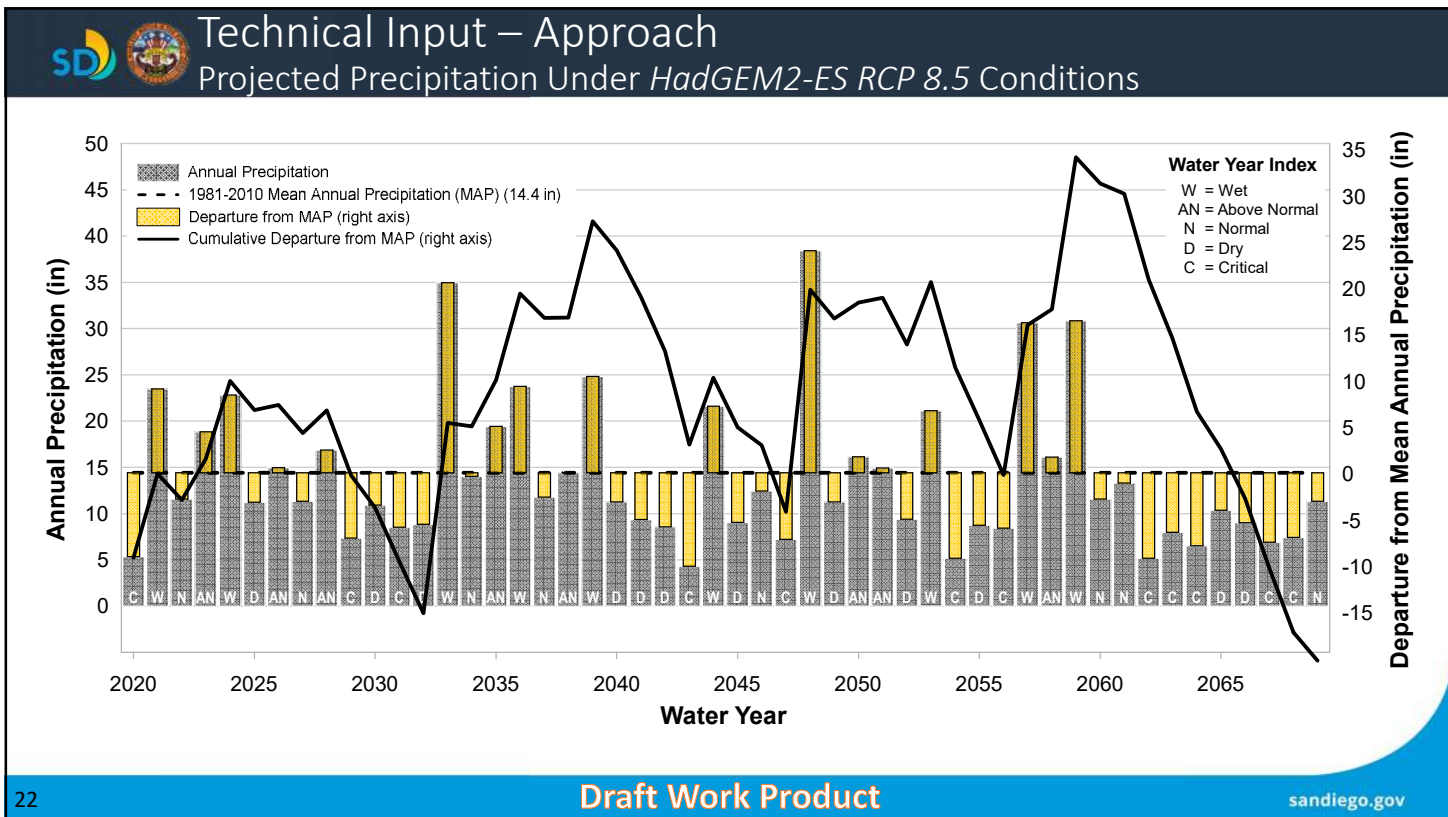
19



20

Parameter	Approach for GSP Model Projections
Precipitation	<ul style="list-style-type: none"> <li>Select <i>HadGEM2-ES RCP8.5</i> Global Climate Model (GCM) for the 50-year GSP planning period (Handout 2)</li> <li>Selected GCM has been processed through the Basin Characterization Model (BCM)</li> <li>BCM precipitation datasets are based on downscaled PRISM datasets</li> </ul>
Water year type	<ul style="list-style-type: none"> <li>Computed by Jacobs using <i>HadGEM2-ES RCP8.5</i> GCM and precipitation ranking approach consistent with approach used to establish historical water year types in GSP Model area</li> </ul>
Stream inflows	<ul style="list-style-type: none"> <li>Based on bias-corrected BCM runoff from contributing catchments based on <i>HadGEM2-ES RCP8.5</i> GCM (Handouts 2 &amp; 4a)</li> </ul>
Land use and population	<ul style="list-style-type: none"> <li>Freeze land use and population at WY 2019 Conditions (end of calibration period) (Handout 5)</li> </ul>
Reference ET	<ul style="list-style-type: none"> <li>Dataset provided by BCM (bias-corrected using local CIMIS data) using GCM air temperature data</li> </ul>
Crop coefficients (Kc)	<ul style="list-style-type: none"> <li>Use selected computed Kc values from WY 2017–WY 2019 (near end of calibration period)</li> </ul>
Consumptive use	<ul style="list-style-type: none"> <li>Computed as product of Kc and reference ET</li> </ul>
Groundwater pumping	<ul style="list-style-type: none"> <li>Freeze well-to-parcel designations at 2020 conditions (Handout 5)</li> <li>Rely on projected consumptive use to establish groundwater pumping rates</li> </ul>
Imported water	<ul style="list-style-type: none"> <li>Rely on projected consumptive use in parcels near Cloverdale Creek and San Dieguito River that have been identified as receiving imported water from City of Escondido and Rincon del Diablo</li> </ul>
Lake Hodges stage	<ul style="list-style-type: none"> <li>Use monthly average historical stage based on water year type</li> </ul>

21



22

# San Pasqual Valley GSP Technical Peer Review Meeting

## PRELIMINARY ANALYSIS RESULTS Groundwater Model

23

Draft Work Product



23

### Technical Input – Preliminary Analysis Lake Hodges Monthly Average Stage Assigned to Lower Model Boundary



24

Draft Work Product

sandiego.gov

24



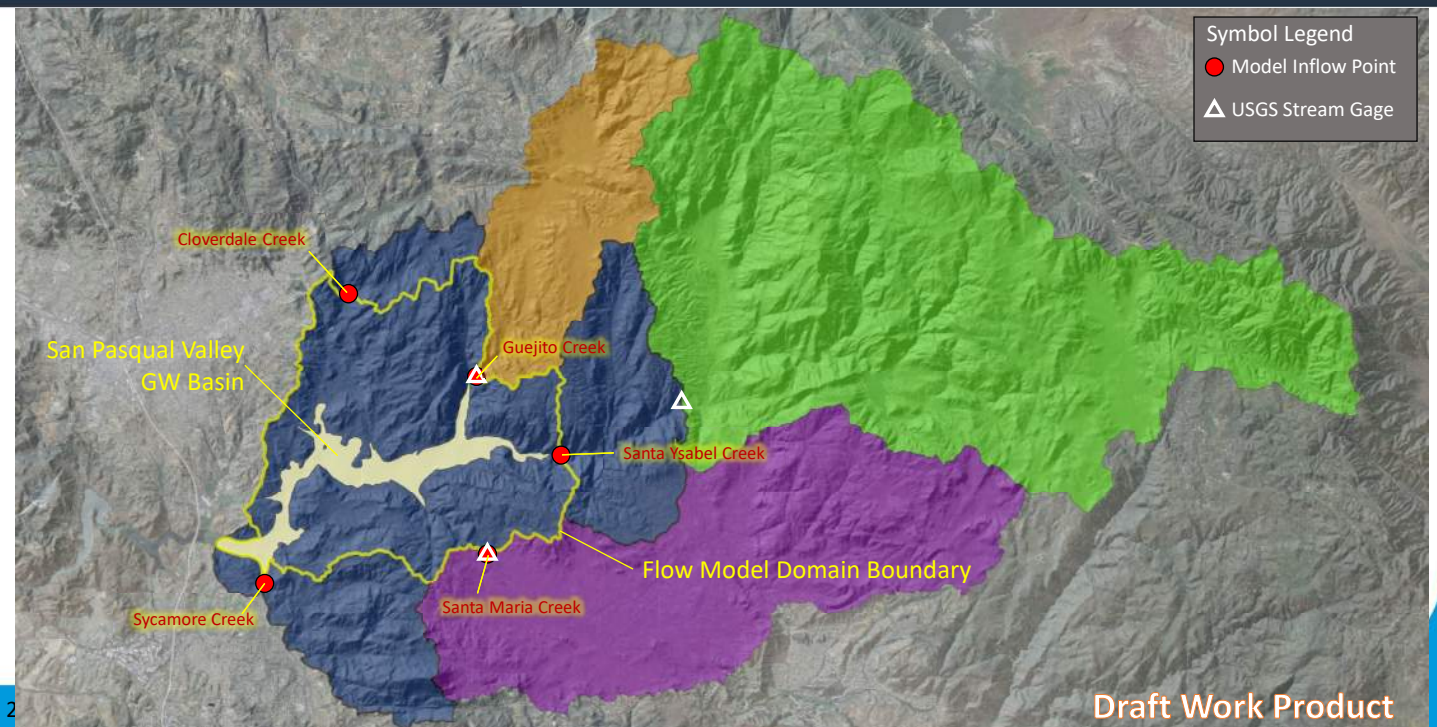
# Bias-corrected Stream Inflows (Handout 4a)

25

Draft Work Product


sandiego.gov

25



2

26



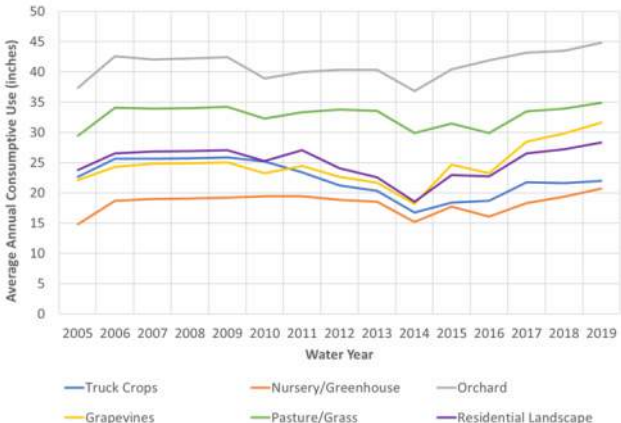
## Technical Input – Preliminary Analysis

### How Consumptive Use is Computed in the Numerical Flow Model

**$CU = CalET_a = K_c \times ET_{REF}$**

*CU = Crop Consumptive Use*  
*CalET<sub>a</sub> = Actual Crop Evapotranspiration*  
*K<sub>c</sub> = Crop Coefficient*  
*ET<sub>REF</sub> = Reference Evapotranspiration*

**Model Domain - Irrigated Crop Consumptive Use**



Year	Consumptive Use Dataset	ET <sub>REF</sub> Needed?
2005	CalETa Direct	No
2006	CalETa Kc	Yes
2007	CalETa Kc	Yes
2008	CalETa Kc	Yes
2009	CalETa Kc	Yes
2010	CalETa Direct	No
2011	CalETa Direct	No
2012	CalETa Direct	No
2013	CalETa Direct	No
2014	CalETa Direct	No
2015	CalETa Direct	No
2016	CalETa Direct	No
2017	CalETa Direct	No
2018	CalETa Kc	Yes
2019	CalETa Direct	No

27
Draft Work Product
sandiego.gov

27

# San Pasqual Valley GSP


## Technical Peer Review Meeting

# REFINED ANALYSIS RESULTS

## Groundwater Model

28

Draft Work Product



28

## Refined Analysis Results – Flow Model Assignments of Wells to Parcels (Handout 5)

**Legend Pumping Wells**

- City of San Diego - Active
- City of San Diego - Inactive
- Rockwood Wells - Active
- Rockwood Wells - Inactive
- San Pasqual Academy
- Other Production Wells

□ Parcel with Well Designation  
□ SPV Groundwater Subbasin

Blue highlighted numbers represent the 'Map Label' presented in the table at the bottom right.

Status of wells represent current conditions (2020)

**WORKING DRAFT**

**Feedback from Stakeholders Has Been Incorporated**

### Well-to-Parcel Relationship

Map Label	Possible Source Wells	Map Label	Possible Source Wells
1	SP001, SP002, SP003, SP004	26	SP0021, SP0022, SP0023, SP0024
2	Not Integrated	27	SP0025, SP0026, SP0027
3	SP008, SP009	28	SP0028, SP0029, SP0030, SP0031
4	SP008, SP009	29	SP0032, SP0033, SP0034, SP0035
5	SP008, SP009	30	SP0036, SP0037, SP0038, SP0039, SP0040, SP0041, SP0042
6	SP008, SP009	31	SP0043, SP0044, SP0045, SP0046, SP0047, SP0048, SP0049, SP0050, SP0051, SP0052
7	SP008, SP009	32	SP0053, SP0054, SP0055, SP0056, SP0057, SP0058, SP0059, SP0060, SP0061, SP0062
8	SP008, SP009	33	SP0063, SP0064, SP0065, SP0066, SP0067, SP0068, SP0069, SP0070, SP0071, SP0072
9	SP008, SP009	34	SP0073, SP0074, SP0075, SP0076, SP0077, SP0078, SP0079, SP0080, SP0081, SP0082
10	SP008, SP009	35	SP0083, SP0084, SP0085, SP0086, SP0087, SP0088, SP0089, SP0090, SP0091, SP0092
11	SP008, SP009	36	SP0093, SP0094, SP0095, SP0096, SP0097, SP0098, SP0099, SP0100, SP0101, SP0102
12	SP008, SP009	37	SP0103, SP0104, SP0105, SP0106, SP0107, SP0108, SP0109, SP0110, SP0111, SP0112
13	SP008, SP009	38	SP0113, SP0114, SP0115, SP0116, SP0117, SP0118, SP0119, SP0120, SP0121, SP0122
14	SP008, SP009	39	SP0123, SP0124, SP0125, SP0126, SP0127, SP0128, SP0129, SP0130, SP0131, SP0132
15	SP008, SP009	40	SP0133, SP0134, SP0135, SP0136, SP0137, SP0138, SP0139, SP0140, SP0141, SP0142
16	SP008, SP009	41	SP0143, SP0144, SP0145, SP0146, SP0147, SP0148, SP0149, SP0150, SP0151, SP0152
17	SP008, SP009	42	SP0153, SP0154, SP0155, SP0156, SP0157, SP0158, SP0159, SP0160, SP0161, SP0162
18	SP008, SP009	43	SP0163, SP0164, SP0165, SP0166, SP0167, SP0168, SP0169, SP0170, SP0171, SP0172
19	SP008, SP009	44	SP0173, SP0174, SP0175, SP0176, SP0177, SP0178, SP0179, SP0180, SP0181, SP0182
20	SP008, SP009	45	SP0183, SP0184, SP0185, SP0186, SP0187, SP0188, SP0189, SP0190, SP0191, SP0192
21	SP008, SP009	46	SP0193, SP0194, SP0195, SP0196, SP0197, SP0198, SP0199, SP0200, SP0201, SP0202
22	SP008, SP009	47	SP0203, SP0204, SP0205, SP0206, SP0207, SP0208, SP0209, SP0210, SP0211, SP0212
23	SP008, SP009	48	SP0213, SP0214, SP0215, SP0216, SP0217, SP0218, SP0219, SP0220, SP0221, SP0222
24	SP008, SP009	49	SP0223, SP0224, SP0225, SP0226, SP0227, SP0228, SP0229, SP0230, SP0231, SP0232
25	SP008, SP009	50	SP0233, SP0234, SP0235, SP0236, SP0237, SP0238, SP0239, SP0240, SP0241, SP0242

Table entries highlighted by color represent parcels that receive water from the same set of wells and will be considered as a single polygon.

299
Draft Work Product
sandiego.gov

29

## Refined Analysis Results – Flow Model Partial List of Pumping Well Status Assignments (Handout 5)


Status of Pumping Well by Water Year - Blue = Active; Gray = Inactive

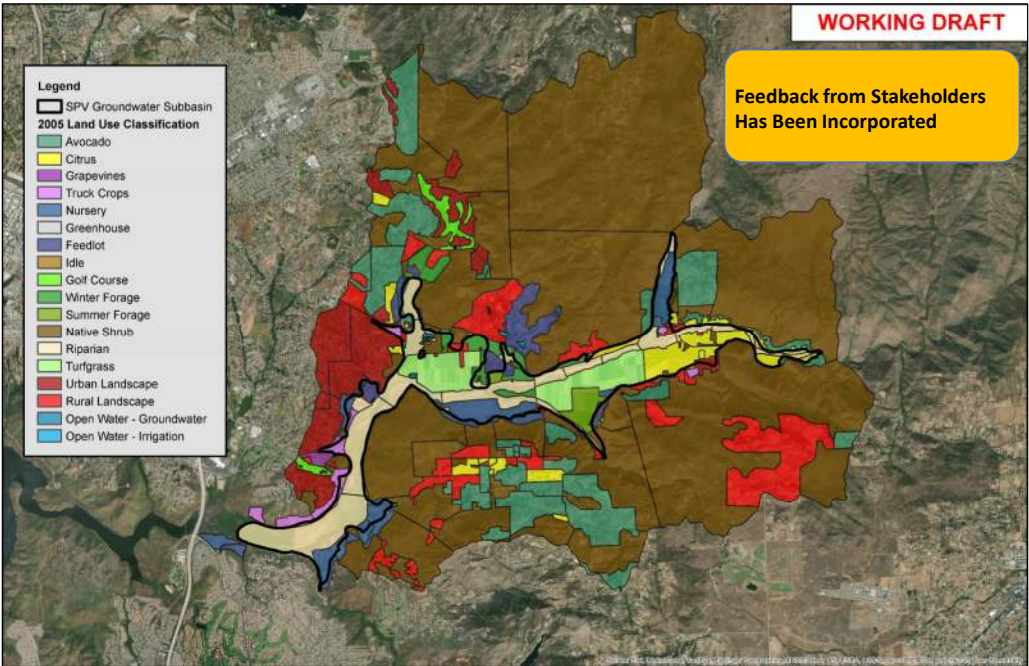
Well ID	Entity	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Current (2020) and Future Conditions
SP001	Kony																
SP002	Kony																
SP003	Kony/Suncoast																
SP004	Kony/Suncoast																
SP005	Kony/Suncoast																
SP006	Wilkins Nursery																
SP007	Kony/Suncoast																
SP008	City/Orfila																
SP009	Brammer																
SP010	Jancic																
SP011	Kony																
SP012	Kony/Suncoast																
SP013	Kony/Suncoast																
SP014	Pinery																
SP015	Pinery																
SP016	Pinery																
SP017	Pinery																
SP018	Pinery																
SP019	Ami Sod																
SP020	City																
SP021	Ami Sod																
SP022	Ami Sod																
SP023	Ami Sod																
SP024	Evergreen Nursery																
SP025	Three C																
SP026	Three C																
SP027	Three C																
SP028	Three C																
SP029	State of CA																
SP031	Brammer																
SP032	Brammer																
SP033	Brammer																
SP034	Brammer																
SP035	Lindshield																
SP036	Lindshield																
SP037	Lindshield																
SP039	Lindshield																
SP040	Lindshield																


**Feedback from City Staff Has Been Incorporated**

300
Draft Work Product
sandiego.gov


30

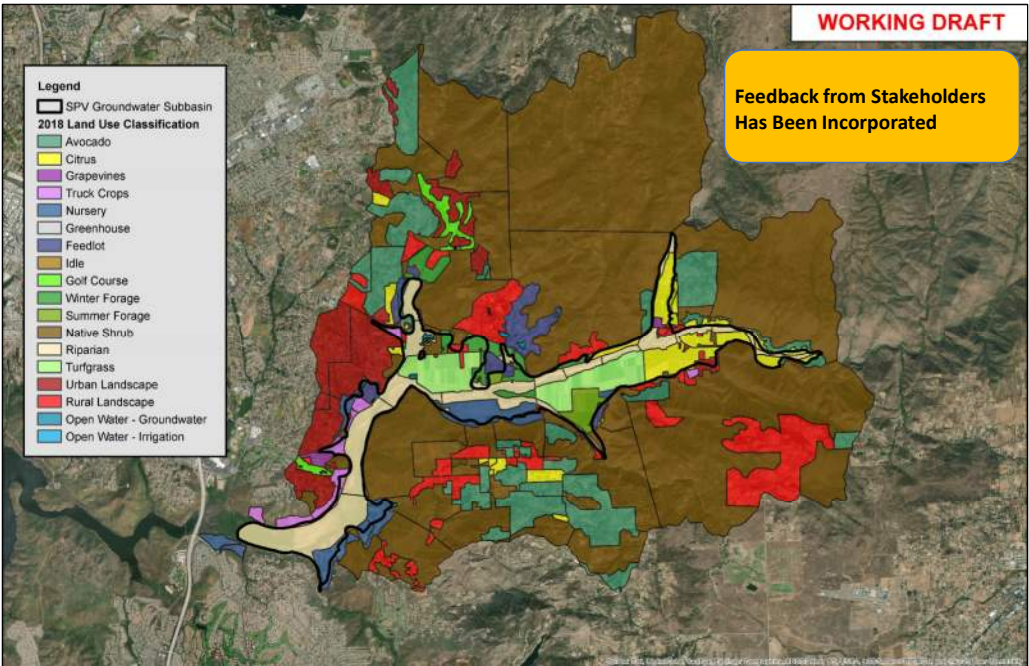
**SD**  **Refined Analysis Results – Flow Model**  
**2005 Land Use (Handout 5)**




**31** **Draft Work Product** 

31

**SD**  **Refined Analysis Results – Flow Model**  
**2018 Land Use (Handout 5)**



**32** **Draft Work Product** 

32



San Pasqual Valley GSP  
Technical Peer Review Meeting

**TECHNICAL INPUT – APPROACH**  
**Groundwater Model**  
**AC COMMENTS**

33

Draft Work Product



33

San Pasqual Valley GSP  
Technical Peer Review Meeting

**TECHNICAL INPUT – APPROACH**  
**Projects and Management Actions**  
**Management Areas**

34

Draft Work Product



34



## Technical Input – Approach Projects and Management Actions

- GSP Regulation 354.44 (a):  
“Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin.”
- Propose meeting this regulation through Adaptive Management framework

35

Draft Work Product

sandiego.gov

35



## Technical Input – Approach Projects and Management Actions

- GSP Regulation 354.44 (b)(1):  
“A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent.”
- Categories of projects and management actions
  - GSP Implementation – Activities that will be conducted regardless of basin conditions
  - Adaptive Management – Activities that will be conducted only as needed
    - Projects
    - Management Actions

36

Draft Work Product

sandiego.gov

36



## Technical Input – Approach Projects and Management Actions

- GSP Implementation:
  - Continue monitoring for levels and quality
  - Advisory Committee meetings
  - Core Team meetings
  - Annual Reports
  - 5-Year Updates
  - Numerical model updates
  - Pursue funding opportunities
  - Groundwater monitoring improvements

37

Draft Work Product

sandiego.gov

37



## Technical Input – Approach Projects and Management Actions

- Adaptive Management:
  - ... is a structured, iterative process of decision making with an aim of reducing uncertainty over time via monitoring to meet resource management objectives.
- The San Pasqual Valley Basin is not experiencing undesirable results related to levels (significantly and unreasonably worse than 2015 conditions)
- Projects and Management Actions (PMAs) will be developed in this GSP to maintain conditions to avoid undesirable results in the future by using adaptive management

38

Draft Work Product

sandiego.gov

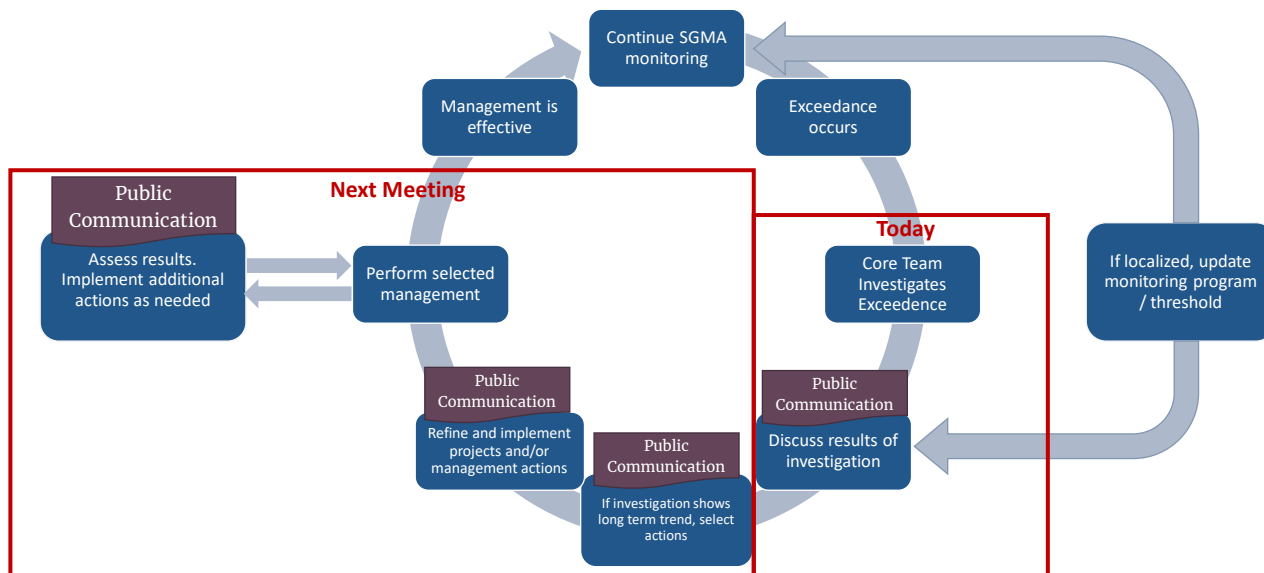
38

**SD**  **Technical Input – Approach**  
Projects and Management Actions


- **Adaptive Management:**
  - Framework for implementation of management actions and projects to address sustainability indicators as needed
  - Iterative and cyclical process
  - Triggered by sustainable management criteria
  - Allows GSA to act when needed to prevent reaching undesirable results

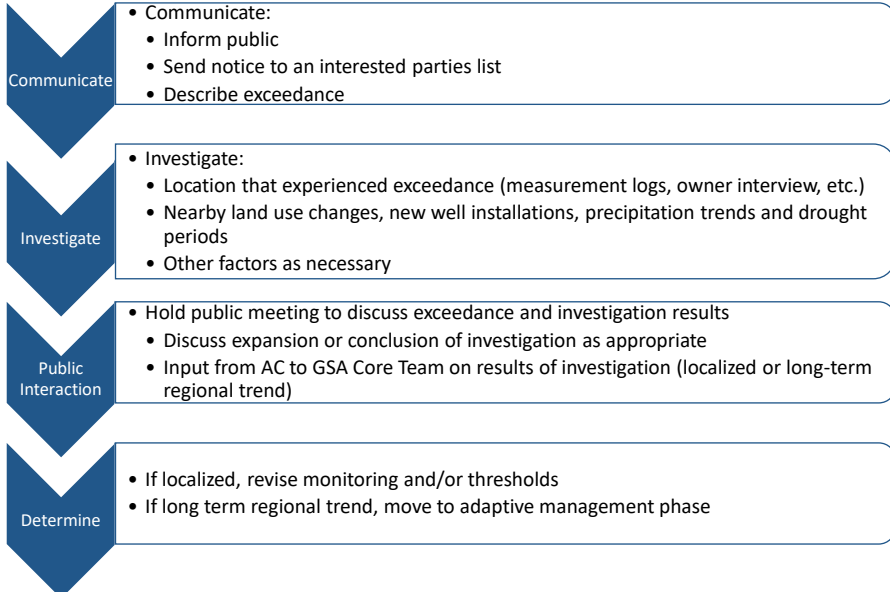
39

**SD**  **Technical Input – Approach**  
Projects and Management Actions



40

 **Technical Input – Approach**  
Projects and Management Actions




```

graph TD
    A[Communicate] --> B[Investigate]
    B --> C[Public Interaction]
    C --> D[Determine]
  
```

- Communicate**
  - Communicate:
    - Inform public
    - Send notice to an interested parties list
    - Describe exceedance
- Investigate**
  - Investigate:
    - Location that experienced exceedance (measurement logs, owner interview, etc.)
    - Nearby land use changes, new well installations, precipitation trends and drought periods
    - Other factors as necessary
- Public Interaction**
  - Hold public meeting to discuss exceedance and investigation results
  - Discuss expansion or conclusion of investigation as appropriate
  - Input from AC to GSA Core Team on results of investigation (localized or long-term regional trend)
- Determine**
  - If localized, revise monitoring and/or thresholds
  - If long term regional trend, move to adaptive management phase

41 **Draft Work Product** sandiego.gov

41

 **Technical Input – Approach**  
Projects and Management Actions

- **Example Projects that may be Considered:**
  - Stormwater Recharge in-channel
  - Recycled Water Recharge or Direct Delivery (Escondido) Membrane Filtration Reverse Osmosis (MFRO) water to Cloverdale Creek
  - Recycled Water Recharge (Escondido) MFRO water with pipeline to eastern portion of Basin
  - Recycled Water Recharge (San Diego) new Water Reclamation Facility water with pipeline to eastern portion of Basin
  - Water Recharge or Direct Delivery from Ramona Municipal Water District to eastern portion of Basin

42 **Draft Work Product** sandiego.gov

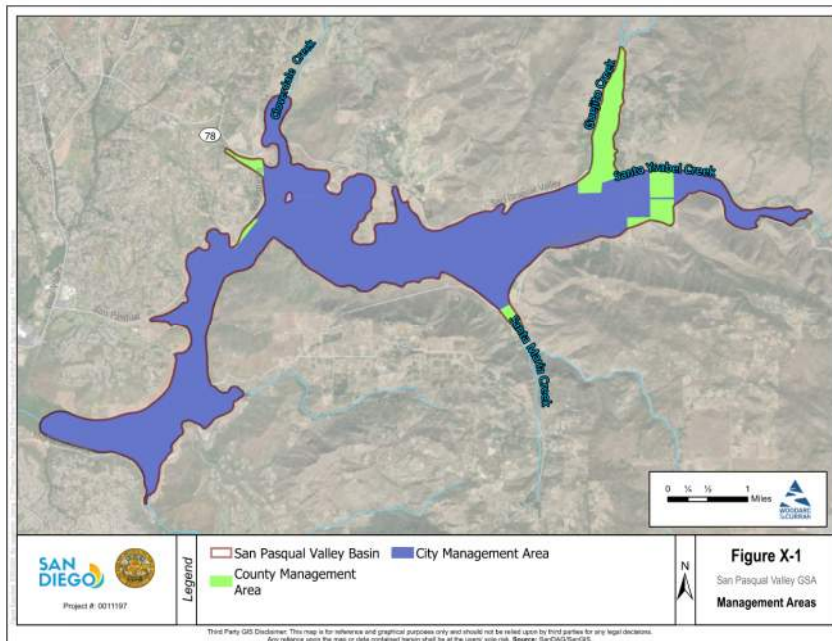
42

**SD**  **Technical Input – Approach**  
Projects and Management Actions

- **Example Management Actions that May be Considered:**
  - Demand Softening – encourage changing of crop types to less water intensive uses
  - Irrigation Efficiency – GSA may encourage improved efficiency
  - RWQCB Coordination – GSA may coordinate with RWQCB on water quality issues
  - Well Inventory – GSA may inventory wells in Basin
  - Basinwide Metering – GSA may require meters on extraction wells
  - Pumping Restrictions – GSA may limit pumping

43

**SD**  **Technical Input – Approach**  
Management Areas




44

San Pasqual Valley GSP  
Technical Peer Review Meeting

# TECHNICAL INPUT – APPROACH AC COMMENTS

45

Draft Work Product



The City of  
**SAN DIEGO**


45

San Pasqual Valley GSP  
Technical Peer Review Meeting

# FIELD PROGRAM UPDATE

46

Draft Work Product



The City of  
**SAN DIEGO**

46



# Field Program Update

- Aquifer testing is still on hold



47

Draft Work Product

sandiego.gov

47

San Pasqual Valley GSP  
 Technical Peer Review Meeting

## FIELD PROGRAM UPDATE

### AC COMMENTS

48

Draft Work Product



48



San Pasqual Valley GSP  
Technical Peer Review Meeting

**FINAL THOUGHTS BY TPR**

49

Draft Work Product



The City of  
**SAN DIEGO**


49

San Pasqual Valley GSP  
Technical Peer Review Meeting

**PUBLIC COMMENT**

50

Draft Work Product



The City of  
**SAN DIEGO**

50

# San Pasqual Valley GSP Technical Peer Review Meeting

## NEXT STEPS & CLOSING REMARKS

51

Draft Work Product



The City of  
**SAN  
DIEGO**

51

### Next Meeting

- Next meeting:
  - Thursday January 14, 2021, 9-11:30am
- Public Notices are at:
  - Online:  
<https://www.sandiegocounty.gov/content/sdc/pds/SGMA/san-pasqual-valley.html>

52

Draft Work Product

sandiego.gov

52



- For additional information, please contact:  
Sandra Carlson at (619) 533-4235  
[carlsons@san Diego.gov](mailto:carlsons@san Diego.gov)

# Thank You!