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Union of Concerned Scientists
Science for a healthy planet and safer world

Local Government Commission
Leaders for Livable Communities

Audubon | CALIFORNIA

The Nature Conservancy
Protecting nature. Preserving life.™

January 13, 2020

Sent via email to don.zdeba@iwvwd.com

Re: Comments on Draft Groundwater Sustainability Plan for Indian Wells Groundwater Basin

To Whom It May Concern,

On behalf of the above-listed organizations, we would like to offer the attached comments on the draft Groundwater Sustainability Plan for the Indian Wells Groundwater Basin. Our organizations are deeply engaged in and committed to the successful implementation of the Sustainable Groundwater Management Act (SGMA) because we understand that groundwater is a critical piece of a resilient California water portfolio, particularly in light of our changing climate. Because California's water and economy are interconnected, the sustainable management of each basin is of interest to both local communities and the state as a whole.

Our organizations have significant expertise in the environmental needs of groundwater and the needs of disadvantaged communities.

- The Nature Conservancy, in collaboration with state agencies, has developed several tools[1] for identifying groundwater dependent ecosystems in every SGMA groundwater basin and has made that tool available to each Groundwater Sustainability Agency.
- Local Government Commission supports leadership development, performs community engagement, and provides technical assistance dealing with groundwater management and other resilience-related topics at the local and regional scales; we provide guidance and resources for statewide applicability to the communities and GSAs we are working with directly in multiple groundwater basins.
- Audubon California is an expert in understanding wetlands and their role in groundwater recharge and applying conservation science to develop multiple-benefit solutions for sustainable groundwater management.
- The Union of Concerned Scientists has been working to ensure that future water supply meets demand and withstands climate change impacts by supporting stakeholder education and integration, and the creation and implementation of science-based Groundwater Sustainability Plans.

[1] https://groundwaterresourcehub.org/

- Clean Water Action and Clean Water Fund are sister organizations that have deep expertise in the provision of safe drinking water, particularly in California's small disadvantaged communities, and co-authored a report on public and stakeholder engagement in SGMA[2].

Because of the number of draft plans being released and our interest in reviewing every plan, we have identified key plan elements that are necessary to ensure that each plan adequately addresses essential requirements of SGMA. A summary review of your plan using our evaluation framework is attached to this letter as Appendix A. Our hope is that you can use our feedback to improve your plan before it is submitted in January 2020.

This review does not look at data quality but instead looks at how data was presented and used to identify and address the needs of disadvantaged communities (DACs), drinking water and the environment. In addition to informing individual groundwater sustainability agencies of our analysis, we plan to aggregate the results of our reviews to identify trends in GSP development, compare plans and determine which basins may require greater attention from our organizations.

Key Indicators

Appendix A provides a list of the questions we posed, how the draft plan responds to those questions and an evaluation by element of major issues with the plan. Below is a summary by element of the questions used to evaluate the plan.

1. Identification of Beneficial Users. This element is meant to ascertain whether and how DACs and groundwater-dependent ecosystems (GDEs) were identified, what standards and guidance were used to determine groundwater quality conditions and establish minimum thresholds for groundwater quality, and how environmental beneficial users and stakeholders were engaged through the development of the draft plan.
2. Communications plan. This element looks at the sufficiency of the communications plan in identifying ongoing stakeholder engagement during plan implementation, explicit information about how DACs were engaged in the planning process and how stakeholder input was incorporated into the GSP process and decision-making.
3. Maps related to Key Beneficial Uses. This element looks for maps related to drinking water users, including the density, location and depths of public supply and domestic wells; maps of GDE and interconnected surface waters with gaining and losing reaches; and monitoring networks.
4. Water Budgets. This element looks at how climate change is explicitly incorporated into current and future water budgets; how demands from urban and domestic water users were incorporated; and whether the historic, current and future water demands of native vegetation and wetlands are included in the budget.
5. Management areas and Monitoring Network. This element looks at where, why and how management areas are established, as well what data gaps have been identified and how the plan addresses those gaps.
6. Measurable Objectives and Undesirable Results. This element evaluates whether the plan explicitly considers the impacts on DACs, GDEs and environmental beneficial users in the development of Undesirable Results and Measurable Objectives. In addition, it examines

[2] https://www.cleanwater.org/publications/collaborating-success-stakeholder-engagement-sustainable-groundwater-management-act

whether stakeholder input was solicited from these beneficial users during the development of those metrics.

7. Management Actions and Costs. This element looks at how identified management actions impact DACs, GDEs and interconnected surface water bodies; whether mitigation for impacts to DACs is discussed or funded; and what efforts will be made to fill identified data gaps in the first five years of the plan. Additionally, this element asks whether any changes to local ordinances or land use plans are included as management actions.

Conclusion

We know that SGMA plan development and implementation is a major undertaking, and we want every basin to be successful. We would be happy to meet with you to discuss our evaluation as you finalize your Plan for submittal to DWR. Feel free to contact Suzannah Sosman at suzannah@aginnovations.org for more information or to schedule a conversation.

Sincerely,

Jennifer Clary
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Clean Water Action/Clean Water Fund

Danielle V. Dolan
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Appendix A
Review of Public Draft GSP

Groundwater Basin/Subbasin: Indian Wells Valley Groundwater Basin (DWR No. 6-054)
GSA: Indian Wells Valley Groundwater Authority
GSP Date: December 2019 Public Review Draft
Note, as of the document download date (December 16, 2019), no figures were included in the December 2019 Public Review Draft available on the GSA's website. Thus, the review of figures herein was limited to those that were included in the November 2019 draft report available on the website. It should be noted that as of January 2, 2020, the Public Review draft figures are available on the website, but that the Public Review Draft GSP text itself has been removed.

1. Identification of Beneficial Users

Were key beneficial users identified and engaged?

Selected relevant requirements and guidance:
GSP Element 2.1.5, "Notice & Communication" (§354.10):
(a) A description of the beneficial uses and users of groundwater in the basin, including the land uses and property interests potentially affected by the use of groundwater in the basin, the types of parties representing those interests, and the nature of consultation with those parties.
GSP Element 2.2.2, "Groundwater Conditions" (§354.16):
(d) Groundwater quality issues that may affect the supply and beneficial uses of groundwater, including a description and map of the location of known groundwater contamination sites and plumes.
(f) Identification of interconnected surface water systems within the basin and an estimate of the quantity and timing of depletions of those systems, utilizing data available from the Department, as specified in Section 353.2, or the best available information.
(g) Identification of groundwater dependent ecosystems within the basin, utilizing data available from the Department, as specified in Section 353.2, or the best available information.
GSP Element 3.3, "Minimum Thresholds" (§354.28):
(4) How minimum thresholds may affect the interests of beneficial uses and users of groundwater or land uses and property interests.

Review Criteria	Yes	No	N/A	Relevant Info per GSP	Location (Section, Page[1])
1. Do beneficial users (BUs) identified within the GSP area include: a. Disadvantaged Communities (DACs)	X			"The following beneficial users and uses have been identified in the IWVGB: ● Municipal ● Domestic (De Minimis private wells owners and mutuals/co-ops) ● City/County ● NAWS China Lake ● Industrial ● Large Agriculture ● Small Agriculture ● Environmental (including wildlife habitat and Groundwater Dependent Ecosystems)" The IWVGA By-Laws require that at least one of the appointed voting PAC	1.3, page 69 1.4.2.1, page 75 1.4.2.3, page 77

[1] Page numbers refer to the page of the PDF.

					members shall also represent Disadvantaged Communities (DACs). On July 20, 2017, the Board approved Resolution No. 08-17 to add a representative of the Inyokern Community Services District as a DAC-representative voting member to the PAC. "During the formation of the IWVGA, a comprehensive listing of interested parties (including name, email, and phone number) was developed. The listing includes local community residents (including Disadvantaged Communities, Severely Disadvantaged Communities, and Economically Distressed Areas), businesses, large and small-scale agriculture, domestic well owners, academic institutions, relevant State and local agencies, Federal agencies, non-profit organizations, and community organizations. […] The listing is attached to this GSP as Appendix 1-D." However, the GSP does not explicitly identify which communities are designated as DACs.	
	b. Tribes	**X**			"Tribal Representation Cherokee Community of Central CA Kern Valley Indian Council Kitanemuk & Yowlumne Tejon Indians Monache Intertribal Association Nuui Cunni Cultural Center, Kern River Paiute Council Tejon Indian Tribe Timbisha Shoshone Tribal Council Tubatulabals of Kern County"	Appendix 1-E, page 427
	c. Small community public water systems (<3,300 connections)	**X**			"The IWVGB serves as the sole supply of potable water for the Indian Wells Valley. Residents of the Indian Wells Valley are served groundwater through private domestic wells, small cooperative groups sharing wells, small mutual water companies, the Inyokern Community Services District (Inyokern CSD), and the Water District." "The Inyokern CSD, established in 1983, provides water, wastewater, and street lighting services to the community of Inyokern, located approximately 7 miles west of Ridgecrest. The Inyokern CSD operates service facilities including approximately 265 water service connections, 4 groundwater production wells, distribution pipelines, and a wastewater treatment plant. The Inyokern CSD serves a primarily residential population of approximately 1,000 and an estimated 420 residential households (Alpert et al., 2014)."	2.2.4, page 94 2.3.3, page 97
2. What data were used to identify presence or absence of DACs?	d. DWR DAC Mapping Tool[2]		**X**		The GSP does not explicitly identify which communities are designated as DACs or the sources used to identify DACs.	
	i. Census Places		**X**			
	ii. Census Block Groups		**X**			
	iii. Census Tracts		**X**			
	e. Other data source		**X**			
3. Groundwater Conditions section includes discussion	f. Drinking Water Quality	**X**			"Currently, substantial groundwater in the IWVGB is of good quality; however, there are regions with poorer water quality due to high concentrations of total	3.4.4, page 171-172

[2] DWR DAC Mapping Tool: https://gis.water.ca.gov/app/dacs/

	of:	g.	California Maximum Contaminant Levels (CA MCLs)[3] (or Public Health Goals where MCL does not exist, e.g. Chromium VI)	X			dissolved solids (TDS) and/or arsenic." "TDS trends for a number of wells sampled throughout the Basin are shown in Figure 3-13. TDS samples indicate concentrations have increased over time in some of the northwest area wells where high rates of pumping may have migrated naturally occurring saline water. The most recent TDS concentrations for wells sampled in the IWVGB are shown in Figure 3-14. Lab results for a number of wells sampled in the U.S. Navy/China Lake and northwestern areas show TDS concentrations considerably above the SMCL (ranging from 1,001 mg/L to >5,000 mg/L). Groundwater below the SMCL occurs in the southern area of the Basin. Degraded water quality has caused groundwater producers in the Basin to relocate pumping to areas with higher water quality. IWV TDS data are provided in Appendix 3-C." "Historically, some wells sampled within the IWVGB have shown arsenic concentrations in groundwater above California's current arsenic MCL (10 µg/L). Existing arsenic data were assembled from earlier field and basin studies (TriEcoTt, 2013; Tetra Tech EM Inc., 2003; Houghton HydroGeo-Logic, 1996; USBR, 1993; Berenbrock, 1987), and DWR's GAMA program. Figure 3-15 displays the most recent groundwater quality measurements for arsenic at 209 wells with laboratory data. The groundwater most strongly affected by arsenic above the MCL (shown as red dots on Figure 3-15 map) occurs in the southeast area of the IWVGB and beneath the Navy Base. The arsenic database included as Appendix 3-F incorporates GAMA data from production wells monitored by IWVWD, Navy, Searles Valley Minerals, mutual water companies, and the Inyokern CSD. Where arsenic occurs above the MCL of 10µg/L, potable water is treated by water suppliers before it is distributed."	
4.	What local, state, and federal standards or plans were used to assess drinking water BUs in the development of Minimum Thresholds (MTs)?	h.	Office of Environmental Health Hazard Assessment Public Health Goal (OEHHA PHGs)[4]		X			
		i.	CA MCLs[3]	X			"In areas of the IWVGB with generally good water quality, the Minimum Threshold is set at the Secondary TDS MCL (500 mg/l) in order [sic] protect current beneficial uses for domestic supply. After evaluating historical data and trends, Minimum Thresholds were established in some areas with poorer water quality at 600 mg/l. The northwest area of the IWVGB has documented poor quality that is still designated for domestic use and is also used for agricultural uses. This area of the IWVGB is of particular concern for water quality degradation; however, limited publicly available water quality data indicate that this area has already documented high TDS concentrations that are pre-SGMA undesirable results. Due to the limited publicly available data, Minimum Thresholds (and other sustainable management criteria) in this area of the IWVGB will need to be established after baseline TDS concentrations are established. This area of the IWVGB would also benefit from cooperative sharing of private data to fill these data gaps."	4.4.3.1, page 223

[3] CA MCLs: https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/MCLsandPHGs.html
[4] OEHHA PHGs: https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/MCLsandPHGs.html

	j. Water Quality Objectives (WQOs) in Regional Water Quality Control Plans		X			
	k. Sustainable Communities Strategies/ Regional Transportation Plans[5]		X			
	l. County and/or City General Plans, Zoning Codes and Ordinances[6]		X			
5. Does the GSP identify how environmental BUs and environmental stakeholders were engaged throughout the development of the GSP?			X		The beneficial uses and users of groundwater include "Environmental (including wildlife habitat and Groundwater Dependent Ecosystems)" (p. 1-4). Users of groundwater, including DACS, SDACs, economically distressed areas, businesses, large and small-scale agriculture, domestic users, federal, state and local agencies, tribal groups, non-profit organizations, community organizations, and environmental groups, were identified during the development of the GSP. The listing of over 150 stakeholders is included as Appendix 1-D, and the Communications & Engagement Plan is provided in Appendix 1-E. The GSP does not clearly detail how these groups were engaged through the GSP development process.	1.3, page 69 1.4.2.3, page 77

Summary/ Comments

The GSP should provide further details on the DACs and tribes in the Plan area, including the name of communities, population, and a description of the sources of water supply. The DWR DAC Mapping Tool can be used to identify and map DACs: https://gis.water.ca.gov/app/dacs/

The GSP should clearly describe and identify what environmental beneficial users were engaged and how they were engaged through the GSP development process.

The GSP should identify whether or not the following beneficial uses and users of groundwater are present: Protected Lands, including refuges, conservation areas, and recreational areas; and Public Trust Uses, including wildlife, aquatic habitat, fisheries, and recreation.

Per GSP regulations, the plan's analysis of Water Quality Conditions should include a discussion of groundwater contamination from China Lake, specifically levels of PFOA/PFOS contamination at this base that have been detected at levels far above US EPA's Lifetime Health Advisory level of 70ppt, (levels of detection ranging from 3800-8,000 ppt0 and the potential for this plume to expand or extend beyond the base under current and modeled future groundwater conditions. The lack of a PHG (currently under development) is not sufficient reason to exclude this discussion, since the Department of Defense has already undertaken an investigation.

The types and locations of environmental uses, species and habitats supported, instream flow requirements, and other designated beneficial environmental uses of surface waters that may be affected by groundwater extraction in the Basin should be specified. To identify environmental users, please refer to the following:

- The NC Dataset (https://gis.water.ca.gov/app/NCDatasetViewer/) which identifies potential presence of groundwater dependent ecosystems in this basin.
- The list of freshwater species located in the Indian Wells Valley Basin can be found here: https://groundwaterresourcehub.org/sgma-tools/environmental-surface-water-beneficiaries/. Please take particular note of the species with protected status.
- CDFW's California Natural Diversity Database (CNDDB) - https://www.wildlife.ca.gov/Data/CNDDB
- USFWS's IPAC report for the Indian Wells Valley Area, if available - https://ecos.fws.gov/ipac/

[5] CARB: https://ww2.arb.ca.gov/resources/documents/scs-evaluation-resources
[6] OPR General Plan Guidelines: http://www.opr.ca.gov/planning/general-plan/

2. Communications Plan

How were key beneficial users engaged and how was their input incorporated into the GSP process and decisions?

Selected relevant requirements and guidance:
GSP Element 2.1.5, "Notice & Communication" (§354.10):
Each Plan shall include a summary of information relating to notification and communication by the Agency with other agencies and interested parties including the following:
(c) Comments regarding the Plan received by the Agency and a summary of any responses by the Agency.
(d) A communication section of the Plan that includes the following:
(1) An explanation of the Agency's decision-making process.
(2) Identification of opportunities for public engagement and a discussion of how public input and response will be used.
(3) A description of how the Agency encourages the active involvement of diverse social, cultural, and economic elements of the population within the basin.
(4) The method the Agency shall follow to inform the public about progress implementing the Plan, including the status of projects and actions.

DWR Guidance Document for GSP Stakeholder Communication and Engagement[7]

Review Criteria	Yes	No	N/A	Relevant Info per GSP	Location (Section, Page)
1. Is a Stakeholder Communication and Engagement Plan (SCEP) included?	X			Appendix 1-E, Communication and Engagement Plan, dated April 19, 2018	Appendix 1-E, page 416
2. Does the SCEP or GSP identify that ongoing engagement will be conducted during GSP implementation?		X		Communication Objectives: "Engage a diverse group of interested parties and stakeholders and promote informed community feedback throughout the GSP preparation and implementation process." However, the GSP does not lay out a plan for ongoing engagement during implementation, beyond the development of the GSP.	Appendix 1-E, page 424
3. Does the SCEP or GSP specifically identify how DAC beneficial users were engaged in the planning process?	X			"The Board established an eleven-person, voting-member Policy Advisory Committee (PAC) to advise the Board on all policy-related matters of the Board and to develop non-binding proposals on policy matters pertaining to the GSP. The Board may appoint individuals to the PAC through an adopted resolution. The PAC is comprised of voting members from the following constituent groups: ● 2 representatives from Large Agriculture ● 1 representative of Small Agriculture ● 2 representatives from Business Interests ● 2 representatives from Domestic Well Owners	1.4.2, page 75-78 1.5, page 80

[7] DWR Guidance Document for GSP Stakeholder Communication and Engagement
https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/Guidance-Document-for-Groundwater-Sustainability-Plan---Stakeholder-Communication-and-Engagement.pdf

				● 2 representatives from residential customers of a public water agency supplier ● 1 representative from the Eastern Kern County Resource Conservation District ● 1 representative from Wholesaler and Industrial User The IWVGA By-Laws require that at least one of the appointed voting PAC members shall also represent Disadvantaged Communities (DACs). On July 20, 2017, the Board approved Resolution No. 08-17 to add a representative of the Inyokern Community Services District as a DAC-representative voting member to the PAC. The PAC also includes non-voting Associate Members that represent the Navy, the Indian Wells Valley Water District, the Kern County Planning and Natural Resources Department, and the BLM." "The TAC is comprised of members from the following constituent groups: ● Large Agriculture ● Business Interests ● Residential Customers of a Public Water Agency ● Domestic Well Owners ● Eastern Kern County Resource Conservation District ● Wholesale and Industrial User ● Indian Wells Valley Water District ● United States Navy ● Kern County Water Agency" "During the formation of the IWVGA, a comprehensive listing of interested parties was developed which includes local community residents (including Disadvantaged Communities, Severely Disadvantaged Communities, and Economically Distressed Areas), businesses, large and small-scale agriculture, domestic well owners, academic institutions, relevant state and local agencies, federal agencies, non-profit organizations, and community organizations. This listing of over 150 stakeholders includes representatives from all types of water users within the IWVGB and was used during the 17-month long GSA formation process for notification of public meetings, notifications, and updates related to discussions on the SGMA." "A listing of all IWVGA Board, PAC, and TAC meetings are provided in Table 1-1 below." In addition to regular meetings, the IWVGA has hosted public workshops to present IWVGA policies and the content of this GSP. Additionally, IWVGA Board Members and Staff have met with individual stakeholder groups to provide GSP updates and discuss groundwater pumping and the allocation process. The following is a partial list of recent meetings, workshops, and outreach events that IWVGA Board members or staff have facilitated with	1.5.1 Public Outreach

				stakeholder groups: ● April 5, 2018: GSP Public Workshop ● October 1, 2018: Stakeholder Meeting with Municipal Pumpers ● October 1, 2018: Stakeholder Meeting with Agricultural Pumpers ● October 1, 2018: Stakeholder Meeting with Federal Pumpers ● October 1, 2018: Stakeholder Meeting with Industrial Pumpers ● March 13, 2019: Outreach Event with Exchange Club ● July 24, 2019: Outreach Event with Rotary Club ● November 14, 2019: Outreach Event with Realtors Association ● December 12, 2019: GPS Public Workshop	
4. Does the SCEP or GSP explicitly describe how stakeholder input was incorporated into the GSP process and decisions?	**X**			"In the course of evaluating each draft technical element of the GSP, the TAC strives for consensus in preparing written recommendations to the WRM. These recommendations (along with all related comments) are submitted to the WRM to document all TAC members' input for consideration in the final preparation of each GSP element." "A listing of all IWVGA Board, PAC, and TAC meetings are provided in Table 1-1 below." "The regular meetings of the Board, PAC, and TAC are open to members of the public, including representatives of all types of water users. At each meeting, members of the public are allowed time to address the Board or respective Committee regarding topics listed and not listed on the meeting agenda. IWVGA documents (such as meeting agendas, minutes, resolutions, ordinances, presentations, meeting packages, etc.) are made available to the public at the following website: https://iwvga.org/ In addition to regular meetings, the IWVGA has hosted public workshops to present IWVGA policies and the content of this GSP. Additionally, IWVGA Board Members and Staff have met with individual stakeholder groups to provide GSP updates and discuss groundwater pumping and the allocation process. The following is a partial list of recent meetings, workshops, and outreach events that IWVGA Board members or staff have facilitated with stakeholder groups: […]"	1.4.2.2, page 77 1.5, page 80-85

Summary/ Comments

It is important that stakeholder engagement be maintained through the development of future projects and management actions and other SGMA compliance and implementation steps. The GSA should lay out a plan to actively engage community members following the GSP preparation period.

The Policy Advisory Committee and Technical Advisory Committee would be improved by adding further dedicated representation from environmental stakeholders.

As of the document download date (December 16, 2019), no figures were included in the Public Review Draft available on the GSA's website. Thus, the review of figures herein was limited to those that were included in the November 2019 draft report available on the website. As of January 2, 2020, the Public Review draft figures are available on the website, but that the Public Review Draft GSP text itself has been removed. The incomplete and inconsistent availability of GSP documents for public review reduces public transparency.

The list of public workshops does not identify targeted efforts to reach disadvantaged communities.

3. Maps Related to Key Beneficial Uses

Were best available data sources used for information related to key beneficial users?

Selected relevant requirements and guidance:
GSP Element 2.1.4 "Additional GSP Elements" (§354.8):
Each Plan shall include a description of the geographic areas covered, including the following information:
(a) One or more maps of the basin that depict the following, as applicable:
(5) The density of wells per square mile, by dasymetric or similar mapping techniques, showing the general distribution of agricultural, industrial, and domestic water supply wells in the basin, including de minimis extractors, and the location and extent of communities dependent upon groundwater, utilizing data provided by the Department, as specified in Section 353.2, or the best available information.

GSP Element 3.5 Monitoring Network (§354.34)
(b) 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. The monitoring network objectives shall be implemented to accomplish the following:
(c) Each monitoring network shall be designed to accomplish the following for each sustainability indicator:
(1) Chronic Lowering of Groundwater Levels. Demonstrate groundwater occurrence, flow directions, and hydraulic gradients between principal aquifers and surface water features by the following methods:
(A) A sufficient density of monitoring wells to collect representative measurements through depth-discrete perforated intervals to characterize the groundwater table or potentiometric surface for each principal aquifer.
(4) Degraded Water Quality. Collect sufficient spatial and temporal data from each applicable principal aquifer to determine groundwater quality trends for water quality indicators, as determined by the Agency, to address known water quality issues.
(6) Depletions of Interconnected Surface Water. Monitor surface water and groundwater, where interconnected surface water conditions exist, to characterize the spatial and temporal exchanges between surface water and groundwater, and to calibrate and apply the tools and methods necessary to calculate depletions of surface water caused by groundwater extractions. The monitoring network shall be able to characterize the following:
(A) Flow conditions including surface water discharge, surface water head, and baseflow contribution.
(B) Identifying the approximate date and location where ephemeral or intermittent flowing streams and rivers cease to flow, if applicable.
(C) Temporal change in conditions due to variations in stream discharge and regional groundwater extraction.
(D) Other factors that may be necessary to identify adverse impacts on beneficial uses of the surface water.
(f) The Agency shall determine the density of monitoring sites and frequency of measurements required to demonstrate short-term, seasonal, and long-term trends based upon the following factors:
(3) Impacts to beneficial uses and users of groundwater and land uses and property interests affected by groundwater production, and adjacent basins that could affect the ability of that basin to meet the sustainability goal.

Review Criteria		Yes	No	N/A	Relevant Info per GSP	Location (Section, Page)
1. Does the GSP Include Maps Related to Drinking Water Users?	a. Well Density		X		"As shown on Figure 2-5, there are 932 estimated groundwater production wells located in the IWVGB with an average well density of approximately 1.6 wells per square mile. A summary of groundwater production wells by type of use is provided in Table 2-4. The NAWS China Lake's groundwater production wells for on-station water uses are not shown on Figure 2-5." Well depths are not provided in the GSP.	2.2.4, page 95 Figure 2-5
	b. Domestic and Public Supply Well Locations & Depths	X				

	i. Based on DWR Well Completion Report Map Application[8]?		X			
	ii. Based on Other Source(s)?	X			"The Desert Research Institute (DRI) has developed a groundwater pumping database for the IWVGB to represent historical pumping conditions and develop future pumping projections. The groundwater pumping database contains a compiled list of active wells in the IWVGB as well as their respective uses of groundwater and approximate well locations, which have been cross-referenced using published existing databases and aerial photographs (see Section 3.3.4.1)." "To confirm the number of domestic/private wells in the IWVGB, the IWVGA has implemented a well registration process to obtain information from all users and owners of groundwater extraction facilities in the IWVGB and properly adopt, implement, and administer this GSP. The well registration process has assisted in verifying well existence and location, but there remains some uncertainty in the existence and locations of all domestic/private wells due to a lack of voluntary well registration. This uncertainty will be reduced through future data gap analysis and groundwater allocation verification, both of which will be conducted as GSP implementation actions."	2.2.4, page 95 3.3.4.1, page 94
2. Does the GSP include maps related to Groundwater Dependent Ecosystem (GDE) locations?	a. Map of GDE Locations	X			"A map of the different vegetative species comprising the GDEs within the IWV is shown in Figure 3-16."	3.4.7, page 175 Figure 3-16
	b. Map of Interconnected Surface Waters (ISWs)		X		"As discussed previously in Section 3.3.3.2, there are no significant interconnected surface water systems that interact with groundwater in the IWVGB. Streams in the valley are typically ephemeral and the majority of recharge occurs as mountain front recharge. Additionally, there are multiple natural springs in the mountain and canyon areas surrounding the IWV (see Figure 3-11). One spring located near Highway 14 is used as the water supply source for a restaurant and brewery." However, p. 4-15 states: "Groundwater is critical to sustaining springs, wetlands, and perennial flow (baseflow) in streams as well as to sustaining vegetation such as phreatophytes that directly tap groundwater." The GSP dismisses ISWs due to the ephemeral nature of streams in the valley, yet there is very little description of the interaction between principal aquifers and surface expression of groundwater. Without further documented evidence, ISWs must be retained for the consideration of sustainable management criteria. This section of the GSP could be improved by providing further analysis of ISWs.	3.4.6, page 174
	i. Does it identify which reaches are gaining and which are losing?		X			
	ii. Depletions to ISWs are quantified by stream segments.		X			
	iii. Depletions to ISWs are quantified seasonally.		X			
3. Does the GSP include maps of monitoring networks?	a. Existing Monitoring Wells	X			"The locations of the KCWA monitoring wells and other monitoring wells in the IWVGB are provided in Figure 2-13." "KCWA has maintained a semi-annual groundwater monitoring program within the Basin since 1995. These data provide a strong foundation for understanding the trends and state of water resources within the Basin. As	2.6.2, page 115 Figure 2-13 3.6, page 188 Figure 3-1

[8] DWR Well Completion Report Map Application: https://www.arcgis.com/apps/webappviewer/index.html?id=181078580a214c0986e2da28f8623b37

						of Fall 2019, 198 monitoring wells, two stream gages, and four weather stations (Figure 3-1) contribute data to the monitoring program. DRI also maintains an eddy covariance station to monitor evapotranspiration/evaporation; and the USGS provides InSAR and earthquake activity data to monitor for land subsidence."	
	b. Existing Monitoring Well Data sources:	i. California Statewide Groundwater Elevation Monitoring (CASGEM)	X			"A subset of the data from 20 of the over 200 wells monitored throughout the IWVGB are submitted to DWR as part of their California Statewide Groundwater Elevation Monitoring (CASGEM) program. CASGEM requires each individual groundwater basin to develop a representative groundwater level monitoring program to assist with tracking change in groundwater levels, and consequently changes in the volume of water stored in the groundwater basin. The CASGEM program aides in identifying the seasonal and long-term trends in the IWVGB. The locations of the IWVGB CASGEM wells are provided in Figure 2-13."	2.6.3, page 116
		ii. Water Board Regulated monitoring sites		X			
		iii. Department of Pesticide Regulation (DPR) monitoring wells		X			
	c. SGMA-Compliance Monitoring Network		X			"Ten monitoring wells have been selected to be representative key wells to monitor chronic lowering of groundwater levels. The locations of these wells are provided in Figure 4-2." "Eleven monitoring wells and production wells have been selected to be representative key wells to monitor water quality degradation. The locations of these wells are provided in Figure 4-3."	4.4.2.6, page 221 4.4.3.6, page 225 Figure 4-2, 4-3
	i. SGMA Monitoring Network map includes identified DACs?			X			
	ii. SGMA Monitoring Network map includes identified GDEs?			X			

Summary/ Comments

As noted on the first page of this form, given that no figures were included in the Public Review Draft downloaded December 16, 2019, all review of figures herein are of November draft figures.

Per 23 CCR §354.8, the GSP is required to present the density of wells on maps. The GSP only provides an average well density across the whole plan area, and does not differentiate between private domestic wells, public supply wells, and agricultural wells. Well locations are presented on Figure 2-5, with different symbols for each type of well, however given the scale of this map and the overlapping symbols, it is difficult to discern the differences in relative distribution of wells. Therefore, the GSP should present well density information on separate maps for each type of well.

The GSP should also provide the depths of wells by type, including and especially for domestic wells and public supply wells. Well density and depth data can be downloaded from the DWR-provided resource: https://www.arcgis.com/apps/webappviewer/index.html?id=181078580a214c0986e2da28f8623b37.

The GSP should include maps of the SGMA monitoring network overlaid with location of DACs, domestic wells, community water systems, GDEs, and any other sensitive

beneficial users. Providing these maps will allow the reader to evaluate the adequacy of the network to monitor conditions near these beneficial users, a requirement of the monitoring network under 23 CCR § 354.34(b)(2).

The following suggestions could be used to clarify the analysis of the presence of potential GDEs in the Basin. The GSP should map the original NC dataset, and clearly document which polygons were added (and what local sources were used to identify them), removed (and the removal reason), and kept (from the original NC dataset). Provide one map to denote the most accurate picture of potential GDEs in the Basin showing the source of the data. For example, note if any GDEs were added or removed based on the November 2018 field visit. Additionally, note if any GDEs were added or removed based on the US Navy mapping of GDEs on NAWS China Lake. On the final map figure, more easily distinguishable colors or patterns should be used to distinguish the GDE Units from one another.

The GSP should provide information on the historical or current groundwater conditions in the GDEs or the ecological conditions present. The GSP should also identify whether any endangered or threatened freshwater species of animals and plants, or areas with critical habitat are located in or near any of the GDEs, since some organisms rely on uplands and wetlands during different stages of their lifecycle.

It is recommended that the GSP provide further analysis of ISWs. The GSP should evaluate stream reaches with depth to groundwater contour maps. The GSP should also reconcile any data gaps (shallow monitoring wells, stream gauges, and nested/clustered wells) along surface water features in the Monitoring Network section of the GSP to improve ISW mapping. The GSP should provide a cross-section and/or corresponding hydrographs to show the relationship between the stream channels and the depth to groundwater at wells near the stream.

4. Water Budgets

How were climate change projections incorporated into projected/future water budget and how were key beneficial users addressed?

Selected relevant requirements and guidance:
GSP Element 2.2.3 "Water Budget Information" (Reg. § 354.18)
Each Plan shall include a water budget for the basin that provides an accounting and assessment of the total annual volume of groundwater and surface water entering and leaving the basin, including historical, current and projected water budget conditions, and the change in the volume of water stored. Water budget information shall be reported in tabular and graphical form.

*Projected water budgets shall be used to estimate future baseline conditions of supply, **demand**, and aquifer response to Plan implementation, and to identify the uncertainties of these projected water budget components. The projected water budget shall utilize the following methodologies and assumptions to estimate future baseline conditions concerning hydrology, water demand and surface water supply availability or reliability over the planning and implementation horizon:*
(b) The water budget shall quantify the following, either through direct measurements or estimates based on data:
(5) If overdraft conditions occur, as defined in Bulletin 118, the water budget shall include a quantification of overdraft over a period of years during which water year and water supply conditions approximate average conditions.
(6) The water year type associated with the annual supply, demand, and change in groundwater stored.
(c) Each Plan shall quantify the current, historical, and projected water budget for the basin as follows:
*(1) Current water budget information shall quantify current inflows and outflows for the basin using the most recent hydrology, water supply, **water demand**, and land use information.*

DWR Water Budget BMP[9]
DWR Guidance for Climate Change Data Use During GSP Development and Resource Guide[10]

Review Criteria	Yes	No	N/A	Relevant Info per GSP	Location (Section, Page)
1. Are climate change projections explicitly incorporated in future/ projected water budget scenario(s)?		X		"DRI (McGraw et al, 2016) examined the predicted precipitation quantities for several published IPCC climate models and documented conflicting results; ie, some models predicted decreases and some predicted increases in precipitation in the future with the assumed driver of CO2 increase. This GSP does not incorporate any precipitation change in model simulations into the future other than annual fluctuations similar to those that have been observed in the past record."	3.5.6, page 188
2. Is there a description of the methodology used to include climate change?		X			
3. What is used as the basis a. DWR-Provided Climate Change Data and Guidance[11]		X			

[9] DWR BMP for the Sustainable <management of Groundwater Water Budget: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/BMP-4-Water-Budget.pdf
[10] DWR Guidance Document for the Sustainable Management of Groundwater Guidance for Climate Change Data Use During GSP Development: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/Climate-Change-Guidance_Final.pdf
[11] DWR Guidance Document for the Sustainable Management of Groundwater Guidance for Climate Change Data Use During GSP Development: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/Climate-Change-Guidance_Final.pdf

for climate change assumptions?	b. Other				X			
4. Does the GSP use multiple climate scenarios?					X			
5. Does the GSP quantitatively incorporate climate change projections?					X			
6. Does the GSP explicitly account for climate change in the following elements of the future/projected water budget?	a. Inflows:	i. Precipitation			X			
		ii. Surface Water			X			
		iii. Imported Water			X			
		iv. Subsurface Inflow			X			
	b. Outflows:	i. Evapotranspiration			X			
		ii. Surface Water Outflows (incl. Exports)			X			
		iii. Groundwater Outflows (incl. Exports)			X			
7. Are demands by these sectors (drinking water users) explicitly included in the future/projected water budget?	a. Domestic Well users (<5 connections)		X			"DRI developed a groundwater pumping database to represent historical pumping and to assist with making future pumping projections (McGraw et al., 2016). The database contains pumping from 1920 to 2013. The USGS and the USBR provided pumping estimates from 1920 to 1995 and the Cooperative Group provided pumping estimates from 1995 to 2016. Pumping wells were assigned to one of the following water use categories: ● Private domestic ● Municipal ● City of Ridgecrest ● Industrial (Searles Valley Minerals) ● U.S Navy (NAWS China Lake) ● Agriculture" "IWVWD groundwater pumping was assumed to increase by 1% annually. This increase represented overall increase in pumping in the IWVGB due to growth in domestic and municipal sectors, and is not intended to imply growth is limited to the IWVWD service area only."	3.3.4.1, page 158 3.5.5, page 186
	b. State Small Water systems (5-14 connections)				X			
	c. Small community water systems (<3,300 connections)		X					
	d. Medium and Large community water systems (> 3,300 connections)		X					
	e. Non-community water systems		X					
8. Are water uses for native vegetation and/or wetlands explicitly included in the current and historical water budgets?			X			"The ET that occurs at the China Lake Playa and nearby phreatophytic area is the primary natural discharge for the IWVGB." ET is included in the historical, current, and projected water budgets in Table 3-6, 3-7, 3-8, 3-10, and 3-12. The current estimate of evapotranspiration (ET) in the basin is given as	3.3.4.1, page 159
9. Are water uses for native vegetation and/or wetlands explicitly included in the projected/future water budget?			X					

DWR Resource Guide DWR-Provided Climate Change Data and Guidance for Use During GSP Development: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/Resource-Guide-Climate-Change-Guidance_v8.pdf

				4,850 ac-ft/yr (Table 3-7). The ET of saltgrass, pickleweed, greasewood and bare playa are discussed individually, but the basis of the total estimated evapotranspiration is not provided. Please clarify how the total ET was calculated in the current water budget.	

Summary/ Comments

It appears that climate change was not considered in the projected water budgets. The regulations [23 CCR §354.18(e)] state that "Each Plan shall rely on the best available information and best available science to quantify the water budget for the basin in order to provide an understanding of historical and projected hydrology, water demand, water supply, land use, population, climate change, sea level rise, groundwater and surface water interaction, and subsurface groundwater flow" (p. 12 of DWR BMP for Water Budgets). DWR's Guidance for Climate Change Data is intended as a source of guidance for climate change factors, but is not incorporated or even discussed in the GSP.

The GSP should explain what changes to factors such as land use and population were used for the future water budgets.

Elaborate on the methodology used for future precipitation/runoff changes considering the regulations and DWR guidance, and provide the quantitative effects of climate change on each water budget component.

The historical average budget in Table 3-6 shows the interbasin outflow as 60 AFY, while in the current budget in Table 3-7 the interbasin outflow is 50 AFY. The GSP should clarify the basis for the estimated amounts of interbasin outflow in the historical and current water budgets.

The GSP should clarify how the total ET was calculated in the current water budget.

In addition to the Predicted Water Budgets with Projects shown, the GSP should provide a baseline future budget without the projects and management actions.

5. Management Areas and Monitoring Network

How were key beneficial users considered in the selection and monitoring of Management Areas and was the monitoring network designed appropriately to identify impacts on DACs and GDEs?

Selected relevant requirements and guidance:
GSP Element 3.3, "Management Areas" (§354.20):

(b) A basin that includes one or more management areas shall describe the following in the Plan:
(2) The minimum thresholds and measurable objectives established for each management area, and an explanation of the rationale for selecting those values, if different from the basin at large.
(3) The level of monitoring and analysis appropriate for each management area.
(4) An explanation of how the management area can operate under different minimum thresholds and measurable objectives without causing undesirable results outside the management area, if applicable.
(c) If a Plan includes one or more management areas, the Plan shall include descriptions, maps, and other information required by this Subarticle sufficient to describe conditions in those areas.

CWC Guide to Protecting Drinking Water Quality under the SGMA[12]
TNC's Groundwater Dependent Ecosystems under the SGMA, Guidance for Preparing GSPs[13]

Review Criteria	Yes	No	N/A	Relevant Info per GSP	Location (Section, Page)
1. Does the GSP define one or more Management Area?		X		The GSP does not define any Management Areas.	
2. Were the management areas defined specifically to manage GDEs?			X		
3. Were the management areas defined specifically to manage DACs?			X		
a. If yes, are the Measurable Objectives (MOs) and MTs for GDE/DAC management areas more restrictive than for the basin as a whole?			X		
b. If yes, are the proposed management actions for GDE/DAC management areas more restrictive/ aggressive than for the basin as a whole?			X		
4. Does the GSP include maps or descriptions indicating what DACs are located in each Management Area(s)?			X		
5. Does the GSP include maps or descriptions indicating what GDEs are located in each Management Area(s)?			X		
6. Does the plan identify gaps in the monitoring network for DACs and/or GDEs?	X			"As discussed in Section 3.4.7, most of the GDEs are on federal property within IWV. The Navy's Integrated Natural Resources Monitoring Plan (INRMP) inventories and monitors phreatophytic vegetation that relies on groundwater to maintain its ecosystem. Data gaps associated with GDEs in IWV include quantifying root extinction depths, better mapping of vegetation types, and	3.6.1.4, page 193
a. If yes, are plans included to address the identified deficiencies?	X				

[12] CWC Guide to Protecting Drinking Water Quality under the SGMA: https://d3n8a8pro7vhmx.cloudfront.net/communitywatercenter/pages/293/attachments/original/1559328858/Guide_to_Protecting_Drinking_Water_Quality_Under_the_Sustainable_Groundwater_Management_Act.pdf?1559328858
[13] TNC's Groundwater Dependent Ecosystems under the SGMA, Guidance for Preparing GSPs: https://www.scienceforconservation.org/assets/downloads/GDEsUnderSGMA.pdf

				correlating depth to groundwater with vegetative health. Dataloggers were purchased under Prop 1 Grant funding to utilize existing wells in the vicinity of GDEs to monitor groundwater levels. Further coordination with the Navy will be required to evaluate vegetation health as groundwater levels are monitored. Data will start to be collected and analyzed under the Prop 1 Grant funding. These data gaps will be re-evaluated for the 5-year progress report to develop a correlation between measured data and vegetation health."	

Summary/ Comments

If management areas are defined in the future, care should be taken so that they and the associated monitoring network are designed to adequately assess and protect against impacts to all beneficial users, including GDEs and DACs.

The GSP should describe the GDE monitoring program, and address how the need to link and correlate groundwater level declines to biological responses and significant and adverse impacts to GDEs and ISWs will be addressed by the monitoring program. The GSP should also add the number of wells to be used, the locations, and the screened intervals and depths.

The ten proposed representative wells to be used for monitoring groundwater levels, shown in Figure 4-2 and listed in Table 4-1, are predominantly deep wells which will not adequately monitor impacts to GDEs. The GSP should describe whether other existing wells can be used to monitor the shallow aquifer or propose installing new wells.

The GSP should show the location of the ten multi-level monitoring wells on a map and present the well hydrographs, along with an analysis of the vertical gradients that can be determined from the data.

6. Measurable Objectives, Minimum Thresholds, and Undesirable Results

How were DAC and GDE beneficial uses and users considered in the establishment of Sustainable Management Criteria?

Selected relevant requirements and guidance:
GSP Element 3.4 "Undesirable Results" (§ 354.26):
(b) The description of undesirable results shall include the following:
(3) Potential effects on the beneficial uses and users of groundwater, on land uses and property interests, and other potential effects that may occur or are occurring from undesirable results

GSP Element 3.2 "Measurable Objectives" (§ 354.30)
(a) Each Agency shall establish measurable objectives, including interim milestones in increments of five years, to achieve the sustainability goal for the basin within 20 years of Plan implementation and to continue to sustainably manage the groundwater basin over the planning and implementation horizon.

Review Criteria	Yes	No	N/A	Relevant Info per GSP	Location (Section, Page)
1. Are DAC impacts considered in the development of Undesirable Results (URs), MOs, and MTs for groundwater levels and groundwater quality?	X			Groundwater Levels URs: "The IWVGB will continue to experience negative impacts related to the chronic lowing of groundwater levels if not addressed through projects and management actions. The potential basin impacts include: ● Impacts to shallow wells directly caused by lowering of groundwater levels which would require deepening or replacement ● Impacts to shallow wells due to degraded water quality indirectly caused by lowering of groundwater levels which would require well abandonment or treatment ● Encroachment on mission of NAWS China Lake ● Land subsidence causing impacts to infrastructure ● Jeopardy to beneficial uses including domestic supplies, industrial supplies, and agriculture supplies which could result in fallowing of agricultural land ● Financial impacts to all groundwater users and well owners for mitigation costs (including de minimis groundwater users and members of disadvantaged communities) ● Reduction of impacts caused by increased dust and desertification caused by declining water tables." MTs: "Groundwater conditions in the IWVGB will be improved by limiting the decline of groundwater levels. The Minimum Threshold for the chronic lowering of groundwater levels will minimize undesirable results caused by reduction of groundwater in storage, degraded water quality, and land subsidence which will subsequently protect beneficial users and uses from undesirable results. The risk to wells going dry, along with the associated financial impacts, will be mitigated by limiting the chronic decline of	4.3.2.3, page 210 4.4.2.4, page 220 4.3.3.3, page 212 4.4.3.4, page 224

				groundwater levels. Beneficial uses including groundwater for domestic/municipal use, industrial use, and agriculture use will be protected; however, the Minimum Threshold for the chronic lowering of groundwater levels impacts and limits amount of groundwater production that can occur for beneficial uses in the IWVGB. As discussed in Section 5, projects and management actions implemented to mitigate the chronic lowering of groundwater levels have financial costs that will be partially borne by beneficial users in the IWVGB." Groundwater Quality URs: "The IWVGB will continue to experience negative impacts related due to degraded water quality if not addressed through projects and management actions. The potential basin impacts to beneficial uses and users include: ● Impacts to shallow wells due to degraded water quality which would require well abandonment or treatment ● Encroachment on mission of NAWS China Lake ● Jeopardy to beneficial uses including domestic supplies, industrial supplies, and agriculture supplies which could result in fallowing of agricultural land ● Financial impacts to all groundwater users and well owners for mitigation costs (including de minimis groundwater users and members of disadvantaged communities)" MTs: "Groundwater conditions in the IWVGB will be improved by establishing Minimum Thresholds to limit and mitigate the degradation of groundwater quality, which will subsequently protect beneficial users and uses from undesirable results. By maintaining TDS concentrations below Minimum Threshold, the number of wells that would require well abandonment or treatment due to water quality degradation will be reduced and beneficial uses will be protected. As discussed in Section 5, projects and management actions implemented to mitigate the degraded water quality have financial costs that will be partially borne by beneficial users in the IWVGB."	
2. Does the GSP explicitly discuss how stakeholder input from DAC community members was considered in the development of URs, MOs, and MTs?		**X**		Stakeholder input is not explicitly discussed in the development of URs, MOs, and MTs.	
3. Does the GSP explicitly consider impacts to GDEs and environmental BUs of surface water in the development of MOs and MTs for groundwater levels and depletions of ISWs?		**X**		Impacts to GDEs and environmental BUs of surface water are not explicitly considered.	
4. Does the GSP explicitly consider impacts GDEs and environmental BUs of surface water and recreational lands in the discussion and development of Undesirable Results?		**X**		The URs of groundwater levels and groundwater quality only describe potential effects relating to human beneficial uses of groundwater and neglects environmental beneficial uses that could be adversely affected by chronic groundwater level decline. Please add "potential adverse impacts to environmental uses and users" to the list of potential effects.	4.3.5, page 214

					"Ephemeral streams exist in the mountain canyons, but typically do not flow past the mouths of the canyon except for in very wet years. There are multiple natural springs in the IWV (see Figure 3-11). There is currently no data documenting any undesirable results or basin impacts related to depletions of interconnected surface water. Groundwater is critical to sustaining springs, wetlands, and perennial flow (baseflow) in streams as well as to sustaining vegetation such as phreatophytes that directly tap groundwater. As discussed in Section 3.4.7, GDEs on the valley floor are vulnerable and susceptible to impacts related to the chronic lowering of groundwater levels. Model results simulating Baseline conditions (no action) indicate continued drastic lowering of groundwater levels in the vicinity of the GDEs near the China Lake Playa if appropriate projects and management actions are not implemented (see Appendix 3-H). Specifics regarding the relationship between groundwater levels and the health of GDEs is currently not known, including extinction root depths, and there is no current monitoring program to track GDE health; therefore, GDE monitoring, currently a data gap, is proposed as part of the GSP monitoring program. Due to limited data on the relationship of interconnected surface water (springs) to GDEs and GDE's direct use of groundwater, no additional sustainable management criteria are proposed at this time."	
5. Does the GSP clearly identify and detail the anticipated degree of water level decline from current elevations to the water level MOs and MTs?			X		The GSP does not clearly identify the anticipated degree of water level decline from current conditions. "The lower value between the following data was used to determine the Minimum Threshold: 1. 5 feet below the minimum of the simulated groundwater level before groundwater level recovery is anticipated due to the implementation of projects and management actions; or 2. 5 feet below recent minimum historical value."	4.4.2.1, page 219
6. If yes, does it include:	a. Is this information presented in table(s)?		X			
	b. Is this information presented on map(s)?		X			
	c. Is this information presented relative to the locations of DACs and domestic well users?		X			
	d. Is this information presented relative to the locations of ISW and GDEs?		X			
7. Does the GSP include an analysis of the anticipated impacts of water level MOs and MTs on drinking water users?			X		See Question 1 above. The GSP does not include an analysis of the anticipated impacts.	
8. If yes:	a. On domestic well users?		X			
	b. On small water system production wells?		X			
	c. Was an analysis conducted and clearly illustrated (with maps) to identify what wells would be expected to be partially and fully dewatered at the MOs?		X			
	d. Was an analysis conducted and clearly illustrated (with maps) to identify what wells would be expected to be partially and fully dewatered at the MTs?		X			
	e. Was an economic analysis performed to assess the increased operation costs associated with increased lift as a result of water level decline?		X			
9. Does the sustainability goal explicitly include drinking water and nature?			X		There is no mention of the environment in the Sustainability Goal. Since GDEs	4.2.2, page 202

				are present in the Subbasin, they should be recognized as beneficial users of groundwater and should be included in the Sustainability Goal. "The sustainability goal is to manage and preserve the IWVGB groundwater resource as a sustainable water supply. To the greatest extent possible, the goal is to preserve the character of the community, preserve the quality of life of IWV residents, and sustain the mission at NAWS China Lake. The absence of undesirable results, defined as significant and unreasonable effects of groundwater conditions, throughout the planning horizon will indicate that the sustainability goal has been achieved. The sustainability goal will be accomplished by achieving the following objectives: ● Operate the IWVGB groundwater resource within the sustainable yield. ● Implement projects and management actions to reduce IWVGB groundwater demands, increase reuse of current supplies, obtain supplemental water supplies, and mitigate undesirable results. ● Monitor the IWVGB actively and thoroughly and adaptively manage the projects and management actions to ensure the GSP is effective and undesirable results are avoided."	

Summary/ Comments

The GSP should clearly identify and detail the anticipated degree of water level decline from current elevations to the water level MOs/MTs. The GSP should also describe how the approach of developing water level MOs/MTs is protective of the diverse drinking water users within the Plan area. An impact analysis should be performed to evaluate and quantify the potential impacts to domestic and public supply wells associated with the water level MOs/MTs. The locations of potentially impacted wells should be identified and presented in maps so that the public and DWR may assess the well impacts specific to DACs and other sensitive users within the Plan area. This analysis will further support the planning and development of the Shallow Well Mitigation program planned by the GSA.

The GSP should explicitly demonstrate whether and how the stakeholder input was considered in the development of URs, MOs, and MTs.

The GSP should include GDEs and ISWs in the discussion of Sustainable Management Criteria and state whether the MTs, MOs and interim milestones will help achieve the sustainability goal as it pertains to the environment.

The GSP should elaborate on how the criteria for determining URs would be applied in a way that is protective of significant and unreasonable harm to GDEs. A procedure could be included for violation of MTs that includes early identification of potential GDE impacts and appropriate response actions. This could be accomplished efficiently and cost-effectively using remote sensing tools, such as GDE Pulse. The GSP should also provide more specifics on what biological responses (e.g., extent of habitat, growth, recruitment rates) would best characterize a significant and unreasonable impact to GDEs.

Even though data is lacking on ISWs, they should be included in the Sustainable Management Criteria and Undesirable Results. The analysis for potential depletion of ISWs should include all beneficial users of surface water that could be affected by groundwater withdrawals, including environmental users.

7. Management Actions and Costs

What does the GSP identify as specific actions to achieve the MOs, particularly those that affect the key BUs, including actions triggered by failure to meet MOs? What funding mechanisms and processes are identified that will ensure that the proposed projects and management actions are achievable and implementable?

Selected relevant requirements and guidance
GSP Element 4.0 Projects and Management Actions to Achieve Sustainability Goal (§ 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.
(b) Each Plan shall include a description of the projects and management actions that include the following:
(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.

Review Criteria	Yes	No	N/A	Relevant Info per GSP	Location (Section, Page)
1. Does the GSP identify benefits or impacts to DACs as a result of identified management actions?	X			"The Shallow Well Mitigation program will provide a direct benefit to beneficial users in the IWVGB who have unreasonably experienced water supply and financial hardships due to overdraft conditions in the IWVGB. Many of the beneficial users that will benefit from the implementation of this project are members of disadvantaged communities. The implementation of the other proposed projects and management actions will also improve groundwater conditions and are anticipated[sic] reduce the number of shallow wells that will be impacted in the future, as compared to the anticipated number of impacted shallow wells under baseline conditions (see Appendix 3-E)." "The IWVGA will confer with domestic and municipal groundwater producers (namely the Water District, City, Navy, SDWC, Inyokern CSD, and private/domestic well owners) to discuss historical and current conservation measures, which will be used as a guide to establish the new voluntary conservation measures on a basin-wide level. Specifically, the IWVGA will review the current conservation measures governing landscape irrigation, wash-downs, and other practices that potentially waste water that could be directed toward higher beneficial uses. The IWVGA may also determine the health and safety water use requirements for domestic water use in the IWVGB and use these requirements as another guide to establish the new voluntary conservation measures."	5.3.4.2, page 277 5.3.3.1, page 270
2. If yes: a. Is a plan to mitigate impacts on DAC drinking water users included in the proposed Projects and Management Actions?	X			Project No. 4: Shallow Well Mitigation Program "The IWVGA will prepare a mitigation plan (Shallow Well Mitigation Plan) to address the approximately 872 shallow wells in the IWVGB. The Shallow Well Mitigation Plan will include the development of criteria to characterize the level of impacts and the development of an evaluation process to access the viability of the wells." "After the adoption of the Shallow Well Mitigation Plan, in appropriate	5.3.4, page 276

					intervals throughout the planning horizon, shallow wells will be evaluated based on the adopted criteria and organized into specific areas/zones for development of effective mitigation options. Some wells may be proposed to be abandoned (not mitigated) based on evaluation of impacts. Specific improvements will be identified for impacted shallow well which may include deepening the well, replacing the well, connecting to existing water systems, or other mitigation measures. The wells recommended for mitigation will be placed on an Impacted Shallow Well Priority List and will be scheduled for mitigation."	
	b. Does the GSP identify costs to fund a mitigation program?	x			"The estimated cost to develop the Shallow Well Mitigation Plan is $70,000. The estimated annual cost to administer the program is $20,000. The model results for the proposed projects and management actions indicate that potentially 22 shallow wells could be impacted. The estimated cost to mitigate these impacts is $1.65 million."	5.3.4.4, page 278
	c. Does the GSP include a funding mechanism to support the mitigation program?		x			
3. Does the GSP identify any demand management measures in its projects and management actions?		x				
4. If yes, does it include:	a. Irrigation efficiency program	x			"The IWVGA will also coordinate with agricultural pumpers to investigate the potential for and feasibility of additional conservation in irrigation practices."	5.3.3, page 270
	b. Ag land fallowing (voluntary or mandatory)	x			"All groundwater pumpers who are assigned a Transient Pool Allocation may be enrolled, at their sole election, in a Fallowing Program."	5.2.1, page 243
	c. Pumping allocation/restriction	x			Management Action No. 1: Implement Annual Pumping Allocation Plan, Transient Pool and Fallowing Program	5.2.1, page 241
	d. Pumping fees/fines	x			"These Annual Pumping Allocations will be used for the purpose of assigning pumping fees ("Augmentation Fees"). The Augmentation Fees will in turn provide the funding for the development of supplemental water supplies and other projects and management actions to achieve sustainability."	5.2.1, page 241
	e. Development of a water market/credit system		x			
	f. Prohibition on new well construction		x			
	g. Limits on municipal pumping		x		"Rather, all groundwater pumpers continue to possess the right to produce groundwater provided they pay the Augmentation Fee. While this action will not directly limit groundwater extraction by any individual entity, it is anticipated that the costs associated with the Augmentation Fee will result in voluntary pumping reductions and the implementation of additional conservation measures to lower demands thereby assisting in achieving sustainability." "In accordance with SGMA and California Water law, a five-year base period defined as January 1, 2010 through December 31, 2014 ("Base Period") will be used to evaluate groundwater production for all groundwater pumpers, with the exception of NAWS China Lake and de minimis users."	5.2.1, page 241
	h. Limits on domestic well pumping		x			
	i. Other	x			Project No. 3: Basin-wide Conservation Efforts "The Water District, City, and NAWS China Lake have previously adopted conservation measures within their respective service areas in an effort to mitigate the conditions of overdraft in the IWVGB (see Sections 2.7.3 and 2.7.4). An additional project is to develop additional voluntary and	5.3.3, page 270 5.3.6, page 283

					rebate-based conservation efforts for domestic beneficial uses in the IWVGB, and to also promote additional conservation efforts for the other beneficial uses that rely on groundwater from the IWVGB." Project No. 6: Pumping Optimization Project "Evaluation of the modeling results for the proposed groundwater management and project scenarios showed that some current groundwater pumping needs to be redistributed in the basin to reduce concentrated pumping centers that would lead to continuing localized declining groundwater levels and corresponding continuing impacts to shallow domestic wells."	
5. Does the GSP identify water supply augmentation projects in its projects and management actions?		X				
6. If yes, does it include:	a. Increasing existing water supplies		X			
	b. Obtaining new water supplies	X			Project No. 1: Develop Imported Water Supply	5.3.1, page 250
	c. Increasing surface water storage		X			
	d. Groundwater recharge projects – District or Regional level	X			Option 2: Groundwater Recharge Project with LADWP Recycled Water Subproject 2: Groundwater Recharge	5.3.1, page 251 5.3.2, page 262
	e. On-farm recharge		X			
	f. Conjunctive use of surface water		X			
	g. Developing/utilizing recycled water	X			Project No. 2: Optimize Use of Recycled Water	5.3.2, page 260
	h. Stormwater capture and reuse		X			
	i. Increasing operational flexibility (e.g., new interties and conveyance)		X			
	j. Other		X			
7. Does the GSP identify specific management actions and funding mechanisms to meet the identified MOs for groundwater quality and groundwater levels?		X			The project benefits section of each project and management action discusses the anticipated benefits which include reduction of unreasonable and chronic lowering of groundwater levels, reduction of unreasonable water quality degradation and/or improvement of water quality conditions. Funding mechanisms are discussed under the costs sections and section 6.3.	
8. Does the GSP include plans to fill identified data gaps by the first five-year report?		X			Section 3.6.1 discusses plans to fill data gaps in groundwater level monitoring, water budget, groundwater quality monitoring, GDEs, and aquifer properties.	3.6.1, page 190
9. Do proposed management actions include any changes to local ordinances or land use planning?			X			
10. Does the GSP identify additional/contingent actions and funding mechanisms in the event that MOs are not met by the identified actions?			X		The GSP does not identify specific additional/contingent actions. "If planned project and management actions are unable to be realized or the intended IWVGB benefits are not achieved, sustainable management criteria, including Minimum Thresholds and Measurable Objectives, will need to be revaluated and additional or more aggressive management actions may need to be implemented."	4.4, page 215 5.3, page 289

					"The IWVGA is taking an adaptive management approach to IWVGB management over the planning horizon. Consequently, potential projects and management actions will continuously be considered and evaluated over the planning horizon to ensure that the most beneficial and economically feasible projects and management actions are implemented to reach sustainability in the IWVGB. Proposed projects and management actions may be modified, as necessary, if the intended project benefits are not realized in the intended timeframe."	
11. Does the GSP provide a plan to study the interconnectedness of surface water bodies?			**X**		"As discussed previously in Section 3.3.3.2, there are no significant interconnected surface water systems that interact with groundwater in the IWVGB."	3.4.6, page 174
12. If yes:	a. Does the GSP identify costs to study the interconnectedness of surface water bodies?		**X**			
	b. Does the GSP include a funding mechanism to support the study of interconnected surface water bodies?		**X**			
13. Does the GSP explicitly evaluate potential impacts of projects and management actions on groundwater levels near surface water bodies?			**X**			

Summary/ Comments

Section 5.3.4.4. identifies that potentially 22 shallow wells could be impacted as a result of projects and management actions. This well impact analysis should be described and included in the GSP, including all assumptions and methodologies as well as maps indicating the location of anticipated impacts. It is not clear from the GSP if the analysis conducted evaluates impacts from selected projects and management actions or the future conditions at anticipated MOs and/or MTs.

It is recommended that a discussion be added for each project or management action to clearly identify the impacts to DACs/drinking water users, including results of the impacts analyses referenced in Section 5.3.4.4. For example,would Project 6, Pumping Optimization, have the potential to either affect the movement of an existing plume of contamination (such as the PFOS/PFOA under the China Lake base) or potentially to control some contamination, such as salinity. These potential impacts must be part of project review for all identified management actions.

The GSP should clearly identify the funding mechanism(s) that will be used to support the shallow well mitigation program identified in Section 5.3.4.

The GSP should include environmental benefits and multiple benefits as criteria for assessing project priorities. For the projects already identified, consider stating how ISWs and GDEs will benefit or be protected, or what other environmental benefits will accrue. For projects that construct recharge basins, consider identifying if there is habitat value incorporated into the design and how the recharge basins could be managed to benefit environmental users.