

Groundwater Sustainability Plan for Big Valley Groundwater Basin Lassen and Modoc Counties

Advisory Committee Meeting 7

February 3, 2021

2086 Sustainability Indicator Analysis

Well Information		Well Coordinates/Inventory		Trend Analysis	
Well ID	2086	Well	41.5242	Seasonal Data Method	April-October
Alternate Name	2086	Upland	-121.1886	Upland Trend 1	Full Data
State Number	3601071000000	Well Depth	183 ft	Draw Range	08/01/01 - 02/01/20
ICSD/SDA ID	421242612110000000	Screen Surface Elevation	4326.36 ft	Upland Trend 2	08/01/01 - 02/01/20
Well Location		Ref. Point Elevation	4127.90 ft	Extend Trend Line	Yes
County	Lassen	Screen Depth Range	41 to 183 ft	Trend Result	Stable
Basin	Big Valley	Screen Elevation Range	4018 to 3948 ft	Upland Trend 1	08/01/01 - 02/01/20
Soil Basin		Principal Aquifer		Upland Trend 2	08/01/01 - 02/01/20
Management Area		Well Elevation of Record	1570 - 2019	Draw Range	08/01/01 - 02/01/20
Principal Agency		Perennial Record	4078.8 ft	Extend Trend Line	Yes
Well Type Information		US Draw Range	4134.4 ft	Trend Result	Stable
Well Type	Unscreened				
Well Use	Other				
Completion Type	Single				

Water Surface Elevation (WSE) Hydrograph

Sustainability Indicator Considerations

Parameter	Value	Year	Trend 1-Full	Trend 2-Spring
WS Elevation Range	Min: 4077 ft, Max: 4121 ft	2022	4078 ft, 4079 ft	4078 ft, 4079 ft
2015 WS Elevations	Spring: 4077 ft, Fall: 4081 ft	2015	4080 ft, 4081 ft	4081 ft, 4081 ft
Most Recent WS Elev	Spring: 4081 ft, Fall: 4082 ft	2021	4082 ft, 4081 ft	4081 ft, 4079 ft

Sustainability Indicator Settings

Parameter	Value	Description
WSI Threshold	2022	4,082.0 ft
MAD - Measurable Objective	2022	4,082.0 ft
WSI	2022	4,082.0 ft

Well Depths Within Area

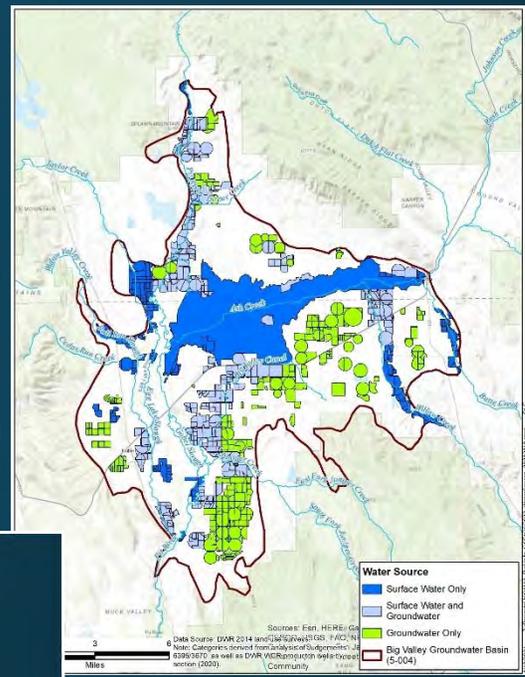
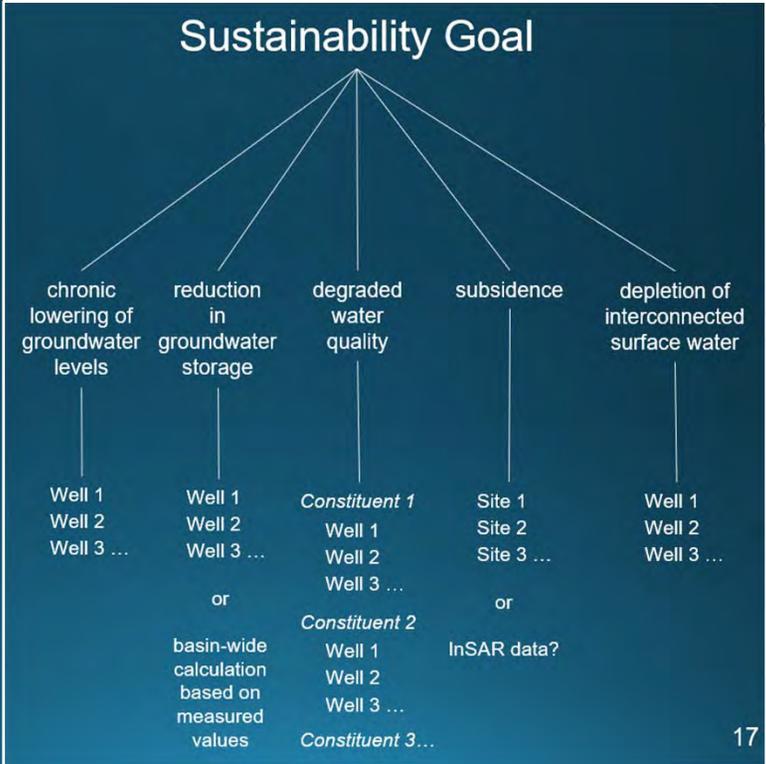
Well Type	Number	Depth (feet)	Shallowest (feet)	Elevation (feet)
Unscreened	13	41	4000	4080
Production (AG)	6	170	3956	4000

Sustainability Indicators to Consider

Indicator	Water Levels	Constituent Storage	Water Quality	Subsidence	Mitigation
Water Levels	Yes				
Constituent Storage		Yes			
Water Quality			Yes		
Subsidence				Yes	
Mitigation					Yes

Other Pertinent Information

Distance from Nearest Perennial Stream: 2.1 miles
 Name of Nearest Perennial Stream: 20.8 miles
 Distance from Nearest GDC: 1.5 miles
 Description of Nearest GDC: But Run Slough near Hubbar



Big Valley Groundwater Advisory Committee

Memorandum of Understanding Review





Meeting Ground Rules

- **Turn cell phones off or to vibrate.**
- **Public Speakers – Please provide a name for the Clerk and Public**
- **Use common conversational courtesy and treat each other with respect. Please speak up for the Clerk and recording.**
- **Remember that all ideas and points of view and are valuable.**
- **Be candid, listen actively and seek to understand others.**
- **Be concise and share the air.**
- **Avoid bringing up past issues if they have already been voiced.**
- **Welcome levity and humor to the discussions.**



Meeting Ground Rules

- **Stay focused on the meeting agenda.**
- **Avoid editorial comments.**
- **Strive to focus on interests versus positions.**
- **View challenges as problems to be solved rather than battles to be won.**
- **Be creative and innovative problem solvers.**
- **Negotiate in good faith.**
- **Consider the long-term view.**
- **Foster mutual understanding and attempt to address the interests and concerns of all participants.**
- **Inform, educate and seek input from community constituents.**



Goals of the BVAC

Create a Groundwater Sustainability Plan that meets the regulations while protecting the livelihood of the Big Valley Groundwater Basin residents.

- **Ensure local control of the Big Valley Groundwater Basin** be maintained by the Lassen and Modoc GSAs.
- **Work collaboratively and transparently** with other members to identify common goals, foster mutual understanding, and develop a GSP that all members and their constituents can live with and support.
- **Negotiate in good faith to achieve consensus** on management of groundwater resources in the Big Valley groundwater basin into the future.
- **Develop a common understanding of existing groundwater resources...current** and future needs.
- **Consider and integrate science**, to the best of its ability and with support from qualified scientific consultants, during GSP development and implementation.
- **Support implementation efforts guided by GSP goals** to use, monitor, and manage water resources in a sustainable manner, ensure local control, address current and future local water needs, and support the agricultural economy, Adin, Bieber, Nubieber, Lookout, and outlying communities, tourist visitation and fish and wildlife habitat in the basin.
- **Solicit and incorporate community and stakeholder interests** into committee discussions and emerging committee agreements in order to develop a locally-informed and broadly supported GSP. **Provide a forum for the public** to comment during the preparation of the GSP.
- **End product, a GSP the BVAC can recommend to the GSA's**

Decision-making Procedures

- 1) Consensus as the Fundamental Principle:** The advisory committee shall strive for consensus (agreement among all participants) in all of its decision-making. Working toward consensus is a fundamental principle which will guide group efforts, particularly when crafting any draft or final advisory committee proposals, reports or recommendations for GSA Boards consideration. If the committee is unable to reach consensus, the range of opinions provided, including areas of agreement and disagreement, will be documented in meeting summaries or otherwise communicated in written reports when advisory committee work is shared with the GSA Boards.
- 2) Definition of Consensus:** Consensus means all committee members either fully support or can live with a particular decision and believe that their constituents can as well. In reaching consensus, some committee members may strongly endorse a particular proposal, report or recommendation while others may simply accept it as "workable." Others may only be able to "live with it" as less than desired but still acceptable. Still others may choose to "stand aside" by verbally noting disagreement, yet allowing the group to reach consensus without them, or by abstaining altogether. Any of these actions constitutes consensus.
- 3) Less than 100% Consensus Decision Making:** **The advisory committee is consensus seeking but shall not limit itself to strict consensus if 100% agreement among all participants cannot be reached after all interests and options have been thoroughly identified, explored and discussed.** Less-than-consensus decision-making shall not be undertaken lightly. If the committee cannot come to 100% agreement, it could set aside the particular issue while it continues work on other issues, then revisit the disagreement later in the process. Finally, the committee recognizes that certain deadlines must be met during the collaborative process to ensure completion of all SGMA opportunities and requirements on time.

Decision-making Procedures

Consensus seeking efforts recognize that a convened group such as Big Valley Advisory Committee makes recommendations, **but is not a formal decision-making body like the Lassen or Modoc GSA's.**

The Chair may commonly ask, when it appears consensus or near consensus agreement has emerged or is emerging, if any member cannot live with said agreement. For any final decisions, committee members will demonstrate consensus, or lack thereof, in the following manner:



Nay:	I do not support the proposal.	
Aye:	I support the proposal.	
Stand Aside:	Member verbally notes he/she is willing to stand aside and allow group consensus	
Abstention:	At times, a pending decision may be infeasible for a participant to weigh in on. Member verbally notes he/she abstains. Abstentions do not prevent group consensus.	



Any member that stands aside or abstains from a decision is encouraged to explain why his/her choice is in his/her best interest.

Remember there is a deadline for the GSP, so try to work through issues with this in mind.

AGENDA

- Subject #1

- Chapter 6 – Water Budget (Revised Draft)

- Subject #2:

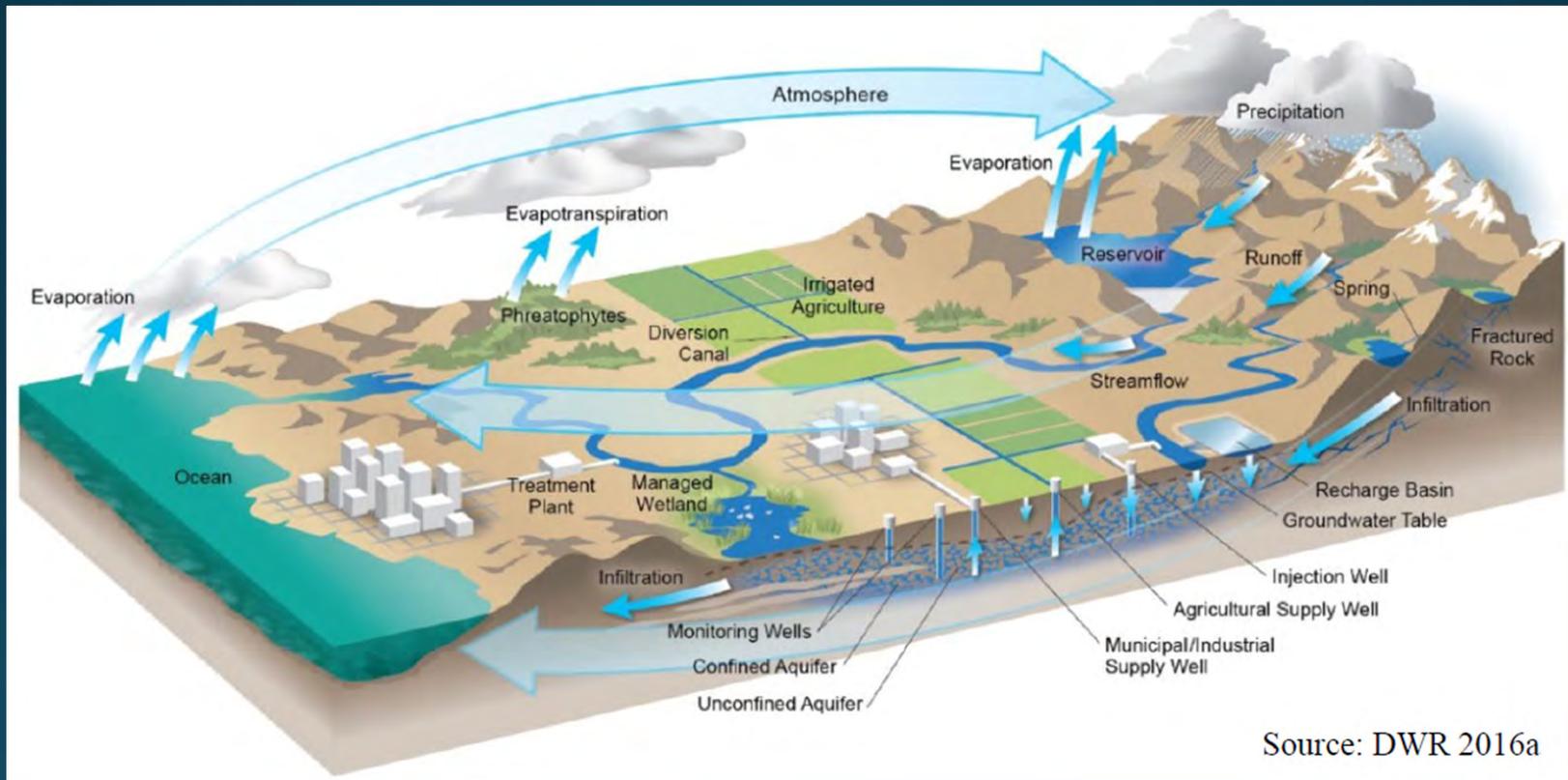
- Chapter 7 – Sustainable Management Criteria (Public Draft)

- Subject #3

- Chapter 8 – Monitoring Networks (Introduction and Discussion)

SUBJECT #1: CH 6 WATER BUDGET

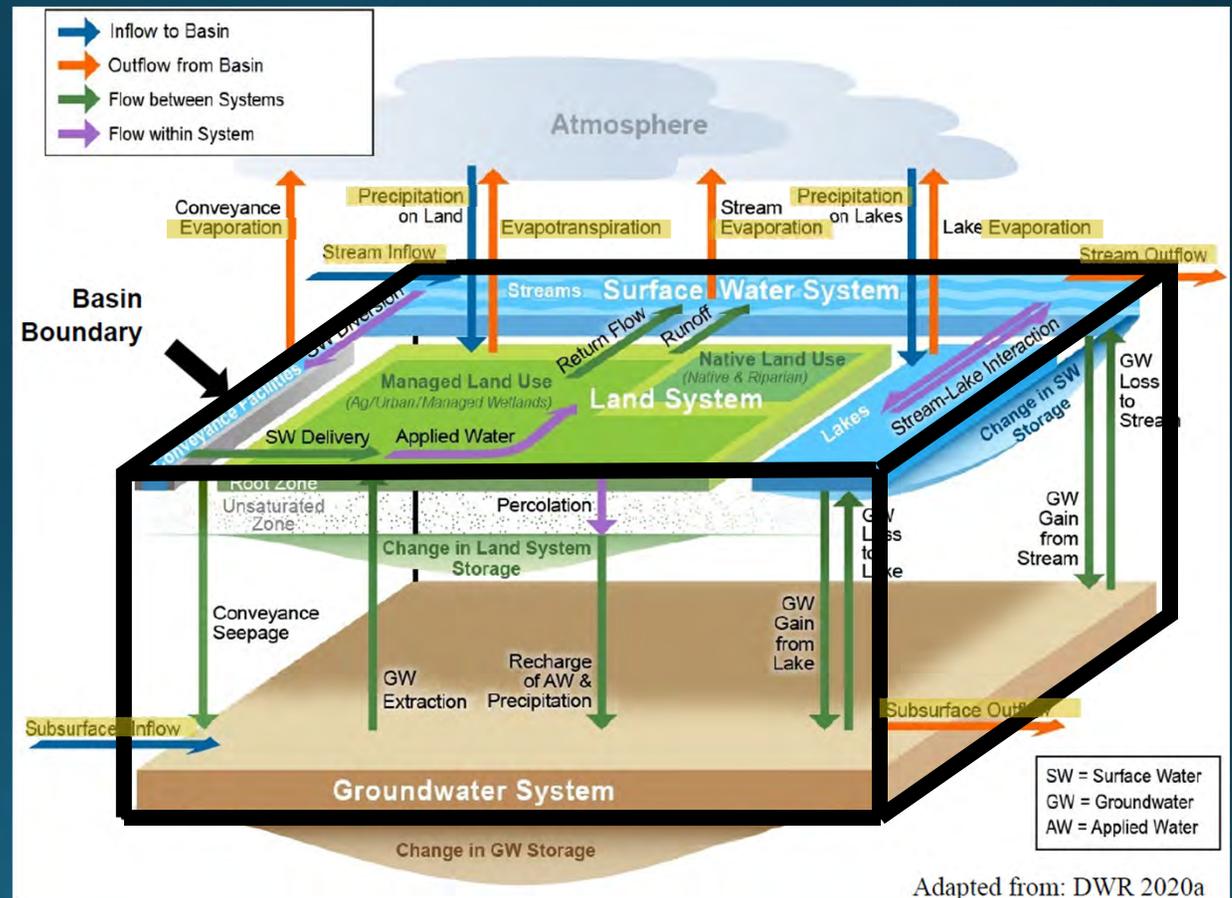
Hydrologic Cycle



SUBJECT #1: CH 6 WATER BUDGET

Groundwater Basin External Components

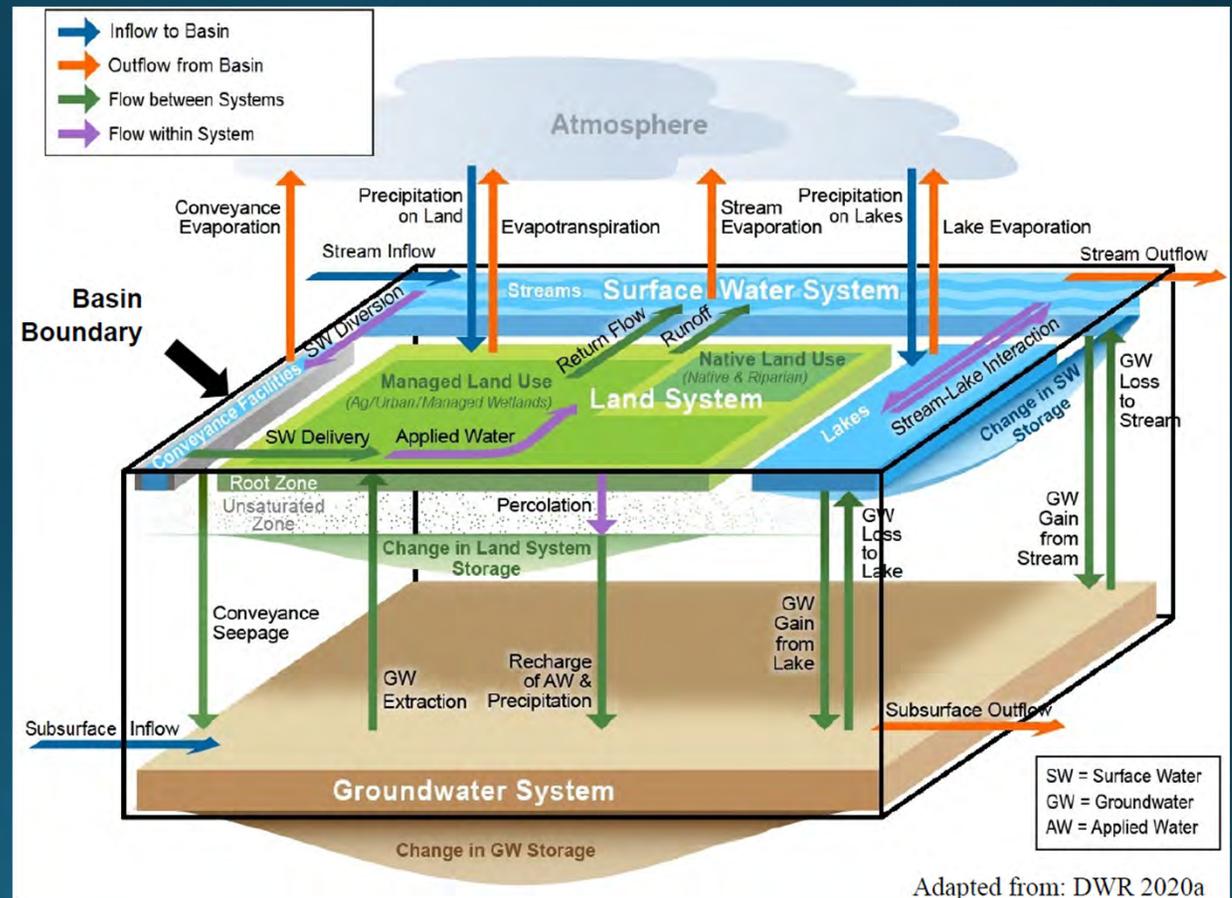
- Stream Inflow/Outflow
- Precipitation
- Evaporation and Evapotranspiration
- Subsurface Inflow/Outflow



SUBJECT #1: CH 6 WATER BUDGET

Three Systems:

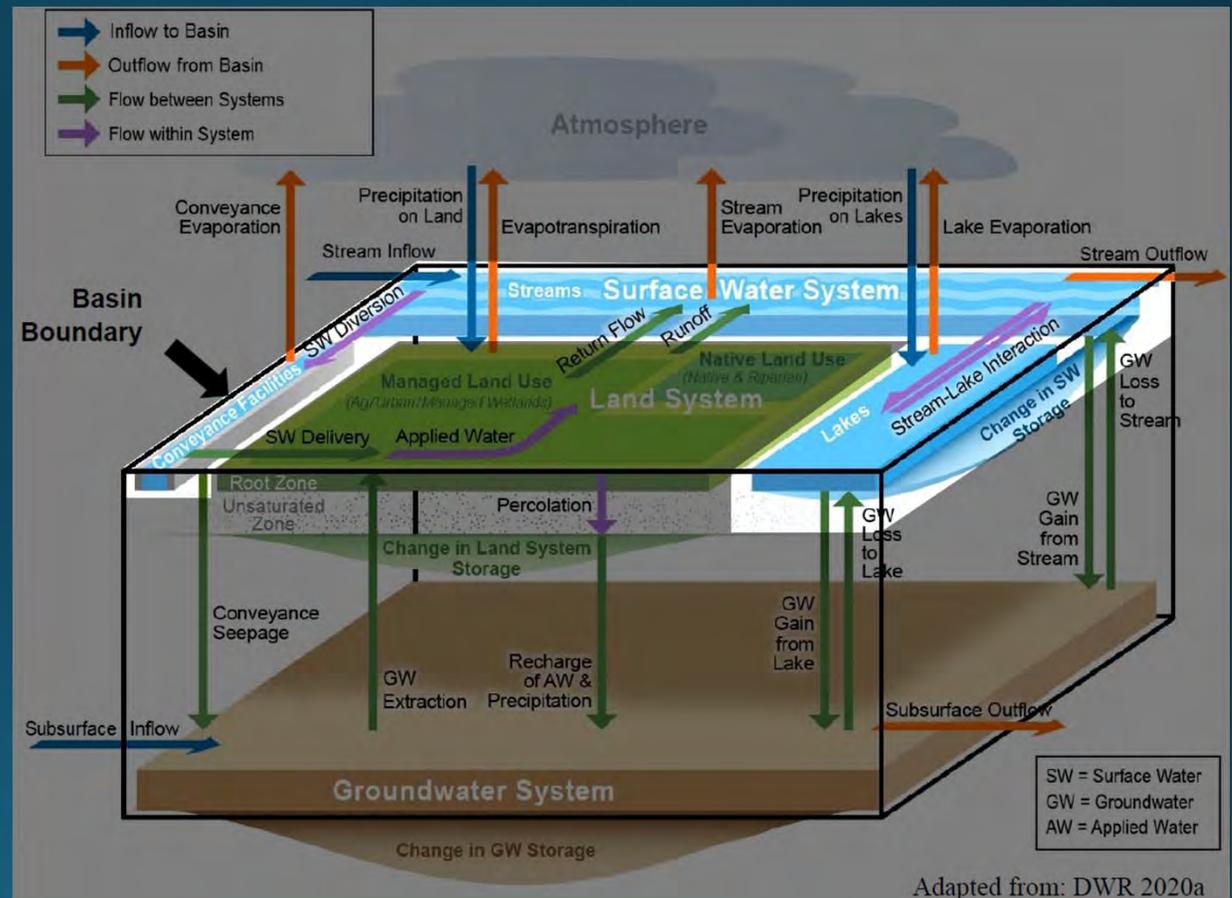
- Surface Water
- Land
- Groundwater



SUBJECT #1: CH 6 WATER BUDGET

Three Systems:

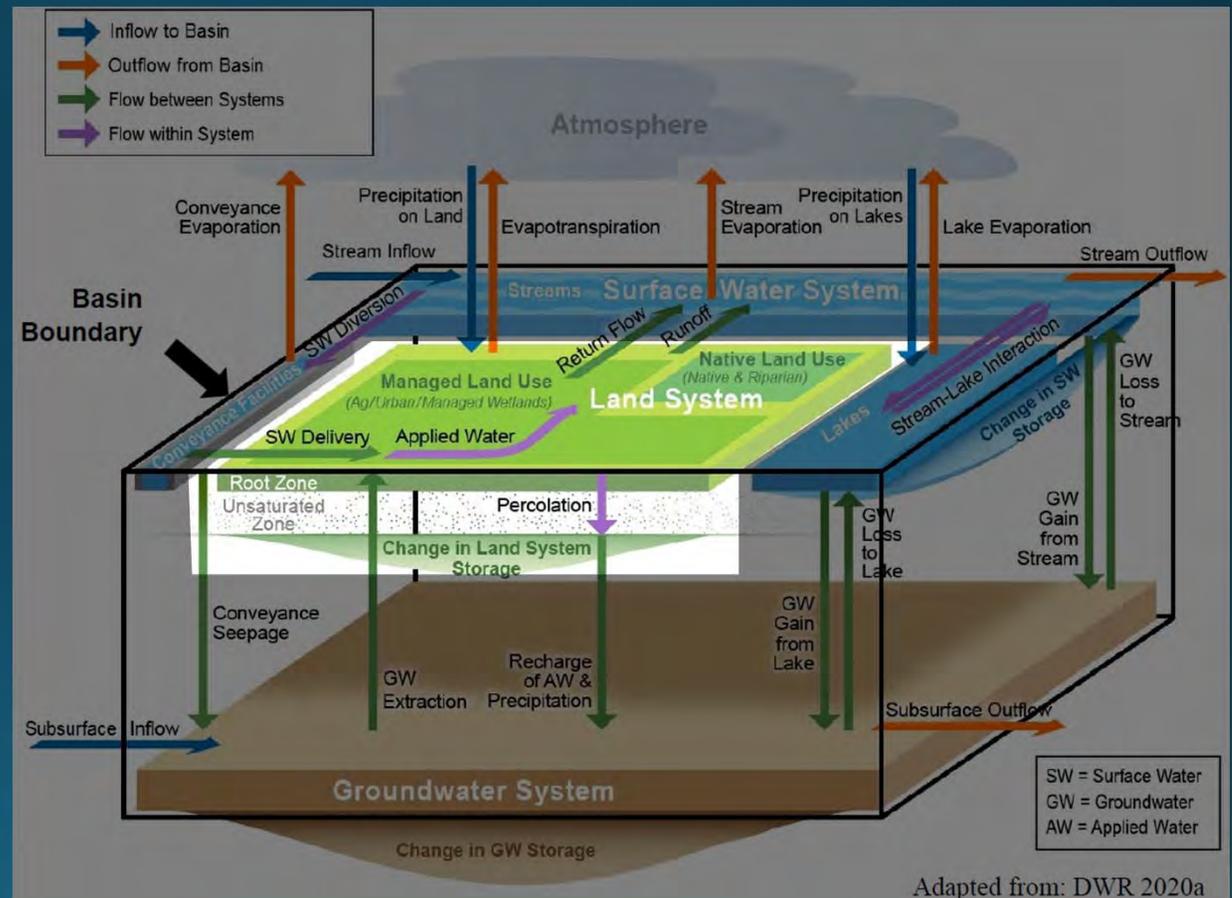
- **Surface Water**
 - Assume in balance from year to year
- **Land**
- **Groundwater**



SUBJECT #1: CH 6 WATER BUDGET

Three Systems:

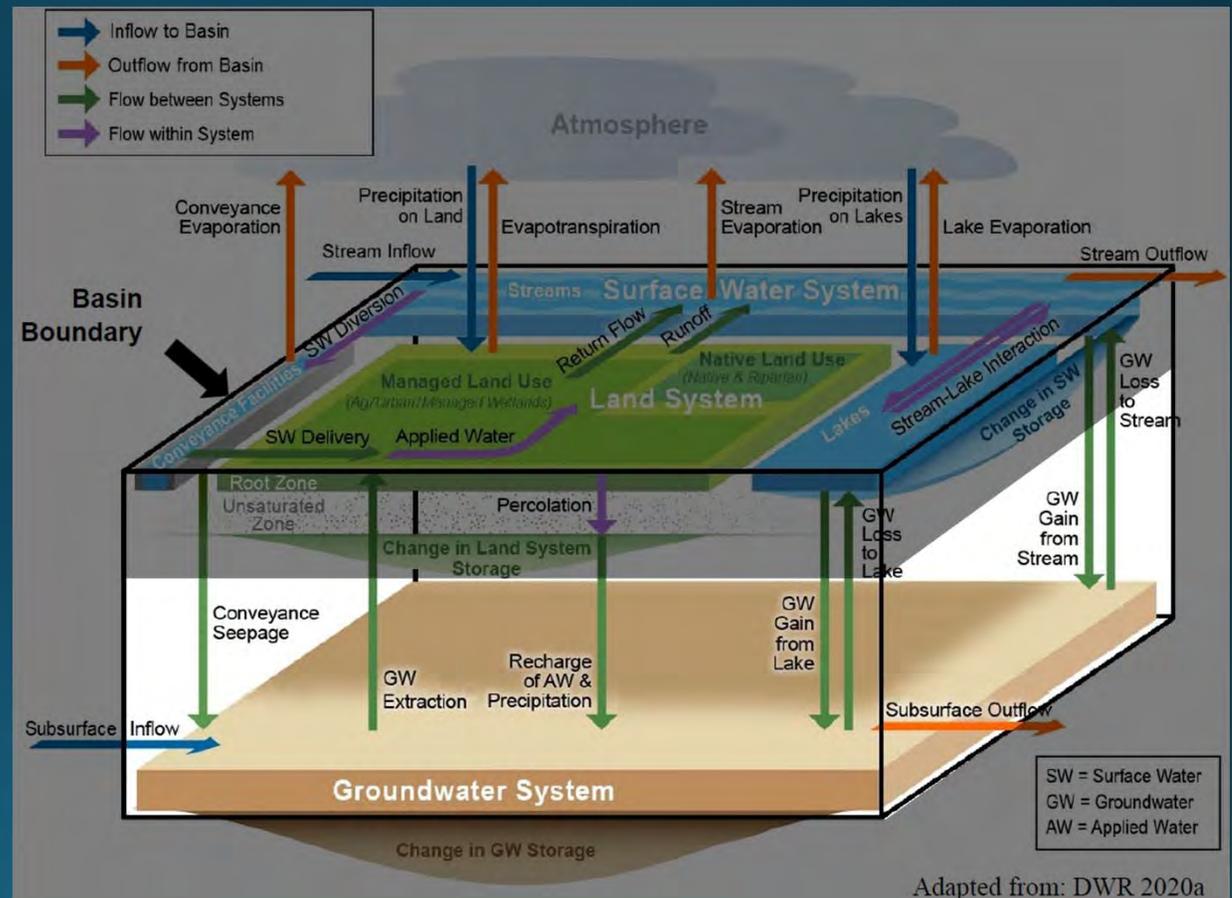
- Surface Water
- Land
 - Assume in balance from year to year
- Groundwater



SUBJECT #1: CH 6 WATER BUDGET

Three Systems:

- Surface Water
- Land
- Groundwater
 - Allowed to vary from year to year



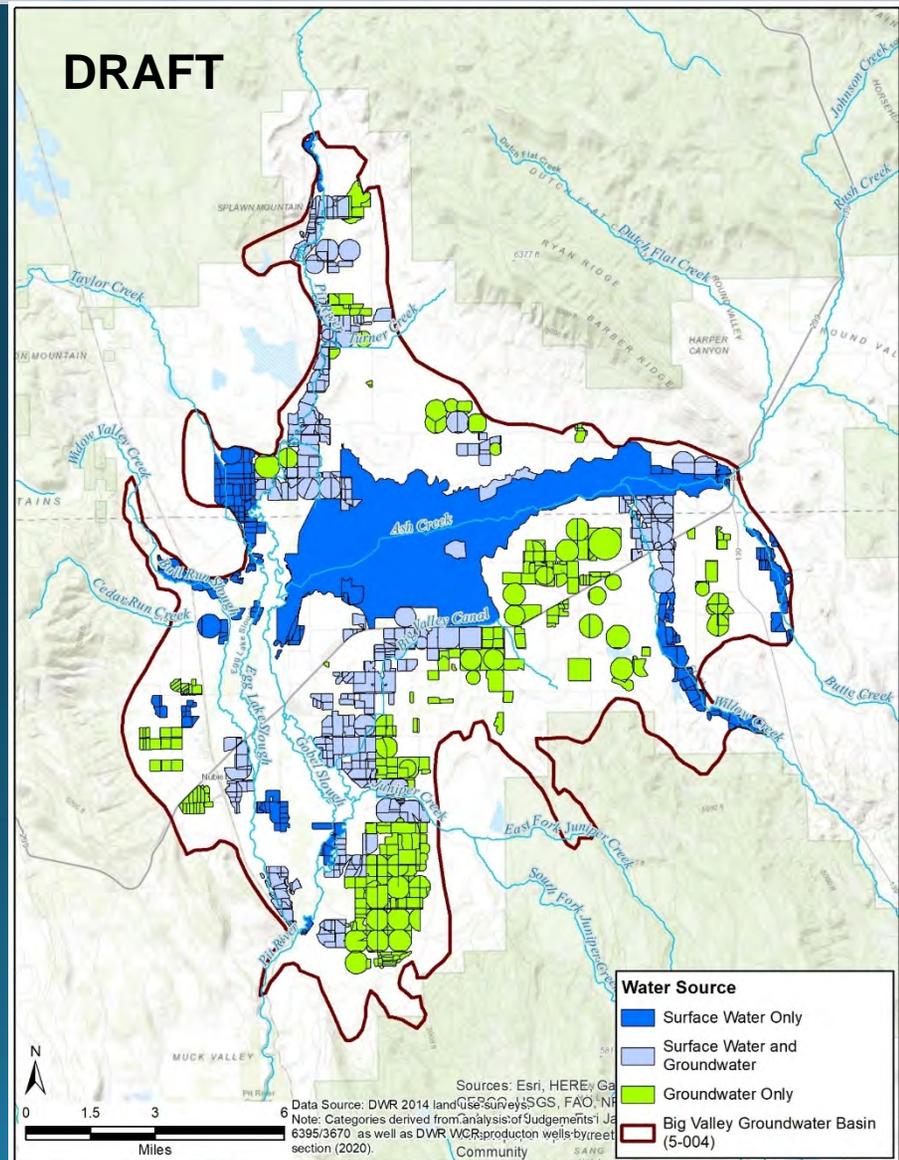
SUBJECT #1: CH 6 WATER BUDGET

Big Valley GSP Comment Matrix

Document	Packet Page	Page & Line Number	Comment	Date	Notes and Responses
Public Draft Ch 6, Current Wtr Budget			The Tables in Chapter 6 should say "ESTIMATED" or "ASSUMED" for Inflow, Outflow.	Dec. 2	Data is used where it's available, rough estimates are made in other areas, and assumptions based on best professional judgement in still other areas. The water budget is balanced by adjusting the estimates and assumptions within generally acceptable ranges until the budget is balanced. As such, the water budget is not necessarily a unique solution, but represents the best professional estimate. Water budget estimates of this type are considered order of magnitude estimates and can be refined as new data becomes available.
Public Draft Ch 6, Current Wtr Budget			Some areas are shown on the map as irrigated, when they are actually dry farmed. These areas have only been irrigated on a select few occasions.	Dec. 2	In order to reflect these farming practices, the GSP development team needs data to substantiate it. Input was requested on water source throughout the Basin in previous BVAC meetings. Similar input will be solicited at upcoming meetings and the new information can be incorporated into the Water Budget in future revisions.
Public Draft Ch 6, Current Wtr Budget			Concern that the 14,000 acres of the wetland don't show irrigation. Ash Creek Refuge is white on the map, rather than blue.	Dec. 2	The focus was on calculating irrigated acreage. Wetlands are a water use in the water budget - the assumption is that 98% of the water supply on the refuge is from surface water, and 2% groundwater. The wetlands in the Ash Creek Wildlife area have been added to Figure 6-5.
Public Draft Ch 6, Current Wtr Budget			How were the percentages of 98% surface water and 2% groundwater derived for the wetlands?	Dec. 2	Starting with the area of the wetlands, the evapotranspiration values (more specific to the conditions in Big Valley) are combined with crop co-efficients. A coefficient was used for crops similar to the vegetation of the wetland. The yields an estimate of evapotranspiration associated with the plants in the wetland. If the refuge did not run any groundwater pumps, then the refuge would be supplied 100% by surface water. Because there are three pumps that are occasionally run, there is some source from groundwater. The 2% was estimated based on professional judgement due to knowledge of the locations of the wells, the areas that they irrigate and conversations from the CDFW about how often they use them (typically for a month or two in the fall to bridge the driest part of the year). Consultant staff has reached out to the CDFW to obtain pumping data, but they have indicated that the data does not exist. As such, 2% is currently the best estimate. Text was added to the chapter to document this estimate.
Public Draft Ch 6, Current Wtr Budget			What are the options for determining runoff? Which way is best?		Modeling or calculations using the "Curve Number Method" (CNM) are the two widely accepted options to determine runoff. In the opinion of the consultants, modeling runoff would not produce significantly improved estimates from CNM, but would take additional time and budget.
Public Draft Ch 6, Current Wtr Budget			Is there a way to get a larger map, or better electronic version, to take a closer look at the basin boundary?	Dec. 2	A KMZ file (viewable in Google Earth) of the Basin Boundary has been posted on the website. An email notification was sent to the interested parties notifying them of the file and how to use it.
Public Draft Ch 6, Current Wtr Budget			Using the numbers on this chart, does this mean that a 7-8% reduction in pumping is needed?	Dec. 2	What this means is that there needs to be about 5,000 AF per year on average in compensation to reduce overdraft. It might involve managed aquifer recharge, reduced pumping or combination of the two. Reducing overdraft can be achieved in various ways.
Public Draft Ch 6, Future Wtr Budget			Is it required to use 50 years of data? Does it specify which years of data need to be used?	Dec. 2	At least 50 years of historical data are required as per the GSP Regulations. Going back further would include data from a time period with higher uncertainty and lower accuracy.

SUBJECT #1: CH 6 WATER BUDGET – REVISIONS

- Water Source Figure updated
 - Added Ash Creek Wildlife Area to water source map
 - Most of ACWA is surface water. Areas of groundwater enhancement delineated
 - Dept of Fish and Wildlife could not provide data on volume of groundwater pump
 - Updated mapping of irrigated acreage, irrigation methods, and water source is planned for 2021
- Overall Budget Results (1983-2018)
 - Budget calculations same as previous draft
 - Sustainable Yield:
 - 39,400 acre-feet per year
 - Groundwater Use:
 - 44,600 acre-feet per year
 - Overdraft:
 - 5,200 acre-feet per year



SUBJECT #1: CH 6 WATER BUDGET

Questions and Clarifications?

SUBJECT #1: CH 6 WATER BUDGET

Comments and Discussion

Set aside?

SUBJECT #2: CH 7 SUSTAINABLE MANAGEMENT CRITERIA

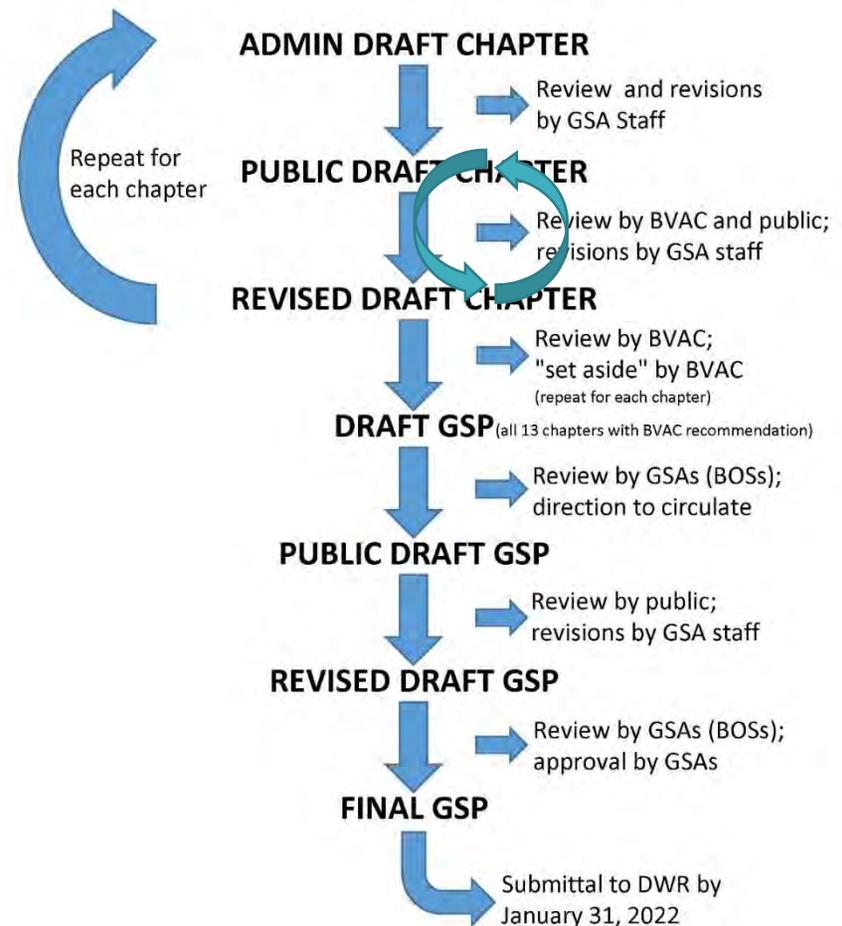
Thomas Harter Presentation

SUBJECT #2: CH 7 SUSTAINABLE MANAGEMENT CRITERIA

SMC Development Process

- Today: Introduce SMC and Monitoring Network requirements and examples. GSAs listen to discussion and accept initial thoughts and input from BVAC and public.
- February: GSAs re-write Chapters 7 and 8 based on input from today and release for BVAC and public review.
- March 3 BVAC meeting: GSAs present Revised Chapters 7 and 8 and accept further comment and input from BVAC and public.
- March: GSAs further revise and release Chapters 7 and 8 for BVAC and public review.
- April 7 BVAC meeting: GSAs present Revised Chapters 7 and 8 and Public Chapter 9 (Projects and Management Actions)

GSP Development Process Chart



SUBJECT #2: CH 7 SUSTAINABLE MANAGEMENT CRITERIA

Sustainability Goal

“Each Agency shall establish in its Plan a sustainability goal for the basin that culminates in the absence of undesirable results within 20 years...” (GSP Regulations §354.24)

Cuyama Basin:

“To maintain a sustainable groundwater resource for beneficial users of the Basin now and into the future consistent with the California Constitution.”

North Yuba Basin:

“...to maintain a locally managed, economically viable, sustainable groundwater resource for existing and future beneficial use in Yuba County by continuing existing management to maintain operation within the sustainable yield or by modification of existing management to address unforeseen future conditions.”

Kaweah Basin:

“...to preserve the viability of existing agricultural enterprises of the region and the smaller communities that provide much of their job base in the Sub-basin, including the school districts serving these communities. The Goal will also strive to fulfill the water needs of existing and amended county and city general plans that commit to continued economic and population growth within Tulare County.”

SUBJECT #2: CH 7 SUSTAINABLE MANAGEMENT CRITERIA

Sustainability Goal

What does the GSP seek to achieve and/or protect?

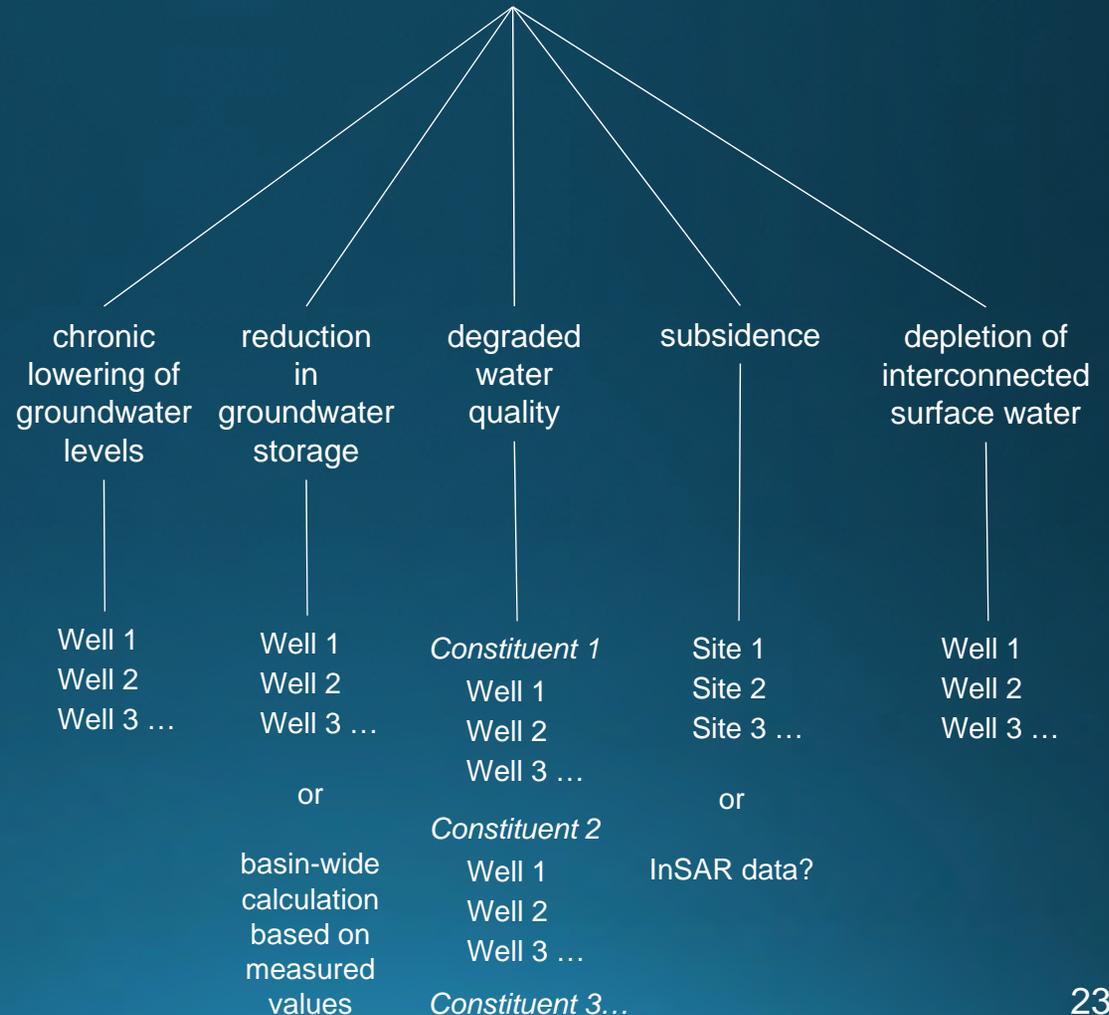
Undesirable Results

What is “significant and unreasonable” for each Sustainability Indicator based on the sustainability goal?

Minimum Thresholds Measurable Objectives Interim Milestones

What are the measured values that will determine if the basin is sustainable?

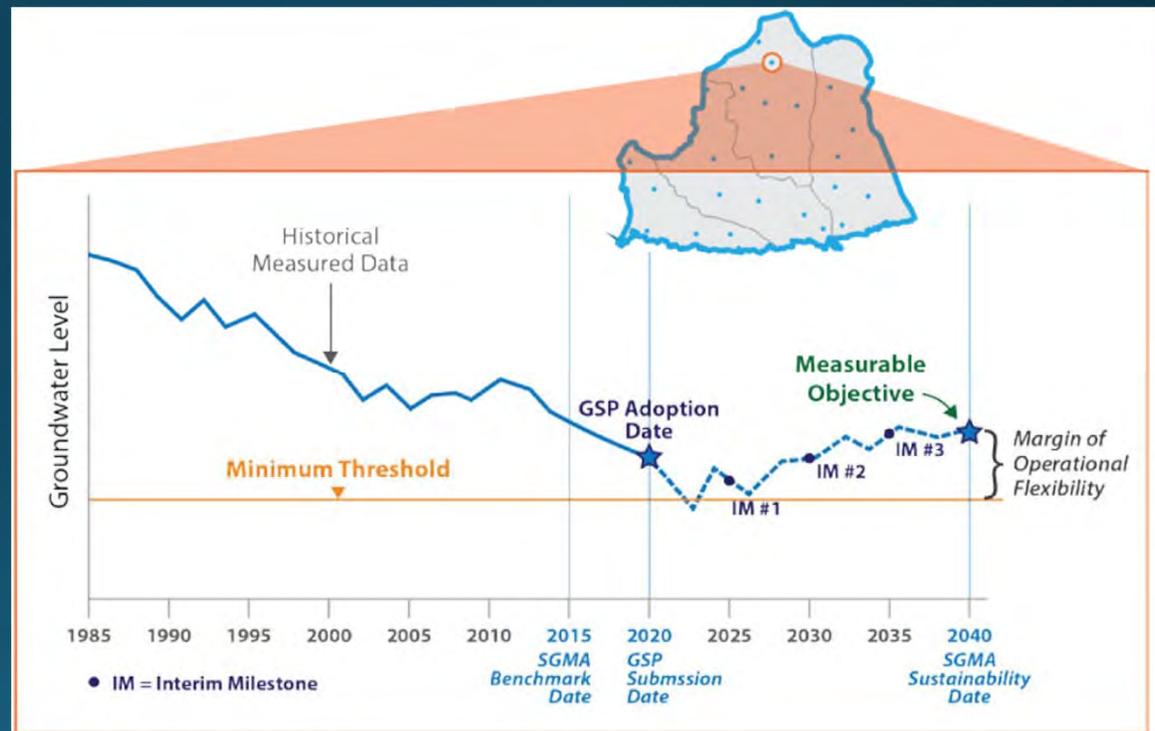
Sustainability Goal



SUBJECT #2: CH 7 SUSTAINABLE MANAGEMENT CRITERIA

Measuring Sustainability:

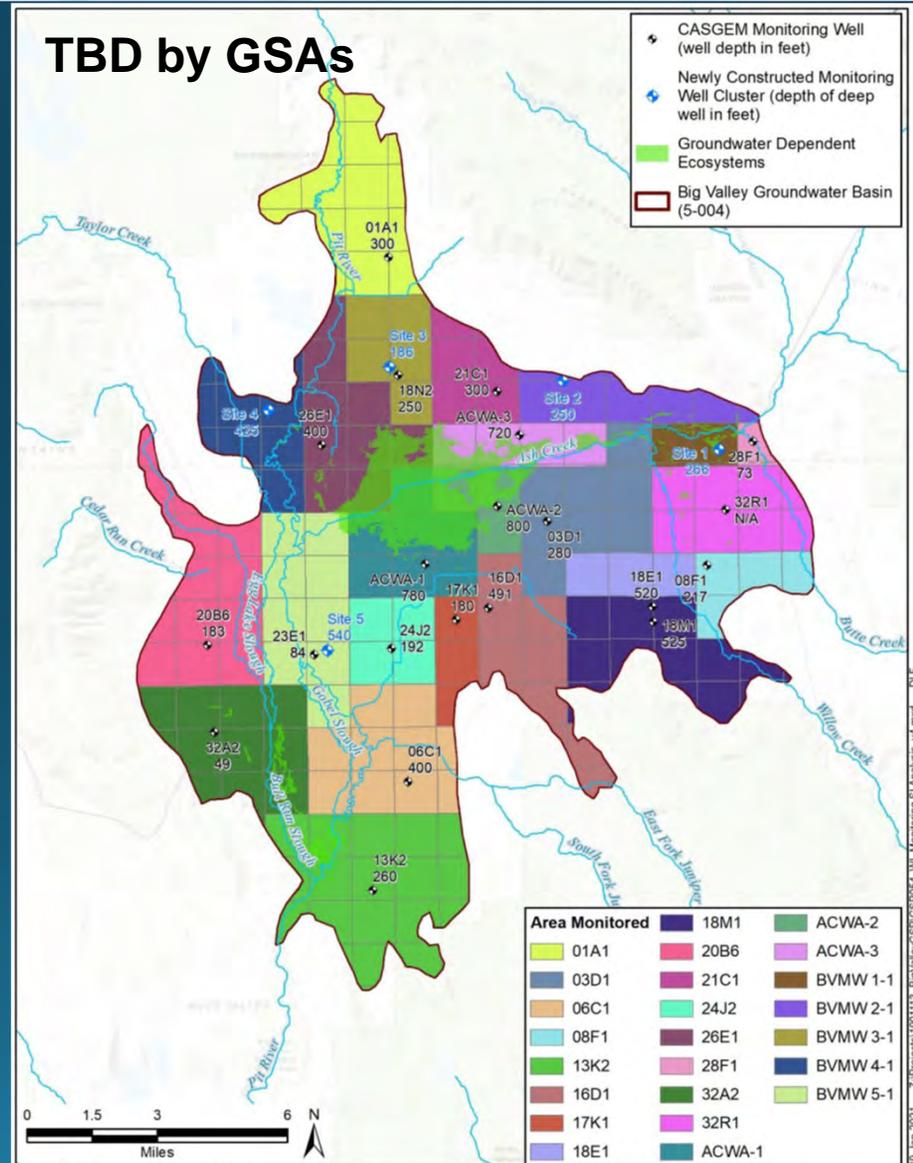
- **Minimum Threshold**
 - If measured values exceed this level, it could indicate an undesirable result.
 - A single MT exceedance doesn't necessarily mean the basin isn't sustainable.
- **Measurable Objective**
 - What value should we measure if the sustainability goal is being achieved?
- **Interim Milestones**
 - What values should we expect between 2022 and 2042 to indicate we are moving toward sustainability.
 - IMs are not required



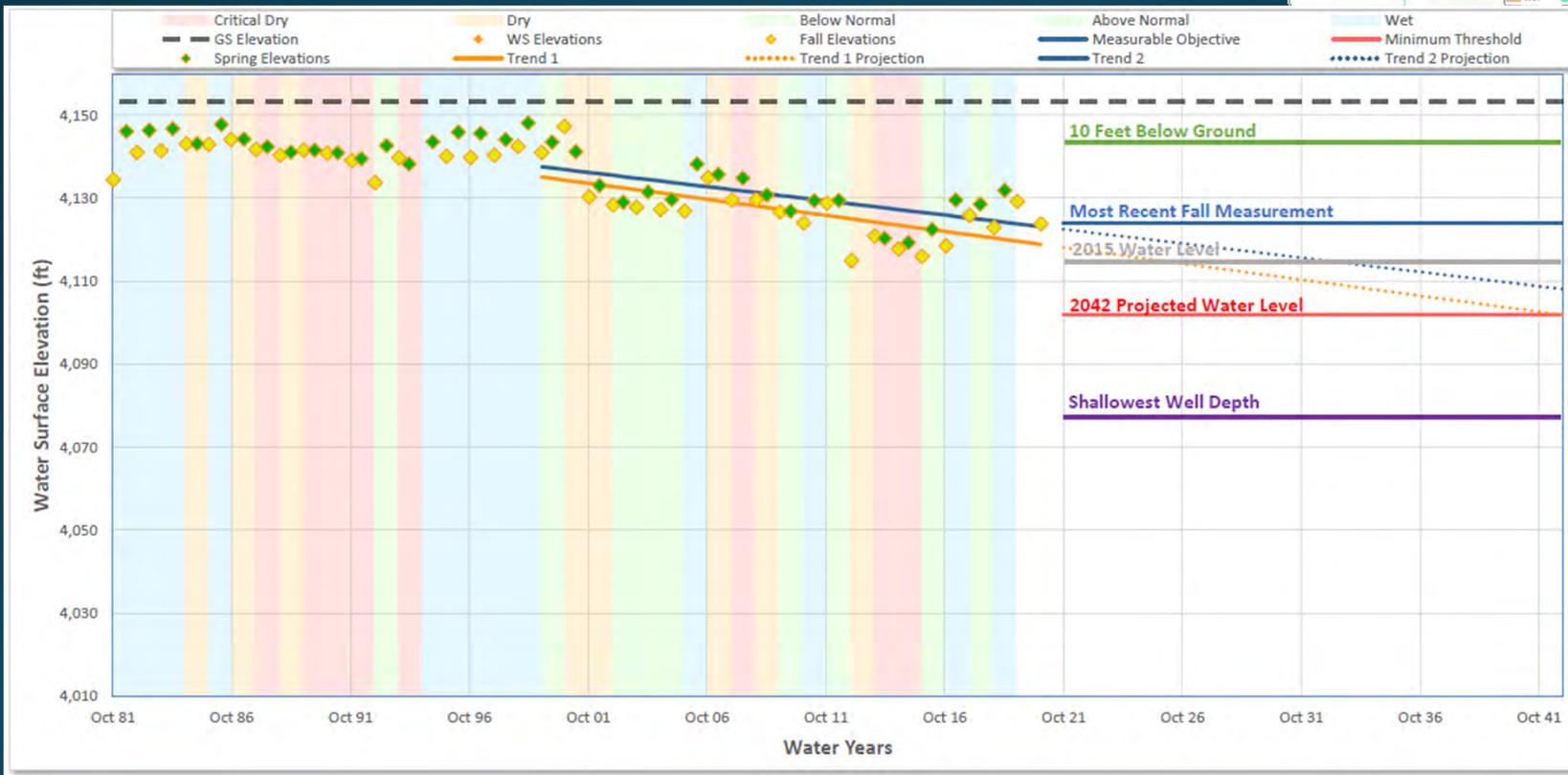
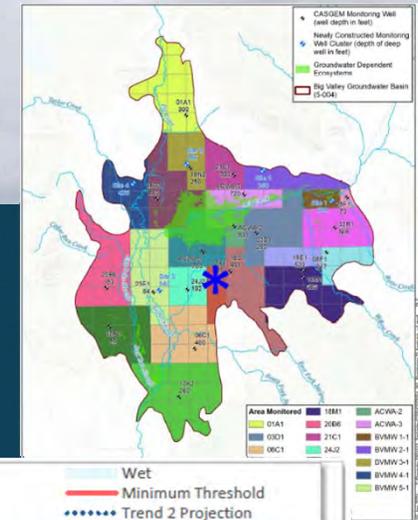
Source: DWR 2017

SUBJECT #2: CH 7 SUSTAINABLE MANAGEMENT CRITERIA

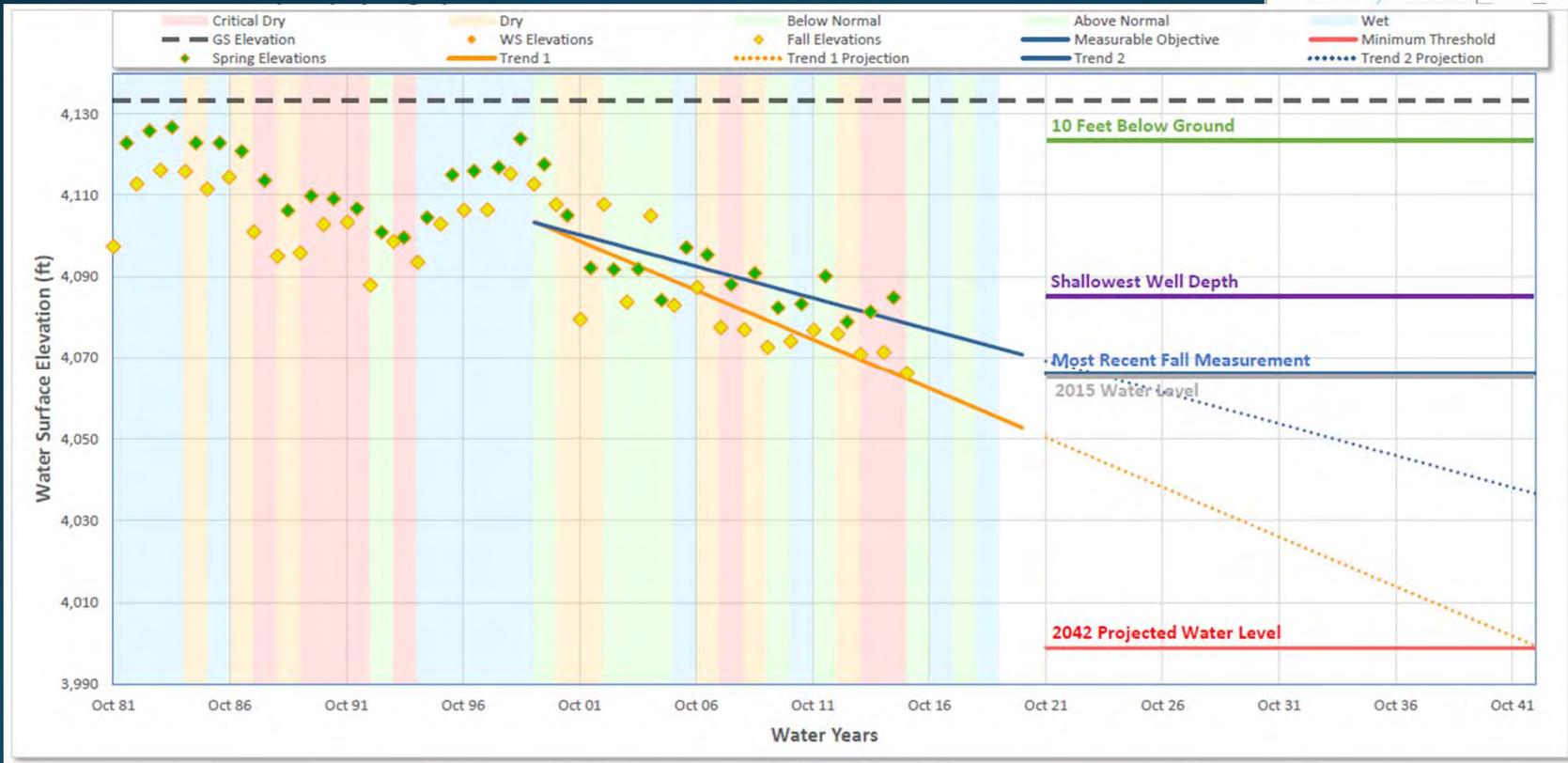
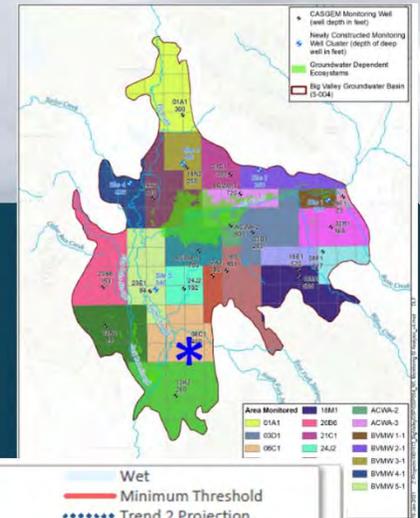
- How was this map created?
- Potential Representative Monitoring
 - Which wells/sites represent which areas of the Basin?
 - Do we want lots of representative wells/sites or few?
 - Few is easier to establish and manage
 - Many means a single MT exceedance has less of an impact (if we establish a percentage of exceedances in our undesirable results narrative)
- Different thresholds in different parts of the basin?
 - Should we establish Management Areas
 - Different wells/sites can have different thresholds even without Management Areas



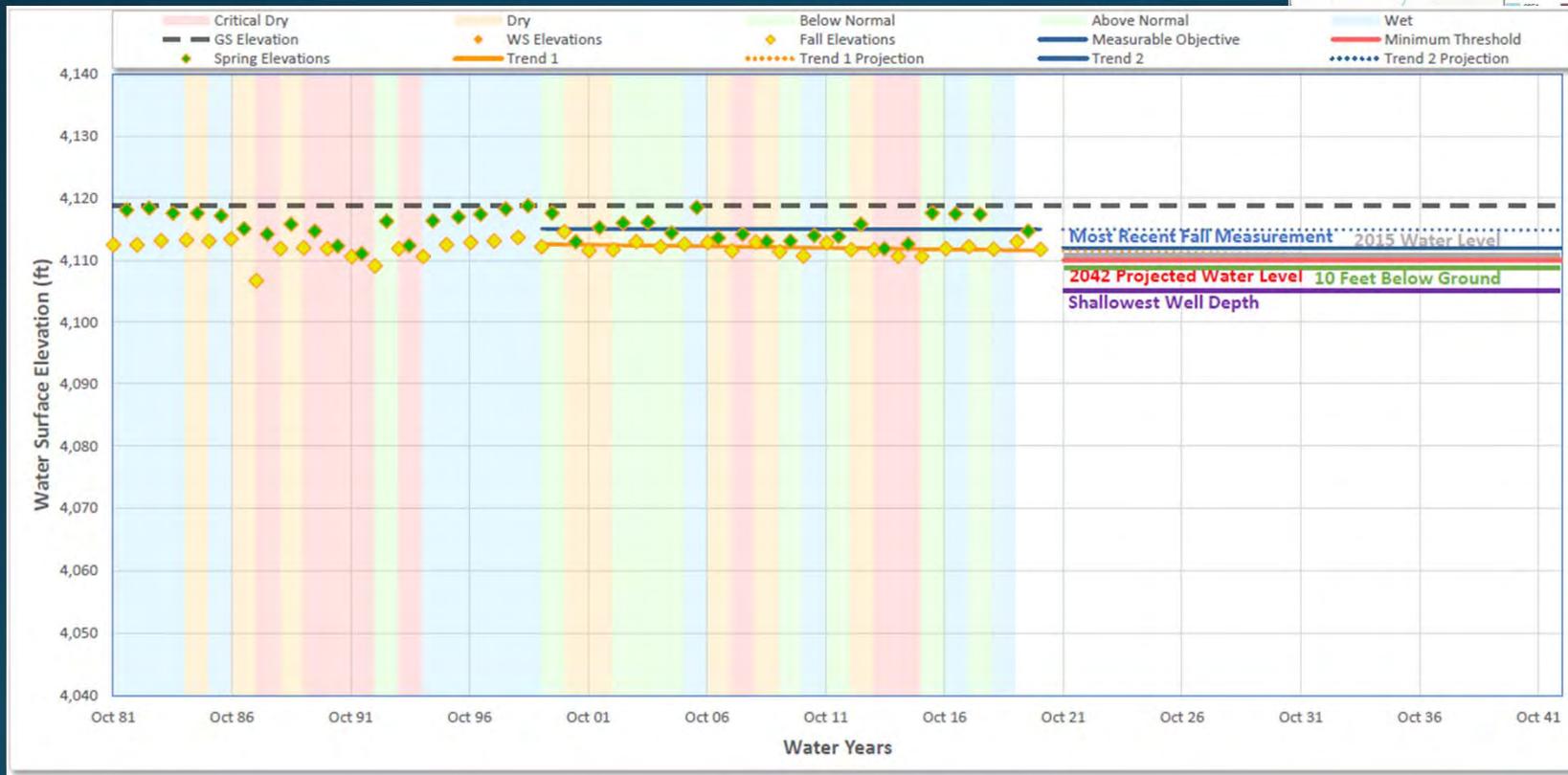
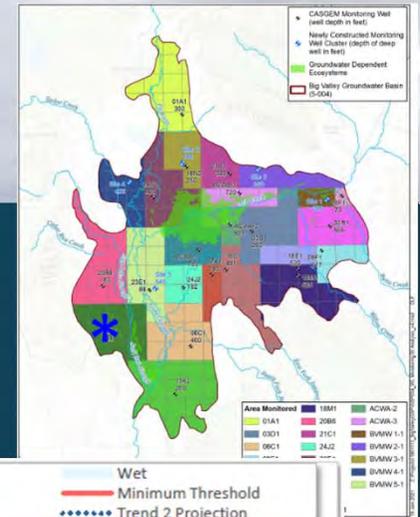
SUBJECT #2: CH 7 SUSTAINABLE MANAGEMENT CRITERIA



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SUBJECT #2: CH 7 SUSTAINABLE MANAGEMENT CRITERIA

Discussion of Possible Language for Big Valley Sustainability Goal

“Each Agency shall establish in its Plan a sustainability goal for the basin that culminates in the absence of undesirable results within 20 years...” (GSP Regulations §354.24)

Cuyama Basin:

*“To maintain a sustainable groundwater resource for **beneficial users** of the Basin now and into the future consistent with the California Constitution.”*

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Kaweah Basin:

*“...to preserve the viability of **existing agricultural enterprises** of the region and the smaller **communities** that provide much of their job base in the Sub-basin, including the school districts serving these communities. The Goal will also strive to fulfill the water needs of existing and amended county and city **general plans** that commit to continued **economic and population growth** within Tulare County.”*

SUBJECT #2: CH 7 SUSTAINABLE MANAGEMENT CRITERIA

Discussion of Possible Criteria and Effects for Big Valley Undesirable Results

“Each Agency shall describe in its Plan the processes and criteria relied upon to define undesirable results applicable to the basin. Undesirable results occur when significant and unreasonable effects for any of the sustainability indicators are caused by groundwater conditions occurring throughout the basin. (GSP Regulations §354.26)

	chronic lowering of groundwater levels	reduction in groundwater storage	degraded water quality	subsidence	depletion of interconnected surface water
Cause	• _____	• _____	• _____	• _____	• _____
Criteria	• _____	• _____	• _____	• _____	• _____
Effects	• _____	• _____	• _____	• _____	• _____

SUBJECT #2: CH 7 SUSTAINABLE MANAGEMENT CRITERIA

Questions and Clarifications?

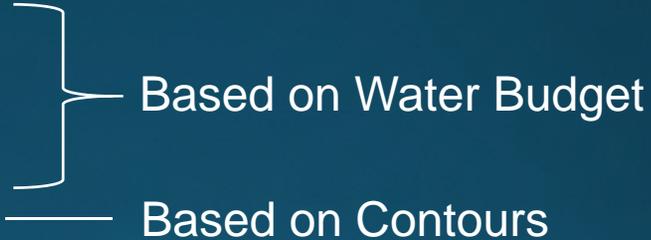
SUBJECT #2: CH 7 SUSTAINABLE MANAGEMENT CRITERIA

Comments and Discussion

Next Steps?

SUBJECT #3: CH 8 MONITORING NETWORKS

Annual Reporting Requirements:

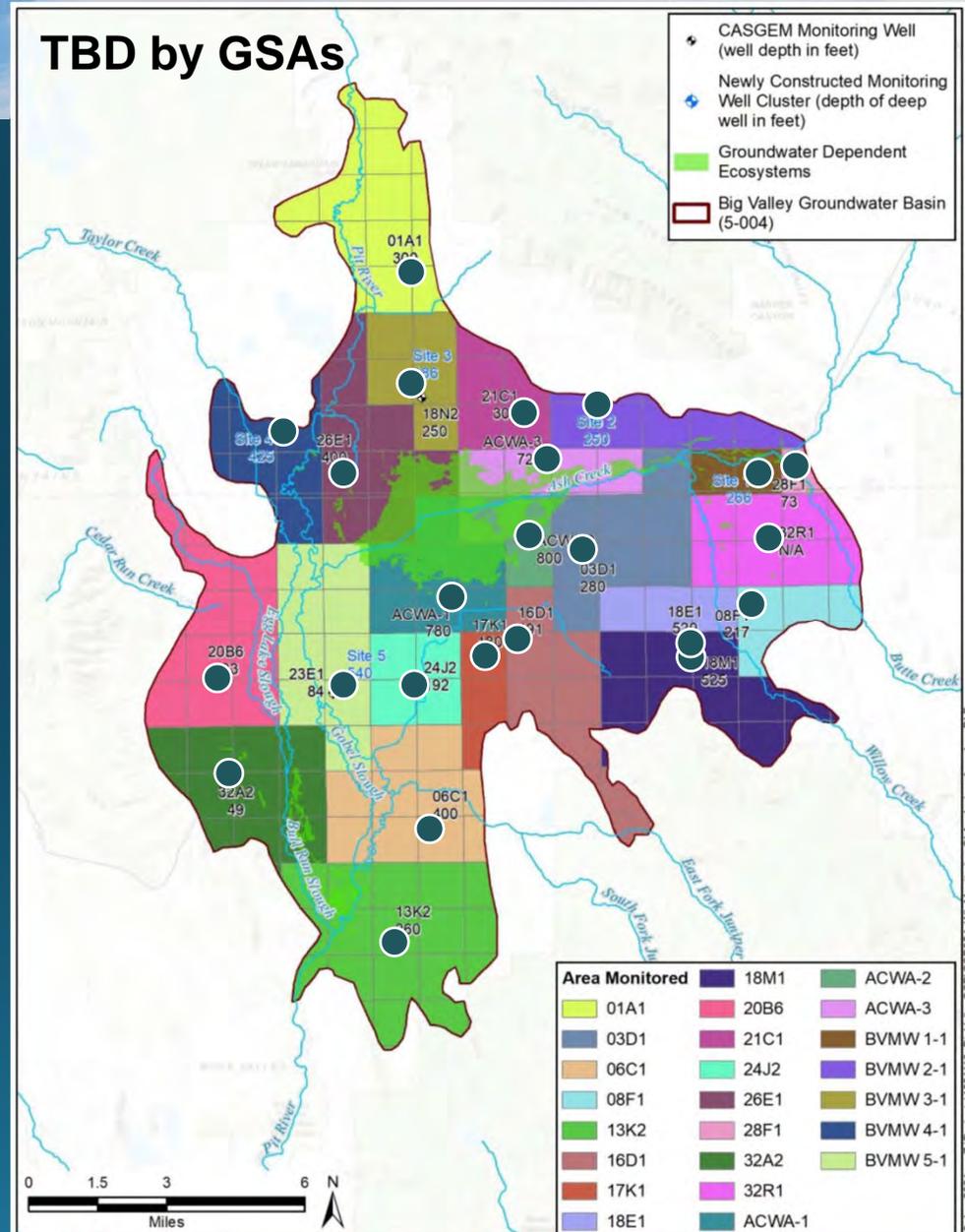
- Groundwater Level Hydrographs
 - Contour Maps (based on groundwater levels)
 - Estimated volumes of:
 - Groundwater Extraction
 - Surface Water Supply
 - Total Water Use
 - Change in Groundwater Storage
- Based on Water Budget
- Based on Contours
- 

Other Monitoring: (must be performed on a regular schedule, but not necessarily annually)

- Water quality
- Subsidence

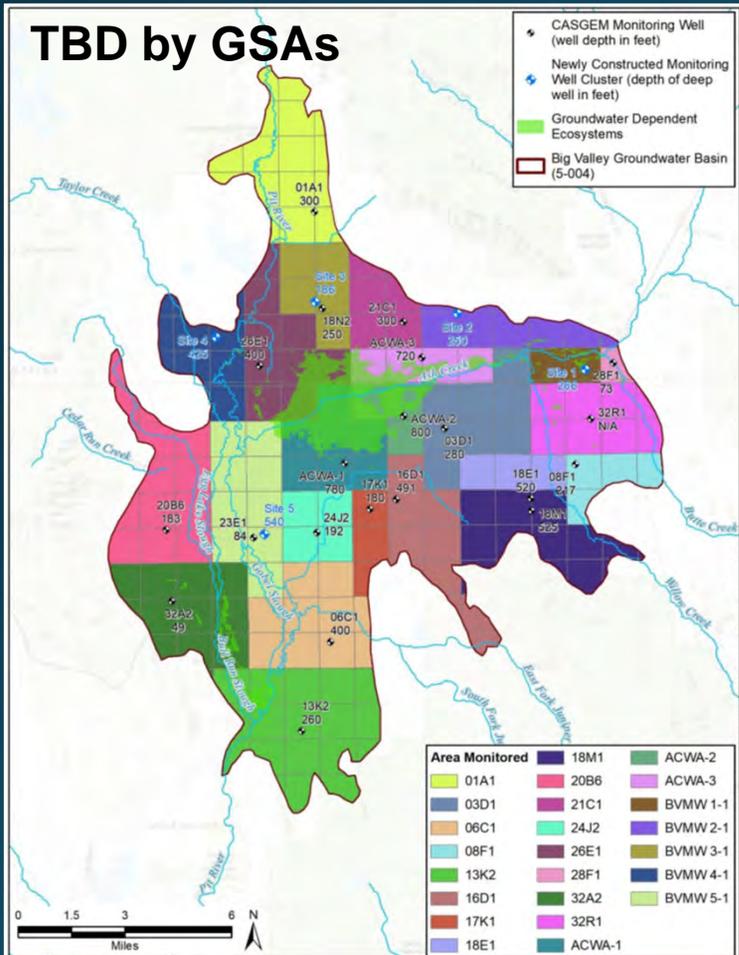
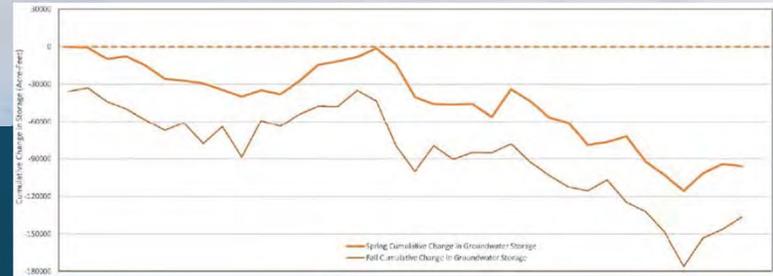
SUBJECT #3: CH 8 MONITORING NETWORKS

- Chronic Lowering of Groundwater Levels Potential Monitoring Network
- CASGEM wells
- Newly constructed well clusters
- Additional wells?
 - Lassen-Modoc Flood Control and Water Conservation District wells?

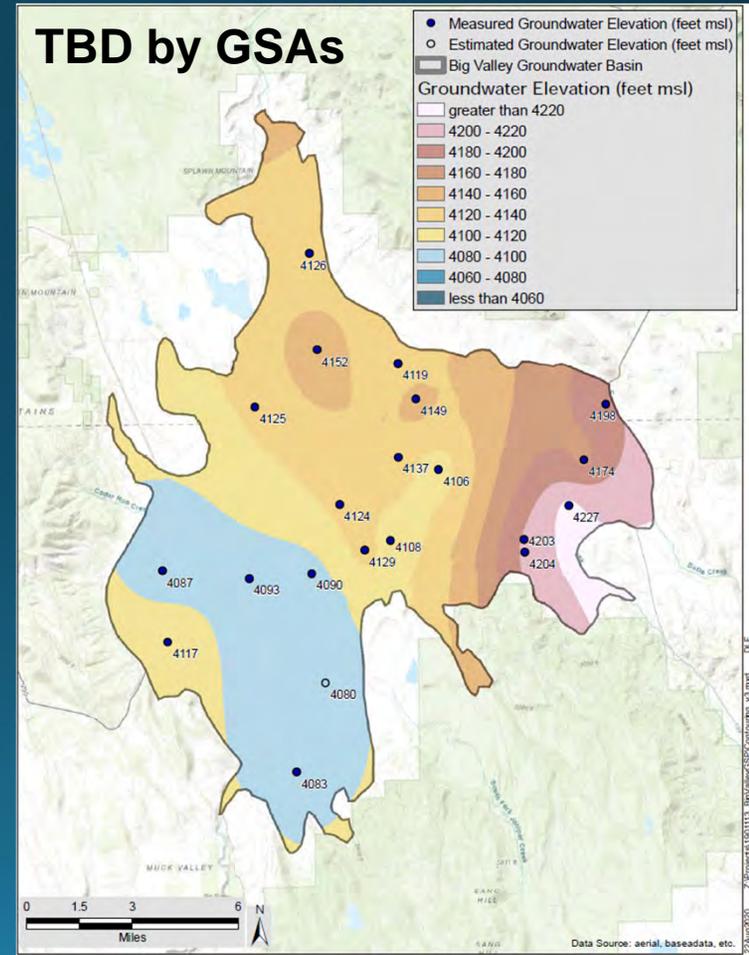


SUBJECT #3: CH 8 MONITORING NETWORKS

- Groundwater Storage Potential Monitoring Network



OR



SUBJECT #3: CH 8 MONITORING NETWORKS

- Water Quality Potential Monitoring Network

Which Constituents?

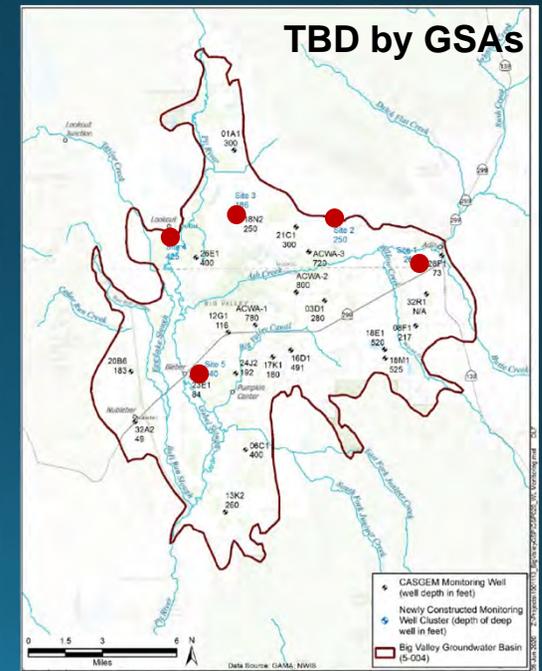
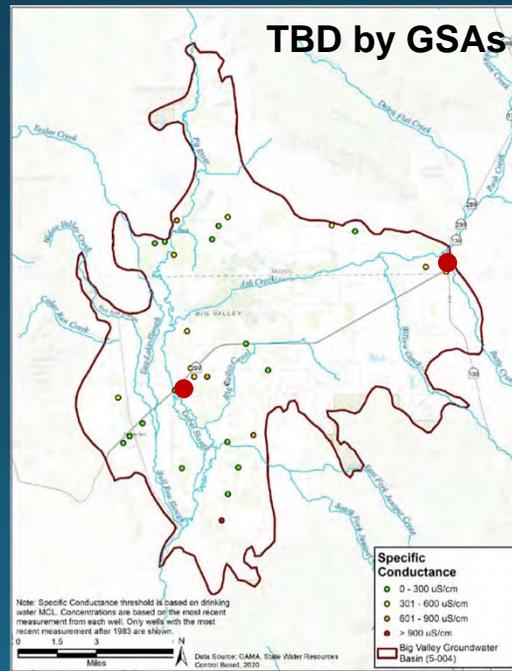
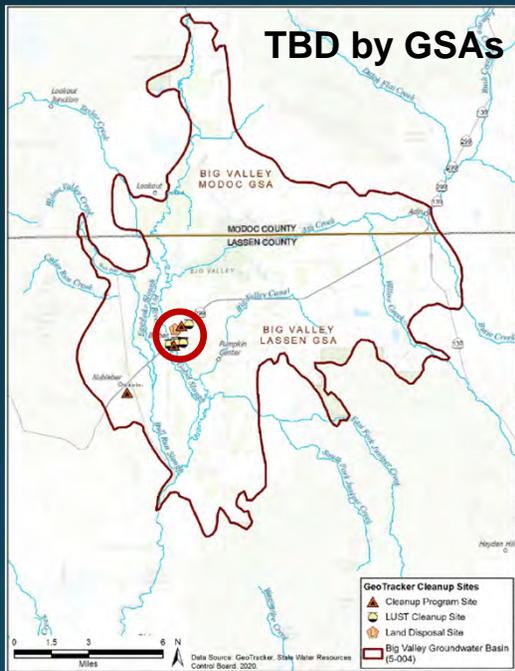
Regulated Sites?

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Division of Drinking Water?

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GSA Monitoring?



SUBJECT #3: CH 8 MONITORING NETWORKS

- Subsidence Potential Monitoring Network

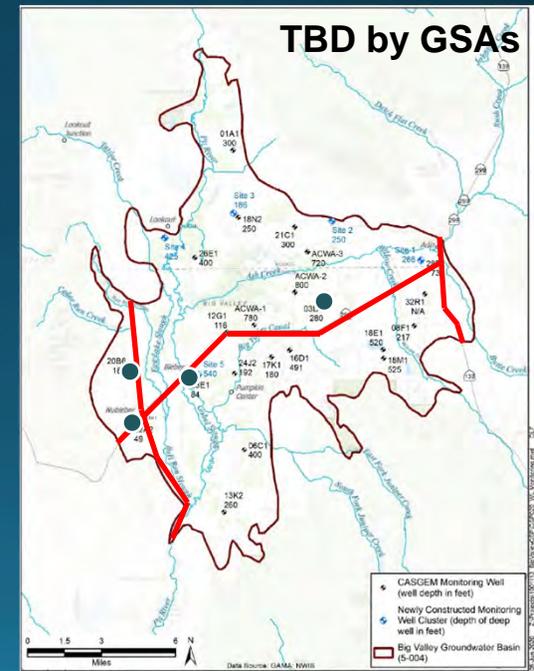
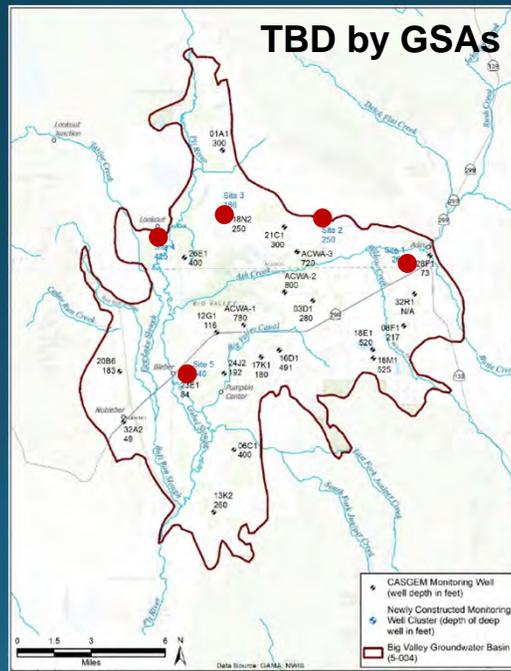
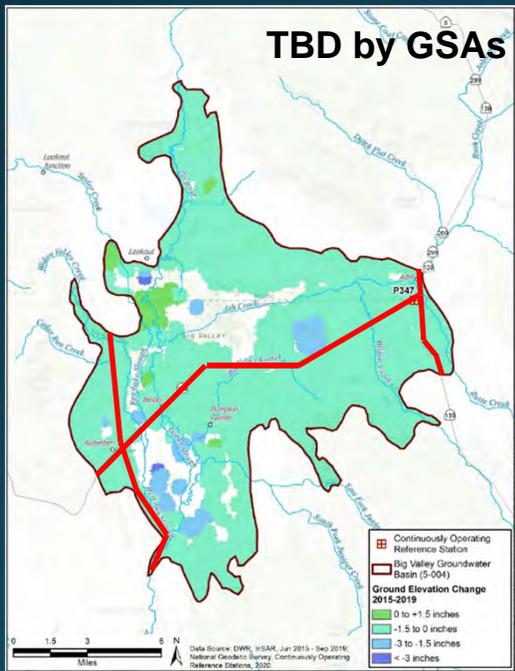
InSAR?

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Benchmark Surveys?

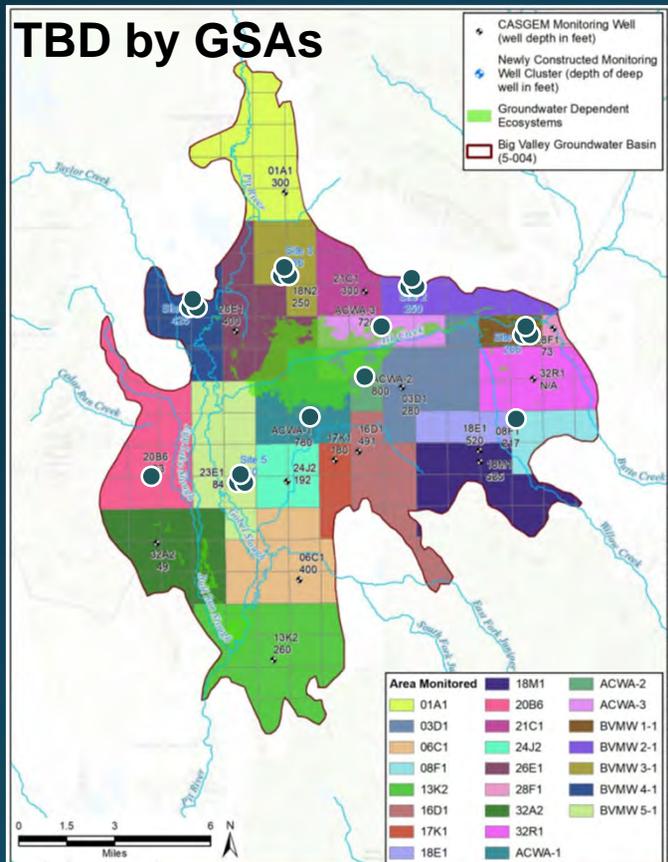
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Water Levels?



SUBJECT #3: CH 8 MONITORING NETWORKS

- Surface Water Depletions Potential Monitoring Network

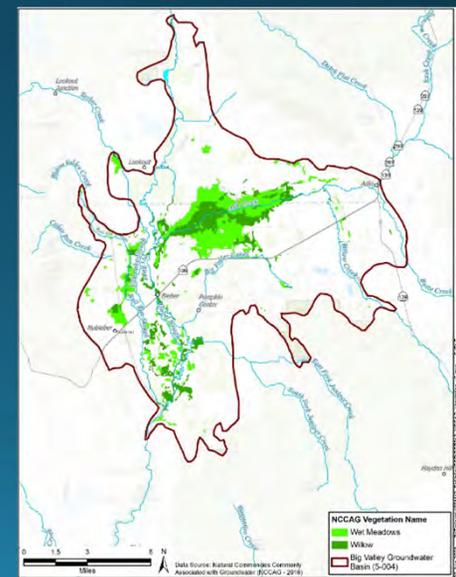
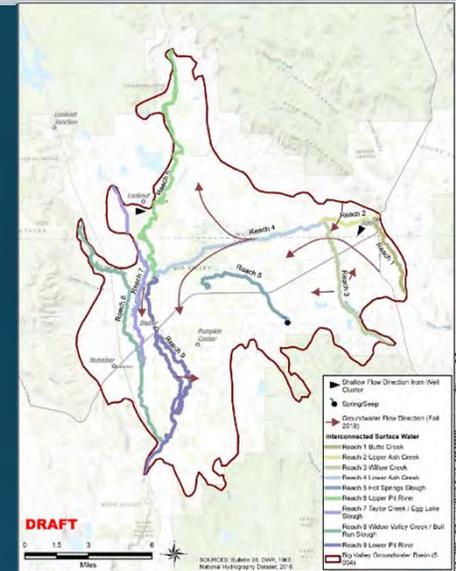


Water Levels

considering

Interconnected Surface Water

Groundwater Dependent Ecosystems



SUBJECT #3: CH 8 MONITORING NETWORKS

Discussion of Possible Objectives for Big Valley Undesirable Results

“Each Plan shall include a description of the monitoring network objectives for the basin, including an explanation of how the network will be developed and implemented to monitor groundwater and related surface conditions, and the interconnection of surface water and groundwater, with sufficient temporal frequency and spatial density to evaluate the affects and effectiveness of Plan implementation.. (GSP Regulations §354.34)

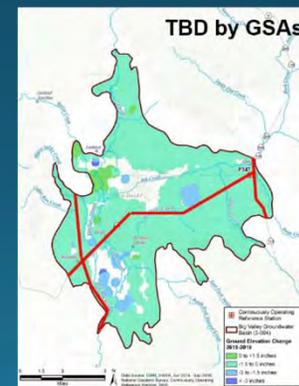
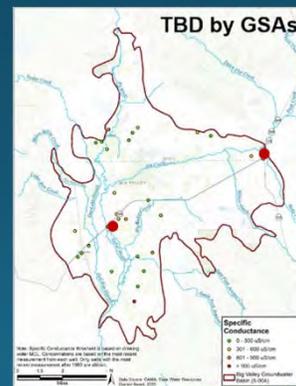
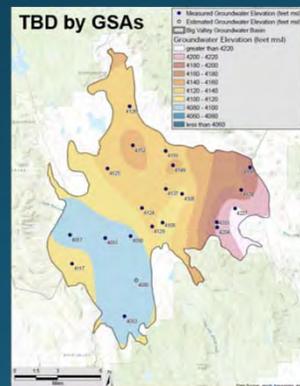
chronic lowering of groundwater levels

reduction in groundwater storage

degraded water quality

subsidence

depletion of interconnected surface water



SUBJECT #3: CH 8 MONITORING NETWORKS

Questions and Clarifications?

SUBJECT #3: CH 8 MONITORING NETWORKS

Comments and Discussion

QUESTIONS OR COMMENTS FOR ITEMS NOT ON THE AGENDA



- GSA Staff and Consultants will be available after the meeting to talk, answer questions, and hear your concerns.