Groundwater Sustainability Plan for Big Valley Groundwater Basin

Lassen and Modoc Counties

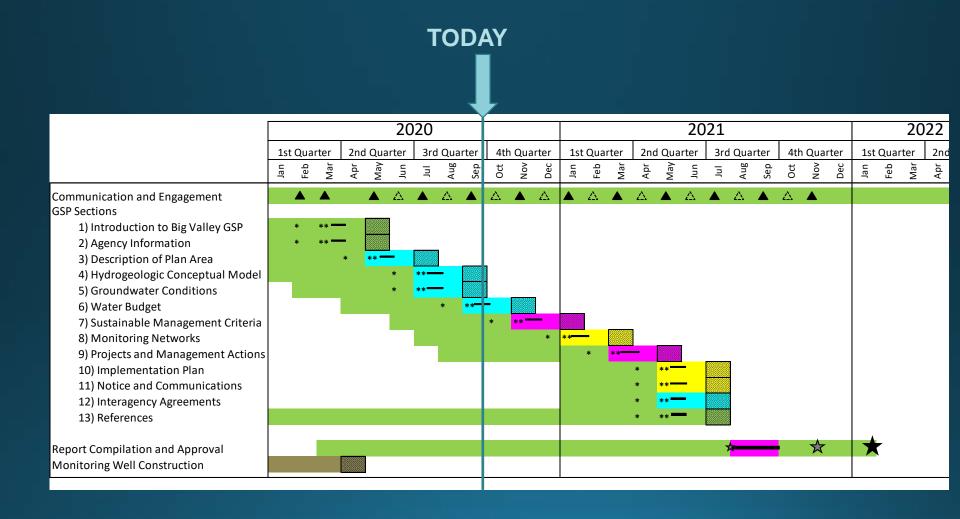
Advisory Committee Meeting 5

September 24, 2020

GENERAL UPDATES AND SCHEDULE

- Groundwater Sustainability Agency (GSA) staff and consultants plan to conduct the November 4, 2020, regular meeting of the Big Valley Groundwater Advisory Committee (BVAC) as scheduled.
- A public workshop/community meeting is being planned for the first part of December (before December 13, 2020). This will not be a meeting of the BVAC. Date to be announced in the very near future on the bigvalleygsp.org project website and to the Interested Parties list.
- BVAC member participation is optional, but please let staff know if any committee members plan on attending, as there may be Brown Act requirements.
- The public is encouraged to submit any ideas they may have for the workshop.

GSP DEVELOPMENT SCHEDULE



GSP CHAPTERS

- 1 Introduction
- **2 Agency Information**
- 3 Description of Plan Area
- 4 Hydrogeologic Conceptual Model
- **5 Groundwater Conditions**
- 6 Water Budget
- 7 Sustainable Management Criteria
- **8 Monitoring Networks**
- **9 Projects and Management Actions**
- 10 Implementation Plan
- 11 Notice and Communications
- **12 Interagency Agreements**
- 13 Reference List

Stakeholder input: LOW. Background and foundational information. Mostly provided by consultant team and GSA staff. <u>Just need to meet the regulations</u>.

Stakeholder input: LOW. Foundational and structural information based on best available data and science. Must be signed by a Professional Geologist.

Stakeholder input: HIGH. Decision-making chapter. Establishes the monitoring, thresholds and management actions that stakeholders will have to adhere to.

Stakeholder input: MODERATE. Describes how the decisions made in Ch 7-9 will be implemented and how stakeholders will continue to be informed and participate.

Stakeholder input: LOW. Just need to meet the regulations.

CORRESPONDENCE

- On August 11, 2020, the Lassen County Board of Supervisors approved a letter to the Governor and a letter to the legislature requesting that the deadline to submit a Groundwater Sustainability Plan (GSP) to DWR be extended by one year (to January 31, 2023 (pages 1-9 of the packet).
- In summary, the letters argue that COVID-19 has made conducting meetings difficult (due primarily to lack of internet) and will make meeting the January 31, 2022, deadline difficult.
- As of this date, staff is unaware of any response.
 Inquiries have been made and GSA staff may work with the BVAC Chair to seek a response.

AGENDA

- Subject #1
 - Chapter 5 Groundwater Conditions

- Subject #2:
 - Chapter 3 Plan Area
 - Chapter 4 Hydrogeologic Conceptual Model

- Subject #3
 - New Prop 68 Grant Water Measurement Enhancement

SUBJECT #1: CH 5 GROUNDWATER CONDITIONS – WATER LEVELS

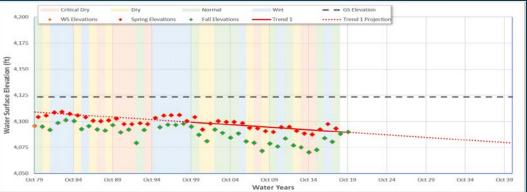
Groundwater Levels

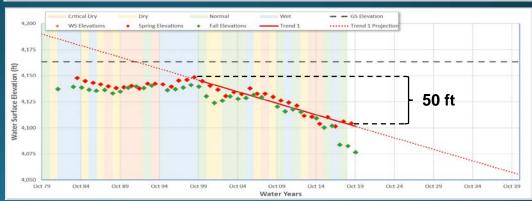
Plotted hydrographs

Analyzed trend for 22 wells (2000 – present spring water levels)

- 12 wells stable or rising
- 9 wells declining 1 to 3 ft/yr
- 1 well not able to be analyzed







SUBJECT #1: CH 5
GROUNDWATER
CONDITIONS – WATER
LEVELS

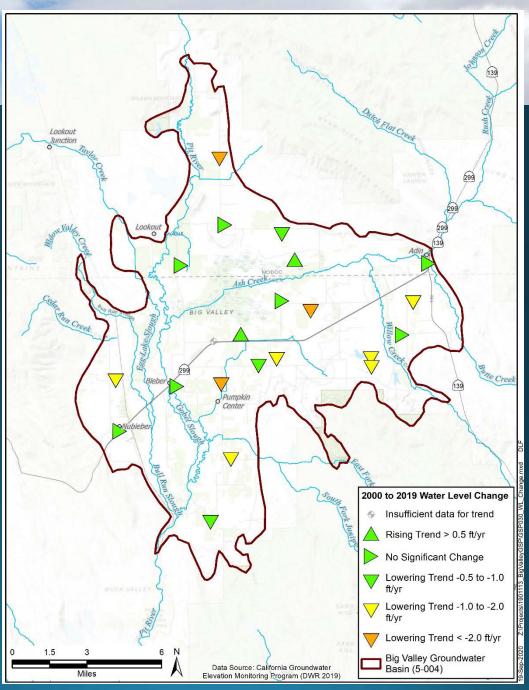
Groundwater Levels

Trends around the Basin (2000 to 2019)

Area near Ash Creek Wildlife Area generally stable

Largest declines in:

- North
- East-central
- South-central



SUBJECT #1: CH 5
GROUNDWATER
CONDITIONS – WATER
LEVELS

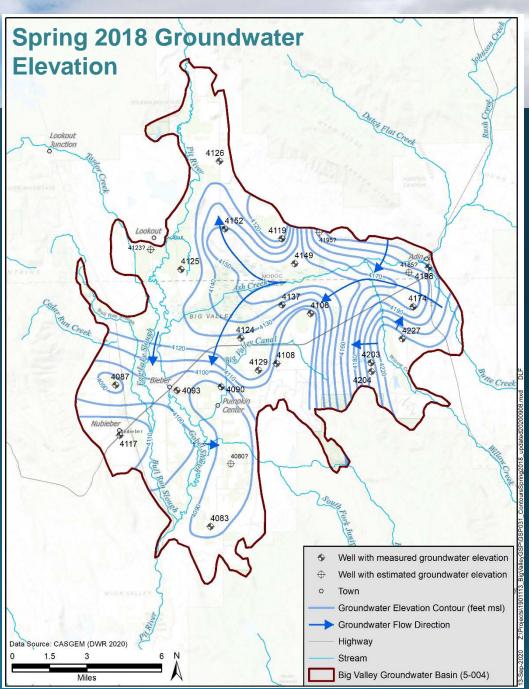
Groundwater Levels

Groundwater Elevation Contours

Flow generally east to west and to the south

There is northerly flow toward Adin (gaining stream?)

Westerly flow toward Pumpkin Center?



SUBJECT #1: CH 5
GROUNDWATER
CONDITIONS – WATER
LEVELS

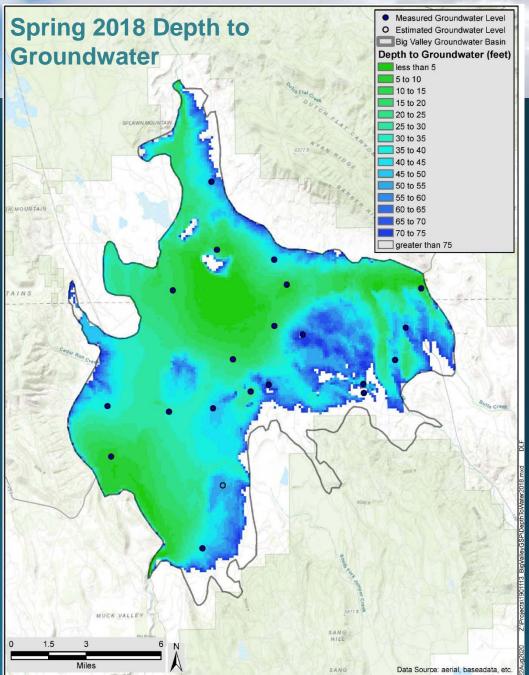
Groundwater Levels

Depth to Groundwater

Generally less than 50 feet, particularly in and around Ash Creek Wildlife Area

Greater than 50 feet:

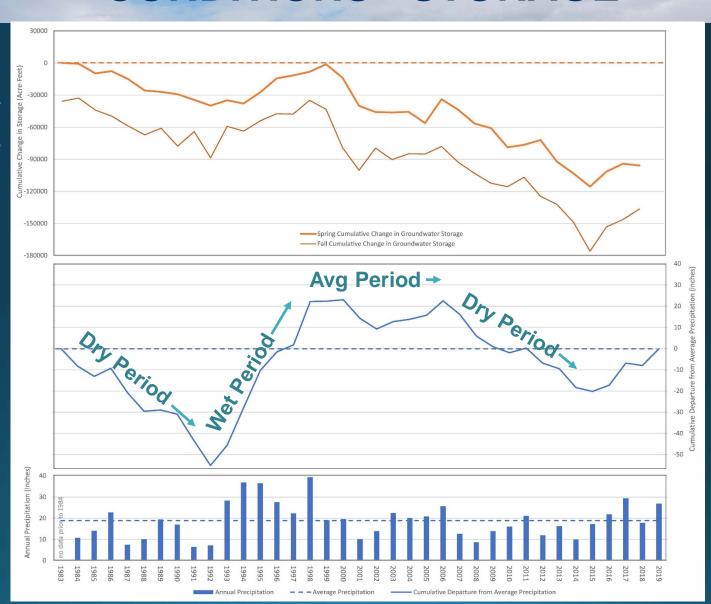
- East-central area
- Southern area



SUBJECT #1: CH 5 GROUNDWATER CONDITIONS - STORAGE

Groundwater Storage

Precipitation



SUBJECT #1: CH 5 GROUNDWATER CONDITIONS - WATER LEVELS AND STORAGE

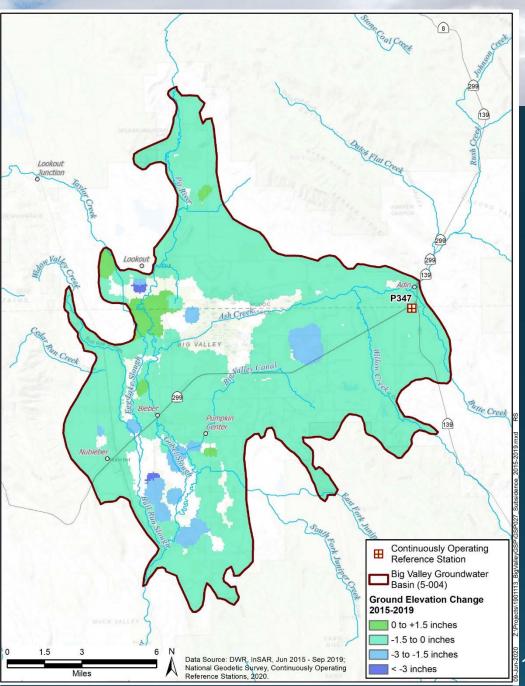
Questions and Clarifications?

SUBJECT #1: CH 5
GROUNDWATER
CONDITIONS SUBSIDENCE

Subsidence

Ranges from +1.5 inches to -3 inches

Two areas show potential evidence of subsidence



SUBJECT #1: CH 5 GROUNDWATER CONDITIONS - SUBSIDENCE

Questions and Clarifications?

SUBJECT #1: CH 5 GROUNDWATER CONDITIONS – WATER QUALITY

- Overall water quality is good to excellent for all beneficial uses
- Notable constituents with elevated concentrations based on suitability thresholds for beneficial uses:

Naturally occurring

- Arsenic
- Iron
- Manganese

Naturally occurring or anthropogenic

Specific Conductance (~Total Dissolved Solids)

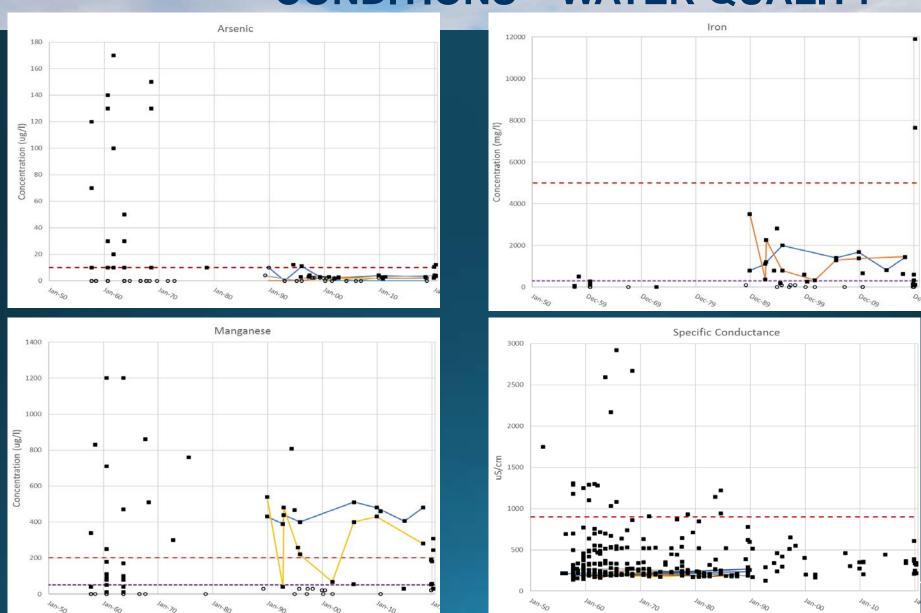
SUBJECT #1: CH 5 GROUNDWATER CONDITIONS – WATER QUALITY

- Suitability
 Threshold
 - Drinking Water
 - Agricultural

											# Wells	% of Wells
									# Wells	% of Wells	with Most	with Most
									with	with	Recent	Recent
	Suitability	Suitability				# Meas	% of Meas		Average	Average	Meas	Meas
	Threshold	Threshold	Total # of			Above	Above	# Wells	Above	Above	Above	Above
Constituent Name	Concentration	Type	Meas	min	max	Threshold	Threshold	With Meas	Threshold	Threshold	Threshold	Threshold
Aluminum	200	DW1	41	0	552	2	5%	18	1		0	
Antimony	6	DW1	45	0	36	1	2%	20	1	5%	0	0% L
Arsenic	10	DW1	53	0	12	4	8%	23	3	13%	3	13%
Barium	1000	DW1	49	0	600	0	0%	23	0	0%	0	0%
Beryllium	4	DW1	48	0	1	0	0%	23	0	0%	0	0%
Cadmium	5	DW1	49	0	1	0	0%	23	0	0%	0	0%
Chromium (Total)	50	DW1	36	0	20	0	0%	13	0	0%	0	0%
Chromium (Hexavalent)	10	DW1*	13	0.05	3.29	0	0%	13	0	0%	0	0%
Copper	1300	DW1	34	0	190	0	0%	21	0	0%	0	0%
Fluoride	2000	DW1	42	0	500	0	0%	16	0	0%	0	0%
Lead	15	DW1	28	0	6.2	0	0%	16	0	0%	0	0%
Mercury	2	DW1	44	0	1	0	0%	19	0	0%	0	0%
Nickel	100	DW1	46	0	10	0	0%	20	0	0%	0	0%
Nitrate (as N)	10000	DW1	151	0	4610	0	0%	24	0	0%	0	0%
Nitrite	1000	DW1	62	0	930	0	0%	20	0	0%	0	0%
Nitrate + Nitrite (as N)	10000	DW1	2	40	2250	0	0%	2	0	0%	0	0%
Selenium	50	DW1	49	0	5	0	0%	23	0	0%	0	0%
Thallium	2	DW1	46	0	1	0	0%	20	0	0%	0	0%
Chloride	250000	DW2	66	1400	79000	0	0%	43	0	0%	0	0%
Iron	300	DW2	50	0	11900	26	52%	21	8	38%	9	43% L
Iron	5000	AG	50	0	11900	2	4%	21	2	10%	2	10%
Manganese	50	DW2	45	0	807	28	62%	21	12	57%	11	52% L
Manganese	200	AG	45	0	807	22	49%	21	7	33%	7	33%
Silver	100	DW2	36	0	20	0	0%	19	0	0%	0	0%
Specific Conductance	900	DW2	66	125	1220	3	5%	42	1	2%	1	2%
Sulfate	250000	DW2	60	500	1143000	1	2%	40	0	0%	0	0% L
Total Dissolved Solids (TDS)	500000	DW2	57	131000	492000	0	0%	39	0	0%	0	0%
Zinc	5000	DW2	34	0	500	0	0%	20	0	0%	0	0%
Boron	700	AG	40	0	100	0	0%	34	0	0%	0	0%
Sodium	69000	AG	33	11600	69000	0	0%	21	0	0%	0	0%

Sou

SUBJECT #1: CH 5 GROUNDWATER CONDITIONS – WATER QUALITY

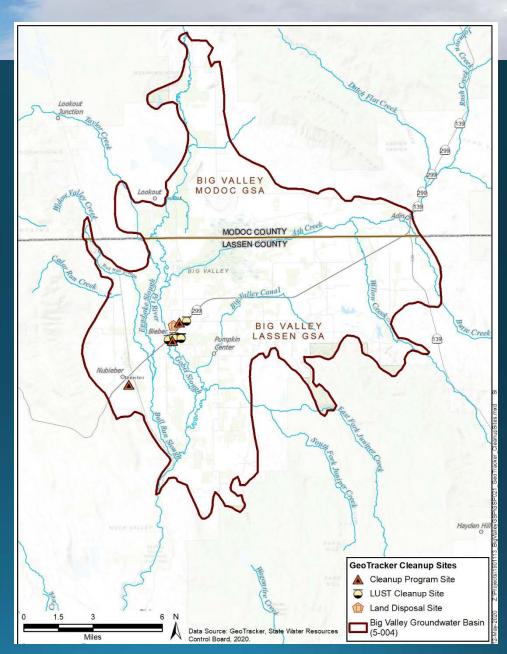


SUBJECT #1: CH 5 GROUNDWATER CONDITIONS - WQ

Contamination Sites

All 10 sites are located in Bieber and Nubieber

- 9 sites petroleum hydrocarbons,
 - + former County Landfill
 - 5 cases closed
 - 4 cases remain open
 - · No cases with active remediation
 - 1 case ready for closure
 - · 3 cases with ongoing monitoring
 - · 1 case with substantial residual
 - · 2 cases with lesser impacts
 - County landfill with ongoing monitoring
- All cases are regulated by the RWQCB

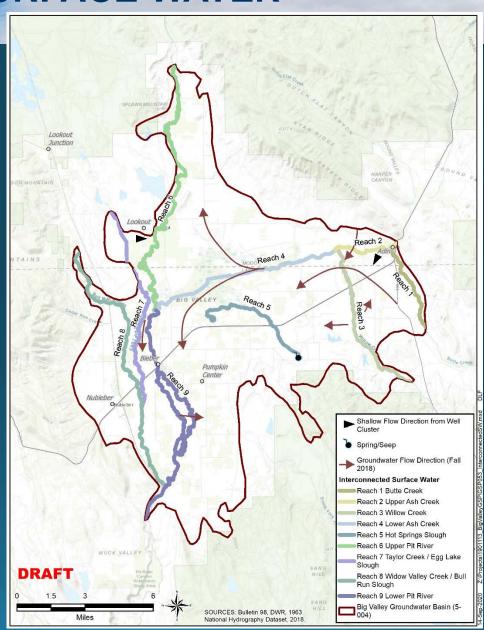


SUBJECT #1: CH 5 GROUNDWATER CONDITIONS – WATER QUALITY

Questions and Clarifications?

SUBJECT #1: CH 5 GROUNDWATER CONDITIONS INTERCONNECTED SURFACE WATER

- Surface water depletion is one of the 6 sustainability indicators
- Will need to decide what is significant and unreasonable depletion
- Depletions may have effects on ecosystems
- Perennial streams divided into 9 reaches
 - Surface water groundwater interactions is described for each reach
 - Most surface water reaches are "losing"
 - "Gaining" north of Ash Creek near Adin

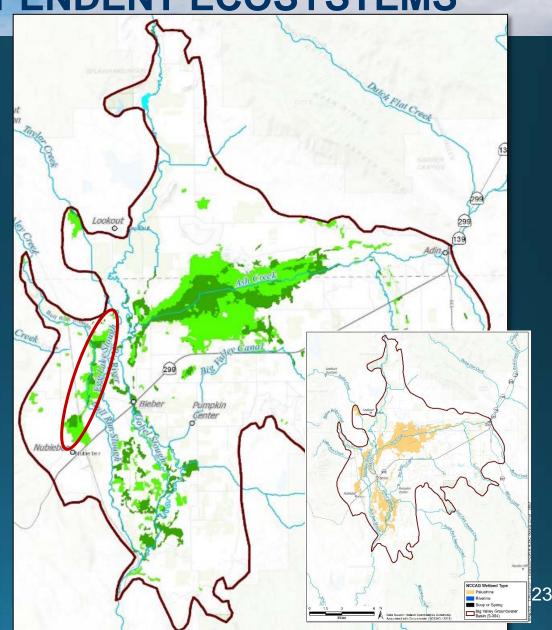


SUBJECT #1: CH 5 GROUNDWATER CONDITIONS – INTERCONNECTED SURFACE WATER

Questions and Clarifications?

- Groundwater Dependent Ecosystems (GDEs) in the GSP regulations:
 - Definition: "Refers to ecological communities or species that depend on groundwater emerging from aquifers or on groundwater occurring near the ground surface." (Section 351 (o) of GSP regulations)
 - Description in Groundwater Conditions: "Identification of groundwater dependent ecosystems within the basin, utilizing data available from DWR or the best available information." (Section 354.16 (g) of GSP regulations)
- DWR has provided the "Natural Communities Commonly Associated with Groundwater (NCCAG)" dataset
 - Starting point for identifying Groundwater Dependent Ecosystems (GDEs)
 - Broad combination of pre-existing datasets
 - Must be reviewed and refined during GSP development

- NCCAG dataset shows potential GDE locations:
 - Ash Creek wildlife area
 - Southern, braided portion of the Pit River
 - Smaller areas along other creeks
 - Along Pit River sloughs

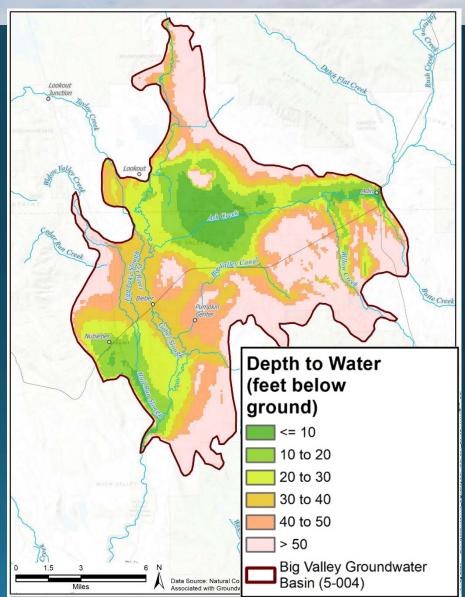


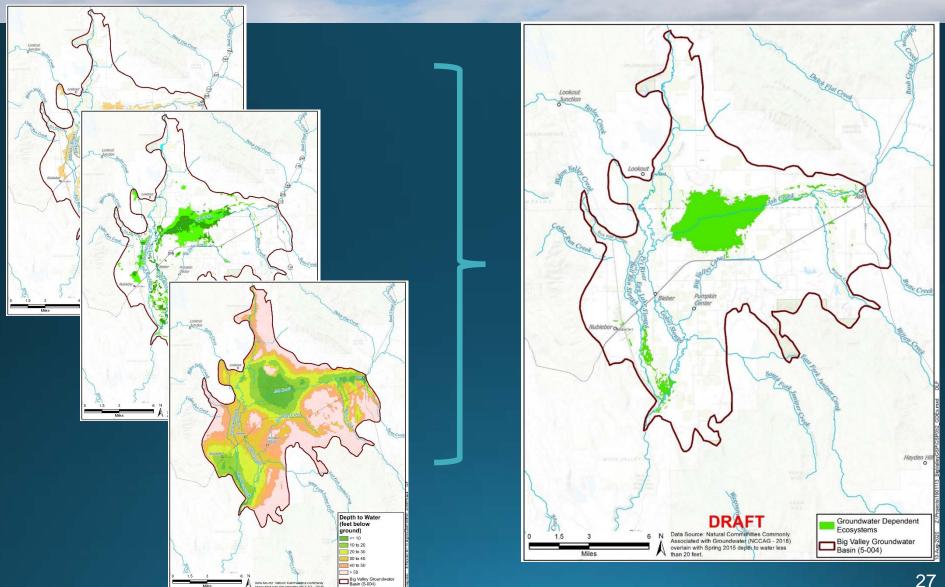
- Along Pit River sloughs
 - Not groundwater dependent
 - Not obviously habitat
- Need to refine dataset



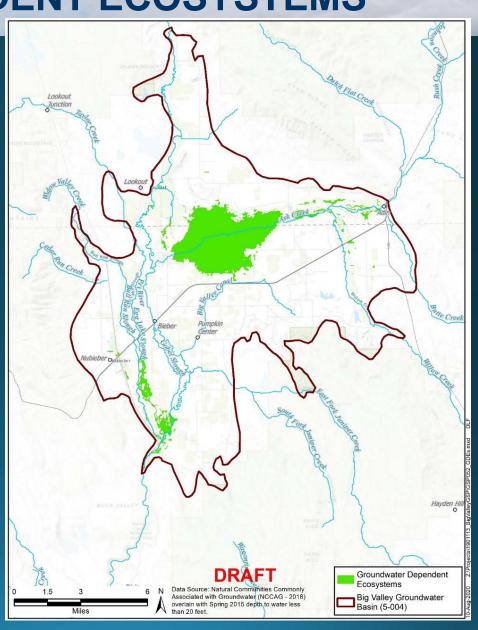
- Refining NCCAG dataset to identify probably GDEs:
 - Consider rooting depth of GDE plants
 - Expert review of Big Valley plant rooting depths
 - 20 feet determined as depth necessary to protect plants
- Areas with depth to water over 20 feet cannot be GDEs
- Analysis: Filtered NCCAG to only include areas with depth to water less than 20 feet, to refine dataset to areas more likely to be GDEs

- Depth to water map of Big Valley (Spring 2018)
 - Levels are lower in the fall
 - Levels were lower during the drought
- Areas over 20 feet from surface have been that way for years and could not support vegetation





- Proposed "Potential GDE" map:
 - Chapter defends a 10 foot rooting depth.
 - Removed areas where groundwater is deeper than 20 feet (due to the soils' "capillary fringe")
 - Remaining potential GDEs are in Ash Creek Wildlife Area, along streams, and the southern end of the Pit River where groundwater is shallow



Questions and Clarifications?

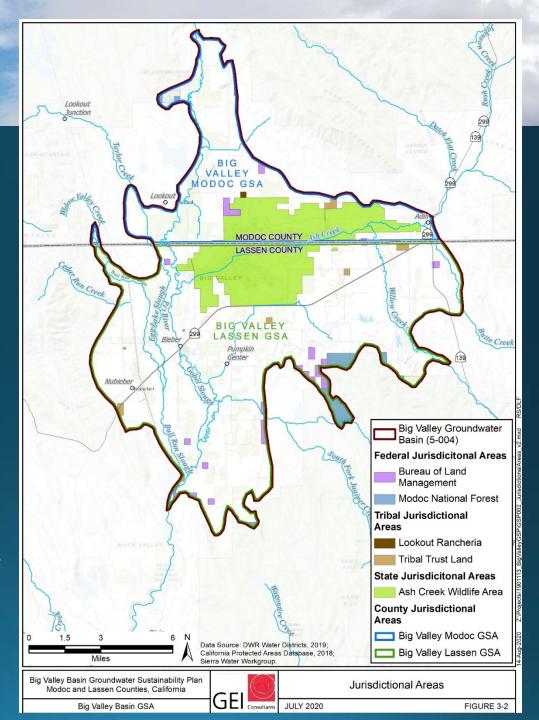
SUBJECT #1: CH 5 GROUNDWATER CONDITIONS

Comments and Discussion

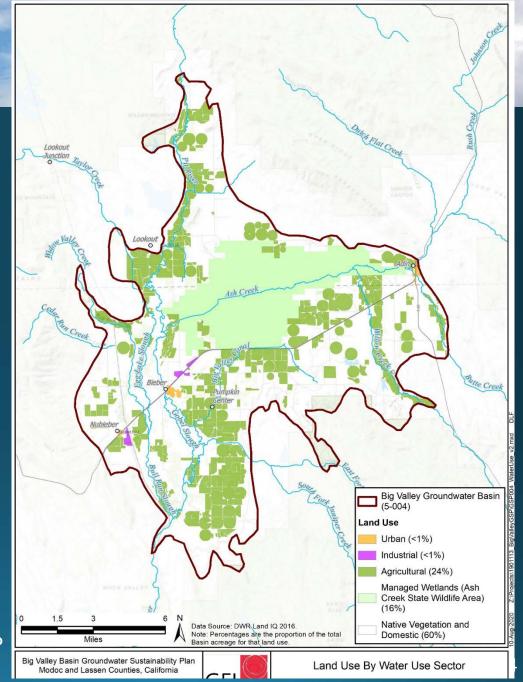
SUBJECT #2: CH 3 PLAN AREA AND CH 4 HYDROGEOLOGIC CONCEPTUAL MODEL

- Major Changes to text:
 - Jurisdictional areas
 - Land Use and Water Use Sectors
 - Water Source
 - Well Inventory

- Jurisdictional areas
 - Re-ordered categories
 - Federal
 - Tribal
 - State
 - County
 - County sub-jurisdictions removed
 - Census designated places
 - Cemeteries
 - Airports

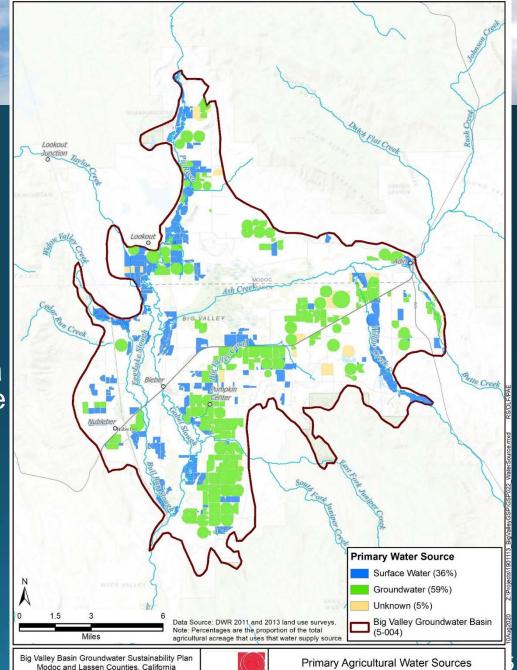


- Land Use and Water Use Sectors
 - Used 2016 Land Use data from DWR
 - Re-defined land use categories to align with SGMA's water use sectors
 - Urban
 - Industrial
 - Agricultural
 - Managed Wetlands (ACWA)
 - Native Vegetation and <u>Domestic</u>
 - Removed discussion of crop types and riparian areas
 - Not required for this part of the GSP



Water Source

- Used more recent data recently provided by DWR (2011 and 2013)
- New DWR data does not distinguish areas that use a combination of both surface and groundwater
- Water Source indicated as "Primary" source
- More detailed assessment is being performed and will be presented in Ch 6



Well Inventory

- Added text to clarify where data comes from and uncertainty associated with it
- Re-organized table and text for clarity on the two datasets and how they correlate
- 2015/2017 dataset contains more detail on well tyes

Table 3-3 Well Inventory in the BVGB									
WCR 2018 DWR Map Layer				DWR 2015/2017 WCR Inventory					
	Lassen Modoc				Lassen	Modoc			
	County	County			County	County			
Type of	Total	Total		Proposed Use	Total	Total			
Well ^a	Wells	Wells		of Well ^b	Wells	Wells			
Domestic	136	81		Domestic	142	79			
Production	177	76		Irrigation	157	65			
				Stock	11	5			
				Industrial	6	0			
Public Supply	5	1		Public	5	1			
Subtotal (476)	318	158		Subtotal (471)	321	150			
				Monitor	55	0			
				Test	25	29			
				Other	7	2			
				Unknown	27	7			
Total (476)	318	158		Total (623)	435	188			

SUBJECT #2: CH 3 PLAN AREA

- Other notable edits
 - Added a short description of the Modoc National Forest Land and Resource Management Plan (Section 3.7.3)
 - No BLM or State Wildlife Area land use plans have been identified

SUBJECT #2: CH 3 PLAN AREA

Questions and Clarifications?

- Major Changes to text:
 - Data gaps, data availability, data quality, and uncertainty
 - Single principal aquifer
 - Definable bottom of aquifer
 - Effect of faults on groundwater flow
 - Surface water bodies

- Data gaps, data quality, and uncertainty.
 - Added text to present caveats about the HCM
 - Key statements:
 - "The HCM presents <u>best available information and expert opinion</u> to form the basis for descriptions of elements of this GSP"
 - "Significant uncertainty exists in this HCM and stakeholders have expressed concern about the <u>possible regulatory repercussions</u> associated with making decisions <u>using incomplete and/or uncertain</u> information."
 - "The stakeholders ... have limited financial means to fill data gaps, so the filling of the data gaps presented at the end of this chapter are contingent on outside funding."

Single Principal Aquifer

- Text added:
 - "...aquifer conditions vary greatly throughout the Basin.

 However, clearly defined, widespread distinct aquifer units have
 not been identified."
- Important for the BVAC to note:
 - A single principal aquifer in the HCM indicates that there is insufficient scientific evidence for more than one.
 - There are upcoming opportunities for acknowledging differing conditions in the Basin through other means.
 - By defining "Management Areas"
 - By having different minimum thresholds in different parts of the Basin

- Definable Bottom of Aquifer
 - Recently obtained data from two deep geothermal wells was included.
 - "Practical bottom" of 1200 feet based on the depths of water wells drilled in the Basin and uses that as the "Definable Bottom"
 - "Physical bottom" or "effective bottom" could extend much deeper
 - The "Definable Bottom" could be changed in the future if wells are drilled to utilize water deeper than 1200 feet.

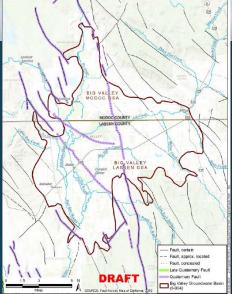
Table	4-1	Well	Depths

Depth Interval (feet bgs)	Deepest Well per Section ^a		Count of All Wells
< 200	10%		41%
200 – 400	16%	43%	25%
400 – 600	27%		17%
600 – 800	28%	42%	12%
800 – 1000	14%		4%
1000 – 1200	4%		1%
> 1200 ^b	1%		< 1%

^a A section is a 1 mile by 1 mile square. There are 134 sections in the BVGB

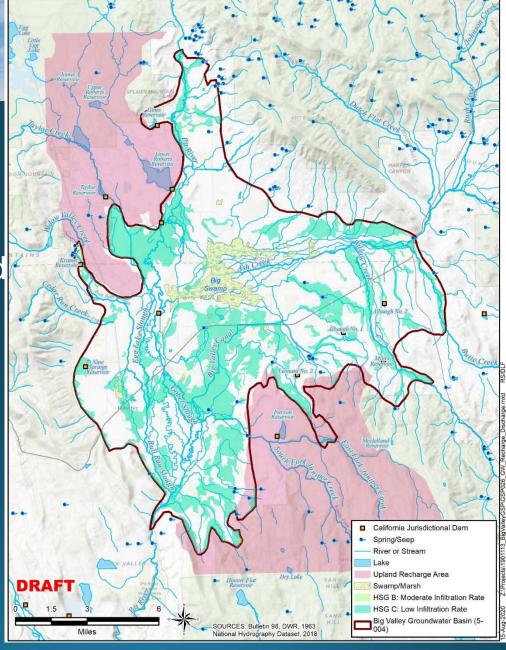
^b Test borings: BV-1 and BV-2 are only water wells drilled deeper than 1200 ft

- Effect of Faults on Groundwater Flow
 - No significant changes to text
 - Clear scientific evidence for the effect of faults on groundwater flow is lacking.
 - Opportunities for acknowledging differing conditions in the Basin through other means.
 - By defining "Management Areas"
 - By having different minimum thresholds in different parts of the Basin



SUBJECT #2: CH 4 HCM

- Surface Water Bodies
 - Dams, ponds, and reservoirs both inside and outside the Basin
 - Added dams to map
 - Imported water is water that otherwise would have flowed elsewhere. Therefore, no imported water in BVGB.



Questions and Clarifications?

SUBJECT #2: CH 3 PLAN AREA AND CH 4 HYDROGEOLOGIC CONCEPTUAL MODEL

Comments and Discussion









FUNDING FOR THIS PROJECT HAS BEEN PROVIDED IN FULL OR IN PART FROM THE CALIFORNIA DROUGHT, WATER, PARKS, CLIMATE, COASTAL PROTECTION, AND OUTDOOR ACCESS FOR ALL ACT OF 2018 (PROPOSITION 68) AND THROUGH AN AGREEMENT WITH THE STATE DEPARTMENT OF WATER RESOURCES."

STAKEHOLDER ENGAGEMENT

- FOUR OUTREACH MEETINGS
- TWO LASSEN MODOC-FLOOD CONTROL AND WATER CONSERVATION DISTRICT MEETINGS
- ONE MEETING WITH THE BIG VALLEY WATER-USERS ASSOCIATION
- PROVIDE OUTREACH IN PARTNERSHIP WITH LASSEN COUNTY FOR GSP DEVELOPMENT,
 STAKEHOLDER OUTREACH, AND TO HOLD THE BIG VALLEY GROUNDWATER ADVISORY
 COMMITTEE MEETINGS FOR THE DEVELOPMENT OF THE GSP.



GSP DEVELOPMENT

- COORDINATE, OBTAIN, PROCESS, AND COMPILE DATA FROM THE LASSEN-MODOC COUNTY
 FLOOD CONTROL AND WATER CONSERVATION DISTRICT FOR USE IN THE GSP
- WORK WITH STAKEHOLDERS TO IDENTIFY THE ACCURATE NUMBER OF IRRIGATED ACRES IN THE BIG VALLEY BASIN AND CONTRACT FOR A GIS MAP OF ACCURATE ACRES

MONITORING/ASSESSMENT

- STREAM GAGE PLANNING INVESTIGATE EXISTING SITES AND STRUCTURES AND PLAN FOR THE INSTALLATION OF STREAM GAGE(S) IN THE PIT RIVER.
- VOLUNTARY WELL OBSERVATION INSTALLATION PLANNING MAP THE LOCATIONS OF WELLS IN THE BIG VALLEY BASIN AND WORK TO OBTAIN LANDOWNER AGREEMENTS FOR PARTICIPATION IN THE OBSERVATION PROGRAM.
- GROUNDWATER WINTER RECHARGE STUDY COORDINATE AND CONTRACT WITH LOCAL AGENCY TO
 CONDUCT A WINTER RECHARGE STUDY IN THE BIG VALLEY BASIN TO IDENTIFY IF THE EXCESS WINTER
 SURFACE WATER PROVIDES BENEFICIAL GROUNDWATER RECHARGE.

- JUNIPER RECHARGE STUDY COORDINATE AND CONTRACT WITH LOCAL AGENCY TO CONTINUE DATA COLLECTION OF SOIL MOISTURE AND GROUNDWATER MONITORING ON THE PREVIOUS ASH VALLEY RANCH NATIVE GRASSLAND RESTORATION VEGETATION MONITORING STUDY CONDUCTED IN 2014.
- DRAINAGE RECHARGE STUDY COORDINATE WITH LASSEN COUNTY AND CONTRACT WITH LOCAL AGENCY TO IDENTIFY AND ASSESS POTENTIAL DRAINAGE RECHARGE PROJECTS.
- PARTICIPATION SURVEY PLEASE FILL OUT THE FORM IF YOU ARE INTERESTED IN PARTICIPATING IN ANY OF THE FOLLOWING PROGRAMS.

CONSTRUCTION/IMPLEMENTATION

- STREAM GAGE INSTALLATION ONCE SITES ARE IDENTIFIED AND LANDOWNER AGREEMENTS
 ARE IN PLACE, THE STREAM GAGE(S) WILL BE INSTALLED WITH THE END GOAL OF MEASURING
 THE AMOUNT OF SURFACE WATER ENTERING AND EXITING THE BASIN
- OBSERVATION WELL EQUIPMENT INSTALLATION ENHANCE THE CURRENT WELL
 OBSERVATION NETWORK TO BETTER UNDERSTAND THE BIG VALLEY GROUNDWATER BASIN
 THROUGH FLOWMETERS AND SATELLITE TELEMETRY DEVICES TO MEASURE GROUNDWATER



DWR AGREEMENT AND TIMELINE

- ALL WORK MUST BE COMPLETED BY APRIL 30, 2022
- IDENTIFY LOCATIONS OF STREAM GAGE(S) BY WINTER OF 2020, INSTALLATION OF GAGE(S)
 WILL BE SUMMER OF 2021
- IDENTIFY LANDOWNER PARTICIPANTS FOR PROGRAMS, INSTALLATION OF OBSERVATION EQUIPMENT SUMMER OF 2021
- PARTICIPATION IN WINTER RECHARGE (2020 AND 2021 TWO YEARS OF DATA)

COUNTY OF MODOC

CONTACT INFORMATION

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QUESTIONS OR COMMENTS FOR ITEMS NOT ON THE AGENDA



