Butte Subbasin
Groundwater Sustainability Plan - Basin Setting and Monitoring Network Chapters
Public Review Draft- Summer 2020
Comment Tracking Table

#	Commenter Name	Commenter Organization	Chapter* (BaS or MoN)	Section	Line #s or Figure #	Comment	Proposed Action
1	Dave Van Baren	CDFW	BaS	1.1.7.1	635	The word "Refuge" should be changed to "Area." Refuges are federal lands, and Areas are state run facilities.	Revise document based on comment
2	Bridget Gibbons	CDFW	BaS	1.1.8.1	706	Groundwater Sustainability Agencies must consider all beneficial users of groundwater, including environmental users of groundwater [Water Code 10723.2(e)]. CDFW recommends including GDE beneficial users of groundwater and interconnected surface waters as primary water uses. Groundwater Sustainability Plans must identify and consider potential effects on all beneficial uses and users of groundwater [22 CCR 354.10(a), 354.26(b)(3), 2354.28(b)(4), 354.34(b)(2), and 354.34(f)(3)].	Document to be revised. GDEs are in the process of being identifed in the subbasin and will be included in the Basin Setting Chapter when the effort is complete. GDEs will also be considered along with all beneficial uses/users during development of SMCs.
3	Bridget Gibbons	CDFW	BaS	1.1.9.1	753	CDFW recommends the installation of shallow groundwater monitoring wells near GDEs and interconnected surface waters to monitor impacts to environmental beneficial uses and users.	Recommendation noted and will be considered for inclusion in the description of data gaps and possible PMAs for additional monitoring
4	Bridget Gibbons	CDFW	BaS	1.1.9.2	759	CDFW recommends pairing shallow groundwater monitoring wells near interconnected surface waters with streamflow gauges to further inform the BBGM and improve understanding of interconnectivity.	Recommendation noted and will be considered for inclusion in the description of data gaps and possible PMAs for additional monitoring
5	Dave Van Baren	CDFW	BaS	1.2.2.1	882	Additional context clarifying that Spring 2015 was the height of the drought should be included. Though the section mentions curtailed supply of surface delivery from the settlement contractors, including clear references to the drought adds important context and clarity when discussing conditions from these years.	Revise document based on comment
6	Dave Van Baren	CDFW	BaS	1.2.2.1	901-904	Again, context that high pumping in 2015 was related to the drought would add clarity.	Revise document based on comment
7	Dave Van Baren	CDFW	BaS	1.2.2.3	970	Specificying specific drought years, rather than "recent" would add clarity.	Revise document based on comment
8	Dave Van Baren	CDFW	BaS	1.2.2.4	992-1011	Should the benefit of wildlife area's having summer water and permanent water be mentioned as potential sources of percolation into the aquifer?	Revise document based on comment
9	Dave Van Baren	CDFW	BaS	1.2.4.1	1074	"In" should be changed to "is".	Revise document based on comment
10	Bridget Gibbons	CDFW	BaS	1.2.6.1	1323	Additional monitoring of shallow groundwater will help to refine the BBGM simulated groundwater elevations and allow for more accurate groundwater elevation contours throughout the basin.	Staff agrees. Recommendation noted and will be considered for inclusion in the description of data gaps and possible PMAs for additional monitoring
11	Bridget Gibbons	CDFW	BaS	1.2	N/A	The Groundwater Conditions section does not include "identification of groundwater dependent ecosystems within the basin" as required by 22 CCR 354.16(g). A map identifying groundwater dependent ecosystems throughout the basin should be included, drawing from best available information, along with a description of the GDEs' ecological condition and an identification of GDE ecological importance. CDFW recommends that GDE identification err on the side of inclusivity until evidence exists that an ecosystem has no significant dependence on groundwater across seasons and water year types.	Document to be revised. GDEs are in the process of being identifed in the subbasin and will be included in the Basin Setting Chapter when the effort is complete. GDEs will also be considered along with all beneficial uses/users during development of SMCs.
12	Bridget Gibbons	CDFW	BaS	1.3.4	1651	Though the categories of evapotranspiration considered are identified in Table 1-6 (agricultural, urban and industrial, managed wetlands, native vegetation, and canal evaporation), it would add clarity to identify those categories in the explanatory text as well.	Revise document based on comment
13	Bridget Gibbons	CDFW	BaS	1.3.4	1670/ Table 1-7	The groundwater system water budget does not include evapotranspiration as an identified outflow. Water used by groundwater dependent ecosystems should be included in the groundwater system water budget to prevent an underestimation of system outflows. If water use by groundwater dependent ecosystems is captured by a different groundwater system water budget category, please add clarification.	Revise document based on comment to clarify. The BBGM does not estimate evapotranspiration of groundwater. Water in the rootzone is available to riparian and native land uses in the model
14	Dave Van Baren	CDFW	BaS	1.3.8.1	2147-2148	Please add clarity to this paragraph regarding the reference to managed wetlands in this section and the statement regarding additional data being needed. Managed wetlands are systems that existed naturally, and in the case of State and Federal areas, have significant documentation associated with water sources relative to surrounding farms. Why are they referenced specifically?	Revise document based on comment
15	Bridget Gibbons	CDFW	MoN	1.1.6.1	Figure 1-4	Additional multi-completion groundwater monitoring well reference locations proximate to streams and paired with streamglow gauges are needed to further refine the characterization of groundwater and surface water interconnectedness.	Recommendation noted and will be considered for inclusion in the description of data gaps and possible PMAs for additional monitoring
16	Ben King	Stakeholder	BaS	1.1	122+	The foundational support for the hydrogeology of the southern portion of the Butte Basin needs to include reports that analyze the dominant geological features of this area which is the volcanic structure of the Sutter Buttes and the presence of the Willows fault that runs between the geologic formation of the Sutter Buttes and the Sacramento River and City of Colusa near the south western boundary of the Basin.	Revise document based on comment by adding references to applicable reports
17	Ben King	Stakeholder	BaS		122+	Regarding the Sutter Buttes - suggested foundational reports are: Hull, Laurence (1984)" Geochemistry of Ground Water in the Sacramento Valley, California USGS Geological Survey Professional Paper 1401-B which frames the importance of the Sutter Buttes as being one of the unique geormophic units of the Sacramento Valley - see Page B4. See also Hausback,Muffler and Clynne (2011) "US Geological Survey - Reducing The Risk From Volcano Hazards - Sutter Buttes - The Lone Volcano in California's Great Valley" which discusses the predominant presence of the shallow sea on the floor of the Sacramento Valley over the last 75 million years and the eruption of the volcano 1.6 million years ago. Particular reference to localized faults in the volcano structure, the Colusa Dome formation and the interplay between the geologic historical setting of an ancient sea bed with a more recent volcanic episode.	Information noted and will be incorporated as appropriate

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18	Ben King	Stakeholder	BaS		122+	The most comprehensive ground water quality data which empirically supports the geochemical heritage of the volcanic structure admidst an ancient sea bed is Schmitt, Fram, Dawson and Belitz (2008) " Ground-Water Quality Data in the Middle Sacramento Valley Study Unit, 2006 - Results from The California GAMA Program - USGS in cooperation of the SWRCB - see in particular the 2006 results for GAMA well ESAC- 21 - See Table 9 Major and Minor Ions - Cloride 626 mg/L, TDS 1290, Table 10 Trace Elements - Arsenic 80.6 ug/L, Boron 1010 ug/L, Table 4 Water Quality Indicators Specific Conductance 2370 uS/cm, Table 13 Nitrogen and Oygen Isotopes O of Dissolved Carbonates + 5.57 per. mil and Carbon - 14 - 11 % modern. The GAMA Site ESAC-21 is the nearest measurement site north of the Sutter Buttes on the south western portion of the Basin which appear as extreme empirical support for the ancient sea bed and volcanic geochemistry.	Information noted and will be incorporated as appropriate
19	Ben King	Stakeholder	BaS		122+	The potential adverse impact of another earth quake such as the 1975 Oroville earthquake on future water quality and water flows due to the presence of the Willows fault, the Colusa Dome and localized faults within the volcanic structure of the Sutter Buttes is foundationally addressed in Harwood and Helley (1987) " Late Cenozoic Tectonism of the Sacramento Valley, California" USGS Professional Paper 1359. The foundational research for the HCM should also include the work of Springhorn, Steven T. (2008) "Stratigraphic Analysis and Hydrogeologic Characterization of Cenozoic Strata in the Sacramento Valley near the Sutter Buttes" Springhorn's work is particullary important because much is not known about lateral depths or ground water quality of the fresh water aquifer at the southern boundary of the Basin. Springhorn suggests that the Sutter Buttes rampart extends in a 15 mile circumferential apron around the Buttes which would facilitate the lateral movement of connate seawater and trace elements 10 to 15 miles into the southern boundary of the Basin.	Information noted and will be incorporated as appropriate
20	Ben King	Stakeholder	BaS	1.1.1.1	143+	The Lateral Boundary description should highlight the portion of Basin that includes the Butte Sink and the proximity of both Butte Creek/Slough and the Sacramento River on the southwest western boundary. Butte Sink should be noted as a Groundwater Dependent Ecosystem.	Revise document based on comment to include reference to Butte Sink around line 144
21	Ben King	Stakeholder	BaS	1.1.1.2	163+	Springhorn's thesis quoted in the Sutter County GMP should be included in this section. On Page 23 of the GMP " The Sutter Buttes Rampart consists largely of gravel, sand,silt and clay sediments which were deposited circumferentailly around the Buttes as a geologic apron. These sediments may extend up to 15 miles north and west beyond the Sacramento River". The depth of the southern portion of the Basin depends on the depth and stratigraphy of the geologic apron as it is extends north from the Buttes.	Information noted and will be incorporated as appropriate
22	Ben King	Stakeholder	BaS	1.1.2	182+	The topography of the elevational depression of the Butte Sink should be highlighted because it not only manifests itself as a high water table but also as an area of highly flood flows.There should also be some reference to the presence of the housing on the east side of the Sacramento River and the confluence of Butte Creek and the Sacramento River overflow via the Colusa Weir on the southwestern portion of the Basin. Seasonal flooding commonly occurs on the south western portion of the Basin and impacts both the GDE of the Butte Sink and the SDAC residential area on the east side of the Sacramento River.	Information noted and will be incorporated as appropriate
23	Ben King	Stakeholder	BaS	1.1.2.3	238+	It should be noted that surface water is being diverted from the Sacramento River by RD 1004 and also by other Settlement Countractors on the western boundary of the Basin. This will be an important consideration to assess lateral groundwater flows caused by future groundwater subsitution, potential on-farm recharge opportunities and potential adverse lateral groundwater flows caused by pumping depressions.	No change proposed. The text includes RD 1004 as a surface water diverter from both Butte Creek and the Sacramento River.
24	Ben King	Stakeholder	BaS	1.1.2.4	254+	The seasonal flooding from the common overflow via the Colusa Weir, Butte Creek and sometimes the Moulton Weir needs to be noted as it portains to the southwestern portion of the Basin. It should also be noted that these flows are interconnected with the operation and flows of the the Sutter Bypass.	Information noted and will be incorporated as appropriate. Additional description of flooding in the subbasin will be added.
25	Ben King	Stakeholder	BaS	1.1.3	329+	It should be noted that the interplay between the northern façade of the Sutter Buttes Rampart and lateral depths are unknown in the southern portion of the Basin.	Revise document based on comment to include reference to Sutter Buttes in section 1.1.3
26	Ben King	Stakeholder	BaS	1.1.4	346+	The geology of the unique geomorphic unit that comprises the Sutter Buttes Rampart and Colusa Dome should be included since they underly portions of the Basin. Possible inclusion of the Figure of the Sutter Buttes Volcano from Hausback et al.	Information noted and will be incorporated as appropriate.
27	Ben King	Stakeholder	BaS	1.1.6	546+	Figure 1-9D illustrates the Southwest Cross Section but there is no discussion of the complexity and uncertainty regarding lateral depths and the potential for lateral movement across the stratigraphic interface of the Rampart	Revise document to add additional description of cross-sections
28	Ben King	Stakeholder	BaS	1.1.7.3	621+	Reference the Sutter Buttes Volcano Figure in Hausback et. al.	Revise document to incorporate comment
29	Ben King	Stakeholder	BaS	1.1.7.1	631+	There is empirical evidence that connate seawater is moving laterally across the stratigraphic apron of the Sutter Buttes Rampart and contaminating the fresh water aquifer and has been for approximately 100 years. See "Sutter - Yuba Counties Investigation , SWRCB Bulliten No. 6. September 1952 Page 38, See Figure 19 of the Sutter County GMP regarding EC and arsenic levels, See reported arsenic levels for Grimes municipal water distict and Arsenic levels in the Yuba City groundwater supply for its sewage system as analyzed by the EPA. This lateral movement on the north facade of the Sutter Buttes is empirically supported by high arsenic levels in ESAC-21, ESAC-11, ESAC-5, ESAC-28 and ESAC-31 as reported in the USGS GAMA report by Schmitt et. al. as cited above.	Information noted and will be incorporated as appropriate.
30	Ben King	Stakeholder	BaS	1.1.8.4	725+	See the Figures referenced for the USGS GAMA report by Schmitt et. al. for ESAC-21 regarding many extreme and concerning water quality observations.	Information noted and will be incorporated as appropriate.
31	Ben King	Stakeholder	BaS	1.1.9	751+	As mentioned above - the extent and depth of the Sutter Buttes Rampart, the movement of connate sea water along the stratigraphy of the Rampart and the contamination of the fresh water aquifer by the connate sea water and related contaminants are all HCM Data Gaps.	Recommendation noted and will be considered for inclusion in the description of HCM data gaps and possible PMAs for additional monitoring
32	Ben King	Stakeholder	BaS	1.2.2.2	906+	Concern for the vertical gradient between the connate seawater and topographical depression of the Butte Sink. Concern that the lateral movement of the seawater and other contaminants will be agrivated by pumping depression relating to increased groundwater subsitution by Settlement Contractors on the east side of the Sacramento River within the scope of the circumferential apron of the Sutter Buttes Rampart.	Concern noted and can be taken into consideration through development of SMCs

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33	Ben King	Stakeholder	BaS	1.2.3	1042+	For most of the 75 million years that comprises the geologic formation of the Butte Basin, the Basin was the location of a shallow salt water sea. The issues and mitigation needed to address seawater from the Sutter Buttes and seawater from a coastal site follow the same laws of chemistry and and uniquely different from a natural occuring contaminant that comes into solution. In fact to the extent that the connate sea water is anoxic the chemisty and biochemistry of seawaters interaction with fresh water is the same as the interaction of seawater and freshwater on a coastal site. It is interesting to think that the spread of arsenic from the Sutter Buttes may have the same biochemical genisus as the spread of arsenate in Chesapeake Bay which anoxic seawater intermixes with oxidized fresh water. The laws of physics and chemistry are the same on the coast or in the valley. NA and CL ions act the same in all sea water. The question is whether or not we should start from the perspective from a couple of geologic minutes or analyze from the perspective of geologic hours. The complexity of the geology of the Sutter Buttes demands the perspective gained from continium of time and not just the arrogance of trying to short circuit the proper analytical framework.	Concern noted and can be taken into consideration through development of SMCs
34	Ben King	Stakeholder	BaS	1.2.4	1049+	There is a long history of groundwater contamination from the lateral movement of seawater brines and arsenic to the south of the Sutter Buttes as documented in the Yuba -Sutter Investigations Bulletin No. 6 and the Sutter County GMP. ESAC- 21 contaminant levels are extreme. GAMA arsenic level observations for ESAC-21, 11,5,28,and 31 give the impression that the geological apron of the Sutter Buttes Rampart is contaminating fresh water in the southern portion of the Basin.	Information noted and will be incorporated as appropriate.
35	Ben King	Stakeholder	BaS	1.3.3.3	1543+	Potential increases in groundwater pumping caused by groundwater subsitution by Settlement Contractors water transfer sales should be considered in the analysis.	Concern noted and can be taken into consideration through development of SMC or through PMAs
36	Ben King	Stakeholder	MoN	1.1.1	35 - 42	Possibly one bullet point highlighting the need to protect the water availability and water quality for the Groundwater Dependent Ecosystems in the Basin. Highlight the importance of Gray Lodge and the Butte Sink in general. Other is to protect water quality and quantity for the domestic well users specifically highlighting the neighboring SDAC residents	These issues are covered by the more general bullet, "Monitor impacts to the beneficial uses and users of groundwater." since beneficial uses/users include GDEs and domestic well users. No proposed change to the text.
37	Ben King	Stakeholder	MoN		82+	Please refer to my comments in the Chapter section. The question is the right foundational approach to mitigate potential problems. Connate seawater is seawater not salts that have come into solution. Gravity pushes seawater along stratigraphic layers the same irrespective if it is on the Coast or in the valley. Pumping pulls seawater the same irrespective if it is on the coast or in the valley. Please look closely at the GAMA observations for ESAC-21 near the intersection of Butte Creek and Laux Road since this is the heart of the Butte Sink GDE. The Carbon Dating observations seem to validate that this water is connate and the water quality related observations are extreme and very concerning. The comparison to other GAMA sites is alarming - something is going on at this site and the monitoring network needs to be set up to mitigate the spread of contaminants. See the USGS report by Schmitt et. al. cited in the Chapter and referenced below:	Approach regarding SMCs for Seawater intrusion vs. Water Quality will be raised for discussion by the BAB/GSAs. Information noted and will be incorporated as appropriate.
38	Ben King	Stakeholder	MoN	1.1.4.1	217+	As cited in Basin Setting Chapter Comments, Springer has identified the Sutter Buttes Rampart as a geologic apron with a circumference of 15 miles north and west of the Sutter Buttes. This apron extends below the southern portion of the Basin and there is evidence of sea water and arsenic contamination near or within the Basin. This problem has been identified in the 1930's as existing south of the Sutter Buttes in State Water Board Bulletin No. 6 (see cite in Chapter Comments) and recently identified in the Sutter County GMP. The arsenic contamination identified by the EPA in the Yuba City sewage system groundwater supply and the elevated arsenic levels in the Grimes water system also seem to be coming from the lateral movement of seawater from the Buttes. 2006 GAMA observations in ESAC- 21, ESAC-11,ESAC-5, ESAC-28, and ESAC31 indicate the northerly movement of arsenic	Information noted and will be incorporated as appropriate.
39	Ben King	Stakeholder	MoN			Specific attention should be focused on all of the quality observation in the USGS report of Schmitt, Fram, Dawson and Belitz (2008) " Ground-Water Quality Data in the Middle Sacramento Valley Study Unit, 2006 - Results from The California GAMA Program - USGS in cooperation of the SWRCB - see in particular the 2006 results for GAMA well ESAC- 21 - See Table 9 Major and Minor Ions - Cloride 626 mg/L, TDS 1290, Table 10 Trace Elements - Arsenic 80.6 ug/L, Boron 1010 ug/L, Table 4 Water Quality Indicators Specific Conductance 2370 uS/cm, Table 13 Nitrogen and Oygen Isotopes O of Dissolved Carbonates + 5.57 per. mil and Carbon - 14 - 11 % modern. The GAMA Site ESAC-21 is the nearest measurement site north of the Sutter Buttes near the intersection of Butte Creek and Laux Road.	Information noted and will be considered for incorporation into monitoring network and support of SMC development
40	Ben King	Stakeholder	MoN			Monitoring sites should be placed in a circumferential pattern away from the Sutter Buttes consistent with the expected span of the Sutter Buttes Rampart Formation. Particular attention should be on the potential for contamination of the water suppy for the Butte Sink and Gray Lodge since it is closest to the Sutter Buttes.	Recommendation noted and will be considered for inclusion of PMAs for additional monitoring
41	Ben King	Stakeholder	MoN			As pumping increases for groundwater subsititution by Settlement Contractors on the east side of the Sacramento River these monitoring sites should be assess whether the pumping depressions agrivate any potential spread of these contaminants across the GDE areas and potentially into domestic wells of residents in the SDAC area of the east side of the Sacramento River in Colusa County.	Information noted and will be considered for incorporation into monitoring network and support of SMC development
42	Ben King	Stakeholder	MoN			Some provision should be made in the area of the Colusa Dome since there is a potential interaction of the Colusa Dome, the Willows Fault and localized faults within the volcanic structure of the Sutter Buttes. A future earthquake could be a catalyst for an adverse contamination event.	Information noted and will be considered for incorporation into monitoring network and support of SMC development

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43	Ben King	Stakeholder	MoN			Some consideration should be made to monitor potential contamination of the water supply for the City of Colusa since it is near the confluence of the Sutter Buttes Rampart, the Colusa Dome and the Willows Fault. The current arsenic levels for the municpal water supply for the unincorporated area of Grimes is approximately 24 ug/L (See Environmental Integrity Project Report (September 2016) " Arsenic in California Drinking Water" Appendix B Page 21 - Colusa Co. WWD#1 - Grimes) and is the highest in the Sacramento Valley. Monitoring should be made to protect the domestic wells on the east side of the Sacramento River and Colusa as mentioned.	Information noted and will be considered for incorporation into monitoring network and support of SMC development

* Abbreviate BaS for Basin Setting Chapter and MoN for Monitoring Network Chapter

BBGM- Butte Basin Groundwater Model; **GDE**- Groundwater Dependent Ecosystem; **HCM**- Hydrogeologic Conceptual Model; **PMA**- Project and Management Action; **SMC**- Sustainable Management Criteria

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