COMMENT DOCUMENT	COMMENTER	DATE SUBMITTED	COMMENT	RESPONSE
			current ET is 4,850 AFY or 63% of our entire recharge. ET is wasted water. Reducing the ET would reduce outflows, which is critical to the overall water budget. The pumping optimization project needs to redistribute water pumping to both minimize localized declining water levels and reduce ET. The GSP should be updated to address both aspects of pumping optimization and include an ET goal. The GSP should also provide a quantitative cost benefit justification for the twenty-three million dollar capital expense.	its relation to China Lake Playa vegetation/GDEs will be required to evaluate potential environmental uses of water.
			12. Paragraph 5.4.2, Direct Potable Reuse Project, gives the impression that Direct Potable Reuse is a futuristic concept that is not compatible with the IWV timetable. We need to be sustainable by 2040, more than 20 years from now. DPR is a State priority, which is being vigorously pursued by the SWRCB. It is logical to expect the State to make both grants and low cost loans readily available for DPR. DPR needs to be a priority. We need to consider the synergism and compatibility of initial projects with future integration with a DPR strategy. The GSP should describe appropriate synergism between the currently proposed recycled water projects and a future DPR strategy.	Comment noted. As station in Section 5.4.2: "The IWVGA will evaluate the compatibility of the planned recycled water subprojects (see Section 5.3.2) with a future DPR project as the regulations for DPR projects are developed and adopted."
#11	The Nature Conservancy	12/27/19	Checklist Item 1 - Notice & Communication (23 CCR §354.10) [Section 1.3 Beneficial Uses and Users (p. 1-3 to 1-4)] • We appreciate that the 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. Please 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.	Comment noted.
			• 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 identifies potential presence of groundwater dependent ecosystems in this basin. ○ The list of freshwater species located in the Attachment C of this letter. 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 https://ecos.fws.gov/ipac/the beneficial uses and users of groundwater stated in the GSP NC Dataset (https://gis.water.ca.gov/app/NCDatasetViewer) Which Indian Wells Valley Basin in the area if available.	Comment noted.

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			Checklist Items 2 to 4 - Description of general plans and other land use plans relevant to GDEs and their relationship to the GSP (23 CCR §354.8) [Section 2.5.2 Summary of General Plans and Other Land Use Plans (p. 2-15 to 2-24)] The Kern, Inyo and San Bernardino Counties General Plans were adopted prior to the development of the Indian Wells Valley Groundwater Authority. The provided summaries of the plans emphasize policies that relate to water supply and groundwater, but do not include discussion of goals and policies related to the protection and management of GDEs that could be affected by groundwater withdrawals. Please include a discussion of how implementation of the GSP may affect and be coordinated with General Plan policies and procedures regarding the protection of aquatic habitats and other environmental users.	Comment noted.
			[Section 2.6 Existing Water Resources Monitoring Programs (p. 2-25 to 2-27)] The Kern, Inyo and San Bernardino Counties General Plans were adopted prior to the development of the Indian Wells Valley Groundwater Authority. The provided summaries of the plans emphasize policies that relate to water supply and groundwater, but do not include discussion of goals and policies related to the protection and management of GDEs that could be affected by groundwater withdrawals. Please include a discussion of how implementation of the GSP may affect and be coordinated with General Plan policies and procedures regarding the protection of aquatic habitats and other environmental users.	Comment noted.
			[Section 2.6 Existing Water Resources Monitoring Programs (p. 2-25 to 2-27)] Locations of monitoring wells in the IWV Groundwater Basin are shown on Figure 2-13, but there is no listing of well attributes such as screened interval or well depth. **Please provide a table with well construction information for the wells currently monitored.**	Comment noted.
			[Section 2.7.7 Well Permitting and Procedures (p. 2-38 to 2-42] •Well permitting is handled by Kern, Inyo, and San Bernardino counties, the three counties that encompass the basin. Please include a discussion of how future well permitting will be coordinated with the GSP to assure achievement of the Plan's sustainability goals.	Comment noted.
			• The State Third Appellate District recently found that Counties have a responsibility to consider the potential impacts of groundwater withdrawals on public trust resources when permitting new wells near streams with public trust uses (ELF vs. SWRCB and Siskiyou County, No. C083239). Compliance of well permitting programs with this requirement should be stated in the GSP. Checklist Items 5, 6, and 7 – Hydrogeologic Conceptual Model (23 CCR §354.14)	Comment noted.
			[Section 3.3.1 Geology and Hydrogeology (p. 3-7 to 3-9)]	Additional data is needed and will be addressed as a data gap when implementing the GSP.

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			•The GSP describes two principal aquifers on p. 3-9, the shallow aquifer and deeper aquifer. The GSP describes a strong connection between the two aquifers in portions of the Basin, with confinement or artesian conditions in other areas of the Basin. The GSP also describes springs and seeps on p. 3-14. However, the GSP does not clearly describe the hydrologic dynamics between surface expressions of groundwater (springs and seeps) and the two principle aquifers. The basin-wide cross sections provided in Figures 3-5a & 3-5b are regional and do not include a graphical representation of the manner in which shallow groundwater may interact with GDEs, nor does the HCM shown on Figure 3-3. Please include further description and/or an example near-surface cross section that depicts the conceptual understanding of hydrologic dynamics that govern communication between the principal aquifers and surface expressions of groundwater.	
			The GSP states (p. 3 in the IWVGB is from the water in unconsolidated alluvial deposits. These water- bearing sediments store and transmit water and are divided into the following hydrostratigraphic features that are important for analyzing sustainability criteria and-8):"For the GSP, the groundwater depletion that is of concern groundwater budgets." Please include a discussion of the basin bottom in this section. As noted on page 9 of DWR's Hydrogeologic Conceptual Model BMP (https://water.ca.gov/LegacyFiles/groundwater/sgm/pdfs/BMP_HCM_Final_2016-12-23.pdf) "the definable bottom of the basin should be at least as deep as the deepest groundwater extractions". Thus, groundwater extraction well depth data should be included in the determination of the basin bottom. Properly defining the bottom of the basin will prevent the possibility of extractors with wells deeper than the basin boundary from claiming exemption from SGMA due to their well residing outside the vertical extent of the basin boundary. Checklist Items 8, 9, and 10 – Interconnected Surface Waters (ISW) (23 CCR §354.16)	Additional data is needed and will be addressed as a data gap when implementing the GSP.
			[Section 3.3.3.2 Streamflow and Mountain Front Recharge (p. 3-13 to 3-14)] [Section 3.4.6 Interconnected Surface Water Systems (p. 3-33)] [4.3.5 Depletions of Interconnected Surface Water Undesirable Results] • The systems which interact with groundwater in IWVGB" and goes on to state (p. 3-33): "Streams in the valley are typically ephemeral and the majority of recharge occurs asmountain front recharge. Additionally, there are multiple natural springs in the mountain and canyon areas surrounding the IWV (see Figure 3-11)." 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 thatdirectly tap groundwater." The GSP dismisses ISWs due to the ephemeral nature of streams in the valley, yet as noted above in the comments for Checklist Items 5-7,there is very little description of the interaction between principle aquifers and surface expression of groundwater. Without further documented evidence, ISWs should be retained for the consideration of sustainable management criteria. This section of the GSP could be improved by providing further analysis of ISWs. Please note the following best practices for analyzing ISWs provided in the subsequent bullets.	Comment addressed in Sections 4.3 and 4.3.5. Additional data is needed and will be addressed as a data gap when implementing the GSP. The IWVGA will reevaluate the need to establish sustainability criteria for interconnected surfaced water and GDEs as data gaps are filled.

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			○ ISWs are best estimated by first determining which reaches are disconnected from groundwater. This approach would involve comparing groundwater elevations with a land surface Digital Elevation Model that could identify which surface waters have groundwater consistently below surface water features, such that an unsaturated zone would separate surface water from groundwater. Please evaluate stream reaches with depth to groundwater contour maps (please see Attachment D for bestpractices for completing this step). Please 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.	Comment noted.
			○ The hydraulically connected at any point by a continuous saturated zone to the underlying aquifer and the overlying surface water is not completely depleted". "At any point" has both a spatial and temporal component. Even short durations of interconnections of groundwater and surface water can be GSP states (p. 3-14): "There are no significant interconnected surface water completely regulations [23 CCR §351(o)] define ISWs as "surface water that is crucial for surface water flow and supporting environmental users of groundwater and surface water. Please 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 tream. Checklist Items 11 to 15, Identifying and Mapping GDEs (23 CCR §354.16)	Comment noted.
			Checklist Items 11 to 15, Identifying and Mapping GDEs (23 CCR §354.16) [Section 3.4.7 Groundwater-Dependent Ecosystems (GDEs) (p. 3-34)] • TNC acknowledges and applauds IWVGA for the use of the NC dataset, as mapped on Figure 3-16. We also appreciate the inclusion of species type on Figure 3-16. The following suggestions could be used to clarify the analysis of the presence of potential GDEs in the Basin.	Comment noted.
			• The NC dataset is a starting point for GSAs to identify GDEs in their basin. Please 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). The basin's GDE shapefile, which is submitted via the SGMA Portal, should also include two new fields in its attribute table denoting: 1) which polygons were kept/removed/added, and 2) the change reason (e.g., why polygons were added or removed). Please clarify what the legend on Figure 3-16 means by "Not Applicable". If this represents a removed GDE Unit, please state the removal reason.	Comment noted.
			• Please provide one map to denote the most accurate picture of potential GDEs in the Basin showing the source of the data. For example, please 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.	Comment noted.

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			• Please map to denote the most accurate picture of potential map figure, please use more easily distinguishable colors or patterns to distinguish the GDE Units from one another. Checklist Items 16 to 20, Describing GDEs (23 CCR §354.16)	Comment noted.
			[Section 3.4.7 Groundwater-Dependent Ecosystems (GDEs) (p. 3-34)] • Provide information on either historical or groundwater conditions in the GDEs or the ecological conditions present. Refer to GDE Pulse (https://gde.codefornature.org; See Attachment E of this letter for more details) or any other locally available data to describe depth to groundwater trends in and around GDE areas, as well as trends in plant growth (e.g., NDVI) and plant moisture (e.g., NDMI). Below is a screenshot example of data available in GDE Pulse for NC dataset polygons found in the Indian Wells Valley Basin:	Comment addressed.
			• Please 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. Resources for this include the list of freshwater species located in the Indian Wells Valley Basin that can be found in Attachment C of this letter, the Critical Species Look book, and CDFW's CNDDB database. For example, please note where the endangered Mohave Tui Chub are located in reference to the GDE units. Checklist Items 21 and 22 – Water Budget (23 CCR §354.18)	Comment noted.
			[Section 3.3.4 Water Budget and Overdraft Conditions (p. 3-15 to 3-25)] • The Valley and concluded that it is possible that currently approximately 50 AFY of the groundwater flow in the Salt Wells Valley originates as underflow from the IWV as distinguished from mountain front recharge from the Argus Range." 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. Please clarify the basis for the estimated amounts of interbasin outflow in the historical and current water budgets.	See Section 3.5. The GSP modeling effort provides tools necessary for estimating the groundwater aquifer's hydrologic water budget.
			• The current estimate of 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.	See pages 7 and 8 of Appendix 3-H.
			• The projected water budgets were using the IWV groundwater model (Pohlman et al, 2019) with the projects and management actions implemented. The future budgets are shown in Table 3-8 with GSP states (p. 3-20):"DRI performed a hydraulic analysis of the Salt Wells evapotranspiration(ET) in the basin is given as	See Table 3-10.

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			4,850 ac-simulated for the years 2035, 2040, and 2070 a new term Artificial Recharge included, representing the recharge by the projects and management actions. In addition to the Predicted Water Budgets with Projects shown, please provide a baseline future budget without the projects and management actions.	
			• It appears that climate change was not considered in the projected water budgets. The GSP states (p. 3-47): "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." 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. Please further elaborate on the decision to not consider climate change in the projected water budget considering the regulations and DWR guidance. Please further describe the methodology for future precipitation that was employed. Checklist Items 23 to 25 – Sustainability Goal (23 CCR §354.24)	See Section 3.5.6.
			[Section 4.2 Sustainability Goal (p. 4-2)] • The 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." There is no mention of environmental users or uses (GDEs and ISWs) in the Sustainability Goal. Since GDEs are present in the Subbasin, they should be recognized as beneficial users of groundwater and should be included in the Sustainability Goal. GSP states the Sustainability Goal as (p.4-3): "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." There is no mention of environmental users or uses (GDEs and ISWs) in the Sustainability Goal. Since GDEs are present in the Subbasin, they should be recognized as beneficial users of groundwater and should be included in the Sustainability Goal. Checklist Items 26-29 – Measurable Objectives (23 CCR §354.30) and Minimum Thresholds (23 CCR §354.28)	Comment noted. Environmental beneficial uses and users, are recognized as part of the community.

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			Sections 4.4.2 Chronic Lowering of Groundwater Levels Minimum Threshold (p. 4-19)] [Sections 4.5.2 Chronic Lowering of Groundwater Levels Measurable Objective and Interim Milestones (p. 4-32)] • This GDEs rely on shallow groundwater, further groundwater monitoring in the shallow zone is necessary to determine potential effects on GDEs. The representative monitoring sites for chronic lowering of groundwater level SMC are wells that monitor the deeper aquifer and thus do not monitor potential effects on GDEs. Please include GDEs in these sections and state whether the minimum thresholds, measurable objectives and interim milestones will help achieve the sustainability goal as it pertains to the environment. Minimum Threshold and Measurable Objective do not consider GDEs. Because GDEs rely on shallow groundwater, further groundwater monitoring in the shallow zone is necessary to determine potential effects on GDEs. The representative monitoring sites for chronic lowering of groundwater level SMC are wells that monitor the deeper aquifer and thus do not monitor potential effects on GDEs. Please include GDEs in these sections and state whether the minimum thresholds, measurable objectives and interim milestones will help achieve the sustainability goal as it pertains to the environment.	Revisions made to Section 4.3 and Section 4.3.5.
			[Sections 4.4.3 Degraded Water Quality Minimum Threshold (p. 4-24)] [Sections 4.5.3 Degraded Water Quality Measurable Objective and Interim Milestones (p. 4- 32)] • This needs of GDEs. As previously stated, because GDEs rely on shallow groundwater, further groundwater monitoring in the shallow zone is necessary to determine potential effects on GDEs. The representative monitoring sites for degraded water quality SMC are wells that monitor the deeper aquifer and thus do not monitor potential effects on GDEs. Please include a discussion about GDEs and water quality and state whether the minimum thresholds, measurable objective sand interim milestones will help achieve the sustainability goal as it pertains to environmental users and uses of groundwater. Checklist Item 30-46 – Undesirable Results (23 CCR §354.26)	Revisions made to Section 4.3 and Section 4.3.5.
			[Section 4.3.2 Chronic Lowering of Groundwater Levels Undesirable Results (p. 4-11)] • This section only describes 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 presented in Section 4.3.2.3.	Revisions made to Section 4.3 and Section 4.3.5
			• This section refers to the shallow well impact analysis in Appendix 3E and states that the number of shallow wells that would be impacted if the proposed projects and management actions are implemented is estimated to be 22, which IWVGA considers a feasible number of wells that can be mitigated. GDEs, however, are not considered in this analysis. Damage to GDEs can occur within a relatively	Additional data is needed and will be addressed as a data gap when implementing the GSP.

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			short period of time and can be irreversible, leading to the permanent loss of an environmental resource. Please elaborate on how the criteria for determining Undesirable Results would be applied in a way that is protective of significant and unreasonable harm to GDEs. A procedure could be included for violation of minimum thresholds 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. Refer to Appendix E of this letter for an overview of GDE Pulse, an online tool for monitoring the health of GDEs over time.	
			• Please 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. The definition of 'significant and unreasonable' is a qualitative statement that is used to describe when undesirable results would occur in the basin, such that a minimum threshold can be quantified. Potential effects on all beneficial users of groundwater in the basin need to be taken into consideration. According to the California Constitution Article X, §2, water resources in California must be "put to beneficial use to the fullest extent of which they are capable". Please identify appropriate biological indicators that can be used to monitor potential impacts to environmental beneficial users due to groundwater conditions. Refer to Appendix E of this letter for an overview of GDE Pulse, an online tool for monitoring the health of GDEs over time.	Additional data is needed and will be addressed as a data gap when implementing the GSP.
			[Section 4.3.3 Degraded Water Quality Undesirable Results (p. 4-12)] • This section only describes potential effects relating to human beneficial uses of groundwater and neglects environmental beneficial uses that could be adversely affected by degraded water quality. Please add "potential adverse impacts to environmental uses and users" to the list of potential effects presented in Section 4.3.3.3.	Comment noted.
			[Section 4.3.5 Depletions of Interconnected Surface Water Undesirable Results (p. 4-14)] • GDEs are often adjacent to streams or associated with riparian corridors where ISWs exist, even if only seasonally or are discontinuous along a longitudinal profile. ISWs that are not continuously connected spatially and/or temporally are still ISWs and should not be excluded from this GSP. The regulations [23 CCR §351(o)] define interconnected surface waters as "surface water that is hydraulically connected at any point by a continuous saturated zone to the underlying aquifer and the overlying surface water is not completely depleted". Please include ISWs in the Sustainable Management Criteria and state how they will help achieve the Sustainability Goal as it pertains to the environment.	Revisions made to Section 4.3 and Section 4.3.5. The IWVGA will reevaluate the need to establish sustainability criteria for interconnected surfaced water and GDEs as data gaps are filled.
			• The GSP states (p. 4-15): "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." It further states (p. 4-15): "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." This section does not consider Undesirable Results for Interconnected Surface Water systems. Even though data is lacking on	Revisions made to Section 4.3 and Section 4.3.5.

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			ISWs, they should be included in the Sustainable Management Criteria and Undesirable Results. The analysis for potential depletion of ISWs should include beneficial users of surface water that could be affected by groundwater withdrawals, including environmental users. Please discuss the data gap for ISWs in the Monitoring Network section of the GSP and discuss future plans to fill the data gap. Possible monitoring could includes hallow monitoring wells, stream gauges, and nested/clustered wells along surface water features to improve ISW mapping.	
			Checklist Items 47, 48 and 49 – Monitoring Network (23 CCR §354.34) [Section 4.7.1 Proposed Monitoring Network and Schedule (p. 4-36 to 4-37)] • The GSP states (p. 4-15): "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." However, this monitoring is not described in Section 4.7. Please 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.	Comment noted. See Section 3.6.1.4 and 4.3.5. Additional data is needed and will be addressed as a data gap when implementing the GSP.
			• The GSP states (p. 3-50): "Data gaps in the groundwater level monitoring program exist outside of the pumping areas. There are only a few monitoring wells in the El Paso area, mostly open space managed by BLM. Groundwater resources in this area have not been fully characterized or quantified. The largest ephemeral stream system in IWV commences from this area in Freeman and Little Dixie Washes. Additional well drilling to characterize the aquifer structure and properties, and groundwater level monitoring could provide a better understanding of the occurrence and movement of water in this area." Please discuss this data gap in the Monitoring Network section of the GSP and discuss future plans to fill this data gap. Possible monitoring could include shallow monitoring wells, stream gauges, and nested/clustered wells along surface water features to improve ISW mapping.	Additional data is needed and will be addressed as a data gap when implementing the GSP.
			• The GSP states (p. 4-36): "The existing groundwater level monitoring network is very robust for establishing changes in groundwater levels over time throughout the Indian Wells Valley basin and will continue throughout the planning horizon. As discussed in Section 3.6, depth to water is, and will continue to be, measured biannually at 198 wells during Spring (March) and Fall (October) to observe seasonal changes in groundwater levels. Water levels measured at these wells will also be used to determine the change of storage in the Basin annually." 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. Please expand the shallow groundwater monitoring network through shallow and/or nested wells to further understand the potential for GDEs to be supported by shallow groundwater or	Additional data is needed and will be addressed as a data gap when implementing the GSP.

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			upward vertical gradients that produce surface expression of groundwater in the form of springs and seeps. If existing wells cannot be used to monitor the shallow aquifer, propose installing new wells.	
			• The of groundwater flow, identifying some of the recharge and discharge areas within the GSP states (p. 4-15): "Specifics regarding the relationship between groundwater GDEs will be added GSP states (p. 3-50): "Data gaps in the groundwater level monitoring program GSP states (p. 4-36): "The existing groundwater level monitoring network is GSP states (p. 3-49): "Ten multi-level monitoring wells provide vertical gradients Basin." Please show the location of these wells on a map and present the well hydrographs, along with an analysis of the vertical gradients that can be determined from the data. Checklist Items 50 and 51 – Projects and Management Actions to Achieve Sustainability Goal (23 CCR §354.44)	Comment noted.
			[Section 5. Projects and Management Actions (p. 5-1)] • We appreciated that the IWVGB includes GDEs that are beneficial environmental uses and users of groundwater. To strengthen management of Environmental beneficial users and uses, they should be considered in establishing project priorities. In addition, consistent with existing grant and funding guidelines for SGMA-related work, consideration should be given to multi-benefit projects that can address water quantity as well as providing environmental benefits or benefits to disadvantaged communities. Please include environmental benefits and multiple benefits as criteria for assessing project priorities. For the projects already identified, please consider stating how ISWs and GDEs will benefit or be protected, or what other environmental benefits will accrue.	Comment noted.
			• Recharge basins, reservoir and facilities for managed stormwater recharge project scan be designed as multi-benefit projects to include elements that act functionally as wetlands and provide a benefit for wildlife and aquatic species. In some cases, such multiple-benefit projects and facilities have been incorporated into local Habitat Conservation Plans (HCPs) and Natural Community Conservation Plans (NCCPs), more fully recognizing the value of the habitat that they provide and the species they support. For projects that construct recharge basins, please consider identifying if there is habitat value incorporated into the design and how the recharge basins could be managed to benefit environmental users. Grant and funding priorities for SGMA-related work may be given to multi-benefit projects that can address water quantity as well as provide environmental benefits. Therefore, please include environmental benefits and multiple benefits as criteria for assessing project priorities.	Comment noted.
			[Section 5.2.1 Management Action No. 1: Implement Annual Pumping Allocation Plan, Transient Pool and Fallowing Program (p. 5-4 to 5-13)] • The IWVGA proposes an Annual Allocation Plan, Transient Pool and Fallowing Program to address the critical overdraft in the Basin. "The IWVB does not have the legal authority to restrict, assess, or regulate production for NAWS China Lake,	Revisions made to Section 4.3 and Section 4.3.5.

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			therefore NAWS China Lake groundwater production is considered highest of beneficial use" (p. 5-10). "Implementation of the Annual Pumping Allocation Plan, Transient Pool and Fallowing Program may be subject to environmental regulations and could require the preparation of environmental studies. The IWVGA will follow all regulatory requirements associated with the environmental processes including IWVGA proposes an Annual Allocation Plan, Transient Pool and Fallowing public noticing and review requirements" (p. 5-11). Please include environmental users in the list of beneficial uses of groundwater on p. 5-10and describe how GDEs will be protected after this management action is implemented.	
			[Section 5.3.1 Project No. 1 Develop Imported Water Supply (p. 5-13 to 5-22)] • The WVGA is considering two options for importing water into the Basin, Thereby reducing reliance on groundwater. Project benefits include increasing groundwater levels and groundwater storage, improved water quality, and reduced land subsidence, however there is no mention of potential environmental benefits. Please state what environmental benefits would accrue from this project.	Comment noted.
			[Section 5.3.2 Project No. 2 Optimize Use of Recycled Water (p. 5-23 to 5-33)] • Two projects have been proposed to increase the quantity of recycled water at the City of Ridgefield treated wastewater and use it for landscaping at several locations shown in Figure 5-3 and 5-4. The purpose of these projects is to replace use of groundwater with use of non-potable recycled water, benefitting groundwater levels and storage. However, the recycled water currently benefits the Tui Chub habitat. Increased use of recycled water for other purposes would decrease return flows that are a significant source of water for Tui Chub habitat. Please describe how the habitat of the Tui Chub will be protected if this project is implemented.	Comment noted.
			Section 5.4.3 Additional Projects (5-52)] • The GSP states (5-52): "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." Please discuss the protection of environmental users and environmental benefits in the evaluation process.	Comment noted.
#12	Judie Decker	01/08/2020	General Text Comments Each section of this document has a table of contents. The Appendices and the Figures should also be listed in the Table of Contents for each section. All the Figures need to also be identified. For example: Section 1 Figure 1. A proof reader is needed to correct sentence structure, grammar, and other "mechanical" errors. There is much verbiage in the document that seems to be unnecessary or is repetitious. An example is the beginning of Section 3. The history of water is not really necessary unless it is an item that is required or recommended. All California water basins saw use by Native Americans and then by passing explorers, traders, and settlers. However, if the history of water in the IWV is going to be included then mention of early day farming and land settlement in Ridgecrest	Comment noted.

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			and the Inyokern/North Brown Rd area needs to be mentioned, This section should include statements regarding the change in climate in this area over the last 100+ years. Long ago the Shoshone/Piute tribes camped along the shores of a much larger China Lake. When DWP built their first aqueduct there were streams flowing into this valley on a year round basis, streams like Dixie Wash and others.	
			Further Comments In some sentences the draft document states that the Basin has been in overdraft for 50 years and in some sentences it says 60 years. The document needs to be consistent with this number; it is certainly more than 50 years which was 1969. Many technical reports are cited in the GSP that state this fact. These technical reports were made available to the public at the time they were published. The major pumpers have known about the overdraft for over a half century and chose to ignore it until the implementation of SGMA law. As a result, it is going to cost the water consumers of this Basin many millions of dollars more than it would have if the problem had been addressed in a timely fashion.	Comment addressed in a previous GSP draft.
			For example, The Water District started pumping from the Ridgecrest Field, moved to the Intermediate Field where they had 3 major producing wells on 40 acres, and then moved to the West and Southwest where they are repeating the process seen in the Intermediate Field. As each area was pumped over time the field became less productive as water levels dropped and water quality declined. They now have 4 wells along Bowman Road west of Highway 395. Each is about one half mile from the other. This practice of the Water District having a series of major wells close to one another has seriously impacted most of the shallow well owners, both those close to District wells and those farther away. This issue needs to be mentioned since there is discussion about the impact on shallow wells by agricultural pumping.	Comment noted.
			An explanation that some of the projects that are suggested will be the responsibility of individual governing agencies needs to be stated. At the present time the recycled water is under the purview of the City of Ridgecrest. Optimizing pumping and moving wells to the northern portion of the IWV is an item that is solely within the governance of the Indian Wells Valley Water District. These projects, when approved by their Boards, will have to undergo a full CEQA review which takes some time to process, including at least one public hearing as part of the CEQA process. The dates you have put on projects associated with independent governing agencies needs to be removed. The projects need to be deferred to those appropriate agencies. The dates listed in the draft are probably unrealistic.	Comment noted.
			How much longer will our aquifer support the present overdraft pumping?	Comment noted.
			Is there a hydrological “point of no return” for a water basin?	Comment noted.
			How long will it take to implement the proposed projects?	Implementation of the GSP will begin immediately after GSP adoption and will continue throughout the planning horizon. Sustainability must be reached by 2040.
			The longer all this takes the less water will be available for the future. Litigation will only delay the solution, perhaps for decades. Meanwhile, the status quo will continue, and the Basin will dip even further into overdraft.	Comment noted.
			Comments on Section 1 Page 3 This sentence is incorrect. ”…water producers have been FORCED (emphasis mine) to mine the basin in order to meet water demand.” Please state the facts of the situation. This sentence should read:	Comment addressed in a previous GSP draft.

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			”…water producers have mined the basin in order to meet water demand.”	
			Page 4 The paragraph about DACs which starts on Page 3 needs an addition. Many of the DAC Community are either customers of the IWVWD or the Inyokern CSD. This paragraph should state this.	Comment noted.
			Page 10 Regarding the paragraph describing the addition of the Inyokern CSD. Remove Tim Carroll’s name. He will not always be the CSD’s Representative but they will always have a representative. This is what has been done for the names of other representatives from agencies listed.	Comment addressed in a previous GSP draft.
			Comments on Section 2 Page 9 First sentence reads ”However, a number of Navy…”. It should state: “However, the majority of Navy…”	Comment addressed in a previous GSP draft.
			2.4.6 IWV Cooperative Groundwater Management Group I am uncertain why there is so much written on a group that is no longer in existence and in reality did little. However, if you are going to have this inclusion, it needs to state: The Cooperative Groundwater Group was formed by the major public pumpers as a result of the findings and recommendations from the 1993 Bureau of Reclamation Report. In its later years the group included other entities (some of them are mentioned). Agriculture needs to be added.	Comment addressed in a previous GSP draft.
			2.5 Land Use “Implementation of the GSP may impact land use…” It should say: “Implementation of the GSP will impact land use…”	Comment noted.
			Page 27 Top paragraph Recheck the facts in this paragraph. I believe you will find that the 100 wells monitored were monitored by the IWVWD, the KCWA, and the U.S. Navy-not the co-operative group. The co-operative group did not monitor any wells. Many of the wells monitored are part of a mitigation effort by the IWVWD and have been monitored since the 1980s.	Comment addressed in a previous GSP draft.
			Page 33 2.7.4.1 Fifth Bullet ”Prohibit landscape irrigation on the surface..” Check and see if this statement is copied correctly because it doesn’t make sense.	Comment addressed.
			Comments on Section 3 Pages 6-7 History of Water Use in the IWV These pages have reference given to various authors. All of the information that is given here is general knowledge and can be found in several publications. All author references should be removed here. It is also general knowledge that sheep used to be driven through this valley every spring. There is no relevance to the GSP in noting that sheep were driven through the valley.	Comment noted.
			Page 8 Regarding both the text and footnote 6, SKYTEM. SKYTEM findings have never been publicly presented or published. This needs to be noted and/or this segment removed.	Comment addressed in a previous GSP draft.
			Page 10 Blue Max Peak is most definitely not the highest peak that drains from the Sierras into this Basin –it is Owens Peak.	Comment addressed in a previous GSP draft.
			3.4.4 Overdraft Conditions Again, there is a need for consistency on when Overdraft first began. There needs to be an emphasis on the time before the 1960s. The need is not for DWR but rather for those members of the public who refuse to believe we have a serious water problem.	Comment addressed in a previous GSP draft.
			Page 34 3.4.6 The last line. Change lodge to restaurant. A lodge implies a hotel/motel. While the facility is called The Indian Wells Lodge it is a restaurant. This may need to be changed elsewhere if the lodge is referred to.	Comment addressed in a previous GSP draft.

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			Note to Stetson Staff: Section 3 is of Critical Importance. It must clearly and accurately define the water situation. As it is there are those who will argue to negate its findings and thus, try to weaken the need for action	Comment noted.
			Comments on Section 4 Pages 8-10 4.2.3 Sustainability Measures: Implement Annual Pumping Allocation Plan, Transient Pool and Voluntary Fallowing Program. There is very little detail in this paragraph. There is so little detail that a reader who had not been closely following the GA Board and committee meetings carefully would have no idea what this is about. Therefore, it is a good way to spread and enforce distrust instead of fostering co-operation. Suggest you separate these three measures and give a short description of each. Also it is important to pair any fallowing effort with dust mitigation because the two issues go together.	Comment noted. Project Number 5 is directly linked to the fallowing program of Management Action Number 1.
			Page 10 4.2.4 Explanation of How Goals will be Achieved The title of this section does not match what is written. There are no details of how these goals will be achieved. Some possibilities under each category should be listed. They can be listed without going into a lot of detail.	The goal of managing and preserving the IWVGB groundwater resource as a sustainable water supply, while avoiding undesirable results, is achieved through implementation of the Projects and Management Actions.
			The first bullet has the pumping allocation plant, transient pool and fallowing land as one section. These should be listed separately with an explanation of each.	Comment noted.
			Under the section on Conservation it should be noted that even extreme conservation will not solve the overdraft problem in this valley.	Comment addressed in Section 5.3.3.
			Several of the items in 4.2.4 list dates when they will be accomplished. These dates are not realistic. For instance, Pumping Optimization is listed as being accomplished by 2025. Yet when one reads further one discovers this project includes the buying out of large agricultural entities, the IWVWD installing new wells, pumping equipment and the necessary pipeline. It would take over 5 years to execute this project without the involvement of land purchase. This is true of the other projects that have dates associated with them.	Comment noted.
			Page 12 It is stated that because of the IWV's location there is no seawater intrusion. However, there is saline water intrusion in some areas due to heavy pumping. As the higher quality water is depleted it is replaced with, in most cases, a much lower quality of water. Thus, some de minimis wells have had to be abandoned because they are no longer potable. This should be noted.	Comment noted.
			Page 14 Second paragraph-last sentence add the phrase at least: " It is estimated that at least 97 wells…" Does this number include the shallow wells belonging to co-ops and Mutuals? I don't think so.	Yes, the estimate includes shallow wells belonging to co-ops and mutual.
			Page 14 Check the grammar in the third paragraph, third line.	Comment noted.
			Page 14 Third paragraph. Will the reader really understand this paragraph? I think not.	Comment noted.
			Page 20 Number 3. Add a sentence to indicate that Coso Valley, Rose Valley and Salt Wells Valley have no or few residents, and water uses. Also include: Salt Wells Valley is federal land under the jurisdiction of the U.S. Navy as is Coso Valley. Most of Rose Valley is owned by DWP. It seems like Searles Valley needs to be included here also. In a sentence about Searles Valley it would be noted that their water comes from the IWVGB.	Comment addressed in a previous GSP draft.
			4.4.1.1 Fourth line down: change stimulated to simulated	Comment addressed in a previous GSP draft.
			Page 21 First paragraph Make sure that the reference to the 40-50 acre feet of outflow to Salt Wellls Valley remains the same in all of the tables and references in this document	Comment addressed in a previous GSP draft.

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			4.4.1.5 Relationship with Federal, State and Local Standards This short paragraph is an understatement in the extreme. It should say that that these entities must address the issues of SGMA in their updated General Plans. They should update their General Plans upon adoption of the GSP by the IWVGA Board. The downplaying of this section is a clear indicator of the conflict of interest that exists between individuals from land use entities sitting as groundwater authority board members. This change needs to also be added to all other sections where General Plans are discussed as in 4.2.5	Comment noted.
			Page 27 Discussion of poor quality water. It needs to be noted here that degraded water quality occurs throughout the groundwater basin at depth. Thus, as the water levels decline so does the water quality While this problem is more severe in the Northwest part of the valley it is very evident elsewhere. I would note the issue with the cemetery which has removed all of its turf due to an extreme degradation in water quality in their well. Water quality degradation is the very reason that the IWVWD has moved its production wells ever westward. The above information needs to be noted in this section.	Comment addressed in a previous GSP draft. See Section 3.4.4.
			Comments on Section 5 Pages 6-7 Introduction. This section is unclear and somewhat confusing. Since Section 5 is a description of the actions that are planned to reach sustainability the introduction needs to contain more information. Perhaps a short outline is needed so the reader can see what will take place, when it will begin and which groups of users will be involved. Here are some questions that need to be answered in this section. Management Action 1 involved 3 parts. Who will be affected by each of these parts? What type of user will pay an Allocation fee? How long will this fee be in place? Which type of user is listed in the Transient Pool? How long will this pool be available? Fallowing land should be combined with dust mitigation because they go together. Where does it fit in? It will take many years to actually receive imported water. This time period needs to be shown. Do de minimis users pay allocation fees? What requirements will be applied to Searles Valley Minerals?	Comment noted.
			Recycled water. Again this is a city of Ridgecrest project and not a GA project. This should be noted in the discussion of recycled water. There are other projects that would result in a beneficial use of this water besides the ones mentioned. They should be included as possibilities.	Comment addressed in 5.3.2.1. Independent of this GSP, the City is currently planning to upgrade, expand, and potentially relocate the existing City WWTF. The IWVGA will coordinate with the City to further optimize the use of recycled water in the IWVGB beyond the current scope of the City's project to upgrade, expand, and potentially relocate the existing City WWTF. This portion would be the IWVGA project.
			Conservation This is Management Action 3. However, conservation by the Navy and by the IWVWD customers has been ongoing for many years. This needs to be noted in this document. Nothing has been mentioned about a conservation effort to replace the aged leaky pipes that carry water from the Indian Wells Valley to Searles Valley. While Searles Valley Minerals is a private company the savings in water loss would benefit all valley water users.	Comment addressed in Section 2.7.3.
			Page 8 Bullet 9 Is this verbiage a direct quotation from the existing law? As stated earlier the IWV lies in the Mojave Desert. A desert is always in a state of drought. If it had enough water it would no longer be a desert.	Comment noted.
			5.1.1.1 Management Actions Pumping Allocations and Augmentation Fees It is unclear to the reader exactly who will be required to pay these fees. It is clear what the fees will be used for, but it is unclear who will pay them. Do de minimis, co-ops and Mutuals pay? Will	Comment noted.

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			public utilities pay? industrial? This needs to be clarified on Page 9 which is the introduction to this section of text.	
			Page 11 Second paragraph "Groundwater production in excess of Annual Pumping Allocations…" How is this going to be tracked and enforced?	Comment noted.
			5.2.1.2 Costs Page 15 Administrative costs-do these include legal fees? The legal fees should be separated so the public can know how much they are. This should be done for all the projects listed in the GSP.	Comment noted.
			5.1.1 Recycled Water Projects This document needs to state that there are other potential use for the recycled water that may be more cost effective. They will be investigated. One possibility is to sell Trona the treated water for their use on brine ponds. A new pipe would have to be built for this project. This proposal would reduce the amount of water used by Searles Valley Minerals for industrial purposes by almost 100%. Sending the water to Trona would be far cheaper than building purple pipe to send the water to Cerro Coso College. Cerro Coso is the largest IWVWD customer. At one point it used 10% of all water pumped by the District. It also pays the most per gallon of water because it must be electrically boosted 4 times to reach the campus. Another factor in considering sending the water to Trona is that Searles Valley Minerals maintains their water pipeline. Pipes that are installed in the city for recycled water use will have to maintained by a governmental agency like the city of Ridgecrest or the IWVWD. This would cost the public more money in an already very costly endeavor.	Comment addressed in previous GSP draft.
			5.3.2 Basin Wide Conservation Efforts 2 paragraph under Project Description "the IWGA will confer…the Water District…" Need to add the Inyokern CSD to this list	Comment addressed in previous GSP draft.
			Last sentence same paragraph "The IWVGA will implement the Water Conservation Strategic Plan…" Here is another example where a description of the placement of authority is needed. The Navy, as listed above, is a Federal agency responsible for its federal lands. The IWVWD, the City of Ridgecrest and the Inyokern CSD regulate the citizens that lie within their boundaries. They are all Special Districts of the State of California. The IWVGA is not a Special District. Which governing entity has the top authority? The public needs to know.	Comment noted.
			5.3.2.8 Legal Authority Page 39 This paragraph is the same for each management action. .Again, it is important to describe the hierarchy of legal authority between the governing entities in this valley.	Comment noted.
			Page 40 Second paragraph. Shallow Well Mitigation. Wells usually do not decline instantly. It is a process that happens over time. Your last two sentences indicate that no one with a shallow well in existence will be eligible for mitigation unless their new well is drilled after 2/1/2020. Perhaps you need to add a segment on Shallow Well Buy Out. Many well owners are not the original developers of the property. They will not be able to answer the questions that are listed on this page. Furthermore the questions posed are value judgments. Water levels and water quality has been declining in virtually every shallow well drilled in this valley. The same holds true for major production wells in this valley. Refer to my comments earlier about the practices of the IWVWD with regards to a history of their well placement.	See Section 5.3.4.1. Existing shallow wells that experience impacts related to chronic lowering of groundwater levels and/or degraded water quality occurring after February 1, 2020 are eligible for mitigation, pending the evaluation of the impacts. It is not accurate that the well has to be drilled after February 1, 2020 to be eligible for mitigation, but impacts must occur after that date.
			The same holds true for the US Navy. They used to pump wells that were fairly evenly spaced along highway 178, but more recently have been using one well that is located in	Comment noted.

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			Section 17. Investigate what that has done to surrounding domestic well owners, who were using wells in the area before the Navy drilled theirs.	
			The Shallow Well Mitigation Plan as it currently stands is a hollow plan. The words written are true to the situation that has and is being experienced by shallow well owners throughout the valley. Then comes the timeline requirement of 2/1/2020. This is a clear message to those well owners that, in fact, the IWVGA will do nothing to alleviate their well problems.	See Section 5.3.4.1. Existing shallow wells that experience impacts related to chronic lowering of groundwater levels and/or degraded water quality occurring after February 1, 2020 are eligible for mitigation, pending the evaluation of the impacts. It is not accurate that the well has to be drilled after February 1, 2020 to be eligible for mitigation, but impacts must occur after that date.
			5.3.4 Dust Mitigation This is listed as Project 5 However, it goes with land fallowing, and should be so noted both here and in the fallowing land portion of the document. Many people still live in this Valley who remember the travesty that occurred when the County of Kern allowed the Arciero Farms to cease operation (because of the over pumping of economical water) and simply walk away. To the east of the farms lies a small community, Cantil, that was literally buried under blowing sand. The problem, though reduced by the recent installation of solar fields, still exists. The County road department must scrape the paved road that passes through the area after every major wind storm so that traveling vehicles do not get stuck in the sand.	Comment addressed in Section 5.3.5. The Dust mitigation plan is linked to the Fallowing Program of Management Action No. 1.
			Fallowing farm land, especially in the Northwest part of the valley will severely negatively impact the mission of the Navy. Therefore, it needs to be stated in this GSP that land will not be fallowed without a comprehensive dust mitigation plan in place for that parcel of land.	Comment addressed in Section 5.3.5.
			The GSP needs careful examination of different methods that have been used for dust control. Note; that long ago the UP railroad used snow fencing to try to control blowing sand in the area of the Eastern Mojave called the Devil's Playground. Even many years ago one could only see small sections of this fencing because the sand had completely covered it.	Comment noted.
			5.1.1 Pumping Optimization Project. Again, this project would be one that would be executed by the IWVWD. The cost and efforts to do this would be borne by them. This fact needs to be noted up front. One possibility that is not mentioned is for the Inyokern CSD to join the IWVWD for this project.	The project is an GSP project to mitigate Basin undesirable results. At this time, the financial and legal roles of each IWV entity in the GSP projects and management actions cannot yet be defined.
			5.3.4.13 Regulatory Process Page 48 If this is to be a Water District project why would the IWVGA do a CEQA on it? The IWVWD would have to do a CEQA on their project.	Comment noted.
			5.3.4.14 Public Notice First line, states Shallow Well Mitigation Plan. Shouldn't it say Pumping Optimization Plan?	Comment addressed in previous GSP draft.
			5.4.1 Brackish Groundwater Project. Verbiage in this section needs to note that this project will still be pumping groundwater from our Basin. It should also note that this project will be pumping water at a much higher cost because of the methods for pumping that are being proposed. It should also note that there are several negative effects to the area surrounding the pumping project that can occur if this project is implemented These negative facts need to be included with the description of this project. This project is proposed for the farthest northwest part of the IWV.	Comment noted.
			Comments on Section 6 This section has the wrong title page.	Comment addressed in previous GSP draft.
			Is a more detailed Implementation Plan going to be written? If so, then this needs to be stated in this section of the GSP. It needs to include some details as to timelines and schedules, the order and priority of	Comment noted.

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			projects and how they will be accomplished. One of the first projects is the allocation and augmentation plan. This needs to be detailed to assist those who will be affected by it.	
			Page 3 Third bullet point Incorrect English: "adaptively management the program"	Comment addressed in previous GSP draft.
			Pages 3-4. The bullet points do not fit well with the last paragraph on page 3. It would be appropriate to list the proposed projects in order of their priority. It would be clear if the projects were related to one another. For instance, if land is fallowed then a dust mitigation plan must be activated immediately.. The two projects are closely related to one another. It also states that:"…the initial priority is demand reduction…" But page 4 has a bullet entitled Pumping Optimization Projects. One is contrary to the other..	Comment noted.
			The projects/plans need to state their associated costs and timing and value. For a given project what is the cost per acre foot of water saved. In this regard it needs to be noted that some of the projects are under the purview of different agencies and that these agencies will bear all or some of the costs for the project. An example of this is water reuse. The city of Ridgecrest has been collecting tax dollars for years for the wastewater facility upgrade. They will (and should) bear the cost of this project. When listing it here in Section 6 the cost per acre foot needs to be added. The same hold true for the Well Optimization Plan. This is for the IWVWD.	Comment noted.
			The projects that will be implemented by the GA Board need to be listed with a cost to benefit received comparison. This should be a part of Table 6.1.	Comment noted.
			They also need to be listed in the order of priority. Which project will save the most water. This exercise should exclude Imported Water with an explanation of its great importance and the complication and cost involved. It is a separate issue and the cost for this water must be borne by every pumper in the valley from the Federal government down to the local level.	The GSP is designed to mitigate all undesirable results in the Basin. All proposed projects and management actions are intended to be implemented.
			In the costs section there is no separation of costs and payments for work already accomplished. What did the Prop 1 grant funding cover? How much money has been spent annually on Administrative Costs? How much money annually has the City, the IWVWD, the three counties contributed? How much has been spent by the agencies involved on legal costs? What are the estimated legal costs yet to be spent-especially in the light of the very strong probability of litigation? It would seem that these potential costs should be added to the GSP.	Comment noted.
			While a timeline is given for implementation of some of the projects a closer examination of the timeline in relation to GSP approval by the state needs to be given. What projects can be legally and realistically be undertaken in the interim months while awaiting GSP approval?	Comment noted.
#13	Thomas S. Bunn, II, (Searles Valley Minerals)	01/08/2020	**1. Searles's pre-Navy water rights for industrial use should be respected.** The Plan recognizes that extraction allocations under Water Code section 10726.4(a)(2) should be consistent with federal and state water rights. That section provides, "A limitation on extractions by a groundwater sustainability agency shall not be construed to be a final determination of rights to extract groundwater from the basin or any portion of the basin." The Plan claims that its Annual Pumping Allocations do not determine water rights because they do not prohibit the pumping of groundwater, but the imposition of a significant Augmentation Fee for pumping over the Allocation has the effect of significantly burdening the exercise of water rights. Therefore, the Allocations should be consistent with water rights.	Comment related to legal positions and not specifically relevant to the GSP.

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			Searles has provided evidence of its pre-Navy appropriations, and will do so again in connection with the Plan's implementation process. An appropriation that pre-dates the reservation of land for the Navy base has priority over the Federal Reserved Right. (See *Cappaert v. United States* (1976) 426 U.S. 128, 138.) The Plan seems to say that because of sovereign immunity, this priority should be reversed: "The IWVGA does not have legal authority to restrict, assess, or regulate production for NAWS China Lake; therefore, NAWS China Lake groundwater production is considered of highest beneficial use." (page 5-10) But this does not follow. Sovereign immunity is a matter of enforcement and does not affect the IWVGA's obligation to respect priorities established by federal law. Therefore, Searles should receive an Allocation in the full amount of its pre-Navy appropriation.	Comment related to legal positions and not specifically relevant to the GSP.
			2. Searles Domestic Water Company's municipal use priority is separate from Searles's pre-Navy water rights. The list of groundwater pumpers for domestic use on page 5-10 should include Searles Domestic Water Company, which supplies water for municipal and domestic use in the Searles Valley. The priority for this use does not depend on whether Searles Valley Minerals has a pre-Navy water right for its industrial use. Therefore, Searles Domestic Water Company should receive an allocation equal to its use during the Base Period, in addition to the allocation for Searles's pre-Navy water right.	Comment related to legal positions and not specifically relevant to the GSP.
			3. The Water District should not receive any preference based on serving water to the Navy workforce. On page 5-10, the Plan quotes the Navy's response that "[s]ince the Navy mission at China Lake requires its workforce, the full Navy water requirements are the combination of the on-Station requirements and those of the Navy workforce and their dependents off-Station." Searles is pleased that the Plan does not claim that the Federal Reserved Right extends to production by third parties to serve Navy personnel off-Station, which Searles believes is not supported by any legal authority.	Comment related to legal positions and not specifically relevant to the GSP.
			4. The IWVGA does not have authority to impose an Augmentation Fee. The statutes referred to in section 5.2.1.8, Legal Authority, do not authorize the imposition of an Augmentation Fee. Specifically, Water Code section 10725.4 authorizes *investigations* to propose and update fees, and not the fees themselves. Nothing in SGMA authorizes discriminatory fees to enforce an allocation plan.	Comment related to legal positions and not specifically relevant to the GSP.
			5. The Plan does not provide sufficient justification for the limited amount in the Transient Pool nor for its non-transferability. The Plan states that the purpose of the Transient Pool is to "facilitate coordinated production reductions and to allow groundwater users to plan and coordinate their individual groundwater pumping termination." (page 5-6) But the Plan provides no explanation why the Transient Pool is limited to 51,000 acre-feet, in view of the large amount of groundwater in storage and the economic dislocations that the Allocation will cause. The Plan also does not explain why the Transient Pool water is not transferable. Making the water transferable would allow parties wishing to exit the Basin to be partially compensated for their investment at a negotiated price, while providing other parties with water to support their operations until imported water is available.	Comment related to legal positions and not specifically relevant to the GSP.

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			6. The anticipated timing of the approval and implementation of the allocation ordinance is inconsistent with Section 10728.6 of the Water Code and the California Environmental Quality Act ("CEQA") requirements. The Plan states that the Annual Pumping Allocation Plan, Transient Pool and Fallowing Program *may* be subject to environmental review. This statement is misleading as it offers the possibility that such implementation would be exempt from those environmental requirements. Section 10728.6 of the Water Code expressly states that the exemption from the requirements of Division 13 (commencing with Section 21000) of the Public Resources Code applicable to the preparation and adoption of a groundwater sustainability plan (GSP) does not apply to "a project that would implement actions taken pursuant to a plan." Further, an activity qualifies as a "project" subject to CEQA if that activity is undertaken, funded, or approved by a public agency and may cause either a direct, or reasonably foreseeable indirect, physical change in the environment. (Pub. Resources Code, § 21065; *Union of Medical Marijuana Patients, Inc. v. City of San Diego* (2019) 7 Cal.5th 1171.) It is difficult to imagine how the implementation of this management action would not cause a "direct, or reasonably foreseeable indirect, physical change" in the basin. Therefore, Sections 5.2.1.5 and 5.2.1.7 of the Plan must be amended to reflect an affirmative commitment by IWVGA to conduct an environmental review prior to the adoption of an allocation ordinance and an accordingly more realistic implementation timeline.	Comment related to legal positions and not specifically relevant to the GSP.
			7. This Management Action No.1 is based on incomplete and inaccurate data and thus its implementation must be deferred until the monitoring network is better developed. The Plan states in Section 5.2.1.7 that Management Action No.1 would be presented to IWVGA Board for consideration and approval at its June 2020 meeting. This not only is contrary to CEQA requirements, but also ignores the numerous acknowledgements throughout the Plan of serious data gaps which put into question the accuracy of the basin's sustainable yield, water budget, sustainability goal and threshold estimates upon which IWVGA relies in implementing this Management Action No. 1 and the other management actions and projects. The Plan expressly states in several sections that data tracking is fairly recent (mostly since SGMA came into effect; e.g., page ES-15) and that many of the "historical" data points are based on a single measurement recorded at the time of well installation (e.g., see page ES-16.) It is advisable that management actions, including without limitation Management Action No. 1, be deferred until such time as better monitoring data is in put place but no earlier than the first Plan update is due to DWR, i.e., at least until 2025.	Comment noted.
#14	Scott S. Slater Amy M. Steinfeld (Mojave Pistachios)	01/08/2020	**Failure of The IWVGA to Provide Meaningful Opportunities for Diverse Stakeholder Engagement Violates Mojave's Right to Procedural Due Process and Fails to Satisfy the Requirements of SGMA.**	Comment related to legal positions and not specifically relevant to the GSP.
			Plan Management Action No. 1 Should be Reformulated to Ensure Substantive Due Process, Consistency with Common Law Water Rights Principles, and Provide an Adequate Basis for the IWVGA's Determinations.	Comment related to legal positions and not specifically relevant to the GSP.
			A. IWVGA's Actions Violate Mojave's Right to Substantive and Due Process.	Comment related to legal positions and not specifically relevant to the GSP.
			B. The Plan is Vague and Should be More Explicit as to Which Users will be Granted an Allocation.	Comment noted.
			C. As Presently Formulated, the Allocation System is Contrary to SGMA's Mandates Because it Requires Water Rights Determinations by the IWVGA, Prioritizing Some Uses Above Others Based Upon Considerations Inconsistent with Common Law.	Comment related to legal positions and not specifically relevant to the GSP.

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			D. Management Action No. 1 is Flawed because it Requires Groundwater Users Excluded from the Annual Pumping Allocation Plan to Unlawfully Subsidize Users Awarded an Allocation.	Comment related to legal positions and not specifically relevant to the GSP.
			E. The Plan Fails to Provide a Reasoned Basis for the Rejection of Proportional Allocations Based Upon the Cumulative Requirements of all Beneficial Uses in Combination with Reasonable Measures Narrowly Tailored to Avoid Undesirable Results During the Planning Horizon.	Comment related to legal positions and not specifically relevant to the GSP.
			F. The Plan Should More Clearly Explain and Justify Treatment of NAWS China Lake.	Comment noted.
			G. The Plan “Takes” the Water Rights of Overlying Landowners, Including Mojave’s.	Comment related to legal positions and not specifically relevant to the GSP.
			H. The Fallowing Program Contemplated by the Plan is Inadequate to Compensate Agricultural Water Users for their Investments.	Comment noted.
			I. The Plan Should Include Additional Detail on the Transient Pool Allocation and Provide a Justification for why Shares of the Transient Pool are Non-transferrable.	Comment noted.
			J. The Plan Must be Updated to Reflect that Management Action No. 1 is Subject to the California Environmental Quality Act (CEQA)	Comment addressed in Section 5.2.1.5.
			The Best Available Scientific Information Demonstrates that the Plan Dramatically Underestimates the Amount of Water in Storage and Recharge Estimates and Consequently Fails to Recognize the Opportunity for Continued Beneficial Use of Groundwater Over the 20 Year Planning Horizon and Beyond.	The best available information was used at the time the analyses for the GSP were conducted.
			A. The Plan Underestimates the Amount of Water in Storage.	The best available information was used at the time the analyses for the GSP were conducted.
			B. Recharge.	The best available information was used at the time the analyses for the GSP were conducted.
			Likewise, the Analysis of Undesirable Results must be based on the Best Available Science and Information.	The best available information was used at the time the analyses for the GSP were conducted.
#15	Derek R. Hoffman (Meadowbrook Dairy)	01/08/20	The GSP development approach has apparently focused on ways to eliminate private groundwater producers from the Basin, rather than evaluating and considering appropriate sustainable management criteria and identifying appropriate projects and management actions to avoid specific undesirable results and to achieve specific interim milestones, measure objectives and a well-defined sustainability goal. By failing to meet SGMA’s mandates, a GSP based upon the Model Scenario 6 described in the GSP risks placing the Basin on a path to State Water Board intervention.	The GSP does not propose elimination of any particular pumper group. See Section 5.2.1. All groundwater pumpers continue to possess the right to produce groundwater. The GSP assumes that costs associated with the Augmentation Fee will result in voluntary pumping reductions, including reductions by agricultural pumpers.
			Meadowbrook submitted several prior comment letters identifying technical and policy issues regarding the draft sustainability goal language, the sustainable management criteria, and Model Scenario 6.2. Those letters are attached as Exhibits 30, 31, 32.	Comment noted.
			As detailed in prior Meadowbrook’s prior comment letters, the development process and substance of the sustainable management criteria are fundamentally flawed. The sustainable management criteria were not substantively discussed or vetted publicly by the TAC, PAC or the Board. Instead, the proposed minimum thresholds, interim milestones, and measurable objectives for many of the sustainability indicators generally reflect plotted points on a Model Scenario 6.2 model run that: (1) is based	Portions of the comment are related to producers and process and are not specifically relevant to the GSP. The best available information was used at the time analyses for the GSP were conducted.

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			upon numerous modeling assumptions that have never been released to the public despite many PAC-, TAC- and public member requests for that information; (2) includes predetermined, hard-wired, vague and objectionable projects and management actions that have not been publicly discussed or approved by the Groundwater Authority and are based upon unsubstantiated legal theories; (3) is not based upon best available information and science; and (4) does not address whether or how a set of defined projects and management actions will result in avoiding specifically defined undesirable results.	
			The development of sustainable management criteria for the GSP requires significantly greater transparency, detail and data. The GSP's heavy reliance on Model Scenario 6.2 outputs and assumptions in selecting sustainable management criteria is neither appropriate nor consistent with the statutory and regulatory requirements cited above.	Comment noted.
			As indicated in this and prior letters, Meadowbrook objects to a GSP based principally upon Model Scenario 6.2, which proposes adversely affects and potentially eliminates Meadowbrook's water rights.	No groundwater pumpers, including agricultural pumpers, will be prohibited from pumping groundwater as a result of the allocations. Pumping above a pumper's allocation of the safe yield or the transit pool will be subject to an augmentation fee.
			Sections 1.2. and 4.2 Sustainability Goal The development of the GSP sustainability goal is inconsistent with the applicable statutory, regulatory and best management practices provisions.	Comment noted.
			The sustainability goal was determined by the IWVGA staff without any meaningful, public vetting of the sustainable management criteria for each of the sustainability indicators.	Comment related to process and not specifically relevant to the GSP. The sustainability goal draft text was specifically given to PAC and TAC members at the October 2019 PAC/TAC meetings for their comment and input.
			The sustainability goal incorrectly conflates an estimated natural long-term average recharge with sustainable yield. This fails to consider and evaluate the statutory and regulatory principle of defining and identifying undesirable results.	Comment noted.
			The sustainability goal fails to indicate how it considers the interests of all beneficial uses and users of groundwater, specifically including holders of overlying groundwater rights including agricultural users, including farmers, ranchers and dairy professionals.	Comment noted. Beneficial uses and users are recognized as part of the community.
			Section 4.2.3. Sustainability Measures The purpose of this section is not clear, since neither SGMA nor the GSP Regulations refer to sustainability measures. SGMA and the GSP Regulations require the IWVGA to establish sustainable management criteria, including undesirable results, establish minimum thresholds and measurable objectives for each applicable sustainability indicator. This section is duplicative and nearly identical to Section 4.2.4.	Comment Noted. GSP Emergency Regulations § 354.24 require a "discussion of the measures that will be implemented to ensure that the basin will be operated within its yield, and an explanation of how the sustainability goal is likely to be achieved…" These requirements are addressed in Section 4.2.3 and 4.2.4 of the GSP.
			Section 4.3. Undesirable Results The process by which the GSP developed and identified undesirable results for the applicable sustainability indictors fails to comply with the GSP Regulations and BMPs.	Undesirable results are defined in SGMA Section 10721 (x) as effects caused by groundwater conditions caused significant and unreasonable: • Chronic lowering of groundwater levels • Reduction of groundwater storage • Seawater intrusion • Degraded water quality • Land subsidence • Depletions of interconnected surface water The undesirable results defined in the GSP are consistent with the SGMA definition.

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			The GSP does not adequately describe the processes and criteria relied upon to define undesirable results applicable to the Basin, or the basis for determining the point at which undesirable results are both significant and unreasonable. Rather, this section makes broad, vague statements including: "The reduction of groundwater in storage is directly related to the chronic lowering of groundwater levels." "Hydrographs of wells taken throughout the IWV demonstrate significant and unreasonable prolonged drawdown causing undesirable results (see Appendix 3-D and Section 3.4.2)." "As discussed in Section 3.4.4.1, TDS samples indicate concentrations have increased over time in areas where high rates of pumping have occurred and indicative of groundwater water quality degradation undesirable results." "As discussed in Section 3.4.5, land subsidence has historically caused undesirable results to facilities at NAWS China Lake, particularly the SNORT alignment."	Comment noted.
			The GSP identifies "undesirable results" based upon modeling scenario assumptions and outputs, and not upon reliable, best available science and information. This section states: "The numerical model was also used to simulate future conditions if the GSP proposed projects and management actions described in Section 5 are implemented to use as a tool for establishing sustainable management criteria (Scenario 6.2)."	The best available information was used at the time analyses for the GSP were conducted.
			Section 4.3.1. Reduction of Groundwater in Storage Undesirable Results The GSP does not adequately describe the processes and criteria relied upon to define undesirable results for loss of groundwater in storage. Rather, this section makes the broad, vague statements: "The current and prolonged state of overdraft in the IWVGB, due to unsustainable groundwater production, is causing and has caused significant and unreasonable reduction of groundwater in storage." "Modeling results simulating baseline conditions (no action) indicate a drastic reduction of groundwater in storage will continue in the future. (See Appendix 3-H.)."	Comment noted.
			These assumptions fail to establish or support an amount at which a loss of groundwater in storage is both significant and unreasonable. Likewise, these assumptions fail to establish or support whether and why a loss of no more than 215,000 acre-feet of groundwater in storage would avoid undesirable results.	Comment noted.
			Despite the GSP's express emphasis on loss of storage a primary concern, the GSP acknowledges that the amount of total and usable basin storage remains a significant data gap.	See Section 3.3.4.4.
			The GSP fails to state the 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 a specific, quantified loss of groundwater storage as an undesirable result.	See Section 4.3.1.2 and 5.2.1.2.
			Rather, this section: vaguely refers to a need for "preservation of groundwater in storage [as] a high priority for the IWVGA"; declares that "By preserving the groundwater in storage, the IWVGA can help achieve the sustainability goal by protecting the future of the community, preserving quality of life for the residents of the Basin and sustaining the mission at NAWS China Lake;" cites liberally to a Navy letter that identified "groundwater resources" as the "number one encroachment concern" to the Navy without independent analysis or evaluation of the content, assumptions and information upon which that letter is based; and fails to evaluate or address impacts on agricultural, industrial and other beneficial users of groundwater.	Comment noted.

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			The GSP fails to establish with adequate evidence how undesirable results or minimum thresholds for groundwater elevations may serve as a proxy for establishing undesirable results or minimum thresholds for loss of groundwater in storage as required by GSP Regulation § 354.28(d). Rather, this section broadly and vaguely asserts that: "In areas in the IWV where the groundwater levels have been steadily declining, the water levels have dropped enough to impact shallow wells, requiring wells to be deepened, re-drilled, or abandoned as a water source"; cites its own shallow well impact analysis, which is replete with recognized data gaps and uncertainty; and vaguely asserts that "the number of shallow wells impacted due to the chronic lowering of groundwater levels, which is related to the significant and unreasonable reduction of groundwater in storage (Appendix 3-E)."	Comment noted.
			This section broadly asserts that "the number of wells estimated to be impacted is the criterion to define significant and unreasonable reduction of groundwater in storage." It then, again, compares the "baseline" model results against the Model Scenario 6.2. results, and declares, without explanation that: "number of shallow wells that would be impacted if the proposed projects and management actions are implemented is estimated to be 22, which is a feasible number of wells that can be mitigated."	Comment noted.
			This section vaguely states that "The amount of groundwater estimated to be removed from storage with the proposed projects and management actions is the maximum amount of useable groundwater reserves than can be extracted to prevent undesirable results while still providing a margin of safety for future use, uncertainties, and potential changes to the NAWS China Lake mission". It fails to quantify the undesirable results; define or justify the "margin of safety"; define "future use"; define the "potential changes to the NAWS China lake mission" or identify the information and assumptions on which those "potential changes" are based.	Comment noted.
			This section fails to address the impacts on agricultural users arising from the implementation of the proposed projects and management actions.	Comment noted.
			The GSP ignores current information and data which indicates much more groundwater in storage than the assumptions made in the GSP.	The best available information was used at the time analyses for the GSP were conducted.
			The GSP and Model Scenario 6.2 do not include other potentially significant projects and storage supplies, such as potential storage and use of groundwater in the El Paso area. Rather, this section dismisses, without analysis of sustainable management criteria, the prospect of utilizing El Paso area supplies.	See Table 3-3.
			Section 4.3.2. Chronic Lowering of Groundwater Levels The GSP relies heavily on its shallow well impact analysis, which is replete with recognized data gaps and uncertainty. A primary flaw with that analysis is its failure to define when and where the effects of the groundwater conditions cause undesirable results for each applicable sustainability indicator including lowering groundwater levels. That analysis provides inadequate indication of when, where, how or why the estimated number of shallow wells were or will be "impacted". This is a critical flaw in the GSP, particularly where the GSP simultaneously seeks to eradicate the entire agricultural community through Management Action No. 1.	See Appendix 3-E.
			The GSP fails to evaluate the severe recent drought conditions in establishing the undesirable results for groundwater levels.	Comment noted.

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			In describing undesirable results for chronic lowering of groundwater levels and other sustainability indicators, the GSP fails to specifically identify and quantify pre-2015 undesirable results for each sustainability indictor, and whether the GSP seeks to address pre-2015 undesirable results.	Comment noted.
			Section 4.3.3. Degraded Water Quality Undesirable Results This section fails to explain why the GSP considers the contaminated, "de-designated" groundwater area below NAWS China Lake to be a "pre- SGMA undesirable result" or why it "will not be addressed by projects and management actions and will not have sustainable management criteria established for it."	Comment noted.
			As noted by Meadowbrook's TAC representative and other TAC members, the "de-designated" area comprises potentially hundreds of thousands of acre feet or more of groundwater that could be available for some beneficial use, such as military industrial uses. GSP Figure 4-1 depicts the extensive de-designated area.	Comment noted.
			The GSP is inconsistent with SGMA, the GSP Regulations and DWR Best Management Practices in that it simultaneously: ignores the de-designated area below NAWS China Lake, suggests that the Navy has a federal reserved water right that swallows the entire Basin and extends to non-federal entities, and forces potentially all agricultural groundwater users into a temporary pool despite major data gaps on total storage and impacts on shallow wells and without properly establishing sustainable management criteria.	Comment noted.
			This section fails to address recent United States Department of Defense reports indicating known PFOS/PFOA contamination at NAWS China Lake, including a DoD report indicating that 7 of 11 NAWS China Lake wells tested above EPA limits by orders of magnitude at 8M parts per trillion, representing one of the highest known contaminated DOD sites in the world. Exhibit 33.	Comment noted.
			This section fails to explain the criteria used to define when and where the effects of the groundwater conditions cause undesirable results for this sustainability indicator. Rather, it merely states that "Degradation of groundwater quality is considered significant and unreasonable if the quality is degraded such that it is unsuitable for the current beneficial uses in the IWVGB." This section also fails to identify or adequately analyze the referenced "current beneficial uses in the IWVGB" and at what point a water quality condition becomes "unsuitable" for a particular beneficial use. Certain beneficial uses of groundwater can, for example, sustain higher thresholds of TDS than other beneficial uses.	Comment noted.
			Section 4.3.4. Land Subsidence Undesirable Results The GSP analysis regarding land subsidence focuses almost exclusively on Navy property interests, but fails to consider in corresponding detail potential land subsidence issues occurring throughout the Basin.	See Appendix 3-G.
			The GSP analysis regarding land subsidence is inadequate due to its over- reliance on Model Scenario 6.2 and the current "baseline model" run scenario. See comments below regarding model scenario flaws.	Comment noted.
			Section 4.3.5. Depletions of Interconnected Surface Water Undesirable Results The GSP recognizes that interconnected surface water may be critical to support groundwater dependent ecosystems, and that surface flows exist that may support the groundwater system. The GSP then inexplicably indicates, however, that it proposes "no	Comment noted.

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			additional sustainable management criteria" due to "limited data on the relationship of interconnected surface water (springs) to GDEs and GDE's (sp) direct use of groundwater."	
			The lack of reliable data and analysis for interconnected surface water represents a critical GSP data gap.	See Sections 3.7.7 and 3.6.1.4.
			Section 4.4. Minimum Thresholds The GSP's failure to comply with these statutory, regulatory and best management practices requirements is especially stark. In most instances, the GSP merely assigned minimum thresholds based upon Model Scenario 6.2 assumptions and outputs projected by the implementation of pre-determined projects and management actions.	Comment noted.
			The GSP indicates that impacts to groundwater pumpers, land uses, and other interests within the IWVGB were considered when developing minimum thresholds, but fails to explain how those interests were considered, particularly agricultural users like Meadowbrook.	Comment noted.
			The GSP fails to consider and evaluate multiple potential minimum thresholds at specific representative monitoring sites and how different minimum thresholds would impact beneficial uses and users of water.	Comment noted.
			The GSP fails to consider and evaluate data provided by Meadowbrook and also GSP referenced data indicating stabilizing trends in groundwater levels and water quality conditions in the shallow aquifer from which Meadowbrook produces groundwater.	Comment noted.
			The GSP fails to consider that certain projects and management actions may not be necessary to avoid specific, appropriate, quantified minimum thresholds in the northwest area if groundwater production levels continue at current levels or are reduced through conservation efforts. Instead, the GSP projects a "doomsday" "baseline" scenario, compares that scenario to pre-determined Model Scenario 6.2 assumptions, and then selects minimum thresholds at levels predicated upon those modeling scenarios.	Comment noted.
			Section 4.4.1 Reduction of Groundwater in Storage Minimum Threshold The GSP indicates that avoiding loss of storage is a primary concern, but simultaneously lacks critical data and information regarding total and effective Basin storage.	See Section 3.3.4.4.
			The GSP simultaneously, and inappropriately, seeks to force agricultural users into a temporary pool allowing them to collectively use no more than 51,000 acre feet of "storage". The GSP fails to explain the basis for the 51,000 acre-foot figure. Rather, that figure appears to derive from pre-determined Modeling Scenario 6.2 assumptions developed by IWVGA staff and Navy representatives.	Comment noted.
			The GSP fails to explain why, specifically, the "simulated value of the total loss in storage at year 2070 after the projects and management actions are implemented (Scenario 6.2) plus an additional 10 percent buffer" comprises an appropriate minimum threshold.	Comment noted.
			Instead, the GSP must analyze based upon best available science and information, including filling critical data gaps, the questions posed by DWR in its BMP SMC for establishing a minimum threshold for loss of groundwater in storage.	The best available information was used at the time the analyses for the GSP were conducted.
			The GSP fails to establish, based upon best available science and information, the historical trends, water year types and projected water use in the Basin according to water budgets established in accordance with the GSP Regulations (see comments below regarding water budget issues).	Comment noted.

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			The GSP fails to establish, based upon best available science and information, what groundwater reserves are needed to withstand future droughts.	The best available information was used at the time the analyses for the GSP were conducted.
			The GSP fails to establish, based upon best available science and information, where, when and for what reasons wells have gone dry.	The best available information was used at the time the analyses for the GSP were conducted.
			The GSP fails to establish, based upon best available science and information, what the effective storage is for the Basin	The best available information was used at the time the analyses for the GSP were conducted.
			The GSP fails to establish, based upon best available science and information the average, minimum, and maximum depth of municipal, agricultural, and domestic wells.	Comment noted.
			The GSP fails to establish, based upon best available science and information, what potential impacts on pumping costs might be, and whether mitigating such costs would be more technically, economically and practically feasible than the full combination of the aggressive proposed projects and management actions.	Comment noted.
			The GSP fails to consider or establish appropriate management areas to evaluate potential alternative sustainable management criteria to manage loss of groundwater in storage.	Comment noted.
			Section 4.4.2 Chronic Lowering of Groundwater Levels Minimum Threshold The GSP fails to satisfy SGMA, the GSP Regulations and DWR Best Management Practices in establishing minimum thresholds for chronic lowering of groundwater levels.	Comment noted.
			The GSP data demonstrates that at the referenced USBR-6 monitoring site near Meadowbrook, groundwater levels are already achieving the measurable objective set for that monitoring site and have been since approximately 2011, prior to imposing any of the proposed projects and management actions. See GSP Figure 4-5e. In fact, all three interim milestones for USBR-6 are far above the measurable objective. This represents one of the most critical GSP flaws. The GSP fails to explain or justify, based on best available science and information, why Meadowbrook should be required to ultimately cease pumping the native groundwater supply (or pay for imported water) when the GSP monitoring site nearest Meadowbrook indicates that groundwater levels are already achieving the measurable objective. Exhibit 40.	Comment noted.
			The GSP fails to explain or support with data, how maintaining current production levels near Meadowbrook will cause undesirable results. By definition, an undesirable result does not exist at a particular monitoring site where the sustainability indicator is operating at the measurable objective.	Comment noted.
			The GSP fails to explain how the minimum threshold for USBR-6 was established. This section states generally that minimum thresholds were set at the lower of "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 5 feet below recent minimum historical value."	Comment noted.
			GSP Figure 4-5e and this section suggest that that the minimum threshold for USBR-6 was established at five feet below a "recent minimum historical value." Figure 4-5e depicts a minimum threshold at 2,166 ft msl. The GSP fails to explain or justify with technical support how groundwater levels at five feet below "recent minimal historical values" at USBR-6 causes undesirable results to nearby shallow wells, which the GSP states is the primary basis for the sustainability criteria for chronic lowering of groundwater levels.	Comment noted.
			The GSP states that "the results of the shallow well impact analysis (see Appendix 3-E) is the criteria to define significant and unreasonable chronic lowering of groundwater levels." As discussed in this letter, that analysis is replete with critical data gaps and	The best available information was used at the time the analyses for the GSP were conducted.

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			questionable assumptions, and fails to demonstrate when and where those impacts have or are expected to occur.	
			The GSP must analyze based upon best available science and information, including filling critical data gaps, the questions posed by DWRs BMP SMC for establishing a minimum threshold for chronic lowering of groundwater levels.	The best available information was used at the time the analyses for the GSP were conducted.
			The GSP fails to establish, based upon best available science and information for each monitoring site, the average, minimum, and maximum depths of municipal, agricultural, and domestic wells.	Comment noted.
			The GSP fails to establish, based upon best available science and information for each monitoring site, the screen intervals of those nearby wells.	Comment noted.
			The GSP fails to establish, based upon best available science and information for each monitoring site, the average, minimum, and maximum depth of municipal, agricultural, and domestic wells.	Comment noted.
			The GSP fails to establish, based upon best available science and information, for each monitoring site, what potential impacts on pumping costs might be, and whether mitigating such costs would be more technically, economically and practically feasible than the full combination of the aggressive proposed projects and management actions.	Comment noted.
			The GSP fails to establish, based upon best available science and information for each monitoring site, the potential impacts of changing groundwater levels on groundwater dependent ecosystems.	Comment noted.
			The GSP fails to establish, based upon best available science and information for each monitoring site, which principal aquifer, or aquifers, the representative monitoring site evaluating.	Comment noted.
			Section 4.4.3 Degraded Water Quality Minimum Threshold As with other minimum thresholds, the GSP fails to satisfy SGMA, the GSP Regulations and DWR Best Management Practices in establishing minimum thresholds for degraded water quality.	Comment noted.
			The GSP fails to establish minimum thresholds at each monitoring site based upon best available science and information. In fact, for USBR-6 near Meadowbrook, GSP Table 4-5 indicates that no sustainable management criteria have been determined at all. For USBR-6, Table 4-5 indicates "ND" for a minimum threshold, interim milestone and measurable objective. ND means "not determined at this time. As baseline TDS sampling data is gathered, these criteria will be established." Exhibit 41.	The best available information was used at the time the analyses for the GSP were conducted.
			The GSP recognizes a critical lack of TDS data in the northwest area and other areas of the Basin. It recognizes in this section in fact that "there are areas where there is not enough reliable data to establish Minimum Thresholds at this time until baseline TDS conditions are established."	The best available information was used at the time the analyses for the GSP were conducted.
			The lack of any GSP sustainable management criteria for degraded water quality at the USBR-6 monitoring site is a significant data gap that clearly demonstrates a failure to justify the aggressive projects and management actions that would render nearby agricultural users like Meadowbrook to a temporary pool.	No groundwater pumpers, including agricultural pumpers, will be prohibited from pumping groundwater as a result of the allocations. Pumping above a pumper's allocation of the safe yield or the transit pool will be subject to an augmentation fee.
			Section 4.4.4 Land Subsidence Minimum Threshold See comments above regarding land subsidence undesirable results.	Comment noted.
			Section 4.5 Measurable Objectives and Interim Milestones	Comment noted.

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			As with other sustainability indicators, the GSP fails to satisfy SGMA, the GSP Regulations and DWR Best Management Practices in measurable objectives and interim milestones.	
			The primary flaw with the GSP's proposed measurable objectives and interim milestones is that they are based upon assumptions and outputs from Model Scenario 6.2. and are not based upon best available science and information.	The best available information was used at the time the analyses for the GSP were conducted.
			The measureable objectives and interim milestones are based upon the projects and management actions, whereas SGMA requires a GSA to consider projects and management actions to meet the measurable objectives, with specific descriptions of how those projects and management actions will achieve their desired goals.	Comment noted.
			The GSP fails to explain or justify in many instances whether, and if so why, it seeks to impose measurable objectives designed to address pre-SGMA conditions. Rather, the GSP appears selectively designate and then ignore certain pre-SGMA conditions (e.g. the de-designated area) while aggressively addressing other pre-SGMA conditions (e.g. loss of groundwater in storage).	Comment noted.
			The GSP also fails to explain or justify why, in some areas, the GSP apparently seeks to far exceed the stated measurable objectives. One example is groundwater levels, where Figures 4-5a through 4-5j indicate groundwater levels at nearly every monitoring site achieving levels over the planning and implementation horizon at approximately double the difference between the minimum threshold and the measurable objective. This unexplained objective indicates that the projects and management actions may be unnecessarily aggressive and fail to consider their punitive impacts on beneficial uses and users of groundwater.	Comment noted.
			Section 2.2.4. Water Supply Source This section states that "The Navy produces and distributes groundwater for the on-station water uses at the NAWS China Lake. However, the majority of Navy- affiliated staff reside off-station, and the water supply needs of the off-station Navy- affiliated staff and their dependents are supplied by either the Water District, Inyokern CSD, or by privately-owned domestic wells." The GSP fails to explain or justify how this information is relevant to the Projects and Management Actions. Instead, this appears to reflect IWVGA staff intentions to pursue the unsubstantiated "extended federal reserved water right" theory asserted by IWVGA representatives. Exhibits 34, 42, 43.	Comment noted.
			This section indicates that Figure 2-5 indicates an estimated 932 groundwater production wells within the Basin. This section fails to identify the source of information for Figure 2-5 or address how the GSP incorporates data for "the NAWS China Lake's groundwater production wells for on-station water uses [which] are not shown on Figure 2-5."	Comment noted.
			The GSP fails to explain how it distinguishes "Large Agriculture" from "Small Agriculture" in Table 2-5, which identifies 18 wells for "Large Agriculture" and 20 wells for "Small Agriculture".	Comment noted.
			The GSP fails to explain whether any Navy wells are accounted for in Table 2-5, and if so, under what beneficial use category(ies).	Comment noted.
			This section asserts that approximately 832 of the 932 groundwater production wells are "domestic/private wells in the IWVGB produced approximately 800 acre-feet (AF) in 2015, or approximately 3% of total groundwater production in 2015." It then describes a process by which the IWVGA has only recently begun requiring registration of those wells in order	The best available information was used at the time the analyses for the GSP were conducted.

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			to gather the necessary data to implement the shallow well mitigation program. This represents a critical data gap.	
			This section acknowledges that: "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."	Comment noted.
			The lack of domestic well data is very prejudicial and harmful to Meadowbrook. In 2018, Meadowbrook repeatedly urged the IWVGA to require registration of all wells in the basin and that a lack of reliable data on domestic wells would result in significant data gaps that would materially impact the adequacy of the GSP. In adopting IWVGA Ordinance No. 02-18, the IWVGA opted at the last minute to remove well registration requirement for de minimis extractors due to political reasons. Consequently, the GSP suffers from a significant and material data gap necessary to properly establish sustainable management criteria. That data gap will not be addressed until long after GSP adoption but the GSP nonetheless indicates pursuing Management Action No. 1 that will eradicate most if not all agriculture from the Basin. Meadowbrook and other stakeholders have voiced these issues many, many times to the IWVGA Board, PAC and TAC. Exhibits 25, 26, 27.	The best available information was used at the time the analyses for the GSP were conducted.
			The GSP describes "domestic/private" well production as "3% of total groundwater production in 2015". Yet, the GSP estimate of 800 AFY for this group represents more than 10% of the GSP's "Current Sustainable Yield." The failure of the GSP to sufficiently gather data and determine, based on best available science and information, how many "domestic/private" wells exist and how many of those wells are truly de minimis as defined by SGMA, represents a significant data gap in this particular Basin. Reports have been made that there are many properties in the Basin with large irrigated areas and that use water horses and other non-domestic purposes.	The best available information was used at the time the analyses for the GSP were conducted.
			Section 2.5.2.1. Kern County Land Use The GSP fails to identify the actual projected growth rate for the City of Ridgecrest.	Comment noted.
			The GSP fails to mention the highly contested and controversial effort by Kern County to downzone Meadowbrook and other agricultural use areas prior to SGAM implementation in approximately 2014.	Comment noted.
			Section 2.5.2.5. Federal Lands The GSP fails to describe the content and implications of Navy's Comprehensive Land Use Management Plan for land use management and environmental resources management for NAWS China Lake, and how it might impact water resources management in the Basin.	Comment noted.
			Section 2.6.4. NAWS China Lake Monitoring Program The GSP refers to the Navy's Basewide Groundwater Monitoring Program to provide groundwater quality and water level data to support the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process at Installation Restoration	Comment noted.

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			Sites and Operable Units located throughout Naval Air Weapons Station China Lake. The GSP attaches a portion of that plan as GSP Appendix 2-A. The GSP fails to analyze the impact of that plan on the GSP, or vice versa.	
			Section 2.7.2. Salt and Nutrient Management Plan The GSP summarizes the current Basin Salt Nutrient Management Plan ("SNMP") but does not provide any detail as to the contents, findings or recommendations of the SNMP, or how the GSP considers and implements the SNMP into the development of the sustainable management criteria or the projects and management actions.	Comment noted.
			It is unfathomable that the IWVGA, through the GSP, would seek to eradicate an entire industry of agricultural groundwater users at an impact of tens if not hundreds of millions of dollars while simultaneously failing to outline plans and actions to address the Tui Chub. A management plan for the Tui Chub should be established, including freeing up as much water as possible for other purposes, before any aggressive actions are taken that might reduce groundwater production by agricultural users.	No groundwater pumpers, including agricultural pumpers, will be prohibited from pumping groundwater as a result of the allocations. Pumping above a pumper's allocation of the safe yield or the transit pool will be subject to an augmentation fee.
			The GSP fails to indicate whether the Tui Chub is considered a Groundwater Dependent Ecosystem. The GSP needs to be clear on whether the Tui Chubb meets the definition of a Groundwater Dependent Ecosystem, which is defined under GSP Regulations § 351(m) as ecological communities or species that depend on groundwater emerging from aquifers or on groundwater occurring near the ground surface.	Comment noted.
			Section 2.7.6 Groundwater Contamination Clean Up This section indicates that: "Per the Navy's 2014 INRMP, NAWS China Lake is assessing and remediating areas of past contamination on its ranges through the IRP, including sites of possible and confirmed groundwater contamination. A list of these sites along with their cause of contamination and remediation status is provided in Appendix 2-A." It does not, however, address how those contamination remediation efforts might impact water resources management in the Basin.	Comment noted.
			This section fails to address recent Department of Defense reports regarding known PFOS/PFOA contamination at NAWS China Lake, including a DOD report indicating that 7 of 11 NAWS China Lake wells tested above EPA limits by orders of magnitude at 8M parts per trillion, representing one of the highest known contaminated DoD sites in the world. Exhibit 33	Comment noted.
			Section 3.2. History of Water Use in the Indian Wells Valley This section provides an interesting history of the Indian Wells Valley and cites several information sources, but fails to evaluate or justify whether those sources are deemed the best available science and information.	Comment noted.
			The GSP fails to cite the source of data for the text regarding Searles Valley Minerals water use and infrastructure at pages 3-3 and 3-4.	Comment noted.
			The GSP fails to cite the source of data for the text regarding Navy water use at page 3-4.	Comment noted.
			The GSP fails to cite the data and source for the referenced USGS and USBR records that are asserted to have documented "water use in the IWV over the past 70 years".	Comment noted.
			As Meadowbrook has indicated many times in written and verbal comments, the IWV Cooperative Groundwater Management Group data referenced in this section and attached as Appendix 3-A to the GSP is replete with data gaps, estimates and unanswered	The best available information was used at the time the analyses for the GSP were conducted.

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			questions and assumptions. The use of such estimates for water budgets and other aspects of the GSP must be appropriately qualified and addressed.	
			The GSP fails to establish the Basin Setting in accordance with SGMA, the GSP Regulations and DWR BMPs.	Comment noted.
			The Basin setting is replete with critical data gaps, and a failure to establish water budgets as required by the GSP Regulations.	Data gaps are addressed in Section 3.6.1.
			Section 3.3 Hydrogeologic Conceptual Model The GSP fails to establish a hydrogeological conceptual model that contains all of the information required by GSP Regulation § 354.14. Notable required but missing information includes the definable bottom of the basin, the principal aquifers and aquitards, the physical properties of aquifers and aquitards, including the vertical and lateral extent, hydraulic conductivity, and storativity, and structural properties of the basin that restrict groundwater flow within the principal aquifers.	Comment noted.
			The GSP’s reliance and emphasis on Kern County’s 2014 Todd Report is misplaced. The Todd Report was generated for purposes of Kern County’s land use planning purposes and for not SGMA planning purposes. The author of the Todd Report indicated that the purposes of the Todd Report were limited in their scope and that further study and analysis would be required for SGMA planning purposes.	The best available information was used at the time the analyses for the GSP were conducted.
			Section 3.3.1. Geology and Hydrogeology The information on geology and hydrogeology is based primarily on reports dating back to 1960. As the GSP must be based upon the best available science and information, the GSP should be revised utilizing the most sophisticated data, such as the SkyTEM project referenced elsewhere in the GSP.	The best available information was used at the time the analyses for the GSP were conducted.
			Section 3.3.4.1. Water Budget Elements The GSP summarizes only selected prior recharge studies but fails to explain the basis for that selection. All relevant prior recharge studies should be listed and explained, including the USGS study referenced in the GSP.	The best available information was used at the time the analyses for the GSP were conducted.
			The GSP indicates that “The location of all groundwater production wells in the IWV is shown in Figure 2-5.” The location of NAWS China Lake wells is not depicted, which represents a significant data gap.	Comment noted.
			As addressed earlier, the GSP acknowledges that data for domestic groundwater well production is limited, and IWVGA staff have recently reported that only a handful of domestic well owners have registered their wells. The GSP must address and fill this data gap particularly given the GSP’s stated emphasis on seeking to minimize impacts on shallow wells as a primary basis for sustainable management criteria.	Comment noted.
			The GSP does not recognize Meadowbrook’s water conservation efforts and reduced groundwater production in recent years as compared to its historical production. Rather, the GSP paints “Agricultural” groundwater use collectively as having recently expanded and that it is expected to expand further “unless restricted”. The GSP must instead comply with the GSP Regulations with respect to current and future water budgets.	Comment noted.
			The GSP fails to explain the relevance of the content regarding groundwater production by the IWVWD and domestic wells “to Navy-affiliated staff … and their dependents that reside off-Station.” That information is no more relevant than IWVWD production data for any of its other customers. The only apparent purpose for including this language seems to be an attempt to support the IWVGA’s theory of an “extended” off-reservation federal	Comment noted.

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			reserved water right for the Navy. Meadowbrook and others have submitted multiple letters outlining the legal flaws in that theory. Exhibits 30, 31, 32.	
			Section 3.3.4.2. Historical Water Budgets The GSP Regulations require the GSP to include historical water budgets. As set forth above, GSP Regulation § 354.18(a), (b) and (c)(2) contain specific requirements for establishing the historical water budget.	Comment noted.
			The GSP historical water budget fails to comply with GSP Regulation § 354.18.	Comment noted.
			Section 3.3.4.3 Current Water Budget The GSP Regulations require the GSP to include a current water budget. As set forth above, GSP Regulation § 354.18(a), (b) and (c)(1) contain specific requirements for establishing the current water budget.	Comment noted.
			The GSP current water budget fails to comply with GSP Regulation 354.18.	Comment noted.
			The "current water budget" information in the GSP baldly states that: "In more recent years, agricultural water demands have increased resulting in higher groundwater extractions compared to the long-term average. Reductions in the ET occurring at China Lake Playa and subsurface flow to the Salt Wells Valley also require water balance adjustments." It then states without explanation that "The current average estimated water budget for IWV is defined as the years 2011 to 2015 and is shown in Table 3-7."	Comment noted.
			The GSP "current water budget" fails to quantify outflows from the groundwater system by water use sectors. Instead, it inappropriately singles out asserted trends in "agricultural water demands" and then, without explanation, describes a "current water budget" based on years 2011 to 2015.	Comment noted.
			The GSP fails to quantify the change in annual volume of groundwater in storage between seasonal high conditions.	Comment noted.
			The GSP fails to quantify the water year type associated with the annual supply, demand, and change in groundwater stored. This is particularly important considering that 2011-2015 included record drought years.	Comment noted.
			The GSP fails to quantify current inflows and outflows for the basin using the most recent hydrology, water supply, water demand and land use information. Instead, it inexplicably identifies "2011 – 2015" as the "current water budget" years and does not show how this designation complies with GSP regulatory requirements.	Comment noted.
			The GSP fails to use water years rather than calendar years.	Comment addressed.
			The GSP fails to explain or provide a quantification of overdraft over a period of years during which water year and water supply conditions approximate average conditions.	Comment noted.
			The GSP fails to use current water budget information for temperature, water year type, evapotranspiration, and land use, in developing the water budget.	Comment noted.
			The GSP fails to present the current water budget in both tabular and graphical form.	Comment noted.
			The GSP's use of the terms: "sustainable yield," "Current Sustainable Yield," and "Future Sustainable Yield" is both confusing and inconsistent with SGMA, the GSP Regulations and the BMP SMC. Neither SGMA nor the GSP Regulations define or distinguish between a "current" and "future" sustainable yield. Rather, a basin's sustainable yield is intrinsically linked to avoiding specific, undesirable results. The GSP concept of "current" and	Comment noted.

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			"future" sustainable yield appears to be based primarily on total Basin inflows and outflows, rather than an evaluation based upon sustainable management criteria or appropriately defined current and projected water budgets.	
			The GSP conflates an "estimated long-term average natural recharge to the IWVGB" with "sustainable yield" and frequently refers to an objective of making "pumping equal to sustainable yield". The primary problem is that using a basin-wide average recharge estimate fails to meet the definitional requirement of "operating within the sustainable yield" which inherently requires avoiding specifically and locally defined, quantified, technically- and legally-supportable undesirable results. Meadowbrook has submitted multiple letters to the IWVGA citing GSP regulatory requirements and DWR BMPs highlighting these and related issues, which have not been addressed.	Comment noted.
			The GSP fails to explain the basis for the "Artificial Recharge" figure of 3,500AF and why that figure is considered an appropriate amount for the Basin.	Comment noted.
			The GSP Recognizes a continuing loss of storage even after full implementation of Model Scenario 6.2, but fails to analyze that continuing loss in terms of avoiding undesirable results throughout the Basin.	Comment noted.
			Section 3.4. Current and Historical Groundwater Conditions and Hydrology	Comment noted.
			The GSP fails to satisfy the requirements of GSP Regulations § 354.16.	Comment noted.
			Section 3.5.4 Baseline Conditions The GSP does not comply with the GSP Regulations with respect to the "baseline" conditions used in Model Scenario 6.2 or the water budget.For example, the GSP established "baseline conditions" using the numerical model "with the purpose of understanding future projected conditions if the GSP were not implemented … under 'no action' conditions." This section describes using selective input data for precipitation, streamflow and recharge data, but does not explain how that information complies with the assumptions required for baseline and projected water budget information detailed in GSP Regulation § 354.18.	Comment noted.
			As described above, the GSP contains no section or analysis for projected water budgets.	Comment addressed in Table 3-8, Table 3-10, and Table 3-12 which provide projected budgets with and without GSP implementation.
			Section 3.5.5. Numerical Model Scenario 6.2. The GSP fails to discuss, address or evaluate the merits of Model Scenarios 1, 2, 3, 4, 5, or 6.1.	Comment noted.
			The GSP fails to mention that Model Scenarios 3, 4, 5, 6.1 and 6.2. received no prior input from the TAC, the TAC model ad hoc committee or the PAC prior to being presented to those committees and the public.	All modeling scenarios and modeling results were discussed with the TAC.
			The GSP does not explain the close involvement of the Navy in developing the modeling scenarios. As reflected in the Navy's letter of November 7, 2018, the Navy agreed to transfer the model's "maintenance, further development, and configuration management to the IWV GA," but "with a condition of this transfer that the Navy shall be a participant of the model's configuration management process that oversees, recommends, and dispositions any changes to the model's capability and functionality." It reiterates that "The Navy shall be a participant of the model's configuration management process that	Comment related to IWVGA policies and/or procedures and not specifically relevant to the GSP.

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			oversees, recommends, and dispositions any changes to the model's capability and functionality." Exhibit 38.	
			Detailed Model Scenario 6.2 assumptions have never been revealed to the PAC, TAC or the public. Meadowbrook has submitted multiple comments letters detailing the legal, technical, procedural and practical flaws in Model Scenario 6.2, which remain unresolved.	All modelling scenarios and modeling results were discussed with the TAC.
			The GSP provides "a summary of the assumptions for Scenario 6.2." but fails to provide the detailed information necessary to comply with SGMA, the GSP Regulations and DWR Best Management Practices.	Comment noted.
			The GSP summarizes the Model Scenario 6.2 assumptions for Management Action No. 1: Pumping Allocations as follows: "Pumping: Allocations were assumed to begin February 2020 and were based on pumping history and the highest beneficial uses of groundwater." This fails to explain: what the specific allocations were assumed for each pumper, including Meadowbrook; what information was used for "pumping history" and the criteria assumptions used for allocating according to "highest beneficial uses" of groundwater. Clearly, specific assumptions were made in assigning specific allocations to specific pumpers Model Scenario 6.2; however, neither the model documentation nor the GSP details what those assumptions are.	Comment noted.
			"Groundwater producers who did not continuously pump groundwater from 2010 to 2014 were assumed to cease pumping." This fails to explain: which specific groundwater producers were assumed to cease pumping; what data was used to determine whether and how much pumping occurred from 2010 to 2014.	Comment noted.
			"Domestic and municipal pumpers were assigned an allocation equivalent to their highest continuous annual pumping from 2010 to 2014." This fails to explain which producers were considered "domestic and municipal pumpers"; the pumping allocations assigned to those pumpers; the reason for using the "highest continuous annual pumping" amount rather than the lowest continual annual pumping; and what data was used to determine how much pumping occurred from 2010 to 2014.	Comment noted.
			"Pool Allocations: A pool of water was allocated for agricultural and industrial use." This fails to explain: why agricultural and industrial use is targeted for inclusion in the pool; the meaning of "industrial use"; which agricultural and industrial users specifically were included in the pool.	Comment noted.
			"Portions of the pool were allocated to agriculture and industrial groundwater producers based on historical irrigated acres and historical water use." This fails to explain: what the specific allocations were; what data was used to determine "historical irrigated acres and historical water use"; and the specific criteria used for those allocations; why the GSP inexplicably removes Searles Valley Minerals from the pool, and how the removal of Searles Valley Minerals from the pool impacts the Model Scenario 6.2 assumptions and results.	Comment noted.
			"Although these allocations could be used at the discretion of the groundwater producer, for modeling purposes, it was assumed that current pumping rates continued until the individual pool allocations were exhausted." This fails to identify the assumptions used for "current pumping rates". It also fails to consider or address the impact on modeling results if entities in the pool significantly reduce annual groundwater production rates.	Comment noted.
			"Lease Market: A lease market for unused groundwater allocations was assumed to	Comment noted.

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			be created driven by the relative economic value of the water to the users for modeling purposes, it was assumed possible sellers include some large agriculture, the IWVWD, and the City of Ridgecrest; possible buyers include some large agriculture and industrial users.” This does not explain why this version of the GSP no longer includes a “lease market” and now instead expressly prohibits those in the pool from transferring their allocations to any entity other than to the IWVGA through the fallowing program. The GSP fails to explain why Section 5 has removed the lease market concept, nor does it explain who made the decision to remove the transferability concept that was included in the model scenario.	
			“Project No. 1: Imported Water. Imported water used for groundwater replenishment is assumed to begin in 2035. Imported water is used to offset pumping over the sustainable yield of the IWVGB.” This fails to explain which pumpers, in which quantities, and in what locations, production is offset by imported water.	Comment noted.
			Project No. 2: Recycled Water. Recycled water for direct non potable use and for injection is assumed to begin in 2025. Recycled water is assumed to be used by the City of Ridgecrest and Searles. This fails to explain the specific quantities of recycled water assumed to be used by the City of Ridgecrest, Searles Valley Minerals, and other potential users, and over what period of time.	Comment noted.
			“Project No. 6: Pumping Optimization. Pumping was optimized to prevent additional lowering of groundwater levels near pumping depressions by redistributing pumping from the Southwest and Southeast regions of the IWVGB to the Northwest region where less pumping is anticipated over time. For the purposes of modeling, it was assumed that some of the IWVWD and Searles Valley Minerals pumping would be relocated.” This fails to explain: the “pumping depressions” are referenced here; where, exactly Model Scenario 6.2. assumes IWVWD and Searles Valley Minerals pumping would be relocated; the quantity of that relocated production; the justification for removing Meadowbrook from the very area that IWVWD and Searles Valley Minerals would be relocated, in terms of sustainable management criteria; how relocation of IWVWD pumping to the “Northwest region” complies with the terms of the publicly-referenced agreement between IWVWD and Mojave Pistachios that has been described to prohibit IWVWD from producing groundwater in that northwest area.	All groundwater pumpers continue to possess the right to produce groundwater. The GSP assumes that costs associated with the Augmentation Fee will result in voluntary pumping reductions, including reductions by agricultural pumpers.
			“Growth: IWVWD groundwater pumping was assumed to increase by 1% annually.” This fails to explain the growth assumptions outside of the IWVWD service territory.	Comment noted.
			The GSP fails to explain why 2070 basin total production of 14,000 AFY assumed in Model Scenario 6.2. has been reduced to 12,000 AFY in GSP Section 5.	Comment noted.
			The GSP states at page 3-46 states that “Additional Scenario 6.2 water budgets at specific years are provided in Table 3-8.” Table 3-8 on page 3-27 does not provide that information.	Comment noted.
			Section 3.6. Existing Monitoring Network and Evaluation “The wells in the existing monitoring program have varying supporting data, with limited well log and construction data. Table 3-10 summarizes existing wells monitored for groundwater levels by different management areas within the IWVGB.” The GSP does not describe the “varying supporting data, with limited well log and construction data”. This represents a critical data gap.	Comment noted.
			The reference to “management areas within the IWVGB” is confusing because	Comment noted.

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			the IWVGA has not considered or established management areas as defined by SGMA and the GSP Regulations.	
			The GSP fails to consider or establish management areas, despite requests by Meadowbrook and other stakeholders.	Comment noted.
			The GSP simultaneously seeks to improperly treat agriculture as a water use sector management area by forcing agricultural users into a temporary pool and through fallowing as described in Management Action No. 1.	No groundwater pumpers, including agricultural pumpers, will be prohibited from pumping groundwater as a result of the allocations. Pumping above a pumper's allocation of the safe yield or the transit pool will be subject to an augmentation fee.
			As noted in this letter, the USBR-6 monitoring site indicates that groundwater levels near Meadowbrook are already operating at the designated measurable objective. The GSP should but fails to consider establishing appropriate management areas to reflect important varying conditions throughout the Basin.	Comment noted.
			Section 3.3.4.4. Overdraft Conditions The GSP frequently refers broadly to "pumping centers", "areas of depression", and areas of "declining water levels" but fails to consider and incorporate information and comments supplied by Meadowbrook indicating water levels and water quality at its production wells have shown stabilizing trends over recent years.	The best available information was used at the time the analyses for the GSP were conducted.
			The GSP mischaracterizes water level trends for USBR-6. The GSP indicates that USBR-6 "demonstrate[s] significant prolonged groundwater level declines near pumping centers." In fact, that data indicates recent stabilizing trends, particularly in the shallow aquifer.	Comment noted.
			The GSP cites three studies dated 1969, 1973 and 1993 regarding estimated groundwater in storage. Those estimates range from 1,020,000 AF to 3,020,000, and are based upon very different hydrogeologic assumptions. The GSP selects one of those studies without stated technical justification and estimates based upon rough pumping estimates, a total of 1,750,000 AF in storage.	The best available information was used at the time the analyses for the GSP were conducted.
			The GSP groundwater storage estimate represents a significant data gap. The GSP expressly recognizes "a number of limitations and sources of uncertainty with these estimates" but nonetheless places extreme emphasis on avoiding "loss of storage" as a primary management objective and even seeks to limit total agricultural production to a mere and one-time fraction of the total storage. The GSP offers no current analysis of the amount of water in storage. The GSP must use best available science and information. GSP Regulation § 354.14 require the hydrogeological conceptual model to include extensive information pertaining to groundwater in storage, including information regarding the definable bottom of the basin, principal aquifers and aquitards, lateral basin boundaries, including major geologic features that significantly affect groundwater flow, and related technical information yielding reliable estimated groundwater in storage.	See Section 3.3.4.4.
			Notwithstanding the GSP's recognition that the total available groundwater in storage represents a significant data gap, this section offers no additional information or plan to investigate the amount of water in storage.	Comment noted.
			SkyTEM information and related, more current data indicates total Basin groundwater in storage could range as high as 6 to 8 million acre feet, or possibly more.	The best available information was used at the time the analyses for the GSP were conducted.
			THE PLAN DOES NOT CONSIDER THE INTERESTS OF THE BENEFICIAL USES AND USERS OF GROUNDWATER IN THE BASIN, OR THE LAND USES AND PROPERTY INTERESTS POTENTIALLY AFFECTED BY THE USE OF GROUNDWATER IN THE BASIN.	Comment noted.

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			The GSP fails to explain how it considered the interests of holders of overlying groundwater rights including agricultural users, including farmers, ranchers and dairy professionals, including Meadowbrook.	Comment noted.
			The GSP Regulations governing sustainable management criteria include requirements to consider beneficial uses and users of water, as referenced above. The GSP fails to explain how it considered beneficial uses and users in the process of developing the sustainable management criteria.	Comment noted.
			The reference "FRWR" refers to the federal reserved water right. This pre-determination is not consistent with the process outlined in Section 5 of the GSP, it suggests that the groundwater allocation ordinance process set forth in Section 5 of the GSP has already been determined without due process, and it may be in violation of the Brown Act and the Joint Powers Agreement. IWVGA counsel has already recognized Brown Act issues arising from the "Big Three" provisions of the Joint Powers Agreement when two of the "Big Three" representatives coordinate on matters outside of publicly noticed meetings. Exhibit 36. At the very least, this certainly evidences a failure to appropriately consider the interests of all beneficial uses and users, including agricultural users in the Indian Wells Valley.	Comment related to legal positions and not specifically relevant to the GSP.
			Section 1.3. Beneficial Uses and Users This section does not address the existence or identify of other potential beneficial uses and users in the Basin.	Comment noted.
			This section describes users but not uses of water.	Comment noted.
			This section fails to describe the assumed beneficial uses of water by NAWS China Lake.	Comment noted.
			This section fails to describe the assumed beneficial uses of water by "Industrial".	Comment noted.
			This section fails to explain the difference between Large and Small Agriculture.	Comment addressed.
			Prior to SGMA, Kern County attempted unsuccessfully to significantly alter zoning for Meadowbrook's properties and other agricultural properties in the Basin. The SGMA process appears to be a continuation of Kern County's efforts to eradicate agriculture from the Basin.	All groundwater pumpers continue to possess the right to produce groundwater. The GSP assumes that costs associated with the Augmentation Fee will result in voluntary pumping reductions, including reductions by agricultural pumpers.
			The issues raised in this comment letter regarding Model Scenario 6.2., the intention to force agricultural users into a temporary pool, the aggressive timeline to implement the temporary pool and fallowing, the fee structures presently imposed and to be imposed on agricultural users, all while elevating Navy interests and in spite of significant data gaps and lack of transparency, evidence failure of the GSP and the IWVGA to consider the land uses and property interests of Meadowbrook.	All groundwater pumpers continue to possess the right to produce groundwater. The GSP assumes that costs associated with the Augmentation Fee will result in voluntary pumping reductions, including reductions by agricultural pumpers.
			THE PROJECTS AND MANAGEMENT ACTIONS ARE NOT DEMONSTRABLY FEASIBLE, NOT LIKELY TO PREVENT UNDESIRABLE RESULTS NOR ENSURE THAT THE BASIN IS OPERATED WITHIN ITS SUSTAINABLE YIELD; AND THE PLAN FAILS TO SHOW THAT THE AGENCY HAS THE LEGAL AUTHORITY AND FINANCIAL RESOURCES NECESSARY TO IMPLEMENT THE PLAN.	Comment noted.
			Section 5.2.1 Management Action No. 1: Implement Annual Pumping Allocation Plan, Transient Pool and Fallowing Program	Comment related to legal positions and not specifically relevant to the GSP.

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			As described earlier in this letter, it appears that two of the "Big Three" voting member representatives of the IWVGA Board have pre-determined that the Navy will have "the main right on which all other allocations are based" and that determination will be based largely, if not primarily, on economic considerations rather than federal and state water rights laws and principles.	
			On February 22, 2019, the IWVGA Chair was reported to have stated publicly: "When the Navy came out formally and said they are considering groundwater an encroachment issue that is something we've got to solve, otherwise they are going to say it's encroachment on the mission of the base. And them being the major economic driver of the area, that means a lot…they are the major economic driver and they are in the driver's seat." Exhibit 43.	Comment noted.
			On March 4, 2019, the Kern County representative of the IWVGA was reported to have stated publicly: "…I want the Navy and this community to understand that Kern County, all five supervisors, stand behind you. We will support the Navy and we will support this community in any vote that I make." Exhibit 43.	Comment noted.
			The content of the March 7, 2019 email [Exhibit 39] accurately predicted the positions taken by counsel for certain parties during the March 2019 attorney allocation meetings, as reflected in IWVGA special counsel's summary reports given to the IWVGA. The report for the meeting of Marchindicates describes "a list of concepts and issues raised which could be then presented to the Authority Board for consideration… 1. 1. There were proposed bases which have been presented which would deprioritize agricultural production, including the purported priority of "Health and Safety" water, which presumably would include some amount of gallons per person per day which the District could serve with a first priority, the statutory priority of municipal and industrial water over agricultural waterand the assertion that agricultural use of water in the Basin under present circumstances should not be considered a reasonable use of water. 2. The City of Ridgecrest has become established to perform the core role of facilitating the Navy Mission at the China Lake base, so that preserving a water priority for the District and others serving Navy employees for base operations should constitute the priority goal for the allocation plan." Exhibit 34.	Comment noted.
			On March 8, 2019, the Kern County representative of the IWVGA was reported to have stated publicly: "All I know is from my perspective, it's [Navy encroachment letter] a game-changer. Because the strategic imperative is now changed. We need to preserve the Navy's mission in the Indian Wells Valley. And that has implications that dwarf other decisions…now that the letter has been released in my mind, it changes the over-arching strategy of what we are trying to do. Now the strategy is emphatically and clearly and empirically that our job is to preserve the Navy base and to preserve the Navy mission because it is being encroached upon. The way I read it [the letter], their federal reserve right will not just include the water that they are using on the base today but will include all the water required by all their employees and their families." Exhibit 43.	Comment noted.
			Likewise, the attorney allocations meeting report of March 29, 2019 reflects continued entrenched efforts to deprioritize agriculture and elevate Navy interests in the allocation plan: "It was stated that the Authority Board desires options presented for its consideration of an allocation plan … Those concepts might be applied to protect water production by the district and others in proportion to	All groundwater pumpers continue to possess the right to produce groundwater. The GSP assumes that costs associated with the Augmentation Fee will result in voluntary pumping reductions, including reductions by agricultural pumpers.

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			the connections of ratepayers which include a person who works at the Naval Base. It was noted that agricultural uses would be very likely to be terminated by application of those principles relatively quickly, be bought out or be ramped down over an agreed period of time." Exhibit 34.	
			On October 1, 2019, the Kern County representative of the IWVGA was reported to have stated publicly: "I think we are on the very edge of getting that [IWVGA Groundwater Sustainability Plan] done. We need to get it done and get it moving. The satisfaction I will get from that will be significant because we give it to the Navy and say 'you have no worries, we don't have a threat to our base because we have a sustainment plan." Exhibit 43.	Comment noted.
			By directive of the United States Office of the Under Secretary of Defense in memorandum entitled, "Water Rights and Water Resources Management on Department of Defense Installation and Ranges in the United States and Territories," NAWS China Lake was ordered in May 2014 to gather and organize within six months of that memorandum, a "permanent record containing all existing documentation establishing its water rights … [and] determine the amount of water used at each installation and range." It was further directed to identify within one year all water sources, including those supplied on site and by third parties. Exhibit 35. Assuming NAWS China Lake complied with this directive, it would have gathered all such information and data by May 2015. The GSP fails to indicate whether and to what extent such information was requested, obtained, evaluated by the IWVGA and utilized in preparing the GSP.	Comment noted.
			IWVGA staff has further evidenced a pre-determined intention to allocate Meadowbrook (and other agricultural groundwater users) ZERO acre-feet of the IWVGA's estimated annual basin native supply. At the October 3, IWVGA Board, Water Resources Manager and Staff 2019 PAC and TAC meetings, the Water Resources Manager distributed to the PAC and TAC a document entitled, "Introduction to Sustainable Yield Allocation Chart" which rendered Meadowbrook a "0" allocation to produce groundwater from the native yield, would force Meadowbrook into a temporary pool—without due process or just compensation. Exhibit 42.	All groundwater pumpers continue to possess the right to produce groundwater. The GSP assumes that costs associated with the Augmentation Fee will result in voluntary pumping reductions, including reductions by agricultural pumpers.
			That allocation chart, without citation to any supporting legal authority, would allocate nearly the entire IWVGA estimated annual basin recharge to the Navy, and relegate all agricultural water users including Meadowbrook to an unidentified and unquantified "Pool" that would require them to cease pumping once depleted (i.e. consistent with Management Action No. 1)—without due process or just compensation. The allocation chart is based upon other unrevealed though highly questionable and untenable legal theories and factual assumptions. See Meadowbrook's addressing similar issues in Model Scenario 6, and related concerns. Exhibits 30, 31, 32.	Comment related to legal positions and not specifically relevant to the GSP.
			Management Action No. 1 is clearly built upon assumptions contained in Model Scenario 6.2. For example, this section indicates that the "total allocations from Transient Pool are anticipated to be limited to no more than 51,000	Comment noted.

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			acre feet." The GSP Appendix 3-H summarizes the Model Scenario 6 assumptions in the PowerPoint presentation slides contained in that section. Under "Scenario 6 Summary", it states: "Draft summary of concepts for Scenario 6 was developed in coordination with the Attorneys" . "Final model 1 inputs provided to DRI after finalizing the summary of concepts with the Attorneys". "Discussion of Scenario 6 results and goals with DRI." "Second iteration of Scenario 6 (6.2) developed to further evaluate imported water requirement".	
			Meadowbrook and many other parties have requested many times that the Model Scenario 6.2 assumptions and criteria be made publicly available, but the IWVGA has not released those details. Exhibits, 30, 31, 32.	Comment noted.
			The GSP fails to identify The GSP fails to identify based upon best available science and information how much groundwater is in storage in the Basin.	See Section 3.3.4.4.
			The GSP fails to identify based upon best available science and information how much usable groundwater is in storage in the Basin. Nor does the GSP state whether it deems all usable water usable for all purposes, or whether some water will be usable for some purposes (e.g. industrial) and not others (e.g. domestic).	See Section 3.3.4.4
			The GSP fails to explain or provide technical justification for the 51,000 AF figure proposed for the "Transient Pool".	Comment noted.
			The GSP fails to explain or provide technical justification for how a 51,000 AF Transient Pool management action satisfies SGMA's requirements to avoid undesirable results in at specific monitoring sites.	Comment noted.
			The GSP fails to explain or provide technical justification for why the Transient Pool was reduced from the amount proposed in prior IWVGA staff materials, or to explain the technical and legal basis for Kern County Counsel's recent public comment that, if adjusted from Model Scenario 6.2., the Transient Pool figure would "only go lower".	Comment noted.
			The GSP is replete with references indicating that agricultural users will be relegated to the temporary pool, suggesting that no agricultural user will be allocated a permanent allocation to the native supply	Comment noted.
			The GSP allocation management action attempts to regulate groundwater users according water use sectors without defining water use sectors.	Comment noted.
			The November 2019 Draft GSP contained provisions that transient pool allocations would be transferable. The GSP has inexplicably removed those transferability provisions. Please state the reasons for removing the transferability provisions.	Comment noted.
			Water Code Section 10726.2 authorizes an Agency to acquire real and personal property rights by grant, purchase, lease, contract, etc., or to provide for a program of voluntary fallowing of agricultural lands, it does not authorize an Agency to force agricultural fallowing or to take property rights without due process and just compensation.	Comment related to legal positions and not specifically relevant to the GSP.
			Any taking of Meadowbrook's property rights—including water rights—requires due process and just compensation. If the IWVGA or the Navy considers "taking" property or water rights to be necessary in order for the	Comment related to legal positions and not specifically relevant to the GSP.

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			Navy's mission to be sustained, that will require due process and just compensation. Management Action No. 1 and the projected $9 million fallowing program do not satisfy the constitutional and statutory requirements.	
			The allocation ordinance process described in Management Action No. 1 indicates that the IWVGA will assign allocations based upon its evaluation of water rights, priorities and other factors. IWVGA attorneys have already indicated in the October 2019 "Sustainable Yield Allocation Chart" their position that the Navy has a federal reserved water right that could exceed the entire average basin recharge, citing the June 2019 letter from the Navy as a basis for that assertion. The "extended" federal reserved water right concept is not based on established case law. How then, can any producer, especially Meadowbrook, expect to receive a fair, factual and legally-supported process and determination of an allocation for Meadowbrook when that determination will be based on recommendations made presumably by the same IWVGA staff that produced the October 2019 allocation chart and two of the "Big Three" voting representatives of the IWVGA Board who have pre-determined that the Navy will have "the main right on which all other allocations are based" and that determination will be based largely, if not primarily, on economic considerations rather than federal and state water rights laws and principles	Comment related to legal positions and not specifically relevant to the GSP.
			The GSP does not explain how imposition of an allocation framework will satisfy SGMA and the Regulations' requirements to avoid specific undesirable results.	Comment noted.
			The discussion in this section regarding a Navy federal reserved water right and other water right priorities and interests is a legal argument, and highlights the due process concern identified above	Comment related to legal positions and not specifically relevant to the GSP.
			The GSP fails to explain how IWVGA member agencies that produce groundwater will participate in the allocation ordinance process, and how conflict of interest does not arise for those agencies to make determinations of their own allocations.	Comment related to legal positions and not specifically relevant to the GSP.
			The GSP fails to explain whether the IWVGA intends to recognize an allocation for the Navy in the amount of 2,041 AF in accordance with the Navy's prior request, and if so, to provide any justification for doing so when the Navy's June 2019 letter indicates a much lower current Navy demand on the base at approximately 1,450 AFY. Section 2.7.3.3. indicates that "In October2018, the Navy estimated its short-term future water needs on the installation to be approximately 2,041 AFY, which includes a 25% increase in current water use." A 25% increase over 1,450 AFY is closer to 1,800 AFY.	Comment noted.
			The GSP fails to explain whether, when or how the IWVGA has ever questioned or objectively evaluated the merit of using a 2,041 AF figure for a Navy allocation, and if so, to provide the justification for doing so.	Comment noted.
			The GSP fails to identify the source of this information, including whether it was derived from the Navy economic materials referenced in the March 7, 2019 email referenced above. The GSP fails to indicate whether it has evaluated the extent to which NAWS China Lake operations in the North and South	Comment noted.

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			Ranges, respectively, rely upon the IWVGB as a source of water supply, whether NAWS China Lake operations in the North Range draw water from sources other than the IWVGB, whether NAWS China Lake operations in the South Range draw water from sources other than the IWVGB, whether NAWS China Lake operations in either the North or South Ranges have access to water supplies other than the IWVGB, such as from other groundwater basins, whether the GSP assumptions regarding Navy water demands include NAWS China Lake operations for the entirety of North and South Ranges, or whether the GSP evaluated potential sources of water supply for the Navy beyond the IWV Basin.	
			The GSP indication that imposing Management Action No. 1 will result in "rising groundwater levels" in certain areas, particularly North Brown Road, is evidence that the management action overreaches, especially where the cost of that action is the unlawful taking of extensive agricultural property and water rights in the Indian Wells Valley.	Comment related to legal positions and not specifically relevant to the GSP.
			The Draft GSP fails to address how applications for new groundwater production in the Basin will be addressed.	Comment noted.
			The Draft GSP fails to address CEQA and NEPA requirements for Management Action No. 1 and for all other Projects and Management Actions. Section 1.1 states: "The proposed projects and management actions will need to be fully developed and/or designed after adoption of the GSP. These projects and management actions may be required to comply with environmental compliance regulations, including the preparation of CEQA and/or National Environmental Policy Act (NEPA) reviews before they are implemented." This could dramatically impact implementation and should have been at least preliminarily evaluated in the GSP document.	Comment noted.
			The Draft GSP fails to explain the basis for the $9 million figure for the "Fallowing Program". It also fails to answer Meadowbrook's question if that figure is in any way based upon the IWVGA's prior appraisal of Meadowbrook property which was performed without prior notice to Meadowbrook.	Comment noted.
			The GSP fails to explain whether the $9 million figure is based upon stripping Agriculture of groundwater production rights before "taking" the properties, or the basis for determining whether that $9 million figure is adequate.	Comment noted.
			The GSP cites often (and often exclusively) to Water Code § 10725.2(a), which states "A groundwater sustainability agency may perform any act necessary or proper to carry out the purposes of this part." This section does not, however, authorize the IWVGA to perform acts that contravene SGMA, including implementing projects and management actions that are not supported by sustainable management criteria based upon best available science and information or that fail to comply with other substantive and procedural requirements imposed by SGMA and the GSP Regulations. Nor does it authorize an Agency to violate the constitutional prohibition of taking without due process and just compensation.	Comment noted.
			The GSP fails to explain how Management Action No. 1 would affected or	Comment noted.

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			modified when further study reveals a significantly greater volume of groundwater in storage, a higher annual average natural recharge, or other potentially significant changes to the Model Scenario 6.2. assumptions and criteria.	
			In any allocation process, Meadowbrook is entitled to and must receive a permanent allocation. Meadowbrook has already indicated many times a willingness to "ramp down"—even significantly—in order to achieve sustainability. Sustainability must be in accordance with SGMA, however, and not based upon politically-driven decision making devoid of best available science and information.	Comment noted.
			Section 5.3.1 Project No. 1: Develop Imported Water Supply Development of an imported water supply is critically important to achieving Basin sustainability.	Comment noted.
			Further details regarding the nature, scope, costs, funding and impacts of an imported water supply must be developed and considered, including publicly.	
			The imported water project should be vetted thoroughly before implementing other significant groundwater management actions that would significantly impact existing beneficial uses and users of groundwater.	Comment noted.
			After properly establishing minimum thresholds and other sustainable management criteria, the IWVGA can evaluate potential necessary mitigation programs while developing, evaluating and vetting the imported water project.	Comment noted.
			Section 5.3.2 Project No. 2: Optimize Use of Recycled Water Maximizing available recycled water is critically important to achieving Basin sustainability.	Comment noted.
			Further details regarding the nature, scope, costs, funding and impacts of potential recycled water projects must be developed and considered, including publicly.	Comment noted.
			The recycled water projects should be vetted thoroughly before implementing other significant groundwater management actions that would significantly impact existing beneficial uses and users of groundwater.	Comment noted.
			After properly establishing minimum thresholds and other sustainable management criteria, the IWVGA can evaluate potential necessary mitigation programs while developing, evaluating and vetting recycled water projects.	Comment noted.
			The GSP indicates the IWVGA would pay for feasibility studies and infrastructure to fund Searles Valley Minerals—a private entity—retrofitting to use recycled or brackish water. The GSP fails to specify the source of those funds or the authority for or justification of that concept. The GSP fails to explain whether the IWVGA would use fees generated by private pumpers it seeks to eradicate from the Basin to fund studies and projects specifically to benefit other private pumpers that it determines should not be eradicated, and how doing so would not comprise an improper gift of public funds.	Comment noted.

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			The GSP fails to indicate a similar willingness on the part of the IWVGA to reach out to other private pumpers, like Meadowbrook, to discuss potential conservation measures, feasibility studies, and the use of potential alternative supplies, as it suggests doing for Searles Valley Minerals.	Comment noted.
			Section 5.3.3 Project No. 3: Basin-wide Conservation Efforts Maximizing water conservation is critically important to achieving Basin sustainability.	Comment noted.
			Further details regarding the nature, scope, costs, funding and impacts of water conservation programs must be developed and considered, including publicly.	Comment noted.
			The water conservation programs should be vetted thoroughly before implementing other significant groundwater management actions that would significantly impact existing beneficial uses and users of groundwater.	Comment noted.
			After properly establishing minimum thresholds and other sustainable management criteria, the IWVGA can evaluate potential necessary mitigation programs while developing, evaluating and vetting conservation programs water projects.	Comment noted.
			The IWVGA should consider all feasible conservation measures, both voluntary and mandatory, for all uses and users of groundwater. The GSP currently and improperly targets agricultural users by forcing them into a one-time use temporary pool while simultaneously imposing no mandatory or voluntary conservation measures on other uses and users of groundwater. This represents a failure to consider all beneficial uses and users of groundwater.	Comment noted.
			The GSP indicates the IWVGA would pay for feasibility studies and infrastructure to fund Searles Valley Minerals—a private entity—retrofitting to use recycled or brackish water. The GSP fails to specify the source of those funds. The GSP fails to explain whether the IWVGA would use fees generated by private pumpers it seeks to eradicate from the Basin to fund studies and projects specifically to benefit other private pumpers that it determines should not be eradicated, and how doing so would not comprise an improper gift of public funds.	Comment noted.
			The GSP fails to indicate a similar willingness on the part of the IWVGA to reach out to other private pumpers, like Meadowbrook, to discuss potential conservation measures, feasibility studies, and the use of potential alternative supplies, as it suggests doing for Searles Valley Minerals.	Comment noted.
			Section 5.3.4 Project No. 4: Shallow Well Mitigation Program As Meadowbrook has previously indicated, the IWVGA should develop a shallow well mitigation plan based upon best available science and information, before considering imposing any significant pumping limitations. By contrast, the GSP seeks to impose the harsh Management Action No. 1 allocation and fallowing process before implementing the shallow well mitigation program.	The best available information was used at the time the analyses for the GSP were conducted.
			The GSP reference to "financial hardships" fails to acknowledge the economic impacts to agricultural users who stand to face tens if not hundreds of	Comment noted.

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			millions of dollars in impact that would result from the Projects and Management Actions.	
			The GSP fails to explain or demonstrate specifically whether, when or how Meadowbrook's groundwater production impairs any specific shallow wells. The IWVGA has not and cannot answer this question. Yet, the IWVGA still proposes forcing Meadowbrook into a temporary pool and ultimately forcing it out of business, while requiring no conservation from the Indian Wells Valley Water District and other well owners it intends to "protect", only to then move the Indian Wells Valley Water District and potentially other large producers to the very place that Meadowbrook has operated for decades!	All groundwater pumpers continue to possess the right to produce groundwater. The GSP assumes that costs associated with the Augmentation Fee will result in voluntary pumping reductions, including reductions by agricultural pumpers.
			Section 5.3.5 Project No. 5: Dust Control Mitigation Program The GSP fails to explain the basis for the $19 million figure for "Dust Mitigation", and why the GSP deems dust mitigation more important and to be funded more than double that of fallowing.	Comment noted.
			It is worth noting that "dust control" has been a primary focus of the written comments submitted to the IWVGA by the TAC member appointed by the Kern County representative of the IWVGA Board. Exhibit 37.	Comment noted.
			Section 5.3.6 Project No. 6: Pumping Optimization Project The GSP fails to identify which existing groundwater wells the Indian Wells Valley Water District or any other entity would utilize in the North Brown Road area in Modeling Scenario 6.2, or alternatively, where new wells would be drilled.	Comment noted.
			The GSP fails to identify which wells cease operating, and when, under Modeling Scenario 6.2.	Comment noted.
			The GSP fails to identify which wells continue operating, and at what levels of groundwater production, under Modeling Scenario 6.2.	Comment noted.
			The GSP fails to explain the basis for the $23 million figure for "Pumping Optimization".	Comment noted.
			Section 5.4 Conceptual Projects Still Under Consideration As a participating member of the Brackish Water Group, Meadowbrook supports the further evaluation of brackish water supplies.	Comment noted.
			The potential use of brackish water supplies by the entities noted in the GSP in lieu of groundwater should be vetted and considered before considering imposing any significant pumping limitations.	Comment noted.
			Section 6.2 Schedule for Implementation The aggressive, prescriptive nature of the Draft GSP leaves little room for adaptive management as required by SGMA.	Comment noted.
			The GSP fails, for example, to consider how the sustainable management criteria and projects and management actions should be adjusted when the IWVGA recognizes new and more accurate data for groundwater in storage, potential future additional conservation by Meadowbrook and other producers, the introduction of brackish water supplies, and other	Comment noted and will be considered in future GSP updates.

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			projects and management actions not yet sufficiently evaluated.	
			Section 6.3.1 Implementation Costs See detailed comments on Section 5 above, regarding issues pertaining to GSP implementation costs for specific projects and management actions.	Comment noted.
			Section 6.3.2 Potential Funding Sources The IWVGA has severe current and projected funding gaps, as noted at recent IWVGA Board meetings.	Comment noted.
			The Draft GSP identifies potential project capital costs in excess of $350 million, and potential annual costs in nearly of $10 million. The GSP provides insufficient detail on how those costs will be funded, including how they might impact the various beneficial users of groundwater.	Comment noted.
			The GSP fails to provide an estimated range of the contemplated "Administration Fees", "Mitigation Fees" or "Augmentation Fees". An estimate of the potential GSP implementation fees is critical to inform stakeholders regarding GSP impacts.	Comment noted.
			The GSP fails to note that the current $30/acre fee is among the highest, if not the highest, GSP-development fee in California, notwithstanding WVGA's receipt of over $1.5 million in grant funding. It also fails to note that the fee was imposed over the strenuous objection of many parties who submitted extensive comment letters into the record. See Meadowbrook comment letters attached as Exhibits 25, 26, 27.	Comment noted.
			Meadowbrook is supportive of the IWVGA seeking and exhausting all potential sources of federal, state and local grant funding and related financing, in order to minimize acute local cost impacts	Comment noted.
			The IWVGA must comply with California Constitutional and statutory requirements in implementing any fees under Water Code 10730.2.	Comment noted.
			THE IWVGA HAS NOT RESPONDED TO COMMENTS THAT RAISE CREDIBLE TECHNICAL OR POLICY ISSUES WITH THE PLAN	Comment noted.
			Section 1.4.1. Organization and Management Structure of the IWVGA The GSP does not mention that the 17-month-long formation process of the IWVGA was highly controversial. During the early stages of the formation of the IWVGA Joint Powers Authority, The Meadowbrook Mutual Water Company engaged in good faith to participate as a board member in collaboration with the other IWVGA member agencies. Those efforts were met with stiff resistance from most of the member agencies, particularly Kern County and the City of Ridgecrest. Meadowbrook submitted multiple comment letters to each of the IWVGA member agencies on this matter. Exhibits 1 – 9.	Comment related to IWVGA policies and/or procedures and not specifically relevant to the GSP.
			The GSP fails to indicate whether the Navy or BLM representatives attended or participated in any closed session meetings of the IWVGA Board.	Comment noted.
			The GSP indicates that "All IWVGA Board meetings are held in accordance with the Ralph M. Brown Act, set forth in the California Government Code sections 54950, et seq." but does not mention the IWVGA board member "pre-meeting" practices that were deemed by counsel to be in violation of the Brown Act when pumping fees were being considered. Exhibit 36.	Comment noted.

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			Section 1.4.2.1. Policy Advisory Committee (PAC) As memorialized in many comment letters and verbal comments on the record by Meadowbrook representatives and others, despite Meadowbrook's significant efforts to persuade the IWVGA to establish the PAC and obtain representation on the PAC, the PAC was only rarely engaged in the manner required by the IWVGA Bylaws. Exhibits 11- 21, 24-29.	Comment related to IWVGA policies and/or procedures and not specifically relevant to the GSP.
			Section 1.4.2.2. Technical Advisory Committee (TAC) The IWVGA Bylaws require that the TAC "will assist the Water Resources Manager in the preparation of the GSP and will work collaboratively with other committees of the Board." (Bylaws, Section 5.11.) The Bylaws also require that "The Water Resources Manager shall attend and set the agenda of each TAC meeting so that each technical element of the GSP is presented to the TAC, in draft, to afford the TAC a reasonable opportunity to review and conduct a thorough evaluation prior to finalization of that technical element."	Comment related to IWVGA policies and/or procedures and not specifically relevant to the GSP.
			In actuality, the TAC was largely deprived of the opportunity to review each technical element of the GSP in draft and was most frequently deprived of a reasonable opportunity to review and conduct a thorough evaluation prior to finalization of each technical element. The IWVGA Board, PAC and TAC meeting minutes, videos, reports and summaries are replete with comments memorializing this significant substantive and procedural failure. Those failures ranged from, for example, almost always distributing substantive materials to the TAC and PAC only minutes before their actual meetings, to completely bypassing the TAC and PAC in the development of Model Scenarios 3, 4, 5, 6.1 and 6.2.	Comment related to IWVGA policies and/or procedures and not specifically relevant to the GSP.
			Meadowbrook made a concerted effort to assist in the productive development of the GSP, including proposing schedules, timeframes and administrative processes to assist the PAC and TAC in developing the technical and policy aspects of the GSP. Nonetheless, for well over a year, the TAC and PAC were given no meaningful direction from the IWVGA, and became bogged down, at no fault of their own, in administrative and procedural challenges. Exhibits 24, 28, 29.	Comment related to IWVGA policies and/or procedures and not specifically relevant to the GSP.
			The GSP acknowledges that "As stated in Article 5.12 of the IWVGA By-Laws, TAC members must have a formal education and experience in a groundwater-related field while also maintaining an understanding of the technical aspects of the IWVGB or similar basins in California." The GSP fails to note, however, that the IWVGA Board did not adhere to this requirement in all cases. As one example, the Kern County representative to the IWVGA Board nominated a TAC member that did not meet the requisite criteria of Bylaws Article 5.12. The Kern County representative disclosed having a financial, employer/employee relationship with that TAC representative and then abstained from voting to approve of the resolution appointing that individual to the TAC due to a conflict of interest. The IWVGA June 2019	Comment related to IWVGA policies and/or procedures and not specifically relevant to the GSP.

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			meeting minutes memorialize this process. Exhibit 34.	
			GSP Appendix The Appendix includes two comment letters previously submitted by the Navy. The Appendix does not list, attach or reference even one of the many detailed comment letters submitted by Meadowbrook and other parties. Exhibits 1-32.	Comment noted.
			General Comments: •Please provide the names of all individuals and their State of California license information (i.e. Stetson, DRI and contractor for responsible for GDE survey work) that will authorize this document.	Comment noted.
#16	Eddy Teasdale	01/08/2020	**EXECUTIVE SUMMARY** **General Comments:** •November 2019 Comment – As requested, why did the TAC not have a chance to review the ES prior to issuing the Public Review Draft?	Comment noted.
			ES 1.1 Purpose of Groundwater Sustainability Plan, page ES-1 – Please provide technical references for the statement regarding the overdraft statement.	Comment addressed.
			ES 1.2 Agency Information, page ES-1, first sentence. Text states basin as a critically overdraft basin of medium priority, but reference 1 states high priority. Please resolve this discrepancy.	Comment addressed in Section ES 1.2. The 2016 Bulletin 118 interim update identified the IWVGB as medium priority. Since then, the *Sustainable Groundwater Management Act 2018 Basin Prioritization: Process and Results*, published by DWR in January 2019, identified the IWVGB as high priority.
			ES 1.2 Agency Information, page ES-2, second paragraph. Please include a statement to explain why other beneficial users (domestic, small and large agricultural interests) were excluded from being involved with the formation of the IWVGA	Comment related to IWVGA policies and/or procedures and not specifically relevant to the GSP.
			ES 1.2 Agency Information, page ES-3, last paragraph. The TAC was established for the express purpose of giving interested parties a reasonable opportunity to review and conduct a thorough evaluation of each technical element of the GSP did not occur as stated. Examples of these inputs would be the lack of input given to TAC to review specific sections of the GSP, the short-notice given to review critical key documents (sometime the TAC were given no time to review WRM materials ahead of the TAC meetings), the failure of the GA to respond to specific technical comment letters provided during the development of the GSP (reference Attachment 1 and 4), the development of a groundwater funded model by the Navy that occurred prior to the formation of the TAC, and unfortunately although known to have several flaws is being used as a tool to develop the future of groundwater use in this basin.	Comment related to IWVGA policies and/or procedures and not specifically relevant to the GSP.
			ES 2.1 General Description and Setting, ES-4, first paragraph, 5 sentence. Please provide a technical reference to support the statement concerning 50 years of overdraft.	Comment addressed.
			ES 2.3 Water Supply Source, page ES-5, first paragraph. Please include a summary table for all of the water supply users and include a percentage of their use in the basin.	Comment noted.
			ES 2.5 Regional Water Management Agencies, page ES-5, first sentence. Why is the text in this sentence bold?	Comment addressed.
			ES 2.6 Land Use, page ES-6, first paragraph. Why are small and large agriculture not included in the list of lands overlying the basin?	Comment addressed in Section 2.5.3. Lands designated for agriculture fall under the land use and general plans of the entities specified in ES 2.6.
			ES 2.7 Existing Water Resource Monitoring Programs, page ES-6, second paragraph. Please include a list of all entities that helped implement the Indian Wells Valley Cooperative Groundwater Management Group.	Comment addressed in Section 2.4.6.

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			ES 2.7 Existing Water Resource Monitoring Programs, page ES-6, third paragraph. There are other entities that are also conducting groundwater monitoring (i.e. Large Agriculture), and those entities have offered to share that information with other monitoring entities (i.e. IWVGA). Unfortunately, this data exchange has not been a transparent process (i.e. groundwater level data is cherry-picked to align with the non-agricultural interests).	Comment addressed in Section 2.6.1.
			ES 2.8 Existing Water Resourced Management Programs, page ES-7, first paragraph. Please provide a reference to overdraft statement. In addition, please provide additional information on where the overdraft within the basin is occurring and provide additional details as to why groundwater management specific areas (reference Attachment 1) were not implemented to address the basin wide overdraft condition. In addition, please include an additional bullet to highlight the conservation measures agriculture have implemented to reduce groundwater usage.	Reference has been added. Overdraft is a basin-wide condition that occurs when outflows exceed inflows and is not area specific.
			ES 3.1.1 Geology and Hydrogeology, page ES-9, first paragraph, third sentence. Please provide evidence to support the statement that there is a strong connection between the shallow aquifer and the deeper aquifer.	Comment noted.
			ES-3.1.2 Soils, page ES-9, first paragraph, last sentence. If the additional preliminary soil surveys were conducted, how were they reviewed by the author if they are not digitally available?	Comment noted.
			ES 3.1.4 Water Budget and Overdraft Conditions, ES-10, Table ES-1. Please provide additional details as to why IWV defined the 2011 to 2015 time frame to develop the water budget and who determined this was an appropriate methodology given this does not meet the minimum 10 years suggested by DWR and the 2011 to 2015 time frame represents very dry climatic conditions (reference Attachment 5).	Comment noted.
			ES 3.1.5 Sustainable Yield, page ES-11, first paragraph, third paragraph. DRI was contracted by NAWS to develop the model without direct input from the TAC; therefore, the statement regarding coordination is not correct. Revise sentence to state that DRI, through a sub-contract with NAWS developed the initial estimated long-term natural recharge. As noted by several TAC members, the DRI model conceptually has architectural and structural errors, which will impact the estimates of overdraft. As noted, several times throughout this GSP development process, overdraft should not be quantified as a single value, and will fluctuate based on hydrologic conditions.	The numerical model was reviewed by technical staff of the Water Resources Manager and approved by the IWV TAC and was considered the best available tool.
			ES 3.2 Reduction of Groundwater Storage, page ES-11, first paragraph. The statement, significant reduction in storage, should be quantified. Please discuss and identify where chronic lowering of groundwater levels and supposed water quality degradation is occurring. Also, regarding land subsidence, the only documented case of any land subsidence is occurring on NAWS property and has become evident throughout the development of the GSP. NAWS has not committed to reduce pumping and instead projects increased pumping, so please explain how subsidence will be addressed?	Comment noted.
			ES 3.2.2 Chronic Lowering of Groundwater Levels, page ES-12, second sentence. As stated, groundwater levels remain stable in other locations, please provide additional geographic details to where this is located (i.e. in proximity to North Brown Road).	Comment noted.
			ES 3.2.2 Chronic Lowering of Groundwater Levels, page ES-12, third sentence. Please provide reference to how shallow production wells have been impacted. In addition, please provide geographic details to where this is occurring.	See Appendix 3-E.

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			ES 3.2.4 Groundwater Quality Conditions, ES-12, first paragraph. Please include additional details on impacts to groundwater quality from anthropogenic activities.	Comment noted.
			ES 3.2.5 Land Subsidence, ES-13, first paragraph. Please clarify if land subsidence is occurring and identify where this is occurring.	See Appendix 3-G.
			ES 3.2.7 Groundwater Dependent Ecosystems, page ES-13, first paragraph. If GDE's are confined to NAWS property, please provide further details on how GDE's will be addressed, if NAWS is not required to reduce pumping. Should GDE's and land subsidence not be included as a sustainable management criteria, given the IWVGA has no authority to control the entity who is causing these issues?	The relationship of groundwater levels and GDE health has been identified as a data gap and will be addressed when implementing the GSP.
			ES 3.3 Numerical Model, page ES-14, first paragraph. Please include a statement further defining how the DRI model was peer reviewed. As this author was part of the TAC model ad-hoc group, I would disagree with the statement peer review. Prior to the formation of the TAC, the DRI model was developed without any input from anyone other than NAWS staff. The TAC only reviewed the model documentation after insisting (reference Attachment 2) and we were informed from the beginning that there would be no structural changes to the model, which is unfortunate since there are known structural issues with the model (i.e. given current pumping distribution, pumping volumes are overestimated in Layer 1, anisotropy values are not realistic, etc.).	Comment addressed in Section 3.5.1.
			ES 3.3 Numerical Model, page ES-14, second paragraph. Please include a statement that the solute and transport model was developed but has not been calibrated again observed data and was not reviewed by the TAC model-ad hoc group.	Comment noted.
			ES 3.3 Numerical Model, page ES-14, last paragraph. As stated, and documented several times (see Attachment 3), Scenario 6.2 should be considered a management action only and is not the only management action that could be implemented to address declining groundwater levels in specific areas of the basin.	A model scenario is not the same as a management action.
			ES 3.4 Existing Monitoring Network and Data Gap Evaluation, page ES-15, first paragraph, second sentence. Please check formatting.	Comment addressed.
			ES 3.4 Existing Monitoring Network and Data Gap Evaluation, page ES-15, first paragraph, fourth sentence. Please explain why small and large agricultural wells are not part of the current monitoring program.	Comment noted.
			ES 3.4 Existing Monitoring Network and Data Gap Evaluation, page ES-15, first paragraph, sixth sentence. Please specify how many monitoring wells are in the El Paso area, and provide a brief synopsis of the general trend of groundwater levels in this area.	Comment noted.
			ES 3.4 Existing Monitoring Network and Data Gap Evaluation, page ES-15, second paragraph, fourth sentence. Regarding Sand Canyon, prior to 2019 minimal maintenance occurred until Meadowbrook Dairy assisted in implementing a maintenance program. Please include a sentence to reflect that Meadowbrook Dairy is collaborating on maintaining and participating in the collection of critical surface water data as an in-kind service.	Comment noted.
			ES 3.4 Existing Monitoring Network and Data Gap Evaluation, page ES-15, third paragraph, last sentence. In addition to quantifying domestic well water use, domestic well information and water levels should also be included in the data gap analysis.	Comment noted.
			ES 3.4 Existing Monitoring Network and Data Gap Evaluation, page ES-16, first paragraph. Are the Seabees licensed by the State of California to design, drill, install and test monitoring wells? What licensed professional provided oversight of the Seabees work?	Comment noted.

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			ES 3.4 Existing Monitoring Network and Data Gap Evaluation, page ES-16, fourth paragraph, first sentence. Please explain how using limited aquifer property data could impact the predictive quality of the current groundwater model, and also how these uncertainties will influence both the current baseline model and any predictive future scenarios (reference Attachment 2).	Comment noted.
			ES 3.4 Existing Monitoring Network and Data Gap Evaluation, page ES-16, fourth paragraph. Please check formatting.	Comment addressed.
			ES 4.1 Sustainability Goal, page ES-16, first paragraph. Please explain why agricultural interests are excluded from the list.	No particular groundwater pumper or interest group was mentioned directly in the sustainability goal with the exception of NAWS China Lake, a particular and unique case. Agriculture interests are recognized as a part of the community.
			ES 4.2 Undesirable Results, page ES-17, third paragraph. Other than on NAWS property, where else is land subsidence an issue? Also, given the geographic specific SMCs (i.e. land subsidence within NAWS property, declining groundwater levels within the City of Ridgecrest), why was the concept of Management areas not implemented (reference Attachment 2)?	Comment addressed in Appendix 3-G.
			ES 4.3 Minimum Thresholds, Measurable Objectives and Interim Milestones, ES-9, third paragraph. Table references are incorrect, they are mislabeled and there are 5 tables not 4, please revise accordingly.	Comment addressed.
			ES 4.3 Minimum Thresholds, Measurable Objective and Interim Milestones, ES-19, Table ES-2. Please provide additional details as to who decided on the minimum threshold and interim milestones for groundwater removed from storage as this was not vetted by TAC.	TAC members reviewed the sustainable management criteria and had opportunity to comment on approach.
			ES 4.3 Minimum Thresholds, Measurable Objective and Interim Milestones, ES-20, Table ES-3. Please provide additional details as to who decided on the minimum threshold and interim milestones for groundwater removed from storage as this was not vetted by TAC. In addition, several of these wells have multiple wells installed (i.e. USBR 6 has three wells), is the author referencing USBR-06S, if so, please provide additional descriptions. Also, at selected representative monitoring sites, groundwater levels actually increase, why was this methodology selected?	TAC members reviewed the sustainable management criteria and had opportunity to comment on approach.
			ES 4.3 Minimum Thresholds, Measurable Objective and Interim Milestones, ES-20, Table ES-3 (Sustainable Management Criteria for Degraded Water Quality), should be referenced as Table ES-4. Recent groundwater sampling in Sand Canyon had TDS valued greater than 500 mg/L. Given this water quality will increase in TDS as it is percolated through the subsurface, is it reasonable to have TDS values less than 500 mg/L in this basin? Also, please explain in a table legend what ND stands for.	Comment noted.
			ES 4.3 Minimum Thresholds, Measurable Objective and Interim Milestones, ES-20, Table ES-5. How will SMC for land subsidence be controlled if NAWS increased pumping and/or is not willing to participate in the GSP implementation?	Comment noted.
			ES 5.0 Project and Management Actions, page ES-23, first paragraph. Please include additional explanations as to how Projects and Management Actions were vetted prior to being decided upon.	Comment noted. Projects and management actions were presented and discussed at multiple TAC meetings.
			ES 5.1 Management Action 1, page ES-23, first paragraph. How was the base period from 2010 to 2014 determined? The term "safe yield" is not defined and should not be part of this analysis, rather the sustainable yield should be evaluated based upon specific SMCs in order to evaluate how management actions will be implemented. Also, as detailed	Comment noted.

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			throughout this process, the 7,650 AFY is only an estimate based on a numerical model (which has errors). The allocation plan should be evaluated after collecting additional SMC specific data for a minimum of 5 years. Management Action 1 unfairly targets individuals that do not sit on the IWVGA board (which is primarily made up of non-pumper members). In addition, IWVGA board members selected who has a chance to participate in annual and transient pool allocation, which again is unfair to pumpers and members of the public.	
			ES 5.4 Project No. 3: Basin-Wide Conservation Efforts, page ES-26, first paragraph. The text should note that some Large Agricultural interest groups have also adopted conservation measures (i.e. pilot testing other crops).	Comment noted.
			ES 5.5 Project No. 4: Shallow Well Mitigation Program, page ES-27, first paragraph. The shallow mitigation program should not be implemented until additional data (i.e. groundwater levels, groundwater pumping, well construction, etc.) is collected, evaluated and then utilized to assess the implementation of developing Management Action No. 1 (reference Attachment 4).	Comment noted.
			ES 5.7 Project 6: Pumping Optimization Project, page ES-28, second paragraph. As agreed upon by most technically competent members of the IWVGA committees, current pumping in the North Brown Road area is sustainable; therefore landowners who purposely selected this area of the basin to operate are being unfairly forced from their property to allow for other users (who are determined by IWVGA board members) to move into this area and continue to operate. There are other management options that can be utilized to avoid this process (such as developing a physical solution among pumpers within the basin).	Comment noted.
			ES 5.8 Conceptual Projects Still Under Consideration, page ES-29. As detailed in our November 2019 comment letter (reference Attachment 5), there are additional conceptual projects that should be further studied, refined and evaluated rather than driving non IWVGA pumpers out of the basin. A summary of these projects could include: Utilize groundwater from the El Paso subarea (estimated to be approximately 4,000 AFY); pump and treat current de-designated area groundwater supply from NAWS property, utilize evaporative loses from Coso Geothermal field and SVM, evaluate projects for SVM to treat groundwater in Salt Wells Valley Basin or find alternative sources of useable groundwater.	Comment noted. Additional potential projects will be considered during the planning horizon.
			ES 6.0 Implementation Summary, page ES-30, first paragraph. Please provide further explanation on how undesirable impacts are being defined and identify where they are occurring.	Comment addressed in Section 4.3.
			ES 6.0 Implementation Summary, page ES-30, second paragraph, second sentence. There are, in fact, several reliable sources of water available, but unfortunately the IWVGA board has purposely chosen not to evaluate these other sources and given the lack of transparency has alienated all non-urban pumpers from developing a physical solution.	Comment noted.
			ES 6.2 Cost and Funding, page ES-32, Table ES-4 Estimated GSP Implementation Costs, should be referenced as Table ES-6. Please provide additional specific details as to how financially viable it will be to implement any of the Management Actions and Projects given the IWVGA's funding gaps and if NAWS is not required to participate in pumping fee. What will the cost impacts be to IWVWD customers and groundwater pumpers, and more importantly are these costs (estimated to result in an increase of several thousand dollars per year per household) realistic.	Comment noted.

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			SECTION 1 – INTRODUCTION **General Comments:** November 2019 Comment - Section 1.2 Sustainability Goal, page 1-3, second paragraph. The sustainability goal is to manage and preserve the IWVGB groundwater resources as sustainable water supply for all beneficial users. To the greatest extent possible, the goal is to preserve the character of the community, and beneficial users, preserve the quality.	Comment noted. Beneficial users are part of the community.
			November 2019 Comment - Section 1.4 Agency Information, page 1-5, second paragraph. Text should provide additional detail on whether the federal agencies are also voluntarily willing to comply with any decisions with the GSA to impose projects and management actions on federal land in order to ensure the basin is sustainable by 2040.	Comment noted and will be considered in future GSP updates. Federal agencies have governing authority over their managed lands; projects/management actions that may affect federal lands will be evaluated on a case-by-case basis during GSP implementation.
			November 2019 Comment - Section 1.4.1 (Organization and Management Structure of the IWVGA), page 1-5. Include additional details identifying notable exclusions of some beneficial users (i.e. agricultural and environmental interests, whether as voting or non-voting members) and the reason(s) why beneficial users were not included despite this group makes up more than 50% of the pumping in the basin.	Comment related to IWVGA policies, procedures, and/or legal positions and not specifically relevant to the GSP.
			Section 1.4.2 Legal Authority, page 1-8, first paragraph. Please further expand on why members of the IWVGA board (primarily comprised of non-pumpers) decided to exclude most pumpers and also have the powers to implement fees on pumpers that they are attempting to force out of the basin.	Comment related to IWVGA policies, procedures, and/or legal positions and not specifically relevant to the GSP.
			Section 1.4.2.2 Technical Advisory Committee (TAC), page 1-10, first paragraph. Please explain why TAC members were not given the opportunity to review specific sections of the GSP (i.e. 3, 4, 5, 6, the ES and reference Attachment 4) prior to the release of the complete draft GSP.	TAC members were given opportunity to comment on draft GSP sections as they were completed.
			Section 1.4.2.2 Technical Advisory Committee (TAC), page 1-11, first paragraph. This author disagrees with the statement regarding the incorporation of TAC comments into how GSP content was developed. There have been no written responses from the WRM to any technical comments (delivered through comment letters (reference Attachments 1 through 5). In addition, during the development of the draft GSP, there was no formal tracking of TAC specific comments and ultimately all TAC comments were vetted through the WRM (who works directly for the IWVGA board, again who are made up primarily of non-pumpers with).	Comment noted.
			November 2019 Comment - Section 1.5 Notice of Communication. Although the author references the C&E, DWR is also looking for summary documentation of all meetings, and examples of how all public meetings were advertised (including how specific technical content was distributed to non-English speaking members of the public).	Comment addressed in Section 1.5.
			November 2019 Comment – Why was the DWR Preparation Checklist not moved from the appendix and incorporated into this section to allow more efficient review by CA DWR?	Comment noted.
			Section 1.5.1 Public Outreach, page 1-19. Please include as an appendix a summary of the workshop activities, attendees and comments received. In addition, please replace the bullet format with a summary table, that lists the event, the data and the specific topics covered at the event.	Comment noted.
			SECTION 2 – PLAN AREA **General Comments:** November 2019 Comment - Section 2.5.2.1 (Kern County), page 2-17, first paragraph. Although the El Paso area is largely uninhabited and current groundwater demand does	Comment addressed in a previous GSP draft (see Section 2.5.2.1); at this time, it is assumed that existing groundwater supplies in El Paso cannot be sustainably extracted to meet demands due to the limited mountain front recharge to that area. This concept will be re-evaluated as more data becomes available.

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			not require "significant" groundwater extraction, given the increasing trends in groundwater levels to this area over the last decade, future "significant" groundwater extraction could be possible and should be further investigated for potential projects and management actions prior to enforcing perhaps unnecessary or insufficiently supported pumping allocations.	
			November 2019 Comment - Section 2.5.2.1 Kern County, page 2-17, Table 2-6. Please include a footnote to explain to the reader the designation of Limited Agriculture and Exclusive Agriculture.	Comment noted.
			November 2019 Comment - Section 2.7.1 Background, page 2-27, last paragraph. Please provide a reference to historic and recent studies regarding overdraft conditions in the basin. Are the current conditions a result of overdraft or removal of temporary surplus (or both)?	Comment noted. Historical hydrographs do not show the change in storage as a 'removal of temporary surplus', but as a trend of decreasing groundwater in storage.
			November 2019 Comment - Section 2.7.3 Conservation Programs, page 2-29. Please include a detailed section of both water efficiency and demand management measures and practices currently underway by large Agriculture (specifically to Alfalfa operations along north Brown Road).	Comment Noted.
			November 2019 Comment - Section 2.7.6 Groundwater Contamination Cleanup, page 2-37. Please provide additional details on all chemicals of concern (including chemicals per- and polyfluoroalkyl substances (PFAS)) and results of the 2017 sampling that turned up PFAS levels of 8 million parts per trillion (which are the highest in California, and one of the highest globally as noted in the report).	Comment noted and will be considered in future GSP updates and during GSp implementation.
			November 2019 Comment - Section 2.7.7.4 IWVGA Policies, page 2-42. Provide additional details on how the extraction fee was calculated.	Comment related to IWVGA policies and/or procedures and not specifically relevant to the GSP.
			Section 2.7.7.4 IWVGA Policies, page 2-44. Please provide specific details on the outreach efforts as part of IWVGA Ordinance 01-19 to reach out to non de minimis and de minimis extractors and based on best available data how many non de minimis and de minimis pumpers have failed to register their wells. In addition, explain the current management process for enforcement for unregistered groundwater extraction facilities.	Comment related to IWVGA policies and/or procedures and not specifically relevant to the GSP.
			Figure 2-4. Please add labels for all major streams, creeks and springs	Comment noted.
			Figure 2-5. Please distinguish between IWVWD pumping wells and CSD wells. Also, please include location of all wells including NAWS wells.	Comment noted. NAWS wells are not shown on Figure 2-5 protect the security of NAWS assets.
			Figure 2-14. Please include additional details (table insert) summarizing the status of the contaminated site (i.e. active, closed, groundwater, vadose zone, current monitoring activities, etc.).	Comment noted. See Appendix 2-A.
			Figure labeling needs to be consistent, as an example, Section 2 figure captions are located in the top right-hand side of the page, while figure captions for Section 3 are located on the bottom right hand side of the page.	Comment noted. Figures are formatted based on page size and orientation for consistent printing.
			SECTION 3 – BASIN SETTING General Comments: • Section 3.1 Introduction, page 3-1, third sentence. Please check formatting.	Comment addressed.

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			November 2019 Comment - Section 3.1 Introduction, page 3-1, first paragraph, third sentence. The descriptive HCM…will be used to describe basin setting "static" conditions. Why is the author using the word "static" here?	Comment addressed in Section 3.1.
			November 2019 Comment - Section 3.2 History of Water Use in the Indian Wells Valley, page 3-4, third paragraph. According to the data presented, peak groundwater usage occurred in 1985 (approximately 29,730 AF), not in 2007 (29,430 AF). In addition, significant conservation efforts were made by the Navy (60% reduction), Meadowbrook Dairy (35% reduction), but an increase occurred of 45% IWVWD. Please revise paragraph and tables to reflect peak water usage and conservation measures implemented by all beneficial groundwater users.	Comment addressed and corrections made to the table/text.
			Section 3.3 Hydrogeologic Conceptual Model, page 3-6, first paragraph. Please include a description why more recent geologic and hydrogeologic data (funded in part by CA DWR) was not utilized as part of the GSP (reference Attachment 1). In addition, please explain how this data will be incorporated into a revised numerical model and how current management decisions will be refined and or modified if revised modeling activities contradict the current model (that is not utilizing the most current data sets).	Comment addressed in previous GSP draft. See footnote 19, page 3-6. Recent geologic work will be considered in future GSP updates.
			November 2019 Comment - Section 3.3.1 (Geology and Hydrogeology), page 3-7, first paragraph, Figures 3-5a and 3-5b. Given the recent amount of new geologic and hydrogeologic information, and concerns about overdraft in this basin, the author should include more recent local geologic information (i.e. SkyTEM, supported financially by DWR and recent installation of new production wells, reference Attachment 1). Also please revise cross-section to be in color. Also provide more than just two cross-sections (the minimum required by SGMA). Additional cross-sections should be developed specifically through the North Brown Road Area and include at least one diagonal cross-section (either oriented Northeast-Southwest and/or Northwest-Southeast).	Comment addressed in previous GSP draft. See first paragraph of section 3.3.1. Recent geologic work and updated cross sections will be considered in future GSP updates.
			November 2019 Comment - Section 3.3.1 Geology and Hydrogeology, page 3-9, first paragraph. Please provide a more detailed description of the two principal aquifers (i.e. thickness) and how the applicable aquifer characteristics (thickness, permeability, etc.) change throughout the basin.	Comment noted. Thickness maps may be developed for future GSP updates.
			November 2019 Comment - Section 3.3.1 Geology and Hydrogeology, page 3-9, second paragraph. Regarding USBR (1993) slug test data. Typically slug tests are not very useful as they only represent a very small area within the vicinity of the test location. A sentence should be included to reflect the value of this data.	Comment addressed in previous GSP draft. See footnote 22.
			Section 3.3.2 Soils, page 3-10, second paragraph. Please include Bullard et al 2019 report into the appendix. As required by SGMA, all reference material used to support the GSP must be included.	May 2019 document has been added to the DMS library (IWVGSP.com) and is available for public access and download.
			Section 3.3.3.1 Climate and Precipitation, page 3-11, second paragraph, first sentence, please check spelling.	Comment addressed.
			Section 3.3.3.1 Climate and Precipitation, page 3-11, second paragraph, last sentence. Text states annual precipitation by water year, but reference (No. 26) indicated data by water year were not available. Please clarify and resolve. As detailed under SGMA, this data should be reported as the average for 1980 through 2010 as water year (per DWR) and not calendar year.	Comment addressed and text clarified.
			November 2019 Comment - Section 3.3.3.1 Climate and Precipitation, page 3-11, second	Comment addressed in previous GSP draft. See Figure 3-9.

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			paragraph, Figure 3-9. A paragraph should be included to explain whether the information illustrated on Figure 3-9 was used to select the historical water budget period. Also, these plots should be redone to report data in water years and not calendar year per GSP regulations.	
			Section 3.3.3.2 Streamflow and Mountain Front Recharge, page 3-11, first paragraph. Please provide all streamflow data, analysis type (including calculations), field notes, as an appendix for all stream gauging.	Streamflow data is available with links to data source on the DMS website.
			November 2019 Comment - Section 3.3.3.2 Streamflow and Mountain-Front Recharge, page 3- 13, first paragraph. Mountain front recharge is difficult to quantify and estimate and often has a lot of uncertainty associated with it. Please reference current work on mountain front recharge as part of the Antelope Valley adjudication and provide revised documentation utilizing current methodologies using all recent data (the author should not rely exclusively on others' work).	Mountain front recharge addressed in model documentation. See Appendix 3-H. The topic of mountain-block recharge is fully described by McGraw et al. (2016) and was discussed with the Model Ad Hoc Group of the IWV Technical Advisory Committee. Comment noted and will be considered in future GSP updates.
			November 2019 Comment - Section 3.3.3.2 Streamflow and Mountain-Front Recharge, page 3- 14, first paragraph. Is there data that proves the statement "There are no significant interconnected surface water systems"? To exclude this SMC, GSP needs to have data to support this. The use of the phrase".......no significant....." implies there are interconnected surface-waters, yet in the opinion of the author they are not significant. They either are or are not interconnected surface waters.	Comment noted.
			Section 3.3.3.2 Streamflow and Mountain-Front Recharge, page 3-14, if influent steam TDS concentrations are greater than 500 mg/L is it not realistic to have SMC for water quality set lower than 500 mg/L.	Comment noted.
			November 2019 Comment - Section 3.3.3.2 Streamflow and Mountain-Front Recharge, page 3-14, first paragraph, fourth sentence "The IWVGB has many natural springs....." if the basin contains springs, then it contains interconnected surface water.	Comment noted.
			Section 3.3.4 Water Budget and Overdraft and Overdraft Conditions, page 3-15, first paragraph. Please include a section detailing in plain language terms what a water budget is (i.e. Water budgets are similar to a bank account in that there are inflows, outflows, and a change in the bank account balance or storage. Inflows and outflows in the hydrologic system are largely driven by processes occurring on the land surface. Within the Subbasin, these inflows and outflows aredominated by land use).	Comment addressed in Section 3.3.4.
			Section 3.3.4.1 Water Budget Elements, page 3-16, first complete paragraph. The USGS BCM model has been issued as a draft and given the large range in recharge estimates would be very useful for this GSP. Please include USGS even as an estimate to Table 3-4	The USGS BCM model draft was not approved by the TAC model ad hoc, so draft results were not included.
			Section 3.3.4.1 Water Budget Elements, page 3-16, Table 3-4. Given the range of recharge estimated, baseline model runs should utilize a range, and not just rely on a single recharge estimate, developed by NAWS sub-contractor (reference Attachment 1).	Different recharge estimates were considered (and modeled by DRI) during TAC model ad hoc review. This value (7,650 AFY) was agreed to for planning model runs.
			Section 3.3.4.1 Water Budget Elements/Groundwater Pumping, page 3-17, first paragraph. Please provide data as appendix that summarizes the analysis conducted utilizing the McGraw et al. 2016 reference.	The annual data from 1975 to 2016 are included as Appendix 3-A.
			Section 3.3.4.1 Water Budget Elements, page 3-20, second paragraph. With all the various sources of groundwater pumping data described and the known error through the reporting process in previous sections, please provide detail on what quality control measures were implemented, and how this author's comparisons of pumping estimates made over time periods were common to each of the investigations? Also, how did	Pumping volume verification will be addressed during plan implementation

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			previous studies vary and compare to the Cooperative Group's historical data? Please include additional details on this information in the text and include all analysis as an appendix (reference Attachment 2).	
			November 2019 Comment - Section 3.3.4.1 Water Budget Elements, page 3-20, third paragraph. How was the domestic wells residence average of 1 AFY determined (reference Attachment 2)? This should be explained and also how do pumping volumes vary over time. Same comment applies to water use by mutuals and co-ops. Footnote 13 should be expanded upon and included into this paragraph.	Pumping volume estimates for domestic, mutual, and cooperative wells are addressed in the Shallow Well Impact Analysis, Appendix 3-E.
			November 2019 Comment - Section 3.3.4.1 Water Budget Elements, page 3-18, fourth paragraph. The previous paragraphs sound exclusively promotional for the Navy while a similar tone and content is not provided other non-IWVGA members. There is no mention of the reduction in ag pumping from 1985, 2007 or 2015 like there is for urban discussion or the Navy, why not?	Comment addressed to include more statistics and trends.
			November 2019 Comment - Section 3.3.4.1 Water Budget Elements, page 3-19, second paragraph the last sentence of this paragraph is not supported by any information provided to support it. Unless there is relevant agreed upon information available, please remove the sentence "unless restricted, agricultural use is expected to increase significantly", as this is not necessarily true.	Comment addressed. This originated from the baseline estimates provided by agriculture.
			November 2019 Comment - Section 3.3.4.1 Water Budget Elements, page 3-19, second paragraph. Does the current ET value vary on an annual basis? If so, a range should be presented along with any variations associated with dry versus wet climatic conditions.	Comment noted. This revision can be considered with model trend tables in future GSP updates
			November 2019 Comment - Section 3.3.4.2 Historical Water Budgets, page 3-21, Table 3-6. The historical water budget spans almost 100 years and does not account for any temporary surplus. This is not a representative period of analysis for evaluating a SGMA historical water budget period because the selection of this long of a period includes different cultural conditions that have occurred over that time frame. This selection of such a long-time frame is not consistent with industry practice in the selection of a representative period that represents average annual historical conditions.	Table 3-6 contains the historical calibration period. Table 3-7 provides the recent historical (2011-2015) summary, representative of current conditions.
			November 2019 Comment - Section 3.3.4.2 Historical Water Budgets, page 3-21, first paragraph. Revise first sentence from "extractions increased" to "extractions occurred." In addition, please explain whether the IWVGA has considered the process described in this paragraph to be related to removal of temporary surplus rather than an overdraft condition.	Comment noted. The pumping data available show an increase in groundwater production. Historical hydrographs do not show the change in storage as a 'removal of temporary surplus', but as a trend of decreasing groundwater in storage.
			Section 3.3.4.2 Historical Water Budgets, page 3-21, Table 3-6. Since there is still outflow from the basin (ET and Interbasin Subsurface Flow), which is similar to what happened in San Fernando), IWVGA should conduct an analysis and consider whether this reduction in storage is not overdraft but removal of temporary surplus.	Comment noted. The pumping data available show an increase in groundwater production. Historical hydrographs do not show the change in storage as a 'removal of temporary surplus', but as a trend of decreasing groundwater in storage. Part of data gap analysis and well drilling is to study outflow to Salt Wells Valley and ET.
			November 2019 Comment - Section 3.3.4.3 Current Water Budget, page 3-22, first paragraph. For GSP purposes, the "current water budget" follows the historical water budget; it is not a subset of the historical water budget. Since the historical water budget used for the GSP was 1922 through 2016, it is not clear why the current water budget should be 2011 to 2015. In addition, the 2011 through 2015 period corresponds to an extremely dry period in California history and any review of groundwater levels or water budgets is going to show dramatic declines. The selection of this period appears to be a case of "pick a period and pick your answer".	Comment noted. The groundwater levels do not show an increase in the rate of decline during these years compared with previous (wetter) years. The period was picked to show recent conditions, ending 2015, DWR's planning year.

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			November 2019 Comment - Section 3.3.4.4 Overdraft Conditions, page 3-22. If there is still outflow from the basin to Salt Wells Valley and extensive ET still occurs at the playa, IWVGA must consider whether this is a removal of temporary surplus, and not overdraft.	Historical hydrographs (see DMS on IWVgsp.com) do not show the change in storage as a 'removal of temporary surplus', but as a trend of decreasing groundwater in storage.
			Please provide basin wide figures illustrating groundwater elevations for select periods (dry, wet, historic, current, change in groundwater elevation) utilizing all known data sets. Do not just rely on work by others, the author should utilize their own interpolations and include adequate details (utilizing linear and color contour statistical methodologies).	Comment addressed in Appendix 3-E, Shallow Well Impact.
			Section 3.3.4.4 Overdraft Conditions, page 3-23, second paragraph. As mentioned, several times throughout our review of the GSP development process, USBR-6 is not a single well, this location has three different wells, each screened at a specific interval. For the last 5 years, groundwater levels have been stable at the USBR-6S location. There are two other well depths, but they are screened below all major pumping depths in this area. Based on this data, is it rationale to defend that current pumping volumes in and around the Brown Road area are not operating sustainably? Please revise the text to provide a more comprehensive analysis of all wells detailed in this section.	Comment noted and may be considered in future GSP updates
			November 2019 Comments - Section 3.3.4.4 Overdraft Conditions, page 3-22, first paragraph, last sentence. Disagree with the author, as you are using a historically dry period, coupled with a period of temporary surplus to conclude overdraft occurs. In addition, the current water budget period should follow historical water budget period, not be part of it (reference GSP Best Management Practices).	Historical hydrographs do not show the change in storage as a 'removal of temporary surplus', but as a trend of decreasing groundwater in storage.
			Section 3.3.4.4 Overdraft Conditions, page 3-25. Please include text that details the most current estimated available storage from both the DRI model and recent WRM evaluation. Recent preliminary investigations by others have estimated that usable amount of available storage could exceed 10 million AF.	Comment noted and will be considered in future GSP updates
			Assuming there is approximately 10 million AF of groundwater in storage, and the cumulative change in storage has been approximately 620,000 AF since 1992 (23-year period); this cumulative change in storage, which includes both representative dry and wet years, reflects a rate of approximately 0.3% per year. It would not be reasonable to expect that the available groundwater in storage would be exhausted over any foreseeable time period.	Comment noted and will be considered in future GSP updates
			Section 3.3.5 Sustainable Yield, page 3-26, first paragraph. Please provide written documentation where the IWV TAC estimated the long-term average natural recharge to be 7,650 AFY (reference Attachment 1). Several members of the TAC agreed to a range for recharge and attempted to utilize a range as well as sustainable management criteria into analysis (see Attachment). Please remove reference to TAC.	Comment addressed in Section 2.4.3 of Appendix 3-H. The volume of natural recharge was determined by the TAC model ad hoc group at a workshop with DRI on 8/29/2018 and presented to the TAC fall 2018. Modeling was completed on two different recharge rates, and particle tracking was completed by DRI to validate the recharge estimate and travel times. This model workshop was added as a footnote.
			November 2019 Comment - Section 3.3.5 (Sustainable Yield), page 3-26. Please include details on what the estimated sustainable yield would be if climate change is incorporated (as required by SGMA, reference Attachment 4)?	Comment noted.
			November 2019 Comment - Section 3.3.5 Sustainable Yield, page 3-27, Table 3-8. Regarding Outflows, specific to ET. The ET should be separated out to differentiate between ET from vegetation versus ET from China Lake Playa. ET from China Lake is water that could instead be captured by increasing extraction, thereby removing surplus and	Comment noted.

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			increasing aquifer storage space. This is water that is being wasted unless it is meeting a reasonable and beneficial use.	
			November 2019 Comment - Section 3.3.5 Sustainable Yield, page 3-27, Table 3-8. Regarding Outflows, specific to Extractions. Provide information on extraction by water use sector (ag, urban, domestic, and other).	Comment noted. This is a planning number without a disaggregation to water use
			Section 3.3.5 Sustainable Yield, page 3-27, Table 3-8. Regarding Change of Groundwater Storage. This increase of -4.080 AFY in aquifer storage depletion indicates that sustainability is not being projected beyond 2040 on an annual basis. As described in the text, the water budget is not intended to be a direct measure of sustainability, instead sustainability indicators are used. Given this fact, please incorporate this context into the overall long-range plan on this basin, i.e., focus on sustainability indicators in specific areas of the basin, and then adjust the specific management actions to meet the sustainability metrics without specifically targeting large agriculture where in certain parts of the basins are actually operating (pumping) without having an negative impact on groundwater levels (i.e. USBR 6S groundwater levels are stable).	Comment noted.
			Section 3.3.5 Sustainable Yield, page 3-29. The formulation of the water budget should be separated into a ground-surface water budget and a groundwater budget to clarify the water budget dynamics of the basin, or the author could potentially have more sustainable yield in order to reduce the amount of outflow via ET and subsurface flows to Salt Valley to near zero. Please include the equation that was used to estimate sustainable yield. Currently, the author is only assuming that recharge equals sustainable yield when in reality water lost to ET and outflow to Salt Valley should be included. DWR's Draft BMP also indicates that reducing pumping to an estimated basin-wide average annual recharge does not equate to sustainability.	Comment noted.
			Section 3.3.5 Sustainable Yield, page 3-29. Why did the author not include climatic variability over the 50-year planning horizon?	Comment noted and will be considered in future GSP updates.
			Section 3.4 Current and Historical Groundwater Conditions and Hydrology, page 3-28, second paragraph, third sentence. Please check formatting.	Comment addressed.
			Section 4.4.1 Reduction of Groundwater Storage. Overdraft is noted to be occurring in specific areas of the basin (as noted in text developed by the GSP author in section 3.4.2); however please include a detailed section on why specific management areas and/or zones were not developed to allow for specific problem areas to be managed separately and not impact areas that are currently operating in a sustainable manner (reference Attachment 2).	Management Areas will be evaluated further in future GSP analysis to address changes in different regions of the aquifer.
			Section 4.4.2 Chronic Lowering of Groundwater Levels. Please provide a figure in the main text that illustrates where in the basin groundwater levels are experiencing "significant" declines and also please define "significant". As denoted above, groundwater levels currently being measured by non-GSA board members indicate that groundwater levels are relatively stable (i.e., not significantly declining" and in fact at least two wells that are currently being monitored as part of this GSP are relatively stable).	Comment addressed in in Figure 3-12 and Appendix 3-E (Shallow Well Impact) to show groundwater level declines. The map displayed as Figure 6 in Appendix 3-E shows the limited area where measured groundwater levels have not declined between 2010 and 2015.
			Section 4.4.2 Chronic Lowering of Groundwater Levels. Please include a section detailing the location of all domestic wells where groundwater elevation was collected and provide a summary table of how water levels have changed through time. Given several	The current semiannual monitoring program has approximately 60 domestic wells where groundwater levels are measured. Appendix 3-E summarizes the available data and

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			statements in the GSP documentation are made about domestic well water levels being impacted from pumping, it is crucial the GSP author provide defensible data to support these statements.	analysis for shallow well impacts. The domestic well database is being refined and will be will continue to be update as data becomes available.
			Section 4.4.2 Chronic Lowering of Groundwater Levels. Please include a section detailing the location of all domestic wells where groundwater elevation was collected and provide a summary table of how water levels have changed through time. Given several statements in the GSP documentation are made about domestic well water levels being impacted from pumping, it is crucial the GSP author provide defensible data to support these statements.	Location of monitored domestic wells (without well owner names for privacy), and measured groundwater levels are on the IWVgsp.com website that contains the DMS.
			Section 3.4.4 Groundwater Quality Conditions, page 3-30. Please include a section detailing the location of all domestic wells that were sampled for water quality and provide a summary table of how that water quality has changed through time. Given several statements in the GSP about domestic well water levels and water quality being impacted from pumping, it is crucial the GSP author provide defensible data to support these statements.	Background TDS, general chemistry sampling was recently completed as part of Prop 1 funding. These data will be incorporated in future analysis and GSP updates.
			November 2019 Comment - Section 3.4.5 Land Subsidence, page 3-33. Please include additional details on actions the Navy is planning to implement to avoid increasing further land subsidence and also provide a detailed approach on how applicable changes to Navy and other pumping would impact other relevant SMC's.	Comment noted and will be considered in future GSP updates.
			November 2019 Comment - Section 3.4.7 Groundwater-Dependent Ecosystems, page 3-34. Please include additional details on actions the Navy is planning to implement to avoid impacting GDE's which are located primarily if not entirely on Navy property.	The relationship of groundwater levels and GDE health has been identified as a data gap and will be addressed when implementing the GSP.
			Section 3.4.7 Groundwater-Dependent Ecosystems, page 3-34. Please include a section detailing what other ecological conditions were assessed to determine the conservation value of potential GDE's. Were critical habitats evaluated?	The relationship of groundwater levels and GDE health has been identified as a data gap and will be addressed when implementing the GSP.
			Section 3.5.1 Initial Model Document, page 3-36, second paragraph. As described in the text, DRI developed the model for NAWS prior to the formation of the TAC, please note this in the text.	Comment addressed.
			Section 3.5.2 Flow Model Review and Recalibration. Although the TAC model-ad hoc group had the opportunity to review model documentation, no review occurred of any of the model input or output files. In addition, as discussed during several technical meetings, there was no willingness to adjust the structural architecture of the model, which is known to be flawed. Also, please include a statement that described how quality control was maintained within the DRI model team, after the departure of the primary model leader and what QA/QC processes were implemented by the GSP author to ensure technical data related to the model were simulated correctly. Did the GSP author review all input model files prior to implementing a specific model simulation?	Comment noted and will be considered in future GSP updates
			Section 3.5.4 Baseline Conditions, page 3-43, first paragraph the "current" baseline model developed for the initial modeling scenarios, should not be considered a true baseline scenario (reference Attachment 4). For the "current" baseline period, a request was made by the WRM to selected producers to estimate potential future pumping over a 50-year period (factoring in growth). This information was compiled and utilized by the WRM in the current groundwater flow model. Subsequent model scenarios have been compared to this "current" baseline model run. Recommend that a "revised" baseline model	Comment noted and will be considered in future GSP updates

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			scenario be developed in accordance with the GSP Regulations. The exact development of how pumping rates in the "revised" baseline model scenario should be discussed further.	
			Section 3.5.4 Baseline Conditions, page 3-43, Table 3-10. Please insert a description as why future climatic conditions were not incorporated into the baseline simulation.	Comment noted.
			November 2019 Comment - Section 3.5.5 Numerical Model Scenario 6.2, page 3-44. Concerns with Scenario 6 (as well as Scenarios 3-5) have been extensively documented in the public record (reference Attachment 4), but largely remain unaddressed and unresolved. Scenario 6.2 includes many built-in assumptions, including for example, imposition of groundwater pumping allocations that require Meadowbrook and other large producers to cease production over a given time period, relocating the IWV Water District's pumping locations to very area of the Basin from which Meadowbrook and others would be eradicated, and importing water, all of which are more accurately described as Projects and Management Actions, and many of which are objectionable, not fully vetted and not agreed upon. Scenario 6.2 is, in other words, more accurately described as a Project and Management Action model scenario, and not a valid framework for a GSP. At a minimum, individual PMA's should instead be specifically identified, detailed in their assumptions, vetted for feasibility and consensus, and then compared to a revised baseline scenario, before being considered for inclusion or implementation in a GSP. As described under the GSP regulations, PMA's should be developed to address sustainability goals, measurable objectives, and undesirable results identified in the Basin. The PMAs developed for the GSP should consider reducing the potential socioeconomic impacts associated with actions required to sustainably manage groundwater in the Basin.	Comment noted. See Section 5.2.1. No groundwater pumpers, including agricultural pumpers, will be prohibited from pumping groundwater as a result of the allocations. Pumping above a pumper's allocation of the safe yield or the transient pool will be subject to an augmentation fee.
			November 2019 Comment - Section 3.5 Numerical Groundwater Model. All documentation related to the model should be included as an appendix. In addition, please provide more details to how the groundwater model is related to the current conceptual understanding of the basin, and where there are known issues where the current flow model does not represent the current conceptual understanding of the basin (i.e. along north Brown Road, Layer 1 in current flow model does not accurately represent the actual lithology (the model underestimates the actual thickness, which would then overestimate the amount of drawdown occurring from pumping in that area). As detailed during several TAC meetings, current groundwater levels (i.e. USBR 6) in North Brown Road have not changed since approximately 2010. Current pumping in the North Brown Road area is estimated to be greater than 15,000 AFY, and recent groundwater data (i.e. USBR 6S, on-going monitoring by large Ag) has not decreased, suggesting that the sustainable yield in the North Brown Road area could be greater than 15,000 AFY. In addition, the El Paso area has increased groundwater levels over the last decade, which by some preliminary estimates equates to approximately 1,000 to 4,000 AFY of additional recharge. This additional recharge could be utilized to supplement existing supplies. Please include a discussion of this and add as a project Concept in Section 5. The potential use of such additional recharge should be seriously considered in informing any "allocation" scheme.	Model documentation is included as Appendix 3-H. Referenced material is available on the DMS website IWVgsp.gov. Many wells along north Brown Road, (shallow, Layer 1) show declining groundwater levels (see DMS website for hydrographs and Appendix 3-E for figure showing areal extent of groundwater level declines). Comment noted and will be considered in future GSP updates.

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			November 2019 Comment - Section 3.5.5 Numerical Model Scenario 6.2, page 3-44, Management Action No. 1. Please explain in more detail how the allocations over a 20-year period to 2040 were determined, how was the "highest beneficial use determined", and why was the highest continual pumping from 2010 to 2014 used for domestic and municipal pumping (which was also an extremely dry period in California).	The total annual pumping and the distribution of the annual pumping by water use group assumed for Modeling Scenario 6.2 is shown in Table 3-11 for the years 2020, 2040, and 2070. Management Action No. 1 will allocate the safe yield of the basin. It will not allocate pumping. No groundwater pumpers will be prohibited from pumping groundwater as a result of the allocations.
			Section 3.5.5 Numerical Model Scenario 6.2, page 3-46, last bullet summary item. Although the GSP author considers projects 3, 4 and 5 not relevant, it is critical to at a minimum explain what these Projects included. Please refine and modify text accordingly.	Projects 3, 4, and 5 are described in section 5.3. Scenario 6.2. is the model scenario that simulates the proposed projects and management actions.
			November 2019 Comment - Section 3.5.5 Numerical Model Scenario 6.2, page 3-46, Table 3-11. Why would agricultural water use necessarily increase from 42% (in 2020) to 56% (in 2070)? Please include text to explain or correct error.	Comment addressed.
			November 2019 Comment - Section 3.5.6 Climate Change, page 3-47. Section 354.18(c)(3) of the GSP regulations require climate change be considered. Model inputs for climate projections should be developed using guidelines outlined in the DWR "Guidance for Climate Change Data Use During Groundwater Sustainability Plan Development" document (DWR, 2018).	USGS BCM climate change analysis was inconclusive. Comment noted and will be considered in future GSP updates.
			Section 3.5.6 Climate Change, page 3-47. Please include a section in the text on how model uncertainty due to climate change was evaluated.	Comment noted.
			November 2019 Comment - Management Areas Section should be included as detailed in DWR Annotated outline – Please provide a detailed explanation of why management areas were not evaluated and were not determined to be appropriate for this basin to help facilitate groundwater management by the different water use sector, geology and aquifer characteristics. Multiple requests and suggestions were made from TAC members and the public to consider management areas (Attachment 2).	Management Areas will be evaluated further in future GSP analysis to address changes in different regions of the aquifer.
			Section 3.6 Existing Monitoring Network and Evaluation, page 3-47. Why is this section included here? This section should be moved to Sustainability Management Criteria Section (as detailed in DWR annotated guideline document).	Comment noted.
			Figure 3-2. Specific contour lines are not legible on this figure, please revise. In addition, a digital elevation map should also be included to help the reader better visually illustrate the topography of this area.	Comment noted. USGS topographic map is available as a background on the DMS' IWVgsp.com website.
			Figure 3-4a. Please provide additional cross-sections as requested (reference Attachment 5).	Comment noted and will be considered in future GSP updates.
			Figure 3-5a and Figure 3-5b. Revise figure format to include color and utilize 11 X 17 format. Also, please include the original geophysical logs (as an overlay) next to the lithology for each well.	Comment noted and will be considered in future GSP updates.
			Figure 3-5b. As detailed in Figure 3-5a, please include where NAWS area is depicted in the figure.	Comment addressed.
			Figure 3-9. As detailed in the cumulative departure curves from China Lake, 2010 – 2015 indicates a dry year, and not an average year, and therefore the methodology used to develop the baseline model scenario, and proposed allocation concepts are technically flawed.	Comment noted.
			Figure 3-10. Please provide similar hydrograph data for all creeks that are currently being monitored, including Sand Canyon.	Data is accessible on the DMS' IWVgsp.com website. https://iwvgsp.com/surface-sites/surface_info.php?ID=20000001 Comment noted and will be considered in future GSP updates.

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			Figure 3-12. As detailed by the hydrographs, groundwater levels measured from USBR-06 shallow have been stable since approximately 2010 and USBR-10 groundwater levels from all depths have been stable since 2000. Please include additional details on this figure to illustrate the change in groundwater elevation for all key wells. Also, please include at least 5 other contour figures (1995, 2000, 2005, 2010), developed by WRM that include the entire area. Please do not rely solely on others work. Also, please include at least four figures that illustrate the relative change in groundwater levels (i.e. from 2000 to 2005, 2005 to 2010, 2010 to 2015, and 2000 to 2015).	This figure shows measured groundwater levels from multi-level monitoring wells and 2015 groundwater level contours. Other measured groundwater level data are accessible on the DMS' IWVgsp.com website.
			Figure 3-13. Based on recent water quality data, TDS values in the shallow wells from USBR-6, USBR-10, NR-2, USBR-5 (located in primary ag pumping areas) and NACC-71 have not shown any significant increase in TDS values since at least 1995. MW TTBK-MW12 (located on NWAS property) has shown significant increase in TDS. Please address this comment.	Commented noted. Background TDS, general chemistry sampling was recently completed as part of Prop 1 funding. These data will be incorporated in future analysis and GSP updates
			Figure 3-19. As discussed above, because of the errors in the original structural architecture of the model, and where pumping has been assigned, the model currently overestimates pumping impacts.	Comment noted and will be considered in future GSP updates.
			Figure 3-22. Baseline annual and cumulative plots are misleading, as illustrated this baseline is not a true baseline scenario (please include a footnote to identify the assumptions, reference Attachment 2, 3 and 5).	The baseline used in this study is defined in Section 3.5.4. Changing the Baseline will be considered in future GSP updates.
			SECTION 4 – SUSTAINABILITY MANAGEMENT CRITERIA **General Comments:** November 2019 Comment - Revise entire Section 4 to follow DWR GSP annotated outline as agreed upon among the TAC and WRM. As an example, why are undesirable results presented prior to measurable objectives and minimum thresholds?	Comment noted.
			November 2019 Comment – Please include a general summary table for sustainable management criteria. The summary table should include the Sustainability Indicator, Minimum Threshold, Measurable Objective and Undesirable Result.	Comment addressed in Section 4.6 and Tables 4.3, 4.4, 4.5, and 4.6.
			As noted in Section 3, data gaps and uncertainty are known to exist in the characterization of the hydrogeologic conceptual model and groundwater conditions. Please explain how this uncertainty was considered when developing the sustainable management criteria and how these uncertainties could impact the SMCs presented in this section.	Comment noted.
			Section 4.2.3 Sustainability Measures, page 4-4. Please include a description of how sustainable management criteria were developed using information from interested parties and public input.	Comment addressed in Section 1.5.
			Section 4.2.4 Explanation of How Goal will be achieved. Why is the GSP author including a description of PMA before they are introduced? Remove all reference to PMAs and include language that ensures the Plan area meets its sustainable goal by 2040, the GSA proposed projects and management actions (PMAs) described in Chapter 5, to address undesirable results. The projects and PMAs proposed include augmentation projects and management actions that optimize groundwater use in the Subbasin. The sustainability goals will be maintained through proactive monitoring and management by the GSA as described in this and the following chapters"	Comment noted.
			Section 4.2.4 Explanation of How Goal will be Achieved, page 4-5, first bullet. Why is the GSP author constantly dismissing water conservation efforts currently being implemented by other users, i.e. large agriculture?	Comment noted.

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			Section 4.3 Undesirable Results, page 4-7. There is no reference in the introduction in regard to all beneficial use type, please include a statement (as required by GSP regulations).	Comment noted.
			Section 4.3.1 Cause of Undesirable Results, page 4-8, last paragraph. Baseline conditions are referenced as no action, but this baseline as defined is not realistic (Attachment 3, 4 and 5). A realistic baseline model scenario (utilizing realistic, peer-reviewed data that follows GSP regulations) should be run. As is, the Baseline condition detailed in this report is not realistic and will affect all additional model results and impacts on how various SMCs are set	The pumping assumptions, in particular the annual pumping volumes, in the Baseline scenario were developed directly by the stakeholders and pumper groups and represents the best available data available to the IWVGA at the time of development. The pumping data and the baseline model scenario were discussed with the TAC on multiple occasions. Baseline condition scenario results are used as a comparison to model results simulating the proposed projects and management actions (Scenario 6.2); however, baseline results are not used to directly establish Sustainable Management Criteria. See Section 4.
			Section 4.3.1.2 Criteria to Define Undesirable Results, page 4-9, second paragraph. Regarding the reference to the NAWS letter, given the concern of encroachment concerns, please state what actions NAWS is taking to reduce those concerns (e.g. what PMA are they willing to support financially).	Comment noted.
			Section 4.3.1.2 Criteria to Define Undesirable Results, page 4-9. Again, using the incorrect baseline model scenario will result in overestimating impacts to domestic wells. A baseline model scenario that complies with GSP regulations should have been used. In addition, given the current structural architecture of the model, pumping is overestimated in the upper aquifer (which is were all domestic wells are screened). The domestic well analysis utilized groundwater elevation contours prepared by others and relied on "hear say" from well owners and did not utilize any peer-reviewed verified data and should be considered as a preliminary analysis, which will be further expanded up during GSP implementation.	The Baseline scenario were developed directly by the stakeholders and pumper groups and represents the best available data available to the IWVGA at the time of development. The pumping data and the baseline model scenario were discussed with the TAC on multiple occasions.
			Section 4.3.2.1 Cause of Undesirable Results, page 4-10. As detailed in previous comments, the current Baseline (no action) is not realistic and should be modified to a realistic baseline condition in compliance with GSP regulations as all subsequent SMC criteria (i.e. land subsidence) based on this scenario are not accurate (reference Attachment 3, 4 and 5).	The Baseline scenario were developed directly by the stakeholders and pumper groups and represents the best available data available to the IWVGA at the time of development. The Baseline condition scenario results are used as a comparison to model results simulating the proposed projects and management actions (Scenario 6.2); however, baseline results are not used to directly establish Sustainable Management Criteria, and particularly were not used to develop land subsidence Sustainable Management Criteria. See Section 4.
			Section 4.3.2.1 Cause of Undesirable Results, page 4012, first bullet. Other than NAWS related pumping, what other beneficial users have control on inducing potential land subsidence?	All pumping and IWVGB overdraft can contribute to potential land subsidence.
			Section 4.3.3.1 Cause of Undesirable Results, page 4-12. Given the concern of elevated TDS concentrations, please identify where these are occurring and explain why management areas were not implemented to help manage these specific areas (reference Attachment 2).	Comment noted.
			Section 4.3.4.2 Criteria to Define Undesirable Results, page 4-14. Given that land subsidence is primarily occurring on NAWS property, potential effects are constrained to this area of the subbasin, and NAWS is not required to participate in SGMA, how can land subsidence be alleviated by non-NAWS pumping? A groundwater management area concept could have allowed for local control to help alleviate these area specific problems (reference Attachment 2). Please include a description of management areas was not implemented and who decided that.	Comment noted.
			Section 4.4 Minimum Thresholds, page 4-15. Please revise this section to align with GSP	Comment noted. The GSP proposed monitoring network is in Section 4.

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			Annotated Outline, i.e., Measurable Objectives should be first, followed by Minimum Thresholds and then introduce Undesirable Results. In addition, the Monitoring Network detailed in Section 3 should be moved to Section 4.	
			Section 4.4.1 Reduction of Groundwater in Storage Minimum Threshold. Since Groundwater levels serve as a proxy for storage, groundwater level minimum thresholds should be presented prior to groundwater storage.	Groundwater levels are not proposed to be used as a proxy for groundwater in storage. Groundwater levels will be used along with other IWVGB data to calculate the change in storage.
			Section 4.4.1 Reduction of Groundwater in Storage Minimum Thresholds. As required by GSP regulations, Minimum thresholds for reduction of groundwater storage shall be calculated based on historical trends, water year type and projected water use. Reduction in storage in not a parameter that can be directly measured; rather, change in storage should be calculated from change in change in groundwater levels and aquifer material. The numerical model is one tool, but please utilize additional analysis to evaluate. As an example, develop spatially weighted average differences of groundwater levels and model derived storage	Comment noted.
			November 2019 Comment - Section 4.4.1.7 Method of Quantitative Measurement, page 4-19. For comparison purposes, please provide the Theissen weighted average polygon method to historic and current groundwater conditions and include a detailed description and figures in Section 3. This information will then inform the baseline comparison and can be utilized to assess the impacts of future project management actions into the future	Comment noted.
			Section 4.4.2.6 Representative Monitoring Sites, page 4-23, Table 4-1. Please clarify that USBR- 06S is the well be designated as the monitoring well, not just USBR-6.	Comment addressed.
			Section 4.4.2.6 Representative Monitoring Sites, page 4-23, Table 4-1. Include a column detailing the proposed baseline water surface elevation for each well.	Comment noted.
			Section 4.4.2.6 Representative Monitoring Sites, page 4-23. Please reference an appendix that contains hydrographs from which minimum thresholds were developed.	Comment noted.
			Section 4.4.3.1 Criteria Used to Establish Minimum Thresholds, page 4-24, first paragraph. SGMA water quality objectives focuses on a constituent's contribution due to activities at the land surface rather than on the presence of naturally occurring constituents. Please provide additional details on what information was reviewed to develop TDS as a constituent	Comment noted.
			November 2019 Comment - Section 4.4.3 Degraded Water Quality Minimum Thresholds, page 4- 24, second paragraph. Please provide further justification on why the author is increasing minimum threshold values to 600 mg/L and 1,000 mg/L in areas with poor water quality. In addition, water quality data for current agricultural wells have not significantly changed since the early 1990's. Significant data already exists to determine minimum thresholds in this area and should also be derived based on beneficial usage. Please explain how postponing the establishment of minimum thresholds impacts proposed management actions and projects— including potentially imposing severe groundwater pumping limitations that would eliminate an entire class of producers—and how such postponement is justified under SGMA, the DWR Regulations and related requirements	Minimum thresholds have not been set at 1,000 mg/l. 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. See Section 5.2.1. All groundwater pumpers may continue to pump groundwater subject to the appropriate groundwater production fee.
			Section 4.4.3.1 Criteria Used to Establish Minimum Thresholds, page 4-24, first paragraph. Given the known uncertainty in the current solute transport model, why were other methodologies not utilized to evaluate TDS minimum thresholds. As detailed in the text, TDS concentrations are only available for a few GSP monitoring locations. One common	Comment noted and may be considered in future GSP updates.

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			methodology would be to calculate the expected concentration of TDS utilizing the trend in annual changes in concentrations (i.e. expected concentration = initial concentration + (Trend concentration X the number of years since initial concentration). Then compare the expected concentration value to the TDS expected value. If the analyzed concentration is lower than expected concentration, then the analyzed concentration is better than expected concentration for that particular year that represents the measurable objective. If the analyzed TDS concentration is higher than the expected concentration, then add the minimum threshold relative change in concentration value to the expected concentration to obtain TDS concentration that, if exceeded would exceed the minimum threshold concentration. Then compare the analyzed TDS concentration to the expected minimum concentration and is the analyzed concentration is lower than the minimum threshold would not be exceeded.	
			Section 4.4.3.6 Representative Monitoring Sites, page 4-27, Table 4-2. Please include a column that details the minimum threshold concentration for each well.	Comment addressed in Table 4-5.
			November 2019 Comment - Section 4.4.3.6 Representative Monitoring Sites, page 4-28. Given the potential for additional groundwater extraction from the El Paso area, recommend adding additional wells to this monitoring network.	Comment noted.
			Section 4.4.4 Land Subsidence, page 4-29, first paragraph. This section is confusing as an MT of 0.09 inches/year is being proposed, but then a subsequent sentence suggested that setting the MT may not provide total protection. In addition, as detailed above this area is on NAWS property, and therefore if NWAS is not planning to curtail pumping how can subsidence (induced from NAWS pumping) be managed. Other than on NAWS property, is land subsidence an issue for this basin? If not, then suggest removing this SMC from the GSP.	Comment noted.
			Section 4.4.4.2 Relationship to Other Sustainability Indicators. If groundwater levels fluctuate from NWAS pumping, then subsidence could occur. Without controlling NWAS pumping, subsidence will more than likely occur in SNORT area.	Comment noted.
			Section 4.4.4.6 Representative Monitoring Sites, page 4-30, third paragraph. If land subsidence is going to be part of this GSP, then please list key indicator wells and the subsequent threshold. Thresholds should be both rate of change and groundwater elevation.	Comment noted and may be considered in future GSP updates.
			Section 4.5 Measurable Objectives, page 4-31, first paragraph. Present Groundwater elevation data prior to reduction in storage.	Comment noted.
			Section 4.5.1 Reduction of Groundwater in Storage Measurable Objective and Interim Milestones, page 4-31. Provide a summary table that presents the interim milestones (5, 10 and 15 yr.) for change in groundwater storage, not the cumulative volume of groundwater removed from storage.	Comment noted.
			Section 4.6.1 Reduction of Groundwater in Storage, Table 4-3, page 4-33. Please include a column that details the change in storage and not just the groundwater removed from storage estimates. In addition, since change in storage is directly related to change in groundwater elevations (multiplied by aquifer storage coefficients) and the areal extend of the subbasin, please also reference the wells used to measure groundwater elevation change as part of this analysis.	Comment noted.

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			Section 4.6.2 Chronic Lowering of Groundwater Levels Summary, Table 4-4. Include a column that contains the baseline (i.e. 2015) groundwater elevation, and date of the baseline measurement.	Comment noted.
			Section 4.6.2 Chronic Lowering of Groundwater Levels Summary, Table 4-4. Please provide further justification as to why only 10 wells are proposed to be utilized to monitor sustainable management criteria. DWR has developed specific regulations and guidance documents (reference Monitoring Networks and Identification of Data Gaps BMP) that recommend that in a basin the size of IWV (600 square miles) and pumps more than 10,000 AFY, the minimum number of monitoring well locations should be between 24 and 60. In addition, why would the author not integrate current agricultural well monitoring into the program?	Comment addressed in Section 4.7.1. The IWVGB has more than the minimum recommended number of monitoring wells. Basin stakeholders may cooperatively and voluntarily provide additional groundwater data to assist in Basin understanding.
			Section 4.6.2 Chronic Lowering of Groundwater Levels Summary, Table 4-4. Please include the specific well designation that will be utilized, i.e. USBR-06S.	Comment addressed.
			November 2019 Comment - Section 4.6.2 Chronic Lowering of Groundwater Levels. Several monitoring wells listed in the proposed network have groundwater data that indicate groundwater levels have been stable since 2010 (USBR-01, USBR-04), 2012 (USBR-06S), 2014 (USBR-2), and 2016 (NR 2). Why would current pumping in these areas need to be adjusted or reduced since current groundwater levels in these areas indicate that current pumping is sustainable? And if imposed, how does the IWVGA justify the Scenario 6.2 PMA that would eradicate Agriculture and then move the water district and other producers into that very area?	Comment noted. See Section 5.2.1. All groundwater pumpers may continue to pump groundwater subject to the appropriate groundwater production fee.
			Section 4.6.3 Degraded Water Quality Summary, Table 4-5. As detailed above, interim milestones for water quality should be described as annual TDS increase. Also, wells designated as ND, TDS concentrations have not been determined at this time. Given this uncertainty, how will water quality SMCs be derived post-GSP?	Comment noted.
			Section 4.6.4 Land Subsidence Summary, Table 4.6. In addition to a subsidence rate, please include groundwater elevation data that would also be used as proxy from nearby wells to monitor land subsidence.	Comment noted. Groundwater levels are not currently proposed to be a proxy to monitor for land subsidence.
			November 2019 Comment - Section 4.7.1 GSP Proposed Monitoring Network, page 4-36, first paragraph. Please provide further justification as to why only 10 or 11 wells are proposed to be utilized to monitor sustainable management criteria. DWR has developed specific regulations and guidance documents (reference Monitoring Networks and Identification of Data Gaps BMP) that recommend that in a basin the size of IWV (600 square miles) and pumps more than 10,000 AFY, the minimum number of monitoring well locations should be between 24 and 60.	Comment addressed in Section 4.7.1. The IWVGB has more than the minimum recommended number of monitoring wells.
			Section 4.7.1 Proposed Monitoring Network and Schedule, page 4-36, second paragraph. If the additional 198 wells are going to be utilized to monitoring groundwater level changes and calculate change in storage, then these wells needs to be included as key monitoring wells and applicable SMC's need to be developed for that group as well.	Comment noted.
			Section 4.7.1 Proposed Monitoring Network, page 4-37, third paragraph. If there are additional water quality data from GAMA wells, why are they not being included into the list of key water quality monitoring wells?	Comment addressed in Section 4.7.1. Water quality data from 39 wells that are currently reporting under the GAMA program will continue to be incorporated into the IWV DMS and used to evaluate the changes in TDS within the Basin.
			Section 4.7.1 Proposed Monitoring Network, page 4-37, fourth sentence. Please provide specific details on how IWVGA will coordinate with U.S. Navy to identify wells that will be	Comment noted.

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			monitored to evaluate land subsidence. In addition, please explain how potential reduction in pumping on U.S. Navy property will be implemented.	
			Section 4.7 GSP Proposed Monitoring Network, page 4-36. Please include a summary table that lists the well, GPS coordinates, the specific SMC the associated well will monitor, the monitoring frequency and the basis for selecting that specific well(s).	Comment addressed in Sections 4.4, 4.5, and 4.6.
			Figure 4-1. Please include a list of all the NAWS contaminated sites on this figure.	Comment noted.
			Figure 4-2. Additional key wells are needed in the NE and SW areas. Based on previous monitoring well location figures, there are data available. Please revise figured to include all monitoring wells needed (per recommendations by DWR) for a basin this size and then pumps in excess of 10,000 AFY.	Comment noted and will be considered in future GSP updates.
			Figure 4-5e. Based on the historic hydrograph, groundwater elevations in this well have been stable since 2011, indicating that groundwater pumping in this area is currently sustainable. Please revise linear historic trend line accordingly and quantify and display both the annual and 5-year change in GWE.	Comment noted.
			Figures 4-6a – 4-6f. Please quantify and display annual and 5-year change in TDS concentrations.	Comment noted.
			SECTION 5 – PROJECTS AND MANAGEMENT ACTIONS **General Comments:** Section 5.1 Introduction, page 5-1, first paragraph. SGMA defines “sustainable yield” as the maximum quantity of water, calculated over a base period representative of long-term conditions in the basin and including any temporary surplus, that can be withdrawn annually from a groundwater supply without causing an undesirable result. Please insert a description that details this information and provide the base period time period.	Comment noted (see Sections 3.3.3.2 and 3.3.4.1).
			Section 5.1 Introduction, page 5-1, second paragraph. Please remove first sentence as the current sustainable yield estimate as mentioned several times throughout the development of this GSP should be further evaluated, provided as a range as this is misleading the reader.	Comment noted.
			November 2019 Comment - Provide a summary table for each PMA that includes the project, measurable objective expected to benefit, expected benefits to stakeholders, current status, timetable (initiation and completion), estimated cost and permitting and regulatory process.	Comment addressed in the text in Sections 5.2.1, 5.3.1, 5.3.2, 5.3.3, 5.3.4, 5.3.5, and 5.3.6.
			Section 5.2.1 Management Action No. 1, page 5-5, last paragraph. Please provide the SGMA code reference for the establishment of a base period. As detailed several times throughout the GSP development process, 2010 – 2015 might not be considered an appropriate base period as this period represents a predominately dry period in California, the base period does not represent long term conditions, etc.	Comment related to legal positions and not specifically relevant to the GSP.
			Section 5.2.1 Management Action No. 1, page 5-6. The allocation and transient pool concept will be determined by IWVGA, which currently only represents select groundwater pumpers (IWVWD and the Navy) in the basin (totaling less than 40% of the pumping in the basin). Please explain how the proposed allocation concept is going to protect those entities that are not represented by IWVGA?	Comment noted and will be addressed with the final allocations, transient pool, and fallowing program is adopted.
			Section 5.2.1 Management Action No. 1, page 5-6, third paragraph. Please provide additional details on how the 51,000 acre-feet estimate was derived, the individual parties that were involved with developing that estimate. Also, please explain how other	Comment noted. Other alternatives to this management action were considered through use of the basin model in coordination with the TAC, Ad-Hoc modeling committee, IWVGA staff, and/or IWVGA Board.

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			pumpers who are not represented on the IWVGA board were involved with evaluating and providing input on this methodology concept.	
			Section 5.2.1 Management Action No. 1, page 5-7, second paragraph, fourth sentence. Reference to 37,000 AFY baseline is incorrect and overestimated pumping in the basin. As detailed numerous times in this letter, the referenced baseline should not be considered a baseline, as this assumed "business as usual", which all water users in the basin realized is not possible.	The baseline effort was developed in direct coordination with the stakeholders and pumper groups as a projection of what would be pumped if the GSP was not implemented and pumping restrictions, either direct or indirect, were not implemented. Though it may be common knowledge that "business as usual" is not possible going forward, DWR must be informed of the associated consequences (overdraft).
			Section 5.2.1.3 Justification, page 5-9, third paragraph. Without a clear understanding of the FRWR, it will be extremely difficult if not impossible to implement any allocation scheme. As this author has said several times throughout the development of this GSP, all pumping (including from the Navy) needs to be quantified prior to attempting to manage the basin. Water budgets are similar to a bank account in that there are inflows, outflows, and a change in the bank account balance or storage. Inflows and outflows in the hydrologic system are largely driven by processes occurring on the land surface and it is impossible to estimate the bank account in this basin without qualifying NAWS future pumping demands.	Comment noted and will be considered in future GSP updates and during the pumping verification process post GSP adoption. An official quantification of the FRWR has not yet been established by the Navy, and this GSP does not attempt to quantify the FRWR.
			Section 5.2.1.5 Permitting and Regulatory Process, page 5-11, last paragraph. Please elaborate on how determination, implementation and enforcement of groundwater allocations will occur.	Comment noted and will be considered in future GSP updates. Additional details of the management action program will be addressed when the program is fully developed and adopted.
			Section 5.2.1.7 Implementation Process and Timetable, page 5-12, second paragraph. Please explain who is included in the "All groundwater pumpers" category and how domestic de-minimis users and NAWS pumping information will be evaluated, given this is a variable that has not been quantified and would be critical in understanding total volumes pumped from the entire basin.	Comment noted and will be considered in future GSP updates.
			Section 5.2.1.7 Implementation Process and Timetable, page 5-12, second paragraph. It is not realistic to only have 15 days to review and provide comments on this document. In addition, the WRM works for the IWVGA, which does not represent all groundwater pumpers in the basin, please provide a detailed process for how this information will be reviewed, and perhaps bring in a third-party state agency to participate in the review.	Comment noted.
			Section 5.2.1.8 Legal Authority, page 5-12, last paragraph. Although the GSA has the authority to regulate groundwater extractions, an initial allocation of groundwater extraction or any other limitation on groundwater extraction by the GSA "shall not be construed to be a final determination of the rights to extract groundwater from the basin or any portion of the basin." (Water Code, § 10726.4(a)(2).) In this instance, similar to a physical solution, the management strategy must pay due regard to common law and competing water right claims. (See City of Santa Maria v. Adam, (2012) 211 Cal.App.4th 266, 288; California Am. Water Co. v. City of Seaside, (2010) 183 Cal.App.4th 471, 480.)	Comment related to legal positions and not specifically relevant to the GSP. See Section 5.2.1.8.
			Section 5.2.1.8 Legal Authority, page 5-13. For each management action and project, please include a section that details how the PMA relates to groundwater sustainability and the expected benefits and metrics. Also include a summary table to detail this process.	Comment addressed in text in the project description and the project benefits subsections for each project and management action.
			Section 5.3.3 Project No. 3: Basin-wide Conservation Efforts, page 5-33, second paragraph. Why is the WRM excluding large and small agricultural interests from discussing historical, current and proposed future conservation measures that could be implemented?	Comment addressed in Section 5.3.3.1. The IWVGA will coordinate with agricultural pumpers to investigate the potential for and feasibility of additional conservation in irrigation practices.

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			Section 5.3.4 Project No. 4: Shallow Well Mitigation Program. Recommend the shallow well mitigation program be established, data collected and then depending on the results of this program allocation, discussions for all groundwater users could be further refined and implemented during the 5-year GSP update.	Comment noted.
			Section 5.3.6 Project NO. 6: Pumping Optimization Project. Please explain why IWVGA wants to force agriculture (who are not represented by any IWVGA board members) out of the NW area of the basin (where current pumping is sustainable), and then allow other pumpers (that are represented on the IWVGA board) to move into this area and begin pumping? Is there not a potential conflict of interest in making these management decisions?	The GSP does not propose to eliminate any particular pumper group or to force any pumper group in its entirety out of any region of the IWVGB. All groundwater pumpers continue to possess the right to produce groundwater. See also SGMA Section 10726.4 for additional authorities granted to the IWVGA.
			Section 5.4 (Conceptual projects under consideration). Please include an additional project to this list. The project would focus on investigating the potential to utilize surplus groundwater in the El Paso subarea to supplement existing supplies. Preliminary useable groundwater estimates are greater than 4,000 AFY, or even higher if additional volumes are removed from storage. This PMA should be seriously investigated and considered before imposing groundwater pumping limitations or allocations.	Comment addressed in a previous GSP draft (see Section 2.5.2.1); at this time, it is assumed that existing groundwater supplies in El Paso cannot be sustainably extracted to meet demands due to the limited mountain front recharge to that area. This concept will be re-evaluated as more data becomes available.
			November 2019 Comment - Section 5.4.3 Conceptual project under consideration. Please include a project that would focus on treating and using the current de-designated area groundwater supply below NAWS property (which is preliminarily estimated to exceed 500,000 AF). This PMA should be seriously investigated and considered before imposing groundwater pumping limitations or allocations.	Comment noted. Additional potential projects will be considered during the planning horizon.
			November 2019 Comment - Section 5.4.3 Conceptual project under consideration. Please include a project that would evaluate the feasibility to capture current evaporative loses from the Coso Geothermal field and utilize to enhance water in the IWV (which is preliminarily estimated to exceed 10,000 AFY). This PMA should be seriously investigated and considered before imposing groundwater pumping limitations or allocations.	Comment noted. Additional potential projects will be considered during the planning horizon.
			November 2019 Comment - Section 5.4.3 Conceptual project under consideration. Please include a project that would evaluate the feasibility for SVM to treat local groundwater in the Salt Wells Valley Basin (which is preliminarily estimated to exceed 500 AFY).	Comment noted. Additional potential projects will be considered during the planning horizon. Per the IWVGA's Joint Powers Authority Agreement, the GSP shall not authorize any water supply augmentation to the IWVGB with groundwater from a basin within the jurisdiction of a general member of the IWVGA without the approval of the Primary Director representing that general member.
			November 2019 Comment - Section 5.4.3 Conceptual project under consideration. Please include a project that would evaluate the feasibility for SVM to capture current evaporative loses from their facilities.	Comment noted. Additional potential projects will be considered during the planning horizon.
			Include additional figures to illustrate the approximate location of ALL conceptual projects also under consideration.	Comment noted.
			SECTION 6 – IMPLEMENTATION PLAN **General Comments:** November 2019 Comment - Section 6.1 Implementation Plan Summary. Please include how stakeholder engagement through the advisory committee activities will be utilized to allow the general public to provide input and develop an exchange amongst a broad range of stakeholders. Develop a schedule (including meeting times, i.e. quarterly) to discuss GSP and GSA activities, provide input and present on items of interest.	Comment noted.
			November 2019 Comment - Describe how public outreach will continue and provide	Comment addressed in Section 6.1.

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			opportunities for engagement during GSP implementation. This should include providing opportunities for public participation, especially from all beneficial users, at public meetings, providing access to GSP information online, and continued coordination with entities conducting outreach.	
			Section 6.3 GSP Implementation Costs and Funding, page 6-5, Table 6-1. Please provide costs for conceptual projects under consideration. This information is critical to ensure that all projects are considered	Comment noted.
			November 2019 Comment - Section 6.3.2 Potential Funding Sources, page 6-6. Please provide more detail on the potential funding amount associated with each potential funding source and how that related to applicable projects and management actions.	Comment noted and will be considered in future GSP updates as more information about specific funding source amounts become available over the 20-year planning horizon.
			November 2019 Comment - Section 6.3.2 Potential Funding Sources. Please provide a planning level estimate of annual amount of funds needed to implement GSP projects. Also, prior to implementation of any fee or assessment program needed to fund these projects, please detail the types of assessment studies or other analysis (consistent with regulatory requirements) needed in this section. Notably, the IWVGA's currently imposed GSP development groundwater extraction fee of $30/AF is among the highest in the State, was not supported by a traditional Proposition 26/218 study or analysis and was imposed over extensive objections raised by many producers and members of the public.	Comment addressed in a previous GSP draft. See Table 6-1. See Sections 5.2.1, 5.3.1, 5.3.2, 5.3.3, 5.3.4, 5.3.5, 5.3.6 for discussion on the permitting and regulatory process and the implementation process and timetable.
			November 2019 Comment - Section 6.4 Periodic Evaluations and Assessment. Please include a summary table for GSP Schedule for Implementation. The table should highlight the high-level activities anticipated for each five-year period. These activities are necessary for ongoing plan monitoring and updates, as well as tentative schedules for projects and management actions.	Comment addressed in Figure 6-1.
			November 2019 Comment - Provide an additional section, entitled First Five Year Update (2020– 2025) and identify several key tasks that were identified during the development of the first GSP that need to be further developed or resolved in the five-year GSP update. These could be special studies that need resolution but could not be resolved during the initial GSP development. These could include establishment of metering program, finalizing allocation framework, developing methodology for establishing minimum thresholds for new wells, refining and improving the current groundwater model, mitigation for possible future domestic wells, creating a data gap plan, etc.	Comment addressed in Section 6.4.2.
			APPENDIX (1-A) – GSP MODEL DOCUMENTATION General Comments: Please provide a revised document that includes signatures for all members, as the current version does not.	Appendix 1-A is the IWVGA JPA Agreement, not GSP Model Documentation. The current Appendix 1-A does have signatures of all five members.
			APPENDIX (1-D) – LISTING OF INTERESTED PARTIES General Comments: Please include a data as to when this list was generated. As is, there are several interested parties' names missing from this list.	Comment noted.
			APPENDIX (1-E) – COMMUNICATION AND ENGAGEMENT PLAN General Comments: Donna Thomas is no longer associated with the IWVGA PAC, therefore please revise PAC chair, or whoever was in charge of further implementing the Communication and Engagement Plan.	Comment noted.
			APPENDIX (2-A) – POSSIBLE AND CONFIRMED GROUNDWATER CONTAMINATION SITES	Comment noted.

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			General Comments: Please add additional data that approximates both the vertical and horizontal contamination for each contaminated site. As displayed, the data only identified the site and not the lateral and vertical extend of the site contamination.	
			APPENDIX (3-A) – WATER PRODUCTION DATA General Comments: Please provide a revised table that is complete (through 2017) and estimate the error associated with gathering this pumping information. Please include a graphic to illustrate the change in groundwater usage for each entity from 2000 – 2005, 2005 – 2010, 2010 – 2015 and 2015 – 2017.	Comment noted.
			APPENDIX (3-D) – GROUNDWATER ELEVATION CONTOUR MAPS AND SELECTED WELL HYDROGRAPHS General Comments: There are no contour maps included in this appendix. Please include contour maps or remove the word contour map from this appendix. Also, please revise selected hydrographs to include all current data (through 2018).	Comment addressed.
			APPENDIX (3-E) – SHALLOW WELL IMPACT ANALYSIS General Comments: What independent analysis occurred to verify the 2014 estimate of shallow wells?	Comment noted.
			Section 3.0 Changes in Depth to Groundwater. Why did the author rely on KCWA contour maps and not perform their own independent contouring analysis?	Comment noted.
			Figure 4 and Figure 5. Please include the well control points used by KCWA to interpolate this information. In addition, also provide a change in groundwater elevation contour map between 2000 – 2005, 2005 – 2010, and 2000 to 2015.	Comment noted.
			Please include additional details to how regional pumping changed from 2010 to 2015 in specific areas to correlate pumping to these changes in groundwater levels. According to Appendix 3-A, pumping in 2010 was approximately 27,000 AFY and in 2015 it was 25,000 AFY. Given the reduction in pumping, why would groundwater elevation data not correlate?	Comment noted.
			Section 7. Please provide a similar analysis using a realistic baseline scenario (less than 35,000 AFY) as this presents an unbiased review of planned pumping and would align with current annual pumping estimates (approx. 25,000 AFY).	Comment noted.
			APPENDIX (3-E) – SHALLOW WELL IMPACT ANALYSIS General Comments: Please include a Table of Contents	Comment noted.
			Section II.5 Subsidence modeling with MODFLOW, page 267, last paragraph. The author admits that the model overestimated subsidence, which was also observed in several groundwater elevation simulations. This overestimation is related to the model structure and how pumping is allocated into specific layers.	Comment noted.
			APPENDIX (3-H) – GSP MODEL DOCUMENTATION General Comments: November 2019 Comment - The primary authors of this model document should sign, date and stamp this document per California Code of Regulations.	Comment noted.
			November 2019 Comment - Section 2.4.1, page 2, describe the vertical extension of the General- Head Boundary. Also, provide a figure which illustrates the location of GHB and	Comment addressed in Section 2.4.1 of Appendix 3-H. Text was revised to describe boundary cells where GHB head value of 2,152 ft are assigned and where no-flow

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			No-Flow boundary conditions on the perimeter boundaries and a cross section which shows the vertical distribution of the boundary conditions as well.	boundaries and boundary cells are located (including below recharge boundary cells and GHB cells). Figure 1 was revised to show perimeter boundary conditions. Figure 4 revised to highlight recharge boundaries. Based on revisions to the text, a cross section is not needed.
			November 2019 Comment - Section 2.4.3, page 3, describe if the recharge rates are specified only at the highest active layer of the model or only at the first layer. Also, describe briefly why the author did not use "Recharge" package of MODFLOW to simulate the mountain-front recharge and instead, the "Well" package was utilized.	Comment addressed in Section 2.4.3 of Appendix 3-H. Text was revised to clarify that recharge is applied only to boundary cells in Layers 1, 2, and 3.
			Based on previous work, transient recharge is not constant (i.e. the same as steady state recharge). Why was this not incorporated into the model to take advantage of additional wet years, which would result in additional water in storage.	Comment noted.
			Section 2.4.3, and the associated figure 4 on page 6 implies that there are some recharge boundary conditions on the perimeter boundaries but the figure shows "black lines" everywhere on the perimeter boundary. Provide more transparent description or revise the figure with color lines representing different boundary conditions (No-Flow/GHB/Recharge) on the study domain.	Comment noted.
			November 2019 Comment - Figure 4, page 24, provide units for the flux values.	Comment noted.
			November 2019 Comment - Section 2.4.5, page 4, provide a range of depth for the pumping wells.	Comment noted.
			Figure 11. Where NAWS pumping wells simulated? If so, please include approximate locations.	Comment noted.
			November 2019 Comment - Section 2.4.5, page 11, describe the package used for simulating the pumping wells. Is it "Well" package or "MNW" package (Multi-Node Well)?	Comment addressed in Section 2.4.5 of Appendix 3-H. Text was revised to include reference to MODFLOW WEL package (first sentence of Section 2.4.5). Reference to maximum pumping depth and that pumping occurs in all model layers were added to text.
			Section 2.5.1 Steady-State Model, page 16, vertical anisotropy value is not realistic and will underestimate the impact from pumping. Vertical anisotropy ratio should be closer to 0.1 (or 10% of horizontal hydraulic conductivity) and should also be varied spatially. Please revise model language to address this uncertainty and explain the potential impacts on all model scenarios.	Comment noted.
			Section 2.5.1 Steady-State Model, Figure 14. Please include the locations of calibration targets.	Comment noted.
			Section 2.5.1 Steady-State Model, Figure 17. Given the error in using unrealistic vertical anisotropy values, and the non-unique solution for this code, please address the uncertainty in this calibration and identify other hydrologic properties that will need to be refined as part of the modeling process, and the impacts this will have and the proposed allocation schemes.	Comment noted.
			Section 2.5.2 Transient-Historical Model, Figure 27. In general, simulated groundwater levels are lower than observed groundwater levels. In addition to the error in vertical anisotropy (which would indicate simulated water levels should be less than observed), please explain this model error and the impacts it will have on any model simulations.	Comment noted.
			Section 2.6 Sensitivity Analysis. Please revise sensitivity analysis to include vertical anisotropy evaluation. Recommend running at 0.1, 0.5 and comparing to baseline. In addition, given that this model is being utilized to drive management decisions, please include at least 15 wells to assess simulated heads.	Comment noted.

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			Section 2.7 Predictive Flow Models, page 39. Reference is made to the baseline flow model simulates a "no action" alternative, where most groundwater withdrawal rates and locations that occurred in 2016 are continued into the future…….These baseline assumptions do not align with the baseline scenario presented in the GSP. Please explain the difference and resolve accordingly.	Comment noted.
			Section 2.7 Predictive Flow Models, page 39. There were in fact more than just two predictive flow models run, please present a brief summary of all predictive model scenarios and the applicable inputs and assumptions for each.	Comment noted.
			November 2019 Comment - Section 3.2, page 13, provide more detailed information about the temporal-resolution of the transport model. The flow model has annual time discretization for the transient model and monthly discretization for the predictive model. What is the time-step of the transport model?	Comment addressed.
			Section 3.3 Configuration, page 41, third paragraph, third sentence. Please correct reference to Section XX.	Comment addressed.
			November 2019 Comment - Section 3.4, page 14, last line, and the associated figure 36, page 43, simple averaging of simulated TDS value from layers of the multi-screen well is not exactly an appropriate approach, unless the flow rates to the well screens are the same for those layers. The calculation of mean concentration from a multi-screen well is usually based on volumetric flow rates to/from each screen. This flow rate can be captured by using MNW package in modeling the pumping wells (https://pdfs.semanticscholar.org/e8f2/dc3b4aa227532ad74f977b99abf070560321.pdf):	Comment noted. The mean TDS values were not weighted by the relative flow rates contributed by screens at multiple depths because flow-rate data were generally unavailable.
			Section 3.4 Initial Boundary Conditions, page 49, Figure 41. Influent concentrations of 350 mg/L are too low. Based on recent surface water sampling data (Sand Canyon), TDS concentrations are greater than 500 mg/L. Please revise analysis accordingly.	Comment noted.
			November 2019 Comment - Section 3.5, page 50, provide additional graphs to describe the qualitative validation of the model using box and whisker plot of the TDS concentrations (simulated vs. measured) for different time intervals (for example 1920-50, 1951-70, 1971-90, 1991-2016) for shallow (plot #1), intermediate (plot #2), and deep (plot #3) TDS zones. Collect all available measured concentrations for each depth zone, for each time interval, and then compare them with the model's results at the same location and time (As reference, review https://doi.org/10.1016/j.jconhyd.2019.103521 , section 3.1).	Comment noted. The plots proposed by the reviewer cannot be generated for the GSP TDS transport model. The model does not simulate the 70-year historical period; instead data from this period are aggregated to form the TDS initial conditions for the prediction period of 2020 to 2070. In addition, measured TDS values are not yet available for the prediction period, so a comparison to forecasted TDS values cannot be made at this time.
			Section 3.5, page 51, Figure 42. For clarification, based on proposed DRI baseline model predictions, there is no annual rate of change for TDS is several areas (not designated as yellow or orange), please clarify this and incorporate into the legend (reference as TDS = no change).	Comment noted.
			Section 3.6 Transport Results, page 52, first paragraph, last sentence. Correct reference to Section XX of the GSP report.	Comment addressed.
			Section 3.6 Transport Results, page 53, Figure 43 and Figure 44. Based on transport results, there is very little change predicted to occur under assuming baseline and model scenario 6.2. Given these results, is there really a TDS issue from pumping occurring in this basin?	Comment noted.
			Section 4, page 17, add to the limitation list, that this transport model is qualified only for the purpose of "scenario analysis" and it is not an "absolute predictive model" because	Comment noted.

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			the transport model has not been quantitatively calibrated (which increases the uncertainty of the simulated results).	
			Section 4, page 17. Please include an explanation why climate change was not evaluated as part of this modeling effort.	Comment noted.
			Either address or include a statement as to why not all PMA were evaluated and presented as part of this modeling report (instead they are buried in an appendix). This is critical to ensure sustainability is achieved utilizing one or more PMA's.	Comment noted. The GSP is not a feasibility study that presents all options that were once considered.
			Please note that numerical groundwater models are created based on simplified assumptions used to replicate complex natural systems. Consequently, results are generally subject to errors and limitations due to conceptual misunderstandings of the hydrologic system and uncertainties in estimating aquifer properties and boundary conditions. These uncertainties are due to both spatial and temporal limitations in observation data and the types of observation data available.	Comment noted.
			Please include a summary and conclusions section in this report	Comment noted. The executive summary provides a summary of the GSP.
			Please highlight the sustainability yield calculated from all scenarios and present as a range in AFY.	Comment noted.
			APPENDIX (4-A) – NAVY LETTER ON ENCROACHMENT CONCERN General Comments: If Navy correspondence is going to be included, please also include all correspondence material from all entities. Including Navy only correspondence indicates favoritism by the IWVGA and will be looked on negatively by DWR.	Comment noted.
			APPENDIX (5-A) – U.S. NAVY LETTER ON HISTORICAL WATER USE **General Comments:** This correspondence should be removed and be incorporated as part of the allocation discussion scheduled to occur after the GSP has been submitted in 2020 or allow other beneficial users to provide similar documentation and include into this GSP appendix.	Comment noted.
17	**Clean Water Action, Clean Water Fund, Union of Concerned Scientists, The Nature Conservancy, Audubon California, local Government Commission**	**1/13/2020**	The GSP does not explicitly identify which communities are designated as DACs.	Comment noted.
			The GSP does not explicitly identify which communities are designated as DACs or the sources used to identify DACs.	Comment noted.
			The GSP should provide further details on the DACs and tribes in the Plan area, including the name of communities, population and 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/	Comment noted.
			The GSP should clearly describe and identify what environmental beneficial users were engaged and how they were engaged through the GSP development process.	Comment noted.
			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.	Comment noted.
			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 3800-8000 ppt and the potential for this plume to expand or extend beyond the base under current and modeled future groundwater conditions. The lack of PHG (currently under	Comment noted.

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			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/	Comment noted.
			The GSP does not lay out a plan for ongoing engagement during implementation, beyond the development of the GSP.	Comment addressed in Section 6.1
			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.	Comment noted. See Section 6.1.
			The Policy Advisory Committee and Technical Advisory Committee would be improved by adding further dedicated representation from environmental stakeholders.	Comment related to IWVGA policies and/or procedures and not specifically relevant to the GSP.
			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.	Comment noted.
			The list of public workshops does not identify targeted efforts to reach disadvantaged communities.	Comment noted.
			Well depths are not provided in the GSP.	Well depths are provided in the GSP Data Management Systems: https://iwvgsp.com. See Sections 2.8 and 4.7.1.
			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.	Comment addressed in Sections 4.3 and 4.3.5. The IWVGA will reevaluate the need to establish sustainability criteria for interconnected surfaced water and GDEs as data gaps are filled.
			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.	Comment noted.
			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	Comment noted.

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			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	Well depths are provided in the GSP Data Management Systems: https://iwvgsp.com. See Sections 2.8 and 4.7.1.
			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).	Comment noted.
			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.	Comment noted.
			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.	Comment noted.
			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.	Comment noted.
			The current estimate of evapotranspiration (ET) in the basin is given as 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.	See pages 7 and 8 of Appendix 3-H.
			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,	See Section 3.5.6.

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			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.	
			GSP should explain what changes to factors such as land use and population were used for the future water budgets.	Comment noted.
			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.	See Section 3.5.6.
			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.	See Section 3.5. The GSP modeling effort provides tools necessary for estimating the groundwater aquifer's hydrologic water budget.
			The GSP should clarify how the total ET was calculated in the current water budget.	See pages 7 and 8 of Appendix 3-H.
			In addition to the Predicted Water Budgets with Projects shown, the GSP should provide a baseline future budget without the projects and management actions.	See Table 3-10.
			The GSP does not define any Management Areas.	Comment noted.
			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.	Comment noted.
			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.	Comment noted. See Section 3.6.1.4 and 4.3.5. Additional data is needed and will be addressed as a data gap when implementing the GSP.
			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.	Comment noted. See Section 3.6.1.4.
			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.	Comment noted.
			Stakeholder input is not explicitly discussed in the development of URs, MOs, and MTs.	Comment noted.
			Impacts to GDEs and environmental BUs of surface water are not explicitly considered.	Comment noted. See Section 3.6.1.4.
			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)	Comment addressed. Revisions made to Section 4.3 and Section 4.3.5
			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	Historical groundwater declines are provided in Figure 3-12 and Appendix 3-D. Groundwater levels under simulated Baseline conditions (without GSP implementation) are provided in Appendix 3-H. Simulated groundwater levels under Scenario 6.2.

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			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)	conditions (with GSP projects and management actions implemented) are provided in Figures 4-5a through 4-5j.
			See Question 1 above. The GSP does not include an analysis of the anticipated impacts.	Comment noted.
			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."	Comment noted. Environmental beneficial uses and users, are recognized as part of the community.
			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.	Comment noted. Simulated groundwater levels under Scenario 6.2. conditions (with GSP projects and management actions implemented) are provided in Figures 4-5a through 4-5j.
			The GSP should explicitly demonstrate whether and how the stakeholder input was considered in the development of URs, MOs, and MTs.	Comment noted.
			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.	Comment noted. See Section 3.6.1.4.
			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.	Comment noted. See Section 3.6.1.4.
			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	Comment noted.

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			should include all beneficial users of surface water that could be affected by groundwater withdrawals, including environmental users.	
			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.	See Section 3.4.2 and Appendix 3-E.
			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.	Comment noted.
			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.	See Section 6.3.2 for a listing of potential funding sources.
			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.	Comment noted.
18	**Donald M. Zdeba**	**01/15/2020**	On page 119 it states the District's Ordinance 103 allows: "Irrigation only between 8:00 PM – 8:00 AM; irrigation limited to 3 days per week based on addresses (**1 day per week from November through February**)" That is incorrect. It is still 3 days per week, but no restriction on hours. Here is the correct wording from the Ordinance. http://www.iwvwd.com/wp-content/uploads/2017/09/Ordinance-No.-103-Emergency-Water-Conservation.pdf "During the months of November, December, January and February, all customers of the District (residential/commercial/public/industrial) with even-numbered addresses may only operate irrigation systems on Tuesday, Thursday and Saturday and odd numbered addresses may only operate irrigation systems on Wednesday, Friday and Sunday. Irrigation systems may not be operated on Mondays."	Comment addressed.
			On page 77, IWVWD is identified as a member of the TAC, but not as a non-voting member of the committee like the United States Navy.	Comment addressed.
19	**Camille Anderson, Searles Valley Minerals**	**01/02/2020**	**TYPOS/ERRORS/GRAMMER** **Table of Contents:** The spacing and indentation for the chapters and subchapters needs to be consistent.	Comment noted.
			TOC - The list of tables, p. xxiii, Table ES-5: the words "Land Subsidence" are misspelled.	Comment addressed in a previous draft.

COMMENT DOCUMENT	COMMENTER	DATE SUBMITTED	COMMENT	RESPONSE
			TOC - p. xxiii, Table 3-4 should not have a colon.	Comment addressed.
			p. ES-8 IWVGB is bounded on the west by the Sierra Nevada Mountains to the west…	Comment addressed.
			p. ES-9 the Basin associated with the lacustrine and includes China Lake's playa deposits. The word deposits is missing after lacustrine.	Comment addressed.
			p. ES-10 The recharge zones identified by DRI are shown in. The total area of recharge is about 770 square miles. The first sentence is incomplete.	Comment addressed.
			p. ES-14 3 paragraph has margins set incorrectly.	Comment addressed.
			p. ES-15 Subsurface flow into the Basin from Rose Valley and out of the Basin towards Salt Wells Valley were estimated using the groundwater model. Should be was estimated or subsurface flows.	Comment addressed.
			p. ES-16 3 paragraph has margins set incorrectly.	Comment addressed.
			p. ES-18 Reduction of impacts caused by increased dust and desertification caused by declining water tables. Should be Increase of impacts…	Comment addressed.
			p. 1-13 Implementation of the proposed projects and management actions required to achieve sustainability are provided in Table 6-1. These costs are anticipated to be funded through Federal and State grants and loans and local pump fees. The first sentence is incomplete in the context and should probably read "Implementation costs and timetables of the …"	Comment addressed.
			p. 2-30 Irrigation only between 8:00 PM – 8:00 AM; irrigation limited to 3 days per week based on addresses (1 day per week from November through February)	Comment addressed.
			p. 2-30 Irrigation only between 8:00 PM – 8:00 AM; irrigation limited to 3 days per week based on addresses (1 day per week from November through February)	Comment addressed.
			p. 2-30 Prohibits recreational fountains or decorative water features. This ordinance actually prohibits those features that are not recirculating. The current bullet point is misleading.	Comment noted.
			p. 2-36 Tui Chubb habitat, should be Chub	Comment addressed.
			p. 2-51 and 2-52 The phrase "This page left intentionally blank" appears on page 2-51 which is not blank. Nothing is on page 2-52 which is blank.	Comment addressed.
			p. 3-1 water budget for the basin.. After basin should be only 1 period.	Comment addressed.
			p. 3-6 IWVGB is bounded on the west by the Sierra Nevada Mountains to the west, the Coso Range to the north…	Comment addressed.
			p. 3-27 supply without casing… at bottom of page should be causing.	Comment addressed.
			p. 3-28 Section 3.4.7below is missing a space before the word "below"	Comment addressed.
			p. 4-1 ensure the IWVGB does not experiencing undesirable results in the future. Should be experience.	Comment addressed.
			P. 4-12 Bullet point with no text.	Comment addressed.
			p. 5-5, line 12 the word IWVGB should be IWVGA.	Comment addressed.
			p. 5-16 The sentence "Similarly, current domestic and municipal users would not be able to demands without an augmented water supply" is incomplete.	Comment addressed.
			p. 5-21 The sentence "subsequent use or in a manner consistent with the provisions of Section 10727.2."Accordingly, SGMA" needs a space after 10727.2.	Comment addressed.
			p. 5-21 In the sentence "…running long-term average of Table A deliveries is currently 2,571 TAF, or approximately 62% of the total Table A entitlement (DWR 2018)", the numbers should not be bold.	Comment addressed.

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			p. 5-24 recycled water subprojects may be developed after the GSP is adopted and could be subsequently be developed…	Comment addressed.
			p. 5-27 Reduction of unreasonable water quality degradation and/or Improvement of water quality… the word improvement should not be capitalized.	Comment addressed.
			p. 5-32 City could develop a new tertiary WWTF.. There are 2 periods after WWTF.	Comment addressed.
			p. 5-33 the sentence “The Water Conservation Strategic Plan will also identify conservation actions that other entities will implement” needs a period at the end.	Comment addressed.
			p. 5-35 NAWS China Lake.. has 2 periods.	Comment addressed.
			p. 5-35 water conservation efforts that are implemented. . has 2 periods.	Comment addressed.
			p. 5-43 According to the Agricultural Guide to Controlling Windblown San and Dust. Sand is misspelled.	Comment addressed.
			p. 5-45 implementation of dust control measure will like include a series of permits and approvals should be likely not like.	Comment addressed.
			p. 5-47 It is also anticipated that groundwater pumping by the Water District west and southwest of the City will continue and that, along with pumping by SVM and others, the groundwater levels in these areas will not completely stabilize by 2040. This sentence is awkward.	Comment noted.
			p. 5-47 The pumping optimization program is proposed relocate some of the Water District The word “to” needs to be inserted in the phrase “proposed relocate”.	Comment addressed.
			p. 5-48 or to take water from the facilities with the Water District and perhaps Searles Minerals Inc. should say Searles Valley Minerals Inc.	Comment addressed.
			p. 5-50 and 5-51 bullet point spacing is different on the two pages.	Comment addressed.
			p. 6-1 at bottom of page is bullet point with nothing there.	Comment addressed.
			p. 6-2 at bottom of page “to implementation of specific projects are developed, the public be provided opportunity to review” the public will be provided with the opportunity…	Comment addressed.
			Figures: The following figures have the word Searles next to Hwy 395 on the maps that notes where Searles Station, a railroad milestone, is located. This is not located in Searles Valley and is not the location of Searles Valley Minerals. Please remove this word Searles on the figures/maps as it is confusing. This word is on figures 2-1, 2-2, 3-1, 3-6, 3-11, 3-12, 3-13, 3-14, 3-15, 3-16, 5-1, 5-2.	Comment noted.
20	**Camille Anderson, Searles Valley Minerals**	**01/07/2020**	**General Comments and Questions:** Supervisors from Kern, San Bernardino and Inyo County are on the IWVGA Board. What actions such as ordinances, requirements, restrictions, etc. will be determined by these counties for future well drilling (not replacement) and pumping in the IWVGB?	Comment noted.
			Throughout the GSP in all sections, the phrase “shallow well” is used. Sometimes there are quotes around the phrase, sometimes not. A definition of shallow well is not obvious. Please provide a definition, including a numerical range of depths for a “shallow well”. Does this just refer to any well that is thought to be pumping from the shallow aquifer? Please contrast that with the definition of a deep well.	Comment noted.
			SECTION: EXECUTIVE SUMMARY Comments SVM has on this section are mainly contained in the Section 5 comments.	Comment noted.
			SECTION 2: PLAN AREA	Comment noted.

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			On p. 2-29, Water District ordinances 98 and 99 apply to new housing and are not retroactive to existing housing. This is not made clear in the description of the ordinance.	
			On p 2-33 section 2.7.4.2 Water Efficient Landscaping The Water District has implemented numerous water-efficient landscape requirements for customers within its service area, including: • Prohibiting turf in the front yard; • Limiting plants in front yards to those provided in a Water District-approved list; • Prohibiting front yard irrigation systems that are not low-volume; • Requiring use of high=efficiency irrigation sprinkler heads; • Prohibiting irrigation runoff. Most of these items are for new construction and are not retroactive to current housing.	Comment noted.
			SECTION 4: SUSTAINABLE MANAGEMENT CRITERIA On p. 4-3, the definition of the Sustainability goal is stated "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." This definition leaves out the quality of life of the residents of Searles Valley who are served by the CA PUC-regulated SDWC. We suggest that the sentence reads "…quality of life of IWV and Searles Valley residents…"	Comment noted.
			SECTION 5: PROJECTS AND MANAGEMENT ACTIONS A general comment on the Projects and Management Actions section is that this is indeed a "planning document." Details are scarce and timetables seem overly optimistic. Funding is yet to be determined. The projects and management actions will affect everyone in the Indian Wells Valley and Searles Valley, but the details will be worked out after the plan is adopted by the GA. This does not allow much time for affected entities to prepare for any changes to their water usage or cost of water. It also does not allow much time for entities to budget an unknown amount of money for potential "augmentation fees". Is there a compelling reason for implementing the Management actions and projects immediately upon adoption of the plan?	Comment noted. Management Actions and Projects must be implemented as soon as possible due to the current state of severe overdraft in the Basin.
			In the public comments sections of the various projects, the phrase "The public and relevant entities will be given the opportunity and time to participate in and provide feedback on … through the project's environmental review processes." is used. For large, complex, expensive projects, public and relevant entities should be given advance notice to participate and comment before the environmental review process. Otherwise there will be less buy-in from the public and relevant entities.	Comment noted.
			In most of this section, it is stated that the IWVGA is going to provide studies, engineering, funding, etc. Who will actually perform this work? Will this fall to the TAC members? Will there be funding for Stetson, or some other engineering firm, to do the actual engineering?	Comment noted and will be determined post GSP adoption.
			p. 5-3 The GSP is a planning document, and consequently, the level of detail in the proposed planned projects and management actions reflect the necessary level of specificity. After projects and management actions are fully developed, specific design and/or implementation plans will be prepared, as applicable and necessary.	Comment noted.

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			The draft notes that this GSP is a planning document and that the detail reflects the necessary level of specificity for planned projects and management actions. However, the projects and management plans listed in this document are complicated, expensive, and have a large potential impact upon entities pumping from the IWVGB. Multi-year projects of this scope necessarily entail extensive review and scrutiny even when nearly all stakeholders agree to these projects. Since there is little necessary detail in this document and the document states that most of the plans and actions will be developed after the GSP is adopted by the IWVGA, what are the IWVGA and public agreeing to in this GSP? Who will be developing the details of the plans and actions? Who will be paying for the development and/or engineering of these plans and actions? The answers to these questions are neither obvious not transparent. Where is the money going to come from to develop and plan all of these projects and actions in the short time frame listed in Chapter 5? The lack of necessary detail is a cause for concern in this late stage of GSP development.	
			p. 5-4 Given the magnitude of overdraft and the current basin conditions, all planned projects and management actions should be implemented to eliminate undesirable results and shall be implemented with the earliest feasible timetable. Given the lack of specifics in the plan, the seeming lack of funding to prepare a detailed plan of projects and/or management actions and the lack of funding to implement any plan, the timetables for implementation appear overly optimistic. If funding is not available, will the timetables change? Will the GA prioritize projects based on scarce funds?	Comment noted.
			p. 5-4 If one or more of the planned projects and management actions cannot be implemented, the IWVGA will consider additional, and perhaps more severe, actions to reach sustainability. This statement does not have any details behind it. What other, more severe actions might be contemplated?	Additional management actions will be developed, as necessary to reach sustainability, if the planned projects and management actions cannot be implemented. If necessary, in the future, total annual pumping for the Basin may need be reduced to the Current Sustainable Yield of about 7,650 AFY.
			Management Action No. 1: Implement Annual Pumping Allocation Plan, Transient Pool and Fallowing Program Will the augmentation fees be enough to provide the appropriate funding for planned projects and management actions? Is there an approximate number that is being planned for? As pumping decreases, will the fee increase?	Comment related to IWVGA policies and/or procedures and not specifically relevant to the GSP.
			p. 5-5 The Annual Pumping Allocation program will assign each qualified groundwater pumper, as described in the following, an Annual Pumping Allocation of the safe yield, if any, after consideration of: 1) Federal Reserve Water Rights (FRWR); 2) California water rights; 3) Beneficial use priorities under California Law; 4) Historical groundwater production; and, 5) Municipal requirements for health and safety. Are these listed in the highest priority to lowest? What is this order based on?	This listing is not in priority.
			Is the IWVGA going to use the Navy's desired pumping number of 6530 AFY as stated on p. 5-9, "This letter, provided in Appendix 5-A, estimates the NAWS China Lake water requirement to be 6,530 AFY." Or will the GA use the other allocation estimate requested by the Navy of 2041 AFY as stated in this sentence on p. 5-9 "For planning purposes, the U.S. Navy requested the IWVGA use 2,041 AFY as a reasonable estimate of current and	Comment related to IWVGA policies and/or procedures and not specifically relevant to the GSP. Comment to be addressed post GSP adoption.

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			future annual groundwater production on the installation." Since the Safe yield is assumed to be 7650, and allocations will be made from the safe yield after FRWR are considered, the two different numbers from the Navy have large implications for all other pumpers in the IWVGB. Which one will the GA use in determining allocations from the estimated safe yield of 7650 AFY?	
			p. 5-5 to 5-6 An Annual Pumping Allocation, based on California water rights law and historical pumping during the Base Period, will be assigned to groundwater pumpers. The Annual Pumping Allocations will be regularly reevaluated to ensure sustainability. Reevaluated based on what? Reevaluated based on undesirable results, not making milestones, not having enough money for projects, or something else? Once the allocations have been assigned, if the pumping allocations are changed because of reevaluations, will these changes be done as a percentage affecting all pumpers or will individual pumpers be cherry picked to decrease pumping?	Comment related to IWVGA policies and/or procedures and not specifically relevant to the GSP. Comment to be addressed post GSP adoption.
			p. 5-6 Groundwater production in excess of Annual Pumping Allocations and Transient Pool Allocations will be subject to an Augmentation Fee in an amount that is determined to be sufficient for the acquisition of supplemental water supplies pursuant to this plan. If the fees and fallowing and transient pool allocations cause pumping to decrease, will fees be increased in order to be "sufficient for the acquisition of supplemental water"?	Comment related to IWVGA policies and/or procedures and not specifically relevant to the GSP. Comment to be addressed post GSP adoption.
			p. 5-6 Pursuant to the Fallowing Program, the groundwater pumper may elect to sell their Transient Pool Allocation back to the IWVGA. This payment shall be made in three equal payments to be paid annually. The fallowing plan is supposed to be implemented immediately. Where will the money to pay for the transient pool allocation come from? Will fees be introduced right away to fund this program? The timing of the outflow of costs and the inflow of fees does not match the timing of the implementation of these actions. Will the GA delay implementation if they have no money?	Comment related to IWVGA policies and/or procedures and not specifically relevant to the GSP. Comment to be addressed post GSP adoption.
			p. 5-10 …and use by SGMA defined de minimis pumpers, which also cannot be reduced… The actual legislative wording on this is not definitive and one can make the argument that the de minimus pumpers can be reduced.	Comment related to legal positions and not specifically relevant to the GSP. Comment to be addressed post GSP adoption.
			p. 5-10 In the IWVGB, groundwater pumpers in the domestic category which would provide the highest beneficial use include production by the IWVWD, Inyokern CSD, individual domestic well owners (de minimis pumpers), and mutual water companies serving domestic users. In the discussion of beneficial uses of groundwater, the Searles Domestic Water Company which serves the communities in Searles Valley of Trona, Argus, Westend and Pioneer Point is missing and should be added to the sentence above. This CA PUC-regulated water company is the only source of potable water for the residents of these communities.	Comment addressed.
			p. 5-10 The beneficial uses of other groundwater users, including agricultural and industrial users, will subsequently be evaluated based on water rights priorities. Is the priority for allocation of water based on water rights priorities or beneficial uses? What exactly are the priorities that the GA will be using to set allocations and augmentation fees?	Comment related to legal positions and not specifically relevant to the GSP.
			p. 5-11 Current groundwater production that has existed and has been continuous prior to the establishment of NAWS China Lake will be given a priority over more recent pumping that has occurred since the IWVGB has been documented to be in overdraft conditions, at least since the 1960s. Searles Valley Minerals has pre-existing water rights that pre-date	Comment noted.

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			the establishment of NAWS China Lake and has been pumping water from the IWV since the early 1930's. Personnel that work in Searles Valley and their families have resided in the Indian Wells Valley since industrial activity started in Searles Valley.	
			p. 5-11 Section 5.2.1.5 Permitting and Regulatory Process This section does not mention that the CA PUC must be involved in any decision by the SDWC to increase fees on its customers due to the possible increase in the cost of water because of augmentation fees assigned to SVM.	Comment noted.
			p. 5-12 All groundwater pumpers shall be instructed to submit records of their historical pumping and any other relevant material to the IWVGA prior to March 1, 2020. How will the pumpers know which documents are relevant? Will we be getting more details on exactly what is needed from whom? Will there be community outreach? Are de minimus pumpers exempt from this? Will these documents be released to the public?	Comment noted and will be addressed post GSP.
			p. 5-12 The IWVGA shall determine each groundwater pumper's Annual Pumping Allocation and/or Transient Pool Allocation following the adoption of this plan. All groundwater pumpers shall be instructed to submit records of their historical pumping and any other relevant material to the IWVGA prior to March 1, 2020. On or before April 15, 2020, the IWVGA Water Resources Manager shall review these materials and provide a draft recommendation of each groundwater pumper's Annual Pumping Allocation and/or Transient Pool Allocation to each groundwater pumper who submitted materials and to the IWVGA TAC members. By April 30th, 2020, all groundwater pumpers shall submit comments on the draft recommendation to the Water Resources Manager. The Water Resources Manager shall consider these comments and present a final report and recommendation to the IWVGA Board for consideration at its June 2020 meeting. Those receiving a Transient Pool Allocation may elect to join the Fallowing Program by no later than August 1, 2020. This is a very short timetable, especially in light of the numerous data gaps identified in the Plan. Is there a compelling reason for this? This timetable only talks about allocation, not augmentation fees. At what point in this process will augmentation fees be determined? When will the fees start? When will they be paid? Will the fee amount per AF fluctuate or be steady? If the fees change, will that be on a yearly basis or as needed? Will the IWVGA try to earn interest on this money if it is banked? Will these fees be subject to the Prop 218 constraints? This timeline does not seem to account for environmental review.	Comment noted and will be addressed post GSP.
			Project No. 1: Develop Imported Water Supply p. 5-14 Option 2: Groundwater Recharge Project with LADWP Has there been any discussion with the Navy about possibly renewing the ability they once had to tap into this aqueduct as mentioned on page 3 of the May 2019 report on Navy Demographics and Water Requirements at NAWS China Lake?	Comment noted. Discussions with all relevant parties, including potentially the Navy, will continue post GSP adoption.
			p. 5-15 A map of the facilities required for the Option 2 project is shown on Figure 5-2, including a preliminary location of the surface spreading grounds. Why surface spreading grounds and not direct injection? There will be loss of water if spreading grounds are used and not all of the water will be available for recharge. Is there a technical reason for using spreading grounds?	Injection and surface spreading have vastly different costs, permitting requirements, and other considerations.

COMMENT DOCUMENT	COMMENTER	DATE SUBMITTED	COMMENT	RESPONSE
			p. 5-19 The public and relevant entities will be given the opportunity and time to participate in and provide feedback on the procurement of imported water supplies through the project's environmental review processes. It would be beneficial to have advance public notice of the project details prior to the environmental reviews since these are such large and complex projects.	Comment noted.
			p. 5-20 5.3.1.7 Implementation Process and Timetable The timetable for the engineering and studies prior to the decision about which option to choose seems ambitious. Who will be doing the preliminary engineering? Will this go out for bid? Where will the funding for the engineering come from?	Comment noted.
			p. 5-22 Should it be determined with certainty that imported water supplies will be unavailable (or unavailable at a reasonable cost) within the planning and implementation horizon, the IWVGA will consider modifications to the GSP including potentially revisiting Management Action No. 1 and modifying the Annual Pumping Allocations such that the IWVGB may reach sustainability without imported water supplies. At what point will modifying annual pumping allocations be considered on the timeline? When will the certainty be reached? After 2023, 2030 or some other deadline?	Comment noted and will be addressed post GSP adoption.
			Project No. 2: Optimize Use of Recycled Water p. 5-24 The IWVGA has identified the following three (3) recycled water subprojects as conceptually feasible for potential implementation in accordance with this GSP. Recycled Water Subproject 1– Landscape Irrigation in the City and NAWS China Lake Recycled Water Subproject 1a– Landscape Irrigation at Cerro Coso Community College Recycled Water Subproject 2 - Landscape use of recycled water is not the most beneficial use. Groundwater recharge (subproject 2) would be better. Landscape usage is generally a choice and not a necessity. Although recycled water could supplant water used on landscaping, the water used for landscaping can also be decreased by decreasing or changing the landscaping. Recycled water supplanting industrial water would also be a better choice than supplanting landscaping.	Comment noted.
			p. 5-24 *Further evaluation of the other potential opportunities for recycled water subprojects in the IWVGB (including industrial use of recycled water) will be conducted as a post-GSP action.* Searles Valley Minerals would be interested in exploring using recycled water in its processes.	Comment noted.
			p. 5-27 *Existing groundwater uses for landscape irrigation should be replaced with non-potable water supplies (i.e. recycled water) to the greatest extent feasible so that groundwater may be produced primarily for domestic purposes.* Or landscaping should be altered such that minimum water is needed.	Comment noted.
			p. 5-29 *It should be noted that the required facilities for Recycled Water Subproject 1a are considered an extension of the facilities required for Recycled Water Subproject 1. The costs presented above and in Table 5-4 are considered incremental extensions of the costs listed in Table 5-3.* Or Cerro Coso could xeriscape.	Comment noted.
			Project No. 3: Basin-wide Conservation Efforts At the beginning of this section introducing conservation, p. 5-33 states *An additional project is to develop additional voluntary and rebate-based conservation efforts for*	Comment addressed.

COMMENT DOCUMENT	COMMENTER	DATE SUBMITTED	COMMENT	RESPONSE
			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. But at the bottom of p. 5-33 it states *The IWVGA will build upon the historical and current mandatory water use restrictions to potentially establish new basin-wide mandatory conservation measures that will reduce per-capita water demands for domestic and recreational (irrigation) uses of groundwater to the greatest extent feasible.* This is somewhat confusing since the conservation efforts discussed seem to be both voluntary and mandatory. SVM suggests that the first sentence above state that the conservation efforts will be a mixture of voluntary, rebate-based and mandatory efforts.	
			p. 5-37 *The public and relevant entities will be given notice of the IWVGA's adoption of ordinances that would enforce any additional conservation measures.* Dos this include notifying the CA PUC which is the regulatory agency that regulates the SDWC?	Comment noted.
			p. 5-38 *IWVGA will coordinate with SVM staff starting as soon as practical regarding possible additional opportunities for conservation in SVM's mineral recovery process. A feasibility study and engineering report describing the potential for SVM to use recycled and/or brackish water will be completed as soon as practical. If SVM use of recycled and/or brackish water is technologically and financially feasible, construction of new production facilities and conveyance infrastructure, will commence no later than January 2025.* If funding is not available, will this timetable move out?	Comment noted.
			Project No. 4: Shallow Well Mitigation Program p. 5-39 *The IWVGA will prepare a mitigation plan (Shallow Well Mitigation Plan) to address the approximately 872 shallow wells in the IWVGB.* Who will develop the plan? Is it the GA, Stetson, TAC, someone else? Is there a plan to reduce the drilling of new wells in the IWVGB? Will the counties put a moratorium on drilling new wells (not replacement wells) or restrict areas where new wells can be drilled? If new wells are drilled, will they be subject to this program?	Comment noted and will be addressed post GSP adoption.
			p. 5-40 *The wells recommended for mitigation will be placed on an Impacted Shallow Well Priority List and will be scheduled for mitigation.* This plan is vague. How long will wells sit on the list before they are mitigated? Will they be mitigated on a first come, first serve? Will this be dependent on funding? Will this program be available to new wells drilled after 2020?	Comment noted and will be addressed post GSP adoption.
			Project No. 5: Dust Control Mitigation Program p. 5-43 *Wind breaks/wind barriers: According to the Agricultural Guide to Controlling Windblown San and Dust, wind typically does not lift sand much more than three feet into the air. Consequently, the wind breaks/wind barriers create a "trap" which interrupts to transport of blowing sand and causes the sand to deposit at the site of the wind break. Wind breaks may include, but are not limited to, solid or porous fences, straw bales, tilling soils to create surface roughness, and berms.* There are some scientific arguments against this approach. In some cases this can make the situation worse. Hopefully each area will be considered individually for dust control programs and the program will be tailored to the specific environmental conditions of that area, not a "one size fits all" approach.	Comment noted.

COMMENT DOCUMENT	COMMENTER	DATE SUBMITTED	COMMENT	RESPONSE
			p. 5-44 *Implementation of mitigation efforts ~~which do not involve use of water~~ will result in an effective replacement of vegetation, and contribute to long-term decreased groundwater use.* Cross out the phrase above. It is unnecessarily constraining.	Comment noted.
			p. 5-44 *The metric for measuring project benefits will be the number of acres of fallowed agricultural lands that have dust control mitigation measures implemented.* The metric should be the lack of measurable dust coming from fallowed lands as measured against some baseline amount.	Comment noted.
			Project No. 6: Pumping Optimization Project p. 5-47 *The pumping optimization program is proposed relocate some of the Water District, and potentially some of SVM's groundwater pumping, to the northwest portion of the basin. The pumping optimization program is anticipated to include the construction of two new wells in the northwest portion of the basin along Brown Road and approximately nine miles of pipeline to connect the wells to the Water District's water system.* If an SVM well is moved, there will also need to be pipeline installed to connect the well to the SVM water system.	Comment noted.
			SECTION 6: IMPLEMENTATION PLAN p. 6-1 *Increasing water reliability and preserving groundwater resources are critical tasks of the IWVGA and are critical to accomplishing the mission at NAWS China Lake and sustaining the entire IWV community.* The phrase "and the communities located in Searles Valley" should be added to the above sentence.	Comment noted.
			In the funding sections many funding sources are listed, is the IWVGA planning on hiring someone to explore these funding options, or will this fall to the water resources manager or the general manager of the IWVGA?	Comment noted and related to IWVGA policies and/or procedures that will be determined post GSP adoption.
			GSP Draft Volume 2 This volume should have assigned page numbers. The list of appendices should have page numbers and a table of contents. At over 600 pages, it is hard to find the appropriate appendix without scrolling through the whole document.	Comment noted.

COMMENT DOCUMENT	COMMENTER	DATE SUBMITTED	COMMENT	RESPONSE
21	**Wendy Schneider, The Friends of Inyo**	**01/14/2020**	Our organization has significant expertise in the environmental importance of groundwater and surface water in the Eastern Sierra. It recently came to our attention that Section 5.3 the Draft GSP proposed for adoption by the IWVGA includes proposed Management Action Project 1 (Develop Imported Water Supply), Option 2 (Groundwater Recharge Project with LADWP). We have very serious concerns about the inclusion of this project and strongly urge you to remove Project 1, Op5on 2 from the Dra; GSP before it is adopted and submiPed to the Department of Water Resources later this month. Under the concept for Option 2, "Owens Valley water would be recharged into the IVWGB at the spreading grounds and serve as a supplemental source of recharge to replace any groundwater pumping that exceeds the long-term natural recharge to the IVWGB." The Los Angeles Department of Water and Power (LADWP) would provide Owens Valley water to the IWVGA through a new turnout on the LA Aqueduct and a pipeline to convey LADWP's water supply from the Owens Valley to the IWVGB. The development of a new turnout from the LA Aqueduct and the export of Owens Valley water to a never-before served basin would be a significant and detrimental precedent for the Owens Valley watershed, and would undermine the ongoing need for stringent environmental protections for our precious water resources. Further, it is highly unlikely that the IVWGA can secure the permits, legal authorizations, and environmental approvals that would be required to export water from the Owens Valley to the Indian Wells Valley. We believe that the proposed project option is infeasible and it therefore does not meet the most basic requirements for inclusion in a GSP. We also do not agree that the IWVGA has met its obligation to accurately describe the proposed water source, reliability, legal authority, and ability to fund this project option, nor has it adequately considered the collateral impacts to groundwater dependent ecosystems and other natural resources in the basin from which water is proposed to be imported. Friends of the Inyo discourages the IWVGB from expending further efforts to study this project option, as it would be a wasteful use of financial and staff resources. We ask that the IWVGA remove the description of Project Option 2 from its Draft GSP.	Comment noted. All reasonable and feasible imported water options will continue to be explored. Potential impacts and required permitting will be evaluated post GSP adoption.
22	**Richard Button, Tribal Chairperson, Lone Pine Paiute Shoshone Reservation**	**01/14/2020**	Lone Pine Paiute-Shoshone Reservation (LPPSR) is in full support of Inyo County's position to oppose water exports to the Indian Wells Valley Groundwater Basin. The Owens Valley Groundwater Basin is taxed from 100 years of water exports and the engineered loss of a 110 square mile lake. Every year there are more losses of springs and diverted surface water sources. Although the region does not meet California Department of Water Resources' strict definition under SGMA of a basin in distress, the LPPSR community has the historic knowledge of a much richer and healthier environment before exports began. We understand the fear and concerns of an uncertain future due to the depletion of a critical resource. However, the easiest option of taking water from neighboring basins is not an acceptable nor long term solution. The valleys to the north of Indian Wells have little control over their water due to the continuing growth of Los Angeles. Let us learn from past mistakes and find creative alternatives to unsustainable use of fresh water.	Comment noted. All reasonable and feasible imported water options will continue to be explored. Potential impacts and required permitting will be evaluated post GSP adoption.
23	**John-Carl Vallejo, Inyo County**	**1/20/2020**	• 4.1.1 o Missing word first sentence: "…has identified six sustainability which…"	Comment addressed in a previous draft.
			• 4.1.2 o Typo first sentence "…used to measure monitor…"	Comment addressed in a previous draft.
			• 4.2.2	

COMMENT DOCUMENT	COMMENTER	DATE SUBMITTED	COMMENT	RESPONSE
			○ Recommend replace "sustainable water supply" with something like "reliable & potable water supply."	Comment noted. Sustainability Goal language was coordinated with the PAC and TAC members.
			○ Big picture comment: "sustainability" & "sustainable" are SGMA terms of art. So whenever we aren't referring to those terms of art such as in the first sentence "sustainable water supply" we should use different words.	Comment noted. This sentence is referring to the SGMA connotation of "sustainable".
			• 4.2.4 ○ Formatting (underline) errors.	Comment addressed in a previous draft.
			○ Last bullet – is "secondary undesirable results" the accurate phrase, or should it be "…secondary environmental impacts…"	Comment addressed.
			• 4.3.1.2 ○ This section lacks an clear statement of the criteria at the beginning. We should include a clear statement of the criteria up font like is provided in 4.3.2.2. Or move up the second to last paragraph to the top	Comment noted.
			○ First sentence should change "could not be met" to "will not be met"	Comment addressed.
			○ 1st paragraph - consider bring into the paragraph (for context) the available potable water we understand to exist within reasonable reach (shallow well depths).	Comment noted.
			• 4.3.1.3 ○ 1st bullet: "buffer" is not defined.	Comment noted.
			"Jeopardy to beneficial uses…" wording needs adjustment.	Comment noted.
			• 4.3.3.2 ○ Too vague.	Comment noted.
			• 4.3.4.2 ○ We should include short explanation of benchmarks. Do we have any?	Comment noted.
			• 4.4 ○ Second paragraph – "groundwater levels **that exceed** the established…" Is "exceed" the technically accurate word?	Comment addressed
			• 4.4.1 ○ "the stimulated estimated value…" typo?	Comment addressed in previous draft.
			• 4.4.1.4 ○ "…the Minimum Threshold impacts and limits the volume of groundwater that can be…" apparent wording correction needed	Comment noted.
			• 4.4.1.6 ○ "According no representative…" typo – accordingly?	Comment addressed in previous draft.
			○ Second paragraph 1st sentence comma needed. "…dependent on groundwater level historical groundwater elevations…"	Comment noted.

COMMENT DOCUMENT	COMMENTER	DATE SUBMITTED	COMMENT	RESPONSE
			• 4.5.3 ○ "…water quality is set at the highest most recent TDS concentration." Which one is it? Highest, or most recent?	Comment addressed.
			• Section 5 Table of Contents ○ Numbering error 5.3.5.8 then 5.3.1?...	Comment addressed in previous draft.
			• 5.1.1.1 ○ Where is annual statement requirement per 10725.8?	Comment noted. To be addressed post GSP.
			○ "…all groundwater pumpers continue to possess the right to produce groundwater provided they pay the Augmentation Fee." Where is power to suspend pumping per 10726.4?!	Comment related to legal positions and not specifically relevant to the GSP.
			○ Page 11 last paragraph – "…It is anticipated…in the first year of implementation." That sentence appears to double count the Transient Pool Program pumping by referencing it twice.	Comment noted.
			• 5.3.1.1 "…as well as groundwater from the Mono Basin in Inyo County…" The Mono Basin is not in Inyo County. Which basin are you referring to?	Comment addressed.
			• **5.3.1.4** ○ **Table 52 misrepresents the cost of the water rights acquisition. This assumes 1:1. I request that this table show the different costs of 2:1 and 3:1 scenarios. If some change in this regard is not made Inyo County will be very outspoken about this point during public meetings. Feel free to contact me to discuss.**	Comment noted.
			5.3.2.4 • o Are we just throwing numbers around here? $20k annually? Indefinitely?	Comment noted.
			• 5.3.4.4 ○ Need more basic info about potential $19million cost	Comment noted.
			• 5.3.4.7 ○ Last sentence typo – "rick" should be "risk"?	Comment addressed in previous draft.
			• Table 6-1 ○ Same comment re cost of Option 2 as 5.3.1.4	Comment noted.
			• Same comment re lack of explanation for dust mitigation project cost	Comment noted.
24	**Wendy Sugimura, Mono County Community Development Department**	**01/15/20**	**1. The Development of Imported Water Supplies May Require LADWP to Obtain Land Use Approvals and Perform Environmental Review Pursuant to CEQA.** Although LADWP's extraterritorial use and development of its property and resources may be exempt from local regulation, the use and development of the same property by a third party – even with LADWP permission and assistance – may not exempt LADWP from Mono County's authority to regulate land uses. The Mono County General Plan Conservation/Open Space Element includes several policies and objectives related to export of surface water and groundwater. For example, if LADWP were to increase groundwater production in Mono County in order to import water to the Basin, then the Department could require LADWP to obtain a groundwater transfer permit requiring it to,	Comment noted. Potential impacts and required permitting will be evaluated post GSP adoption.

COMMENT DOCUMENT	COMMENTER	DATE SUBMITTED	COMMENT	RESPONSE
			among other things, identify potential environmental impacts to wildlife and riparian habitat, wetlands, in-stream habitat, other water users (such as agricultural operators), and indirect effects such as potential increased flood risk, increased fire hazard risk, increased sedimentation, and reduced groundwater recharge capacity. (See Mono County Code [MCC] §20.01.010 et seq.; General Plan Conservation/Open Space [GP C/OS] Actions 3.E.1.a. and 3.E.1.b.) Groundwater transfer permits are subject to approval by the Mono County Planning Commission, which must deny an application for any such permit if the transfer does not adequately protect the above resources. (GP C/OS Action 3.E.1.b. and 3.E.1.c.) Similarly, the Mono County General Plan requires water transfer projects to avoid – or at the very least mitigate – the potential significant impacts to surface water and groundwater resources. (GP C/OS Policy 3.B.6.) Mitigation measures and associated monitoring programs will be made a condition of any such project or permit approval. (GP C/OS Action 3.B.6.a.) In addition, transfers may not result in adverse water quality impacts. The Mono County General Plan tasks the Department to protect groundwater quality and water-dependent resources from unreasonable development and degradation to ensure county water resources are available and of a quality to meet future county needs. (GP C/OS Objective 4.A.) The export of LADWP water from Mono County could result in negative impacts to the water resources, wildlife, agricultural operations and habitat of three watersheds: the Mono Basin, Long Valley Basin, and the northern section of the Owens Valley Basin (i.e., the Tri-Valley). Specifically, the Department is concerned that any agreement between LADWP and the Authority would increase the diversion of surface water from Mono Lake and the Owens River, prompt the drilling of new groundwater wells, or both. These actions may trigger the need for LADWP to obtain certain land use approvals from the Department as well as groundwater transfer permits, which will necessarily require Mono County to require environmental review be completed pursuant to CEQA. Taken together, it is unclear whether importing water to the Basin, by itself, will be a feasible project to achieve sustainable groundwater management in the Basin	
			2. The Development of Imported Water Supplies May Result in Unacceptable Significant Environmental Impacts to Mono County's Natural Resources, Communities, and Economy. As explained above, Mono County is actively involved in all projects, actions, and decisions with the potential to affect its natural environment, including its water resources and wildlife. In large part, this is because Mono County's economy is based on tourism, agriculture, and recreation, which necessarily depend on water to protect the natural environment that support these interests. The Department is concerned that any additional export of surface water or groundwater from Mono County beyond amounts presently occurring would result in potentially significant environmental impacts requiring environmental review pursuant to CEQA. In August 2018, Mono County brought a lawsuit against LADWP for its decision to remove irrigation water from certain Long Valley ranch leases without first completing environmental review pursuant to CEQA. Among other things, Mono County argued that LADWP's decision to remove irrigation water had the potential to result in significant	Comment noted. Potential impacts and required permitting will be evaluated post GSP adoption.

COMMENT DOCUMENT	COMMENTER	DATE SUBMITTED	COMMENT	RESPONSE
			environmental impacts to the land and water resources of southern Mono County, and thus had the potential to adversely affect the Bi-State Distinct Population Segment (DPS) of Greater Sage Grouse and its habitat in the area; the agricultural economies of Long Valley and Little Round Valley; brown the landscape and allow the intrusion of invasive weeds and combustible fuels increasing aesthetic impacts and the threat of wildfire; and degrade the recreational opportunities and interests that attract visitors from all over the world. Although Mono County's litigation has not been decided, LADWP may be ordered to prepare an environmental review pursuant to CEQA for any increased export from Mono County, which could include mitigation measures that require certain amounts of water remain in Mono County to avoid significant environmental impacts. Even if LADWP was not ordered to prepare such an environmental review, any increase in the export of LAD WP water beyond current amounts will likely be met with such strong opposition from stakeholders that the option should be considered infeasible. In addition, the Bi-State DPS of Greater Sage Grouse is currently proposed to be listed as threatened under the Endangered Species Act by the U.S. Fish and Wildlife Service, and approximately 25% of the entire population is located in Long Valley. In the interest of protecting and preserving this species of concern and its habitat, Mono County participates in a collaborative, multi-agency coalition that includes the Bureau of Land Management, California Department of Fish and Wildlife, U.S. Fish and Wildlife, Inyo National Forest, Humboldt-Toiyabe National Forest, Nevada Department of Wildlife and others. This conservation coalition also fully engaged LADWP over its decision to remove water from certain Long Valley ranch leases due to the real and potential impacts to the Long Valley sage grouse population and habitat, and would likely be highly concerned about water exportation to the Basin as proposed. One result of that engagement is that LADWP is now an actively participating member of this conservation coalition and collaborating on sage grouse conservation actions in Long Valley. The Department recognizes the hard work of the Authority to comply with the mandates of the Sustainable Groundwater Management Act (SGMA) and address the Basin's critical overdraft condition. However, for the reasons set forth above, the Authority has not adequately evaluated or considered the potential impacts to agricultural operators, recreation, groundwater dependent ecosystems, wildlife, and other natural resources in the basins from which water is proposed to be imported, including those in Mono County. Therefore, the Department strongly urges the Authority to eliminate Project No. 1: Develop Imported Water Supply, Option 2: Groundwater Recharge Project with LAD WP. Such a project/management action is likely infeasible, will be met with strong opposition from local stakeholders, and arguably cannot be seen as anything other than creating a new problem in the hope it solves another. Instead, the Department recommends the Authority pursue other projects/management actions that favor water conservation and efficient use over water importing.	
25	**Nick Panzer, Ridgecrest Resident**	**12/16/2019**	1. Specifically, what …"circumstances…would trigger…termination of… [the import]..project"? Reg. 354.44.(b)(1)(A) requires a plan to an answer this question at the outset.	Comment noted and will be considered in future GSP updates as imported water options and feasibility are continued to be explored.

COMMENT DOCUMENT	COMMENTER	DATE SUBMITTED	COMMENT	RESPONSE
			2. Specifically, what "reasonable path to achieve sustainability" will the Plan take if we terminate the import project? Reg. 354.30.(e) requires a plan to answer this question at the outset.	See Section 5.1. Given the magnitude of overdraft and the current Basin conditions, all planned projects and management actions should be implemented to eliminate undesirable results and shall be implemented with the earliest feasible timetable. If one, or more, of the planned projects and management actions cannot be implemented, the IWVGA will consider additional, and perhaps more severe, actions to reach sustainability. If necessary, in the future, total annual pumping for the Basin may need be reduced to the Current Sustainable Yield of about 7,650 AFY.

APPENDIX 1-G

GSP SUBMITTAL CHECKLIST

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Table 1. Preparation Checklist for GSP Submittal

GSP Regulations Section	Water Code Section	Requirement	Description	Section(s) or Page Number(s) in the GSP
Article 3. Technical and Reporting Standards				
352.2		Monitoring Protocols	• Monitoring protocols adopted by the GSA for data collection and management • Monitoring protocols that are designed to detect changes in groundwater levels, groundwater quality, inelastic surface subsidence for basins for which subsidence has been identified as a potential problem, and flow and quality of surface water that directly affect groundwater levels or quality or are caused by groundwater extraction in the basin	Appendix 4-c; Sections 4.1.2; 4.4.1.6; 4.4.2.6; 4.4.3.6; 4.4.4.6; 4.7.1; 4.7.2
Article 5. Plan Contents, Subarticle 1. Administrative Information				
354.4		General Information	• Executive Summary • List of references and technical studies	Sections Executive Summary; 1.7; 2.9; 3.7; 4.8; 5.5; 6.5
354.6		Agency Information	• GSA mailing address • Organization and management structure • Contact information of Plan Manager • Legal authority of GSA • Estimate of implementation costs	Sections 1.4.1; 1.4.2; 6.3.1
354.8(a)	10727.2(a)(4)	Map(s)	• Area covered by GSP • Adjudicated areas, other agencies within the basin, and areas covered by an Alternative • Jurisdictional boundaries of federal or State land • Existing land use designations • Density of wells per square mile	Figures 2-1; 2-3; 2-9; 2-10; 2-11; Sections 2.2; 2.2.4; 2.5

GSP Regulations Section	Water Code Section	Requirement	Description	Section(s) or Page Number(s) in the GSP
Article 5. Plan Contents, Subarticle 1. Administrative Information (Continued)				
354.8(b)		Description of the Plan Area	• Summary of jurisdictional areas and other features	Section 2.2
354.8(c) 354.8(d) 354.8(e)	10727.2(g)	Water Resource Monitoring and Management Programs	• Description of water resources monitoring and management programs • Description of how the monitoring networks of those plans will be incorporated into the GSP • Description of how those plans may limit operational flexibility in the basin • Description of conjunctive use programs	Sections 2.6; 2.7
354.8(f)	10727.2(g)	Land Use Elements or Topic Categories of Applicable General Plans	• Summary of general plans and other land use plans • Description of how implementation of the GSP may change water demands or affect achievement of sustainability and how the GSP addresses those effects • Description of how implementation of the GSP may affect the water supply assumptions of relevant land use plans • Summary of the process for permitting new or replacement wells in the basin • Information regarding the implementation of land use plans outside the basin that could affect the ability of the Agency to achieve sustainable groundwater management	Sections 2.5.2; 2.7.7

GSP Regulations Section	Water Code Section	Requirement	Description	Section(s) or Page Number(s) in the GSP
Article 5. Plan Contents, Subarticle 1. Administrative Information (Continued)				
354.8(g)	10727.4	Additional GSP Contents	**Description of Actions related to:** • Control of saline water intrusion • Wellhead protection • Migration of contaminated groundwater • Well abandonment and well destruction program • Replenishment of groundwater extractions • Conjunctive use and underground storage • Well construction policies • Addressing groundwater contamination cleanup, recharge, diversions to storage, conservation, water recycling, conveyance, and extraction projects • Efficient water management practices • Relationships with State and federal regulatory agencies • Review of land use plans and efforts to coordinate with land use planning agencies to assess activities that potentially create risks to groundwater quality or quantity • Impacts on groundwater dependent ecosystems	Sections 2.5; 2.7; 3.4.7; 2.7.3; 2.7.4; 2.7.5; 2.7.6; 2.7.7
354.10		Notice and Communication	• Description of beneficial uses and users • List of public meetings • GSP comments and responses • Decision-making process • Public engagement • Encouraging active involvement • Informing the public on GSP implementation progress	Sections 1.3; 1.4.1; 1.5; 1.5.1 Appendix 1-F.

GSP Regulations Section	Water Code Section	Requirement	Description	Section(s) or Page Number(s) in the GSP
Article 5. Plan Contents, Subarticle 2. Basin Setting				
354.14		Hydrogeologic Conceptual Model	• Description of the Hydrogeologic Conceptual Model • Two scaled cross-sections • Map(s) of physical characteristics: topographic information, surficial geology, soil characteristics, surface water bodies, source and point of delivery for imported water supplies	Section 3.3; Figures 3-4; 3-5; 3-7; 3-11
354.14(c)(4)	10727.2(a)(5)	Map of Recharge Areas	• Map delineating existing recharge areas that substantially contribute to the replenishment of the basin, potential recharge areas, and discharge areas	Figure 3-11
	10727.2(d)(4)	Recharge Areas	• Description of how recharge areas identified in the plan substantially contribute to the replenishment of the basin	Section 3.3.3.2
354.16	10727.2(a)(1) 10727.2(a)(2)	Current and Historical Groundwater Conditions	• Groundwater elevation data • Estimate of groundwater storage • Seawater intrusion conditions • Groundwater quality issues • Land subsidence conditions • Identification of interconnected surface water systems • Identification of groundwater-dependent ecosystems	Sections 3.3.4; 3.4
354.18	10727.2(a)(3)	Water Budget Information	• Description of inflows, outflows, and change in storage • Quantification of overdraft • Estimate of sustainable yield • Quantification of current, historical, and projected water budgets	Sections 3.3.4; 3.3.5. Tables 3-5, 3-6, 3-7, 3-8, 3-10, 3-12.
	10727.2(d)(5)	Surface Water Supply	• Description of surface water supply used or available for use for groundwater recharge or in-lieu use	Section 3.3.3.2, 2.2.4.

GSP Regulations Section	Water Code Section	Requirement	Description	Section(s) or Page Number(s) in the GSP
Article 5. Plan Contents, Subarticle 2. Basin Setting (Continued)				
354.20		Management Areas	• Reason for creation of each management area • Minimum thresholds and measurable objectives for each management area • Level of monitoring and analysis • Explanation of how management of management areas will not cause undesirable results outside the management area • Description of management areas	N/A
Article 5. Plan Contents, Subarticle 3. Sustainable Management Criteria				
354.24		Sustainability Goal	• Description of the sustainability goal	Section 4.2
354.26		Undesirable Results	• Description of undesirable results • Cause of groundwater conditions that would lead to undesirable results • Criteria used to define undesirable results for each sustainability indicator • Potential effects of undesirable results on beneficial uses and users of groundwater	Section 4.3
354.28	10727.2(d)(1) 10727.2(d)(2)	Minimum Thresholds	• Description of each minimum threshold and how they were established for each sustainability indicator • Relationship for each sustainability indicator • Description of how selection of the minimum threshold may affect beneficial uses and users of groundwater • Standards related to sustainability indicators • How each minimum threshold will be quantitatively measured	Section 4.4

GSP Regulations Section	Water Code Section	Requirement	Description	Section(s) or Page Number(s) in the GSP
Article 5. Plan Contents, Subarticle 3. Sustainable Management Criteria (Continued)				
354.30	10727.2(b)(1) 10727.2(b)(2) 10727.2(d)(1) 10727.2(d)(2)	Measureable Objectives	• Description of establishment of the measureable objectives for each sustainability indicator • Description of how a reasonable margin of safety was established for each measureable objective • Description of a reasonable path to achieve and maintain the sustainability goal, including a description of interim milestones	Sections 4.5; 4.4; 4.2.4
Article 5. Plan Contents, Subarticle 4. Monitoring Networks				
354.34	10727.2(d)(1) 10727.2(d)(2) 10727.2(e) 10727.2(f)	Monitoring Networks	• Description of monitoring network • Description of monitoring network objectives • Description of how the monitoring network is designed to: demonstrate groundwater occurrence, flow directions, and hydraulic gradients between principal aquifers and surface water features; estimate the change in annual groundwater in storage; monitor seawater intrusion; determine groundwater quality trends; identify the rate and extent of land subsidence; and calculate depletions of surface water caused by groundwater extractions • Description of how the monitoring network provides adequate coverage of Sustainability Indicators • Density of monitoring sites and frequency of measurements required to demonstrate short-term, seasonal, and long-term trends • Scientific rational (or reason) for site selection • Consistency with data and reporting standards • Corresponding sustainability indicator, minimum threshold, measureable objective, and interim milestone	Sections 4.4.1.6; 4.4.2.6; 4.4.3.6; 4.4.4.6; 3.6; 2.6.2; 2.6.3; 4.6; 4.7

GSP Regulations Section	Water Code Section	Requirement	Description	Section(s) or Page Number(s) in the GSP
			(Monitoring Networks Continued) • Location and type of each monitoring site within the basin displayed on a map, and reported in tabular format, including information regarding the monitoring site type, frequency of measurement, and the purposes for which the monitoring site is being used • Description of technical standards, data collection methods, and other procedures or protocols to ensure comparable data and methodologies	Figures 4-2; 4-3 Tables 4-1 through 4-6. Section 4.7.2
354.36		Representative Monitoring	• Description of representative sites • Demonstration of adequacy of using groundwater elevations as proxy for other sustainability indicators • Adequate evidence demonstrating site reflects general conditions in the area	Sections 4.4.1.6; 4.4.2.6; 4.4.3.6; 4.4.4.6
354.38		Assessment and Improvement of Monitoring Network	• Review and evaluation of the monitoring network • Identification and description of data gaps • Description of steps to fill data gaps • Description of monitoring frequency and density of sites	Section 3.6 Section 4.7.

GSP Regulations Section	Water Code Section	Requirement	Description	Section(s) or Page Number(s) in the GSP
Article 5. Plan Contents, Subarticle 5. Projects and Management Actions				
354.44		Projects and Management Actions	• Description of projects and management actions that will help achieve the basin's sustainability goal • Measureable objective that is expected to benefit from each project and management action • Circumstances for implementation • Public noticing • Permitting and regulatory process • Time-table for initiation and completion, and the accrual of expected benefits • Expected benefits and how they will be evaluated • How the project or management action will be accomplished. If the projects or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included. • Legal authority required • Estimated costs and plans to meet those costs • Management of groundwater extractions and recharge	Sections 5.2; 5.3; 6.3.2.
354.44(b)(2)	10727.2(d)(3)		• Overdraft mitigation projects and management actions	Sections 5.2; 5.3

GSP Regulations Section	Water Code Section	Requirement	Description	Section(s) or Page Number(s) in the GSP
Article 8. Interagency Agreements				
357.4	10727.6	Coordination Agreements - Shall be submitted to the Department together with the GSPs for the basin and, if approved, shall become part of the GSP for each participating Agency.	**Coordination Agreements shall describe the following:** • A point of contact • Responsibilities of each Agency • Procedures for the timely exchange of information between Agencies • Procedures for resolving conflicts between Agencies • How the Agencies have used the same data and methodologies to coordinate GSPs • How the GSPs implemented together satisfy the requirements of SGMA • Process for submitting all Plans, Plan amendments, supporting information, all monitoring data and other pertinent information, along with annual reports and periodic evaluations • A coordinated data management system for the basin • Coordination agreements shall identify adjudicated areas within the basin, and any local agencies that have adopted an Alternative that has been accepted by the Department	N/A

APPENDIX 2-A

POSSIBLE AND CONFIRMED GROUNDWATER CONTAMINATION SITES

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Integrated Natural Resources Management Plan
Naval Air Weapons Station China Lake

Final
June 2014

Appendix H: Installation Restoration Sites and Approved Pesticide List

H.1 Installation Restoration Sites

Table H-1. Summary of Naval Air Weapons Station China Lake Installation Restoration Program Sites (Navy 2004b).

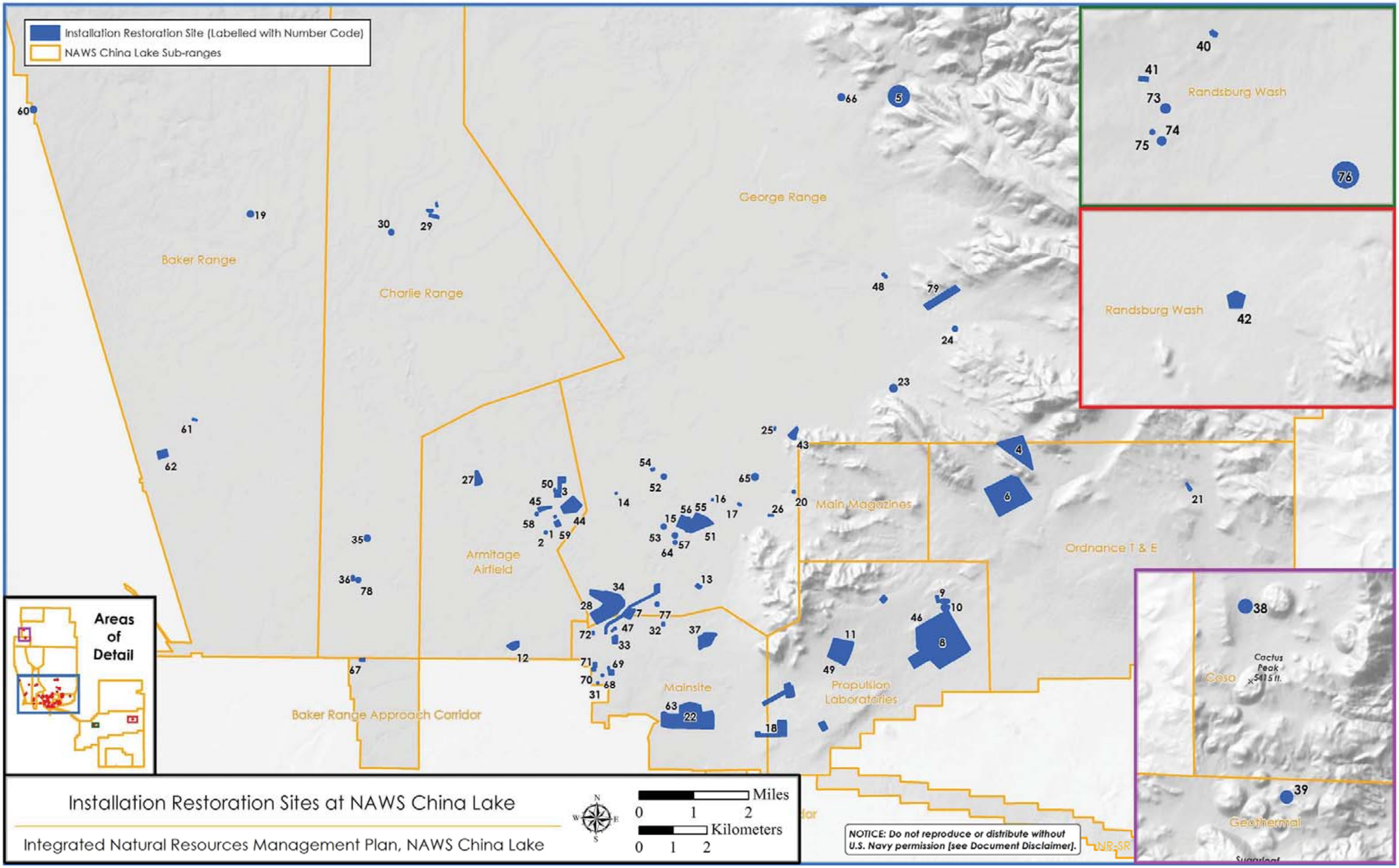
Site	Site Name	Cause of Contamination	Medium	Status*
1	Armitage Airfield Dry Wells (Building 20023)	Substandard jet fuel was disposed of into dry wells	Soil, possible groundwater	Removal & RI/FS
2	Aircraft Washdown Drainage Ditches - Armitage Airfield	Used engine fluids and solvents from maintenance activities were discharged into an unlined ditch	Soil, groundwater	RI/FS
3	Armitage Airfield Leach Pond	Sanitary and industrial waste from airfield operations were discharged into an evaporation/ leach pond	Groundwater, soil	RI/FS
4	Beryllium-Contaminated Equipment Disposal Area	Beryllium-contaminated equipment and structures were burned and buried	Soil	NFA
5	Burro Canyon Open Burning/Open Detonation (Building 32529)	Propellant, Explosive and Pyrotechnic (PEP) and some non-PEP materials	Air, soil	NFA
6	T-Range Disposal Area	Disposal of PEP materials and contaminated trash by open burning; residual wastes were buried in unlined trenches	Air, soil	Removal
7	Michelson Laboratory Drainage Ditches (Building 00005)	Acid and chemical wastes were discharged into unlined ditches	Soil, groundwater	RI/FS
8	Salt Wells Drainage Channels	Chemical waste waters were discharged into natural drainage channels	Soil, possibly groundwater	RI/FS
9	Salt Wells Asbestos Trenches	Asbestos from various Station activities was disposed of in three slit trenches	Soil	NFA
10	Salt Wells Disposal Trenches	Solid and liquid wastes from Salt Wells labs were disposed of in ten slit trenches	Soil	NFA
11	China Lake Propulsion Labs Evaporation Ponds (Buildings 10570 and 10580)	Wastewater from PEP machining operations was discharged into unlined ponds	Groundwater, soil	NFA
12	SNORT Road Landfill	Old gravel quarry was filled with hazardous and nonhazardous wastes from various activities	Soil, groundwater	RI/FS
13	Oily Waste Disposal Area (Water Road)	Waste oils from maintenance activities and grease traps were disposed of in two slit trenches	Soil, groundwater	RI/FS & removal
14	ER Range Septic System (Buildings 31434, 31440, 31433, and 31439)	Lab and sanitary waste from five septic tanks were disposed of through leach lines	Soil, groundwater	NFA
15	R-Range Septic System (Water Road) (Buildings 31434, 31440, 31433, and 31439)	Industrial and sanitary wastes from a lab were discharged to a surface ditch and leach field	Soil, groundwater	RI/FS
16	G-1 Range Septic System (Building 30881)	Sanitary and lab wastes were disposed of through leach lines	Soil, groundwater	NFA
17	G-2 Range Septic System (Building 30994)	Sanitary, explosive, and photo lab wastes were disposed of through leach lines	Soil, groundwater	NFA

Site	Site Name	Cause of Contamination	Medium	Status*
18	China Lake Propulsion Labs Leach Fields (Buildings 11050, 13040, and 14000)	Sanitary and industrial wastes, including PEP and photo lab wastes, were disposed of in leach fields	Soil	RI/FS
19	Baker Range Waste Trenches	Miscellaneous range wastes were disposed of in one large slit trench	Soil	NFA
20	Division 36 Ordnance Waste Area	Miscellaneous range wastes were disposed of in two slit trenches	Soil	NFA
21	CT-4 Disposal Area	Hazardous wastes from weapons testing were disposed of in a slit trench	Soil	NFA
22	Pilot Plant Road Landfill	Wastes from Navy housing and Public Works were disposed of in 12 trenches	Soil, groundwater	RI/FS
23	K-2 South Disposal Area	Range wastes and possibly chlordane were disposed of in three slit trenches	Soil	NFA
24	K-2 North Disposal Area	Range wastes were disposed of in two slit trenches	Soil	NFA
25	G-2 Range Disposal Area	Miscellaneous range wastes were disposed of in three slit trenches	Soil	NFA
26	G-2 Range Ordnance Waste Area	Miscellaneous range wastes were disposed of in two slit trenches	Soil	NFA
27	NAF Disposal Site	Solid and liquid wastes from aircraft operations were disposed of in two slit trenches	Soil, groundwater	NFA
28	Old DPDO Storage Yard	Possible spills of PCBs from leaking transformers; no evidence of spills found	Soil	NFA
29	C-1 Range East Disposal Area	Range wastes, chlordane and possibly unexploded ordnance were disposed of in three trenches	Soil	RI/FS
30	C-1 Range West Disposal Area	Range wastes and possibly unexploded ordnance were disposed of in two trenches	Soil	NFA
31	Public Works Pesticide Rinse Area	Pesticide- and herbicide-contaminated rinse waters were spilled on the ground	Soil	RI/FS & removal
32	Golf Course Pesticide Rinse Area (Building 02333)	Pesticide- and herbicide-contaminated rinse waters were spilled on the ground	Soil	RI/FS & removal
33	Michelson Lab Dry Wells (Building 00005)	Small amounts of fluid from pack-up power batteries were spilled or drained into dry wells	Soil, possible groundwater	RI/FS
34	Lauritsen Road Landfill	Inert and hazardous wastes were disposed of in several large trenches	Soil	NFA
35	SNORT Track Accident	A small amount of beryllium-contaminated materials were buried at this site	Soil	NFA
36	SNORT Storage Sheds (Buildings 20100, 25008, 25009, 25028, and 25021)	Several small spills of hazardous materials occurred in small storage sheds	Soil	NFA
37	Golf Course Landfill	Waste from the general China Lake community was disposed of in this small landfill	Soil	NFA
38	Cactus Flat Disposal Trenches	Wastes from special test programs were disposed of in two small trenches	Soil	NFA
39	CGEH-1 Geothermal Waste	Drilling mud and oil wastes were disposed of in an open pit	Soil	NFA
40	Randsburg Wash #1 (South Range)	Range wastes were disposed of in three slit trenches	Soil	NFA
41	Randsburg Wash #2 (South Range)	General and hazardous wastes were disposed of in two large pits	Soil	NFA
42	Randsburg Wash #3 (South Range)	One-time disposal of 30 drums of fuel, which was burned in the drums	Soil	NFA
43	Minideck (Building 31164)	Firefighting chemicals and unburned jet fuel were discharged into an unlined pond	Groundwater, soil	RI/FS

Site	Site Name	Cause of Contamination	Medium	Status*
44	Armitage Field Fire Fighting Training Area	Firefighting chemicals and unburned jet fuel spilled off the paid and several pits were used for disposal of fuels	Soil	RI/FS
45	NAF Maintenance Area	Aircraft maintenance wastes were disposed of in an unlined ditch	Soil	RI/FS
46	Dunkit Drainage Ditch (Building 15950)	Wastewater and chemicals from rocket motor casing cleaning were discharged into an unlined ditch.	Soil	RI/FS
48	Weapons Survivability Holding Ponds (Bldg. 31169, 73118 and 31179)	Petroleum hydrocarbons	Soil	NFA
47	Michelson Lab Sewer System (Building 00005)	Industrial wastewater from the Public Works compound and Michelson Lab were discharged to lined ponds	Groundwater	Removal & RI/FS
49	Salt Wells Propulsion Lab Industrial Waste Ponds and Sumps	Rinse water from various activities involved in propellant and explosive research was disposed of in ponds and sumps	Groundwater, soil	Removal
50	Airplane Oil Disposal Trench (Buildings 20220 and 20250)	Waste engine oil was disposed of in a trench	Soil	Removal
51	Area R East (Building 31531)	Vehicle maintenance, hazardous materials storage, and inert waste disposal trenches may have resulted in ground contamination	Soil	Removal
52	Area R Warhead Firing Arena (Building 31588)	No evidence of waste disposal	None	NFA
53	Area R Laser Lab Leachline (Building 31516)	Sanitary wastes were disposed of in a leach field	Soil	NFA
55	Area R Solvent Rinse Tank and Vicinity (Buildings 31503, 31504, and 31562)	Contaminated fluids may have escaped from the solvent rinse tank	Soil	RI/FS
56	Area R Static Firing Rocket Test Stands (Buildings 31505, 31568, 31569, and 31615)	Mercury, and possibly acids, bleaches, and unidentified chlorinated solvents were released during the test firings of liquid propellant rockets	Air, soil	Removal
57	Area R Warhead Research Pit (Building 31600)	Construction debris was dumped in this area	Soil	NFA
58	Armitage Field VX-5 Line Shack Storage Area (Building 00031)	Asphalt appears contaminated from the storage of hazardous hydraulic fluid, oil, jet fuel, and solvents	Soil	Removal
59	B-2 Spotting Tower 3 Quonset Hut (Buildings 30069 and 30072)	Area was used as a storage yard for the aircraft tire and brake shop	Soil	NFA
60	B-2 Spotting Tower 3 Quonset Hut (Buildings 30069 and 30072)	Range wastes may have been dumped in this area	Soil	NFA
61	B-3 Tower Dump	Range wastes were disposed of in a small trench	Soil	NFA
62	B-4 Start-Up Area (Buildings 30144 and 30145)	Wastewater from range operations was discharged to a septic system and dry well	Soil, possible groundwater	Removal
63	Dempsey Dumpster Station	Rinse water from dumpster cleaning	Soil	NFA
64	Earth & Planetary Sciences Leach Fields (Buildings 31567 and 31568)	Industrial wastewater was discharged to a septic system	Soil	RI/FS
65	G-2 Range Gun Mounts (Near Building 30964)	Guns were cleaned in the area	Soil	NFA
66	HANS Test Site (Building 32543)	Jet fuel was used in burn tests on composite materials, especially carbon fibers	Soil	NFA
67	Flightlines Lane Haven Dump	Solid waste from a mobile home park was disposed of in this area	Soil	NFA
68	Public Works Old PCB Transformer Storage Area	Possible PCB leakage	Soil	NFA
69	Public Works Vehicle Paint Shop & Drainage Catch Basin (Buildings 00576 and 02664)	Contaminants from Public Works paint shop activities, such as paint and solvents, drained into the surface runoff collection basin	Groundwater, soil	RI/FS

Site	Site Name	Cause of Contamination	Medium	Status*
70	Public Works Tank Truck Dry Well (Buildings 01088 and 02622)	Although this facility was constructed for de-fueling tanker trucks, there is no evidence that it was used for this purpose, but it was used for washing trucks	Soil, possible groundwater	RI/FS
71	Public Works Heavy Duty Equipment Repair Shop Storage Area	Hazardous materials stored in this area may have spilled or leaked	Soil	NFA
72	Railroad Engine House (Building 1055)	Waste oil from diesel locomotives was discharged into a concrete-lined pit that drained into a dry well	Soil, possible groundwater	RI/FS
73	Randsburg Wash Black Powder Assembly Building (Building 7007) (South Range)	Wastewater from black powder handling activities may have been discharged into floor drains	Soil	NFA
74	Randsburg Wash Central Site Old Leach Field (Buildings 70001, 70002, 70003, 70004, 70005, and 70006) (South Range)	Industrial wastewater from a photo lab, and maintenance and machine shops was discharged to a septic system	Soil	NFA
75	Randsburg Wash Gas Station (Building 70005) (South Range)	Vehicle maintenance activities	Soil	NFA
76	Randsburg Wash Gun Line (Buildings 70024, 70025, and 70031) (South Range)	Gun cleaning operations	Soil	NFA
77	Sludge Pit (Water Road)	Road oil was disposed of in a pit	Soil	NFA
78	SNORT Old Photographic Lab Sumps (Building 25010)	Photo processing wastes were discharged to a sump	Groundwater, soil	NFA
80	POI small locations	Various operation activities	Soil	PA

Notes:
In preparing this table, Site 79 was erroneously included. Initial investigations at Site 79 performed between 1999 and 2000 found that no releases of hazardous substances occurred, only the use of ordnance for its intended purpose. The site has been removed from the NAWS-CL Restoration Program and instead will continue to be managed as an active range.
*Removal = recommended for interim removal actions
RI = Remedial Investigation; FS = Feasibility Study; NFA = Navy recommendation for no further action subject to approval by the state agencies; PA = Preliminary Assessment



Map H-1. Installation restoration sites at NAWS China Lake.

APPENDIX 3-A

WATER PRODUCTION DATA

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IWV Ground Water Production Estimates 1975 - Present

Year	Meadow-brook Farms (e)	Simmons Ranch (f)	China Lake Acres	City of R/C	SVM	IWVWD	Inyokern CSD	NAWS (c)	Neal Ranch	Private Wells	Quist Farms	Orchards (d)	R/C Heights	S. Leroy (a/b)	Annual Totals
1975	1516		400		2781	2983	300	5000	2000				1000		15980
1976	1494		400		2911	3099	300	5000	2000				1000	1600	17804
1977	2702		400		3315	3063	300	5000	2000				1000	1600	19380
1978	3216		400		3081	3357	300	5000	2000				1000	1600	19954
1979	3257		400		3081	3402	300	5154	2000	2100			1000	1600	22294
1980	7515		400		2887	3319	300	4995	2041	2100			1000	1600	26157
1981	10036		400		3065	4223	300	4804	2002	2100			1000	1600	29530
1982	10324		400		2887	3963	300	4450	1478	2100			1000	1600	28502
1983	10087		400		2476	4316	300	4402	1752	2400			1000	1600	28733
1984	10312		400		2307	4940	300	4694	1568	2400			1000	1600	29521
1985	10100		400		2397	4981	300	4002	2450	2500			1000	1600	29730
1986	5389		400		2557	5901	300	4430	2353	2500			1000	1600	26430
1987	4141		**Purchased**		2560	7426	300	4422	1447	2500			**Purchased**	**Ranch**	22796
1988	5255		**by**		2560	7889	173	3980	1195	2500			**by**	**Closed**	23552
1989	7064		**IWVWD**		2320	8725	175	4205	**Purchased**	2650		500	**IWVWD**		25639
1990	6187				2505	8600	170	3667	**by**	2650		525			24304
1991	6737				2406	7700	150	3364	**IWVWD**	2650		525			23532
1992	7104				2528	7650	141	3351		2650		550			23974
1993	7701				2607	7800	150	3411		2650		575			24894
1994	7504				2607	8300	146	3684		2650		575			25466
1995	7427				2710	8100	125	3848		2650		595			25455
1996	7807				2620	8504	134	3367		2650		600			25682
1997	7800				2522	8534	139	2983		2650		625			25253
1998	7800				2527	7719	102	3018		2700		640			24506
1999	7800				2537	8242	104	2541		2700		690			24614
2000	7800				2701	8148	111	2690		2800		725			24975
2001	8150				2732	8392	97	2840		2800		750			25761
2002	8460			445	2564	8865	115.6	3138		2800	750	750			27887.6
2003	9420			616	2561	9098	126	3325		2800	750	775			29471
2004	9370			413	2470	8992	118.4	2331		2800	750	800		950	28994.4
2005	9580			366	2504	8545	135	2288		2800	750	825		1025	28818
2006	9460			385	2591.2	8864.4	135	2440		2800	750	840		1050	29315.6
2007	9270			420	2530.4	9198.5	90.7	2533		2800	750	840		1000	29432.6
2008	8957			392	2520.7	8564.8	118	2119		2800	750	900		1200	28321.5
2009	9536			400	2534.5	8398.2	118	1883		2800	750	925		1125	28469.7
2010	9437			339	2586.6	7570	118	1710		2800	750	925		1050	27285.6
2011	9827			370	2457.5	7364.25	118	1734		2800	750	925		1050	27395.75
2012	9876			348	2743	7633.45	117.927	1710		2800	750	1062		800	27840.377
2013	9354	918		423	2706	7531.69	117.68	1538		1100	750	2846			27284.37
2014	7524	1,087		392	2679	7318.7	108	1618		1100	750	4087			26663.7
2015	6517	1,003		427	2518	7050	90.532	1442		1100	750	4387			25284.532
2016	6387	918		373	2377	6411.8	102.335	1595		1100	750	4300			24314.135
2017					2,629	6506.6		1450							
Total	315200	3926	4800	6109	113159	297188.4	7546.174	141156	26286	93250	11250	33062	12000	26850	1081196.9
Avg.	7505	982	400	407	2632	6911	180	3283	1878	2454	750	1181	1000	1343	25743

(a) Spike Leroy ranch started back up in 2004 with approx. 150 acres of alfalfa x 7
(b) 2012 number is an estimate/converted to pistachio 2013
(c) Navy began aggressive water conservation program in 2007

(d) 2013 number based on March 4, 2014 letter to BOS.
2014/2015/2016 data includes 3,700 and 4,000 AF from Mojave Pistacio "based off the UC Davis Pistachio Cost Study plus dust mitigation."
(e) 2005 Brown Road Farming changed to Meadowbrook Farms
(f) Simmons Alfalfa Ranch added March 2014

APPENDIX 3-B

HYDRAULIC CONDUCTIVITY TESTING RESULTS

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FIELD DATA: Aquifer Properties

Well Name	Other Name	UTM - NAD83 - Zone 11 Easting	Northing	Test Type	Screen Interval	Specific Capacity	Specific Capacity	T	T	K	Source	Notes
137		107	107			70	70	79	79	61		
					(ft bgs)	(gpm/ft)	(m^2/day)	(m^2/day)	(ft^2/day)	(ft/day)		
BR-5 deep	n/a	421152.7	3953022.4	Slug Testing	1960-1980	n/a	n/a	n/a	n/a	13.04	TetraTech Report	2
BR-5 medium	n/a	421152.7	3953022.4	Slug Testing	1590-1610	n/a	n/a	n/a	n/a	10.77	TetraTech Report	2
BR-5 shallow	n/a	421152.7	3953022.4	Slug Testing	850-870	n/a	n/a	n/a	n/a	16.44	TetraTech Report	2
BR-10 deep	n/a	421199.0	3966702.2	Slug Testing	1930-1950	n/a	n/a	n/a	n/a	6.52	TetraTech Report	2
BR-10 med deep	n/a	421199.0	3966702.2	Slug Testing	1560-1580	n/a	n/a	n/a	n/a	10.20	TetraTech Report	2
BR-10 med shlw	n/a	421199.0	3966702.2	Slug Testing	1180-1200	n/a	n/a	n/a	n/a	1.45	TetraTech Report	2
BR-10 shallow	n/a	421199.0	3966702.2	Slug Testing	640-660	n/a	n/a	n/a	n/a	13.61	TetraTech Report	2
BR-1 deep	n/a	421986.7	3937048.2	Slug Testing	1750-1770	n/a	n/a	n/a	n/a	0.28	TetraTech Report	2
BR-1 med deep	n/a	421986.7	3937048.2	Slug Testing	1500-1520	n/a	n/a	n/a	n/a	0.71	TetraTech Report	2
BR-1 med shlw	n/a	421986.7	3937048.2	Slug Testing	1040-1060	n/a	n/a	n/a	n/a	17.29	TetraTech Report	2
BR-1 shallow	n/a	421986.7	3937048.2	Slug Testing	615-635	n/a	n/a	n/a	n/a	15.02	TetraTech Report	2
NR-2 deep	n/a	421986.7	3937048.2	Slug Testing	1910-1930	n/a	n/a	n/a	n/a	8.50	TetraTech Report	2
NR-2 medium	n/a	421986.7	3937048.2	Slug Testing	1540-1560	n/a	n/a	n/a	n/a	10.20	TetraTech Report	2
NR-2 shallow	n/a	421986.7	3937048.2	Slug Testing	330-350	n/a	n/a	n/a	n/a	34.02	TetraTech Report	2
BR-2 deep	n/a	422266.6	3942444.5	Slug Testing	1940-1960	n/a	n/a	n/a	n/a	1.16	TetraTech Report	2
BR-2 medium	n/a	422266.6	3942444.5	Slug Testing	1460-1480	n/a	n/a	n/a	n/a	13.61	TetraTech Report	2
BR-2 shallow	n/a	422266.6	3942444.5	Slug Testing	620-640	n/a	n/a	n/a	n/a	0.71	TetraTech Report	2
BR-6 deep	n/a	423998.4	3959176.6	Slug Testing	1400-1420	n/a	n/a	n/a	n/a	14.46	TetraTech Report	2
BR-6 medium	n/a	423998.4	3959176.6	Slug Testing	1190-1910	n/a	n/a	n/a	n/a	18.14	TetraTech Report	2
NR-1 deep	n/a	424803.1	3954348.6	Slug Testing	1960-1980	n/a	n/a	n/a	n/a	3.69	TetraTech Report	2
26S39E19P01	n/a	425494.5	3945924.8	Spec. Cap. Testing	unk	358	6402	5432	9810	n/a	kunkel_chase_1969	
26S39E19P01	n/a	425494.5	3945924.8	Spec. Cap. Testing	unk	296	5294	4782	7989	n/a	kunkel_chase_1969	
26S39E30C01	n/a	425494.5	3945522.5	Spec. Cap. Testing	unk	35	626	1144	796	n/a	kunkel_chase_1969	
26S39E30C01	n/a	425494.5	3945522.5	Spec. Cap. Testing	unk	55	984	1548	1297	n/a	kunkel_chase_1969	
26S39E30F01	n/a	425607.7	3945094.9	Spec. Cap. Testing	unk	81	1449	2007	1971	n/a	kunkel_chase_1969	
26S39E19Q01	n/a	426010.1	3945899.6	Spec. Cap. Testing	unk	58	1037	1604	1374	n/a	kunkel_chase_1969	
26S39E19Q01	n/a	426010.1	3945899.6	Spec. Cap. Testing	unk	105	1878	2388	2608	n/a	kunkel_chase_1969	
26S39E19Q01	n/a	426010.1	3945899.6	Spec. Cap. Testing	unk	84	1502	2056	2050	n/a	kunkel_chase_1969	
26S39E19Q01	n/a	426010.1	3945899.6	Spec. Cap. Testing	unk	99	1770	2296	2448	n/a	kunkel_chase_1969	
27S39E08L01	Well-18	427047.5	3939865.3	Spec. Cap. Testing	unk	86	1533	2084	2095	n/a	Borehole Test Data USBR 1993 Study	2
27S39E08L01	Well-18	427047.5	3939865.3	Spec. Cap. Testing	unk	87	1563	2112	2139	n/a	Borehole Test Data USBR 1993 Study	2
27S39E08L01	Well-18	427047.5	3939865.3	Spec. Cap. Testing	unk	91	1624	2166	2229	n/a	Borehole Test Data USBR 1993 Study	2
27S39E08L01	Well-18	427047.5	3939865.3	Spec. Cap. Testing	unk	97	1738	2268	2400	n/a	Borehole Test Data USBR 1993 Study	2
27S39E08L02	Well-33	427322.3	3939858.9	Spec. Cap. Testing	unk	49	874	1431	1142	n/a	Borehole Test Data USBR 1993 Study	2
27S39E08L02	Well-32	427322.3	3939858.9	Spec. Cap. Testing	unk	59	1055	1623	1400	n/a	Borehole Test Data USBR 1993 Study	2
27S39E08L02	Well-32	427322.3	3939858.9	Spec. Cap. Testing	unk	55	982	1547	1295	n/a	Borehole Test Data USBR 1993 Study	2
27S39E08L02	Well-32	427322.3	3939858.9	Spec. Cap. Testing	unk	57	1027	1593	1359	n/a	Borehole Test Data USBR 1993 Study	2
27S39E08A	Well-34	427763.2	3940635.3	Spec. Cap. Testing	unk	25	441	904	545	n/a	Borehole Test Data USBR 1993 Study	2
26S39E28R	Well-31	429386.1	3944148.5	Spec. Cap. Testing	unk	28	509	996	637	n/a	Borehole Test Data USBR 1993 Study	2
26S39E28R	Well-31	429386.1	3944148.5	Spec. Cap. Testing	unk	62	1100	1669	1464	n/a	Borehole Test Data USBR 1993 Study	2
26S39E28R	Well-31	429386.1	3944148.5	Spec. Cap. Testing	unk	61	1084	1652	1441	n/a	Borehole Test Data USBR 1993 Study	2
26S39E28R	Well-31	429386.1	3944148.5	Spec. Cap. Testing	unk	58	1030	1597	1364	n/a	Borehole Test Data USBR 1993 Study	2
26S39E28R	Well-31	429386.1	3944148.5	Spec. Cap. Testing	unk	63	1127	1696	1502	n/a	Borehole Test Data USBR 1993 Study	2
26S39E28R	Well-31	429386.1	3944148.5	Spec. Cap. Testing	unk	63	1120	1689	1492	n/a	Borehole Test Data USBR 1993 Study	2
26S39E28R	Well-31	429386.1	3944148.5	Spec. Cap. Testing	unk	61	1098	1667	1461	n/a	Borehole Test Data USBR 1993 Study	2
25S39E04R01	n/a	429570.9	3960483.8	Spec. Cap. Testing	unk	73	1306	1872	1761	n/a	kunkel_chase_1969	

Well Name	Other Name	UTM - NAD83 - Zone 11 Easting	Northing	Test Type	Screen Interval (ft bgs)	Specific Capacity (gpm/ft)	Specific Capacity (m^2/day)	T (m^2/day)	T (ft^2/day)	K (ft/day)	Source	Notes
MW-32 deep	n/a	429760.4	3945247.6	Slug Testing	1900-1920	n/a	n/a	n/a	n/a	7.94	TetraTech Report	
MW-32 med deep	n/a	429760.4	3945247.6	Slug Testing	1240-1260	n/a	n/a	n/a	n/a	16.44	TetraTech Report	
MW-32 med shlw	n/a	429760.4	3945247.6	Slug Testing	880-900	n/a	n/a	n/a	n/a	22.39	TetraTech Report	
26S39E27D01	Well-30	429942.2	3945344.2	Spec. Cap. Testing	unk	50	894	1453	1170	n/a	Borehole Test Data USBR 1993 Study	2
BR-3 deep	n/a	431560.9	3940643.0	Slug Testing	1850-1870	n/a	n/a	n/a	n/a	0.43	TetraTech Report	
BR-3 shallow	n/a	431560.9	3940643.0	Slug Testing	650-670	n/a	n/a	n/a	n/a	4.25	TetraTech Report	
25S39E35N01	n/a	431625.4	3952301.0	Spec. Cap. Testing	unk	21	376	812	459	n/a	kunkel_chase_1969	
26S39E11E01	n/a	431642.8	3949922.9	Spec. Cap. Testing	unk	33	590	1100	747	n/a	kunkel_chase_1969	
26S39E26	Well-17	432411.6	3945560.7	Spec. Cap. Testing	unk	39	703	1237	903	n/a	Borehole Test Data USBR 1993 Study	2
26S39E26	Well-17	432411.6	3945560.7	Spec. Cap. Testing	unk	61	1098	1667	1461	n/a	Borehole Test Data USBR 1993 Study	2
26S39E26	Well-17	432411.6	3945560.7	Spec. Cap. Testing	unk	60	1068	1636	1418	n/a	Borehole Test Data USBR 1993 Study	2
26S39E26	Well-17	432411.6	3945560.7	Spec. Cap. Testing	unk	64	1150	1719	1536	n/a	Borehole Test Data USBR 1993 Study	2
BR-4	n/a	432728.7	3945348.0	Slug Testing	1190-1200	n/a	n/a	n/a	n/a	39.69	TetraTech Report	
26S39E25E01	n/a	433050.1	3945001.4	Spec. Cap. Testing	unk	46	823	1374	1070	n/a	kunkel_chase_1969	
26S39E25E01	n/a	433050.1	3945001.4	Spec. Cap. Testing	unk	46	823	1374	1070	n/a	kunkel_chase_1969	
26S39E25E01	n/a	433050.1	3945001.4	Spec. Cap. Testing	unk	38	680	1209	870	n/a	kunkel_chase_1969	
26S39E25D02	n/a	433252.1	3945497.2	Spec. Cap. Testing	unk	45	805	1354	1045	n/a	kunkel_chase_1969	
26S39E25D02	n/a	433252.1	3945497.2	Spec. Cap. Testing	unk	34	608	1122	772	n/a	kunkel_chase_1969	
26S39E24K01	n/a	434056.8	3946301.9	Spec. Cap. Testing	unk	143	2557	2937	3641	n/a	kunkel_chase_1969	
26S39E24K01	n/a	434056.8	3946301.9	Spec. Cap. Testing	unk	28	501	985	626	n/a	kunkel_chase_1969	
26S39E24Q01	n/a	434056.8	3945899.6	Spec. Cap. Testing	unk	28	501	985	626	n/a	kunkel_chase_1969	
25S39E12R01	Well-22	434441.8	3958738.4	Spec. Cap. Testing	unk	37	662	1187	846	n/a	kunkel_chase_1969	
26S39E24R01	n/a	434459.1	3945899.6	Spec. Cap. Testing	unk	41	733	1272	945	n/a	kunkel_chase_1969	
26S39E24R01	n/a	434459.1	3945899.6	Spec. Cap. Testing	unk	28	501	985	626	n/a	kunkel_chase_1969	
26S39E24R01	n/a	434459.1	3945899.6	Spec. Cap. Testing	unk	13	225	577	264	n/a	kunkel_chase_1969	
26S40E19N01	n/a	434794.2	3945790.8	Spec. Cap. Testing	unk	14	250	619	296	n/a	kunkel_chase_1969	
26S40E19P01	n/a	435267.7	3945839.6	Spec. Cap. Testing	unk	18	322	733	388	n/a	kunkel_chase_1969	
26S40E30C	Well-9A	435432.6	3944419.4	Spec. Cap. Testing	unk	42	753	1295	972	n/a	Borehole Test Data USBR 1993 Study	2
26S40E30C	Well-9A	435432.6	3944419.4	Spec. Cap. Testing	unk	44	782	1327	1012	n/a	Borehole Test Data USBR 1993 Study	2
26S40E30C	Well-9A	435432.6	3944419.4	Spec. Cap. Testing	unk	46	821	1372	1067	n/a	Borehole Test Data USBR 1993 Study	2
26S40E30K01	Well-10	435543.2	3944587.4	Spec. Cap. Testing	unk	42	753	1295	972	n/a	Borehole Test Data USBR 1993 Study	2
26S40E30K01	Well-10	435543.2	3944587.4	Spec. Cap. Testing	unk	41	733	1272	945	n/a	Borehole Test Data USBR 1993 Study	2
26S40E30K01	Well-10	435543.2	3944587.4	Spec. Cap. Testing	unk	41	737	1276	950	n/a	Borehole Test Data USBR 1993 Study	2
26S40E20N01	n/a	436479.6	3945839.6	Spec. Cap. Testing	unk	10	179	494	206	n/a	kunkel_chase_1969	
26S40E32K	Well-11	437063.6	3942939.0	Spec. Cap. Testing	unk	25	449	915	556	n/a	Borehole Test Data USBR 1993 Study	2
26S40E32K	Well-11	437063.6	3942939.0	Spec. Cap. Testing	unk	25	452	920	561	n/a	Borehole Test Data USBR 1993 Study	2
26S40E32K	Well-11	437063.6	3942939.0	Spec. Cap. Testing	unk	27	474	949	590	n/a	Borehole Test Data USBR 1993 Study	2
26S40E32G	Well-13	437068.6	3943457.8	Spec. Cap. Testing	unk	13	239	599	281	n/a	Borehole Test Data USBR 1993 Study	2
26S40E32G	Well-13	437068.6	3943457.8	Spec. Cap. Testing	unk	17	308	711	370	n/a	Borehole Test Data USBR 1993 Study	2
26S40E32G	Well-13	437068.6	3943457.8	Spec. Cap. Testing	unk	16	293	688	351	n/a	Borehole Test Data USBR 1993 Study	2
26S40E32G	Well-13	437068.6	3943457.8	Spec. Cap. Testing	unk	16	284	674	340	n/a	Borehole Test Data USBR 1993 Study	2
27S40E04L01	n/a	438356.2	3941574.2	Spec. Cap. Testing	unk	47	841	1394	1095	n/a	kunkel_chase_1969	
27S40E04L01	n/a	438356.2	3941574.2	Spec. Cap. Testing	unk	38	680	1209	870	n/a	kunkel_chase_1969	
26S40E33A01	n/a	439176.9	3943988.0	Spec. Cap. Testing	unk	16	286	677	342	n/a	kunkel_chase_1969	
26S40E33A01	n/a	439176.9	3943988.0	Spec. Cap. Testing	unk	31	554	1055	698	n/a	kunkel_chase_1969	
26S40E34N01	n/a	439622.2	3942781.0	Spec. Cap. Testing	unk	47	841	1394	1095	n/a	kunkel_chase_1969	
JMM31-MW01	n/a	439788.0	3944826.0	Spec. Cap. Testing	unk	n/a	n/a	n/a	n/a	11.00	TetraTech Beneficial Use	
JMM31-MW01	n/a	439788.0	3944826.0	unk	33-48	n/a	n/a	n/a	n/a	11.06	TetraTech Report	

	Other	UTM - NAD83 - Zone 11				Specific	Specific					
Well Name	Name	Easting	Northing	Test Type	Screen Interval	Capacity	Capacity	T	T	K	Source	Notes
					(ft bgs)	(gpm/ft)	(m^2/day)	(m^2/day)	(ft^2/day)	(ft/day)		
26S40E34P	Well-19 abn	440073.4	3942641.5	Spec. Cap. Testing	unk	19	345	768	419	n/a	Borehole Test Data USBR 1993 Study	
26S40E34P	Well-19 abn	440073.4	3942641.5	Spec. Cap. Testing	unk	21	379	817	463	n/a	Borehole Test Data USBR 1993 Study	
26S40E22P01	n/a	440079.0	3945839.6	Spec. Cap. Testing	unk	1	14	91	13	n/a	kunkel_chase_1969	
MK69-MW01	n/a	440121.7	3945079.4	Spec. Cap. Testing	unk	n/a	n/a	n/a	n/a	4.00	TetraTech Beneficial Use	
MK69-MW01	n/a	440121.7	3945079.4	unk	92-102	n/a	n/a	n/a	n/a	2.83	TetraTech Report	
26S40E22P4	n/a	440215.0	3946364.0	Aquifer Test	200-215	n/a	n/a	65.03	700	46.67	1996 Houghton / Stoner Aquifer Testing	1
TTIWV-MW14	n/a	440595.3	3965460.4	Slug Testing	Unknown	n/a	n/a	n/a	n/a	14.20	TetraTech Beneficial Use	
26S40E35H2	n/a	441772.0	3943079.0	Aquifer Test	340-480	n/a	n/a	51.38	553	3.95	1996 Houghton / Stoner Aquifer Testing	1
26S40E23D1	n/a	441809.0	3946342.0	Aquifer Test	385-400	n/a	n/a	0.17	1.87	0.12	1996 Houghton / Stoner Aquifer Testing	1
TTIWV-MW12	n/a	442406.6	3957977.8	Slug Testing	unk	n/a	n/a	n/a	n/a	65.20	TetraTech Beneficial Use	
26S40E36A01	n/a	444022.1	3943831.9	Spec. Cap. Testing	unk	12	215	558	251	n/a	kunkel_chase_1969	
TTIWV-MW13	n/a	444332.1	3962059.8	Slug Testing	unk	n/a	n/a	n/a	n/a	2.83	TetraTech Beneficial Use	
TTIWV-MW09	n/a	445071.2	3951044.1	Slug Testing	unk	n/a	n/a	n/a	n/a	2.44	TetraTech Beneficial Use	
26S39E15J1	n/a	unk	unk	Aquifer Test	unk	n/a	n/a	243.87	2625	n/a	1996 Houghton / Stoner Aquifer Testing	
26S40E13A1	n/a	unk	unk	Aquifer Test	unk	n/a	n/a	15.42	166	n/a	1996 Houghton / Stoner Aquifer Testing	
26S40E13Q1	n/a	unk	unk	Aquifer Test	unk	n/a	n/a	51.28	552	n/a	1996 Houghton / Stoner Aquifer Testing	
26S40E14A1	n/a	unk	unk	Aquifer Test	unk	n/a	n/a	54.16	583	n/a	1996 Houghton / Stoner Aquifer Testing	
26S40E17Q1	n/a	unk	unk	Aquifer Test	unk	n/a	n/a	27.87	300	n/a	1996 Houghton / Stoner Aquifer Testing	
26S40E23B2	n/a	unk	unk	Aquifer Test	unk	n/a	n/a	14.21	153	n/a	1996 Houghton / Stoner Aquifer Testing	
JMM01-MW03	n/a	unk	unk	unk	33-48	n/a	n/a	n/a	n/a	2.01	TetraTech Report	
JMM01-MW04	n/a	unk	unk	unk	33-48	n/a	n/a	n/a	n/a	0.74	TetraTech Report	
JMM01-MW05	n/a	unk	unk	unk	34-49	n/a	n/a	n/a	n/a	1.81	TetraTech Report	
JMM01-MW06	n/a	unk	unk	unk	34-49	n/a	n/a	n/a	n/a	0.51	TetraTech Report	
MK69-SB01	n/a	unk	unk	unk	unk	n/a	n/a	n/a	n/a	0.94	TetraTech Beneficial Use	
MK70-SB02	n/a	unk	unk	unk	unk	n/a	n/a	n/a	n/a	0.028	TetraTech Beneficial Use	
MK72-SB02	n/a	unk	unk	unk	unk	n/a	n/a	n/a	n/a	0.013	TetraTech Beneficial Use	
MKFL-SB01	n/a	unk	unk	unk	unk	n/a	n/a	n/a	n/a	0.050	TetraTech Beneficial Use	
TT07-MW01	n/a	unk	unk	Slug Testing	unk	n/a	n/a	n/a	n/a	2.17	TetraTech Beneficial Use	
TT07-MW02	n/a	unk	unk	Slug Testing	unk	n/a	n/a	n/a	n/a	34.60	TetraTech Beneficial Use	
TT07-SB01	n/a	unk	unk	unk	unk	n/a	n/a	n/a	n/a	0.0002	TetraTech Beneficial Use	
TT07-SB03	n/a	unk	unk	unk	unk	n/a	n/a	n/a	n/a	0.0001	TetraTech Beneficial Use	
TT07-SB04	n/a	unk	unk	unk	unk	n/a	n/a	n/a	n/a	0.0017	TetraTech Beneficial Use	
TT07-SB06	n/a	unk	unk	unk	unk	n/a	n/a	n/a	n/a	0.52	TetraTech Beneficial Use	
TT07-SB11	n/a	unk	unk	unk	unk	n/a	n/a	n/a	n/a	0.000004	TetraTech Beneficial Use	
TT33-MW01	n/a	unk	unk	Slug Testing	unk	n/a	n/a	n/a	n/a	7.34	TetraTech Beneficial Use	
TT33-SB01	n/a	unk	unk	unk	unk	n/a	n/a	n/a	n/a	0.021	TetraTech Beneficial Use	
TT33-SB03	n/a	unk	unk	unk	unk	n/a	n/a	n/a	n/a	0.001	TetraTech Beneficial Use	
TT70-MW01	n/a	unk	unk	Slug Testing	unk	n/a	n/a	n/a	n/a	1.64	TetraTech Beneficial Use	
TT70-MW02	n/a	unk	unk	Slug Testing	unk	n/a	n/a	n/a	n/a	2.39	TetraTech Beneficial Use	
TT71-MW01	n/a	unk	unk	Slug Testing	unk	n/a	n/a	n/a	n/a	3.01	TetraTech Beneficial Use	
TT71-SB02	n/a	unk	unk	unk	unk	n/a	n/a	n/a	n/a	0.52	TetraTech Beneficial Use	
TT71-SB02	n/a	unk	unk	unk	unk	n/a	n/a	n/a	n/a	0.006	TetraTech Beneficial Use	
TT71-SB05	n/a	unk	unk	unk	unk	n/a	n/a	n/a	n/a	0.057	TetraTech Beneficial Use	

SUMMARY

Count	Test Type
36	Slug Testing
72	Spec. Cap. Testing
20	unk
9	Aquifer Test
137	

Count	Data Source
32	TetraTech Report
34	kunkel_chase_1969
36	Borehole Test Data USBR 1993 Study
26	TetraTech Beneficial Use
9	1996 Houghton / Stoner Aquifer Testing
137	

NOTES

1 Exact location not known; used center of section

2 The U.S. Bureau of Reclamation (USBR) reported transmissivities using the Cooper method, with the aquifer thickness assumed to be the same as the screen length. Aquifer thickness is typically much greater, resulting in low transmissivity estimates. USBR hydraulic conductivity values were backcalculated for this table by dividing transmissivity by screen length. Five of the wells slug tested during the USBR study had anomalously low results. The authors of the study deemed these results nonrepresentative, probably due to inadequate well development. The five wells are: BR-3 (medium), BR-6 (shallow), BR-10 (shallow/medium), NR-1 (shallow), and MW-31 (shallow).

APPENDIX 3-C

TDS DATA

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Indian Wells Valley
GSP

Appendix

Total Dissolved Solids (TDS) Database

DRAFT TECHNICAL MEMORANDUM

785 Grand Avenue, Suite 202 • Carlsbad, California • 92008
Phone: (760) 730-0701 Web site: www.stetsonengineers.com

FOR:	Appendix to Groundwater Sustainability Plan	DATE:	August 9, 2019
FROM:	Stetson Engineers, Inc.	JOB NO:	2652-001:08.03
RE:	Development of Indian Wells Valley Water Quality Database: Total Dissolved Solids (TDS)		

A Water Quality Database was developed for Indian Wells Valley Groundwater Authority to evaluate the occurrence and impacts of salinity within the groundwater basin. Total Dissolved Solids (TDS) data were collected from historical documents and verified to laboratory reports when available. The TDS database is part of the Groundwater Sustainability Plan (GSP) and will be updated as new data become available. The data will be used to evaluate changes within the basin from the management actions addressed in the GSP.

This appendix describes the data processing and review of available TDS data that was collected from groundwater wells within Indian Wells Valley groundwater basin. The initial version of the database (January 24, 2019) was reviewed by Desert Research Institute (DRI) and the Technical Advisory Committee's (TAC) Model Ad Hoc Group, and used in the TDS Transport Model developed for Indian Wells Valley's GSP. Updating of the TDS database is ongoing as new data becomes available and is added. Below is a summary of how data were compiled for the January 2019 transport model, as well as the most recent (June 2019) version of the database.

1.0. TDS SPREADSHEET DATABASE

The TDS spreadsheet database was established and formatted to easily provide data for the GSP, the Indian Wells Valley groundwater model, and other studies[1] for analysis of the salinity within the groundwater basin. For the model, the database contains (1) well construction information/locations and spring/surface water locations where TDS samples were collected and analyzed, and (2) date and sample results. The horizontal and vertical distribution of measured TDS data was established based on surveyed well locations and well completion records where available[2]. In addition, the database has a record of all changes and updates, as well as a place to

[1] The Brackish Water Group has used this TDS Database for their analysis of potential saline groundwater projects within the Indian Wells Valley basin.
[2]

contain incomplete data that still needs to be verified. The TDS spreadsheet database contains the following worksheet tabs:

1. "Wells+SW" 551 wells and 13 surface water sampling locations
2. "TDS" 2,044 TDS sample results from 1/26/1920 to 3/5/2019
3. "References" 20 referenced reports or databases
4. "Open Items" 12 open items of potential data sources to follow-up
5. "Notes" journal of data processing conducted Oct 2018 through Jun 2019
6. "Incomplete (+Suspect) TDS Data" data that is questionable and could not be verified.

The accompanied tables and figure to this appendix contain the data and information available in the first five worksheet tabs within the TDS spreadsheet database and demonstrate the database setup. Table 1 shows the elements that define the location of the sample (well, spring, or surface water) and the total depth and screen interval data available for wells. Table 2 provides an example of the TDS data including sample location name, sample date and result, analysis type, the reference of where the data came from, and the confidence level of the data. Table 3 lists the 20 references from which the TDS data was compiled. Table 4 lists 12 open items of potential data that require more research. And, Table 5 contains the journal notes of the work completed on the database through June 2019. TDS data from the June 2019 database are displayed on Figure 1, which shows the horizontal extent and concentration distribution of the most recent TDS measured within the Indian Wells Valley basin.

2.0. DATA PROCESSING

TDS data were initially compiled into a spreadsheet by the Brackish Water Group (BWG) for a study of saline water use within Indian Wells Valley[3]. The data were given to the Groundwater Authority's Water Resource Manager to develop into a TDS database for the GSP and to develop the initial TDS conditions for the Indian Wells Valley model evaluation of salinity conditions within the groundwater basin. Historical documents and databases were collected and TDS data were cross checked with referenced material. Sample dates were updated from report date to sample date, and duplicate TDS samples were removed.

An 'Analysis Type' column was added to differentiate between TDS samples that were the sum of constituents (calc), total filterable residue at 180°C (lab), or if analysis type was not specified (unk). TDS data were also given confidence levels dependent on 1) if data underwent a QA/QC check against the original report (confidence level 1); 2) data were sourced to reports that

[3] Received from Wade Major, AquiLogic, October 2018

were unavailable for QA/QC checks by Stetson (confidence level 2), or 3) data was unverified (confidence level 3). Concurrent with these crosschecks, missing data were added to the database.

Following verification of data with original published reports, data from the Groundwater Ambient Monitoring and Assessment Program (GAMA) were added to the database. Additional verification was completed of original report data and GAMA data. Duplicate samples were removed. When two samples from different sources were collected on the same date TDS values from the most trusted source were used in the database. On occasions where sources and sample date were the same a conservative approach was taken and the highest TDS value was kept.

As new TDS sample data are added to the database, data are crosschecked against data in the TDS database before being added. If data are currently in the database, sources may be updated. However, if TDS samples are not in the database, data are added. Currently, there are 2,044 TDS sample results from 1/26/1920 to 3/5/2019.

3.0. Inventory of Sampled Wells and Surface Water Locations

Well and surface water sample sites were compiled into a separate table, and a unique list of TDS sample locations was developed. Duplicate sites were removed and remaining sites were given unique names. Coordinates and construction data for these wells were compiled to provide the horizontal and vertical water quality location for mapping (Figure 1) and modeling. As new TDS data are added to the database, sample locations for new data are cross checked against location data in the database. New sample locations are appended to the database with unique database IDs. The June 2019 TDS database has 551 wells and 13 surface water sampling locations with measured TDS data.

4.0. References, Open Items, and Notes

The References, Open Items, and Notes tabs of the TDS database contain data sources, a running list of open items to make the database more complete, and a journal of all changes and updates made to the database. These sections maintain the integrity of the spreadsheet database and are key components of keeping it organized and maintaining a record of changes and edits. The most recent June 2019 version of the database contains data sourced from 20 references. Each reference listed on Table 3 indicates the number of TDS samples attributed to it. The Open Items worksheet tab contains a list of open items of some incomplete data that needs to be resolved before it can be included in the TDS database.

The Notes section contains a record of all changes and updates made in the TDS database beginning with the original data compilation provided by the Brackish Water Group. Since the January 2019 iteration (model run) the database has been updated 4 times.

Table 1: TDS Sample Locations

Depth and screen intervals are given in feet below ground surface

Notes: PLScntr - center point of corresponding Township/Range-Section & Tract (if available)

Unique Well Name	Latitude	Longitude	X_UTM	Y_UTM	Depth	Screen Interval[1]	Screen Interval[2]	Screen Interval[3]	Screen Interval[4]	Screen Interval[5]	Notes
24S38E16J02	35.84889	-117.87306	421162.772	3967540.019	611	251-611					
24S38E21A01	35.84144	-117.87177	421271.165	3966712.737	660	640-660					
24S38E21A02	35.84144	-117.87177	421271.165	3966712.737	1200	1180-1200					
24S38E21A03	35.84144	-117.87177	421271.165	3966712.737	1580	1560-1580					
24S38E21A04	35.84144	-117.87177	421271.165	3966712.737	1950	1930-1950					
24S38E28Q01	35.81412	-117.87452			450						
24S38E33J02	35.80194	-117.87167	421241.823	3962332.036	375	240-375					
24S38E35E01	35.80690	-117.85090									
24S39E33D01	35.80773	-117.77812									
24S39E33N01	35.79940	-117.77868									
24S39E34D01	35.80215	-117.75898			325	205-305					
24S40E06A01	35.88328	-117.69368									
24S40E20J01	35.83190	-117.67451			28	58-60					
24S40E21K01	35.83151	-117.65774	440592.878	3965460.296	72	60-70					
24S40E33N01	35.79930	-117.66820	439624.477	3961894.250	16						
24S40E34E01	35.80662	-117.65006			21						
24S40E36A	35.80108	-117.61616	444327.135	3962060.345	27	15-25					
24S40E36M01	35.80024	-117.61486	444443.989	3961967.211	8						
25S38E02E	35.79097	-117.86160			765	310-753					
25S38E02L01	35.79465	-117.86160	422144.413	3961514.811	765						
25S38E03G01	35.79551	-117.87291	421122.734	3961619.689							
25S38E10G	35.77678	-117.87274	421120.046	3959541.507							
25S38E11K02	35.77551	-117.85063									
25S38E11L01	35.77578	-117.86063			400						
25S38E12E	35.77982	-117.84723	423428.145	3959858.948	300						
25S38E12L01	35.77606	-117.84201	423896.400	3959437.926	350	330-350					
25S38E12L02	35.77606	-117.84201	423896.400	3959437.926	1210	1190-1210					
25S38E12L03	35.77611	-117.84111	423978.090	3959442.602	1660	1640-1660					
25S38E12M	35.77575	-117.84655			700	140-700					
25S38E12M01	35.77600	-117.84634	423505.310	3959434.414							
25S38E12Mct	35.75501	-117.84550									
25S38E13C	35.76909	-117.84322			430	260-600					
25S38E13D01	35.76884	-117.84424									
25S38E13J01	35.75833	-117.83389	424614.094	3957465.218	155						
25S38E13L	35.76125	-117.84012			444	109-444					
25S38E13L01	35.75831	-117.83814	424229.868	3957466.152	444						
25S38E13M	35.75998	-117.84689									
25S38E13Q	35.75418	-117.83730				120-490					
25S38E14M02	35.75906	-117.86291	421990.841	3957568.244	405	109-444					
25S38E14N01	35.75740	-117.86271	422007.545	3957384.300	405						
25S38E23G01	35.74895	-117.85644	422565.848	3956441.987	259						
25S38E23J01	35.74690	-117.84813									
25S38E24H	35.71894	-117.86983	421325.663	3953124.732							
25S38E24K	35.74693	-117.83530			490	120-490					
25S38E24K01	35.74511	-117.83702									PLScntr
25S38E24L	35.74368	-117.84160			517	117-571					
25S38E25C	35.73938	-117.84233	423832.878	3955369.942							
25S38E25C01	35.73811	-117.84007	424035.925	3955227.239	305						
25S38E25G01	35.73605	-117.83563	424435.795	3954994.714	305						
25S38E25J	35.73050	-117.83256	424707.961	3954376.772	330	120-330					PLScntr; Elev 2275'
25S38E25J01	35.73217	-117.83174	424784.137	3954562.235	270	250-270					
25S38E25J02	35.73217	-117.83174	424784.137	3954562.235	1150	1130-1150					
25S38E25J03	35.73217	-117.83174	424784.137	3954562.235	1980	1960-1980					
25S38E25Q	35.72477	-117.83008	424927.278	3953740.082							
25S38E34A01	35.72457	-117.86932	421377.590	3953747.942	485						
25S38E34G01	35.71703	-117.86609	421662.927	3952909.855	870	850-870					
25S38E34G02	35.71806	-117.87083	421234.469	3953026.891	1610	1590-1610					
25S38E34G03	35.71806	-117.87083	421234.469	3953026.891	1980	1960-1980					
25S38E34J02	35.71648	-117.86581	421687.582	3952848.499							
25S38E34J03	35.71648	-117.86581	421687.663	3952848.528							
25S38E35A	35.72250	-117.84917	423198.498	3953502.665							
25S38E35H	35.71832	-117.85221	422918.956	3953041.383							
25S38E35M01	35.71557	-117.86159	422068.514	3952743.813	350						

Table 1: TDS Sample Locations

Depth and screen intervals are given in feet below ground surface

Notes: PLScntr - center point of corresponding Township/Range-Section & Tract (if available)

Unique Well Name	Latitude	Longitude	X_UTM	Y_UTM	Depth	Screen Interval[1]	Screen Interval[2]	Screen Interval[3]	Screen Interval[4]	Screen Interval[5]	Notes
25S38E36A01	35.72134	-117.83062			285						
25S38E36B01	35.72495	-117.83674	2048734.884	809805.814	400	130-170	200-220	240-260			
25S38E36D	35.72323	-117.84588	423496.905	3953580.929							
25S38E36G01	35.71869	-117.84268	423781.325	3953074.734	350	330-350					
25S38E36G02	35.71869	-117.84268	423781.325	3953074.734	1560	1540-1560					
25S38E36G03	35.71869	-117.84268	423781.325	3953074.734	1930	1910-1930					
25S38E36Q01	35.71277	-117.83801	424198.053	3952414.935	285	139-285					
25S39E01N01	35.78440	-117.73840				12.8-18.8					
25S39E02E01	35.71924	-117.80844	426879.072	3953110.190	211						
25S39E04R01	35.78645	-117.77834			200	100-200					
25S39E07K01	35.77359	-117.81789	426074.295	3959145.384	122						
25S39E09J01	35.77441	-117.77789			200						
25S39E10E01	35.77690	-117.77479									
25S39E10Q01	35.76940	-117.76618									
25S39E12R02	35.77028	-117.72500	434467.935	3958711.752	150	65-140					
25S39E13E01	35.76356	-117.73979									
25S39E14H01	35.76208	-117.84792	423349.533	3957892.087							
25S39E17D01	35.76829	-117.80979			88						
25S39E19K01	35.74634	-117.82007									
25S39E21B01	35.75273	-117.78423									
25S39E22B01	35.75329	-117.76479									
25S39E22J01	35.74278	-117.76194	431104.797	3955686.968							
25S39E23G01	35.74809	-117.75740	431520.200	3956273.227		850-870					
25S39E23G02	35.74809	-117.75740	431520.200	3956273.227		3300-3320					
25S39E23G03	35.74809	-117.75740	431520.200	3956273.227		5550-5570					
25S39E23G04	35.74809	-117.75740	431520.200	3956273.227		7120-7140					
25S39E24D01	35.75235	-117.73757	433316.313	3956731.329	27						
25S39E26H01	35.73341	-117.74243	432861.438	3954634.191	302						
25S39E28P01	35.72523	-117.78562			161						
25S39E30L01	35.73041	-117.82340									PLScntr
25S39E30N01	35.72745	-117.82757									
25S39E31D01	35.71770	-117.82140			300						PLScntr
25S39E31E01	35.71884	-117.82979									
25S39E31M03	35.71606	-117.82924									
25S39E31R01	35.71056	-117.81444	426327.969	3952151.250	480	120-180					
25S39E35N01	35.71032	-117.75858	431381.500	3952084.992							
25S40E08A01	35.78586	-117.66842	439593.651	3960403.118	17						
25S40E11K01	35.77344	-117.63879	442262.853	3959008.516	62	140-300					
25S40E12M01	35.77347	-117.62642	443381.082	3959004.813	59						
25S40E14H01	35.76417	-117.63716	442403.727	3957979.628	23	11-21					
25S40E18R01	35.75969	-117.60148	445625.691	3957461.829	31.3						
25S40E19L01	35.74458	-117.69887	436809.254	3955844.280	24						
25S40E20F01	35.74889	-117.67835	438668.003	3956309.815	183						
25S40E24H01	35.75572	-117.61493	444406.881	3957029.156	40						
25S40E24N01	35.73995	-117.62923			31						
25S40E25H01	35.73273	-117.61729									
25S40E27E01	35.73134	-117.64562	441614.568	3954342.635	19						
25S40E30E01	35.73254	-117.72033	434859.246	3954522.796	72						
25S40E33L01	35.71288	-117.65800	440481.525	3952302.729	171	70-90	110-130				
25S40E33L02	35.71674	-117.67923	438563.755	3952743.842	22	2-22					
25S40E35D01	35.72064	-117.65140	441083.880	3953159.847	15	10-15					
25S40E35P01	35.71152	-117.64259	441873.942	3952142.791	18	10-15					
25S41E18Q01	35.76790	-117.61430									PLScntr
25S41E19L01	35.74990	-117.60864	444971.386	3956380.295	24						
25S41E21E01	35.75356	-117.57367			188						
25S41E31C01	35.72819	-117.60532	445257.084	3953969.901	14						
26S38E01G02	35.70377	-117.83564	424404.679	3951414.622	365						
26S38E01H03	35.70580	-117.83102	424824.396	3951636.827							
26S38E02Q01	35.70000	-117.85639	422523.507	3951012.794							
26S38E11P02	35.68303	-117.85931			515						
26S38E12R01	35.68175	-117.82912	424973.058	3948967.631							
26S38E17E01	35.67662	-117.91229			110						
26S38E27G01	35.64523	-117.87424			723						
26S38E35B01	35.63567	-117.85504			289						PLScntr

Table 1: TDS Sample Locations

Depth and screen intervals are given in feet below ground surface

Notes: PLScntr - center point of corresponding Township/Range-Section & Tract (if available)

Unique Well Name	Latitude	Longitude	X_UTM	Y_UTM	Depth	Screen Interval[1]	Screen Interval[2]	Screen Interval[3]	Screen Interval[4]	Screen Interval[5]	Notes
26S38E35L	35.62824	-117.85875	422240.002	3943055.734							
26S39E01A02	35.70940	-117.72312	434587.972	3951958.206		200-298					
26S39E02C01	35.70912	-117.75034									
26S39E02N01	35.69662	-117.75562									
26S39E03D01	35.70773	-117.77590									
26S39E05F01	35.70500	-117.80667	427026.473	3951529.258	200	100-200					
26S39E06F01	35.70454	-117.82441	425420.512	3951491.050	305						
26S39E06G01	35.70576	-117.81752	426045.685	3951622.209	285						
26S39E07B	35.69317	-117.81919				205-215					
26S39E07K05	35.68729	-117.81928	425868.852	3949574.611	305						
26S39E07L	35.68163	-117.81839	425944.686	3948945.929	235						
26S39E07M02	35.68757	-117.82818	425064.213	3949612.018	400						
26S39E07M1	35.68696	-117.83003				200-400					
26S39E07M2	35.68732	-117.82997				0-16					
26S39E07N01	35.68317	-117.82567	425287.052	3949122.575							
26S39E07P02	35.68172	-117.82446	425395.065	3948960.061	300						
26S39E07P03	35.68345	-117.82278	425548.568	3949151.727	305						
26S39E08E01	35.69059	-117.80706	426977.822	3949931.755	880						
26S39E08K01	35.68801	-117.79951									
26S39E09H01	35.69116	-117.77669	429726.588	3949972.784		570-880					
26S39E09M01	35.69080	-117.79362	428194.355	3949944.290							
26S39E10E01	35.69127	-117.77660	429733.986	3949984.014							
26S39E10N01	35.69005	-117.75660	431542.946	3949834.591							
26S39E11E01	35.69005	-117.75660	431542.946	3949834.591	250						
26S39E11E02	35.68857	-117.75646	431554.791	3949670.293	191						
26S39E11Q01	35.68107	-117.74868									
26S39E12E01	35.68829	-117.72118									
26S39E12G01	35.68884	-117.73062									
26S39E12N01	35.68245	-117.73812									
26S39E13R03	35.66662	-117.72423	434452.520	3947214.494	300						
26S39E13R04	35.66662	-117.72423	434452.520	3947214.494	800	640-800					
26S39E14E01	35.67551	-117.75757			242						
26S39E14P01	35.66676	-117.74889	432221.263	3947246.791							
26S39E17F02	35.67612	-117.80247	427380.155	3948322.457	881						
26S39E17L01	35.67213	-117.80564				681-881					PLScntr
26S39E18A01	35.67962	-117.81588	426169.715	3948721.395	300						
26S39E18C03	35.67836	-117.82381	425451.147	3948587.678	405						
26S39E18F01	35.67580	-117.82350									PLScntr
26S39E18K01	35.67134	-117.81812			330						
26S39E18K02	35.67257	-117.81792	425978.410	3947940.885	310						
26S39E18R01	35.66830	-117.81225	426487.830	3947463.452	305	290-310					
26S39E19K01	35.65564	-117.82056			803	270-666	590-625	700-790			
26S39E19P01	35.65273	-117.82062			446						
26S39E19P02	35.65264	-117.82092			600	320-360	390-590				
26S39E19Q01	35.64306	-117.81256	426436.600	3944663.332	371						
26S39E20C01	35.66361	-117.80750	426913.344	3946939.340	245						
26S39E20F01	35.66162	-117.80507									
26S39E20K03	35.65654	-117.79921	427657.295	3946148.827	360						
26S39E20Q01	35.65218	-117.80229									
26S39E20R01	35.65445	-117.79532			920	600-900					
26S39E20R02	35.65329	-117.79507			920						
26S39E21Q01	35.65428	-117.78609			1000	700-1000					
26S39E23E01	35.65718	-117.75840									
26S39E23H02	35.65917	-117.74250									
26S39E23H02a	35.65972	-117.74337			1000	470-510	580-650	730-850	900-960		
26S39E23J01	35.66023	-117.74395			660						Note two TD: 660 and 800
26S39E24E01	35.65968	-117.73979									
26S39E24K01	35.65841	-117.72763	434138.241	3946306.191	323	600-900					
26S39E24M	35.65611	-117.73889									
26S39E24M01	35.65975	-117.73966	433050.710	3946462.889	800						
26S39E24P01	35.65301	-117.73340			825	250-350	490-580	640-780			
26S39E24P03	35.65273	-117.73262			1002	503-583	651-731	808-888	930-990		

Table 1: TDS Sample Locations

Depth and screen intervals are given in feet below ground surface

Notes: PLScntr - center point of corresponding Township/Range-Section & Tract (if available)

Unique Well Name	Latitude	Longitude	X_UTM	Y_UTM	Depth	Screen Interval[1]	Screen Interval[2]	Screen Interval[3]	Screen Interval[4]	Screen Interval[5]	Notes
26S39E24Q01	35.64367	-117.71566	435209.790	3944663.673	345						Note two TD: 345 and 361
26S39E24R01	35.65481	-117.72315	434540.396	3945903.877	460						
26S39E25D01	35.63941	-117.72421	434431.841	3944196.250							
26S39E25E	35.64656	-117.73953			387	179-387					
26S39E25E01	35.63597	-117.72399	434449.830	3943815.050	387	179-260	268-284	291-384			
26S39E26A01	35.64967	-117.74214	432817.049	3945346.810	1200	1190-1200					
26S39E26A02-D	35.64980	-117.74234	432799.545	3945360.806	752	730-750					
26S39E26A02-I	35.64980	-117.74234	432799.545	3945360.806	372	350-370					
26S39E26B	35.65151	-117.74670	432405.574	3945553.195	1030	410-490	540-560	735-1015			
26S39E26B1	35.64835	-117.74803				263-323					
26S39E26B2	35.65065	-117.74833			320						
26S39E26C01	35.63993	-117.73989	2077563.420	778915.630	349	190-197	230-278	287-301			
26S39E26D01	35.64860	-117.75760									
26S39E26D02	35.65121	-117.75548	431611.010	3945526.931	1030						
26S39E26L04	35.64136	-117.74913	432177.559	3944430.042	385						
26S39E27C01	35.64830	-117.76900			500						
26S39E27D	35.65024	-117.77578	429773.046	3945433.238	1220	600-1200					
26S39E27D01	35.64844	-117.77495	429846.237	3945233.092	380	360-380					
26S39E27D02	35.64844	-117.77495	429846.237	3945233.092	900	880-900					
26S39E27D03	35.64844	-117.77495	429846.237	3945233.092	1260	1240-1260					
26S39E27D04	35.64844	-117.77495	429846.237	3945233.092	1920	1900-1920					
26S39E27J	35.64176	-117.76212				300-360					
26S39E27L1	35.64321	-117.76863				0-20					
26S39E27L2	35.64334	-117.76866									
26S39E27Q	35.63830	-117.76648				320-360					
26S39E28A01	35.65012	-117.77875									PLScntr
26S39E28B02	35.65051	-117.78284			300						
26S39E28B1	35.65076	-117.78256				0-85					
26S39E28B2	35.65048	-117.78226				0-85					
26S39E28B3	35.65067	-117.78253									
26S39E28C02	35.64086	-117.77906	429467.342	3944394.998	364						
26S39E28D01	35.64864	-117.79067	428423.197	3945266.703	385						
26S39E28G03	35.64521	-117.78397	429026.512	3944881.554	405						
26S39E28P01	35.63920	-117.78760			400						
26S39E28R01	35.63806	-117.77741	429614.648	3944083.645	1220	600-1200					
26S39E29L1	35.64206	-117.80625				0-10					
26S39E29L2	35.64209	-117.80435									
26S39E29P01	35.63953	-117.80380	427226.212	3944266.213	405						
26S39E30C01	35.64857	-117.82146			338						
26S39E30F01	35.64745	-117.82146			386						
26S39E30F03	35.64745	-117.82146			420						
26S39E30J01	35.64425	-117.81385			430	294-298	306-325	330-343	360-370	393-413	location from GAMA (does not agree w previous reports)
26S39E30J02	35.64360	-117.81620									
26S39E30K	35.64379	-117.81723									
26S39E30L	35.64399	-117.81394				300-327					
26S39E31A02	35.63681	-117.81409	426292.276	3943972.160	405						
26S39E31G	35.63148	-117.81871				320-330					
26S39E31H	35.63152	-117.81640									
26S39E31R01	35.62389	-117.81551	426151.708	3942540.317							
26S39E32K	35.62841	-117.80100				320-380					
26S39E32L	35.62905	-117.80464									
26S39E32L01	35.62998	-117.81057	426604.270	3943211.016							
26S39E32M	35.62790	-117.81075				370-380					
26S39E32N	35.62377	-117.80867				366-376					note: two sources for screen intervals: 366-376 and 266-276
26S39E32Q01	35.62577	-117.79902	427646.667	3942735.650	426						
26S39E33B	35.63546	-117.78407									

Table 1: TDS Sample Locations

Depth and screen intervals are given in feet below ground surface

Notes: PLScntr - center point of corresponding Township/Range-Section & Tract (if available)

Unique Well Name	Latitude	Longitude	X_UTM	Y_UTM	Depth	Screen Interval[1]	Screen Interval[2]	Screen Interval[3]	Screen Interval[4]	Screen Interval[5]	Notes
26S39E34F05	35.63054	-117.76836	430427.337	3943242.939	505						
26S39E34H02	35.63104	-117.76082	431110.042	3943293.561	400						
26S39E34Q01	35.62438	-117.76334			465	399-459					
26S39E36B	35.63386	-117.73144			982	362-962					
26S40E01A01	35.71042	-117.61376	444481.173	3952004.534	15						
26S40E01A02	35.70933	-117.61693	444193.669	3951885.434	198						
26S40E01J01	35.70558	-117.61690	444193.652	3951469.365	18						
26S40E01Q01	35.69742	-117.62818	443168.142	3950570.355	22						
26S40E01Q02	35.69843	-117.62015	443894.999	3950677.979	22						
26S40E04Q01	35.69739	-117.67526	438908.664	3950595.981	290						
26S40E05F01	35.70440	-117.70007			25						
26S40E05P01	35.69566	-117.69591	437038.807	3950416.395	98	40-98					
26S40E05P03	35.69634	-117.69562									
26S40E06C01	35.70834	-117.71459	435359.162	3951834.753	620	30-50	70-90	110-130			
26S40E06D01	35.70987	-117.72119	434762.803	3952008.956	320	500-600					
26S40E06D02	35.70934	-117.72235	434657.643	3951951.230	260	276-300					
26S40E06E01	35.70301	-117.72257									
26S40E07E01	35.68822	-117.71507	435298.747	3949603.885	86	120-200					
26S40E07N01	35.68107	-117.68840									
26S40E08N01	35.68162	-117.68618									
26S40E08Q01	35.68134	-117.69145									
26S40E09A01	35.69470	-117.67190	439206.252	3950297.550	100						
26S40E10E01	35.68857	-117.66923									
26S40E10F01	35.69100	-117.66097	440196.513	3949877.499	43	37-43					
26S40E10N01	35.68363	-117.66551	439780.363	3949063.707	134						
26S40E11A01	35.69229	-117.63241	442781.052	3950004.525	5						
26S40E11J01	35.68755	-117.63476	442565.650	3949479.784	18						
26S40E11J03	35.68579	-117.63645			8						
26S40E11N02	35.68162	-117.65090									
26S40E12A01	35.69218	-117.61701			21						
26S40E12G01	35.69058	-117.62216	443707.469	3949808.060	22						
26S40E12Q01	35.68333	-117.62417	443520.946	3949005.868	22						
26S40E12R01	35.68250	-117.61889	443997.940	3948910.420	21						
26S40E13C01	35.67690	-117.62645			22						
26S40E13C02	35.67752	-117.62725	443238.101	3948362.842							
26S40E13D03	35.68163	-117.63077	442921.970	3948820.588							
26S40E13M01	35.67306	-117.63004	442981.828	3947869.794	22						
26S40E14B01	35.67778	-117.64194	441908.237	3948400.064	22	20-22					
26S40E14B02	35.67892	-117.64102									PLScntr
26S40E14H01	35.67246	-117.63923									
26S40E14L01	35.67194	-117.64611	441526.921	3947755.556	57	55-57					
26S40E15E01	35.67646	-117.66545	439780.492	3948267.713	110						
26S40E15E02	35.67646	-117.66545	439780.496	3948267.718	198						
26S40E15N01	35.66722	-117.66944	439411.654	3947245.948	225						
26S40E15N02	35.66889	-117.66778	439563.755	3947429.773	101	99-101					
26S40E16K	35.67063	-117.68598	437917.412	3947634.564	960	938-958					
26S40E16M01	35.67221	-117.68411	438088.437	3947808.383							
26S40E17J01	35.67111	-117.69389	437202.312	3947692.617	97	95-97					
26S40E17N01	35.66690	-117.70479			178						
26S40E17Q01	35.66638	-117.69659	436953.848	3947169.641							
26S40E17R01	35.66746	-117.68979			101						
26S40E18E01	35.67412	-117.72173			119						
26S40E18N01	35.65953	-117.70475	436210.587	3946415.019	158						note: two TD: 158 and 555
26S40E19N	35.65385	-117.71944	434875.761	3945795.012	257	235-255					
26S40E19N01	35.65417	-117.72068	434764.178	3945831.011	306						
26S40E19P01	35.65432	-117.71422	435348.948	3945844.031	261	192-220	253-259				
26S40E20A	35.66619	-117.68874	437664.313	3947143.717							
26S40E20J01	35.65715	-117.68998									PLScntr
26S40E20L01	35.65861	-117.70056	436589.078	3946310.510							
26S40E20N01	35.64310	-117.68558	437932.182	3944580.565	190						
26S40E21A01	35.66329	-117.67173			99						
26S40E21E01	35.66143	-117.68770	437754.946	3946614.948	114						
26S40E21K01	35.65579	-117.67784									

Table 1: TDS Sample Locations
Depth and screen intervals are given in feet below ground surface
Notes: PLScntr - center point of corresponding Township/Range-Section & Tract (if available)

Unique Well Name	Latitude	Longitude	X_UTM	Y_UTM	Depth	Screen Interval[1]	Screen Interval[2]	Screen Interval[3]	Screen Interval[4]	Screen Interval[5]	Notes
26S40E22A01	35.66496	-117.65312			153	33-75					
26S40E22B01	35.66523	-117.65951			63	61-63					
26S40E22H01	35.66190	-117.65423	440784.733	3946646.356	49	47-49					
26S40E22H02	35.66190	-117.65423	440784.733	3946646.356	77	75-77					
26S40E22H03	35.66190	-117.65423	440784.733	3946646.356	97	95-97					
26S40E22J01	35.65829	-117.65590			71	69-71					
26S40E22K01	35.65634	-117.65812			52						
26S40E22N01	35.65417	-117.66944	439401.791	3945797.946	203						
26S40E22P01	35.65250	-117.66556	439752.567	3945610.704	1358	530-830					
26S40E22P02	35.65190	-117.66312	439972.683	3945542.663	75	73-75					
26S40E22P03	35.65355	-117.66371			415						PLScntr
26S40E22P04	35.65347	-117.66378			215	400-415					PLScntr
26S40E23A01	35.66339	-117.63661	442380.485	3946801.321	52	50-52					
26S40E23A02	35.66339	-117.63658	442383.205	3946801.388	77	75-77					
26S40E23B02	35.66526	-117.64147	441942.213	3947011.105	360	300-340					
26S40E23B03	35.66572	-117.63808	442249.018	3947060.355	240	180-220					
26S40E23C01	35.66384	-117.64673			40	200-215					
26S40E23D01	35.66318	-117.65028	441143.438	3946785.506	400	385-400					
26S40E23D02	35.66317	-117.65015	441155.315	3946785.291	185	170-185					
26S40E23G01	35.66162	-117.64284			57	55-57					
26S40E23J01	35.66361	-117.64611	441520.843	3946831.300	60						
26S40E23L01	35.65801	-117.64395			65						
26S40E24B01	35.66434	-117.62320									PLScntr
26S40E24C01	35.66579	-117.62449	443478.878	3947060.341	45	43.5-45.5					
26S40E24M01	35.65800	-117.63123	442863.733	3946199.859	67						
26S40E24R01	35.65343	-117.61875			149						PLScntr
26S40E25C	35.65164	-117.62824	443130.024	3945492.871							
26S40E25C02	35.64857	-117.62867			160						
26S40E25P	35.63874	-117.62704	443229.486	3944061.749							
26S40E26B01	35.64912	-117.64173			50						
26S40E26F01	35.64746	-117.64506	441603.958	3945038.872	77	75-77					
26S40E26N02	35.63857	-117.65046	441109.072	3944057.105	77	72-77					
26S40E27D01	35.65051	-117.66729	439594.451	3945391.174	160	75-77					
26S40E27D02	35.64940	-117.66784	439543.318	3945268.284							
26S40E27E03	35.64662	-117.66590			480						
26S40E28A03	35.65107	-117.67367				100-140					
26S40E28C01	35.65134	-117.68034			147						
26S40E28H01	35.64523	-117.67423									
26S40E28J01	35.64111	-117.67139	439215.888	3944351.147							
26S40E29D01	35.65051	-117.70229									
26S40E29F01	35.64551	-117.69923									
26S40E29N01	35.63773	-117.70256	436390.704	3943996.246							
26S40E30C02	35.64968	-117.71673									
26S40E30E	35.64740	-117.72039			850	320-490	530-830				
26S40E30E01	35.64579	-117.72145									
26S40E30E02	35.64718	-117.71895			378						
26S40E30J01	35.63816	-117.70367	436291.264	3944044.246	405	205-378					
26S40E30K01	35.64287	-117.71374			800	250-800					
26S40E30K02	35.64135	-117.71358			802	220-470	600-760				note: two screen interval sources: other one is 220-630
26S40E30K03	35.64222	-117.71217			800	250-800					
26S40E30K04	35.64138	-117.71318			796	300-460	600-796				
26S40E31D01	35.63500	-117.72111	434709.247	3943705.237	330						
26S40E31J01	35.61704	-117.68892	437609.728	3941692.144	380						
26S40E31K01	35.62611	-117.71361	435381.169	3942714.412							
26S40E31Q01	35.62472	-117.71119	435598.950	3942559.005	385						
26S40E32D01	35.63551	-117.70506			279						
26S40E32E01	35.63246	-117.70451			300						
26S40E32E02	35.63329	-117.70312			280						
26S40E32E06	35.63444	-117.70430	436230.717	3943631.613	405						
26S40E32F	35.63306	-117.69778									
26S40E32F01	35.63305	-117.69826	436774.557	3943475.422	720	520-700					

Table 1: TDS Sample Locations

Depth and screen intervals are given in feet below ground surface

Notes: PLScntr - center point of corresponding Township/Range-Section & Tract (if available)

Unique Well Name	Latitude	Longitude	X_UTM	Y_UTM	Depth	Screen Interval[1]	Screen Interval[2]	Screen Interval[3]	Screen Interval[4]	Screen Interval[5]	Notes
26S40E32K01	35.62833	-117.69602	436976.179	3942956.824	620	260-310	340-380	470-500	520-600		
26S40E32K02	35.62800	-117.69360									
26S40E33A02	35.63690	-117.67062			350						
26S40E33P01	35.62305	-117.67957				169-304					
26S40E33P02	35.62329	-117.67951			250						
26S40E33P03	35.62357	-117.68173									
26S40E33P04	35.61078	-117.65643	440547.952	3940978.398	304	169-182	198-216	233-252	256-272	275-290	
26S40E34N	35.62454	-117.66916				145-227					
26S40E34N01	35.62702	-117.66589	439703.368	3942785.357	232						
26S40E34R01	35.62357	-117.65451									
26S40E35H	35.63474	-117.64345	441741.120	3943627.401							
26S40E35H01	35.63194	-117.63806	442227.162	3943314.376	160	135-142	146-155	176-181			
26S40E35H02	35.63194	-117.63778	442252.313	3943314.212	500	55-70	110-130				
26S40E35Q01	35.62357	-117.64173									
26S40E35Q02	35.62278	-117.64167	441893.556	3942299.828	127	125-127					
26S40E36A01	35.63361	-117.62083	443787.737	3943489.245	270	80-90	107-127	187-195	240-260		
26S40E36K01	35.62800	-117.62240									
26S41E06P01	35.70181	-117.60719	445069.626	3951045.080	30	18-28					
26S41E07D01	35.69829	-117.61117			21						
26S41E07E01	35.69549	-117.61283	444555.418	3950347.873	32						
26S41E07G01	35.69559	-117.60008			32	30-32					PLScntr
27S37E30K	35.55656	-118.03475	406219.674	3935258.284							
27S38E01G01	35.61746	-117.83868			400						
27S38E02B01	35.62118	-117.85481				29.5-31.5					PLScntr
27S38E02C01	35.62278	-117.85750	422348.247	3942448.772	640	620-640					
27S38E02C02	35.62278	-117.85750	422348.247	3942448.772	1480	1460-1480					
27S38E02C03	35.62278	-117.85750	422348.247	3942448.772	1960	1940-1960					
27S38E09C01	35.60662	-117.89375	419049.338	3940686.033		501-581					
27S38E09Q01	35.59363	-117.89259	419140.892	3939244.748							
27S38E09Q02	35.59367	-117.89245	419154.249	3939248.517		380-480					
27S38E10C02	35.60667	-117.87310	420919.683	3940675.129							
27S38E13A01	35.59345	-117.83059	424758.015	3939174.996	770						
27S38E13A02	35.59366	-117.83065	424752.327	3939198.100		232-272	372-472	632-690			
27S38E14M01	35.58201	-117.86525	421606.591	3937933.038		452-552	752-852				
27S38E17A01	35.59371	-117.90204	418285.492	3939260.856		280-340					
27S38E21L01	35.56991	-117.89499	418900.215	3936615.252		905-1005					
27S38E23F01	35.56972	-117.86278	421818.720	3936568.493	635	615-635					
27S38E23F02	35.56972	-117.86278	421818.720	3936568.493	1060	1040-1060					
27S38E23F03	35.56972	-117.86278	421818.720	3936568.493	1520	1500-1520					
27S38E23F04	35.56972	-117.86278	421818.720	3936568.493	1770	1750-1770					
27S38E23R01	35.56633	-117.85026			300	580-680					PLScntr
27S38E27M01	35.55388	-117.88131	420123.519	3934826.511		320-360					
27S38E28R01	35.55135	-117.88229									
27S38E31D01	35.54780	-117.93410									
27S39E02K	35.61222	-117.74722	432325.865	3941196.588	400						
27S39E03B01	35.62126	-117.76578	430652.596	3942212.201	400						
27S39E03C01	35.62177	-117.77066	430211.391	3942272.457	425						
27S39E03C02	35.62205	-117.76993	430277.417	3942302.994	420						
27S39E04C01	35.62173	-117.77156	2068168.000	772267.000	425						
27S39E07R01	35.59634	-117.81673	426015.650	3939485.620		434-514					
27S39E08A02	35.60672	-117.79819			955	550-905					
27S39E08E01	35.60285	-117.81018									PLScntr
27S39E08L01	35.60051	-117.80419	427158.421	3939926.447	1020	560-1000					
27S39E08M01	35.58315	-117.80089	2059479.310	758203.220							
27S39E08M04	35.60055	-117.81151	426492.908	3939938.315	1020	560-1000					
27S39E11D01	35.60722	-117.75472	431642.341	3940647.220	670	650-670					
27S39E11D02	35.60722	-117.75472	431642.341	3940647.220	1340	1320-1340					
27S39E11D03	35.60722	-117.75472	431642.341	3940647.220	1870	1850-1870					
27S39E12M01	35.77600	-117.84634									PLScntr
27S39E19E01	35.57389	-117.82972	424818.038	3937004.883							
27S40E01G02	35.61579	-117.62478									
27S40E01K01	35.61440	-117.62506			400						
27S40E01K02	35.61472	-117.62472	443422.315	3941396.512	164						
27S40E01M01	35.61357	-117.63145			199						

Table 1: TDS Sample Locations
Depth and screen intervals are given in feet below ground surface
Notes: PLScntr - center point of corresponding Township/Range-Section & Tract (if available)

Unique Well Name	Latitude	Longitude	X_UTM	Y_UTM	Depth	Screen Interval[1]	Screen Interval[2]	Screen Interval[3]	Screen Interval[4]	Screen Interval[5]	Notes
27S40E01M02	35.61357	-117.63145			210						
27S40E02A01	35.61885	-117.63617			127						
27S40E02F01	35.61690	-117.64728			127						
27S40E02G01	35.61690	-117.64145			127						
27S40E02G03	35.61857	-117.63923									
27S40E02H01	35.61167	-117.63500	442489.313	3941063.580	200	119-197					
27S40E02J01	35.61167	-117.63500	442489.313	3941063.580	220						
27S40E02N01	35.60940	-117.64923									
27S40E03J01	35.61246	-117.65340									
27S40E03P01	35.60829	-117.66451			120						
27S40E03R01	35.60833	-117.65306	440851.581	3940704.584	162						
27S40E04B01	35.62218	-117.67451			230						
27S40E04B02	35.62218	-117.67451			288	128-278					
27S40E04B3	35.62210	-117.67500			288	138-288					
27S40E04C01	35.62246	-117.67867			300						
27S40E04C02	35.61880	-117.67840	438563.704	3941880.480	280						
27S40E04E02	35.61707	-117.68566			375	150-210					PLScntr
27S40E04F01	35.61667	-117.68333									
27S40E04F02	35.61667	-117.68333									
27S40E04F03	35.61667	-117.68333									
27S40E04F04	35.61667	-117.68333									
27S40E04L01	35.60038	-117.66023	440195.504	3939827.051	252						
27S40E04L02	35.61440	-117.67920									
27S40E05C01	35.62111	-117.69750									
27S40E05D	35.64656	-117.73953			556	251-555					
27S40E05D01	35.62190	-117.70284			555						
27S40E05F	35.61667	-117.70000									this location may have wrong longitude
27S40E06D01	35.60793	-117.70591	2087695.780	767293.420	720	580-700					
27S40E06E02	35.61817	-117.71999	434796.947	3941838.017	445						
27S40E06F01	35.61639	-117.71806	434970.839	3941639.045							
27S40E06H01	35.61579	-117.70618			402	220-400					
27S40E06L01	35.59919	-117.69945	436641.827	3939719.273							
27S40E06R	35.60861	-117.70611									
27S40E06R02	35.60996	-117.70590				255-555					
27S40E07G01	35.60162	-117.71368			410						
27S40E08A01	35.60801	-117.68895			440						
27S40E08B01	35.60635	-117.69645			400						
27S40E08B02	35.60746	-117.69367			400	200-400					
27S40E08F01	35.60107	-117.69729			400	200-400					
27S40E08Q02	35.59440	-117.69617			367						
27S40E09B01	35.60635	-117.67867									
27S40E09K03	35.59990	-117.67414	438935.224	3939782.404	305						
27S40E09L01	35.59712	-117.68164	438253.986	3939478.876	300						
27S40E09L02	35.59829	-117.68034									
27S40E09P01	35.59357	-117.68229			230						
27S40E10A01	35.60773	-117.65312			150						
27S40E10A02	35.60662	-117.65534			126						
27S40E10A07	35.60773	-117.65312									
27S40E10B01	35.60440	-117.65756									
27S40E10C01	35.60440	-117.66395			250						
27S40E10D01	35.60468	-117.66951									
27S40E10E01	35.60385	-117.66951									
27S40E10H01	35.60496	-117.65340									
27S40E10J01	35.59912	-117.65451			180						
27S40E10R01	35.59355	-117.65154	440977.769	3939064.045	263						
27S40E11C02	35.60718	-117.64701									
27S40E11D03	35.60523	-117.64951			165						
27S40E15L01	35.58396	-117.65805	440381.274	3938004.253							
27S40E17G01	35.58885	-117.69284									
28S37E13F01	35.50107	-117.94924			400						
28S37E18R01	35.49347	-118.02861			284						PLScntr
28S38E18F01	35.49912	-117.92923	415722.695	3928793.109	247						

Table 1: TDS Sample Locations

Depth and screen intervals are given in feet below ground surface

Notes: PLScntr - center point of corresponding Township/Range-Section & Tract (if available)

Unique Well Name	Latitude	Longitude	X_UTM	Y_UTM	Depth	Screen Interval[1]	Screen Interval[2]	Screen Interval[3]	Screen Interval[4]	Screen Interval[5]	Notes
ETC44-MW01	35.69228	-117.67267	439138.418	3950027.023							
ITC02-MW21	35.68634	-117.68020	438453.278	3949373.415							
ITC45-MW25	35.69213	-117.68011	438465.209	3950015.390							
JMM07-MW11	35.65979	-117.65885	440365.110	3946415.468							
JMM07-MW13	35.66044	-117.65682	440549.184	3946486.452							
JMM12-MW08			437105.321	3945617.392	153	138-153					
JMM31-MW01	35.64556	-117.66503	439795.337	3944840.264							
JMM32-MW02	35.66070	-117.64329	441774.115	3946506.338							
MK12-MW12	35.65591	-117.68691	437822.051	3946002.461							
MK12-MW16	35.65217	-117.68893	437636.665	3945588.328							
MK29-MW13	35.76967	-117.71967	434949.385	3958640.669	300	280-300					
MK62-MW01	35.64731	-117.66097	440164.189	3945032.501							
MK69-MW01	35.64777	-117.66054	440202.967	3945082.999	66	51-66					
MK69-MW02			440202.818	3945083.877	211	196-210					
MKFL-MW01	35.63894	-117.65353	440830.918	3944099.292	59	48-59					
MKFL-MW02			440438.842	3945312.585	203	182-202					
MKFL-MW03	35.66445	-117.67571	438842.116	3946942.497							
MW01-13	35.68954	-117.67701	438743.863	3949726.002							
RLS07-MW02	35.66443	-117.66238	440048.736	3946932.156							
RLS07-MW03	35.66185	-117.65810	440434.172	3946643.408							
RLS07-MW04	35.66685	-117.65024	441149.138	3947193.472							
RLS12-MW01	35.65779	-117.69139	437418.436	3946213.933							
RLS12-MW04	35.65314	-117.69507	437081.549	3945700.265	136	119-139					
RLS13-MW05	35.67043	-117.63222	442783.194	3947579.438							
RLS15-MW03	35.68946	-117.63417	442620.097	3949691.533							
RLS22-MW07	35.63307	-117.62868	443077.073	3943433.740							
RLS22-MW08 (64')	35.63983	-117.63352	442643.023	3944186.032							
RLS29-MW01	35.76959	-117.72126	434805.079	3958633.278	32	17-32					
RLS34-MW05	35.66836	-117.65678	440559.119	3947364.457							
RLS34-MW06	35.66987	-117.66335	439965.221	3947535.489							
RLS43-MW06	35.66987	-117.66335	439965.221	3947535.489							
26S38E15Q01	35.66829	-117.87285									Spring
5_Mile_Cyn	35.88164	-117.91946	417006.502	3971210.715							Surface
9_Mile_Cyn	35.84321	-117.92573	416400.251	3966954.247							Surface
Big_Spring	35.62483	-117.95818	413233.110	3942760.734							Surface
Bird_Spring_S	35.49959	-118.07795	402234.937	3928982.417							Surface - Source
Cow_Haven_Cyn	35.58598	-117.98849									Surface; PLScntr
Dead_Foot_Cyn	35.86275	-117.92126	416823.859	3969117.599							Surface
Grapevine_Cyn	35.73273	-117.90814	417874.808	3954685.231							Surface
Indian_Wells_Cyn	35.69295	-117.92926	415923.210	3950290.831							Surface
Indian_Wells_Lodge	35.66819	-117.87433									Surface Spring
Little_Lake_Outlet	35.93145	-117.90614	418259.866	3976724.948							Surface
Sand_Canyon	35.77830	-117.9220									Surface
Short_Canyon	35.71074	-117.91780	416978.866	3952253.822							Surface
TT37-MW01	35.65884	-117.62880	443084.483	3946291.596							
TT37-MW02	35.65674	-117.62767	443184.942	3946058.298							
TT37-MW03	35.65551	-117.63221	442773.319	3945925.025							
TTBK-MW03	35.63360	-117.66183	440075.276	3943512.417							
TTBK-MW06	35.65735	-117.68686	437827.836	3946161.761							
TTBK-MW08	35.76000	-117.75378	431857.908	3957591.052							
TTBK-MW09	35.74912	-117.74028	433068.994	3956374.868							
TTBK-MW10	35.63893	-117.64017	442041.105	3944090.541							
TTIWV-MW02-D			434875.761	3945795.012	802	780-800					
TTIWV-MW02-I			434875.761	3945795.012	422	400-420					
TTIWV-MW04			437075.765	3945643.499	657	635-655					
TTIWV-MW07			439616.478	3945223.345	622	600-620					
TTIWV-MW08			441101.066	3944074.928	422	400-420					
TTIWV-MW10			445072.265	3951030.290	342	260-340					
TTIWV-MW15			440588.757	3965479.490	302	280-300					
TTIWV-MW16	35.77026	-117.71969	434947.779	3958705.951	990	948-988					
TTSWV-MW01			456845.390	3945313.950	27	15-25					
TTSWV-MW02			455157.400	3946358.550	48	36-46					
TTSWV-MW03			455153.230	3946349.740	372	350-370					
TTSWV-MW04			453382.460	3947058.060	32	20-30					

Table 1: TDS Sample Locations

Depth and screen intervals are given in feet below ground surface

Notes: PLScntr - center point of corresponding Township/Range-Section & Tract (if available)

Unique Well Name	Latitude	Longitude	X_UTM	Y_UTM	Depth	Screen Interval[1]	Screen Interval[2]	Screen Interval[3]	Screen Interval[4]	Screen Interval[5]	Notes
TTSWV-MW05			452388.380	3944778.270	142	120-140					
TTSWV-MW06			450996.700	3946994.880	52	40-50					
TTSWV-MW07			451010.090	3946998.360	272	250-270					
TTSWV-MW09			449400.410	3948667.120	42	30-40					
TTSWV-MW10			449422.100	3948660.940	197	175-195					

Table 2: IWV TDS Data

Sample Dates in red indicate only sample month/year is known

	min	1/26/1920	100
	max	3/5/2019	232000
	count	2,044	

Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
24S38E16J02	Sawmill Well #1	6/15/1982	1300	Calc	B	1
24S38E16J02	Sawmill Well #1	2/4/2007	1100	Lab	FR: AB	1
24S38E21A01	USBR-10-S	4/14/1995	1140	Ukn	AB	2
24S38E21A01	USBR-10-S	11/30/1995	1120	Ukn	AB	2
24S38E21A01	USBR-10-S	3/18/1993	950	Lab	H	1
24S38E21A01	USBR-10-S	5/30/1996	980	Lab	H96	1
24S38E21A01	USBR-10-S	9/1/1992	1000	Lab	USBR	1
24S38E21A02	USBR-10-S/M	4/14/1995	745	Ukn	AB	2
24S38E21A02	USBR-10-S/M	11/30/1995	995	Ukn	AB	2
24S38E21A02	USBR-10-S/M	6/5/1996	750	Lab	H96	1
24S38E21A02	USBR-10-S/M	9/1/1992	580	Lab	USBR	1
24S38E21A03	USBR-10-M/D	4/14/1995	1140	Ukn	AB	2
24S38E21A03	USBR-10-M/D	6/5/1996	880	Lab	H96	1
24S38E21A03	USBR-10-M/D	9/1/1992	1220	Lab	USBR	1
24S38E21A04	USBR-10-D	4/14/1995	1120	Ukn	AB	2
24S38E21A04	USBR-10-D	12/1/1995	1120	Ukn	AB	2
24S38E21A04	USBR-10-D	6/5/1996	1100	Lab	H96	1
24S38E21A04	USBR-10-D	9/2/1992	1330	Lab	USBR	1
24S38E28Q01	USGS-354851117522501	8/5/1953	615	Ukn	GAMA	1
24S38E33J02	Pearsonville Well	6/15/1982	710	Calc	B	1
24S38E35E01	USGS-354825117510001	4/24/1946	852	Ukn	GAMA	1
24S39E33D01	USGS-354828117463801	2/3/1920	704	Ukn	GAMA	1
24S39E33D01	USGS-354828117463801	4/23/1946	1040	Ukn	GAMA	1
24S39E33N01	USGS-354758117464001	4/23/1946	530	Ukn	GAMA	1
24S39E34D01	N. Baker Well	3/11/1993	500	Lab	H	1
24S39E34D01	N. Baker Well	8/21/2008	480	Ukn	KCWA WQ	3
24S40E06A01	USGS-355300117413401	4/29/1946	3070	Ukn	GAMA	1
24S40E20J01		5/15/1953	1160	Calc	Moyle	1
24S40E21K01	TTIWV-MW14	12/14/2002	3200	Lab	Tri	1
24S40E21K01	TTIWV-MW14	2/17/2002	2560	Lab	TTEMI	1
24S40E33N01		7/6/1953	5120	Calc	Moyle	1
24S40E34E01		7/8/1953	1790	Calc	Moyle	1
24S40E36A	TTIWV-MW13	2/16/2002	3090	Lab	TTEMI	1
24S40E36M01		7/6/1953	1820	Calc	Moyle	1
25S38E02E	Meadowbrook - Big Horn	9/11/2018	920	Lab	MD	1
25S38E02L01		3/18/1993	960	Lab	H	1
25S38E03G01		2/7/2007	520	Lab	FR: AB	1
25S38E10G	Quarry Well	3/7/1990	352	Ukn	H-WQ	2
25S38E11K02		6/5/1953	350	Lab	Moyle	1
25S38E11K02		8/5/1953	304	Calc	Moyle	1
25S38E11L01		9/20/1987	296	Calc	B&S	1
25S38E11L01		7/9/1988	306	Calc	B&S	1
25S38E12E		6/9/1987	760	Ukn	KCWA WQ	3
25S38E12L01	USBR-06-S	5/30/1996	380	Lab	H96	1
25S38E12L01	USBR-06-S	4/14/2004	641	Ukn	L/H-WQ	2
25S38E12L01	USBR-06-S	1/10/1992	596	Lab	USBR	1

Table 2: IWV TDS Data

Sample Dates in red indicate only sample month/year is known

min 1/26/1920 100
max 3/5/2019 232000
count 2,044

Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
25S38E12L02	USBR-06-M	6/18/1996	850	Lab	H96	1
25S38E12L02	USBR-06-M	4/14/2004	1200	Ukn	L/H-WQ	2
25S38E12L02	USBR-06-M	1/10/1992	481	Lab	USBR	1
25S38E12L03	USBR-06-D	6/18/1996	600	Lab	H96	1
25S38E12L03	USBR-06-D	4/14/2004	864	Ukn	L/H-WQ	2
25S38E12L03	USBR-06-D	1/10/1992	540	Lab	USBR	1
25S38E12M	Meadowbrook Well 3	9/11/2018	940	Lab	MD	1
25S38E12M01	LM #3?	3/18/1993	830	Lab	H	1
25S38E12Mct	Meadowbrook - Coyote Trail	9/11/2018	380	Lab	MD	1
25S38E13C	Meadowbrook Well 4	9/11/2018	880	Lab	MD	1
25S38E13D01	USGS-354608117503601	4/24/1946	400	Ukn	GAMA	1
25S38E13J01		7/6/1988	343	Calc	B&S	1
25S38E13J01		1/12/2007	280	Lab	FR: AB	1
25S38E13J01		3/10/1993	330	Lab	H	1
25S38E13J01		3/18/1993	330	Ukn	KCWA WQ	3
25S38E13L	Meadowbrook Well 5	9/11/2018	690	Lab	MD	1
25S38E13L01		6/15/1982	510	Calc	B	1
25S38E13M	Meadowbrook - Headquarters	9/11/2018	760	Lab	MD	1
25S38E13Q	Meadowbrook Well 6	9/11/2018	680	Lab	MD	1
25S38E14M02		8/12/2008	380	Ukn	H-WQ	2
25S38E14N01		5/1/2007	420	Ukn	H-WQ	2
25S38E23G01		4/24/1946	354	Calc	Moyle	1
25S38E23J01	USGS-354449117505001	4/16/1986	430	Ukn	GAMA	1
25S38E24H	Old Man John Well	4/21/1996	640	Ukn	AB	2
25S38E24K	Meadowbrook Well 7	9/11/2018	620	Lab	MD	1
25S38E24K01		3/18/1993	620	Lab	H	1
25S38E24L	Meadowbrook Well 8	9/11/2018	900	Lab	MD	1
25S38E25C	PEACHIE	6/7/2005	710	Ukn	KCWA WQ	3
25S38E25C01		6/7/2005	710	Ukn	H-WQ	2
25S38E25G01		3/26/2008	610	Ukn	H-WQ	2
25S38E25J	B&S Hist. 1988 (25S38E25J01)	8/25/1988	875	Lab	B&S	1
25S38E25J01	NR1-S (Neal Ranch-1-S)	2/2/1991	2406	Lab	USBR	1
25S38E25J02	NR1-M (Neal Ranch-1-M)	2/2/1991	3660	Lab	USBR	1
25S38E25J03	NR1-D (Neal Ranch-1-D)	2/2/1991	3251	Lab	USBR	1
25S38E25Q		1/6/1998	677	Ukn	H-WQ	2
25S38E34A01	Means Well	4/11/2006	260	Ukn	H-WQ	2
25S38E34G01	USBR-05-S	6/5/1996	440	Lab	H96	1
25S38E34G01	USBR-05-S	10/22/2004	412	Ukn	L/H-WQ	2
25S38E34G01	USBR-05-S	1/6/1992	534	Lab	USBR	1
25S38E34G02	USBR-05-M	6/5/1996	1100	Lab	H96	1
25S38E34G02	USBR-05-M	10/22/2004	935	Ukn	L/H-WQ	2
25S38E34G02	USBR-05-M	1/6/1992	837	Lab	USBR	1
25S38E34G03	USBR-05-D	6/5/1996	1200	Lab	H96	1
25S38E34G03	USBR-05-D	10/22/2004	1200	Ukn	L/H-WQ	2

Table 2: IWV TDS Data

Sample Dates in red indicate only sample month/year is known

min	1/26/1920	100
max	3/5/2019	232000
count	2,044	

Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
25S38E34G03	USBR-05-D	1/6/1992	891	Lab	USBR	1
25S38E35A	HLEDIK	10/8/2002	610	Ukn	KCWA WQ	3
25S38E35H	HOFFMAN	2/9/1988	520	Ukn	KCWA WQ	3
25S38E35M01		8/5/1953	589	Calc	Moyle	1
25S38E36A01		8/25/1988	3210	Lab	B&S	1
25S38E36B01	WELL-27 (NWWF 04)	7/29/1988	755	Lab	B&S	1
25S38E36B01	WELL-27 (NWWF 04)	4/17/1986	827	Ukn	GAMA	1
25S38E36D	WOOD	5/8/1984	560	Ukn	KCWA WQ	3
25S38E36D	WOOD	3/7/1989	670	Ukn	KCWA WQ	3
25S38E36D	WOOD	4/3/1989	670	Ukn	KCWA WQ	3
25S38E36D	WOOD	12/21/1992	650	Ukn	KCWA WQ	3
25S38E36D	WOOD	12/8/1994	1790	Ukn	KCWA WQ	3
25S38E36D	WOOD	7/20/1999	946	Ukn	KCWA WQ	3
25S38E36G01	NR2-S (Neal Ranch-2-S)	2/26/1991	808	Lab	USBR	1
25S38E36G02	NR2-M (Neal Ranch-2-M)	2/26/1991	1367	Lab	USBR	1
25S38E36G03	NR2-D (Neal Ranch-2-D)	2/26/1991	3305	Lab	USBR	1
25S38E36Q01		8/12/2008	560	Ukn	H-WQ	2
25S39E01N01	USGS-354704117441501	4/25/1946	602	Ukn	GAMA	1
25S39E02E01		4/23/1946	501	Calc	Moyle	1
25S39E04R01	NAWS Well LB	7/31/1978	690	Calc	B	1
25S39E04R01	NAWS Well LB	3/29/1980	780	Calc	B	1
25S39E04R01	NAWS Well LB	6/1/1987	764	Lab	B&S	1
25S39E04R01	NAWS Well LB	7/8/1988	792	Calc	B&S	1
25S39E04R01	NAWS Well LB	3/27/1990	775	Lab	GAMA	1
25S39E04R01	NAWS Well LB	7/20/1990	810	Lab	GAMA	1
25S39E04R01	NAWS Well LB	5/18/1993	780	Lab	GAMA	1
25S39E04R01	NAWS Well LB	4/11/2002	782	Lab	GAMA	1
25S39E04R01	NAWS Well LB	5/20/2009	730	Lab	GAMA	1
25S39E04R01	NAWS Well LB	12/20/2011	740	Lab	GAMA	1
25S39E04R01	NAWS Well LB	8/5/1953	681	Calc	Moyle	1
25S39E04R01	NAWS Well LB	6/6/1972	644	Calc	W	1
25S39E07K01		4/23/1946	842	Calc	Moyle	1
25S39E09J01	NAWS Well B-1	7/31/1978	540	Calc	B	1
25S39E09J01	NAWS Well B-1	5/4/1979	580	Calc	B	1
25S39E09J01	NAWS Well B-1	3/29/1980	540	Calc	B	1
25S39E09J01	NAWS Well B-1	1/19/1989	584	Calc	B&S	1
25S39E09J01	NAWS Well B-1	10/10/1961	565	Ukn	GAMA	1
25S39E09J01	NAWS Well B-1	7/18/1962	602	Ukn	GAMA	1
25S39E09J01	NAWS Well B-1	10/14/1963	626	Ukn	GAMA	1
25S39E09J01	NAWS Well B-1	9/15/1964	564	Ukn	GAMA	1
25S39E09J01	NAWS Well B-1	5/16/1966	596	Ukn	GAMA	1
25S39E09J01	NAWS Well B-1	9/7/1966	608	Ukn	GAMA	1
25S39E09J01	NAWS Well B-1	6/5/1968	600	Ukn	GAMA	1
25S39E09J01	NAWS Well B-1	5/22/1969	570	Ukn	GAMA	1
25S39E09J01	NAWS Well B-1	10/25/1973	525	Ukn	GAMA	1
25S39E09J01	NAWS Well B-1	5/1/1975	494	Ukn	GAMA	1

Table 2: IWV TDS Data

Sample Dates in red indicate only sample month/year is known

min	1/26/1920	100
max	3/5/2019	232000
count	2,044	

Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
25S39E09J01	NAWS Well B-1	5/12/1976	518	Ukn	GAMA	1
25S39E09J01	NAWS Well B-1	11/19/1985	560	Lab	GAMA	1
25S39E09J01	NAWS Well B-1	3/27/1990	575	Lab	GAMA	1
25S39E09J01	NAWS Well B-1	7/2/1990	610	Lab	GAMA	1
25S39E09J01	NAWS Well B-1	5/18/1993	600	Lab	GAMA	1
25S39E09J01	NAWS Well B-1	4/17/1995	540	Lab	GAMA	1
25S39E09J01	NAWS Well B-1	4/11/2002	525	Lab	GAMA	1
25S39E09J01	NAWS Well B-1	8/23/2012	500	Lab	GAMA	1
25S39E09J01	NAWS Well B-1	8/3/1953	578	Calc	Moyle	1
25S39E09J01	NAWS Well B-1	6/6/1972	516	Calc	W	1
25S39E10E01	USGS-354637117462601	4/23/1946	608	Ukn	GAMA	1
25S39E10Q01	USGS-354610117455501	4/24/1946	584	Ukn	GAMA	1
25S39E12R02	NAWS Well 22	7/31/1978	650	Calc	B	1
25S39E12R02	NAWS Well 22	5/4/1979	680	Calc	B	1
25S39E12R02	NAWS Well 22	3/29/1980	760	Calc	B	1
25S39E12R02	NAWS Well 22	4/28/1987	692	Lab	B&S	1
25S39E12R02	NAWS Well 22	7/8/1988	760	Calc	B&S	1
25S39E12R02	NAWS Well 22	10/11/1961	780	Ukn	GAMA	1
25S39E12R02	NAWS Well 22	7/18/1962	752	Ukn	GAMA	1
25S39E12R02	NAWS Well 22	6/21/1965	776	Ukn	GAMA	1
25S39E12R02	NAWS Well 22	5/16/1966	776	Ukn	GAMA	1
25S39E12R02	NAWS Well 22	9/7/1966	769	Ukn	GAMA	1
25S39E12R02	NAWS Well 22	11/7/1967	746	Ukn	GAMA	1
25S39E12R02	NAWS Well 22	6/5/1968	764	Ukn	GAMA	1
25S39E12R02	NAWS Well 22	11/4/1968	721	Ukn	GAMA	1
25S39E12R02	NAWS Well 22	10/20/1969	768	Ukn	GAMA	1
25S39E12R02	NAWS Well 22	6/1/1970	748	Ukn	GAMA	1
25S39E12R02	NAWS Well 22	10/20/1970	704	Ukn	GAMA	1
25S39E12R02	NAWS Well 22	10/25/1973	776	Ukn	GAMA	1
25S39E12R02	NAWS Well 22	5/1/1975	692	Ukn	GAMA	1
25S39E12R02	NAWS Well 22	5/12/1976	675	Ukn	GAMA	1
25S39E12R02	NAWS Well 22	8/3/1953	676	Calc	Moyle	1
25S39E12R02	NAWS Well 22	4/20/1955	684	Calc	Moyle	1
25S39E12R02	NAWS Well 22	6/6/1972	723	Calc	W	1
25S39E13E01	USGS-354549117442001	4/25/1946	612	Ukn	GAMA	1
25S39E14H01	Childers Well	2/3/2007	600	Lab	FR: AB	1
25S39E17D01	USGS-354606117483201	4/24/1946	264	Ukn	GAMA	1
25S39E19K01	USGS-354447117490901	4/25/1946	446	Lab	GAMA-USGS	1
25S39E21B01	USGS-354510117470001	4/24/1946	349	Ukn	GAMA	1
25S39E22B01	USGS-354512117455001	4/25/1946	450	Ukn	GAMA	1
25S39E22J01	USGS-354435117454001	4/25/1946	778	Lab	GAMA-USGS	1
25S39E22J01	USGS-354435117454001	8/21/2008	840	Ukn	KCWA WQ	3
25S39E23G01	SNORT #1 -S	8/25/1992	9890	Lab	USBR	1
25S39E23G02	SNORT #1-S/M	8/25/1992	9350	Lab	USBR	1
25S39E23G03	SNORT #1-D/M	8/24/1992	12500	Lab	USBR	1
25S39E23G04	SNORT #1-D	8/24/1992	8900	Lab	USBR	1

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min	1/26/1920	100
max	3/5/2019	232000
count	2,044	

Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
25S39E24D01		4/25/1945	386	Calc	Moyle	1
25S39E26H01	USGS-354359117443201	10/14/1963	6530	Lab	GAMA-USGS	1
25S39E26H01	USGS-354359117443201	9/15/1964	1910	Lab	GAMA-USGS	1
25S39E26H01	USGS-354359117443201	10/20/1970	990	Lab	GAMA-USGS	1
25S39E26H01	USGS-354359117443201	6/23/1971	1050	Lab	GAMA-USGS	1
25S39E26H01	USGS-354359117443201	10/27/1971	1560	Lab	GAMA-USGS	1
25S39E26H01	USGS-354359117443201	2/29/1956	841	Calc	Moyle	1
25S39E26H01	USGS-354359117443201	6/6/1972	696	Calc	W	1
25S39E28P01		4/26/1946	484	Calc	Moyle	1
25S39E30L01		3/10/1993	91500	Lab	H	1
25S39E30N01	USGS-354339117493601	12/29/1967	734	Lab	GAMA-USGS	1
25S39E31D01		7/29/1988	845	Lab	B&S	1
25S39E31E01	USGS-354308117494401	4/26/1946	533	Lab	GAMA-USGS	1
25S39E31M03	USGS-354258117494201	5/22/1969	633	Lab	GAMA-USGS	1
25S39E31R01	USGS-354240117485301	5/31/1987	1890	Calc	B&S	1
25S39E31R01	USGS-354240117485301	1/11/2007	550	Lab	FR: AB	1
25S39E31R01	USGS-354240117485301	10/23/1986	2680	Ukn	GAMA	1
25S39E31R01	USGS-354240117485301	3/21/1989	1910	Ukn	GAMA	1
25S39E31R01	USGS-354240117485301	4/11/1990	1900	Ukn	GAMA	1
25S39E31R01	USGS-354240117485301	3/14/1991	1770	Ukn	GAMA	1
25S39E31R01	USGS-354240117485301	3/10/1993	590	Lab	H	1
25S39E31R01	USGS-354240117485301	3/18/1993	590	Ukn	KCWA WQ	3
25S39E31R01	USGS-354240117485301	4/15/1995	550	Ukn	KCWA WQ	3
25S39E31R01	USGS-354240117485301	11/17/1998	980	Ukn	KCWA WQ	3
25S39E35N01	USGS-354242117452701	7/31/1978	430	Calc	B	1
25S39E35N01	USGS-354242117452701	3/29/1980	460	Calc	B	1
25S39E35N01	USGS-354242117452701	10/25/1973	420	Ukn	GAMA	1
25S39E35N01	USGS-354242117452701	5/12/1976	508	Ukn	GAMA	1
25S39E35N01	USGS-354242117452701	4/30/1946	450	Lab	GAMA-USGS	1
25S39E35N01	USGS-354242117452701	5/22/1969	460	Lab	GAMA-USGS	1
25S39E35N01	USGS-354242117452701	10/20/1970	469	Calc	GAMA-USGS	1
25S39E35N01	USGS-354242117452701	6/23/1971	503	Lab	GAMA-USGS	1
25S39E35N01	USGS-354242117452701	10/27/1971	530	Lab	GAMA-USGS	1
25S39E35N01	USGS-354242117452701	7/31/1953	398	Calc	Moyle	1
25S39E35N01	USGS-354242117452701	6/6/1972	463	Calc	W	1
25S40E08A01	USGS-354658117411201	6/20/1978	1100	Calc	B	1
25S40E08A01	USGS-354658117411201	5/16/1979	1200	Calc	B	1
25S40E08A01	USGS-354658117411201	5/20/1980	1100	Calc	B	1
25S40E08A01	USGS-354658117411201	6/9/1982	1200	Calc	B	1
25S40E08A01	USGS-354658117411201	3/5/1974	1160	Ukn	GAMA	1
25S40E08A01	USGS-354658117411201	3/24/1975	1040	Ukn	GAMA	1
25S40E08A01	USGS-354658117411201	8/17/1976	1080	Ukn	GAMA	1
25S40E08A01	USGS-354658117411201	7/9/1953	1100	Calc	Moyle	1
25S40E11K01		6/9/1982	1400	Calc	B	1
25S40E11K01		5/14/1953	1470	Calc	Moyle	1
25S40E11K01		7/6/1953	1340	Calc	Moyle	1

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count	2,044	

Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
25S40E12M01		5/14/1953	2740	Calc	Moyle	1
25S40E14H01	TTIWV-MW12	5/28/2002	2640	Lab	Tri	1
25S40E14H01	TTIWV-MW12	2/16/2002	1730	Lab	TTEMI	1
25S40E18R01	TTBK-MW12	6/21/1978	7700	Calc	B	1
25S40E18R01	TTBK-MW12	5/16/1979	1800	Calc	B	1
25S40E18R01	TTBK-MW12	5/20/1980	940	Calc	B	1
25S40E18R01	TTBK-MW12	6/9/1982	650	Calc	B	1
25S40E18R01	TTBK-MW12	3/5/1974	601	Ukn	GAMA	1
25S40E18R01	TTBK-MW12	3/24/1975	583	Ukn	GAMA	1
25S40E18R01	TTBK-MW12	8/17/1976	637	Ukn	GAMA	1
25S40E18R01	TTBK-MW12	5/12/1999	2600	Lab	Tri	1
25S40E19L01		7/9/1953	12400	Calc	Moyle	1
25S40E20F01	USGS-354450117415301	6/20/1978	580	Calc	B	1
25S40E20F01	USGS-354450117415301	5/16/1979	430	Calc	B	1
25S40E20F01	USGS-354450117415301	5/20/1980	460	Calc	B	1
25S40E20F01	USGS-354450117415301	6/9/1982	490	Calc	B	1
25S40E20F01	USGS-354450117415301	3/7/1974	507	Ukn	GAMA	1
25S40E20F01	USGS-354450117415301	3/24/1975	508	Ukn	GAMA	1
25S40E20F01	USGS-354450117415301	8/18/1976	514	Ukn	GAMA	1
25S40E24H01		5/15/1953	66400	Calc	Moyle	1
25S40E24N01		7/8/1953	5270	Calc	Moyle	1
25S40E25H01	USGS-354358117365901	5/15/1953	66400	Lab	GAMA-USGS	1
25S40E27E01	USGS-354405117395301	7/9/1953	887	Calc	Moyle	1
25S40E27E01	USGS-354405117395301	6/28/1972	799	Calc	W	1
25S40E30E01	TTBK-MW14	2/10/1999	720	Lab	Tri	1
25S40E33L01	USGS-354258117403901	6/21/1978	48000	Calc	B	1
25S40E33L01	USGS-354258117403901	5/21/1980	55000	Calc	B	1
25S40E33L01	USGS-354258117403901	6/9/1982	45000	Calc	B	1
25S40E33L01	USGS-354258117403901	3/7/1974	21300	Ukn	GAMA	1
25S40E33L01	USGS-354258117403901	3/25/1975	38400	Ukn	GAMA	1
25S40E33L01	USGS-354258117403901	8/17/1976	38100	Ukn	GAMA	1
25S40E33L02	USGS-354258117403902	6/21/1978	1400	Calc	B	1
25S40E33L02	USGS-354258117403902	5/31/1979	1300	Calc	B	1
25S40E33L02	USGS-354258117403902	5/22/1980	1400	Calc	B	1
25S40E33L02	USGS-354258117403902	6/9/1982	1400	Calc	B	1
25S40E33L02	USGS-354258117403902	3/7/1974	1270	Ukn	GAMA	1
25S40E33L02	USGS-354258117403902	3/25/1975	1290	Ukn	GAMA	1
25S40E33L02	USGS-354258117403902	8/17/1976	1230	Ukn	GAMA	1
25S40E35D01	TTBK-MW13	11/5/1998	5000	Lab	Tri	1
25S40E35D01	TTBK-MW13	2/16/2002	4830	Lab	TTEMI	1
25S40E35P01	USGS-354240117383501	7/9/1953	6790	Calc	Moyle	1
25S40E35P01	USGS-354240117383501	6/18/1972	7620	Lab	W	1
25S41E18Q01		6/3/1993	7870	Lab	H	1
25S41E19L01		6/19/1996	8100	Lab	H96	1
25S41E19L01		7/9/1953	12400	Calc	Moyle	1
25S41E21E01	USGS-354513117342201	7/31/1978	2900	Calc	B	1

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max	3/5/2019	232000
count	2,044	

Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
25S41E21E01	USGS-354513117342201	12/9/1969	4040	Ukn	GAMA	1
25S41E21E01	USGS-354513117342201	10/20/1970	2950	Ukn	GAMA	1
25S41E21E01	USGS-354513117342201	6/23/1971	2050	Ukn	GAMA	1
25S41E21E01	USGS-354513117342201	10/27/1971	2590	Ukn	GAMA	1
25S41E21E01	USGS-354513117342201	10/25/1973	2820	Ukn	GAMA	1
25S41E21E01	USGS-354513117342201	5/1/1975	2710	Ukn	GAMA	1
25S41E21E01	USGS-354513117342201	5/12/1976	2890	Ukn	GAMA	1
25S41E31C01		7/9/1953	232000	Calc	Moyle	1
26S38E01G02	USGS-354215117500701	1/26/1973	546	Lab	GAMA-USGS	1
26S38E01G02	USGS-354215117500701	5/26/2009	500	Ukn	H-WQ	2
26S38E01H03	STANDARD	2/3/2007	560	Lab	FR: AB	1
26S38E02Q01	USGS-354146117512001	4/26/1946	516	Lab	GAMA-USGS	1
26S38E02Q01	USGS-354146117512001	4/11/1991	590	Ukn	KCWA WQ	3
26S38E11P02		5/4/2007	670	Ukn	H-WQ	2
26S38E12R01	Campbell	2/2/2007	560	Lab	FR: AB	1
26S38E17E01		1/12/1955	585	Lab	Moyle	1
26S38E27G01	USGS-353843117522401	9/17/1985	313	Ukn	GAMA	1
26S38E35B01		6/15/1982	190	Calc	B	1
26S38E35L	Marquardt Well.	2/7/2007	180	Lab	FR: AB	1
26S39E01A02		8/22/2008	26000	Ukn	KCWA WQ	3
26S39E02C01	USGS-354233117445801	4/26/1946	360	Lab	GAMA-USGS	1
26S39E02N01	USGS-354148117451701	4/27/1946	774	Lab	GAMA-USGS	1
26S39E03D01	USGS-354228117463001	4/27/1946	609	Lab	GAMA-USGS	1
26S39E05F01	NAWS Well 23	7/31/1978	560	Calc	B	1
26S39E05F01	NAWS Well 23	3/29/1980	590	Calc	B	1
26S39E05F01	NAWS Well 23	7/8/1988	594	Calc	B&S	1
26S39E05F01	NAWS Well 23	10/25/1973	586	Ukn	GAMA	1
26S39E05F01	NAWS Well 23	5/1/1975	522	Ukn	GAMA	1
26S39E05F01	NAWS Well 23	5/12/1976	555	Ukn	GAMA	1
26S39E05F01	NAWS Well 23	5/6/1987	100	Lab	GAMA	1
26S39E05F01	NAWS Well 23	3/27/1990	570	Lab	GAMA	1
26S39E05F01	NAWS Well 23	7/2/1990	600	Lab	GAMA	1
26S39E05F01	NAWS Well 23	5/18/1993	565	Lab	GAMA	1
26S39E05F01	NAWS Well 23	4/17/1995	585	Lab	GAMA	1
26S39E05F01	NAWS Well 23	9/15/1964	564	Lab	GAMA-USGS	1
26S39E05F01	NAWS Well 23	6/21/1965	490	Calc	GAMA-USGS	1
26S39E05F01	NAWS Well 23	5/16/1966	604	Lab	GAMA-USGS	1
26S39E05F01	NAWS Well 23	9/7/1966	628	Lab	GAMA-USGS	1
26S39E05F01	NAWS Well 23	10/23/1967	576	Lab	GAMA-USGS	1
26S39E05F01	NAWS Well 23	6/5/1968	560	Lab	GAMA-USGS	1
26S39E05F01	NAWS Well 23	11/4/1968	556	Lab	GAMA-USGS	1
26S39E05F01	NAWS Well 23	10/20/1969	624	Lab	GAMA-USGS	1
26S39E05F01	NAWS Well 23	6/1/1970	752	Lab	GAMA-USGS	1
26S39E05F01	NAWS Well 23	10/20/1970	574	Calc	GAMA-USGS	1
26S39E05F01	NAWS Well 23	6/23/1971	633	Lab	GAMA-USGS	1
26S39E05F01	NAWS Well 23	10/27/1971	609	Lab	GAMA-USGS	1

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Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
26S39E05F01	NAWS Well 23	8/3/1953	629	Calc	Moyle	1
26S39E05F01	NAWS Well 23	6/6/1972	602	Calc	W	1
26S39E06F01		8/19/2008	690	Ukn	H-WQ	2
26S39E06G01		5/24/2005	550	Ukn	H-WQ	2
26S39E07B	Sweet Water CO-OP Well 01	3/20/1989	390	Lab	GAMA	1
26S39E07B	Sweet Water CO-OP Well 01	7/20/1999	480	Lab	GAMA	1
26S39E07B	Sweet Water CO-OP Well 01	5/14/2003	440	Lab	GAMA	1
26S39E07B	Sweet Water CO-OP Well 01	6/9/2006	450	Lab	GAMA	1
26S39E07B	Sweet Water CO-OP Well 01	6/11/2009	460	Lab	GAMA	1
26S39E07B	Sweet Water CO-OP Well 01	7/11/2012	390	Lab	GAMA	1
26S39E07B	Sweet Water CO-OP Well 01	7/20/2015	440	Lab	GAMA	1
26S39E07B	Sweet Water CO-OP Well 01	7/10/2018	430	Lab	GAMA	1
26S39E07K05		2/19/2008	380	Ukn	H-WQ	2
26S39E07L		4/7/1998	536	Ukn	H-WQ	2
26S39E07M02		7/27/2010	470	Ukn	H-WQ	2
26S39E07M1	West Valley Mutual Well 01	3/20/1989	475	Lab	GAMA	1
26S39E07M1	West Valley Mutual Well 01	5/28/1996	470	Lab	GAMA	1
26S39E07M1	West Valley Mutual Well 01	6/8/1999	483	Lab	GAMA	1
26S39E07M1	West Valley Mutual Well 01	6/24/2002	490	Lab	GAMA	1
26S39E07M1	West Valley Mutual Well 01	8/10/2006	500	Lab	GAMA	1
26S39E07M1	West Valley Mutual Well 01	4/20/2009	570	Lab	GAMA	1
26S39E07M1	West Valley Mutual Well 01	8/21/2012	480	Lab	GAMA	1
26S39E07M1	West Valley Mutual Well 01	9/2/2015	480	Lab	GAMA	1
26S39E07M1	West Valley Mutual Well 01	11/19/2018	490	Lab	GAMA	2
26S39E07M2	West Valley Mutual Well 02	12/19/2011	430	Lab	GAMA	1
26S39E07M2	West Valley Mutual Well 02	5/13/2014	420	Lab	GAMA	1
26S39E07M2	West Valley Mutual Well 02	8/7/2017	480	Lab	GAMA	1
26S39E07N01	USGS-354055117494401	4/26/1946	358	Lab	GAMA-USGS	1
26S39E07N01	USGS-354055117494401	1/18/1971	335	Lab	GAMA-USGS	1
26S39E07N01	USGS-354055117494401	8/26/1949	302	Calc	Moyle	1
26S39E07N01	USGS-354055117494401	3/27/1951	332	Calc	Moyle	1
26S39E07P02	Campbell	4/3/2003	347	Ukn	L/H-WQ	2

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26S39E07P03		5/7/2002	490	Ukn	KCWA WQ	3
26S39E08E01		5/31/1987	724	Calc	B&S	1
26S39E08E01		6/27/2006	300	Ukn	H-WQ	2
26S39E08K01	USGS-354117117475501	4/27/1946	386	Lab	GAMA-USGS	1
26S39E09H01		1/11/2007	340	Lab	FR: AB	1
26S39E09M01		1/1/2003	190	Ukn	AB	2
26S39E09M01		1/11/2007	180	Lab	FR: AB	1
26S39E10E01	98020-2	3/9/1999	525	Ukn	AB	2
26S39E10N01	USGS-354054117463001	1/24/1946	316	Lab	GAMA-USGS	1
26S39E11E01	USGS-354118117451501	11/17/1998	490	Ukn	AB	2
26S39E11E01	USGS-354118117451501	7/31/1978	400	Calc	B	1
26S39E11E01	USGS-354118117451501	5/4/1979	430	Calc	B	1
26S39E11E01	USGS-354118117451501	3/29/1980	430	Calc	B	1
26S39E11E01	USGS-354118117451501	10/25/1973	406	Ukn	GAMA	1
26S39E11E01	USGS-354118117451501	5/1/1975	414	Ukn	GAMA	1
26S39E11E01	USGS-354118117451501	5/12/1976	509	Ukn	GAMA	1
26S39E11E01	USGS-354118117451501	4/30/1946	288	Lab	GAMA-USGS	1
26S39E11E01	USGS-354118117451501	9/15/1964	263	Lab	GAMA-USGS	1
26S39E11E01	USGS-354118117451501	6/21/1965	316	Lab	GAMA-USGS	1
26S39E11E01	USGS-354118117451501	5/16/1966	312	Lab	GAMA-USGS	1
26S39E11E01	USGS-354118117451501	9/7/1966	328	Lab	GAMA-USGS	1
26S39E11E01	USGS-354118117451501	10/23/1967	356	Lab	GAMA-USGS	1
26S39E11E01	USGS-354118117451501	6/5/1968	312	Lab	GAMA-USGS	1
26S39E11E01	USGS-354118117451501	11/4/1968	452	Lab	GAMA-USGS	1
26S39E11E01	USGS-354118117451501	10/20/1969	368	Lab	GAMA-USGS	1
26S39E11E01	USGS-354118117451501	6/1/1970	360	Lab	GAMA-USGS	1
26S39E11E01	USGS-354118117451501	6/23/1971	391	Lab	GAMA-USGS	1
26S39E11E01	USGS-354118117451501	10/27/1971	423	Lab	GAMA-USGS	1
26S39E11E01	USGS-354118117451501	7/29/1953	248	Calc	Moyle	1
26S39E11E01	USGS-354118117451501	6/6/1972	366	Calc	W	1
26S39E11E02	96020-1	8/15/1996	490	Lab	H96	1
26S39E11Q01	USGS-354052117445201	4/27/1946	236	Lab	GAMA-USGS	1
26S39E12E01	USGS-354118117431301	1/22/1946	899	Ukn	GAMA	1
26S39E12E01	USGS-354118117431301	4/28/1946	1010	Ukn	GAMA	1
26S39E12G01	USGS-354120117434701	4/27/1946	270	Lab	GAMA-USGS	1
26S39E12N01	USGS-354057117441401	4/27/1946	274	Lab	GAMA-USGS	1
26S39E13R03	USNS-01	5/30/1987	223	Calc	B&M	1
26S39E13R03	USNS-01	4/10/1990	217	Ukn	GAMA	1
26S39E13R03	USNS-01	3/13/1991	225	Ukn	GAMA	1
26S39E13R03	USNS-01	4/16/1992	234	Ukn	GAMA	1
26S39E13R03	USNS-01	4/5/1993	228	Ukn	GAMA	1
26S39E13R03	USNS-01	3/21/1993	250	Lab	H	1
26S39E13R03	USNS-01	8/22/2008	230	Ukn	KCWA WQ	3
26S39E13R04	USGS-353959117431903	1/18/1989	826	Calc	B&M	1
26S39E13R04	USGS-353959117431903	3/21/1989	368	Ukn	GAMA	1
26S39E13R04	USGS-353959117431903	3/13/1991	272	Ukn	GAMA	1

Table 2: IWV TDS Data

Sample Dates in red indicate only sample month/year is known

min 1/26/1920 100
max 3/5/2019 232000
count 2,044

Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
26S39E13R04	USGS-353959117431903	4/16/1992	296	Ukn	GAMA	1
26S39E13R04	USGS-353959117431903	4/5/1993	237	Ukn	GAMA	1
26S39E14E01	USGS-354032117452401	4/27/1946	209	Lab	GAMA-USGS	1
26S39E14E01	USGS-354032117452401	1/22/1946	209	Calc	Moyle	1
26S39E14P01		1/11/2007	250	Lab	FR: AB	1
26S39E17F02	NACC-17-1; Kerr McGee 17-1; 17G02	5/31/1987	173	Calc	B&S	1
26S39E17F02	NACC-17-1; Kerr McGee 17-1; 17G02	3/21/1993	200	Ukn	H-WQ	2
26S39E17F02	NACC-17-1; Kerr McGee 17-1; 17G02	5/7/1983	143	Lab	Other	1
26S39E17L01		3/21/1993	200	Lab	H	1
26S39E18A01		6/16/2005	340	Ukn	H-WQ	2
26S39E18C03		2/8/2011	240	Ukn	H-WQ	2
26S39E18F01		3/11/1993	770	Lab	H	1
26S39E18K01	USGS-354017117490201	5/13/1970	255	Lab	GAMA-USGS	1
26S39E18K02		7/1/1988	312	Calc	B&S	1
26S39E18R01		6/4/2002	390	Ukn	H-WQ	2
26S39E19K01	NAWS Well 27	7/31/1978	410	Calc	B	1
26S39E19K01	NAWS Well 27	5/4/1979	410	Calc	B	1
26S39E19K01	NAWS Well 27	3/29/1980	410	Calc	B	1
26S39E19K01	NAWS Well 27	5/1/1975	423	Ukn	GAMA	1
26S39E19K01	NAWS Well 27	5/12/1976	450	Ukn	GAMA	1
26S39E19K01	NAWS Well 27	4/1/1987	393	Lab	GAMA	1
26S39E19K01	NAWS Well 27	3/27/1990	450	Lab	GAMA	1
26S39E19K01	NAWS Well 27	7/2/1990	465	Lab	GAMA	1
26S39E19K01	NAWS Well 27	5/18/1993	480	Lab	GAMA	1
26S39E19K01	NAWS Well 27	6/19/2003	332	Lab	GAMA	1
26S39E19K01	NAWS Well 27	12/27/2006	350	Lab	GAMA	1
26S39E19K01	NAWS Well 27	5/19/2009	330	Lab	GAMA	1
26S39E19K01	NAWS Well 27	12/21/2011	340	Lab	GAMA	1
26S39E19K01	NAWS Well 27	12/9/2014	380	Lab	GAMA	1
26S39E19K01	NAWS Well 27	11/15/2017	390	Lab	GAMA	1
26S39E19K01	NAWS Well 27	10/14/1963	1250	Lab	GAMA-USGS	1
26S39E19K01	NAWS Well 27	9/15/1964	707	Lab	GAMA-USGS	1
26S39E19K01	NAWS Well 27	1/10/1965	1170	Lab	GAMA-USGS	1
26S39E19K01	NAWS Well 27	1/11/1965	1400	Lab	GAMA-USGS	1
26S39E19K01	NAWS Well 27	1/12/1965	1090	Lab	GAMA-USGS	1
26S39E19K01	NAWS Well 27	8/12/1965	798	Lab	GAMA-USGS	1
26S39E19K01	NAWS Well 27	5/16/1966	716	Lab	GAMA-USGS	1
26S39E19K01	NAWS Well 27	9/7/1966	792	Lab	GAMA-USGS	1
26S39E19K01	NAWS Well 27	6/21/1967	456	Lab	GAMA-USGS	1
26S39E19K01	NAWS Well 27	10/23/1967	712	Lab	GAMA-USGS	1
26S39E19K01	NAWS Well 27	6/5/1968	632	Lab	GAMA-USGS	1
26S39E19K01	NAWS Well 27	11/4/1968	840	Lab	GAMA-USGS	1
26S39E19K01	NAWS Well 27	10/20/1969	572	Lab	GAMA-USGS	1
26S39E19K01	NAWS Well 27	6/1/1970	736	Lab	GAMA-USGS	1

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Sample Dates in red indicate only sample month/year is known

min	1/26/1920	100
max	3/5/2019	232000
count	2,044	

Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
26S39E19K01	NAWS Well 27	10/20/1970	503	Calc	GAMA-USGS	1
26S39E19K01	NAWS Well 27	6/23/1971	624	Lab	GAMA-USGS	1
26S39E19K01	NAWS Well 27	10/27/1971	589	Lab	GAMA-USGS	1
26S39E19K01	NAWS Well 27	10/10/1960	697	Lab	Moyle	1
26S39E19K01	NAWS Well 27	5/1/1964	770	Lab	USGS	1
26S39E19K01	NAWS Well 27	6/6/1972	503	Calc	W	1
26S39E19P01	USGS-353910117491101	7/31/1978	320	Calc	B	1
26S39E19P01	USGS-353910117491101	5/4/1979	350	Calc	B	1
26S39E19P01	USGS-353910117491101	3/29/1980	410	Calc	B	1
26S39E19P01	USGS-353910117491101	10/25/1973	349	Ukn	GAMA	1
26S39E19P01	USGS-353910117491101	5/12/1976	313	Ukn	GAMA	1
26S39E19P01	USGS-353910117491101	9/18/1985	331	Ukn	GAMA	1
26S39E19P01	USGS-353910117491101	9/27/1986	318	Ukn	GAMA	1
26S39E19P01	USGS-353910117491101	12/12/1986	329	Ukn	GAMA	1
26S39E19P01	USGS-353910117491101	8/1/1961	355	Lab	GAMA-USGS	1
26S39E19P01	USGS-353910117491101	6/7/1962	415	Lab	GAMA-USGS	1
26S39E19P01	USGS-353910117491101	9/15/1964	291	Lab	GAMA-USGS	1
26S39E19P01	USGS-353910117491101	6/21/1965	368	Lab	GAMA-USGS	1
26S39E19P01	USGS-353910117491101	5/16/1966	332	Lab	GAMA-USGS	1
26S39E19P01	USGS-353910117491101	9/7/1966	336	Lab	GAMA-USGS	1
26S39E19P01	USGS-353910117491101	10/23/1967	320	Lab	GAMA-USGS	1
26S39E19P01	USGS-353910117491101	6/5/1968	336	Lab	GAMA-USGS	1
26S39E19P01	USGS-353910117491101	11/4/1968	304	Lab	GAMA-USGS	1
26S39E19P01	USGS-353910117491101	10/20/1969	368	Lab	GAMA-USGS	1
26S39E19P01	USGS-353910117491101	6/1/1970	328	Lab	GAMA-USGS	1
26S39E19P01	USGS-353910117491101	10/20/1970	325	Lab	GAMA-USGS	1
26S39E19P01	USGS-353910117491101	6/23/1971	358	Lab	GAMA-USGS	1
26S39E19P01	USGS-353910117491101	10/27/1971	342	Lab	GAMA-USGS	1
26S39E19P01	USGS-353910117491101	6/1/1953	320	Calc	Moyle	1
26S39E19P01	USGS-353910117491101	4/1/1963	441	Lab	USGS	1
26S39E19P01	USGS-353910117491101	5/1/1964	370	Lab	USGS	1
26S39E19P01	USGS-353910117491101	6/6/1972	300	Calc	W	1
26S39E19P02	NAWS Well 15	11/19/1985	335	Lab	GAMA	1
26S39E19P02	NAWS Well 15	9/27/1986	323	Lab	GAMA	1
26S39E19P02	NAWS Well 15	3/27/1990	355	Lab	GAMA	1
26S39E19P02	NAWS Well 15	7/2/1990	345	Lab	GAMA	1
26S39E19P02	NAWS Well 15	5/18/1993	255	Lab	GAMA	1
26S39E19P02	NAWS Well 15	6/19/2003	346	Lab	GAMA	1
26S39E19P02	NAWS Well 15	12/27/2006	380	Lab	GAMA	1
26S39E19P02	NAWS Well 15	5/19/2009	370	Lab	GAMA	1
26S39E19P02	NAWS Well 15	12/21/2011	370	Lab	GAMA	1
26S39E19P02	NAWS Well 15	12/9/2014	400	Lab	GAMA	1
26S39E19P02	NAWS Well 15	11/15/2017	410	Lab	GAMA	1
26S39E19Q01	USGS-354408117485801	7/31/1978	380	Calc	B	1
26S39E19Q01	USGS-354408117485801	5/4/1979	520	Calc	B	1
26S39E19Q01	USGS-354408117485801	3/29/1980	380	Calc	B	1

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min	1/26/1920	100
max	3/5/2019	232000
count	2,044	

Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
26S39E19Q01	USGS-354408117485801	5/1/1975	544	Ukn	GAMA	1
26S39E19Q01	USGS-354408117485801	5/12/1976	599	Ukn	GAMA	1
26S39E19Q01	USGS-354408117485801	8/1/1961	395	Lab	GAMA-USGS	1
26S39E19Q01	USGS-354408117485801	6/7/1962	430	Lab	GAMA-USGS	1
26S39E19Q01	USGS-354408117485801	10/14/1963	518	Lab	GAMA-USGS	1
26S39E19Q01	USGS-354408117485801	5/5/1964	410	Lab	GAMA-USGS	1
26S39E19Q01	USGS-354408117485801	9/15/1964	382	Lab	GAMA-USGS	1
26S39E19Q01	USGS-354408117485801	6/21/1965	496	Lab	GAMA-USGS	1
26S39E19Q01	USGS-354408117485801	5/16/1966	348	Lab	GAMA-USGS	1
26S39E19Q01	USGS-354408117485801	9/7/1966	352	Lab	GAMA-USGS	1
26S39E19Q01	USGS-354408117485801	6/6/1972	470	Lab	GAMA-USGS	1
26S39E19Q01	USGS-354408117485801	4/5/1955	365	Calc	Moyle	1
26S39E19Q01	USGS-354408117485801	10/17/1956	431	Calc	Moyle	1
26S39E19Q01	USGS-354408117485801	9/19/1957	365	Calc	Moyle	1
26S39E19Q01	USGS-354408117485801	9/18/1958	343	Calc	Moyle	1
26S39E19Q01	USGS-354408117485801	11/20/1959	203	Calc	Moyle	1
26S39E19Q01	USGS-354408117485801	8/11/1960	346	Calc	Moyle	1
26S39E19Q01	USGS-354408117485801	4/1/1963	515	Lab	USGS	1
26S39E20C01	CLODT OLD WELL	4/7/1998	378	Ukn	H-WQ	2
26S39E20F01	USGS-353942117481501	9/15/1964	263	Lab	GAMA-USGS	1
26S39E20F01	USGS-353942117481501	5/22/1969	270	Lab	GAMA-USGS	1
26S39E20K03		11/19/2007	290	Ukn	H-WQ	2
26S39E20Q01	USGS-353908117480501	4/26/1946	246	Lab	GAMA-USGS	1
26S39E20R01	NAWS Well 30	3/27/1990	225	Lab	GAMA	1
26S39E20R01	NAWS Well 30	5/18/1993	225	Lab	GAMA	1
26S39E20R01	NAWS Well 30	4/17/1995	195	Lab	GAMA	1
26S39E20R01	NAWS Well 30	6/19/2003	200	Lab	GAMA	1
26S39E20R01	NAWS Well 30	12/27/2006	270	Lab	GAMA	1
26S39E20R01	NAWS Well 30	5/19/2009	220	Lab	GAMA	1
26S39E20R01	NAWS Well 30	12/21/2011	220	Lab	GAMA	1
26S39E20R01	NAWS Well 30	12/9/2014	300	Lab	GAMA	1
26S39E20R01	NAWS Well 30	11/15/2017	230	Lab	GAMA	1
26S39E20R02		5/29/1987	199	Lab	B&S	1
26S39E21Q01	NAWS Well 31	5/18/1993	215	Lab	GAMA	1
26S39E21Q01	NAWS Well 31	4/17/1995	225	Lab	GAMA	1
26S39E21Q01	NAWS Well 31	6/19/2003	192	Lab	GAMA	1
26S39E21Q01	NAWS Well 31	12/27/2006	220	Lab	GAMA	1
26S39E21Q01	NAWS Well 31	3/12/2010	240	Lab	GAMA	1
26S39E21Q01	NAWS Well 31	12/21/2011	210	Lab	GAMA	1
26S39E21Q01	NAWS Well 31	12/9/2014	230	Lab	GAMA	1
26S39E21Q01	NAWS Well 31	11/15/2017	220	Lab	GAMA	1
26S39E23E01	USGS-353926117452701	4/27/1946	240	Lab	GAMA-USGS	1
26S39E23H02	NAWS Well 28	3/27/1990	250	Lab	GAMA	1
26S39E23H02	NAWS Well 28	7/2/1990	245	Lab	GAMA	1
26S39E23H02	NAWS Well 28	5/18/1993	265	Lab	GAMA	1
26S39E23H02	NAWS Well 28	6/19/2003	161	Lab	GAMA	1

Table 2: IWV TDS Data

Sample Dates in red indicate min 1/26/1920 100
only sample month/year is known max 3/5/2019 232000
count 2,044

Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
26S39E23H02	NAWS Well 28	12/16/2009	170	Lab	GAMA	1
26S39E23H02a	NAWS Well 28A	4/17/2007	190	Lab	GAMA	1
26S39E23H02a	NAWS Well 28A	12/20/2011	180	Lab	GAMA	1
26S39E23H02a	NAWS Well 28A	12/9/2014	210	Lab	GAMA	1
26S39E23H02a	NAWS Well 28A	11/15/2017	210	Lab	GAMA	1
26S39E23J01	USGS-353937117443501	7/31/1978	230	Calc	B	1
26S39E23J01	USGS-353937117443501	5/4/1979	250	Calc	B	1
26S39E23J01	USGS-353937117443501	10/25/1973	233	Ukn	GAMA	1
26S39E23J01	USGS-353937117443501	5/1/1975	245	Ukn	GAMA	1
26S39E23J01	USGS-353937117443501	5/12/1976	248	Ukn	GAMA	1
26S39E23J01	USGS-353937117443501	4/13/1986	250	Ukn	GAMA	1
26S39E23J01	USGS-353937117443501	10/14/1963	251	Lab	GAMA-USGS	1
26S39E23J01	USGS-353937117443501	9/15/1964	263	Lab	GAMA-USGS	1
26S39E23J01	USGS-353937117443501	6/21/1965	268	Lab	GAMA-USGS	1
26S39E23J01	USGS-353937117443501	5/16/1966	236	Lab	GAMA-USGS	1
26S39E23J01	USGS-353937117443501	9/7/1966	276	Lab	GAMA-USGS	1
26S39E23J01	USGS-353937117443501	10/23/1967	236	Lab	GAMA-USGS	1
26S39E23J01	USGS-353937117443501	6/5/1968	228	Lab	GAMA-USGS	1
26S39E23J01	USGS-353937117443501	11/4/1968	224	Lab	GAMA-USGS	1
26S39E23J01	USGS-353937117443501	10/20/1969	280	Lab	GAMA-USGS	1
26S39E23J01	USGS-353937117443501	6/1/1970	216	Lab	GAMA-USGS	1
26S39E23J01	USGS-353937117443501	10/20/1970	270	Lab	GAMA-USGS	1
26S39E23J01	USGS-353937117443501	10/27/1971	256	Lab	GAMA-USGS	1
26S39E23J01	USGS-353937117443501	10/17/1960	247	Lab	Moyle	1
26S39E23J01	USGS-353937117443501	4/1/1963	308	Lab	USGS	1
26S39E23J01	USGS-353937117443501	5/1/1964	295	Lab	USGS	1
26S39E23J01	USGS-353937117443501	6/6/1972	218	Calc	W	1
26S39E24E01	USGS-353935117442001	4/27/1946	257	Lab	GAMA-USGS	1
26S39E24K01		5/4/1979	580	Calc	B	1
26S39E24M	NAWS Well 29	4/21/1987	212	Lab	GAMA	1
26S39E24M	NAWS Well 29	3/27/1990	230	Lab	GAMA	1
26S39E24M	NAWS Well 29	7/2/1990	235	Lab	GAMA	1
26S39E24M	NAWS Well 29	5/18/1993	265	Lab	GAMA	1
26S39E24M	NAWS Well 29	4/17/1995	260	Lab	GAMA	1
26S39E24M01	USGS-353922117442301	7/31/1978	200	Calc	B	1
26S39E24M01	USGS-353922117442301	5/4/1979	220	Calc	B	1
26S39E24M01	USGS-353922117442301	3/29/1980	210	Calc	B	1
26S39E24M01	USGS-353922117442301	9/15/1964	249	Ukn	GAMA	1
26S39E24M01	USGS-353922117442301	10/20/1970	250	Ukn	GAMA	1
26S39E24M01	USGS-353922117442301	10/25/1973	217	Ukn	GAMA	1
26S39E24M01	USGS-353922117442301	5/1/1975	214	Ukn	GAMA	1
26S39E24M01	USGS-353922117442301	5/12/1976	250	Ukn	GAMA	1
26S39E24M01	USGS-353922117442301	9/18/1985	235	Ukn	GAMA	1
26S39E24M01	USGS-353922117442301	10/14/1963	209	Lab	GAMA-USGS	1
26S39E24M01	USGS-353922117442301	5/16/1966	216	Lab	GAMA-USGS	1
26S39E24M01	USGS-353922117442301	9/7/1966	256	Lab	GAMA-USGS	1

Table 2: IWV TDS Data

Sample Dates in red indicate min 1/26/1920 100
only sample month/year is known max 3/5/2019 232000
count 2,044

Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
26S39E24M01	USGS-353922117442301	10/23/1967	196	Lab	GAMA-USGS	1
26S39E24M01	USGS-353922117442301	6/5/1968	184	Lab	GAMA-USGS	1
26S39E24M01	USGS-353922117442301	11/4/1968	204	Lab	GAMA-USGS	1
26S39E24M01	USGS-353922117442301	10/20/1969	236	Lab	GAMA-USGS	1
26S39E24M01	USGS-353922117442301	6/1/1970	176	Lab	GAMA-USGS	1
26S39E24M01	USGS-353922117442301	6/23/1971	246	Lab	GAMA-USGS	1
26S39E24M01	USGS-353922117442301	10/27/1971	223	Lab	GAMA-USGS	1
26S39E24M01	USGS-353922117442301	5/18/1993	265	Ukn	H-WQ	2
26S39E24M01	USGS-353922117442301	10/27/1960	231	Lab	Moyle	1
26S39E24M01	USGS-353922117442301	4/1/1963	203	Lab	USGS	1
26S39E24M01	USGS-353922117442301	5/1/1964	200	Lab	USGS	1
26S39E24M01	USGS-353922117442301	6/6/1972	218	Calc	W	1
26S39E24P01	USGS-353911117435701	5/4/1979	210	Calc	B	1
26S39E24P01	USGS-353911117435701	5/29/1987	215	Calc	B&S	1
26S39E24P01	USGS-353911117435701	10/25/1973	218	Ukn	GAMA	1
26S39E24P01	USGS-353911117435701	8/1/1961	310	Lab	GAMA-USGS	1
26S39E24P01	USGS-353911117435701	6/7/1962	260	Lab	GAMA-USGS	1
26S39E24P01	USGS-353911117435701	10/14/1963	221	Lab	GAMA-USGS	1
26S39E24P01	USGS-353911117435701	9/15/1964	249	Lab	GAMA-USGS	1
26S39E24P01	USGS-353911117435701	6/21/1965	284	Lab	GAMA-USGS	1
26S39E24P01	USGS-353911117435701	5/16/1966	208	Lab	GAMA-USGS	1
26S39E24P01	USGS-353911117435701	9/7/1966	244	Lab	GAMA-USGS	1
26S39E24P01	USGS-353911117435701	10/23/1967	212	Lab	GAMA-USGS	1
26S39E24P01	USGS-353911117435701	6/5/1968	252	Lab	GAMA-USGS	1
26S39E24P01	USGS-353911117435701	11/4/1968	232	Lab	GAMA-USGS	1
26S39E24P01	USGS-353911117435701	6/1/1970	244	Lab	GAMA-USGS	1
26S39E24P01	USGS-353911117435701	6/23/1971	254	Lab	GAMA-USGS	1
26S39E24P01	USGS-353911117435701	10/27/1971	242	Lab	GAMA-USGS	1
26S39E24P01	USGS-353911117435701	3/6/1958	237	Lab	Moyle	1
26S39E24P01	USGS-353911117435701	9/18/1958	201	Calc	Moyle	1
26S39E24P01	USGS-353911117435701	11/20/1959	210	Calc	Moyle	1
26S39E24P01	USGS-353911117435701	8/11/1960	191	Calc	Moyle	1
26S39E24P01	USGS-353911117435701	5/1/1964	240	Lab	USGS	1
26S39E24P01	USGS-353911117435701	6/6/1972	211	Calc	W	1
26S39E24P03	NAWS Well 18	11/19/1985	215	Lab	GAMA	1
26S39E24P03	NAWS Well 18	3/27/1990	215	Lab	GAMA	1
26S39E24P03	NAWS Well 18	7/2/1990	230	Lab	GAMA	1
26S39E24P03	NAWS Well 18	6/19/2003	180	Lab	GAMA	1
26S39E24P03	NAWS Well 18	4/17/2007	230	Lab	GAMA	1
26S39E24P03	NAWS Well 18	5/19/2009	160	Lab	GAMA	1
26S39E24P03	NAWS Well 18	12/21/2011	200	Lab	GAMA	1
26S39E24P03	NAWS Well 18	3/1/2017	190	Lab	GAMA	1
26S39E24P03	NAWS Well 18	11/15/2017	200	Lab	GAMA	1
26S39E24Q01	USGS-353911117434001	10/14/1963	221	Lab	GAMA-USGS	1
26S39E24Q01	USGS-353911117434001	6/6/1952	219	Calc	Moyle	1
26S39E24Q01	USGS-353911117434001	10/14/1955	226	Calc	Moyle	1

Table 2: IWV TDS Data

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	min	1/26/1920	100
	max	3/5/2019	232000
	count	2,044	

Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
26S39E24Q01	USGS-353911117434001	10/17/1956	197	Calc	Moyle	1
26S39E24Q01	USGS-353911117434001	9/19/1957	218	Calc	Moyle	1
26S39E24Q01	USGS-353911117434001	9/18/1958	231	Calc	Moyle	1
26S39E24R01	USGS-353911117432601	9/18/1957	164	Ukn	GAMA	1
26S39E24R01	USGS-353911117432601	4/5/1955	146	Calc	Moyle	1
26S39E24R01	USGS-353911117432601	10/14/1955	158	Calc	Moyle	1
26S39E24R01	USGS-353911117432601	10/17/1956	141	Calc	Moyle	1
26S39E24R01	USGS-353911117432601	9/18/1958	152	Calc	Moyle	1
26S39E25D01	26S39E25D001M	4/30/1958	390	Ukn	GAMA	1
26S39E25D01	26S39E25D001M	5/30/1996	180	Ukn	H-WQ	2
26S39E25E	Searles Valley Minerals Op Well 30	6/4/2002	250	Lab	GAMA	1
26S39E25E	Searles Valley Minerals Op Well 30	9/20/2005	290	Lab	GAMA	1
26S39E25E	Searles Valley Minerals Op Well 30	9/16/2008	240	Lab	GAMA	1
26S39E25E	Searles Valley Minerals Op Well 30	6/16/2009	250	Lab	GAMA	1
26S39E25E	Searles Valley Minerals Op Well 30	6/7/2011	250	Lab	GAMA	1
26S39E25E	Searles Valley Minerals Op Well 30	6/3/2014	270	Lab	GAMA	1
26S39E25E	Searles Valley Minerals Op Well 30	6/6/2017	260	Lab	GAMA	1
26S39E25E01	USGS-353849117441701	5/29/1987	261	Calc	B&S	1
26S39E25E01	USGS-353849117441701	6/12/1987	251	Lab	B&S	1
26S39E25E01	USGS-353849117441701	2/17/1967	281	Lab	GAMA-USGS	1
26S39E25E01	USGS-353849117441701	9/22/1967	290	Lab	GAMA-USGS	1
26S39E25E01	USGS-353849117441701	6/8/1999	237	Ukn	H-WQ	2
26S39E26A01	USBR-04	5/30/1996	180	Lab	H96	1
26S39E26A01	USBR-04	10/31/1990	183	Lab	USBR	1
26S39E26A02-D	TTIWV-MW01-D	2/17/2002	199	Lab	TTEMI	1
26S39E26A02-I	TTIWV-MW01-I	2/17/2002	278	Lab	TTEMI	1
26S39E26B	IWVWD Well 17	1/7/1988	251	Lab	B&S	1
26S39E26B	IWVWD Well 17	3/8/1990	218	Lab	GAMA	1
26S39E26B	IWVWD Well 17	5/10/1990	168	Lab	GAMA	1
26S39E26B	IWVWD Well 17	1/22/1991	180	Lab	GAMA	1
26S39E26B	IWVWD Well 17	2/5/1992	190	Lab	GAMA	1
26S39E26B	IWVWD Well 17	10/8/1992	154	Lab	GAMA	1
26S39E26B	IWVWD Well 17	12/3/1992	154	Lab	GAMA	1
26S39E26B	IWVWD Well 17	1/21/1993	170	Lab	GAMA	1
26S39E26B	IWVWD Well 17	3/1/1993	169	Lab	GAMA	1
26S39E26B	IWVWD Well 17	2/2/1994	558	Lab	GAMA	1
26S39E26B	IWVWD Well 17	8/8/1994	167	Lab	GAMA	1
26S39E26B	IWVWD Well 17	9/1/1994	162	Lab	GAMA	1
26S39E26B	IWVWD Well 17	6/22/1995	173	Lab	GAMA	1
26S39E26B	IWVWD Well 17	1/24/1996	182	Lab	GAMA	1
26S39E26B	IWVWD Well 17	1/13/1997	190	Lab	GAMA	1
26S39E26B	IWVWD Well 17	2/6/1998	192	Lab	GAMA	1

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Sample Dates in red indicate only sample month/year is known

	min	1/26/1920	100
	max	3/5/2019	232000
	count	2,044	

Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
26S39E26B	IWVWD Well 17	9/9/1998	168	Lab	GAMA	1
26S39E26B	IWVWD Well 17	9/15/1999	164	Lab	GAMA	1
26S39E26B	IWVWD Well 17	8/7/2000	175	Lab	GAMA	1
26S39E26B	IWVWD Well 17	8/21/2001	190	Lab	GAMA	1
26S39E26B	IWVWD Well 17	8/1/2002	180	Lab	GAMA	1
26S39E26B	IWVWD Well 17	9/10/2003	210	Lab	GAMA	1
26S39E26B	IWVWD Well 17	8/12/2004	190	Lab	GAMA	1
26S39E26B	IWVWD Well 17	8/7/2007	200	Lab	GAMA	1
26S39E26B	IWVWD Well 17	4/1/2008	220	Lab	GAMA	1
26S39E26B	IWVWD Well 17	4/5/2011	190	Lab	GAMA	1
26S39E26B	IWVWD Well 17	5/27/2014	210	Lab	GAMA	1
26S39E26B	IWVWD Well 17	5/23/2017	200	Lab	GAMA	1
26S39E26B	IWVWD Well 17	11/13/1967	203	Lab	GAMA-USGS	1
26S39E26B1	Hometown Water Assoc. Well 01	1/9/2002	230	Lab	GAMA	1
26S39E26B1	Hometown Water Assoc. Well 01	8/17/2005	240	Lab	GAMA	1
26S39E26B1	Hometown Water Assoc. Well 01	10/29/2008	300	Lab	GAMA	1
26S39E26B1	Hometown Water Assoc. Well 01	4/20/2009	290	Lab	GAMA	1
26S39E26B1	Hometown Water Assoc. Well 01	8/23/2012	310	Lab	GAMA	1
26S39E26B1	Hometown Water Assoc. Well 01	9/16/2015	370	Lab	GAMA	1
26S39E26B1	Hometown Water Assoc. Well 01	9/6/2018	330	Lab	GAMA	1
26S39E26B2	Buttermilk Acr Water System Well 1	3/29/1994	280	Lab	GAMA	1
26S39E26B2	Buttermilk Acr Water System Well 1	12/17/2003	270	Lab	GAMA	1
26S39E26C01		8/5/2010	310	Ukn	H-WQ	2
26S39E26D01	26S39E26D001M	11/1/1982	256	Ukn	GAMA	1
26S39E26D01	26S39E26D001M	1/26/1920	285	Lab	GAMA-USGS	1
26S39E26D02	USGS-353905117444901	3/22/2005	550	Ukn	GAMA	1
26S39E26D02	USGS-353905117444901	2/2/1994	558	Ukn	H-WQ	2
26S39E26L04		10/27/2009	280	Ukn	H-WQ	2
26S39E27C01	26S39E27C001M	1/7/1988	269	Lab	B&S	1
26S39E27C01	26S39E27C001M	11/1/1982	250	Ukn	GAMA	1
26S39E27C01	26S39E27C001M	7/25/1985	255	Ukn	KCWA WQ	3
26S39E27C01	26S39E27C001M	9/1/1988	242	Ukn	KCWA WQ	3
26S39E27C01	26S39E27C001M	12/20/1989	248	Ukn	KCWA WQ	3
26S39E27C01	26S39E27C001M	3/5/1992	232	Ukn	KCWA WQ	3
26S39E27C01	26S39E27C001M	2/2/1994	235	Ukn	KCWA WQ	3
26S39E27C01	26S39E27C001M	2/15/1995	257	Ukn	KCWA WQ	3
26S39E27C01	26S39E27C001M	1/24/1996	238	Ukn	KCWA WQ	3
26S39E27C01	26S39E27C001M	1/13/1997	248	Ukn	KCWA WQ	3
26S39E27C01	26S39E27C001M	1/26/1998	244	Ukn	KCWA WQ	3
26S39E27C01	26S39E27C001M	9/9/1998	229	Ukn	KCWA WQ	3

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min	1/26/1920	100
max	3/5/2019	232000
count	2,044	

Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
26S39E27C01	26S39E27C001M	9/15/1999	240	Ukn	KCWA WQ	3
26S39E27D	IWVWD Well 30	1/1/2008	560	Ukn	AB	2
26S39E27D	IWVWD Well 30	4/4/2007	220	Lab	FR: AB	1
26S39E27D	IWVWD Well 30	1/21/1993	179	Lab	GAMA	1
26S39E27D	IWVWD Well 30	2/2/1994	186	Lab	GAMA	1
26S39E27D	IWVWD Well 30	2/15/1995	228	Lab	GAMA	1
26S39E27D	IWVWD Well 30	1/24/1996	194	Lab	GAMA	1
26S39E27D	IWVWD Well 30	1/13/1997	206	Lab	GAMA	1
26S39E27D	IWVWD Well 30	1/26/1998	192	Lab	GAMA	1
26S39E27D	IWVWD Well 30	9/9/1998	183	Lab	GAMA	1
26S39E27D	IWVWD Well 30	9/15/1999	181	Lab	GAMA	1
26S39E27D	IWVWD Well 30	8/7/2000	189	Lab	GAMA	1
26S39E27D	IWVWD Well 30	8/21/2001	180	Lab	GAMA	1
26S39E27D	IWVWD Well 30	8/1/2002	190	Lab	GAMA	1
26S39E27D	IWVWD Well 30	9/10/2003	240	Lab	GAMA	1
26S39E27D	IWVWD Well 30	8/12/2004	220	Lab	GAMA	1
26S39E27D	IWVWD Well 30	3/29/2005	210	Lab	GAMA	1
26S39E27D	IWVWD Well 30	4/1/2008	220	Lab	GAMA	1
26S39E27D	IWVWD Well 30	4/5/2011	220	Lab	GAMA	1
26S39E27D	IWVWD Well 30	5/27/2014	240	Lab	GAMA	1
26S39E27D	IWVWD Well 30	5/23/2017	240	Lab	GAMA	1
26S39E27D01	MW-32-S	4/28/1993	270	Ukn	AB	2
26S39E27D01	MW-32-S	4/4/2007	220	Ukn	AB	2
26S39E27D01	MW-32-S	1/21/1993	179	Ukn	KCWA WQ	3
26S39E27D01	MW-32-S	2/2/1994	186	Ukn	KCWA WQ	3
26S39E27D01	MW-32-S	2/15/1995	228	Ukn	KCWA WQ	3
26S39E27D01	MW-32-S	1/24/1996	194	Ukn	KCWA WQ	3
26S39E27D01	MW-32-S	5/30/1996	140	Ukn	KCWA WQ	3
26S39E27D01	MW-32-S	1/26/1998	192	Ukn	KCWA WQ	3
26S39E27D01	MW-32-S	9/9/1998	183	Ukn	KCWA WQ	3
26S39E27D01	MW-32-S	9/15/1999	181	Ukn	KCWA WQ	3
26S39E27D01	MW-32-S	10/17/1991	252	Lab	USBR	1
26S39E27D02	MW-32-S/M	5/30/1996	140	Lab	H96	1
26S39E27D02	MW-32-S/M	10/18/1991	169	Lab	USBR	1
26S39E27D03	MW-32-D/M	6/4/1996	160	Lab	H96	1
26S39E27D03	MW-32-D/M	10/21/1991	176	Lab	USBR	1
26S39E27D04	MW-32-D	10/21/1991	526	Lab	USBR	1
26S39E27J	Dune 3 Mutual Well 02	3/13/1997	280	Lab	GAMA	1
26S39E27J	Dune 3 Mutual Well 02	6/12/2002	280	Lab	GAMA	1
26S39E27J	Dune 3 Mutual Well 02	6/9/2006	300	Lab	GAMA	1
26S39E27J	Dune 3 Mutual Well 02	3/4/2009	280	Lab	GAMA	1
26S39E27J	Dune 3 Mutual Well 02	2/9/2012	280	Lab	GAMA	1
26S39E27J	Dune 3 Mutual Well 02	2/2/2015	310	Lab	GAMA	1
26S39E27J	Dune 3 Mutual Well 02	1/9/2018	280	Lab	GAMA	1
26S39E27L1	China Lakes Mutual Well 01	10/12/1990	245	Lab	GAMA	1

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count	2,044	

Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
26S39E27L1	China Lakes Mutual Well 01	3/25/1991	296	Lab	GAMA	1
26S39E27L1	China Lakes Mutual Well 01	8/8/1995	305	Lab	GAMA	1
26S39E27L1	China Lakes Mutual Well 01	6/15/1999	300	Lab	GAMA	1
26S39E27L1	China Lakes Mutual Well 01	5/4/2005	290	Lab	GAMA	1
26S39E27L1	China Lakes Mutual Well 01	10/29/2008	310	Lab	GAMA	1
26S39E27L1	China Lakes Mutual Well 01	4/20/2009	320	Lab	GAMA	1
26S39E27L1	China Lakes Mutual Well 01	9/17/2012	170	Lab	GAMA	1
26S39E27L1	China Lakes Mutual Well 01	8/5/2015	330	Lab	GAMA	1
26S39E27L1	China Lakes Mutual Well 01	7/9/2018	300	Lab	GAMA	1
26S39E27L2	China Lakes Mutual Well 02	3/16/2011	290	Lab	GAMA	1
26S39E27L2	China Lakes Mutual Well 02	6/9/2014	310	Lab	GAMA	1
26S39E27L2	China Lakes Mutual Well 02	7/10/2017	300	Lab	GAMA	1
26S39E27Q	Dune 3 Mutual Well 01	6/12/2002	270	Lab	GAMA	1
26S39E27Q	Dune 3 Mutual Well 01	6/9/2006	260	Lab	GAMA	1
26S39E27Q	Dune 3 Mutual Well 01	3/4/2009	280	Lab	GAMA	1
26S39E27Q	Dune 3 Mutual Well 01	2/9/2012	320	Lab	GAMA	1
26S39E27Q	Dune 3 Mutual Well 01	2/2/2015	300	Lab	GAMA	1
26S39E27Q	Dune 3 Mutual Well 01	1/9/2018	310	Lab	GAMA	1
26S39E28A01		4/28/1993	270	Lab	H	1
26S39E28B02	USGS-353902117465501	10/7/1970	212	Lab	GAMA-USGS	1
26S39E28B1	Sierra Breeze mutual Well 01	11/8/1995	420	Lab	GAMA	1
26S39E28B1	Sierra Breeze mutual Well 01	6/15/1999	453	Lab	GAMA	1
26S39E28B1	Sierra Breeze mutual Well 01	9/6/2005	450	Lab	GAMA	1
26S39E28B1	Sierra Breeze mutual Well 01	10/29/2008	510	Lab	GAMA	1
26S39E28B2	Sierra Breeze mutual Well 02	9/6/2005	310	Lab	GAMA	1
26S39E28B2	Sierra Breeze mutual Well 02	10/29/2008	350	Lab	GAMA	1
26S39E28B2	Sierra Breeze mutual Well 02	9/14/2011	530	Lab	GAMA	1
26S39E28B2	Sierra Breeze mutual Well 02	7/7/2014	520	Lab	GAMA	1
26S39E28B2	Sierra Breeze mutual Well 02	7/18/2017	480	Lab	GAMA	1
26S39E28B3	Sierra Breeze mutual Well 03	8/2/2010	330	Lab	GAMA	1

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		min	1/26/1920	100
		max	3/5/2019	232000
		count	2,044	

Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
26S39E28B3	Sierra Breeze mutual Well 03	10/3/2013	320	Lab	GAMA	1
26S39E28B3	Sierra Breeze mutual Well 03	12/11/2016	330	Lab	GAMA	1
26S39E28C02		5/1/1957	278	Calc	Moyle	1
26S39E28D01		1/4/2005	280	Ukn	H-WQ	2
26S39E28G03		4/8/2008	310	Ukn	H-WQ	2
26S39E28P01		8/21/2001	260	Ukn	H-WQ	2
26S39E28R01	IWVWD Well 31	4/4/2007	260	Lab	FR: AB	1
26S39E28R01	IWVWD Well 31	7/10/1992	197	Lab	GAMA	1
26S39E28R01	IWVWD Well 31	1/21/1993	200	Lab	GAMA	1
26S39E28R01	IWVWD Well 31	2/2/1994	197	Lab	GAMA	1
26S39E28R01	IWVWD Well 31	2/15/1995	215	Lab	GAMA	1
26S39E28R01	IWVWD Well 31	1/24/1996	206	Lab	GAMA	1
26S39E28R01	IWVWD Well 31	1/13/1997	210	Lab	GAMA	1
26S39E28R01	IWVWD Well 31	2/24/1998	216	Lab	GAMA	1
26S39E28R01	IWVWD Well 31	3/17/1998	215	Lab	GAMA	1
26S39E28R01	IWVWD Well 31	9/9/1998	199	Lab	GAMA	1
26S39E28R01	IWVWD Well 31	9/15/1999	198	Lab	GAMA	1
26S39E28R01	IWVWD Well 31	8/7/2000	204	Lab	GAMA	1
26S39E28R01	IWVWD Well 31	8/21/2001	210	Lab	GAMA	1
26S39E28R01	IWVWD Well 31	8/1/2002	200	Lab	GAMA	1
26S39E28R01	IWVWD Well 31	9/10/2003	270	Lab	GAMA	1
26S39E28R01	IWVWD Well 31	8/12/2004	240	Lab	GAMA	1
26S39E28R01	IWVWD Well 31	3/29/2005	240	Lab	GAMA	1
26S39E28R01	IWVWD Well 31	4/1/2008	550	Lab	GAMA	1
26S39E28R01	IWVWD Well 31	4/5/2011	230	Lab	GAMA	1
26S39E28R01	IWVWD Well 31	5/27/2014	250	Lab	GAMA	1
26S39E28R01	IWVWD Well 31	5/23/2017	220	Lab	GAMA	1
26S39E29L1	E. Inyokern Mutual Well 01	12/20/1989	295	Lab	GAMA	1
26S39E29L1	E. Inyokern Mutual Well 01	3/18/2003	290	Lab	GAMA	1
26S39E29L1	E. Inyokern Mutual Well 01	3/1/2006	280	Lab	GAMA	1
26S39E29L1	E. Inyokern Mutual Well 01	4/20/2009	320	Lab	GAMA	1
26S39E29L1	E. Inyokern Mutual Well 01	10/25/2012	200	Lab	GAMA	1
26S39E29L1	E. Inyokern Mutual Well 01	9/2/2015	310	Lab	GAMA	1
26S39E29L1	E. Inyokern Mutual Well 01	7/9/2018	310	Lab	GAMA	1
26S39E29L2	E. Inyokern Mutual Well 02	3/22/1993	300	Lab	GAMA	1
26S39E29L2	E. Inyokern Mutual Well 02	3/17/2003	150	Lab	GAMA	1
26S39E29L2	E. Inyokern Mutual Well 02	3/1/2006	280	Lab	GAMA	1

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		min	1/26/1920	100
		max	3/5/2019	232000
		count	2,044	

Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
26S39E29L2	E. Inyokern Mutual Well 02	4/20/2009	320	Lab	GAMA	1
26S39E29L2	E. Inyokern Mutual Well 02	10/25/2012	290	Lab	GAMA	1
26S39E29L2	E. Inyokern Mutual Well 02	9/2/2015	300	Lab	GAMA	1
26S39E29P01		9/28/2010	270	Ukn	H-WQ	2
26S39E30C01	USGS-353855117491401	5/1/1975	377	Ukn	GAMA	1
26S39E30F01	USGS-353851117491401	5/1/1975	306	Ukn	GAMA	1
26S39E30F01	USGS-353851117491401	5/12/1976	350	Ukn	GAMA	1
26S39E30F01	USGS-353851117491401	8/1/1961	335	Lab	GAMA-USGS	1
26S39E30F01	USGS-353851117491401	6/7/1962	420	Lab	GAMA-USGS	1
26S39E30F01	USGS-353851117491401	9/15/1964	329	Lab	GAMA-USGS	1
26S39E30F01	USGS-353851117491401	6/21/1965	318	Calc	GAMA-USGS	1
26S39E30F01	USGS-353851117491401	5/16/1966	360	Lab	GAMA-USGS	1
26S39E30F01	USGS-353851117491401	9/7/1966	336	Lab	GAMA-USGS	1
26S39E30F03	USGS-353851117491403	10/25/1973	384	Ukn	GAMA	1
26S39E30F03	USGS-353851117491403	5/25/1967	400	Lab	GAMA-USGS	1
26S39E30F03	USGS-353851117491403	10/16/1967	368	Lab	GAMA-USGS	1
26S39E30F03	USGS-353851117491403	11/4/1968	296	Lab	GAMA-USGS	1
26S39E30F03	USGS-353851117491403	10/20/1969	336	Lab	GAMA-USGS	1
26S39E30F03	USGS-353851117491403	6/1/1970	332	Lab	GAMA-USGS	1
26S39E30F03	USGS-353851117491403	10/20/1970	335	Calc	GAMA-USGS	1
26S39E30F03	USGS-353851117491403	6/23/1971	360	Lab	GAMA-USGS	1
26S39E30F03	USGS-353851117491403	10/27/1971	350	Lab	GAMA-USGS	1
26S39E30F03	USGS-353851117491403	6/6/1972	385	Calc	W	1
26S39E30J01	ICSD-WELL-01	7/7/1988	283	Calc	B&S	1
26S39E30J01	ICSD-WELL-01	5/14/1987	253	Lab	GAMA	1
26S39E30J01	ICSD-WELL-01	3/29/1990	260	Lab	GAMA	1
26S39E30J01	ICSD-WELL-01	6/23/1994	244	Lab	GAMA	1
26S39E30J01	ICSD-WELL-01	6/17/1997	259	Lab	GAMA	1
26S39E30J01	ICSD-WELL-01	6/20/2000	298	Lab	GAMA	1
26S39E30J01	ICSD-WELL-01	4/17/1961	264	Lab	GAMA-USGS	1
26S39E30J01	ICSD-WELL-01	3/11/1993	290	Lab	H	1
26S39E30J01	ICSD-WELL-01	9/13/1982	550	Ukn	KCWA WQ	3
26S39E30J01	ICSD-WELL-01	11/1/1982	256	Ukn	KCWA WQ	3
26S39E30J01	ICSD-WELL-01	3/26/1984	265	Ukn	KCWA WQ	3
26S39E30J01	ICSD-WELL-01	3/8/1990	244	Ukn	KCWA WQ	3
26S39E30J01	ICSD-WELL-01	6/5/1953	253	Calc	Moyle	1
26S39E30J02	26S39E30J002M	9/13/1982	412	Ukn	GAMA	1
26S39E30K	Inyokern CSD Well 03	11/21/1995	295	Lab	GAMA	1
26S39E30K	Inyokern CSD Well 03	12/15/1998	240	Lab	GAMA	1
26S39E30K	Inyokern CSD Well 03	6/17/2003	250	Lab	GAMA	1
26S39E30K	Inyokern CSD Well 03	6/20/2006	270	Lab	GAMA	1
26S39E30K	Inyokern CSD Well 03	6/23/2009	320	Lab	GAMA	1
26S39E30K	Inyokern CSD Well 03	6/17/2014	290	Lab	GAMA	1
26S39E30K	Inyokern CSD Well 03	6/12/2017	330	Lab	GAMA	1

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Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
26S39E30L	Inyokern CSD Well 02	6/29/1989	284	Lab	GAMA	1
26S39E30L	Inyokern CSD Well 02	12/21/1989	285	Lab	GAMA	1
26S39E30L	Inyokern CSD Well 02	2/6/1992	223	Lab	GAMA	1
26S39E30L	Inyokern CSD Well 02	6/23/1994	248	Lab	GAMA	1
26S39E30L	Inyokern CSD Well 02	6/17/1997	245	Lab	GAMA	1
26S39E30L	Inyokern CSD Well 02	6/20/2000	277	Lab	GAMA	1
26S39E30L	Inyokern CSD Well 02	6/17/2003	280	Lab	GAMA	1
26S39E30L	Inyokern CSD Well 02	6/20/2006	310	Lab	GAMA	1
26S39E30L	Inyokern CSD Well 02	6/23/2009	310	Lab	GAMA	1
26S39E30L	Inyokern CSD Well 02	6/17/2014	310	Lab	GAMA	1
26S39E31A02		8/25/2009	270	Ukn	H-WQ	2
26S39E31G	Life Water CO-OP Well 01	1/2/1990	185	Lab	GAMA	1
26S39E31G	Life Water CO-OP Well 01	12/31/1996	295	Lab	GAMA	1
26S39E31G	Life Water CO-OP Well 01	7/15/2002	280	Lab	GAMA	1
26S39E31G	Life Water CO-OP Well 01	8/2/2005	280	Lab	GAMA	1
26S39E31G	Life Water CO-OP Well 01	10/29/2008	300	Lab	GAMA	1
26S39E31G	Life Water CO-OP Well 01	4/20/2009	310	Lab	GAMA	1
26S39E31G	Life Water CO-OP Well 01	12/10/2012	270	Lab	GAMA	1
26S39E31H	Life Water CO-OP Well 02	7/21/2011	280	Lab	GAMA	1
26S39E31H	Life Water CO-OP Well 02	5/13/2014	390	Lab	GAMA	1
26S39E31H	Life Water CO-OP Well 02	8/7/2017	270	Lab	GAMA	1
26S39E31R01	Pennix	2/7/2007	290	Lab	FR: AB	1
26S39E32K	S. Desert Mutual Well 01	5/12/1988	250	Lab	GAMA	1
26S39E32K	S. Desert Mutual Well 01	6/2/1999	268	Lab	GAMA	1
26S39E32K	S. Desert Mutual Well 01	2/26/2003	276	Lab	GAMA	1
26S39E32K	S. Desert Mutual Well 01	4/9/2007	270	Lab	GAMA	1
26S39E32K	S. Desert Mutual Well 01	8/9/2011	300	Lab	GAMA	1
26S39E32K	S. Desert Mutual Well 01	11/4/2014	300	Lab	GAMA	1
26S39E32K	S. Desert Mutual Well 01	8/7/2017	290	Lab	GAMA	1
26S39E32L	148 East Water System Well 1	2/22/2018	320	Lab	GAMA	1
26S39E32L01	Robert Steele	8/17/1983	290	Ukn	KCWA WQ	3
26S39E32L01	Robert Steele	12/13/1985	290	Ukn	KCWA WQ	3
26S39E32L01	Robert Steele	8/9/1988	265	Ukn	KCWA WQ	3
26S39E32L01	Robert Steele	1/19/1990	280	Ukn	KCWA WQ	3
26S39E32M	Owens Peak West Well 01	3/29/1989	285	Lab	GAMA	1
26S39E32M	Owens Peak West Well 01	12/21/1992	285	Lab	GAMA	1
26S39E32M	Owens Peak West Well 01	7/15/1996	290	Lab	GAMA	1
26S39E32M	Owens Peak West Well 01	8/11/1999	280	Lab	GAMA	1
26S39E32M	Owens Peak West Well 01	8/14/2002	280	Lab	GAMA	1
26S39E32M	Owens Peak West Well 01	8/17/2005	310	Lab	GAMA	1
26S39E32M	Owens Peak West Well 01	8/14/2008	270	Lab	GAMA	1
26S39E32M	Owens Peak West Well 01	8/11/2011	280	Lab	GAMA	1
26S39E32M	Owens Peak West Well 01	8/6/2014	300	Lab	GAMA	1
26S39E32M	Owens Peak West Well 01	8/8/2017	290	Lab	GAMA	1
26S39E32N	Owens Peak South Well 01	3/27/1995	275	Lab	GAMA	1
26S39E32N	Owens Peak South Well 01	9/9/1998	300	Lab	GAMA	1

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Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
26S39E32N	Owens Peak South Well 01	8/14/2002	280	Lab	GAMA	1
26S39E32N	Owens Peak South Well 01	8/17/2005	330	Lab	GAMA	1
26S39E32N	Owens Peak South Well 01	8/14/2008	290	Lab	GAMA	1
26S39E32N	Owens Peak South Well 01	8/11/2011	270	Lab	GAMA	1
26S39E32N	Owens Peak South Well 01	8/6/2014	300	Lab	GAMA	1
26S39E32N	Owens Peak South Well 01	8/15/2017	240	Lab	GAMA	1
26S39E32Q01		8/12/2008	250	Ukn	H-WQ	2
26S39E33B	Dixie Water Co Well 01	8/9/1989	270	Lab	GAMA	1
26S39E33B	Dixie Water Co Well 01	5/1/2003	272	Lab	GAMA	1
26S39E33B	Dixie Water Co Well 01	7/31/2012	250	Lab	GAMA	1
26S39E34F05		11/10/2008	250	Ukn	H-WQ	2
26S39E34H02		3/6/2007	290	Ukn	KCWA WQ	3
26S39E34Q01	26S/39E-34Q01; DeMay	1/25/2005	270	Lab	Other	1
26S39E36B	GAMA:SVM Well 35 & Well 36IW; loc = Well 36	8/9/1990	224	Lab	GAMA	1
26S39E36B	GAMA:SVM Well 35 & Well 36IW; loc = Well 36	7/2/1992	204	Lab	GAMA	1
26S39E36B	GAMA:SVM Well 35 & Well 36IW; loc = Well 36	4/4/1996	210	Lab	GAMA	1
26S39E36B	GAMA:SVM Well 35 & Well 36IW; loc = Well 36	6/8/1999	209	Lab	GAMA	1
26S39E36B	GAMA:SVM Well 35 & Well 36IW; loc = Well 36	6/4/2002	210	Lab	GAMA	1
26S39E36B	GAMA:SVM Well 35 & Well 36IW; loc = Well 36	9/20/2005	230	Lab	GAMA	1
26S39E36B	GAMA:SVM Well 35 & Well 36IW; loc = Well 36	9/16/2008	230	Lab	GAMA	1
26S39E36B	GAMA:SVM Well 35 & Well 36IW; loc = Well 36	6/16/2009	290	Lab	GAMA	1
26S39E36B	GAMA:SVM Well 35 & Well 36IW; loc = Well 36	6/7/2011	290	Lab	GAMA	1
26S39E36B	GAMA:SVM Well 35 & Well 36IW; loc = Well 36	6/3/2014	290	Lab	GAMA	1
26S39E36B	GAMA:SVM Well 35 & Well 36IW; loc = Well 36	6/6/2017	210	Lab	GAMA	1
26S40E01A01		7/8/1953	165000	Calc	Moyle	1
26S40E01A02		6/9/1982	11000	Calc	B	1
26S40E01A02		9/17/1986	11400	Calc	B&M	1
26S40E01A02		6/1/1987	11700	Calc	B&S	1
26S40E01A02		3/9/1954	13800	Calc	Moyle	1
26S40E01J01	USGS-354155117370201	6/22/1978	46000	Calc	B	1
26S40E01J01	USGS-354155117370201	5/16/1979	67000	Calc	B	1
26S40E01J01	USGS-354155117370201	5/21/1980	65000	Calc	B	1
26S40E01J01	USGS-354155117370201	6/10/1982	54000	Calc	B	1
26S40E01J01	USGS-354155117370201	7/8/1953	48500	Calc	Moyle	1
26S40E01J01	USGS-354155117370201	6/13/1972	43600	Lab	W	1
26S40E01Q01		6/22/1978	4300	Calc	B	1
26S40E01Q01		5/16/1979	3200	Calc	B	1
26S40E01Q01		5/20/1980	3100	Calc	B	1
26S40E01Q02		6/22/1978	6000	Calc	B	1

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Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
26S40E01Q02		5/15/1979	6100	Calc	B	1
26S40E01Q02		5/20/1980	5700	Calc	B	1
26S40E01Q02		6/11/1982	6500	Calc	B	1
26S40E01Q02		5/24/1996	13000	Lab	H96	1
26S40E04Q01		5/30/1987	481	Calc	B&S	1
26S40E05F01	USGS-354216117415701	4/28/1946	376	Lab	GAMA-USGS	1
26S40E05F01	USGS-354216117415701	2/1/1946	325	Calc	Moyle	1
26S40E05P01	USGS-354147117414101	7/31/1978	610	Calc	B	1
26S40E05P01	USGS-354147117414101	3/29/1980	540	Calc	B	1
26S40E05P01	USGS-354147117414101	10/20/1970	588	Ukn	GAMA	1
26S40E05P01	USGS-354147117414101	10/25/1973	677	Ukn	GAMA	1
26S40E05P01	USGS-354147117414101	5/1/1975	666	Ukn	GAMA	1
26S40E05P01	USGS-354147117414101	5/12/1976	734	Ukn	GAMA	1
26S40E05P01	USGS-354147117414101	9/15/1964	634	Lab	GAMA-USGS	1
26S40E05P01	USGS-354147117414101	5/16/1966	628	Lab	GAMA-USGS	1
26S40E05P01	USGS-354147117414101	9/8/1966	836	Lab	GAMA-USGS	1
26S40E05P01	USGS-354147117414101	6/5/1968	588	Lab	GAMA-USGS	1
26S40E05P01	USGS-354147117414101	11/4/1968	648	Lab	GAMA-USGS	1
26S40E05P01	USGS-354147117414101	10/20/1969	876	Lab	GAMA-USGS	1
26S40E05P01	USGS-354147117414101	6/1/1970	624	Lab	GAMA-USGS	1
26S40E05P01	USGS-354147117414101	6/23/1971	710	Lab	GAMA-USGS	1
26S40E05P01	USGS-354147117414101	10/27/1971	879	Lab	GAMA-USGS	1
26S40E05P01	USGS-354147117414101	8/4/1953	562	Calc	Moyle	1
26S40E05P01	USGS-354147117414101	5/15/1958	530	Calc	Moyle	1
26S40E05P01	USGS-354147117414101	6/6/1972	699	Calc	W	1
26S40E05P03	USGS-354147117414103	4/28/1946	1500	Lab	GAMA-USGS	1
26S40E06C01		5/30/1987	60700	Calc	B&M	1
26S40E06D01		5/30/1987	9050	Calc	B&M	1
26S40E06D02		5/30/1987	8710	Calc	B&M	1
26S40E06D02		3/10/1993	24300	Lab	H	1
26S40E06D02		6/18/1996	26000	Lab	H96	1
26S40E06E01	USGS-354211117431801	4/26/1946	348	Lab	GAMA-USGS	1
26S40E07E01		1/22/1946	898	Calc	Moyle	1
26S40E07E01		4/28/1946	1010	Lab	USGS	1
26S40E07N01	USGS-354052117411501	1/28/1920	242	Lab	GAMA-USGS	1
26S40E07N01	USGS-354052117411501	4/29/1946	219	Lab	GAMA-USGS	1
26S40E08N01	USGS-354054117410701	4/28/1946	788	Lab	GAMA-USGS	1
26S40E08Q01	USGS-354053117412601	4/28/1946	298	Lab	GAMA-USGS	1
26S40E09A01		5/29/1987	535	Calc	B&S	1
26S40E09A01		3/19/1993	620	Lab	H	1
26S40E10E01	USGS-354119117400601	1/29/1920	2010	Lab	GAMA-USGS	1
26S40E10E01	USGS-354119117400601	4/28/1946	1450	Lab	GAMA-USGS	1
26S40E10F01	USGS-354125117393701	6/22/1978	490	Calc	B	1
26S40E10F01	USGS-354125117393701	6/5/1979	490	Calc	B	1
26S40E10F01	USGS-354125117393701	5/20/1980	480	Calc	B	1
26S40E10F01	USGS-354125117393701	6/9/1982	500	Calc	B	1

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26S40E10F01	USGS-354125117393701	3/6/1974	436	Ukn	GAMA	1
26S40E10F01	USGS-354125117393701	3/25/1975	451	Ukn	GAMA	1
26S40E10F01	USGS-354125117393701	8/18/1976	465	Ukn	GAMA	1
26S40E10F01	USGS-354125117393701	7/9/1953	504	Calc	Moyle	1
26S40E10F01	USGS-354125117393701	6/13/1972	520	Lab	W	1
26S40E10N01	USGS-354055117400401	4/28/1946	647	Lab	GAMA-USGS	1
26S40E10N01	USGS-354055117400401	7/6/1953	1010	Calc	Moyle	1
26S40E11A01		7/6/1953	69500	Calc	Moyle	1
26S40E11J01	USGS-354108117380801	6/22/1978	7600	Calc	B	1
26S40E11J01	USGS-354108117380801	5/28/1980	2400	Calc	B	1
26S40E11J01	USGS-354108117380801	6/11/1985	9670	Calc	B&M	1
26S40E11J01	USGS-354108117380801	3/7/1974	3720	Ukn	GAMA	1
26S40E11J01	USGS-354108117380801	3/25/1975	3080	Ukn	GAMA	1
26S40E11J01	USGS-354108117380801	8/18/1976	2040	Ukn	GAMA	1
26S40E11J01	USGS-354108117380801	7/9/1953	1060	Calc	Moyle	1
26S40E11J01	USGS-354108117380801	6/13/1972	5880	Lab	W	1
26S40E11J03	USGS-354109117380803	8/9/1984	9700	Calc	B	1
26S40E11J03	USGS-354109117380803	7/1/1988	8090	Calc	B&S	1
26S40E11J03	USGS-354109117380803	6/11/1985	9670	Ukn	GAMA	1
26S40E11N02		8/9/1984	1300	Calc	B	1
26S40E12A01		6/29/1978	4400	Calc	B	1
26S40E12A01		5/17/1979	4100	Calc	B	1
26S40E12A01		5/21/1980	3700	Calc	B	1
26S40E12G01		5/15/1979	2400	Calc	B	1
26S40E12G01		5/27/1980	2400	Calc	B	1
26S40E12G01		6/11/1982	2800	Calc	B	1
26S40E12Q01	USGS-354101117372201	6/29/1978	1400	Calc	B	1
26S40E12Q01	USGS-354101117372201	5/15/1979	1400	Calc	B	1
26S40E12Q01	USGS-354101117372201	5/27/1980	1200	Calc	B	1
26S40E12Q01	USGS-354101117372201	6/12/1985	1330	Ukn	GAMA	1
26S40E12Q01	USGS-354101117372201	5/24/1996	1000	Lab	H96	1
26S40E12R01		6/29/1978	2000	Calc	B	1
26S40E12R01		6/6/1979	1700	Calc	B	1
26S40E12R01		5/27/1980	1900	Calc	B	1
26S40E12R01		5/24/1996	1500	Lab	H96	1
26S40E13C01	USGS-354037117373201	6/29/1978	2100	Calc	B	1
26S40E13C01	USGS-354037117373201	6/6/1979	2200	Calc	B	1
26S40E13C01	USGS-354037117373201	5/21/1980	2000	Calc	B	1
26S40E13C01	USGS-354037117373201	6/11/1982	2000	Calc	B	1
26S40E13C01	USGS-354037117373201	6/14/1972	2680	Lab	W	1
26S40E13C02	USGS well; ""China Lake Playa""	11/16/1999	1300	Lab	Tri	1
26S40E13D03		8/8/1999	1600	Lab	Tri	1
26S40E13M01	USGS-354010117375601	6/23/1978	1300	Calc	B	1
26S40E13M01	USGS-354010117375601	5/21/1980	1500	Calc	B	1
26S40E13M01	USGS-354010117375601	5/24/1996	1500	Lab	H96	1
26S40E13M01	USGS-354010117375601	6/14/1972	1180	Lab	W	1

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Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
26S40E14B01	USGS-354039117382801	6/20/1978	1600	Calc	B	1
26S40E14B01	USGS-354039117382801	5/15/1979	1600	Calc	B	1
26S40E14B01	USGS-354039117382801	5/20/1980	1300	Calc	B	1
26S40E14B01	USGS-354039117382801	6/9/1982	1600	Calc	B	1
26S40E14B01	USGS-354039117382801	8/6/1984	3300	Calc	B	1
26S40E14B01	USGS-354039117382801	5/27/1987	3500	Calc	B&S	1
26S40E14B01	USGS-354039117382801	7/6/1988	2930	Calc	B&S	1
26S40E14B01	USGS-354039117382801	6/11/1985	2470	Ukn	GAMA	1
26S40E14B01	USGS-354039117382801	4/16/1986	3220	Ukn	GAMA	1
26S40E14B01	USGS-354039117382801	5/24/1996	1900	Lab	H96	1
26S40E14B01	USGS-354039117382801	8/8/1999	26000	Lab	Tri	1
26S40E14B01	USGS-354039117382801	6/12/1972	3780	Lab	W	1
26S40E14B02		3/19/1993	1080	Lab	H	1
26S40E14H01	USGS-354021117381801	6/21/1972	1770	Lab	W	1
26S40E14L01	USGS-354020117384201	6/20/1978	1700	Calc	B	1
26S40E14L01	USGS-354020117384201	5/15/1979	1700	Calc	B	1
26S40E14L01	USGS-354020117384201	5/20/1980	2000	Calc	B	1
26S40E14L01	USGS-354020117384201	8/9/1984	1800	Calc	B	1
26S40E14L01	USGS-354020117384201	6/30/1988	1420	Calc	B&S	1
26S40E14L01	USGS-354020117384201	6/11/1985	1650	Ukn	GAMA	1
26S40E14L01	USGS-354020117384201	5/15/1978	1700	Ukn	KCWA WQ	3
26S40E14L01	USGS-354020117384201	6/12/1972	1070	Lab	W	1
26S40E15E01	USGS-354036117400701	6/20/1978	560	Calc	B	1
26S40E15E01	USGS-354036117400701	5/31/1979	530	Calc	B	1
26S40E15E01	USGS-354036117400701	5/22/1980	550	Calc	B	1
26S40E15E01	USGS-354036117400701	6/10/1982	530	Calc	B	1
26S40E15E01	USGS-354036117400701	3/5/1974	499	Ukn	GAMA	1
26S40E15E01	USGS-354036117400701	3/26/1975	466	Ukn	GAMA	1
26S40E15E01	USGS-354036117400701	8/18/1976	485	Ukn	GAMA	1
26S40E15E01	USGS-354036117400701	4/28/1946	620	Lab	GAMA-USGS	1
26S40E15E01	USGS-354036117400701	7/6/1953	495	Calc	Moyle	1
26S40E15E01	USGS-354036117400701	4/4/1955	464	Calc	Moyle	1
26S40E15E01	USGS-354036117400701	6/29/1972	463	Calc	W	1
26S40E15E02	USGS-354033117400601	6/20/1978	4900	Calc	B	1
26S40E15E02	USGS-354033117400601	5/31/1979	4800	Calc	B	1
26S40E15E02	USGS-354033117400601	3/5/1974	4730	Ukn	GAMA	1
26S40E15E02	USGS-354033117400601	3/26/1975	4730	Ukn	GAMA	1
26S40E15E02	USGS-354033117400601	8/18/1976	4600	Ukn	GAMA	1
26S40E15E02	USGS-354033117400601	4/28/1946	3750	Lab	GAMA-USGS	1
26S40E15E02	USGS-354033117400601	4/4/1955	3900	Calc	Moyle	1
26S40E15N01	USGS-354002117400601	6/21/1978	1200	Calc	B	1
26S40E15N01	USGS-354002117400601	5/31/1979	1300	Calc	B	1
26S40E15N01	USGS-354002117400601	5/22/1980	1200	Calc	B	1
26S40E15N01	USGS-354002117400601	4/28/1946	1340	Lab	GAMA-USGS	1
26S40E15N02	USGS-354011117400001	6/14/1982	840	Calc	B	1
26S40E15N02	USGS-354011117400001	6/11/1985	2890	Calc	B&M	1

Table 2: IWV TDS Data

Sample Dates in red indicate only sample month/year is known

min	1/26/1920	100
max	3/5/2019	232000
count	2,044	

Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
26S40E15N02	USGS-354011117400001	7/9/1988	3170	Calc	B&S	1
26S40E15N02	USGS-354011117400001	8/8/1984	2800	Ukn	GAMA	1
26S40E15N02	USGS-354011117400001	5/29/1996	3000	Lab	H96	1
26S40E16K	TTIWV-MW06	2/17/2002	1980	Lab	TTEMI	1
26S40E16M01	TTBK-MW07	8/5/1999	380	Lab	Tri	1
26S40E17J01	USGS-354022117412201	8/7/1984	250	Calc	B	1
26S40E17J01	USGS-354022117412201	7/2/1988	282	Calc	B&S	1
26S40E17J01	USGS-354022117412201	6/10/1985	267	Ukn	GAMA	1
26S40E17J01	USGS-354022117412201	5/29/1996	260	Lab	H96	1
26S40E17J01	USGS-354022117412201	6/18/1972	308	Lab	W	1
26S40E17N01		10/13/1955	223	Calc	Moyle	1
26S40E17Q01	96030-1	8/6/1996	2400	Lab	H96	1
26S40E17R01	USGS-354003117412001	8/7/1984	290	Calc	B	1
26S40E17R01	USGS-354003117412001	6/10/1985	299	Ukn	GAMA	1
26S40E17R01	USGS-354003117412001	7/2/1988	282	Ukn	GAMA	1
26S40E17R01	USGS-354003117412001	6/18/1972	304	Lab	W	1
26S40E18E01	USGS-354027117431501	4/29/1946	898	Lab	GAMA-USGS	1
26S40E18N01	USGS-353959117431501	4/29/1946	648	Lab	GAMA-USGS	1
26S40E18N01	USGS-353959117431501	4/5/1955	213	Calc	Moyle	1
26S40E19N	TTIWV-MW02-S	2/18/2002	218	Lab	TTEMI	1
26S40E19N01	USGS-353917117431401	2/18/2002	218	Ukn	AB	2
26S40E19N01	USGS-353917117431401	4/30/1946	242	Lab	GAMA-USGS	1
26S40E19N01	USGS-353917117431401	3/19/1993	230	Lab	H	1
26S40E19P01	USGS-353910117430201	3/29/1980	310	Calc	B	1
26S40E19P01	USGS-353910117430201	11/20/1959	210	Ukn	GAMA	1
26S40E19P01	USGS-353910117430201	11/20/1955	210	Calc	Moyle	1
26S40E20A	TTBK-MW04	2/10/1999	350	Lab	Tri	1
26S40E20J01		3/19/1993	360	Lab	H	1
26S40E20L01		3/9/1999	1150	Ukn	KCWA WQ	3
26S40E20N01	USGS-353910117420801	4/30/1946	261	Lab	GAMA-USGS	1
26S40E20N01	USGS-353910117420801	6/1/1953	220	Calc	Moyle	1
26S40E21A01	USGS-353948117401501	8/8/1984	540	Calc	B	1
26S40E21A01	USGS-353948117401501	6/10/1985	481	Ukn	GAMA	1
26S40E21A01	USGS-353948117401501	4/17/1986	644	Ukn	GAMA	1
26S40E21A01	USGS-353948117401501	6/13/1972	612	Lab	W	1
26S40E21E01	USGS-353941117411101	8/7/1984	230	Calc	B	1
26S40E21E01	USGS-353941117411101	6/10/1985	178	Ukn	GAMA	1
26S40E21E01	USGS-353941117411101	6/18/1972	280	Lab	W	1
26S40E21K01	USGS-353921117403701	4/30/1946	430	Lab	GAMA-USGS	1
26S40E22A01	USGS-353954117390801	5/31/1987	8080	Calc	B&S	1
26S40E22A01	USGS-353954117390801	7/6/1988	5830	Calc	B&S	1
26S40E22A01	USGS-353954117390801	3/23/1989	8230	Ukn	GAMA	1
26S40E22B01	USGS-353955117393101	8/9/1984	5200	Calc	B	1
26S40E22B01	USGS-353955117393101	6/2/1987	5290	Calc	B&S	1
26S40E22B01	USGS-353955117393101	7/7/1988	5280	Calc	B&S	1
26S40E22B01	USGS-353955117393101	6/12/1985	5230	Ukn	GAMA	1

Table 2: IWV TDS Data

Sample Dates in red indicate only sample month/year is known

	min	max	count
Sample Date	1/26/1920	3/5/2019	2,044
TDS	100	232000	

Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
26S40E22B01	USGS-353955117393101	4/17/1986	5070	Ukn	GAMA	1
26S40E22B01	USGS-353955117393101	3/22/1989	5170	Ukn	GAMA	1
26S40E22B01	USGS-353955117393101	6/18/1972	5480	Lab	W	1
26S40E22H01	USGS-353942117390801	6/19/1978	5000	Calc	B	1
26S40E22H01	USGS-353942117390801	5/15/1979	4700	Calc	B	1
26S40E22H01	USGS-353942117390801	5/20/1980	4300	Calc	B	1
26S40E22H01	USGS-353942117390801	6/8/1982	5200	Calc	B	1
26S40E22H01	USGS-353942117390801	8/8/1984	4800	Calc	B	1
26S40E22H01	USGS-353942117390801	6/29/1988	4870	Calc	B&S	1
26S40E22H01	USGS-353942117390801	6/12/1985	5140	Ukn	GAMA	1
26S40E22H01	USGS-353942117390801	3/21/1993	5670	Lab	H	1
26S40E22H01	USGS-353942117390801	5/24/1996	4800	Lab	H96	1
26S40E22H01	USGS-353942117390801	8/1/2001	4520	Lab	Tri	1
26S40E22H01	USGS-353942117390801	6/12/1972	7160	Lab	W	1
26S40E22H02	USGS-353942117390802	6/19/1978	13000	Calc	B	1
26S40E22H02	USGS-353942117390802	5/15/1979	12000	Calc	B	1
26S40E22H02	USGS-353942117390802	5/20/1980	13000	Calc	B	1
26S40E22H02	USGS-353942117390802	6/8/1982	14000	Calc	B	1
26S40E22H02	USGS-353942117390802	10/31/1983	12000	Calc	B	1
26S40E22H02	USGS-353942117390802	6/29/1988	12300	Calc	B&S	1
26S40E22H02	USGS-353942117390802	6/12/1985	12900	Ukn	GAMA	1
26S40E22H02	USGS-353942117390802	6/12/1972	16500	Lab	W	1
26S40E22H03	USGS-353942117390803	6/19/1978	5300	Calc	B	1
26S40E22H03	USGS-353942117390803	5/15/1979	5700	Calc	B	1
26S40E22H03	USGS-353942117390803	5/20/1980	6800	Calc	B	1
26S40E22H03	USGS-353942117390803	6/8/1982	6800	Calc	B	1
26S40E22H03	USGS-353942117390803	8/7/1984	2800	Calc	B	1
26S40E22H03	USGS-353942117390803	8/9/1984	5400	Calc	B	1
26S40E22H03	USGS-353942117390803	6/2/1987	8350	Calc	B&S	1
26S40E22H03	USGS-353942117390803	7/7/1988	7820	Calc	B&S	1
26S40E22H03	USGS-353942117390803	6/12/1985	4830	Ukn	GAMA	1
26S40E22H03	USGS-353942117390803	4/17/1986	5860	Ukn	GAMA	1
26S40E22H03	USGS-353942117390803	3/22/1989	8520	Ukn	GAMA	1
26S40E22H03	USGS-353942117390803	6/13/1972	5400	Lab	W	1
26S40E22J01	USGS-353930117391801	10/31/1983	2700	Calc	B	1
26S40E22J01	USGS-353930117391801	8/8/1984	2800	Calc	B	1
26S40E22J01	USGS-353930117391801	7/1/1988	2330	Calc	B&S	1
26S40E22J01	USGS-353930117391801	6/11/1985	2550	Ukn	GAMA	1
26S40E22J01	USGS-353930117391801	6/2/1972	4180	Lab	W	1
26S40E22K01	USGS-353923117392601	10/31/1983	1300	Calc	B	1
26S40E22K01	USGS-353923117392601	8/8/1984	1400	Calc	B	1
26S40E22K01	USGS-353923117392601	6/12/1985	1480	Ukn	GAMA	1
26S40E22K01	USGS-353923117392601	6/1/1972	1040	Lab	W	1
26S40E22N01	USGS-353913117400601	6/20/1978	1000	Calc	B	1
26S40E22N01	USGS-353913117400601	5/31/1979	1100	Calc	B	1
26S40E22N01	USGS-353913117400601	5/23/2008	2100	Calc	B	1

Table 2: IWV TDS Data

Sample Dates in red indicate only sample month/year is known

min 1/26/1920 100
max 3/5/2019 232000
count 2,044

Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
26S40E22N01	USGS-353913117400601	3/6/1974	654	Ukn	GAMA	1
26S40E22N01	USGS-353913117400601	3/26/1975	726	Ukn	GAMA	1
26S40E22N01	USGS-353913117400601	8/19/1976	762	Ukn	GAMA	1
26S40E22N01	USGS-353913117400601	5/23/1980	2130	Ukn	GAMA	1
26S40E22N01	USGS-353913117400601	11/15/1968	432	Lab	GAMA-USGS	1
26S40E22N01	USGS-353913117400601	7/9/1953	520	Calc	Moyle	1
26S40E22N01	USGS-353913117400601	4/4/1955	429	Calc	Moyle	1
26S40E22N01	USGS-353913117400601	6/28/1972	581	Calc	W	1
26S40E22P01	USGS-353908117395201	6/22/1978	1000	Calc	B	1
26S40E22P01	USGS-353908117395201	5/17/1979	830	Calc	B	1
26S40E22P01	USGS-353908117395201	5/28/1980	1100	Calc	B	1
26S40E22P01	USGS-353908117395201	5/27/1987	1070	Calc	B&M	1
26S40E22P01	USGS-353908117395201	8/9/1988	1090	Calc	B&S	1
26S40E22P01	USGS-353908117395201	3/21/1989	1090	Ukn	GAMA	1
26S40E22P01	USGS-353908117395201	4/10/1990	1080	Ukn	GAMA	1
26S40E22P01	USGS-353908117395201	3/12/1991	1120	Ukn	GAMA	1
26S40E22P01	USGS-353908117395201	4/15/1992	1110	Ukn	GAMA	1
26S40E22P01	USGS-353908117395201	4/5/1993	1110	Ukn	GAMA	1
26S40E22P01	USGS-353908117395201	6/18/1996	860	Lab	H96	1
26S40E22P01	USGS-353908117395201	3/11/1954	1090	Ukn	KCWA WQ	3
26S40E22P01	USGS-353908117395201	11/17/1998	1150	Ukn	KCWA WQ	3
26S40E22P01	USGS-353908117395201	2/23/1954	1000	Calc	Moyle	1
26S40E22P01	USGS-353908117395201	6/17/1972	1050	Lab	W	1
26S40E22P02	USGS-353908117394001	10/31/1983	1100	Calc	B	1
26S40E22P02	USGS-353908117394001	8/8/1984	1200	Calc	B	1
26S40E22P02	USGS-353908117394001	6/10/1986	1240	Calc	B&M	1
26S40E22P02	USGS-353908117394001	7/1/1988	1660	Calc	B&S	1
26S40E22P02	USGS-353908117394001	6/10/1985	1240	Ukn	GAMA	1
26S40E22P02	USGS-353908117394001	5/29/1996	1400	Lab	H96	1
26S40E22P02	USGS-353908117394001	6/1/1972	1200	Lab	W	1
26S40E22P03		8/8/1984	1400	Calc	B	1
26S40E22P03		5/26/1987	1230	Calc	B&M	1
26S40E22P03		8/8/1988	1470	Calc	B&S	1
26S40E22P03		6/18/1996	1400	Lab	H96	1
26S40E22P03		5/26/1984	1230	Ukn	KCWA WQ	3
26S40E22P04		8/9/1984	780	Calc	B	1
26S40E22P04		5/26/1987	1890	Calc	B&M	1
26S40E22P04		8/9/1988	1260	Calc	B&S	1
26S40E22P04		6/18/1996	460	Lab	H96	1
26S40E22P04		8/8/1984	780	Ukn	KCWA WQ	3
26S40E23A01	USGS-353948117381001	6/19/1978	2100	Calc	B	1
26S40E23A01	USGS-353948117381001	5/17/1979	2200	Calc	B	1
26S40E23A01	USGS-353948117381001	5/21/1980	2500	Calc	B	1
26S40E23A01	USGS-353948117381001	6/10/1982	3900	Calc	B	1
26S40E23A01	USGS-353948117381001	5/26/1972	2140	Lab	W	1
26S40E23A02	USGS-353948117381002	6/19/1978	1200	Calc	B	1

Table 2: IWV TDS Data

Sample Dates in red indicate only sample month/year is known

min	1/26/1920	100
max	3/5/2019	232000
count	2,044	

Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
26S40E23A02	USGS-353948117381002	5/17/1979	1200	Calc	B	1
26S40E23A02	USGS-353948117381002	6/10/1982	1200	Calc	B	1
26S40E23A02	USGS-353948117381002	5/29/1996	2400	Lab	H96	1
26S40E23A02	USGS-353948117381002	5/26/1972	1400	Lab	W	1
26S40E23B02	USGS-353955117381601	5/27/1987	1190	Calc	B&M	1
26S40E23B02	USGS-353955117381601	1/18/1989	1220	Calc	B&S	1
26S40E23B02	USGS-353955117381601	10/23/1986	1100	Ukn	GAMA	1
26S40E23B02	USGS-353955117381601	3/20/1989	1260	Ukn	GAMA	1
26S40E23B02	USGS-353955117381601	4/10/1990	1320	Ukn	GAMA	1
26S40E23B02	USGS-353955117381601	3/13/1991	1330	Ukn	GAMA	1
26S40E23B02	USGS-353955117381601	4/16/1992	1340	Ukn	GAMA	1
26S40E23B02	USGS-353955117381601	4/5/1993	1220	Ukn	GAMA	1
26S40E23B02	USGS-353955117381601	8/23/1996	1300	Lab	H96	1
26S40E23B03	USGS-353955117381602	5/27/1987	1240	Calc	B&M	1
26S40E23B03	USGS-353955117381602	5/27/1988	1240	Calc	B&S	1
26S40E23B03	USGS-353955117381602	7/7/1988	1140	Calc	B&S	1
26S40E23B03	USGS-353955117381602	3/20/1989	1170	Ukn	GAMA	1
26S40E23B03	USGS-353955117381602	4/10/1990	1360	Ukn	GAMA	1
26S40E23B03	USGS-353955117381602	3/13/1991	1200	Ukn	GAMA	1
26S40E23B03	USGS-353955117381602	4/16/1992	1390	Ukn	GAMA	1
26S40E23B03	USGS-353955117381602	4/5/1993	1080	Ukn	GAMA	1
26S40E23C01		7/9/1953	4060	Calc	Moyle	1
26S40E23D01	USGS-353948117385601	10/31/1983	1400	Calc	B	1
26S40E23D01	USGS-353948117385601	5/26/1987	2090	Calc	B&M	1
26S40E23D01	USGS-353948117385601	6/25/1986	2020	Ukn	GAMA	1
26S40E23D01	USGS-353948117385601	8/26/1996	2000	Lab	H96	1
26S40E23D02	USGS-353948117385602	10/31/1983	4900	Calc	B	1
26S40E23D02	USGS-353948117385602	5/26/1987	5420	Calc	B&M	1
26S40E23D02	USGS-353948117385602	1/9/1986	4620	Ukn	GAMA	1
26S40E23D02	USGS-353948117385602	6/25/1986	5260	Ukn	GAMA	1
26S40E23G01	USGS-353942117383101	8/7/1984	7100	Calc	B	1
26S40E23G01	USGS-353942117383101	6/11/1985	6750	Calc	B&M	1
26S40E23G01	USGS-353942117383101	7/7/1988	6260	Calc	B&S	1
26S40E23G01	USGS-353942117383101	5/29/1996	4400	Lab	H96	1
26S40E23G01	USGS-353942117383101	5/24/1972	10900	Lab	W	1
26S40E23J01	WWTF	8/9/1984	620	Calc	B	1
26S40E23J01	WWTF	5/24/1972	1720	Lab	W	1
26S40E23L01	USGS-353929117383501	6/2/1972	2100	Lab	W	1
26S40E24B01		7/8/1953	1360	Calc	Moyle	1
26S40E24C01	USGS-353953117373701	6/23/1978	1900	Calc	B	1
26S40E24C01	USGS-353953117373701	5/21/1980	1500	Calc	B	1
26S40E24C01	USGS-353953117373701	6/10/1982	2100	Calc	B	1
26S40E24C01	USGS-353953117373701	7/9/1953	675	Calc	Moyle	1
26S40E24C01	USGS-353953117373701	5/26/1972	2500	Lab	W	1
26S40E24M01	USGS-353929117374901	6/12/1972	6080	Lab	W	1
26S40E24R01		3/9/1954	745	Calc	Moyle	1

Table 2: IWV TDS Data

Sample Dates in red indicate only sample month/year is known

min	1/26/1920	100
max	3/5/2019	232000
count	2,044	

Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
26S40E25C	TTBK-MW01	5/13/1999	610	Lab	Tri	1
26S40E25C02		5/28/1987	956	Calc	B&M	1
26S40E25P	RLS22-MW01 (83')	5/18/1999	1100	Lab	Tri	1
26S40E26B01	USGS-353857117382701	7/8/1953	1360	Ukn	GAMA	1
26S40E26F01		6/14/1982	1300	Calc	B	1
26S40E26F01		7/8/1988	1320	Calc	B&M	1
26S40E26F01		3/21/1993	1500	Lab	H	1
26S40E26F01		5/24/1996	1400	Lab	H96	1
26S40E26F01		5/26/1972	952	Lab	W	1
26S40E26N02	TTBK-MW02	5/13/1999	1100	Lab	Tri	1
26S40E26N02	TTBK-MW02	2/18/2002	668	Lab	TTEMI	1
26S40E27D01		7/8/1988	1940	Calc	B&S	1
26S40E27D01		5/31/1996	1660	Lab	H	1
26S40E27D01		8/22/2008	1700	Ukn	KCWA WQ	3
26S40E27D02	35H2 on inside of cap	7/8/1988	1490	Calc	B&S	1
26S40E27E03	USGS-353848117395402	2/26/1989	479	Ukn	GAMA	1
26S40E28A03		6/1/1953	298	Calc	Moyle	1
26S40E28C01		6/1/1953	277	Calc	Moyle	1
26S40E28H01	USGS-353843117402401	11/19/1959	357	Ukn	GAMA	1
26S40E28H01	USGS-353843117402401	6/1/1953	356	Calc	Moyle	1
26S40E28J01	USGS-353828117401301	6/29/1978	330	Calc	B	1
26S40E28J01	USGS-353828117401301	6/1/1979	410	Calc	B	1
26S40E28J01	USGS-353828117401301	5/27/1980	400	Calc	B	1
26S40E28J01	USGS-353828117401301	6/11/1982	590	Calc	B	1
26S40E28J01	USGS-353828117401301	8/10/1984	630	Calc	B	1
26S40E28J01	USGS-353828117401301	9/17/1987	595	Calc	B&M	1
26S40E28J01	USGS-353828117401301	9/1/1987	595	Lab	B&S	1
26S40E28J01	USGS-353828117401301	6/17/1972	298	Lab	W	1
26S40E29D01	USGS-353902117420501	6/17/1972	262	Lab	W	1
26S40E29F01	USGS-353844117415401	11/2/1970	246	Lab	GAMA-USGS	1
26S40E29N01	KLEINSCHMIDT	4/28/2009	180	Ukn	KCWA WQ	3
26S40E30C02	USGS-353859117425702	4/30/1946	202	Lab	GAMA-USGS	1
26S40E30E	GAMA:SVM Well 34	6/11/1987	255	Lab	GAMA	1
26S40E30E	GAMA:SVM Well 34	6/2/1988	179	Lab	GAMA	1
26S40E30E01	USGS-353845117431401	4/30/1946	202	Lab	GAMA-USGS	1
26S40E30E02		5/29/1987	234	Calc	B&S	1
26S40E30E02		6/11/1987	216	Calc	B&S	1
26S40E30E02		8/5/1953	184	Calc	Moyle	1
26S40E30J01		12/11/2007	150	Ukn	H-WQ	2
26S40E30K01	IWVWD Well 08	1/7/1988	237	Lab	B&S	1
26S40E30K01	IWVWD Well 08	4/4/2007	280	Lab	FR: AB	1
26S40E30K01	IWVWD Well 08	6/4/1975	264	Ukn	GAMA	1
26S40E30K01	IWVWD Well 08	3/23/1977	242	Ukn	GAMA	1
26S40E30K01	IWVWD Well 08	7/30/1981	210	Ukn	GAMA	1
26S40E30K01	IWVWD Well 08	3/2/1982	230	Ukn	GAMA	1
26S40E30K01	IWVWD Well 08	7/9/1982	243	Ukn	GAMA	1

Table 2: IWV TDS Data

Sample Dates in red indicate
only sample month/year is known

min	1/26/1920	100
max	3/5/2019	232000
count	2,044	

Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
26S40E30K01	IWVWD Well 08	11/21/1983	223	Ukn	GAMA	1
26S40E30K01	IWVWD Well 08	1/22/1985	260	Lab	GAMA	1
26S40E30K01	IWVWD Well 08	8/1/1986	703	Lab	GAMA	1
26S40E30K01	IWVWD Well 08	12/20/1989	238	Lab	GAMA	1
26S40E30K01	IWVWD Well 08	1/22/1991	207	Lab	GAMA	1
26S40E30K01	IWVWD Well 08	3/6/1992	167	Lab	GAMA	1
26S40E30K01	IWVWD Well 08	1/21/1993	175	Lab	GAMA	1
26S40E30K01	IWVWD Well 08	2/2/1994	190	Lab	GAMA	1
26S40E30K01	IWVWD Well 08	6/22/1995	196	Lab	GAMA	1
26S40E30K01	IWVWD Well 08	1/24/1996	205	Lab	GAMA	1
26S40E30K01	IWVWD Well 08	1/13/1997	223	Lab	GAMA	1
26S40E30K01	IWVWD Well 08	1/26/1998	200	Lab	GAMA	1
26S40E30K01	IWVWD Well 08	9/9/1998	212	Lab	GAMA	1
26S40E30K01	IWVWD Well 08	9/15/1999	227	Lab	GAMA	1
26S40E30K01	IWVWD Well 08	8/7/2000	173	Lab	GAMA	1
26S40E30K01	IWVWD Well 08	8/21/2001	190	Lab	GAMA	1
26S40E30K01	IWVWD Well 08	8/1/2002	200	Lab	GAMA	1
26S40E30K01	IWVWD Well 08	9/10/2003	260	Lab	GAMA	1
26S40E30K01	IWVWD Well 08	8/12/2004	250	Lab	GAMA	1
26S40E30K01	IWVWD Well 08	3/29/2005	240	Lab	GAMA	1
26S40E30K01	IWVWD Well 08	8/21/1964	200	Lab	USGS	1
26S40E30K01	IWVWD Well 08	3/31/1970	207	Lab	USGS	1
26S40E30K02	IWVWD 09 (Abandoned)	5/14/1987	240	Calc	B&S	1
26S40E30K02	IWVWD 09 (Abandoned)	1/7/1988	207	Calc	B&S	1
26S40E30K02	IWVWD 09 (Abandoned)	2/28/1977	296	Ukn	GAMA	1
26S40E30K02	IWVWD 09 (Abandoned)	11/9/1978	240	Ukn	GAMA	1
26S40E30K02	IWVWD 09 (Abandoned)	7/9/1982	270	Ukn	GAMA	1
26S40E30K02	IWVWD 09 (Abandoned)	1/22/1985	263	Lab	GAMA	1
26S40E30K02	IWVWD 09 (Abandoned)	1/14/1988	539	Lab	GAMA	1
26S40E30K02	IWVWD 09 (Abandoned)	6/29/1989	244	Lab	GAMA	1
26S40E30K02	IWVWD 09 (Abandoned)	2/2/1990	217	Lab	GAMA	1
26S40E30K02	IWVWD 09 (Abandoned)	1/22/1991	238	Lab	GAMA	1
26S40E30K02	IWVWD 09 (Abandoned)	3/6/1992	181	Lab	GAMA	1
26S40E30K02	IWVWD 09 (Abandoned)	4/13/1994	215	Lab	GAMA	1
26S40E30K02	IWVWD 09 (Abandoned)	2/15/1995	224	Lab	GAMA	1
26S40E30K02	IWVWD 09 (Abandoned)	1/24/1996	218	Lab	GAMA	1
26S40E30K02	IWVWD 09 (Abandoned)	1/13/1997	287	Lab	GAMA	1
26S40E30K02	IWVWD 09 (Abandoned)	1/26/1998	178	Lab	GAMA	1
26S40E30K02	IWVWD 09 (Abandoned)	9/9/1998	218	Lab	GAMA	1
26S40E30K02	IWVWD 09 (Abandoned)	9/15/1999	212	Lab	GAMA	1
26S40E30K02	IWVWD 09 (Abandoned)	8/7/2000	217	Lab	GAMA	1
26S40E30K02	IWVWD 09 (Abandoned)	8/21/2001	220	Lab	GAMA	1
26S40E30K02	IWVWD 09 (Abandoned)	8/1/2002	240	Lab	GAMA	1
26S40E30K02	IWVWD 09 (Abandoned)	3/31/1970	246	Lab	GAMA-USGS	1
26S40E30K03	IWVWD Well 10	4/4/2007	280	Lab	FR: AB	1
26S40E30K03	IWVWD Well 10	10/24/1974	238	Ukn	GAMA	1

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min	1/26/1920	100
max	3/5/2019	232000
count	2,044	

Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
26S40E30K03	IWVWD Well 10	6/4/1975	304	Ukn	GAMA	1
26S40E30K03	IWVWD Well 10	3/23/1977	317	Ukn	GAMA	1
26S40E30K03	IWVWD Well 10	11/9/1978	350	Ukn	GAMA	1
26S40E30K03	IWVWD Well 10	5/1/1980	330	Ukn	GAMA	1
26S40E30K03	IWVWD Well 10	7/30/1981	255	Ukn	GAMA	1
26S40E30K03	IWVWD Well 10	7/9/1982	377	Ukn	GAMA	1
26S40E30K03	IWVWD Well 10	11/12/1983	267	Ukn	GAMA	1
26S40E30K03	IWVWD Well 10	1/22/1985	323	Lab	GAMA	1
26S40E30K03	IWVWD Well 10	1/7/1988	286	Lab	GAMA	1
26S40E30K03	IWVWD Well 10	1/14/1988	532	Lab	GAMA	1
26S40E30K03	IWVWD Well 10	12/20/1989	377	Lab	GAMA	1
26S40E30K03	IWVWD Well 10	1/22/1991	256	Lab	GAMA	1
26S40E30K03	IWVWD Well 10	3/6/1992	234	Lab	GAMA	1
26S40E30K03	IWVWD Well 10	10/8/1992	232	Lab	GAMA	1
26S40E30K03	IWVWD Well 10	1/22/1993	226	Lab	GAMA	1
26S40E30K03	IWVWD Well 10	2/2/1994	214	Lab	GAMA	1
26S40E30K03	IWVWD Well 10	2/15/1995	234	Lab	GAMA	1
26S40E30K03	IWVWD Well 10	1/24/1996	245	Lab	GAMA	1
26S40E30K03	IWVWD Well 10	1/13/1997	266	Lab	GAMA	1
26S40E30K03	IWVWD Well 10	1/26/1998	248	Lab	GAMA	1
26S40E30K03	IWVWD Well 10	9/9/1998	191	Lab	GAMA	1
26S40E30K03	IWVWD Well 10	9/15/1999	235	Lab	GAMA	1
26S40E30K03	IWVWD Well 10	8/7/2000	217	Lab	GAMA	1
26S40E30K03	IWVWD Well 10	8/21/2001	220	Lab	GAMA	1
26S40E30K03	IWVWD Well 10	8/1/2002	240	Lab	GAMA	1
26S40E30K03	IWVWD Well 10	9/10/2003	290	Lab	GAMA	1
26S40E30K03	IWVWD Well 10	8/12/2004	260	Lab	GAMA	1
26S40E30K03	IWVWD Well 10	3/29/2005	260	Lab	GAMA	1
26S40E30K03	IWVWD Well 10	4/1/2008	280	Lab	GAMA	1
26S40E30K03	IWVWD Well 10	4/5/2011	260	Lab	GAMA	1
26S40E30K03	IWVWD Well 10	7/11/2013	253	Ukn	GAMA	1
26S40E30K03	IWVWD Well 10	5/27/2014	210	Lab	GAMA	1
26S40E30K03	IWVWD Well 10	5/23/2017	250	Lab	GAMA	1
26S40E30K04	IWVWD Well 09A	7/16/2003	290	Lab	GAMA	1
26S40E30K04	IWVWD Well 09A	8/12/2004	280	Lab	GAMA	1
26S40E30K04	IWVWD Well 09A	3/29/2005	310	Lab	GAMA	1
26S40E30K04	IWVWD Well 09A	6/20/2006	416	Ukn	GAMA	1
26S40E30K04	IWVWD Well 09A	3/31/2008	440	Lab	GAMA	1
26S40E30K04	IWVWD Well 09A	6/17/2008	290	Lab	GAMA	1
26S40E30K04	IWVWD Well 09A	4/5/2011	300	Lab	GAMA	1
26S40E30K04	IWVWD Well 09A	5/27/2014	290	Lab	GAMA	1
26S40E30K04	IWVWD Well 09A	5/23/2017	340	Lab	GAMA	1
26S40E31D01	HOPPER	11/27/1981	355	Ukn	H-WQ	2
26S40E31D01	HOPPER	9/30/1997	228	Ukn	KCWA WQ	3
26S40E31J01		3/13/2001	270	Ukn	H-WQ	2
26S40E31K01	BURNS	10/22/2002	520	Ukn	H-WQ	2

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count	2,044	

Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
26S40E31Q01		3/20/2007	410	Ukn	H-WQ	2
26S40E32D01	USGS-353808117421501	4/30/1946	162	Lab	GAMA-USGS	1
26S40E32D01	USGS-353808117421501	9/24/1946	160	Lab	GAMA-USGS	1
26S40E32D01	USGS-353808117421501	7/10/1953	178	Calc	Moyle	1
26S40E32E01		7/9/1953	249	Calc	Moyle	1
26S40E32E02	USGS-353800117420801	6/17/1972	306	Lab	W	1
26S40E32E06		7/27/2010	160	Ukn	H-WQ	2
26S40E32F	IWVWD Well 12 (Abandoned)	1/22/1985	293	Lab	GAMA	1
26S40E32F	IWVWD Well 12 (Abandoned)	1/7/1988	279	Lab	GAMA	1
26S40E32F	IWVWD Well 12 (Abandoned)	12/20/1989	220	Lab	GAMA	1
26S40E32F	IWVWD Well 12 (Abandoned)	1/22/1991	260	Lab	GAMA	1
26S40E32F	IWVWD Well 12 (Abandoned)	3/6/1992	208	Lab	GAMA	1
26S40E32F	IWVWD Well 12 (Abandoned)	10/8/1992	195	Lab	GAMA	1
26S40E32F	IWVWD Well 12 (Abandoned)	1/21/1993	223	Lab	GAMA	1
26S40E32F	IWVWD Well 12 (Abandoned)	3/14/1994	198	Lab	GAMA	1
26S40E32F	IWVWD Well 12 (Abandoned)	2/15/1995	255	Lab	GAMA	1
26S40E32F	IWVWD Well 12 (Abandoned)	1/24/1996	252	Lab	GAMA	1
26S40E32F	IWVWD Well 12 (Abandoned)	1/13/1997	274	Lab	GAMA	1
26S40E32F	IWVWD Well 12 (Abandoned)	1/26/1998	181	Lab	GAMA	1
26S40E32F	IWVWD Well 12 (Abandoned)	9/8/1998	177	Lab	GAMA	1
26S40E32F	IWVWD Well 12 (Abandoned)	9/15/1999	229	Lab	GAMA	1
26S40E32F	IWVWD Well 12 (Abandoned)	8/7/2000	194	Lab	GAMA	1
26S40E32F01	IWVWD Well 13	5/28/1987	446	Calc	B&S	1
26S40E32F01	IWVWD Well 13	1/7/1988	561	Lab	B&S	1
26S40E32F01	IWVWD Well 13	1/22/1985	507	Lab	GAMA	1
26S40E32F01	IWVWD Well 13	12/20/1989	330	Lab	GAMA	1
26S40E32F01	IWVWD Well 13	1/23/1991	439	Lab	GAMA	1
26S40E32F01	IWVWD Well 13	3/6/1992	399	Lab	GAMA	1
26S40E32F01	IWVWD Well 13	10/26/1992	751	Lab	GAMA	1
26S40E32F01	IWVWD Well 13	11/19/1992	486	Lab	GAMA	1
26S40E32F01	IWVWD Well 13	12/17/1992	534	Lab	GAMA	1
26S40E32F01	IWVWD Well 13	1/21/1993	412	Lab	GAMA	1
26S40E32F01	IWVWD Well 13	2/3/1994	418	Lab	GAMA	1
26S40E32F01	IWVWD Well 13	2/15/1995	506	Lab	GAMA	1
26S40E32F01	IWVWD Well 13	1/24/1996	483	Lab	GAMA	1
26S40E32F01	IWVWD Well 13	1/13/1997	807	Lab	GAMA	1

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max	3/5/2019	232000
count	2,044	

Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
26S40E32F01	IWVWD Well 13	1/26/1998	633	Lab	GAMA	1
26S40E32F01	IWVWD Well 13	9/8/1998	433	Lab	GAMA	1
26S40E32F01	IWVWD Well 13	9/15/1999	441	Lab	GAMA	1
26S40E32F01	IWVWD Well 13	8/7/2000	485	Lab	GAMA	1
26S40E32F01	IWVWD Well 13	8/21/2001	460	Lab	GAMA	1
26S40E32F01	IWVWD Well 13	8/1/2002	420	Lab	GAMA	1
26S40E32F01	IWVWD Well 13	9/10/2003	530	Lab	GAMA	1
26S40E32F01	IWVWD Well 13	8/12/2004	490	Lab	GAMA	1
26S40E32F01	IWVWD Well 13	3/29/2005	600	Lab	GAMA	1
26S40E32F01	IWVWD Well 13	4/1/2008	670	Lab	GAMA	1
26S40E32F01	IWVWD Well 13	4/5/2011	570	Lab	GAMA	1
26S40E32F01	IWVWD Well 13	5/27/2014	890	Lab	GAMA	1
26S40E32F01	IWVWD Well 13	5/23/2017	890	Lab	GAMA	1
26S40E32K01	IWVWD Well 11	1/7/1988	268	Lab	B&S	1
26S40E32K01	IWVWD Well 11	4/4/2007	470	Lab	FR: AB	1
26S40E32K01	IWVWD Well 11	5/1/1980	260	Ukn	GAMA	1
26S40E32K01	IWVWD Well 11	6/26/1981	410	Ukn	GAMA	1
26S40E32K01	IWVWD Well 11	7/9/1982	353	Ukn	GAMA	1
26S40E32K01	IWVWD Well 11	11/22/1983	217	Ukn	GAMA	1
26S40E32K01	IWVWD Well 11	1/22/1985	463	Lab	GAMA	1
26S40E32K01	IWVWD Well 11	12/20/1989	434	Lab	GAMA	1
26S40E32K01	IWVWD Well 11	1/22/1991	409	Lab	GAMA	1
26S40E32K01	IWVWD Well 11	3/6/1992	393	Lab	GAMA	1
26S40E32K01	IWVWD Well 11	10/8/1992	378	Lab	GAMA	1
26S40E32K01	IWVWD Well 11	1/22/1993	220	Lab	GAMA	1
26S40E32K01	IWVWD Well 11	2/3/1994	400	Lab	GAMA	1
26S40E32K01	IWVWD Well 11	2/15/1995	221	Lab	GAMA	1
26S40E32K01	IWVWD Well 11	1/24/1996	302	Lab	GAMA	1
26S40E32K01	IWVWD Well 11	1/13/1997	404	Lab	GAMA	1
26S40E32K01	IWVWD Well 11	1/26/1998	399	Lab	GAMA	1
26S40E32K01	IWVWD Well 11	9/8/1998	386	Lab	GAMA	1
26S40E32K01	IWVWD Well 11	9/15/1999	392	Lab	GAMA	1
26S40E32K01	IWVWD Well 11	8/7/2000	252	Lab	GAMA	1
26S40E32K01	IWVWD Well 11	8/21/2001	320	Lab	GAMA	1
26S40E32K01	IWVWD Well 11	8/1/2002	390	Lab	GAMA	1
26S40E32K01	IWVWD Well 11	9/10/2003	290	Lab	GAMA	1
26S40E32K01	IWVWD Well 11	8/12/2004	430	Lab	GAMA	1
26S40E32K01	IWVWD Well 11	3/29/2005	440	Lab	GAMA	1
26S40E32K01	IWVWD Well 11	4/1/2008	530	Lab	GAMA	1
26S40E32K01	IWVWD Well 11	4/5/2011	500	Lab	GAMA	1
26S40E32K01	IWVWD Well 11	5/27/2014	500	Lab	GAMA	1
26S40E32K01	IWVWD Well 11	5/23/2017	530	Lab	GAMA	1
26S40E32K01	IWVWD Well 11	3/19/1993	240	Lab	H	1
26S40E32K02	26S40E32K002M	5/1/1980	290	Ukn	GAMA	1
26S40E32K02	26S40E32K002M	6/26/1981	270	Ukn	GAMA	1
26S40E32K02	26S40E32K002M	11/12/1983	297	Ukn	GAMA	1

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Sample Date	1/26/1920	3/5/2019	2,044
TDS	100	232000	

Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
26S40E33A02		6/1/1953	215	Calc	Moyle	1
26S40E33P01	IWVWD 07 (Destroyed)	8/1/1986	674	Lab	GAMA	1
26S40E33P01	IWVWD 07 (Destroyed)	6/29/1989	378	Lab	GAMA	1
26S40E33P01	IWVWD 07 (Destroyed)	1/23/1991	360	Lab	GAMA	1
26S40E33P01	IWVWD 07 (Destroyed)	3/6/1992	377	Lab	GAMA	1
26S40E33P01	IWVWD 07 (Destroyed)	1/20/1993	387	Lab	GAMA	1
26S40E33P01	IWVWD 07 (Destroyed)	2/3/1994	373	Lab	GAMA	1
26S40E33P01	IWVWD 07 (Destroyed)	2/16/1995	403	Lab	GAMA	1
26S40E33P01	IWVWD 07 (Destroyed)	1/24/1996	401	Lab	GAMA	1
26S40E33P01	IWVWD 07 (Destroyed)	1/13/1997	460	Lab	GAMA	1
26S40E33P01	IWVWD 07 (Destroyed)	2/24/1998	480	Lab	GAMA	1
26S40E33P01	IWVWD 07 (Destroyed)	3/17/1998	475	Lab	GAMA	1
26S40E33P01	IWVWD 07 (Destroyed)	9/8/1998	476	Lab	GAMA	1
26S40E33P01	IWVWD 07 (Destroyed)	9/15/1999	519	Lab	GAMA	1
26S40E33P01	IWVWD 07 (Destroyed)	8/7/2000	539	Lab	GAMA	1
26S40E33P01	IWVWD 07 (Destroyed)	8/21/2001	560	Lab	GAMA	1
26S40E33P01	IWVWD 07 (Destroyed)	8/1/2002	570	Lab	GAMA	1
26S40E33P01	IWVWD 07 (Destroyed)	9/10/2003	680	Lab	GAMA	1
26S40E33P01	IWVWD 07 (Destroyed)	8/12/2004	630	Lab	GAMA	1
26S40E33P01	IWVWD 07 (Destroyed)	2/7/1945	346	Lab	GAMA-USGS	1
26S40E33P01	IWVWD 07 (Destroyed)	1/1/1945	306	Calc	Moyle	1
26S40E33P01	IWVWD 07 (Destroyed)	6/1/1953	280	Calc	Moyle	1
26S40E33P02	USGS-353724117404302	2/7/1945	735	Lab	GAMA-USGS	1
26S40E33P02	USGS-353724117404302	1/8/1951	303	Lab	GAMA-USGS	1
26S40E33P02	USGS-353724117404302	11/19/1959	257	Lab	GAMA-USGS	1
26S40E33P02	USGS-353724117404302	3/31/1970	349	Lab	GAMA-USGS	1
26S40E33P02	USGS-353724117404302	1/1/1945	670	Calc	Moyle	1
26S40E33P03	USGS-353725117405101	4/30/1946	372	Lab	GAMA-USGS	1
26S40E33P03	USGS-353725117405101	9/25/1946	330	Lab	GAMA-USGS	1
26S40E33P03	USGS-353725117405101	7/14/1967	283	Lab	GAMA-USGS	1
26S40E33P04	RC HGTS WELL #7	5/28/1987	343	Calc	B&M	1
26S40E33P04	RC HGTS WELL #7	1/17/1989	353	Calc	B&S	1
26S40E33P04	RC HGTS WELL #7	3/23/1977	324	Ukn	GAMA	1
26S40E33P04	RC HGTS WELL #7	11/13/1978	290	Ukn	GAMA	1
26S40E33P04	RC HGTS WELL #7	5/1/1980	370	Ukn	GAMA	1
26S40E33P04	RC HGTS WELL #7	6/26/1981	440	Ukn	GAMA	1
26S40E33P04	RC HGTS WELL #7	7/30/1981	440	Ukn	GAMA	1
26S40E33P04	RC HGTS WELL #7	7/9/1982	220	Ukn	GAMA	1
26S40E33P04	RC HGTS WELL #7	11/22/1983	330	Ukn	GAMA	1
26S40E33P04	RC HGTS WELL #7	4/17/1992	420	Ukn	GAMA	1
26S40E33P04	RC HGTS WELL #7	4/6/1993	445	Ukn	GAMA	1
26S40E33P04	RC HGTS WELL #7	5/18/1964	306	Lab	GAMA-USGS	1
26S40E33P04	RC HGTS WELL #7	3/31/1970	320	Lab	GAMA-USGS	1
26S40E33P04	RC HGTS WELL #7	8/1/1986	674	Ukn	H-WQ	2
26S40E34N	IWVWD Well 19 (Destroyed)	1/22/1991	458	Lab	GAMA	1

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Sample Date	1/26/1920	3/5/2019	2,044
TDS	100	232000	

Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
26S40E34N	IWVWD Well 19 (Destroyed)	3/6/1992	408	Lab	GAMA	1
26S40E34N	IWVWD Well 19 (Destroyed)	1/20/1993	411	Lab	GAMA	1
26S40E34N	IWVWD Well 19 (Destroyed)	4/14/1993	419	Lab	GAMA	1
26S40E34N	IWVWD Well 19 (Destroyed)	4/29/1993	410	Lab	GAMA	1
26S40E34N	IWVWD Well 19 (Destroyed)	2/3/1994	413	Lab	GAMA	1
26S40E34N	IWVWD Well 19 (Destroyed)	2/15/1995	453	Lab	GAMA	1
26S40E34N	IWVWD Well 19 (Destroyed)	1/24/1996	457	Lab	GAMA	1
26S40E34N	IWVWD Well 19 (Destroyed)	1/13/1997	438	Lab	GAMA	1
26S40E34N	IWVWD Well 19 (Destroyed)	2/6/1998	496	Lab	GAMA	1
26S40E34N	IWVWD Well 19 (Destroyed)	9/8/1998	505	Lab	GAMA	1
26S40E34N	IWVWD Well 19 (Destroyed)	9/15/1999	534	Lab	GAMA	1
26S40E34N	IWVWD Well 19 (Destroyed)	8/7/2000	596	Lab	GAMA	1
26S40E34N	IWVWD Well 19 (Destroyed)	8/21/2001	650	Lab	GAMA	1
26S40E34N	IWVWD Well 19 (Destroyed)	8/1/2002	570	Lab	GAMA	1
26S40E34N	IWVWD Well 19 (Destroyed)	9/10/2003	11000	Lab	GAMA	1
26S40E34N	IWVWD Well 19 (Destroyed)	8/12/2004	640	Lab	GAMA	1
26S40E34N	IWVWD Well 19 (Destroyed)	3/29/2005	700	Lab	GAMA	1
26S40E34N	IWVWD Well 19 (Destroyed)	4/1/2008	720	Lab	GAMA	1
26S40E34N01		7/31/1978	400	Calc	B	1
26S40E34N01		3/29/1980	440	Calc	B	1
26S40E34N01		1/18/1989	442	Calc	B&M	1
26S40E34N01		9/10/2003	11000	Ukn	H-WQ	2
26S40E34N01		6/2/1953	225	Calc	Moyle	1
26S40E34N01		4/6/1955	206	Calc	Moyle	1
26S40E34N01		10/17/1956	221	Calc	Moyle	1
26S40E34N01		9/18/1957	228	Calc	Moyle	1
26S40E34N01		9/18/1958	258	Calc	Moyle	1
26S40E34N01		11/20/1959	292	Calc	Moyle	1
26S40E34N01		8/11/1960	324	Calc	Moyle	1
26S40E34N01		4/30/1946	259	Lab	USGS	1
26S40E34N01		9/24/1946	260	Lab	USGS	1
26S40E34N01		8/1/1961	375	Lab	USGS	1
26S40E34N01		7/18/1962	346	Lab	USGS	1
26S40E34N01		10/14/1963	375	Lab	USGS	1

Table 2: IWV TDS Data

Sample Dates in red indicate only sample month/year is known

min	1/26/1920	100
max	3/5/2019	232000
count	2,044	

Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
26S40E34N01		9/15/1964	343	Lab	USGS	1
26S40E34N01		6/21/1965	328	Lab	USGS	1
26S40E34N01		5/16/1966	296	Lab	USGS	1
26S40E34N01		9/7/1966	316	Lab	USGS	1
26S40E34N01		10/23/1967	268	Lab	USGS	1
26S40E34N01		6/21/1968	352	Lab	USGS	1
26S40E34N01		11/4/1968	292	Lab	USGS	1
26S40E34N01		10/20/1969	324	Lab	USGS	1
26S40E34N01		6/1/1970	360	Lab	USGS	1
26S40E34N01		10/20/1970	349	Calc	USGS	1
26S40E34N01		6/23/1971	277	Lab	USGS	1
26S40E34N01		10/27/1971	391	Lab	USGS	1
26S40E34N01		6/6/1972	321	Calc	W	1
26S40E34R01	USGS-353725117391301	5/1/1946	732	Lab	GAMA-USGS	1
26S40E34R01	USGS-353725117391301	9/24/1946	800	Lab	GAMA-USGS	1
26S40E35H	RLS22-MW02	5/14/1996	1080	Lab	Tri	1
26S40E35H01		5/28/1987	662	Calc	B&M	1
26S40E35H02		8/6/1996	2200	Ukn	AB	2
26S40E35H02		7/8/1988	285	Calc	B&M	1
26S40E35H02		8/5/1996	2200	Lab	H96	1
26S40E35Q01	USGS-353725117382701	9/24/1946	355	Lab	GAMA-USGS	1
26S40E35Q02	S. Boundary	1/19/1989	894	Calc	B&M	1
26S40E35Q02	S. Boundary	3/10/1993	670	Lab	H	1
26S40E35Q02	S. Boundary	6/16/1972	1050	Lab	W	1
26S40E36A01	USGS-353801117370701	6/29/1978	730	Calc	B	1
26S40E36A01	USGS-353801117370701	6/6/1979	750	Calc	B	1
26S40E36A01	USGS-353801117370701	5/27/1980	770	Calc	B	1
26S40E36A01	USGS-353801117370701	6/14/1982	970	Calc	B	1
26S40E36A01	USGS-353801117370701	5/28/1987	1310	Calc	B&S	1
26S40E36A01	USGS-353801117370701	3/6/1974	462	Ukn	GAMA	1
26S40E36A01	USGS-353801117370701	3/25/1975	464	Ukn	GAMA	1
26S40E36A01	USGS-353801117370701	8/19/1976	549	Ukn	GAMA	1
26S40E36A01	USGS-353801117370701	6/17/1985	1140	Ukn	GAMA	1
26S40E36A01	USGS-353801117370701	3/8/1954	1620	Calc	Moyle	1
26S40E36K01	26S40E36K001M	3/30/1982	210	Ukn	GAMA	1
26S41E06P01	TTIWV-MW09	12/12/2002	7190	Lab	Tri	1
26S41E06P01	TTIWV-MW09	2/16/2002	5980	Lab	TTEMI	1
26S41E07D01		6/29/1978	15000	Calc	B	1
26S41E07D01		5/17/1979	15000	Calc	B	1
26S41E07D01		5/21/1980	15000	Calc	B	1
26S41E07D01		3/19/1993	5650	Lab	H	1
26S41E07E01		6/29/1978	4500	Calc	B	1
26S41E07E01		5/17/1979	4600	Calc	B	1
26S41E07E01		5/20/1980	4200	Calc	B	1
26S41E07E01		6/10/1982	5100	Calc	B	1
26S41E07E01		7/9/1953	838	Calc	Moyle	1

Table 2: IWV TDS Data

Sample Dates in red indicate only sample month/year is known

min	1/26/1920	100
max	3/5/2019	232000
count	2,044	

Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
26S41E07G01		6/29/1978	7200	Calc	B	1
26S41E07G01		5/17/1979	7100	Calc	B	1
26S41E07G01		7/9/1953	7890	Calc	Moyle	1
27S37E30K	Horse Canyon Well	1/15/1996	348	Ukn	AB	2
27S37E30K	Horse Canyon Well	4/23/1996	355	Ukn	AB	2
27S37E30K	Horse Canyon Well	7/9/2007	360	Lab	FR: AB	1
27S38E01G01	USGS-353703117501601	9/17/1985	356	Ukn	GAMA	1
27S38E01G01	USGS-353703117501601	11/9/1985	358	Ukn	GAMA	1
27S38E02B01		3/17/1993	310	Lab	H	1
27S38E02C01	USBR-02-S	6/4/1996	240	Ukn	AB	2
27S38E02C01	USBR-02-S	6/4/1996	450	Lab	H96	1
27S38E02C01	USBR-02-S	3/17/1993	310	Ukn	H-WQ	2
27S38E02C01	USBR-02-S	10/20/2004	303	Ukn	KCWA WQ	3
27S38E02C02	USBR-02-M	6/4/1996	330	Lab	H96	1
27S38E02C02	USBR-02-M	10/20/2004	358	Ukn	KCWA WQ	3
27S38E02C02	USBR-02-M	10/30/1990	240	Lab	USBR	1
27S38E02C03	USBR-02-D	6/4/1996	500	Lab	H96	1
27S38E02C03	USBR-02-D	10/20/2004	164	Ukn	KCWA WQ	3
27S38E02C03	USBR-02-D	10/30/1990	354	Lab	USBR	1
27S38E09C01	AB303-03	2/3/2007	460	Lab	FR: AB	1
27S38E09Q01	Father Crowley E.	2/2/2007	430	Lab	FR: AB	1
27S38E09Q02	Father Crowley W.	2/2/2007	980	Lab	FR: AB	1
27S38E10C02		2/3/2007	300	Lab	FR: AB	1
27S38E13A01	SWCB01	3/8/1999	360	Ukn	KCWA WQ	3
27S38E13A02	AB303-01	8/27/2007	300	Lab	FR: AB	1
27S38E14M01		10/11/2007	290	Lab	FR: AB	1
27S38E17A01		10/11/2007	390	Lab	FR: AB	1
27S38E21L01	AB303-05	8/27/2007	510	Lab	FR: AB	1
27S38E23F01	USBR-01-S	3/17/1993	370	Lab	H	1
27S38E23F01	USBR-01-S	6/4/1996	270	Lab	H96	1
27S38E23F01	USBR-01-S	3/18/1993	370	Ukn	KCWA WQ	3
27S38E23F01	USBR-01-S	5/14/2004	282	Ukn	KCWA WQ	3
27S38E23F01	USBR-01-S	3/2/1991	213	Lab	USBR	1
27S38E23F02	USBR-01-S/M	6/4/1996	230	Lab	H96	1
27S38E23F02	USBR-01-S/M	5/14/2004	206	Ukn	KCWA WQ	3
27S38E23F02	USBR-01-S/M	3/2/1991	244	Lab	USBR	1
27S38E23F03	USBR-01-M/D	6/4/1996	230	Lab	H96	1
27S38E23F03	USBR-01-M/D	5/14/2004	246	Ukn	KCWA WQ	3
27S38E23F03	USBR-01-M/D	3/2/1991	354	Lab	USBR	1
27S38E23F04	USBR-01-D	8/27/2007	190	Lab	FR: AB	1
27S38E23F04	USBR-01-D	6/4/1996	240	Lab	H96	1
27S38E23F04	USBR-01-D	5/14/2004	254	Ukn	L/H-WQ	2
27S38E23F04	USBR-01-D	3/2/1991	285	Lab	USBR	1
27S38E23R01		3/29/1960	262	Lab	Moyle	1
27S38E27M01	AB303-07	10/11/2007	260	Lab	FR: AB	1
27S38E28R01	USGS-353305117525301	3/22/1946	380	Lab	GAMA-USGS	1

Table 2: IWV TDS Data

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min	1/26/1920	100
max	3/5/2019	232000
count	2,044	

Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
27S38E28R01	USGS-353305117525301	3/29/1960	262	Lab	GAMA-USGS	1
27S38E31D01	27S38E31D001M	4/20/1962	205	Lab	GAMA-USGS	1
27S38E31D01	27S38E31D001M	6/5/1953	181	Calc	Moyle	1
27S39E02K	ASPHALT CONST. CO	3/7/1990	240	Ukn	KCWA WQ	3
27S39E02K	ASPHALT CONST. CO	10/29/2012	350	Ukn	KCWA WQ	3
27S39E02K	ASPHALT CONST. CO	6/25/2013	350	Ukn	KCWA WQ	3
27S39E03B01	Eugene Curry	3/30/1986	253	Ukn	H-WQ	2
27S39E03C01	Farrell	10/29/2012	300	Ukn	H-WQ	2
27S39E03C01	Farrell	5/6/2013	280	Ukn	KCWA WQ	3
27S39E03C02	Dewhurst	3/6/2001	260	Ukn	H-WQ	2
27S39E04C01	Padgett Well	5/23/2005	274	Ukn	H-WQ	2
27S39E07R01	INYO	3/22/1946	298	Lab	B&S	1
27S39E07R01	INYO	3/14/1955	275	Lab	B&S	1
27S39E07R01	INYO	3/29/1960	271	Lab	B&S	1
27S39E07R01	INYO	8/31/1988	259	Lab	B&S	1
27S39E08A02	IWVWD Well 34	2/13/2007	290	Lab	GAMA	1
27S39E08A02	IWVWD Well 34	2/14/2012	280	Lab	GAMA	1
27S39E08A02	IWVWD Well 34	5/27/2014	290	Lab	GAMA	1
27S39E08A02	IWVWD Well 34	5/23/2017	240	Lab	GAMA	1
27S39E08E01		3/17/1993	230	Lab	H	1
27S39E08L01	IWVWD Well 33	8/21/2001	260	Lab	GAMA	1
27S39E08L01	IWVWD Well 33	8/1/2002	250	Lab	GAMA	1
27S39E08L01	IWVWD Well 33	9/10/2003	310	Lab	GAMA	1
27S39E08L01	IWVWD Well 33	8/12/2004	290	Lab	GAMA	1
27S39E08L01	IWVWD Well 33	3/29/2005	280	Lab	GAMA	1
27S39E08L01	IWVWD Well 33	4/1/2008	280	Lab	GAMA	1
27S39E08L01	IWVWD Well 33	4/5/2011	260	Lab	GAMA	1
27S39E08L01	IWVWD Well 33	5/27/2014	310	Lab	GAMA	1
27S39E08L01	IWVWD Well 33	7/5/2017	250	Lab	GAMA	1
27S39E08M01	TEST WELL	7/2/1987	274	Lab	B&S	1
27S39E08M01	TEST WELL	7/6/1987	262	Lab	B&S	1
27S39E08M01	TEST WELL	5/30/1996	140	Lab	H96	1
27S39E08M04	IWVWD Well 18	8/21/2001	250	Lab	GAMA	1
27S39E08M04	IWVWD Well 18	8/1/2002	240	Lab	GAMA	1
27S39E08M04	IWVWD Well 18	9/10/2003	300	Lab	GAMA	1
27S39E08M04	IWVWD Well 18	10/19/2004	270	Lab	GAMA	1
27S39E08M04	IWVWD Well 18	3/29/2005	270	Lab	GAMA	1
27S39E08M04	IWVWD Well 18	4/1/2008	290	Lab	GAMA	1
27S39E08M04	IWVWD Well 18	4/5/2011	270	Lab	GAMA	1
27S39E08M04	IWVWD Well 18	5/27/2014	280	Lab	GAMA	1
27S39E08M04	IWVWD Well 18	5/23/2017	260	Lab	GAMA	1
27S39E11D01	USBR-03-S	6/4/1996	300	Ukn	AB	2
27S39E11D01	USBR-03-S	6/25/1996	290	Lab	H96	1
27S39E11D01	USBR-03-S	3/18/1991	360	Lab	USBR	1
27S39E11D02	USBR-03-M	6/25/1996	6500	Lab	H96	1
27S39E11D02	USBR-03-M	3/18/1991	955	Lab	USBR	1

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count	2,044	

Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
27S39E11D03	USBR-03-D	6/25/1996	9400	Lab	H96	1
27S39E11D03	USBR-03-D	3/18/1991	6634	Lab	USBR	1
27S39E12M01		6/1/1987	365	Lab	B&S	1
27S39E12M01		9/1/1987	340	Lab	B&S	1
27S39E19E01	IWV WD MW03	3/17/1993	240	Lab	H	1
27S39E19E01	IWV WD MW03	3/18/1993	240	Ukn	KCWA WQ	3
27S40E01G02	USGS-353657117372602	9/23/1946	1540	Lab	GAMA-USGS	1
27S40E01K01	USGS-353652117372701	9/3/1929	983	Lab	GAMA-USGS	1
27S40E01K01	USGS-353652117372701	1/1/1929	920	Calc	Moyle	1
27S40E01K02	George Air Corridor	9/18/1986	452	Ukn	KCWA WQ	3
27S40E01K02	George Air Corridor	6/1/1953	1130	Calc	Moyle	1
27S40E01K02	George Air Corridor	6/17/1972	1510	Lab	W	1
27S40E01M01	USGS-353649117375001	5/1/1946	523	Lab	GAMA-USGS	1
27S40E01M01	USGS-353649117375001	9/23/1946	502	Lab	GAMA-USGS	1
27S40E01M01	USGS-353649117375001	6/4/1953	517	Calc	Moyle	1
27S40E01M02		7/8/1988	599	Calc	B&S	1
27S40E02A01	USGS-353708117380701	6/14/1972	1130	Lab	W	1
27S40E02F01	USGS-353701117384701	6/16/1972	374	Lab	W	1
27S40E02G01	USGS-353701117382601	6/15/1972	1880	Lab	W	1
27S40E02G03	USGS-353707117381801	7/8/1988	1350	Calc	B&M	1
27S40E02G03	USGS-353707117381801	4/12/1990	1420	Ukn	GAMA	1
27S40E02G03	USGS-353707117381801	3/14/1991	1160	Ukn	GAMA	1
27S40E02G03	USGS-353707117381801	4/16/1992	1120	Ukn	GAMA	1
27S40E02G03	USGS-353707117381801	4/6/1993	1040	Ukn	GAMA	1
27S40E02H01	USGS-353657117380101	6/30/1988	684	Calc	B&S	1
27S40E02H01	USGS-353657117380101	5/1/1975	617	Ukn	GAMA	1
27S40E02H01	USGS-353657117380101	6/18/1972	668	Lab	W	1
27S40E02J01	DMP Cemetery	6/28/1978	1100	Calc	B	1
27S40E02J01	DMP Cemetery	6/1/1979	1100	Calc	B	1
27S40E02J01	DMP Cemetery	5/23/1980	1100	Calc	B	1
27S40E02J01	DMP Cemetery	6/1/1987	1130	Calc	B&M	1
27S40E02J01	DMP Cemetery	6/30/1988	1160	Calc	B&S	1
27S40E02J01	DMP Cemetery	2/26/1968	1170	Ukn	GAMA	1
27S40E02J01	DMP Cemetery	4/3/1969	1110	Ukn	GAMA	1
27S40E02J01	DMP Cemetery	8/19/1976	1150	Ukn	GAMA	1
27S40E02J01	DMP Cemetery	3/6/1974	1130	Calc	GAMA-USGS	1
27S40E02J01	DMP Cemetery	3/25/1975	1120	Calc	GAMA-USGS	1
27S40E02J01	DMP Cemetery	3/7/1990	1026	Ukn	KCWA WQ	3
27S40E02J01	DMP Cemetery	6/17/1972	1230	Lab	W	1
27S40E02N01	USGS-353634117385401	4/27/1946	774	Lab	GAMA-USGS	1
27S40E03J01	USGS-353645117390901	3/2/1959	4780	Lab	GAMA-USGS	1
27S40E03P01	USGS-353630117394901	9/25/1946	2200	Lab	GAMA-USGS	1
27S40E03P01	USGS-353630117394901	6/1/1953	4340	Calc	Moyle	1
27S40E03P01	USGS-353630117394901	6/5/1953	4230	Calc	Moyle	1
27S40E03R01	USGS-353630117390901	6/29/1978	700	Calc	B	1
27S40E03R01	USGS-353630117390901	6/6/1979	820	Calc	B	1

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	count	2,044	

Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
27S40E03R01	USGS-353630117390901	5/27/1980	820	Calc	B	1
27S40E03R01	USGS-353630117390901	6/15/1982	920	Calc	B	1
27S40E03R01	USGS-353630117390901	8/19/1976	923	Ukn	GAMA	1
27S40E03R01	USGS-353630117390901	3/7/1974	469	Calc	GAMA-USGS	1
27S40E03R01	USGS-353630117390901	3/25/1975	660	Calc	GAMA-USGS	1
27S40E04B01	USGS-353720117402501	7/14/1967	640	Ukn	GAMA	1
27S40E04B02	USGS-353720117402502	5/29/1987	717	Calc	B&M	1
27S40E04B02	USGS-353720117402502	6/11/1987	676	Calc	B&S	1
27S40E04B02	USGS-353720117402502	6/1/1953	224	Ukn	GAMA	1
27S40E04B02	USGS-353720117402502	5/12/1965	435	Ukn	GAMA	1
27S40E04B02	USGS-353720117402502	7/14/1967	404	Ukn	GAMA	1
27S40E04B3	Searles Valley Minerals Op Well 02	6/11/1987	743	Lab	GAMA	1
27S40E04B3	Searles Valley Minerals Op Well 02	7/2/1992	851	Lab	GAMA	1
27S40E04B3	Searles Valley Minerals Op Well 02	4/4/1996	884	Lab	GAMA	1
27S40E04B3	Searles Valley Minerals Op Well 02	6/8/1999	936	Lab	GAMA	1
27S40E04B3	Searles Valley Minerals Op Well 02	3/19/2002	1000	Lab	GAMA	1
27S40E04B3	Searles Valley Minerals Op Well 02	6/4/2002	1000	Lab	GAMA	1
27S40E04B3	Searles Valley Minerals Op Well 02	9/11/2002	1100	Lab	GAMA	1
27S40E04B3	Searles Valley Minerals Op Well 02	12/17/2002	1100	Lab	GAMA	1
27S40E04B3	Searles Valley Minerals Op Well 02	3/11/2003	1100	Lab	GAMA	1
27S40E04B3	Searles Valley Minerals Op Well 02	3/16/2004	1400	Lab	GAMA	1
27S40E04B3	Searles Valley Minerals Op Well 02	9/7/2004	1200	Lab	GAMA	1
27S40E04B3	Searles Valley Minerals Op Well 02	12/14/2004	1100	Lab	GAMA	1
27S40E04B3	Searles Valley Minerals Op Well 02	3/1/2005	1100	Lab	GAMA	1
27S40E04B3	Searles Valley Minerals Op Well 02	6/14/2005	1100	Lab	GAMA	1
27S40E04B3	Searles Valley Minerals Op Well 02	9/13/2005	1200	Lab	GAMA	1
27S40E04B3	Searles Valley Minerals Op Well 02	9/20/2005	1100	Lab	GAMA	1
27S40E04B3	Searles Valley Minerals Op Well 02	12/13/2005	1000	Lab	GAMA	1
27S40E04B3	Searles Valley Minerals Op Well 02	2/28/2006	1100	Lab	GAMA	1
27S40E04B3	Searles Valley Minerals Op Well 02	6/13/2006	1000	Lab	GAMA	1
27S40E04B3	Searles Valley Minerals Op Well 02	9/5/2006	1100	Lab	GAMA	1
27S40E04B3	Searles Valley Minerals Op Well 02	12/5/2006	1100	Lab	GAMA	1

Table 2: IWV TDS Data

Sample Dates in red indicate	min	1/26/1920	100
only sample month/year is known	max	3/5/2019	232000
	count	2,044	

Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
27S40E04B3	Searles Valley Minerals Op Well 02	3/6/2007	700	Lab	GAMA	1
27S40E04B3	Searles Valley Minerals Op Well 02	9/4/2007	830	Lab	GAMA	1
27S40E04B3	Searles Valley Minerals Op Well 02	12/4/2007	1200	Lab	GAMA	1
27S40E04B3	Searles Valley Minerals Op Well 02	9/16/2008	1100	Lab	GAMA	1
27S40E04B3	Searles Valley Minerals Op Well 02	6/16/2009	1200	Lab	GAMA	1
27S40E04B3	Searles Valley Minerals Op Well 02	6/8/2010	1300	Lab	GAMA	1
27S40E04B3	Searles Valley Minerals Op Well 02	6/7/2011	1100	Lab	GAMA	1
27S40E04B3	Searles Valley Minerals Op Well 02	6/3/2014	1100	Lab	GAMA	1
27S40E04B3	Searles Valley Minerals Op Well 02	6/6/2017	1200	Lab	GAMA	1
27S40E04B3	Searles Valley Minerals Op Well 02	8/8/2017	1100	Lab	GAMA	1
27S40E04B3	Searles Valley Minerals Op Well 02	12/11/2018	1300	Lab	GAMA	1
27S40E04B3	Searles Valley Minerals Op Well 02	3/5/2019	1300	Lab	GAMA	1
27S40E04C01	USGS-353721117404001	5/22/1969	282	Ukn	GAMA	1
27S40E04C01	USGS-353721117404001	3/31/1970	347	Ukn	GAMA	1
27S40E04C01	USGS-353721117404001	11/19/1959	282	Lab	GAMA-USGS	1
27S40E04C02	USGS-353714117403901	11/19/1959	282	Ukn	GAMA	1
27S40E04C02	USGS-353714117403901	3/31/1970	342	Ukn	GAMA	1
27S40E04C02	USGS-353714117403901	3/23/1977	506	Ukn	GAMA	1
27S40E04C02	USGS-353714117403901	11/13/1978	510	Ukn	GAMA	1
27S40E04C02	USGS-353714117403901	12/27/1978	560	Ukn	GAMA	1
27S40E04C02	USGS-353714117403901	8/1/1986	899	Ukn	H-WQ	2
27S40E04E02		6/1/1953	232	Calc	Moyle	1
27S40E04F01	IWVWD 01 (RCH 01; Destroyed)	12/20/1989	499	Lab	GAMA	1
27S40E04F01	IWVWD 01 (RCH 01; Destroyed)	1/1/1949	276	Calc	Moyle	1
27S40E04F02	IWVWD 02 (RCH 02; Destroyed)	6/29/1989	360	Lab	GAMA	1
27S40E04F02	IWVWD 02 (RCH 02; Destroyed)	12/20/1989	499	Lab	GAMA	1
27S40E04F02	IWVWD 02 (RCH 02; Destroyed)	1/22/1991	360	Lab	GAMA	1
27S40E04F02	IWVWD 02 (RCH 02; Destroyed)	3/6/1992	344	Lab	GAMA	1
27S40E04F02	IWVWD 02 (RCH 02; Destroyed)	1/20/1993	336	Lab	GAMA	1
27S40E04F02	IWVWD 02 (RCH 02; Destroyed)	2/2/1994	337	Lab	GAMA	1
27S40E04F02	IWVWD 02 (RCH 02; Destroyed)	2/15/1995	341	Lab	GAMA	1
27S40E04F03	IWVWD 03 (Destroyed)	8/1/1986	899	Lab	GAMA	1

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	min	1/26/1920	100
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	count	2,044	

Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
27S40E04F03	IWVWD 03 (Destroyed)	6/29/1989	434	Lab	GAMA	1
27S40E04F03	IWVWD 03 (Destroyed)	2/2/1990	443	Lab	GAMA	1
27S40E04F03	IWVWD 03 (Destroyed)	1/22/1991	471	Lab	GAMA	1
27S40E04F03	IWVWD 03 (Destroyed)	3/6/1992	401	Lab	GAMA	1
27S40E04F03	IWVWD 03 (Destroyed)	1/20/1993	390	Lab	GAMA	1
27S40E04F04	IWVWD 04 (Destroyed)	8/1/1986	728	Lab	GAMA	1
27S40E04F04	IWVWD 04 (Destroyed)	6/29/1989	215	Lab	GAMA	1
27S40E04F04	IWVWD 04 (Destroyed)	2/2/1990	236	Lab	GAMA	1
27S40E04F04	IWVWD 04 (Destroyed)	3/6/1992	237	Lab	GAMA	1
27S40E04F04	IWVWD 04 (Destroyed)	1/22/1993	236	Lab	GAMA	1
27S40E04L01	USGS-353652117404201	11/9/1978	540	Ukn	GAMA	1
27S40E04L01	USGS-353652117404201	11/19/1959	277	Lab	GAMA-USGS	1
27S40E04L01	USGS-353652117404201	3/31/1970	338	Lab	GAMA-USGS	1
27S40E04L01	USGS-353652117404201	10/1/1971	397	Calc	GAMA-USGS	1
27S40E04L01	USGS-353652117404201	8/1/1986	728	Ukn	H-WQ	2
27S40E04L01	USGS-353652117404201	7/1/1950	303	Calc	Moyle	1
27S40E04L01	USGS-353652117404201	6/1/1953	358	Calc	Moyle	1
27S40E04L01	USGS-353652117404201	4/7/1955	317	Calc	Moyle	1
27S40E04L02	27S40E04L002M	7/9/1982	680	Ukn	GAMA	1
27S40E05C01	IWVWD Well 14 (RCH 13; Destroyed)	12/20/1989	390	Lab	GAMA	1
27S40E05C01	IWVWD Well 14 (RCH 13; Destroyed)	1/22/1991	400	Lab	GAMA	1
27S40E05C01	IWVWD Well 14 (RCH 13; Destroyed)	3/6/1992	365	Lab	GAMA	1
27S40E05C01	IWVWD Well 14 (RCH 13; Destroyed)	1/21/1993	349	Lab	GAMA	1
27S40E05C01	IWVWD Well 14 (RCH 13; Destroyed)	2/2/1994	339	Lab	GAMA	1
27S40E05C01	IWVWD Well 14 (RCH 13; Destroyed)	2/15/1995	364	Lab	GAMA	1
27S40E05C01	IWVWD Well 14 (RCH 13; Destroyed)	5/24/2002	1500	Lab	GAMA	1
27S40E05D	Searles Valley Minerals Op Well 04	6/4/2002	350	Lab	GAMA	1
27S40E05D	Searles Valley Minerals Op Well 04	9/20/2005	380	Lab	GAMA	1
27S40E05D	Searles Valley Minerals Op Well 04	9/16/2008	370	Lab	GAMA	1
27S40E05D	Searles Valley Minerals Op Well 04	6/16/2009	410	Lab	GAMA	1
27S40E05D	Searles Valley Minerals Op Well 04	6/7/2011	410	Lab	GAMA	1
27S40E05D	Searles Valley Minerals Op Well 04	6/3/2014	430	Lab	GAMA	1
27S40E05D	Searles Valley Minerals Op Well 04	6/6/2017	430	Lab	GAMA	1
27S40E05D	Searles Valley Minerals Op Well 04	8/8/2017	390	Lab	GAMA	1
27S40E05D01		5/29/1987	352	Calc	B&S	1

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	min	1/26/1920	100
	max	3/5/2019	232000
	count	2,044	

Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
27S40E05F	IWVWD 05 (RCH 07; Destroyed)	2/2/1990	519	Lab	GAMA	1
27S40E05F	IWVWD 05 (RCH 07; Destroyed)	3/6/1992	495	Lab	GAMA	1
27S40E05F	IWVWD 05 (RCH 07; Destroyed)	1/20/1993	482	Lab	GAMA	1
27S40E05F	IWVWD 05 (RCH 07; Destroyed)	2/2/1994	490	Lab	GAMA	1
27S40E05F	IWVWD 05 (RCH 07; Destroyed)	2/15/1995	474	Lab	GAMA	1
27S40E06D01	Dist. Well 12	3/10/1999	252	Ukn	AB	2
27S40E06D01	Dist. Well 12	5/28/1987	235	Lab	B&S	1
27S40E06D01	Dist. Well 12	1/7/1988	239	Lab	B&S	1
27S40E06D01	Dist. Well 12	1/22/1985	293	Ukn	KCWA WQ	3
27S40E06D01	Dist. Well 12	4/18/1986	275	Ukn	KCWA WQ	3
27S40E06D01	Dist. Well 12	12/20/1989	220	Ukn	KCWA WQ	3
27S40E06D01	Dist. Well 12	3/12/1990	212	Ukn	KCWA WQ	3
27S40E06D01	Dist. Well 12	1/22/1991	260	Ukn	KCWA WQ	3
27S40E06D01	Dist. Well 12	3/6/1992	208	Ukn	KCWA WQ	3
27S40E06D01	Dist. Well 12	10/8/1992	195	Ukn	KCWA WQ	3
27S40E06D01	Dist. Well 12	1/21/1993	223	Ukn	KCWA WQ	3
27S40E06D01	Dist. Well 12	3/14/1994	198	Ukn	KCWA WQ	3
27S40E06D01	Dist. Well 12	2/15/1995	255	Ukn	KCWA WQ	3
27S40E06D01	Dist. Well 12	1/24/1996	252	Ukn	KCWA WQ	3
27S40E06D01	Dist. Well 12	1/13/1997	274	Ukn	KCWA WQ	3
27S40E06D01	Dist. Well 12	1/26/1998	181	Ukn	KCWA WQ	3
27S40E06D01	Dist. Well 12	9/8/1998	177	Ukn	KCWA WQ	3
27S40E06D01	Dist. Well 12	9/15/1999	229	Ukn	KCWA WQ	3
27S40E06E02	TURNER #2	4/24/2007	300	Ukn	H-WQ	2
27S40E06F01	FRISBEE	10/6/1998	673	Ukn	H-WQ	2
27S40E06H01	USGS-353657117421901	6/2/1987	321	Calc	B&S	1
27S40E06H01	USGS-353657117421901	1/14/1988	318	Lab	B&S	1
27S40E06H01	USGS-353657117421901	2/19/1972	264	Lab	GAMA-USGS	1
27S40E06L01	27S40E06L001M	1/26/1983	357	Ukn	GAMA	1
27S40E06L01	27S40E06L001M	11/22/1983	267	Ukn	GAMA	1
27S40E06R	IWVWD Well 15 (RCH 12; Destroyed)	2/11/1988	740	Lab	GAMA	1
27S40E06R	IWVWD Well 15 (RCH 12; Destroyed)	2/2/1990	467	Lab	GAMA	1
27S40E06R	IWVWD Well 15 (RCH 12; Destroyed)	1/22/1991	537	Lab	GAMA	1
27S40E06R	IWVWD Well 15 (RCH 12; Destroyed)	3/6/1992	327	Lab	GAMA	1
27S40E06R	IWVWD Well 15 (RCH 12; Destroyed)	1/22/1993	620	Lab	GAMA	1
27S40E06R02		2/11/1988	760	Lab	B&S	1
27S40E07G01	USGS-353606117424601	8/11/1960	2040	Lab	Moyle	1
27S40E08A01	USGS-353629117411701	1/14/1988	398	Lab	B&S	1
27S40E08A01	USGS-353629117411701	10/25/1949	399	Lab	GAMA-USGS	1

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	min	max	count
Sample Date	1/26/1920	3/5/2019	2,044
TDS	100	232000	

Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
27S40E08A01	USGS-353629117411701	7/2/1970	185	Lab	GAMA-USGS	1
27S40E08A01	USGS-353629117411701	6/1/1953	342	Calc	Moyle	1
27S40E08B01		6/2/1987	398	Calc	B&S	1
27S40E08B01		1/14/1988	420	Lab	B&S	1
27S40E08B02	USGS-353627117413401	1/14/1988	432	Lab	B&S	1
27S40E08B02	USGS-353627117413401	5/19/1970	310	Lab	GAMA-USGS	1
27S40E08F01		1/14/1988	532	Lab	B&S	1
27S40E08Q02		6/2/1987	645	Calc	B&M	1
27S40E08Q02		1/14/1988	559	Lab	B&S	1
27S40E09B01	USGS-353623117404001	4/30/1946	388	Ukn	GAMA	1
27S40E09K03		1/25/2011	1700	Ukn	H-WQ	2
27S40E09L01		6/16/2005	1200	Ukn	H-WQ	2
27S40E09L02	USGS-353554117404601	9/11/1964	923	Lab	GAMA-USGS	1
27S40E09P01	USGS-353537117405301	10/10/1951	498	Lab	GAMA-USGS	1
27S40E09P01	USGS-353537117405301	6/1/1953	508	Calc	Moyle	1
27S40E09P01	USGS-353537117405301	6/29/1972	632	Calc	W	1
27S40E10A01		6/1/1953	712	Calc	Moyle	1
27S40E10A01		4/6/1955	637	Calc	Moyle	1
27S40E10A01		9/18/1958	632	Calc	Moyle	1
27S40E10A02		6/1/1953	1700	Calc	Moyle	1
27S40E10A07	USGS-353628117390804	6/17/1972	896	Lab	W	1
27S40E10B01	USGS-353616117392403	4/29/1946	2670	Lab	GAMA-USGS	1
27S40E10C01	USGS-353616117394701	9/25/1946	1800	Lab	GAMA-USGS	1
27S40E10C01	USGS-353616117394701	7/9/1953	2210	Calc	Moyle	1
27S40E10C01	USGS-353616117394701	4/6/1955	2180	Calc	Moyle	1
27S40E10D01	USGS-353617117400701	9/24/1946	1230	Lab	GAMA-USGS	1
27S40E10E01	USGS-353614117400701	6/19/1962	1340	Lab	GAMA-USGS	1
27S40E10H01	USGS-353618117390901	3/8/1967	427	Ukn	GAMA	1
27S40E10H01	USGS-353618117390901	10/11/1961	441	Lab	GAMA-USGS	1
27S40E10H01	USGS-353618117390901	7/20/1962	442	Lab	GAMA-USGS	1
27S40E10H01	USGS-353618117390901	10/24/1963	421	Calc	GAMA-USGS	1
27S40E10H01	USGS-353618117390901	9/8/1964	445	Lab	GAMA-USGS	1
27S40E10H01	USGS-353618117390901	3/23/1966	452	Lab	GAMA-USGS	1
27S40E10H01	USGS-353618117390901	8/11/1960	466	Lab	Moyle	1
27S40E10J01		4/1/1953	425	Calc	Moyle	1
27S40E10J01		8/5/1953	682	Calc	Moyle	1
27S40E10R01	USGS-353540117390601	6/28/1978	3200	Calc	B	1
27S40E10R01	USGS-353540117390601	6/6/1979	2600	Calc	B	1
27S40E10R01	USGS-353540117390601	5/28/1980	2800	Calc	B	1
27S40E10R01	USGS-353540117390601	8/19/1976	3230	Ukn	GAMA	1
27S40E10R01	USGS-353540117390601	3/7/1974	9340	Lab	GAMA-USGS	1
27S40E10R01	USGS-353540117390601	3/25/1975	2710	Calc	GAMA-USGS	1
27S40E11C02	USGS-353626117384602	4/29/1946	1210	Lab	GAMA-USGS	1
27S40E11C02	USGS-353626117384602	9/23/1946	518	Lab	GAMA-USGS	1
27S40E11D03		6/1/1953	474	Calc	Moyle	1
27S40E15L01	27S40E15L001M; USGS-353504117394401	3/7/1974	1500	Ukn	GAMA	1

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	min	max	count
Sample Date	1/26/1920	3/5/2019	2,044
TDS	100	232000	

Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
27S40E15L01	27S40E15L001M; USGS-353504117394401	6/27/1961	1110	Lab	GAMA-USGS	1
27S40E15L01	27S40E15L001M; USGS-353504117394401	6/29/1972	1370	Calc	W	1
27S40E17G01	USGS-353520117413101	10/6/1969	741	Calc	GAMA-USGS	1
27S40E17G01	USGS-353520117413101	1/29/1970	660	Lab	GAMA-USGS	1
28S37E13F01	USGS-353004117565401	9/25/1990	450	Ukn	GAMA	1
28S37E13F01	USGS-353004117565401	6/5/1953	432	Calc	Moyle	1
28S37E18R01		3/22/1946	230	Calc	Moyle	1
28S37E18R01		3/29/1960	447	Lab	Moyle	1
28S38E18F01	Oil Exploration Well	2/2/2007	630	Lab	FR: AB	1
28S38E18F01	Oil Exploration Well	11/18/1999	657	Ukn	H-WQ	2
ETC44-MW01	ETC44-MW01	4/4/1992	523	Lab	Tri	1
ITC02-MW21	ITC02-MW21	8/5/1999	1300	Lab	Tri	1
ITC45-MW25	ITC45-MW25	5/11/1999	550	Lab	Tri	1
JMM07-MW11	JMM07-MW11	12/4/2002	6220	Lab	Tri	1
JMM07-MW13	JMM07-MW13	12/3/2002	8390	Lab	Tri	1
JMM12-MW08	JMM12-MW08	2/19/2002	350	Lab	TTEMI	1
JMM31-MW01	JMM31-MW01	2/23/1992	3200	Lab	Tri	1
JMM32-MW02	JMM32-MW02	2/22/1992	3000	Lab	Tri	1
MK12-MW12	MK12-MW12	11/12/1999	460	Lab	Tri	1
MK12-MW16	MK12-MW16	4/11/2005	2680	Lab	Tri	1
MK29-MW13	MK29-MW13	2/15/2002	656	Lab	TTEMI	1
MK62-MW01	MK62-MW01	6/11/1998	529	Lab	Tri	1
MK69-MW01	MK69-MW01	12/13/2002	1390	Lab	Tri	1
MK69-MW01	MK69-MW01	2/18/2002	588	Lab	TTEMI	1
MK69-MW02	MK69-MW02	2/18/2002	244	Lab	TTEMI	1
MKFL-MW01	MKFL-MW01	2/25/1999	3600	Lab	Tri	1
MKFL-MW01	MKFL-MW01	2/20/2002	3050	Lab	TTEMI	1
MKFL-MW02	MKFL-MW02	2/20/2002	1330	Lab	TTEMI	1
MKFL-MW03	MKFL-MW03	4/5/2005	2810	Lab	Tri	1
MW01-13	MW01-13	8/25/2009	735	Lab	Tri	1
RLS07-MW02	RLS07-MW02	12/3/2002	5110	Lab	Tri	1
RLS07-MW03	RLS07-MW03	12/3/2002	4310	Lab	Tri	1
RLS07-MW04	RLS07-MW04	2/5/1992	6900	Lab	Tri	1
RLS12-MW01	RLS12-MW01	2/19/1992	320	Lab	Tri	1
RLS12-MW04	RLS12-MW04	12/17/2002	682	Lab	Tri	1
RLS12-MW04	RLS12-MW04	2/19/2002	282	Lab	TTEMI	1
RLS13-MW05	RLS13-MW05	12/5/2002	986	Lab	Tri	1
RLS15-MW03	RLS15-MW03	5/19/2011	3360	Lab	Tri	1
RLS22-MW07	RLS22-MW07	5/14/1996	1140	Lab	Tri	1
RLS22-MW08 (64')	RLS22-MW08 (64')	5/1/1996	982	Lab	Tri	1
RLS29-MW01	RLS29-MW01	2/16/2002	1400	Lab	TTEMI	1
RLS34-MW05	RLS34-MW05	12/4/2002	3960	Lab	Tri	1
RLS34-MW06	RLS34-MW06	2/10/1992	7300	Lab	Tri	1
RLS43-MW06	RLS43-MW06	4/14/2000	11000	Lab	Tri	1
Spring_26S38E15Q01		8/5/1953	519	Calc	Moyle	1

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max	3/5/2019	232000
count	2,044	

Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
Surface_5_Mile_Canyon	5 Mile Canyon	11/21/1995	658	Ukn	AB	2
Surface_5_Mile_Canyon	5 Mile Canyon	11/26/1995	731	Ukn	AB	2
Surface_5_Mile_Canyon	5 Mile Canyon	5/4/1996	633	Ukn	AB	2
Surface_5_Mile_Canyon	5 Mile Canyon	2/19/2007	740	Lab	FR: AB	1
Surface_9_Mile_Canyon	9 Mile Canyon	4/2/1995	560	Ukn	AB	2
Surface_9_Mile_Canyon	9 Mile Canyon	12/2/1995	842	Ukn	AB	2
Surface_9_Mile_Canyon	9 Mile Canyon	5/13/1996	703	Ukn	AB	2
Surface_9_Mile_Canyon	9 Mile Canyon	2/19/2007	640	Lab	FR: AB	1
Surface_9_Mile_Canyon	9 Mile Canyon	3/21/1993	570	Lab	H	1
Surface_Big_Spring	Big Spring	4/9/2007	270	Lab	FR: AB	1
Surface_Bird_Spring_Source	Bird Spring-Source	4/23/1995	245	Ukn	AB	2
Surface_Bird_Spring_Source	Bird Spring-Source	1/15/1996	199	Ukn	AB	2
Surface_Bird_Spring_Source	Bird Spring-Source	5/5/1996	244	Ukn	AB	2
Surface_Cow_Haven_Cyn	Cow Haven Cyn	7/9/2007	240	Lab	FR: AB	1
Surface_Dead_Foot_Canyon	Dead Foot Canyon	4/2/1995	675	Ukn	AB	2
Surface_Dead_Foot_Canyon	Dead Foot Canyon	11/21/1995	668	Ukn	AB	2
Surface_Grapevine_Canyon	Grapevine Canyon	1/20/1995	743	Lab	FR: AB	1
Surface_Grapevine_Canyon	Grapevine Canyon	4/8/1995	490	Lab	FR: AB	1
Surface_Grapevine_Canyon	Grapevine Canyon	5/13/1996	552	Lab	FR: AB	1
Surface_Grapevine_Canyon	Grapevine Canyon	3/10/1999	384	Lab	FR: AB	1
Surface_Grapevine_Canyon	Grapevine Canyon	3/21/1993	590	Lab	H	1
Surface_Indian_Wells_Canyon	Indian Wells Canyon	4/9/2007	610	Lab	FR: AB	1
Surface_Indian_Wells_Canyon	Indian Wells Canyon	3/21/1993	460	Lab	H	1
Surface_Indian_Wells_Lodge_Spring 01	Indian Wells Lodge Spring 01	5/25/1989	550	Lab	GAMA	1
Surface_Indian_Wells_Lodge_Spring 01	Indian Wells Lodge Spring 01	4/29/1997	560	Lab	GAMA	1
Surface_Little_Lake_Outlet	Little Lake Outlet	2/4/2007	1300	Lab	FR: AB	1
Surface_Sand_Canyon	Sand Canyon	4/9/1995	375	Lab	FR: AB	1
Surface_Sand_Canyon	Sand Canyon	11/20/1995	782	Lab	FR: AB	1
Surface_Sand_Canyon	Sand Canyon	5/13/1996	360	Lab	FR: AB	1
Surface_Sand_Canyon	Sand Canyon	2/19/2007	480	Lab	FR: AB	1
Surface_Short_Canyon	Short Canyon	4/8/1995	350	Ukn	AB	2
Surface_Short_Canyon	Short Canyon	1/12/1996	322	Ukn	AB	2
Surface_Short_Canyon	Short Canyon	4/21/1996	492	Ukn	AB	2
Surface_Short_Canyon	Short Canyon	5/13/1996	435	Ukn	AB	2
Surface_Short_Canyon	Short Canyon	4/9/2007	390	Lab	FR: AB	1
Surface_Short_Canyon	Short Canyon	3/21/1993	360	Lab	H	1
TT37-MW01	TT37-MW01	7/11/2001	2340	Lab	Tri	1
TT37-MW02	TT37-MW02	7/10/2001	1500	Lab	Tri	1
TT37-MW03	TT37-MW03	7/11/2001	1720	Lab	Tri	1
TTBK-MW03	TTBK-MW03	11/15/1999	3200	Lab	Tri	1
TTBK-MW06	TTBK-MW06	8/10/1999	340	Lab	Tri	1
TTBK-MW08	TTBK-MW08	5/13/1999	350	Lab	Tri	1
TTBK-MW09	TTBK-MW09	8/4/1999	420	Lab	Tri	1
TTBK-MW10	TTBK-MW10	5/13/1999	640	Lab	Tri	1
TTIWV-MW02-D	TTIWV-MW02-D	2/18/2002	208	Lab	TTEMI	1

Table 2: IWV TDS Data

Sample Dates in red indicate only sample month/year is known

min 1/26/1920 100
max 3/5/2019 232000
count 2,044

Unique Well Name	alternateName	Sample Date	TDS (mg/L)	Analysis Type	TDS Reference	Confidence Level
TTIWV-MW02-I	TTIWV-MW02-I	2/18/2002	152	Lab	TTEMI	1
TTIWV-MW04	TTIWV-MW04	2/20/2002	464	Lab	TTEMI	1
TTIWV-MW07	TTIWV-MW07	2/21/2002	608	Lab	TTEMI	1
TTIWV-MW08	TTIWV-MW08	2/18/2002	376	Lab	TTEMI	1
TTIWV-MW10	TTIWV-MW10	2/16/2002	6320	Lab	TTEMI	1
TTIWV-MW15	TTIWV-MW15	2/17/2002	2000	Lab	TTEMI	1
TTIWV-MW16	TTIWV-MW16	2/16/2002	33900	Lab	TTEMI	1
TTSWV-MW01	TTSWV-MW01	2/13/2002	25800	Lab	TTEMI	1
TTSWV-MW02	TTSWV-MW02	2/13/2002	28800	Lab	TTEMI	1
TTSWV-MW03	TTSWV-MW03	2/14/2002	28100	Lab	TTEMI	1
TTSWV-MW04	TTSWV-MW04	2/15/2002	13700	Lab	TTEMI	1
TTSWV-MW05	TTSWV-MW05	2/15/2002	3030	Lab	TTEMI	1
TTSWV-MW06	TTSWV-MW06	2/14/2002	9780	Lab	TTEMI	1
TTSWV-MW07	TTSWV-MW07	2/14/2002	12100	Lab	TTEMI	1
TTSWV-MW09	TTSWV-MW09	2/15/2002	12500	Lab	TTEMI	1
TTSWV-MW10	TTSWV-MW10	2/15/2002	12300	Lab	TTEMI	1

Table 3: TDS References Used in TDS Data Tab

Year	Reference Abbreviation	Record Count	Report	Author	Confidence Level	Stetson has Ref	Notes
1963	Moyle	134	DWR Bulletin No 91-9: Data on Water Wells in IWV Area	USGS, Moyle	1	x	
1975	W	60	WRI 8-75 Groundwater Quality in Indian Wells Valley	Warner	1	x	
1987	B	196	USGS OFR 86-315	Berenbrock	1	x	
1991	B&M	29	USGS Water Resources Investigation Report 89-4191	Berenbrock and Martin	1	x	
1993	USBR	34	IWV Groundwater Project	USBR	1	x	
1994	B&S	87	USGSWater Resources Investigation Report 93-4003	Berenbrock and Schroeder	1	x	
1996	H96	46	Geohydrologic Investigation Report, NAWS China Lanke, CA	Houghton HydroGeo-Logic	1	x	
1995	H	33	GW Geochemistry of IWV	Houghton	1	x	
2003	TTEMI	35	Basewide Hydrogeologic Characterization Summary Report	Tetra Tech EMI	1	x	
2008	AB	36	Appendix C of AB 303 Final Report (historical report summary)	IWVCGTAC & GTC	2	x	
2008	FR: AB	44	AB303 Final Report (samples collected for report)	IWVCGTAC & GTC	1	x	
2013	Tri	50	Tech Justification of Beneficial Use Changes	TriEco Tt	1	x	Stetson has Final (2013) the 2012 referenced is draft
2015	H-WQ	55	Historical IWV Water Quality 2015 Spreadsheet	Navy, Stephan Bork	2		Compilation of historical data
2018	MD	9	MeadowbrookWaterQualityResults_20180911	from Eddy Teasdale	1	x	
2018	GAMA	828	https://geotracker.waterboards.ca.gov/gama/gamamap/public/	CA Water Boards (DHS)	1	x	accessed database November 2018
2018	KCWA WQ	87	KCWA BaseWQ Spreadsheet (unique, not found in other reports)		3	x	Stetson received 12/17/18 from Michelle Anderson
2018/19	GAMA-USGS	242	GAMA & USGS Inyokern and Ridgecrest Quads Well Data	USGS	1	x	Compilation of data received from Stephan Bork (3/7/2019)
2019	USGS	29	USGS Inyokern and Ridgecrest Quads Well Data	USGS	1	x	Compilation of data received from Stephan Bork (3/7/2019)
variable	Other	2	Other - Well logs or other hard data		1	x	
2009/15	L/H-WQ	8	historical compilations from reports		2		Both Layne 2009 and Historical IWV WQ 2015 Spreadsheet

Table 4: Open Items

Year	Reference Abbreviation	Record Count	Report	Author	Confidence Level	Stetson has Ref	Notes
1975	W		WRI 8-75 Groundwater Quality in Indian Wells Valley	Warner			Determine the x,y location of 26S39E19Q02 to add to database
1986	M/B		1986 Study	Muir & Birman			12/9/18 Email - Earl has hard copy to give to Stetson January 2019 for scanning
1987	W/B		1987 Geochemistry Study (U of Utah)	Whalen & Baskin		x	received January 2019 from Earl for scanning
1996	H96		Geohydrologic Investigation Report, NAWS China Lanke, CA	Houghton HydroGeo-Logic		x	Determine following well locations: 26S39E15J01; 26S40E12D01; 26S40E13A01; 26S40E14A01; 26S40E35G01; 27S40E01G
1996	H96		Geohydrologic Investigation Report, NAWS China Lanke, CA	Houghton HydroGeo-Logic		x	Add surface water and spring TDS samples to database
1999			Evidence for Interbasin Flow through Bedrock in SE Sierra NV	Thyne, Gillespie, Ostdick			Water Quality data is not included in report (see footnote 1 on p. 1 for more info)
2008	AB		Appendix C of AB 303 Final Report (historical report summary)	IWVCGTAC & GTC		x	all historical entries in Apx C table have not been confirmed for this database (only BWG entries checked)
2008	AB		Appendix C of AB 303 Final Report (historical report summary)	IWVCGTAC & GTC		x	new data collected for AB303 Phase II entered into TDS data; check original AB Apx C sources for data (confidence level 2)
2009	L		(report unknown; probably working map?)	Layne			1 figure from report IWVWD (recvd 11/30/2018; Renee)
2018	BWG	31	BWG Sampling Event	BWG		x	Not included yet, need to verify screen intervals to place SC/TDS value into DB
2018	RMC		IWV Groundwater Basin SNMP	RMC & Parker GW Inc.		x	this data is a compilation of historical data; currently in incomplete and shund be cross checked for unique values
variable	Other		Other - Well logs or other hard data			x	Add PMTC Range Well (x,y location and TDS sample) into database

Table 5: TDS Reporting Notes

Data Processing Notes

<u>BWG spreadsheet received October 9, 2018</u>

- 1,207 total data entries were gathered from 15 reports/spreadsheets and 1 field sampling event by the BWG
- 31 data entries from field sampling were omitted due to sampling methods
- Stetson performed a QA/QC on the remaining 1,176 entries and their references
    - 15 of the references used by the BWG were focused to 13
        - Stetson has 10 of the 13 references in their files
        - missing reports requested from BWG on 11/19/2018 and received 11/30/18
    - 334 duplicate entries were deleted
    - AB 303 entries were cross-checked against the original AB 303 Final Report (2008) completed by IWVCGTAC & GTC
        - Sample dates were changed from summarizing reports to actual date of sample
        - When comparing actual sample dates, additional duplicate entries (41) were removed
        - 9 missing entries from the AB 303 Final Report (2008) were added to 'TDS Data' tab
    - Berenbrock and Schroeder enteries were cross-checked against the original USGS OFR 93-4003 (1994)
        - TDS values in orange are 'Solids, sum of constituents, dissolved' (DSC) rather than 'Solids, residue @ 180°C, dissolved' (TDS) - for an explanation on the difference see p. 8 of USGS OFR 93-4003 (Noted in 'Analysis Type' column)
        - 51 missing entries from the USGS OFR 93-4003 (1994) were added 'TDS Data' tab
    - Berenbrock entries were cross-checked against the original USGS OFR 86-315 (1987)
        - TDS values from report are 'Solids, sum of constituents, dissolved' (DSC) rather than 'Solids, residue @ 180°C, dissolved' (TDS) - for an explanation on the difference see p. 8 of USGS OFR 93-4003 (Noted in 'Analysis Type' column)
        - 53 missing entries from the USGS OFR 86-315 were added 'TDS Data' tab
    - Berenbrock & Martin entries were cross-checked against the original USGS WRI 89-4191 (1991)
        - TDS values from report are 'Solids, sum of constituents, dissolved' (DSC) rather than 'Solids, residue @ 180°C, dissolved' (TDS) - for an explanation on the difference see p. 8 of USGS OFR 93-4003 (Noted in 'Analysis Type' column)
        - 14 missing entries from the USGS WRI 89-4191 (1991) were added 'TDS Data' tab
    - Houghton entries were cross-checked against the original GW Geochemistry of IWV (1995) Report
        - 21 missing entries from GW Geochemistry of IWV (1995) were added 'TDS Data' tab
    - TriEco entries were cross-checked against the original Tech Justification of Beneficial Use Changes (2013)
        - 28 missing entries from Tech Justification of Beneficial Use Changes (2013) were added 'TDS Data' tab
- During QA/QC 83 entries were found in Appendix C of the AB 303 Final Report (2008).
  This 2008 report contains both a compilation of historical and new TDS data.
  A confidence level of 1 was given to 44 TDS data that could be verified.
  A confidence level of 2 was given to 39 TDS data that could not be verified.
  We are missing the tables from the AB 303 Phase I Report (2003) which may identify the data source and could improve the data's confidence level
- Data from references RMC and Layne were removed because they were unable to be cross-checked
    - 1 entry from Layne (2009) was based on DRAFT IWVWD figure with 18 TDS values
        - no report was available to effectively QA/QC data - moved to the 'Suspect TDS Data' tab
    - 102 entries from RMC (2018) by BWG were moved to the 'Suspect TDS Data' tab - report did not source TDS data, therefore Stetson was unable to effectively QA/QC data
        - an additional 28 TDS data points were added from the RMC report
        - 20 of the 130 entries entered by the BWG were entered with the incorrect location TDS data assigned to IWVWD wells that should have been assigned to NAWS wells with same well #
        - 26 of the 130 entries have well names indicating that the TDS data were taken from the shallow screen interval. RMC Apx B table listed data without depth; p41 of texts says 'deep aquifer'
        - after accounting for historical report duplicates, there are 52 incomplete (without verifiable source) TDS values in RMC's SNMP remaining.

Additional TDS data added or changes made to TDS database

GAMA

- TDS values for 1,963 entries from the GAMA website were added to the DB & and additional QA/AC was performed
  - 90 TDS entries were moved to the 'Incomplete (+Suspect) TDS Data' tab
  - 752 duplicate entries were deleted
    - Note: where duplicate samples were listed on the same date the TDS value from the most trusted reference/source was used. Where the sources were the same, the highest TDS value was kept

AB303 (2003 and 2008)

- The AB 303 Apx C table listed TDS value of 501 mg/L for both NR-2S and NR-1D. The correct values could not be verified
- TDS values for 38 samples from AB 303 (2003) report by Tetra Tech were added to TDS DB
  - 6 duplicate entries were removed
  - 1 entry from TriEco Tt (2012) was moved to 'Suspect or Incomplete TDS Data' tab due to date

TDS Data from Analysis or Calculation

- the 'analysis type' column was included to clarify the TDS value:

  calc' = TDS valuesare sum of constituents (note, sometimes does not include silica)

  Lab = 'total filterable resudue' from lab analysis; or 'Solids, residue @ 180°C, dissolved' (TDS)'

  SC-calc = multiplying Specific Conductance by TDS/SC ratio where known/measured

  unk = not specified

Confidence Levels

1 TDS data have been cross-checked against original report; or data were downloaded directly from the GAMA website

2 TDS data have been found in AB303 Apx C (2008) report summary tables,
however report was unable to be appropriately cross-checked
Confidence level 2 also applies to (1) unverified Navy's compilation of WQ and (2) Draft Layne figure (ref by BWG)

3 KCWA's water quality database is a compilation of many data sources that have not been verified.
There may be errors in this.

Other Notes

- Dates listed as 1/1/xxxx in red were originally only given as a year
- Cells with unusually low TDS values (i.e. 1-75) that were unable to be cross-checked were moved to suspect data tab
- USGS WRIR 93-4003 references two other reports (Koehler, 1971 & Warner, 1975) that may have additional TDS data, however we do not have these references yet to add to the DB
- To verify unique TDS values for IWVWD and Navy production wells with similar well numbers, The SDWIS number (water system #) was enterend into the following website https://sdwis.waterboards.ca.gov/PDWW/index.jsp
- Requested GIS providecentroid location (x,y of the coordinates of the center of the section) where lat/long not available These are noted as "PLScntr" in the "Notes" Column of the Well Information Tab

1/28/2019 Database Update

1 • 1988 B&S TDS sample well ID (25S38E25J01; 8/25/1988; 875 mg/L) changed to 25S38E25J because 25J01 is assigned to NR-1
1988 historical well 25S38E25J had a total depth of 330 & screen interval of 120-330 from Table 1 (Page 10) of B&S

2 • 25S38E36G01 (NR2-S) TDS sample (2/26/1991; 808 mg/L) was moved from the incomplete tab into the TDS tab
The BWG (NR2-S) conflicted with RMC (NR2-D), however, the sample was re-sourced to USBR (NR2-S)

3 • 1995 AB 27S38E23F01 (USBR-01S) TDS sample (12/15/1995 617 mg/L) was moved into the incomplete tab (#208)
AB ref has a conflicting TRSt (27S38E23F01) and Alternate Name (NR-2)
A true location will need to be determined for this sample

4 • 27S39E11D02 (USBR-03-M) TDS sample (6/25/1996; 6500 mg/L) is inconsistent with historical samples.
Original H-WQ reference not available to verify; TDS value moved to incomplete tab

5 • USBR-05-S (25S38E34G01; 1/6/1992; 534 mg/L) from USBR, 1993 was added to the DB

6 • USBR-10-S/M (24S38E21A02; 9/1/1992; 580 mg/L) from USBR, 1993 was added to the DB

7 • USBR-10 (24S38E21A; 10/30/1995; 1480 mg/L) from AB 303 Appx C not clear on depth zone; moved to incomplete tab

8 • MW-32-S/M 900 feet (26S39E27D02) 10/18/1991 TDS sample has 2 values in the USBR report:
172.8 mg/L and 168.6 mg/L in lab reports (Apx VIII), and 169 mg/L on Table 2 of the main report
TDS was changed from the Apx VIII highest value to the Report Table 2 value (169 mg/L)

9 • MW-32-M/D 1200 feet (26S39E27D02) 10/18/1991 TDS sample has 2 values in the USBR report:
179.3 mg/L and 176.3 mg/L in lab reports (Apx VIII), and 176 mg/L on Table 2 of the main report
TDS was changed from the Apx VIII highest value to the Report Table 2 value (176 mg/L)

10 ● 25S38E34G01 (USBR-05-S) TDS sample (3/18/1993; 5690 mg/L) was moved to incomplete TDS Data tab
due to inconsistency between historical data and well names. Houghton TDS sample for 25S38E34J01 was classified
as USBR-05-S (25S38E34G01) because this well was historically mislabeled. True location and depth unknown.

11 ● USBR-10 (24S38E21A) - 4 TDS samples were added from the AB 303 Appx C database. These values were given a
confidence level of 2 (cannot locate original source (T) referenced in AB303 Appx C table)

12 ● USBR-10 (24S38E21A01; 12/1/1995; 1120 mg/L (BWG)) sample depth was corrected
original BWG value listed as shallow; changed to USBR-10-D (24S38E21A04; AB303 Apx C table elev 630' (depth 1930'))

13 ● Houghton Hydro-Geologic, 1996 Table A2 Labaratory data for groundwater samples from wells added to database
corrected AB303 Apx C alternated names/well ID to match original H96 source (USBR-02 S & M, USBR-01 S & S/M)
updated 28 TDS samples with new Reference Source of H96 and confidence level to 1 from earlier compiled data reference
added 15 TDS samples from H96 reference not included from other compiled data.
6 additional H96 TDS samples that we do not have well locations for. These are listed under Reference tab as an Open Items
Samples for 25S38E34J02 and J03 were referenced as USBR-05; State ID's were corrected to 34G02 and 34G03.

14 ● Alternate name NACC-17-1; Kerr McGee 17-1; 17G02 added for Well 26S39E17F02
added TDS sample (143 mg/L; 5/7/1983) from well report

15 ● Well 26S39E19Q02 sourced from GAMA gives a lat/long (near N Brown Road) that does not agree with the TRS (near Inhokern airport)
the 3 datapoints for this well from 1968 and 1973 were moved to incomplete TDS data

Feb 2019 Database Update

1 ● Added data from 1975 Warner report and QA/QC-ed data
51 entries originally attributed to GAMA were changed to Warner
9 of the 51 entries had TDS values that were updated to match Warner '75

1 26S40E22N01 6/28/1972 TDS sample updated from 582 mg/L (GAMA) to 581 mg/L (Warner)
2 26S40E23G01 5/24/1972 TDS sample updated from 11,000 mg/L (GAMA) to 10,900 mg/L (Warner)
3 26S39E30F03 6/6/1972 TDS sample updated from 385 mg/L (GAMA) to 302 mg/L (Warner)
4 26S39E23J01 6/6/1972 TDS sample updated from 252 mg/L (GAMA) to 218 mg/L (Warner)
5 26S39E24M01 6/6/1972 TDS sample updated from 231 mg/L (GAMA) to 218 mg/L (Warner)
6 26S39E24P01 6/6/1972 TDS sample updated from 238 mg/L (GAMA) to 211 mg/L (Warner)
7 25S39E26H01 6/6/1972 TDS sample updated from 826 mg/L (GAMA) to 696 mg/L (Warner)
8 26S40E17J01 6/18/1972 TDS sample updated from 312 mg/L (GAMA) to 308 mg/L (Warner)
9 26S39E11E01 6/6/1972 TDS sample updated from 812 mg/L (GAMA) to 366 mg/L (Warner)

2 entries originally attributed to KCWA were changed to Warner
2 entries originally attributed to H-WQ were changed to Warner
6 entries from not previously in the database were added

1 26S39E19K01 6/6/1972
2 26S39E19P01 6/6/1972
3 26S40E34N01 6/6/1972
4 25S39E04R01 6/6/1972
5 25S39E09J01 6/6/1972
6 26S39E11E01 6/6/1972

Mar 2019 Database Update

1 ● Addition & QA/QC of data compiled by the Navy (provided by Stephan Bork)
242 entries originally attributed to GAMA were updated to GAMA-Navy based on corresponding Navy data
29 new entries were added as 'Navy' reference

2 ● GAMA duplicate entry for 27S40E07G01 (2040 mg/L) removed

May 2019 Database Update

1 ● Addition of TDS data for the 26S39E34Q01 provided by Tom & Annette DeMay on 5/8/2019
1 new entry was added as 'Other' reference

June 2019 Database Update

1 ● Addition of 3 TDS values from GAMA 6/21/2019 data download
Searles Valley Minerals Op Well 02 (27S40E04B3) 12/11/2018 & 3/5/2019 TDS Samples
West Valley Mutual Well 01 (26S39E07M1) 11/19/2018 TDS Sample

Aug 2019 Database Update

APPENDIX 3-D

SELECTED WELL HYDROGRAPHS

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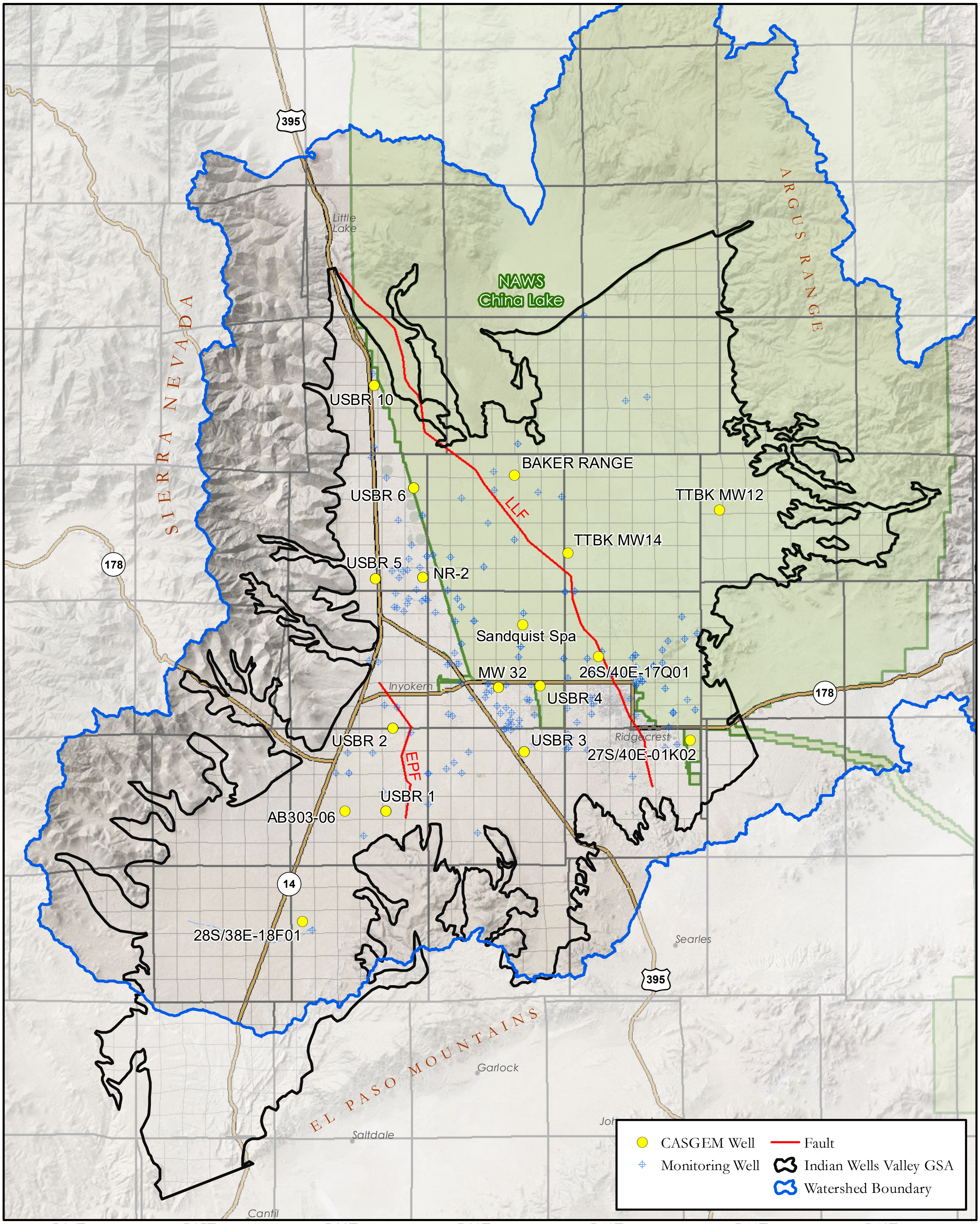

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STETSON ENGINEERS INC.

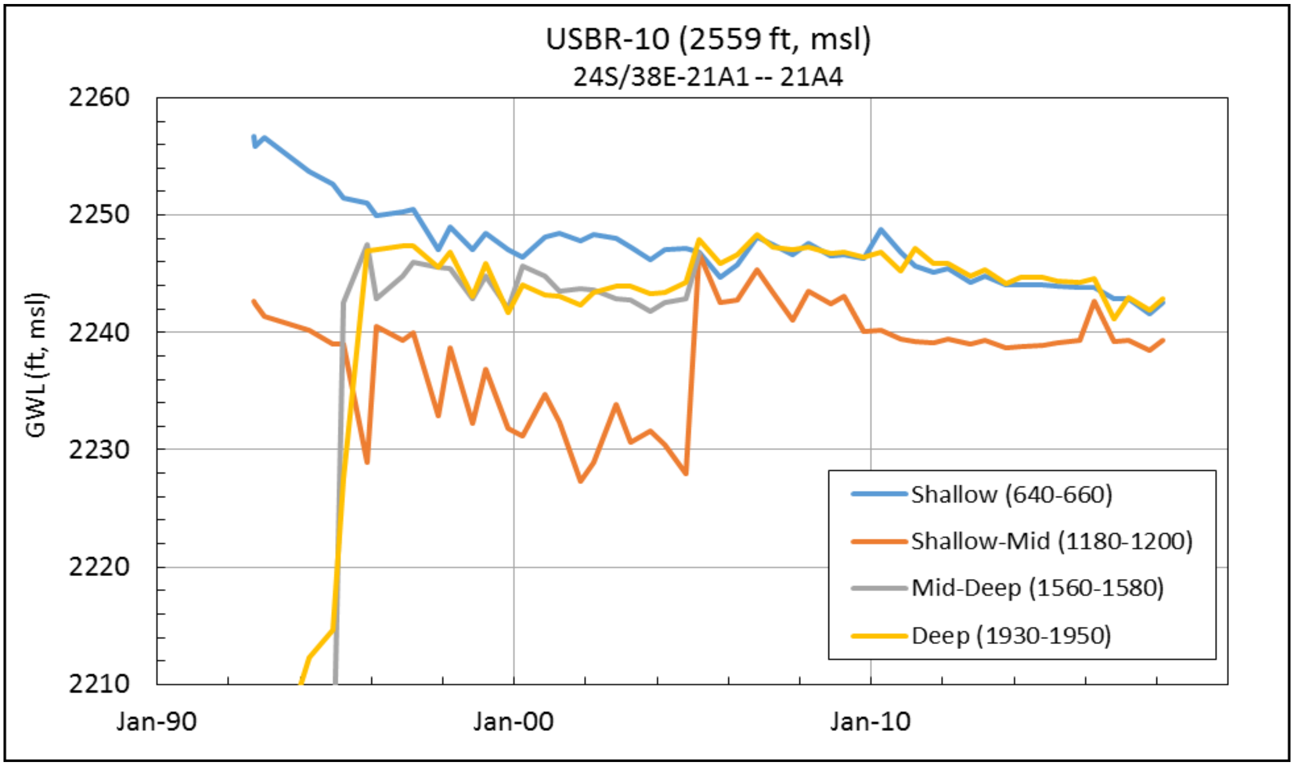
CASGEM HYDROGRAPH LOCATION MAP
INDIAN WELLS VALLEY GSP
DRAFT 10/30/2019

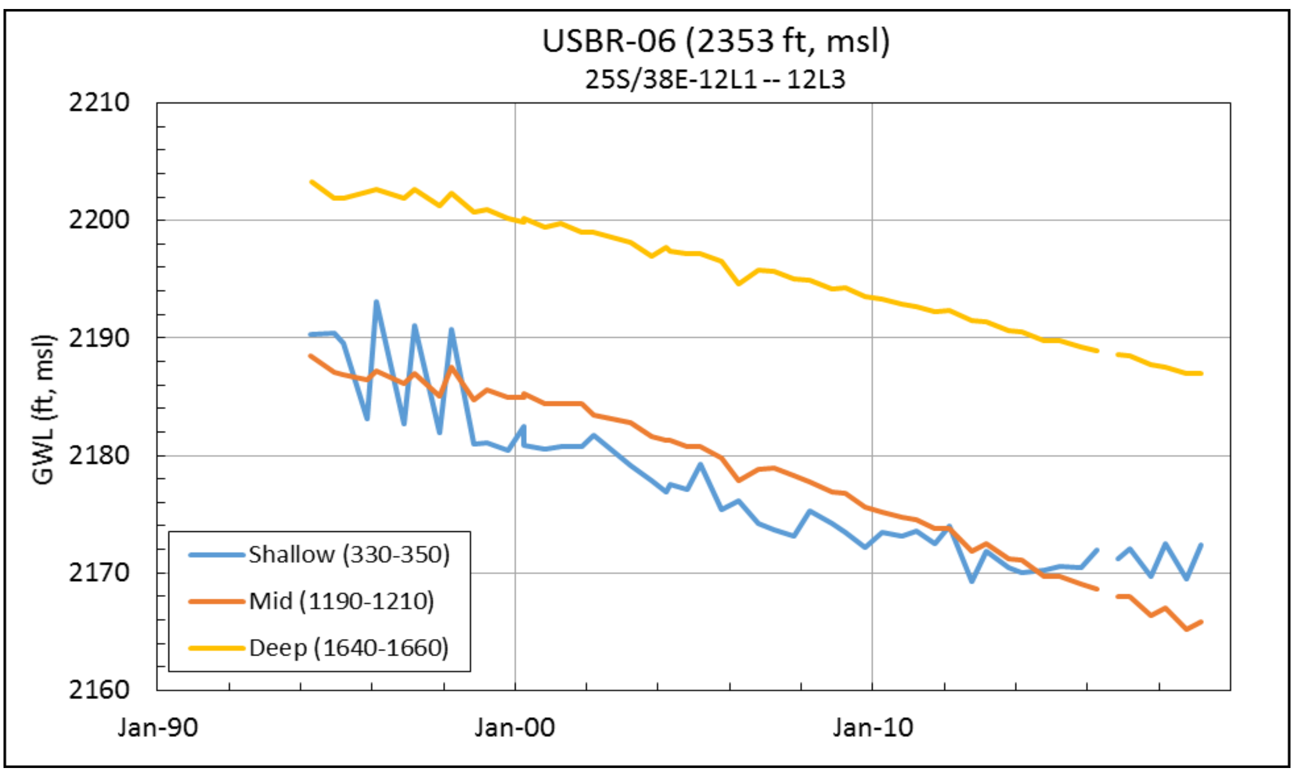
0 2 4 Miles

N

Indian Wells Valley CASGEM Well Hydrographs

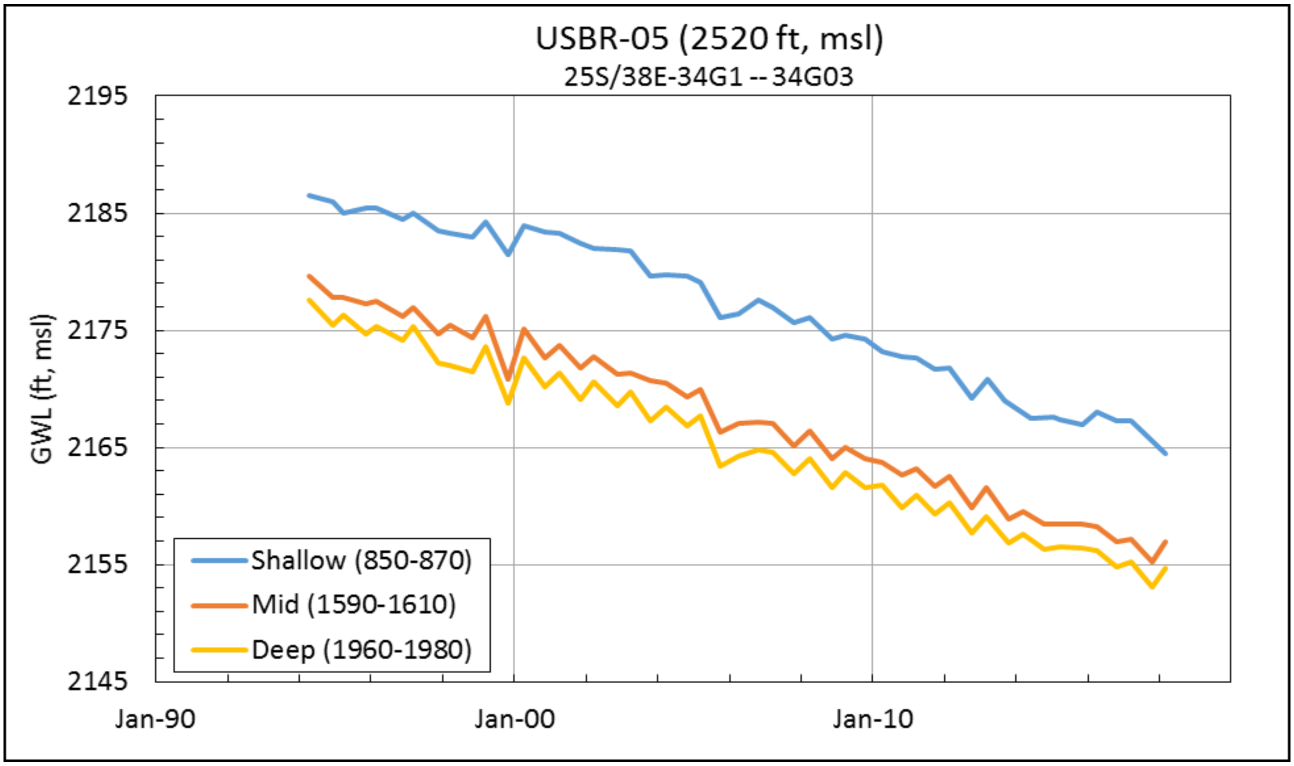
Northwest

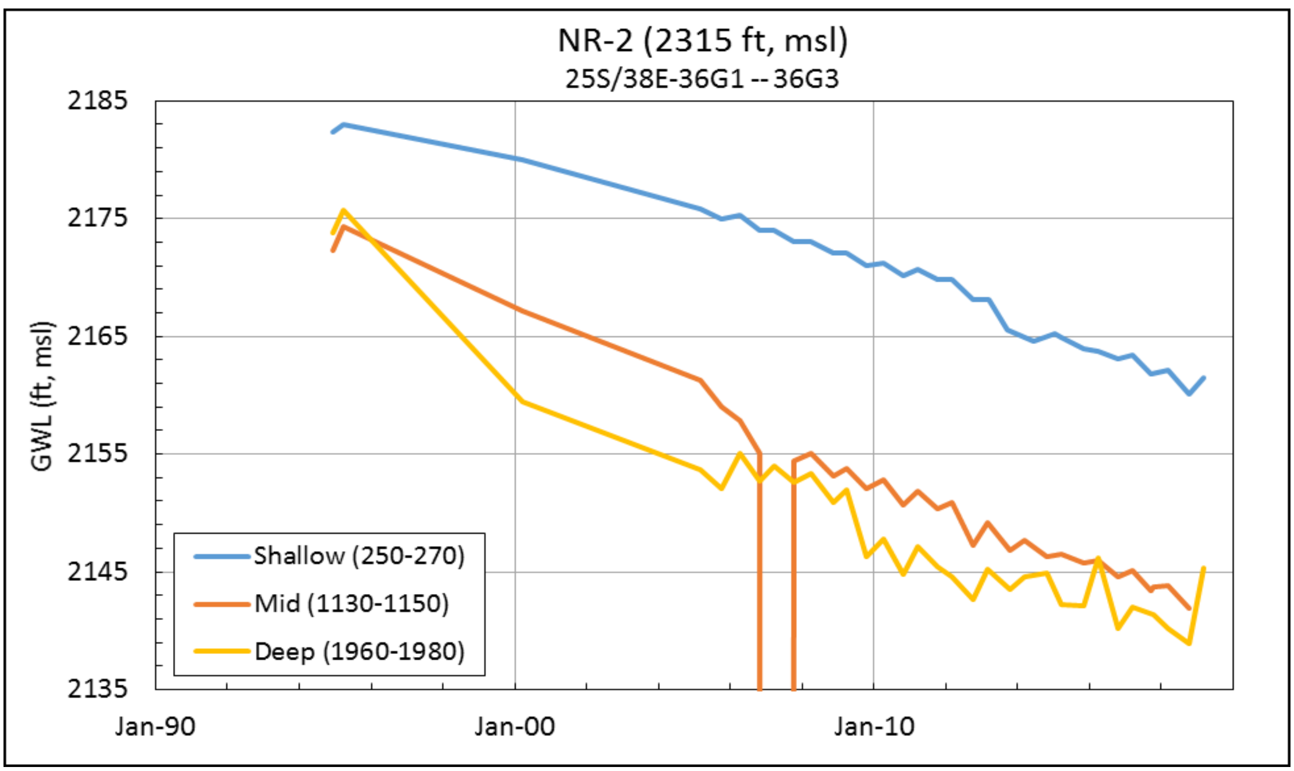




Indian Wells Valley CASGEM Well Hydrographs

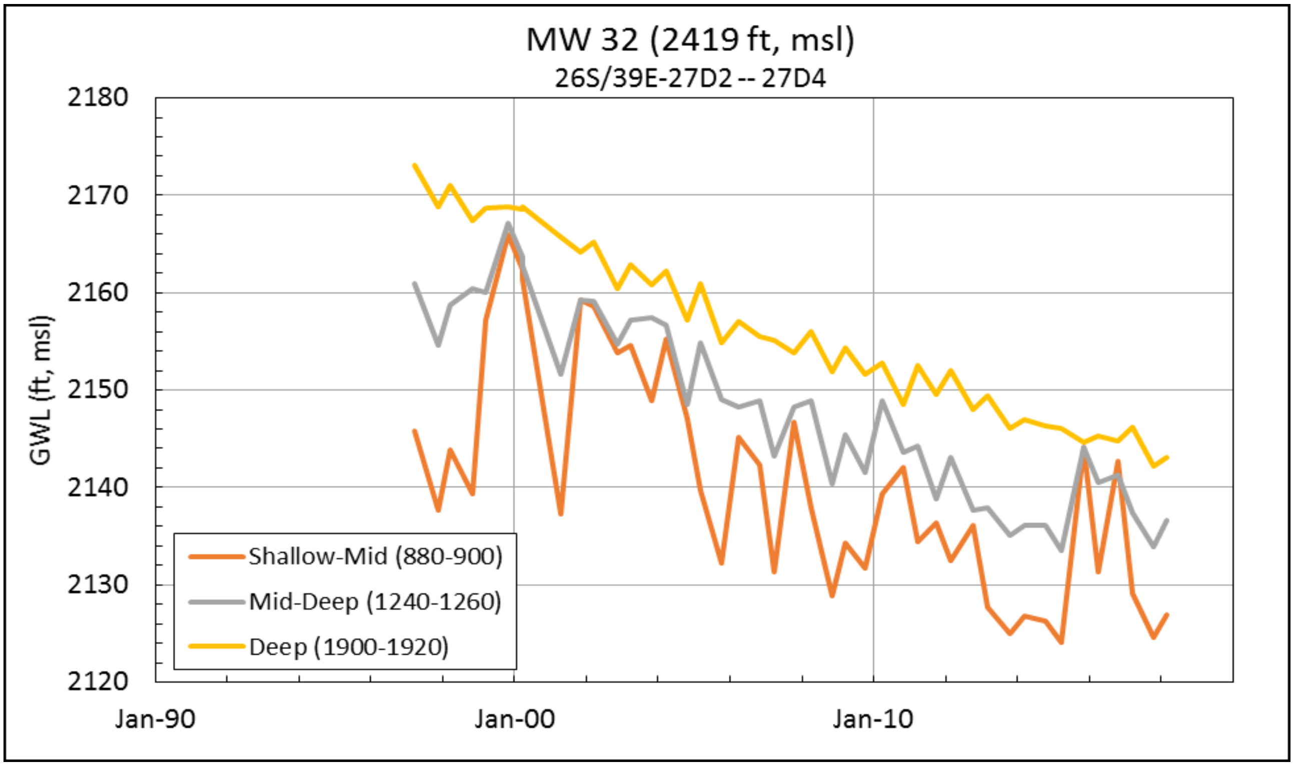
Northwest

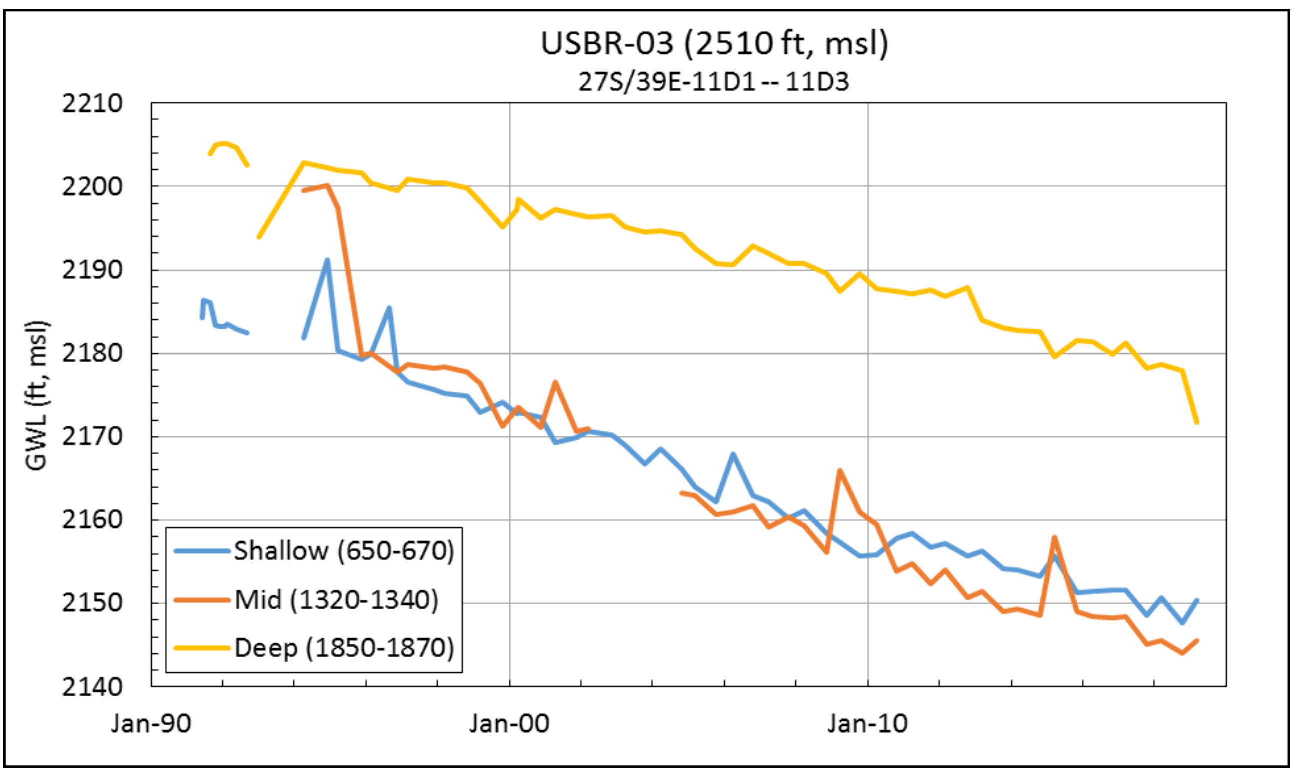




Indian Wells Valley CASGEM Well Hydrographs

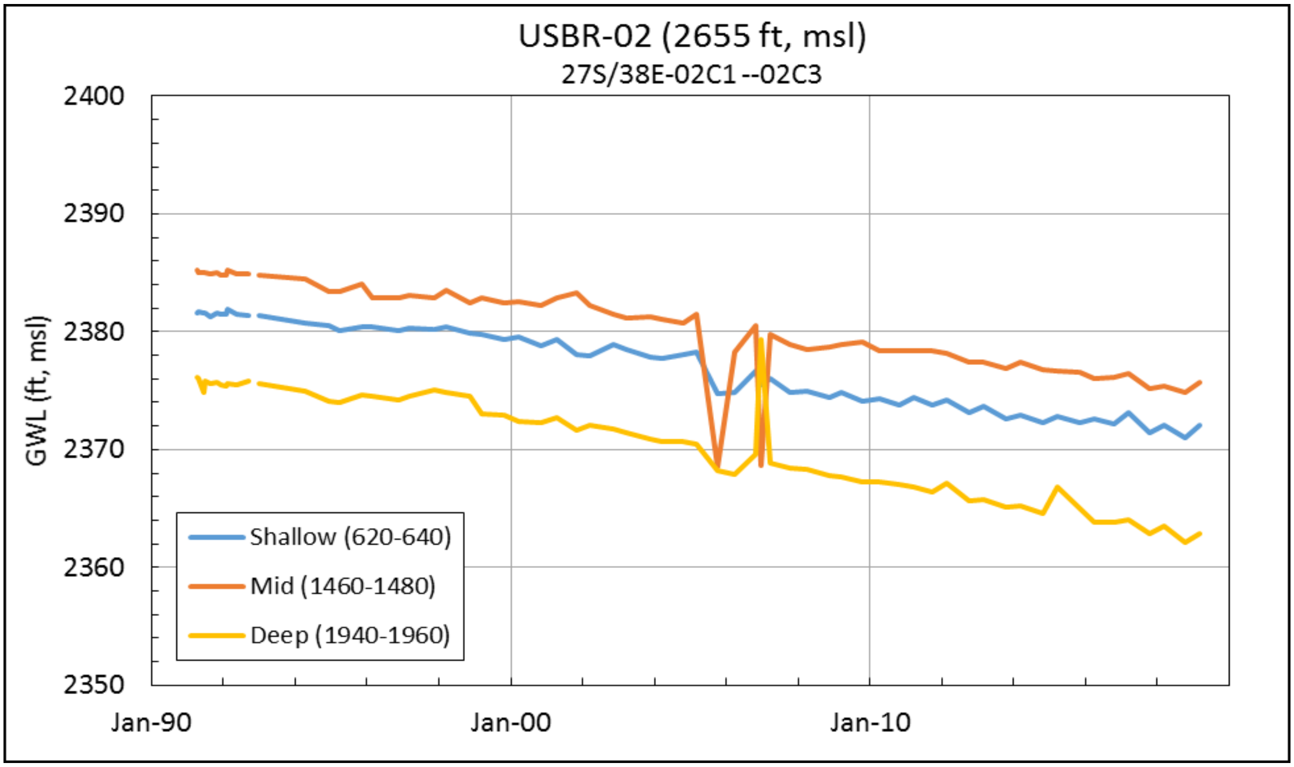
Southeast

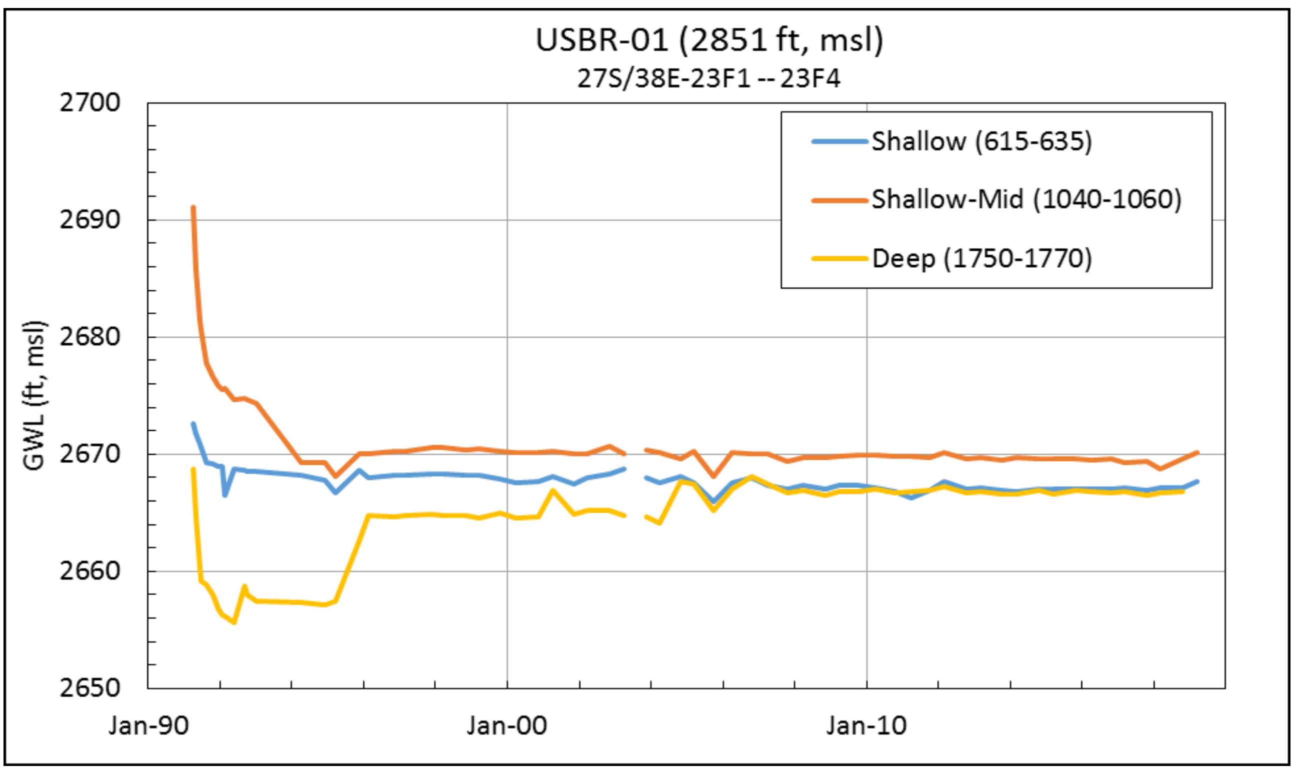




Indian Wells Valley CASGEM Well Hydrographs

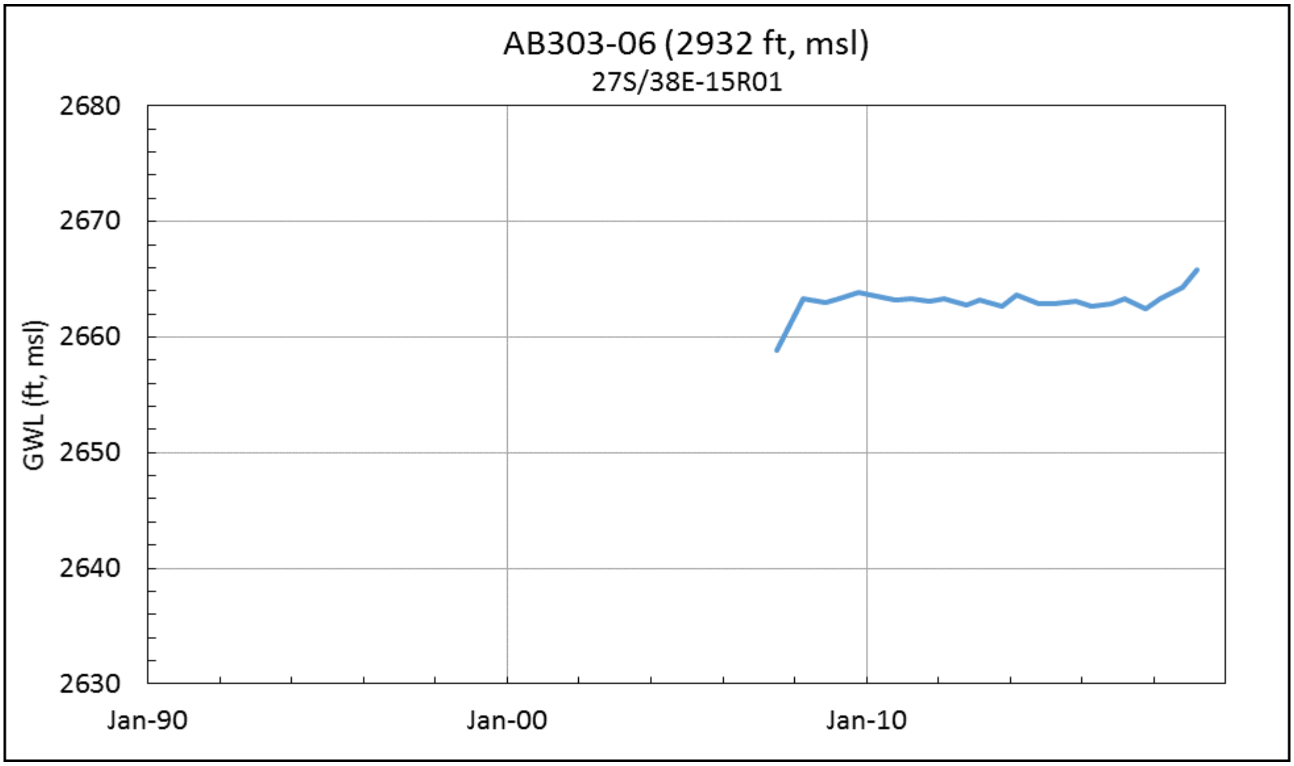
El Paso

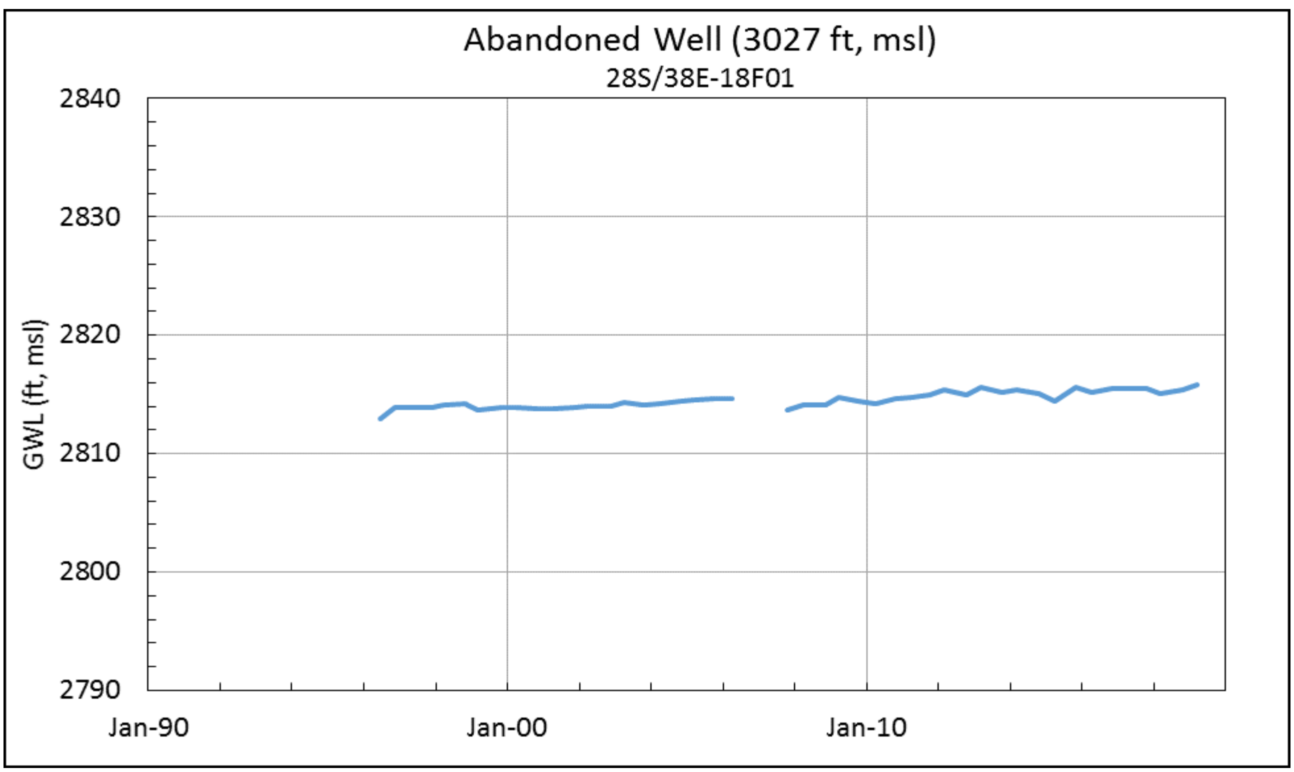




Indian Wells Valley CASGEM Well Hydrographs

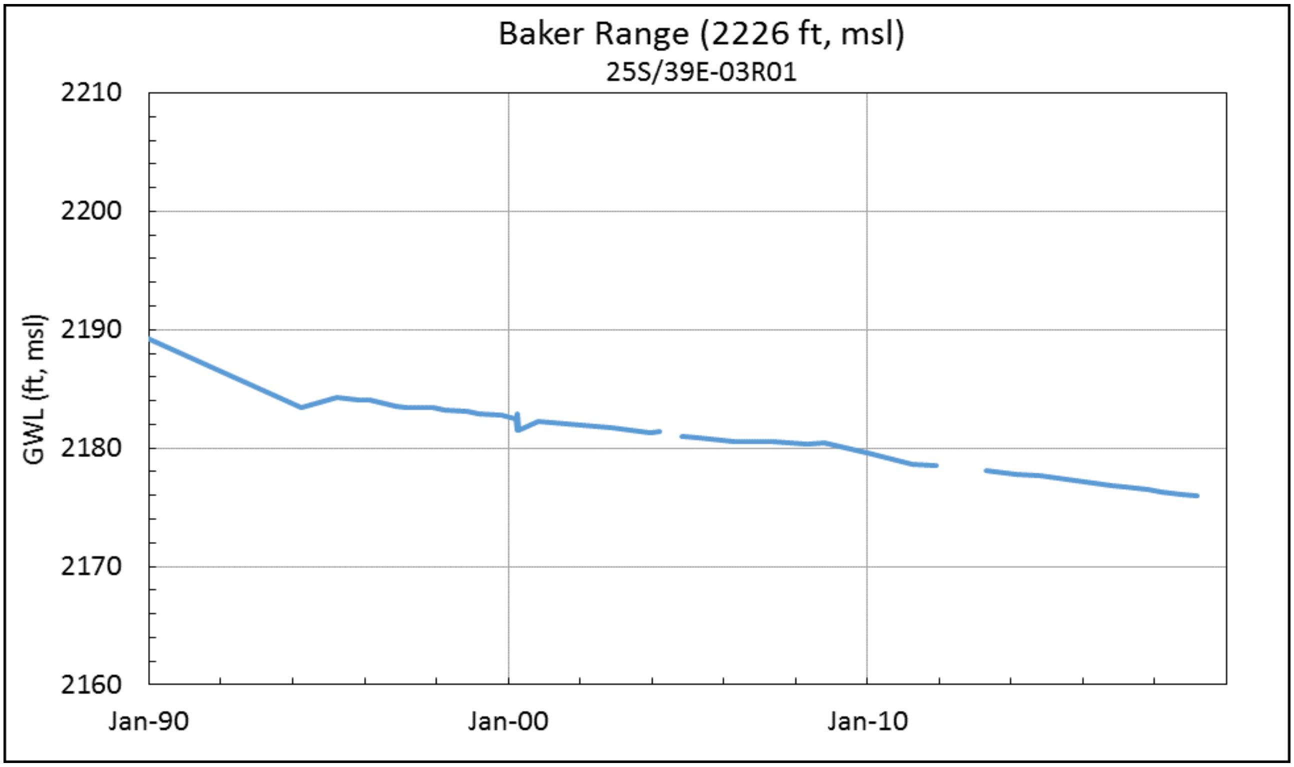
El Paso

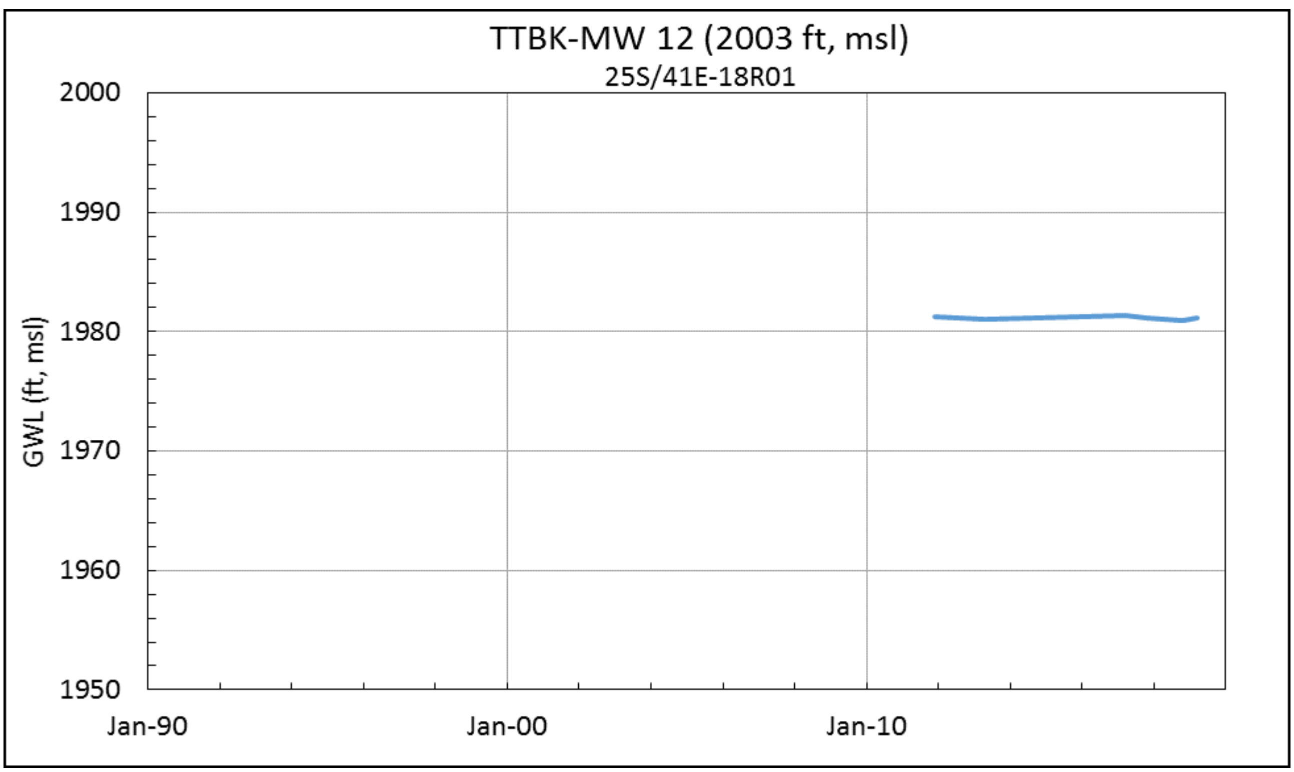




Indian Wells Valley CASGEM Well Hydrographs

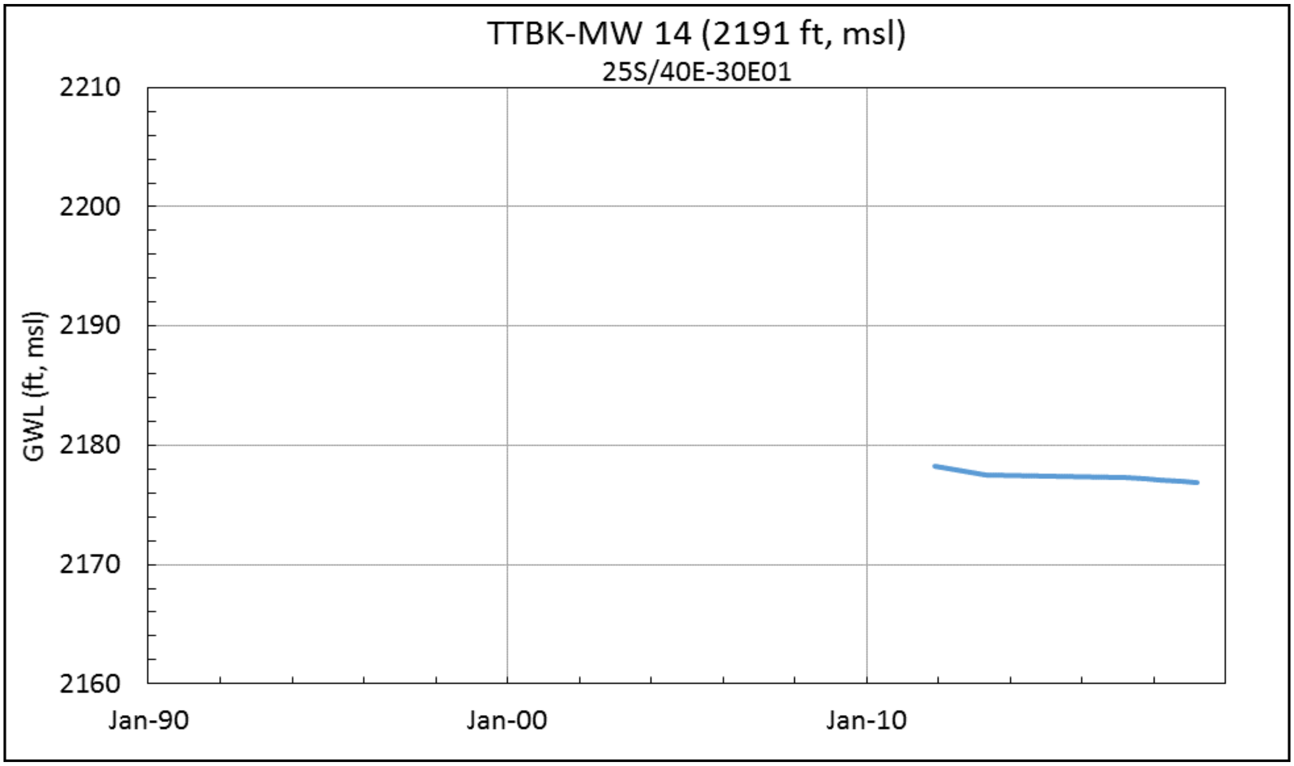
Navy

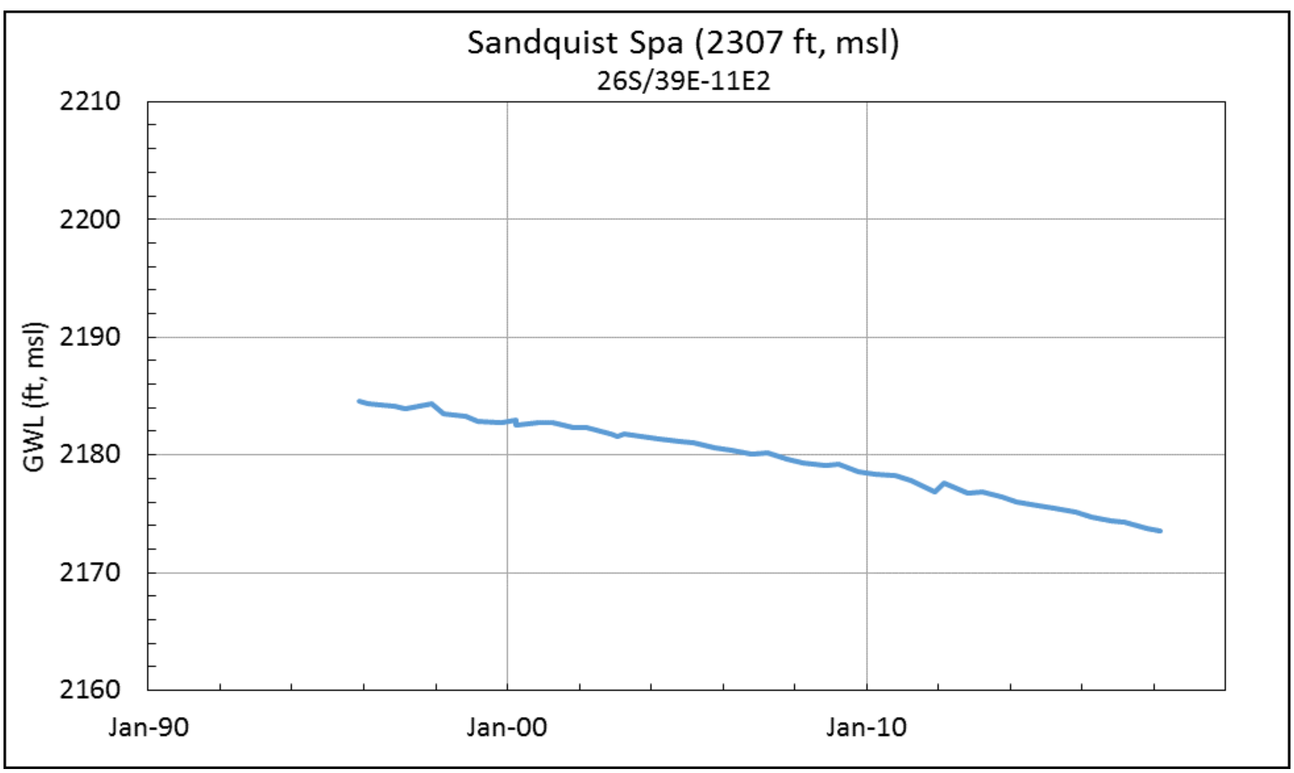




Indian Wells Valley CASGEM Well Hydrographs

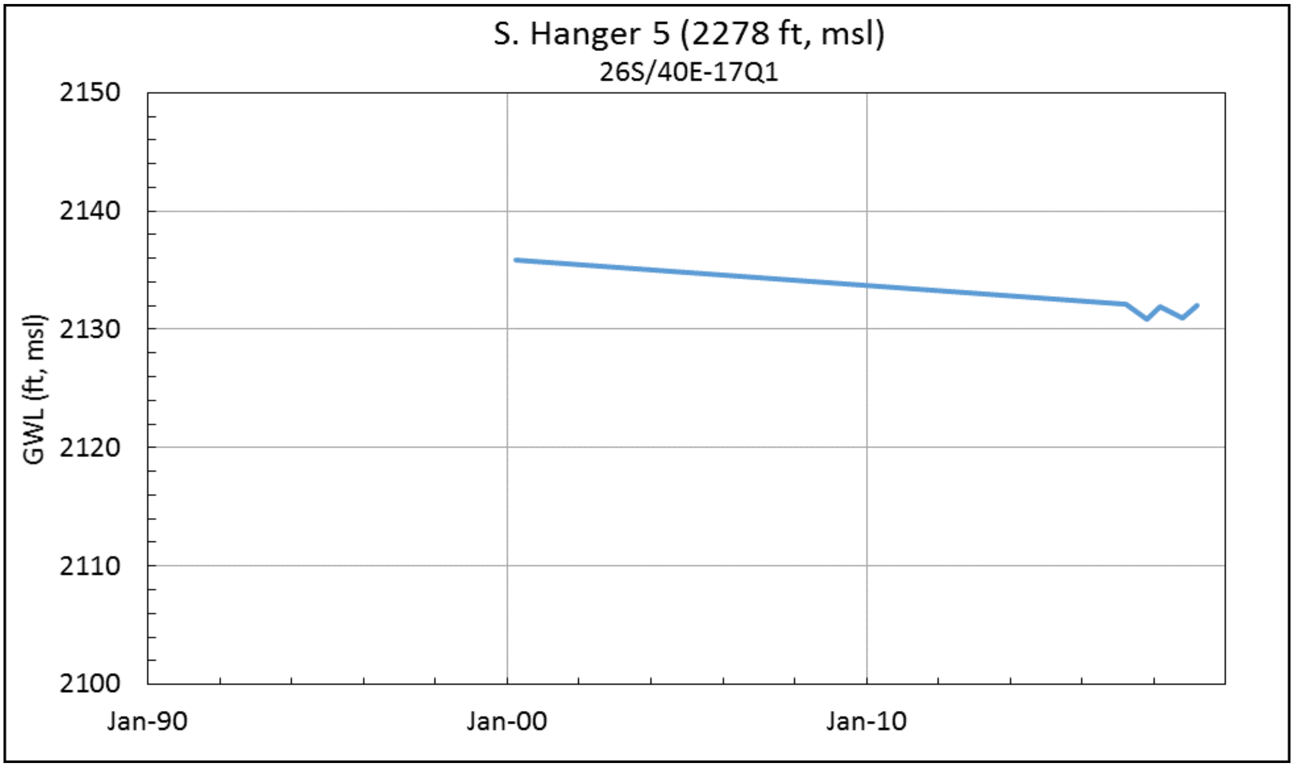
Navy

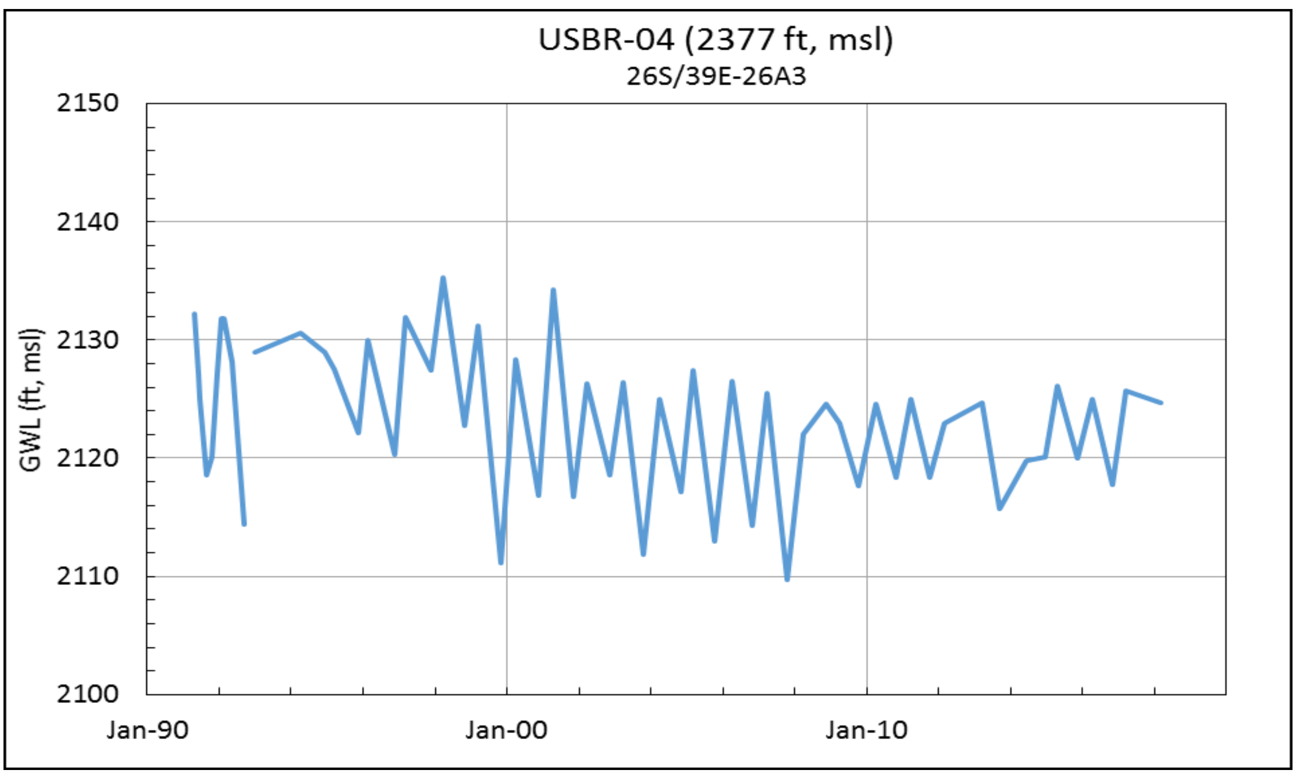




Indian Wells Valley CASGEM Well Hydrographs

Navy





Indian Wells Valley CASGEM Well Hydrographs

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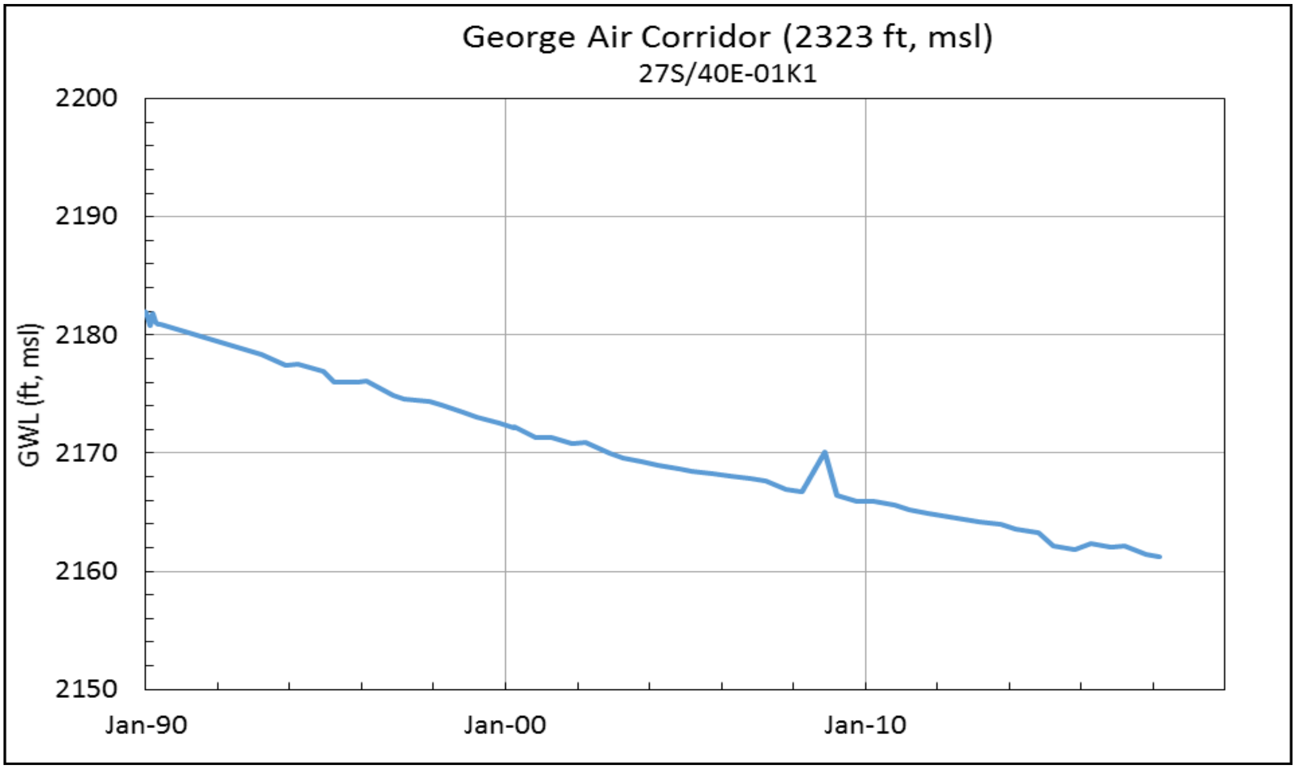

APPENDIX 3-E

SHALLOW WELL IMPACT ANALYSIS

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STETSON ENGINEERS INC.

DRAFT TECHNICAL MEMORANDUM

785 Grand Avenue, Suite 202 • Carlsbad, California • 92008
Phone: (760) 730-0701 FAX: (415) 457-1638 Web site: www.stetsonengineers.com

TO:	IWV TAC	DATE:	October 17, 2019
FROM:	Stetson Engineers, Inc.	JOB NO:	2652-001: 06

RE: Analysis for Estimating Shallow Well Impact for Historical Conditions and Future Management Scenarios
Indian Wells Valley Groundwater Sustainability Plan (GSP)

Historically, groundwater levels have been declining near pumping centers in the Indian Wells Valley aquifer. Groundwater levels remain stable in other locations within the basin near recharge and discharge zones, as well as in the El Paso area which is separated by a fault from the main Indian Wells Valley aquifer. In areas where groundwater levels have been steadily declining, water levels have dropped enough to impact shallow wells, requiring the well to be deepened, re-drilled, or abandoned as a water source. This technical memorandum summarizes a methodology developed to estimate historical impacts, and potential future impacts, to shallow wells due to changes in groundwater levels from groundwater management within the basin. Shallow wells have also been impacted by changes in water quality, primarily Total Dissolved Solids, which are not addressed in this memorandum.

Limited data are available for knowing the true impact to shallow wells within the basin. For this analysis, assumptions needed to be made regarding the inventory (count and distribution), age and construction details of shallow wells, and the rate of localized groundwater drawdown at the wells. Recent groundwater level contour maps developed by the Kern County Water Agency (KCWA) were used to estimate the historical rate of drawdown within different areas of the basin. Future groundwater level changes were developed using a numerical model to predict changes in groundwater levels under future management alternatives that could cause impacts to shallow wells.

A shallow well is considered impacted when the simulated average static water level (SWL) drops to 5 feet above the well pump which would result in cavitation or air entrainment when the well is pumping. Impact to shallow wells for this analysis was determined based on 1) estimated drill dates and well construction and 2) simulated groundwater level change over time. Analyses of shallow well impacts were completed for 872 wells (832 domestic/private wells, 40 mutual water company wells and community service district wells).

1.0. ESTIMATED SHALLOW WELL INVENTORY

For this analysis, it is estimated that there are approximately 872 shallow wells (Table 1) in Indian Wells Valley that could be affected by declining groundwater levels. This estimate was developed based on the 2014 Todd Engineers' Report[1] estimate of 1,588 private domestic rural residences supplied by on-site wells; and responses to the 2018 Pumping Assessment Survey of mutual water company wells with four or more hookups.

TABLE 1. ESTIMATED SHALLOW WELL INVENTORY

# WELLS	# WATER HOOKUPS	WELL TYPE
2	265	Inyokern Community Service District
38	491	Mutual Water Companies
377	377	Private/Domestic Wells listed in KCHD[a] Well Permit Database
455	455	Other Private Wells estimated from Todd Study[b] total DOM[c]
872	1,588	Estimated Total Number of Shallow Wells

a) KCHD: Kern County Health Department
b) Todd, 2914. *Indian Wells Valley Resource Opportunity Plan; Water Availability and Conservation Report.*
c) DOM: domestic well

Locations for these shallow wells were initially developed using maps provided by earlier reports (Todd, 2014) and modeling studies (DRI, 2016). The exact residences connected to mutual water company and community service districts were not known. Therefore, the assumption was made that residences closest to a water purveyor would use this service, and the recorded number of hook-ups were assigned to each mutual water company well so as not to double account shallow wells within these areas. Figure 1 shows the location of 38 mutual water company wells, 2 community service district wells, 832 private domestic wells, and other larger pumping wells in Indian Wells Valley. The final analysis was completed using aerial photos and GIS to estimate the location for all 872 shallow wells.

[1] Pages 15-16 "Private Domestic" in Todd, 2014. *Indian Wells Valley Resource Opportunity Plan; Water Availability and Conservation Report*. Submitted to Kern County Planning and Community Development Department. January 22, 2014.

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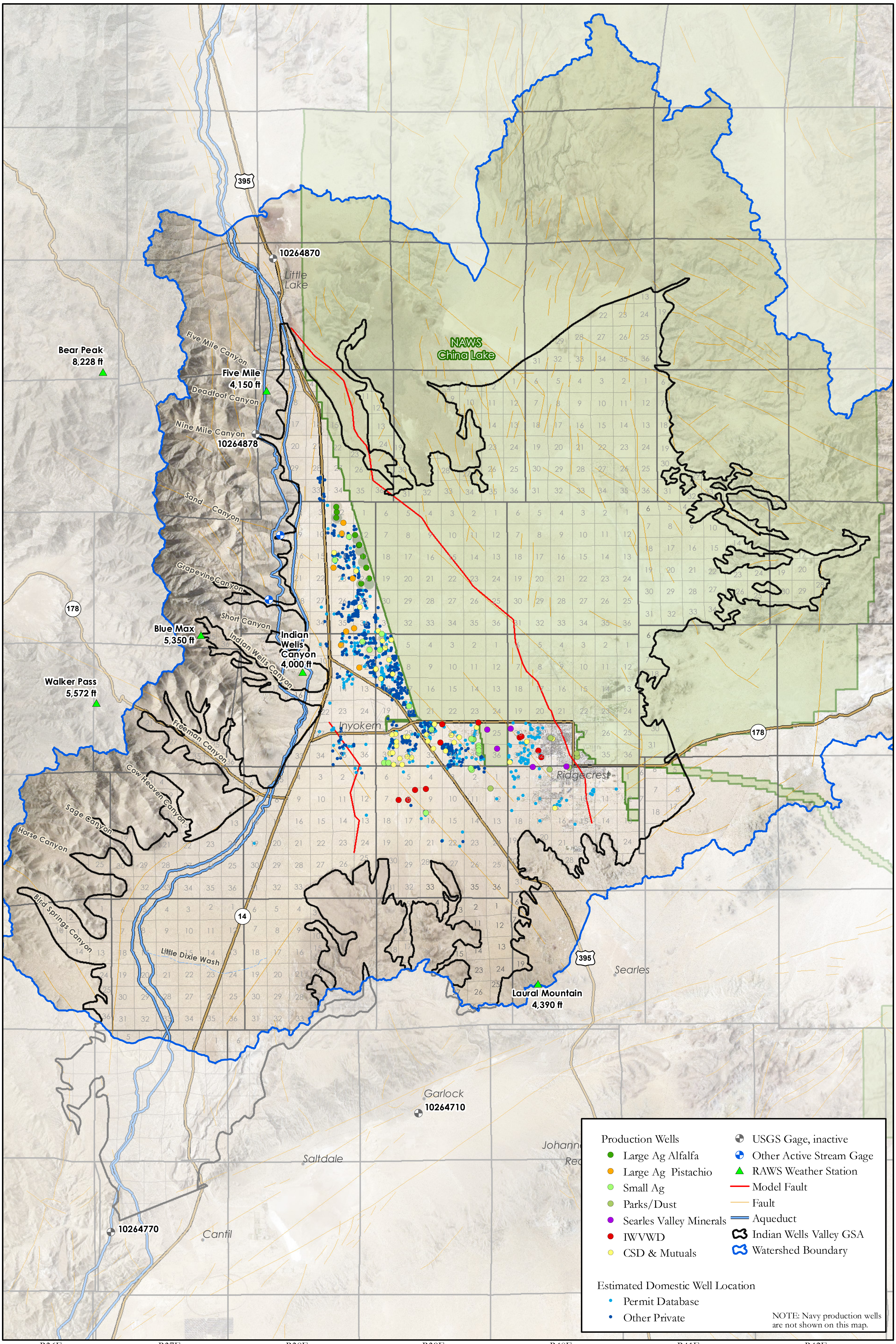

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SHALLOW WELL IMPACT ANALYSIS
PUMPING WELL LOCATIONS
INDIAN WELLS VALLEY
DRAFT 10/14/2019

0 2 4 Miles

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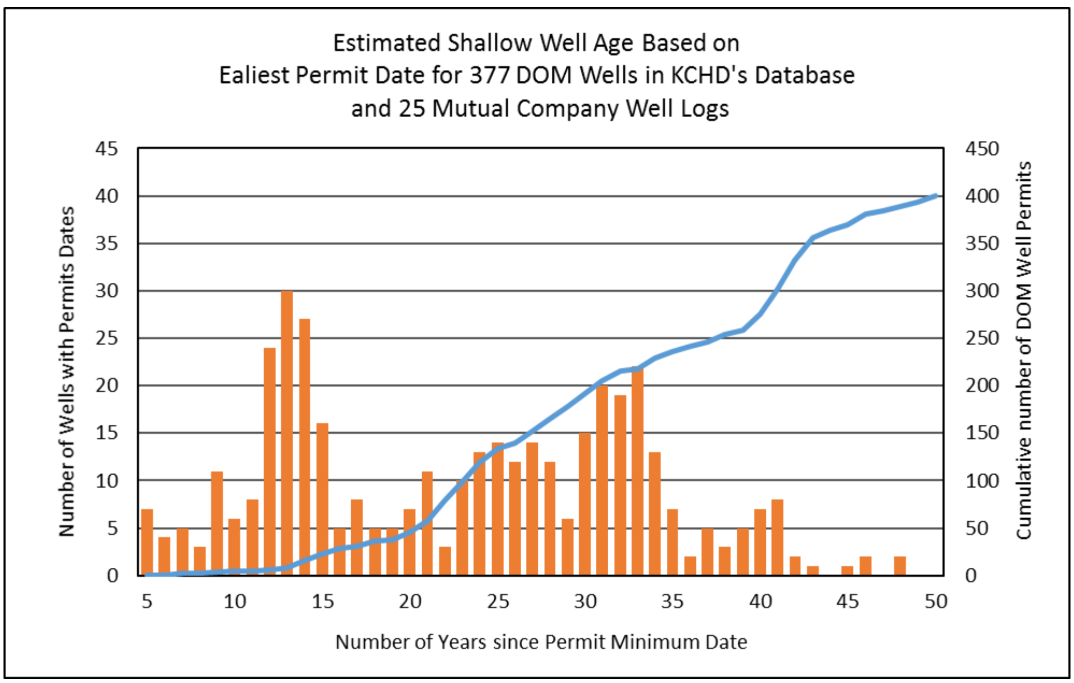
FIGURE 1

2.0. Estimated Shallow Well Construction Date

The Kern County Health Department (KCHD) permit database was used to estimate the year permitted wells were drilled and constructed. Of the 546 permitted wells in the database, there were 377 unique domestic 'shallow' wells with locations inside of Indian Wells Valley. The earliest permit date listed for each well in the KCHD database was used as the year the well was initially constructed. This provided an estimate for the number of years the well would have been influenced by changes in groundwater level. Well logs for 28 mutual water company wells were available from the well registration database. The drilling/construction dates from these well logs were also added into the analysis for a total of 402 estimated drill dates. Figure 2 shows the resulting range of well ages from 5 to 48 years, with the largest number of initial well permits (30) occurring 13 years ago (2006). This database contains the best available data for this initial shallow well impact analysis. More complete data would require a physical survey of the estimated 872 wells.

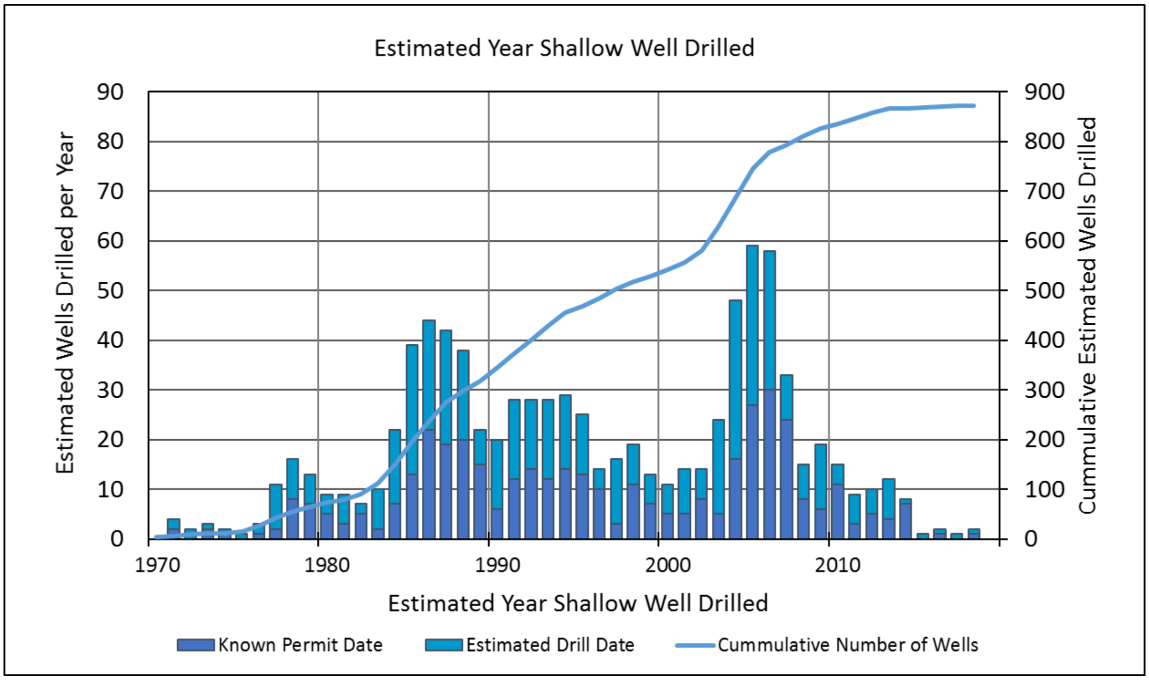
Figure 2 Estimated Age of 402 Shallow Wells Based on Earliest Permit Date or Well Log



The remaining 455 domestic/private wells were assigned drill dates using a random number generator to develop a variable drill-date distribution. An assumption was made that the 455 unknown drill dates would have a similar distribution pattern as the 402 'known' well drill dates.

A randomized number was associated with the locations (T/R-S[2]) for the 455 shallow wells without a known drill date within the basin to assign the order that the wells were drilled. The assigned randomized number was sorted and mapped by percentage of wells drilled/year to estimate when each well was drilled. Figure 3 shows the final distribution of the estimated years that the 872 shallow wells were drilled.

FIGURE 3 ESTIMATED DRILL DATE FOR 872 SHALLOW WELLS



3.0. CHANGES IN DEPTH TO GROUNDWATER (RATE OF DRAWDOWN)

KCWA measures depth to groundwater in the spring and fall each year and develops contour maps showing the water table surface throughout the basin including cones of depression at pumping centers. KCWA's 2010 and 2015[3] groundwater level contours were digitized into GIS files (Figure 4 and Figure 5 respectively), and kriged (a statistical interpolation process) into two surfaces. The average difference of the two groundwater table surfaces was calculated for each 1-square mile section (Section) containing shallow wells. This analysis yielded an average change in groundwater level over 5 years for 428 sections, of which only 76 sections contained shallow wells.

[2] Township/Range-Section public land survey numbering system.
[3] The GIS-digitized contours of KCWA's 2010 and 2015 maps can be viewed on the IWVGSP.com map.

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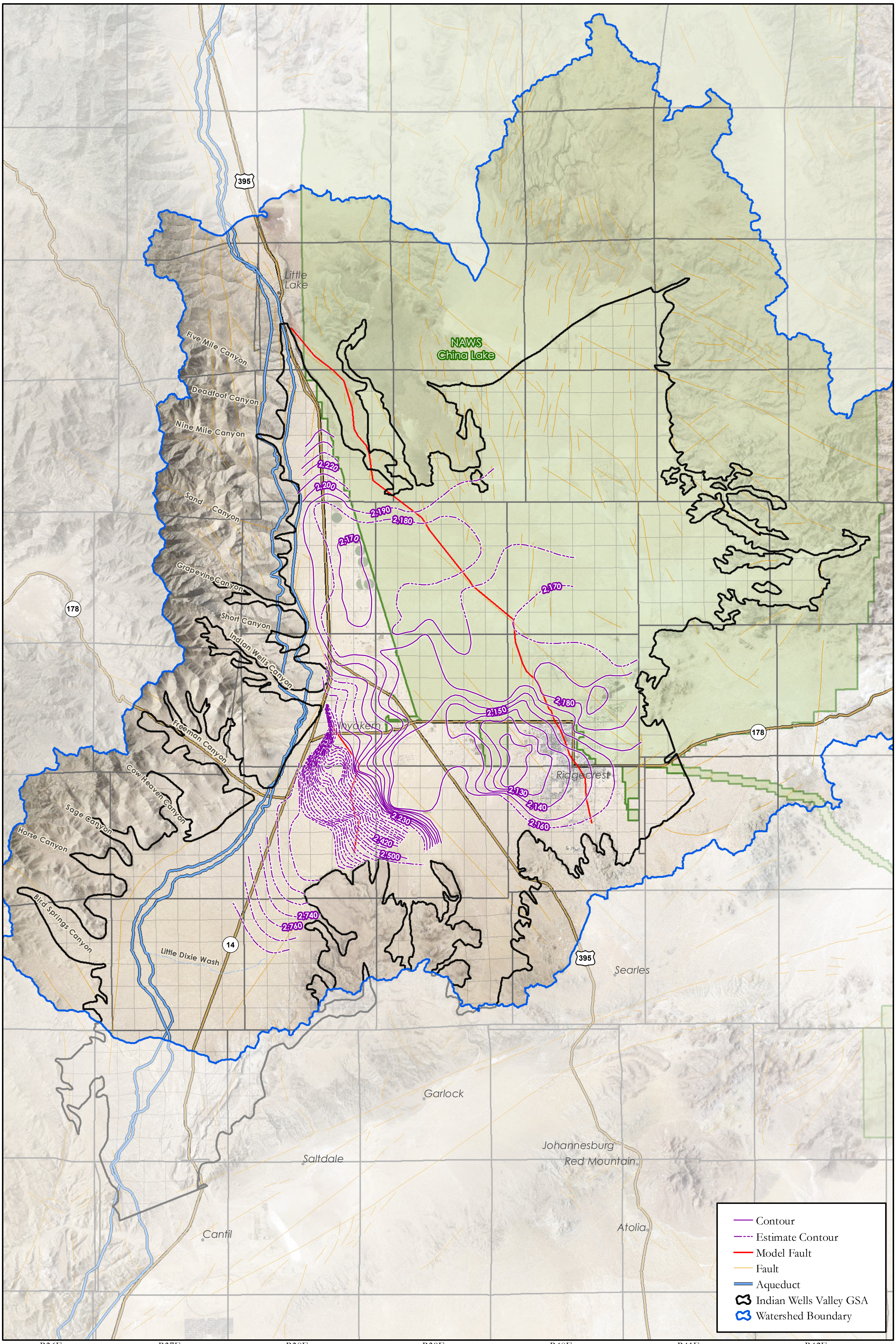

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NOTE:
Contours Digitized from KCWA Map
10-foot contour interval; 20-foot contour interval in Southwest/El Paso Areas.

SHALLOW WELL IMPACT ANALYSIS
2010 KCWA GROUNDWATER LEVEL CONTOURS
INDIAN WELLS VALLEY
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FIGURE 4

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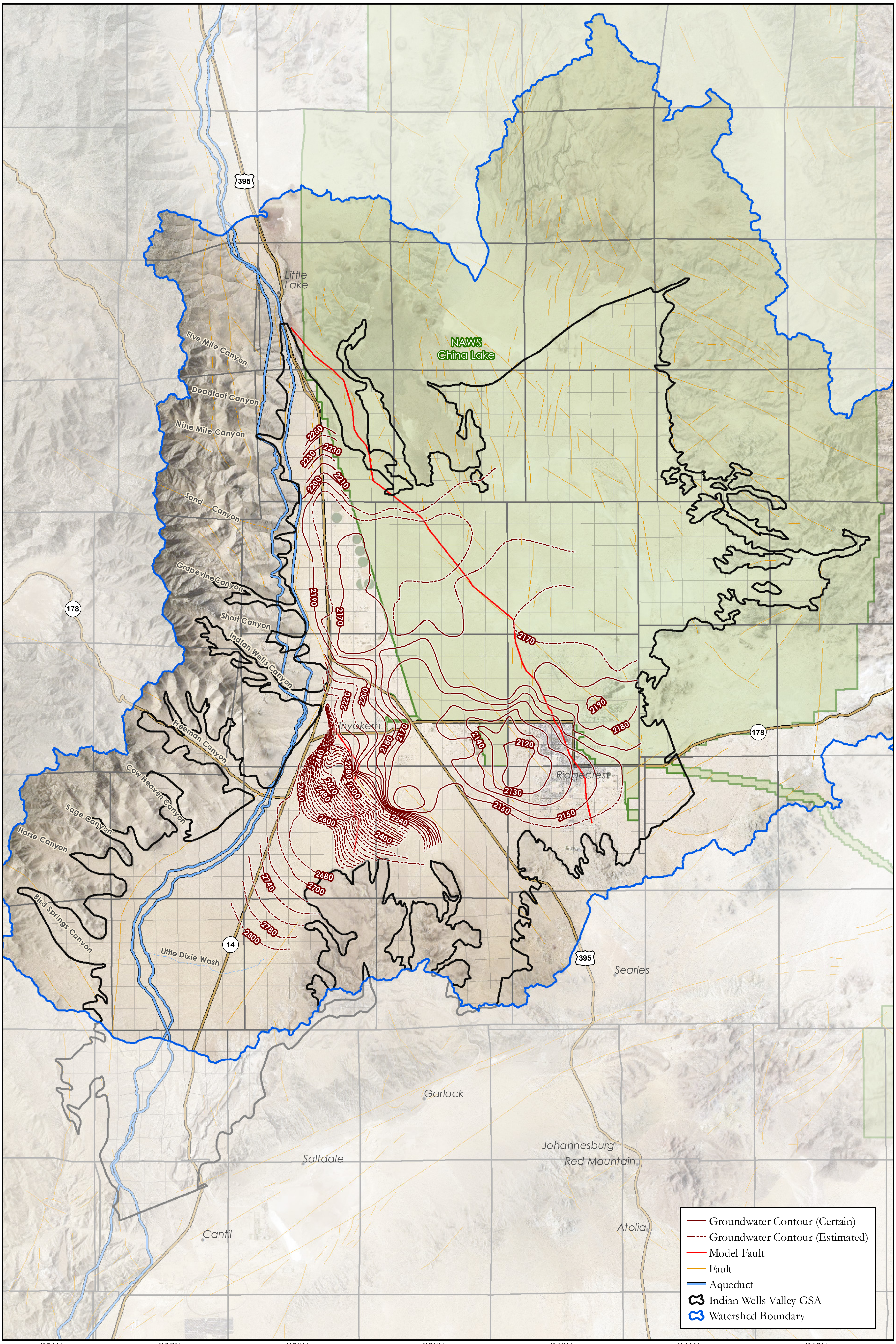

SHALLOW WELL IMPACT ANALYSIS
2015 KCWA GROUNDWATER LEVEL CONTOURS
INDIAN WELLS VALLEY
DRAFT 10/14/2019

0 2 4 Miles

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NOTE:
Contours Digitized from KCWA Map
10-foot contour interval; 20-foot contour interval in Southwest/El Paso Areas.

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FIGURE 5

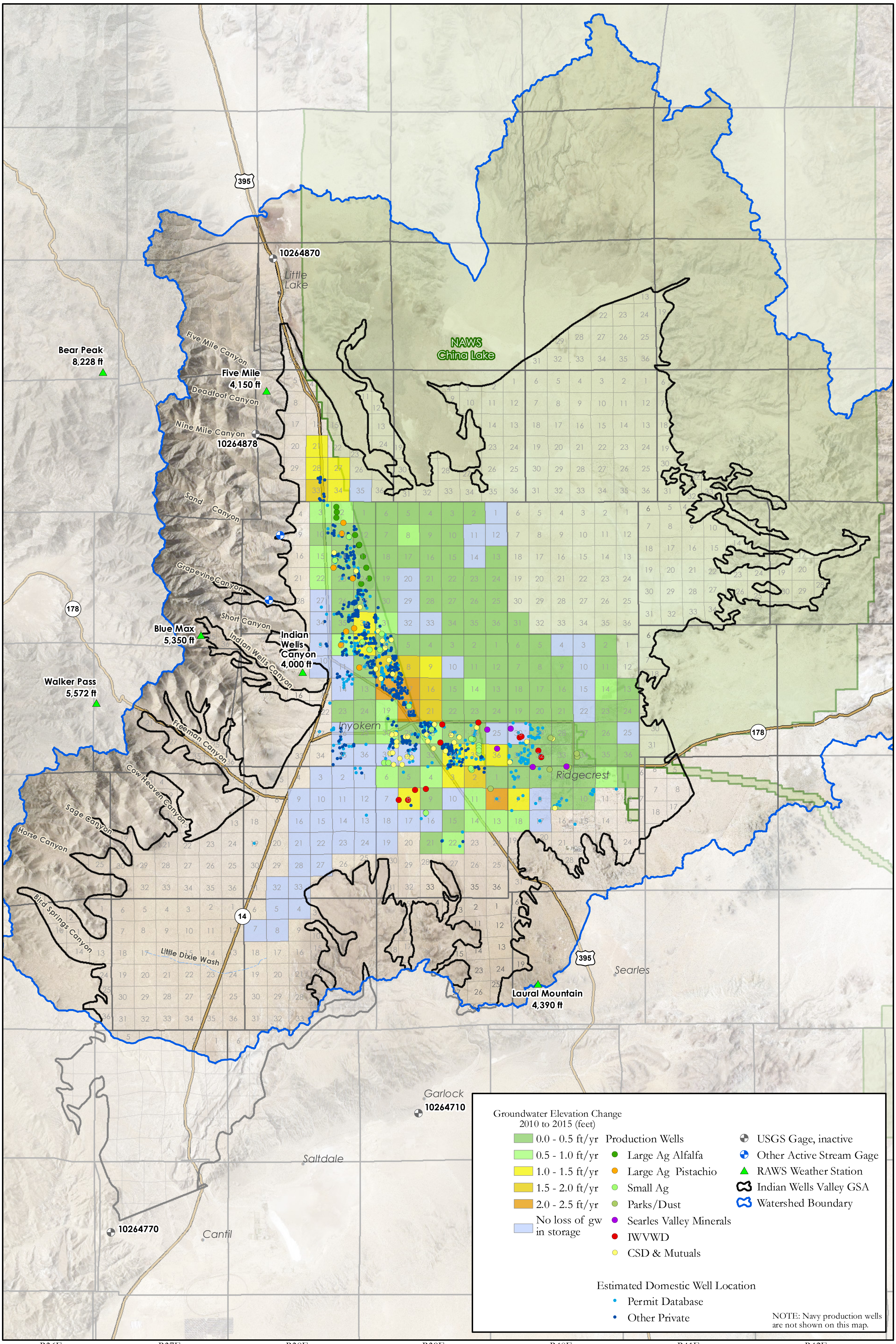
The resulting averages of drawdown/year/Section between Spring 2010 and Spring 2015 are displayed on Figure 6 ranging from no decline (blue) up to 2.0 to 2.5 feet/year (orange). Groundwater level changes between 2010 and 2015 for Sections with shallow wells are summarized below in Table 2. This analysis resulted in no declines in groundwater levels in 22 (29 %) Sections with wells; and 28 (37%) Sections with shallow wells showing drawdown of less than 0.5 feet/year. The average annual drawdown in 16 Sections in the Indian Wells Valley basin was estimated to be greater than one foot/year. Drawdown analysis for five Sections located north of Pearsonville in the northwest sections of Indian Wells Valley are based on limited data and possibly not representative of what is occurring in this area. However, the other eleven (11) Sections showing steeper rates of groundwater level decline are consistent with measured groundwater levels in these areas.

TABLE 2. ESTIMATED AVERAGE DRAWDOWN / YEAR FROM 2010 TO 2015

RANGE IN DRAWDOWN/YEAR	# SECTIONS	# SHALLOW WELLS IN SECTIONS	MAPPED COLOR
No Drawdown	22	108	Blue
> 0.0 to < -0.5	28	333	Darker green
> -0.5 to < -1.0	10	114	Light green
> -1.0 to < -1.5	8	151	Yellow
> -1.5 to < -2.0	4	84	Light orange
> -2.0 to -2.5	4	82	Darker orange
Total:	76	872	

Drawdown based on GIS analysis of KCWA Groundwater Level Contour Maps

The shallow well impact analysis assumed that the recent average rates of drawdown developed for 2010 to 2015 are indicative of the historical average rate of drawdown by Section. Some of this analysis extends the estimated rate of drawdown back in time to estimate historical shallow well impacts. There is both antidotal and reported information of shallow wells in the past that have indicated shallow wells needed to be re-drilled or deepened, but there is no definitive inventory of these impacted wells at this time. A well owner survey would be required to fill in these data gaps.



SHALLOW WELL IMPACT ANALYSIS
INDIAN WELLS VALLEY
DRAFT 10/16/2019

STETSON ENGINEERS INC.

0 2 4 Miles

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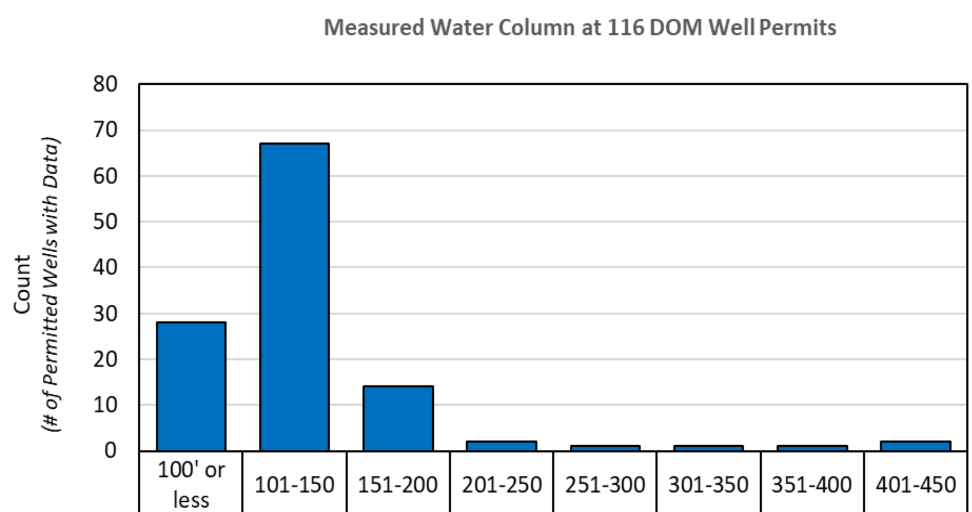
4.0. ESTIMATED SHALLOW WELL CONSTRUCTION AND INITIAL USEABLE WATER COLUMN WITHIN A WELL

The useful lifetime of a shallow well before it would be impacted by groundwater level changes is dependent upon the water column within the well above the pump and the rate of drawdown near the well. Estimates of an average water column were developed from the county's permit database and general drilling practices for domestic wells. It was estimated, that at the time of drilling, approximately 70 feet of water column was needed below the pumping water level to the bottom of the well and 48 feet of water column was typical to accommodate changing groundwater levels.

Kern County Health Department's permit database was used to estimate well construction information for 377 private/domestic wells. Each data record included location, owner, and permit date; and sometimes included total depth (TD), static water level (SWL), and well type. The standing water column at the time of well construction was needed to estimate shallow well impacts: (1) the "full" water column from TD to SWL, and (2) the "useable" water column from the pumping water level (PWL) to the SWL. Sufficient data were available for 116 wells with permits that included TD and SWL of the well. For these shallow wells, the full water column ranged from 69 feet to 450 feet with a median of 118 feet. The full water column distribution for available data is shown in Figure 7 bar graph.

FIGURE 7 MEASURED WATER COLUMN FROM KCHD PERMIT DATABASE



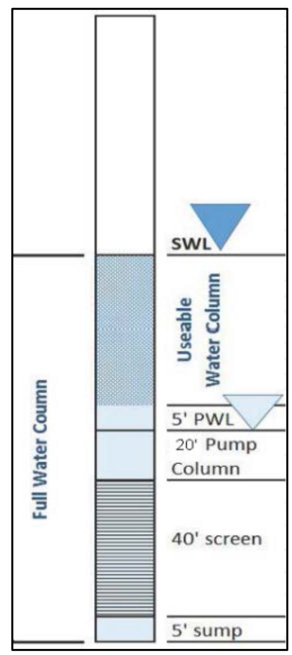
	100' or less	101-150	151-200	201-250	251-300	301-350	351-400	401-450
# Wells	28	67	14	2	1	1	1	2

An additional 83 permitted wells had recorded TD, but no SWL. For these wells, an initial water column was estimated by location and drill date. The drawdown calculated in Section 2.0 was used to estimate overall change in groundwater level for the years since the well was drilled. This change was added to the current groundwater level to "back-calculate" the initial SWL.

In areas of the basin where groundwater levels are dropping, the useable water column above the pumping water level establishes how many more years the well can function before having insufficient water column to pump. Screen intervals, pump column depths and other well construction details were not available at this time. The following general assumptions were made with respect to the domestic well construction: drilling past where the groundwater table is encountered to accommodate a sump, perforated casing, and pump column. The total depth of the constructed well can vary based upon the length of screen interval, the type of pump, and how much blank casing is installed to accommodate groundwater level changes (see schematic).

For shallow domestic wells without construction data, it was estimated that at the time of initial construction, the well was drilled to 118 feet below the groundwater table (median of permitted wells with data) and had a useable water column of 48 feet . This would accommodate a 5-foot sump, 40-foot screen interval, 20 feet for the pump column and 5 feet for drawdown in the well while pumping. The life of the well before it would be impacted by groundwater level changes is dependent upon the useable water column and rate of drawdown near the well:

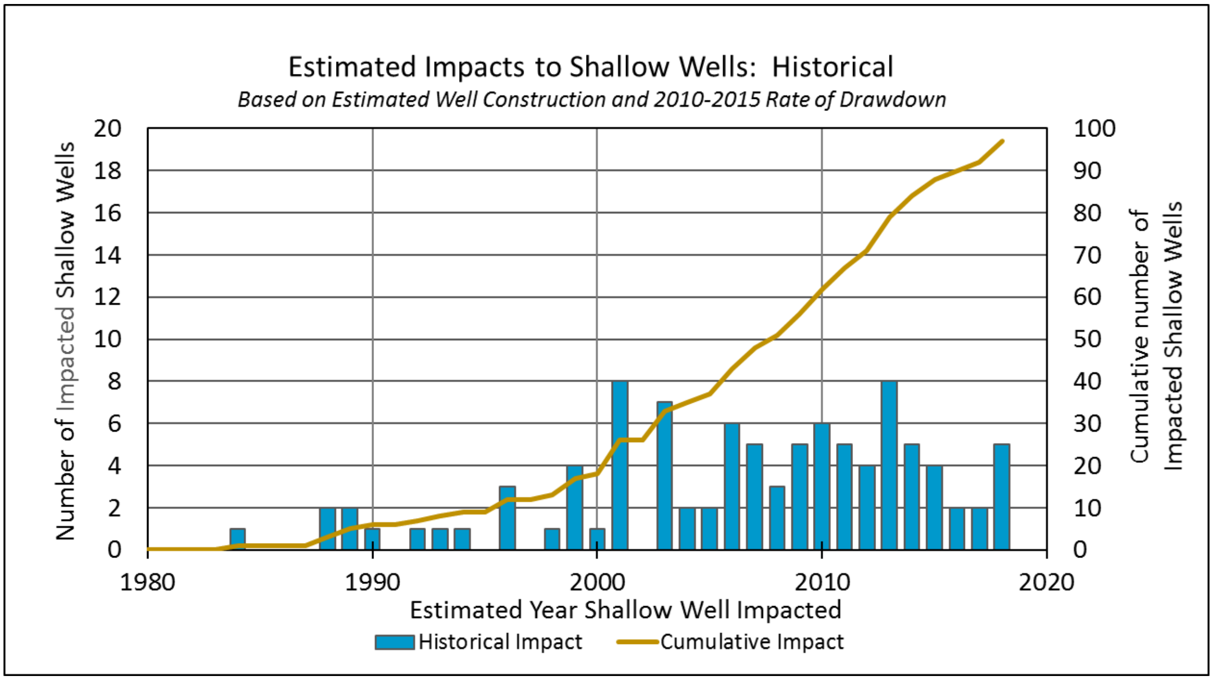
$$\frac{\textit{Useable Water Column (feet)}}{\textit{rate of drawdown per year (feet/year)}} = \textit{\# years left of well operation}$$



5.0. HISTORICAL ESTIMATE OF SHALLOW WELL IMPACT

Historical impacts of changing groundwater levels on shallow wells were assessed using the estimated well construction (Section 4.0), date drilled (Section 2.0), and historical rate of drawdown (Section 3.0). Groundwater level drawdown rates (2010-2015) were used to calculate pre-2019 drawdown. Historical drawdown rates were applied to the number of years since the well was drilled (from drill date to 2019) resulting in the total drawdown since the well was constructed. This drawdown was applied to estimate the usable water column remaining by January 2020. If the well was considered impacted prior to 2019, it was assumed that the well was deepened 40 feet. The graph in Figure 8 shows estimated historical shallow well impacts within Indian Wells Valley, ranging from 0 to 8 wells within any one year. The cumulative number of 97 impacted shallow wells was reached in 2018 using the methodology described above. It is recommended that drilling records be evaluated and outreach to domestic well owners be used to validate this analysis.

FIGURE 8 ESTIMATED HISTORICAL SHALLOW WELL IMPACTS



6.0. METHODOLOGY TO ESTIMATE SHALLOW WELL IMPACT FOR FUTURE CONDITIONS DURING BASELINE (NO ACTION) AND MANAGEMENT ALTERNATIVE 6.2 SCENARIO

The IWV Model groundwater levels are simulated for each active 15.4-acre model cell (820 feet on a side). There are 19,051 active model cells simulated within the model. These model cells overlap with 510 square-mile Sections for this analysis. There are approximately 41.6 model cells per Section (640 acres = 1 square-mile Section). Shallow well locations were estimated to be in 76 of these Sections. The average annual rate of drawdown by Section is applied to estimated depths of shallow wells to evaluate the impact of basin management on shallow wells going dry based on Future Baseline (No Action) and Management Alternatives for the Groundwater Sustainability Plan (GSP).

DRI provided GIS coverages from the IWV Model output files of simulated groundwater levels at the end of five years: 2020, 2025, 2030, 2040, and 2070. These years represent the initial start of the Groundwater Sustainability Plan (2020), the timeframe for different management actions to be taken (2025, 2030, 2040), and the 50-year planning horizon (2070). It is anticipated that rates of drawdown will vary over time influencing the number of shallow wells impacted based on the aquifer's response to when and where management actions are put into place.

The change in groundwater level for each active model cell was calculated for 2020-25 (5 years), 2025-30 (5 years), 2030-40 (10 years), 2040-70 (30 years), and 2020-70 (50 years) for Baseline and Management Alternatives. Groundwater level changes for each of the 19,051 active model cells were used to calculate average annual drawdown for each of the 510 Sections during the five respective management timeframes.

If a well became impacted after January 2020, it was assumed that drillers would be aware of declining groundwater levels and replace or deepen the well an additional 60 feet from the previous year by the next year. These assumptions were made to determine the future no-action baseline impact and all subsequent management alternatives that were modeled.

7.0. BASELINE (NO ACTION) MANAGEMENT ALTERNATIVE RESULTS

A model run scenario representing ”no action” was simulated for the future 50-year baseline condition from 2020 through 2070. This is considered a worst-case scenario where the estimated recent historical pumping of 26,959 acre-feet/year (2010 to 2015 average pumping estimated by IWVGWCG) was projected to increase over time to 38,123 acre-feet/year during the next 50 years (based on input from the major groundwater users in the basin). The shallow well impact analysis results (Figure 9) indicate that most of the 76 Sections with shallow wells will have a drawdown of 1.0 to 1.5 feet/year resulting in a 50-year drawdown of 50 feet or more. The shallow well impact analysis for Baseline conditions estimates that 81 shallow wells would be impacted by 2030, and 231 shallow wells would be impacted by 2040 (Figure 10).

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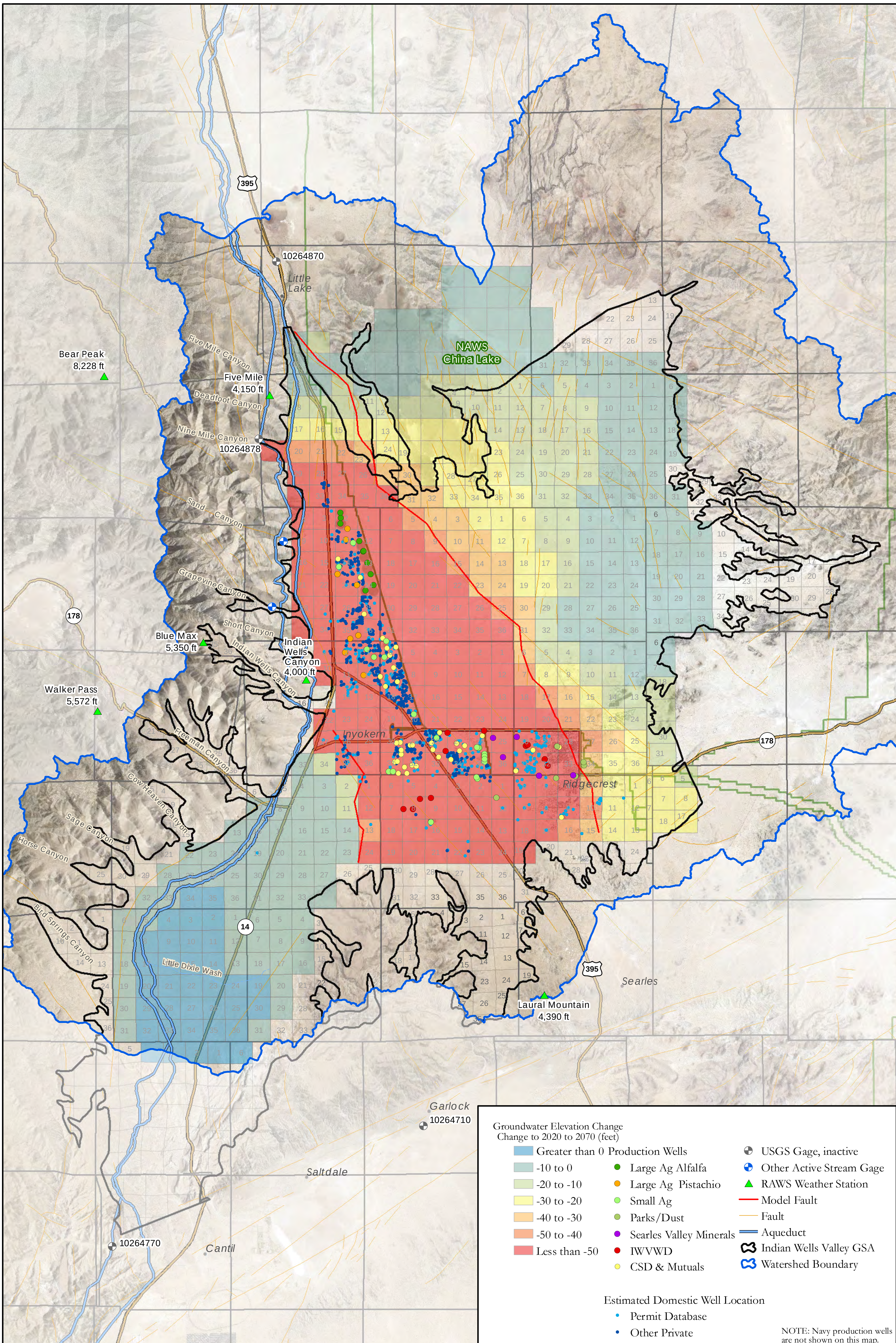

SHALLOW WELL IMPACT ANALYSIS
BASELINE
SIMULATED 50-YEAR DRAWDOWN
INDIAN WELLS VALLEY
DRAFT 3/7/2019

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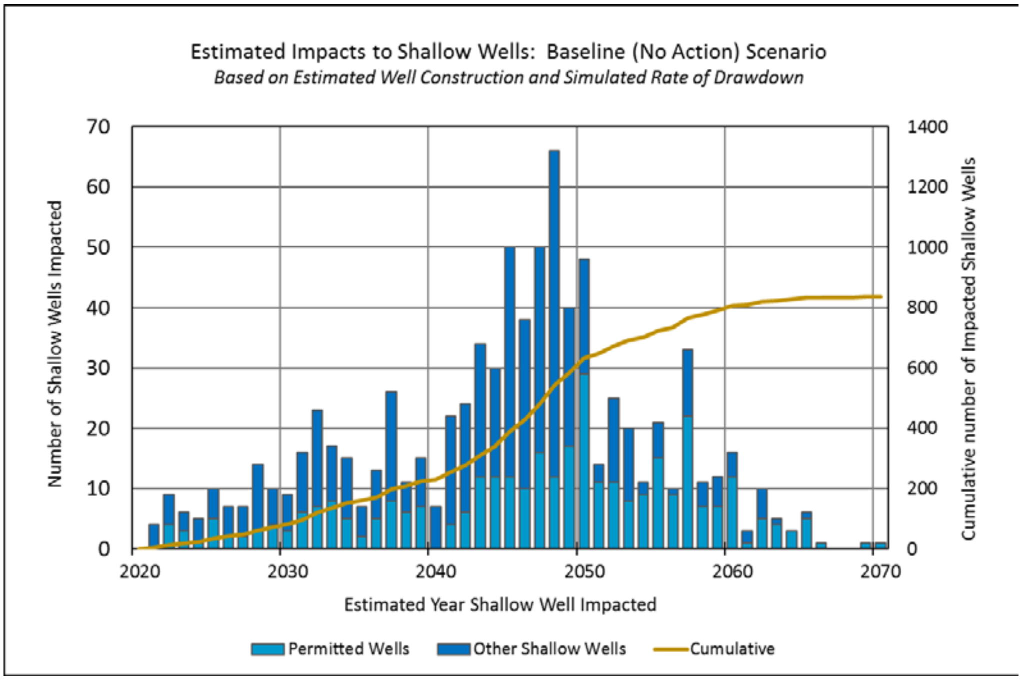
FIGURE 10 ESTIMATED BASELINE (NO ACTION) SHALLOW WELL IMPACTS



8.0. MANAGEMENT SCENARIO 6.2 SHALLOW WELL IMPACT RESULTS

A future 50-year model run representing Management Scenario 6.2 conditions was simulated for 2020 through 2070. This is the GSP scenario developed for the Indian Wells Valley Groundwater Authority with projected pumping at 20,940 acre-feet/year in 2020, 11,150 acre-feet/year in 2030, and 11,252 acre-feet in 2040 and continued with a small population growth consideration through 2070. The shallow well impact analysis results (Figure 11) for Management Scenario 6.2 indicate that most of the 76 Sections with shallow wells will have minimal drawdown resulting in only 22 shallow wells being impacted within the next 50 years. The model simulated drawdowns for Scenario 6.2 conditions estimate 19 shallow wells would be impacted by 2025, and only 3 more wells would be impacted by 2030 (Figure 12).

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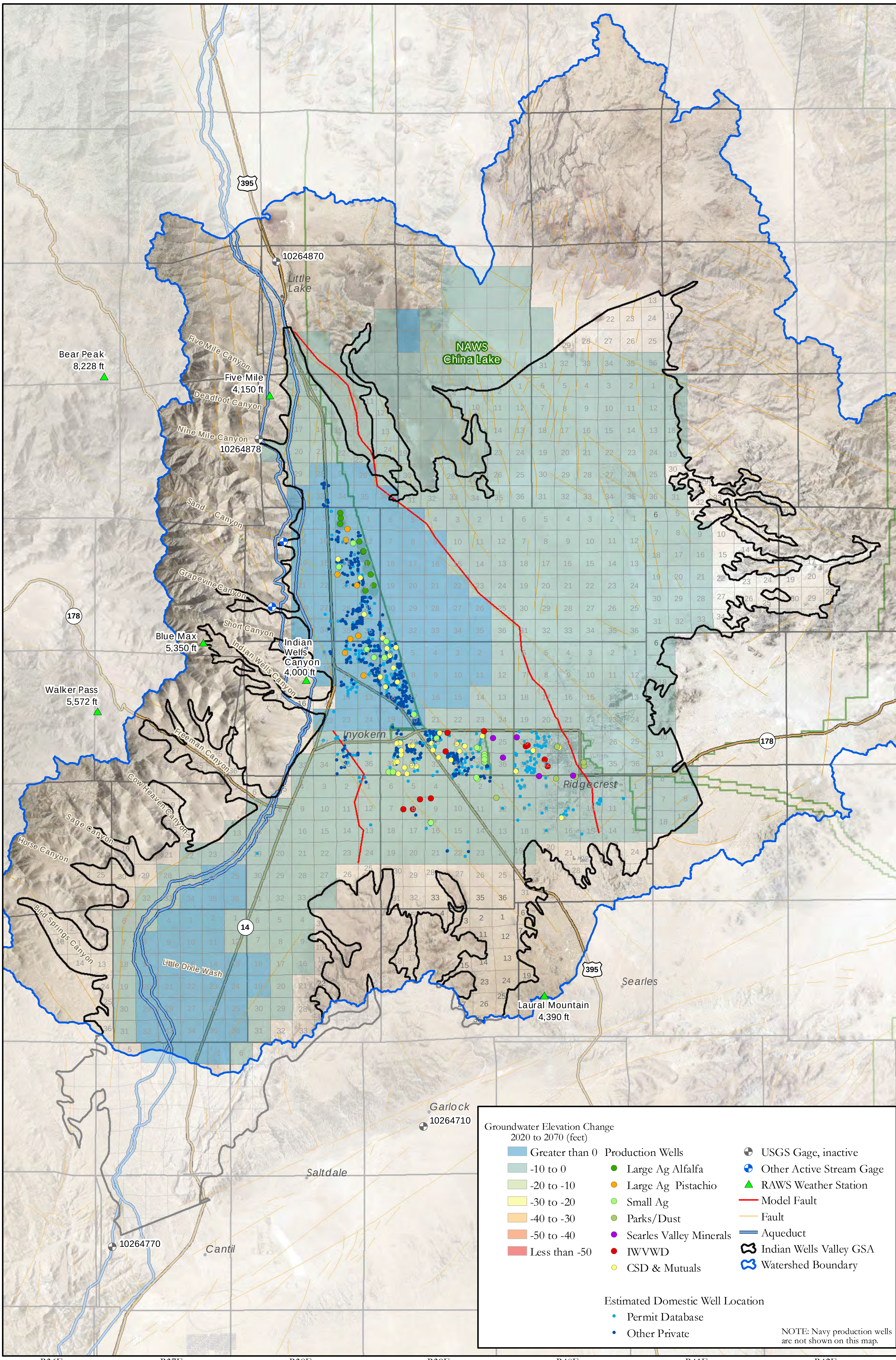

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SHALLOW WELL IMPACT ANALYSIS
MANAGEMENT SCENARIO #6.2
SIMULATED 50-YEAR DRAWDOWN
INDIAN WELLS VALLEY
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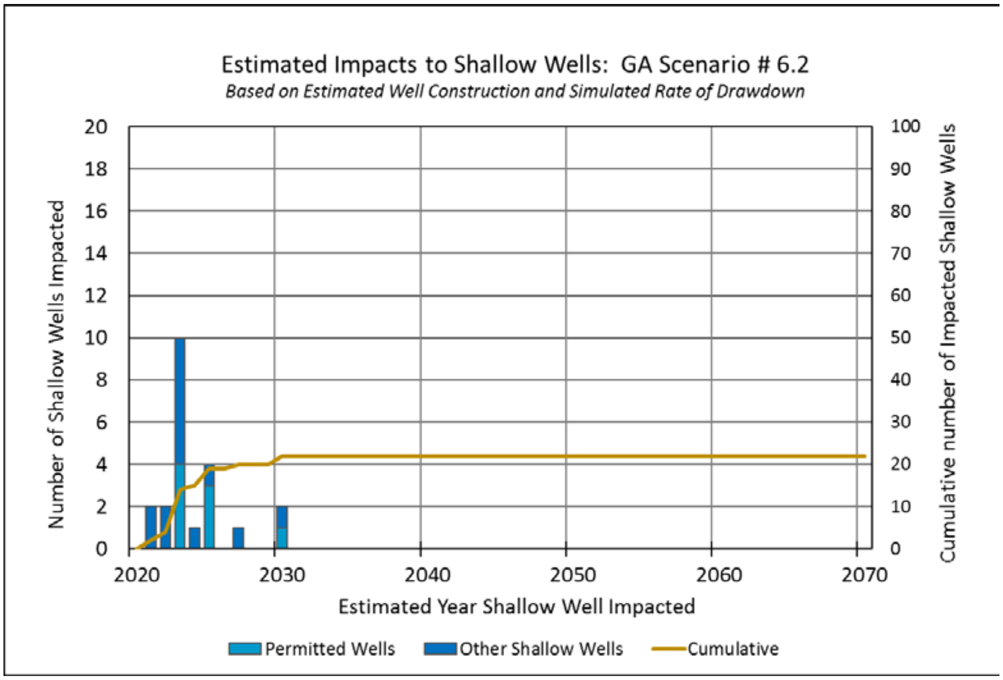
FIGURE 12 ESTIMATED MANAGEMENT SCENARIO 6.2 SHALLOW WELL IMPACTS



9.0. Recommendations

- Confirm the location of shallow rural domestic and mutual water company wells within the basin.
- Canvas all available resources for well logs (RCD, DWR, County Agencies, Well Owners)
- Develop a comprehensive database of initial well construction data, history of well deepening and/or replacement.