State Water Resources Control Board

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KINGS GROUNDWATER SUSTAINABILITY PLANS, GROUNDWATER SUBBASIN NO. 5-022.08

The State Water Resources Control Board (State Water Board) staff (staff) is providing these comments in support of the Department of Water Resources' (DWR) review pursuant to the Sustainable Groundwater Management Act (SGMA) (Water Code § 10720 et seq.) and the regulations implementing SGMA (Cal Code Regs., tit. 23, § 350 et seq.) of groundwater sustainability plans (GSPs) and the coordination agreement for the Kings Groundwater Subbasin (subbasin). Based on an assessment of the potential for impacts to drinking water wells in certain GSP areas and the degree of overdraft in others, staff reviewed five of the seven GSPs in the subbasin:

- North Kings GSP
- Central Kings GSP
- South Kings GSP
- Kings River East GSP
- McMullin Area GSP

Our comments on the GSPs focus on the following areas:

- Basin Setting
- Groundwater Levels and Potential Drinking Water Impacts
- Groundwater Quality
- Depletions of Interconnected Surface Water

- Projects and Management Actions
- Projects Reliant on New or Amended Water Rights
- Engagement

The comments made here are not exhaustive and staff may have additional comments.

Staff has identified that the GSPs allow for continued groundwater overdraft of the subbasin that will likely result in undesirable results. The GSPs define their sustainable management criteria (SMC) for groundwater levels and water quality in a way that is likely cause negative impacts to drinking water users of groundwater. In addition, interconnected surface waters are not appropriately addressed in the GSPs. The proposed projects and management actions, as described in the GSPs, do not appear likely to achieve long-term sustainability based on the water budgets presented and rely heavily on supplemental water supply rather than demand management. Moreover, some of the sources of water proposed in the GSPs are “fully appropriated” year-round, meaning those sources have insufficient supply available for new water right applications.

General Comments

The following comments apply to multiple GSPs in the subbasin. Comments regarding individual GSPs begin on page 21.

Coordination Agreement

1. A coordination agreement must include the sustainable yield for the basin, supported by a description of the undesirable results for the basin, and an explanation of how the minimum thresholds (MTs) and measurable objectives (MOs) defined by each plan relate to those undesirable results. (Cal. Code Regs., tit. 23, §357.4, subd. (b)(3)(C).) The GSPs do not define undesirable results consistently (see #3 and #8) and the coordination agreement for the subbasin does not include a description of how the MTs and MOs in the seven GSPs relate to the undesirable results for the subbasin. Without a meaningful quantification of undesirable results, it’s not possible to manage the basin to reach sustainability goals. Staff recommends the coordination agreement explain how undesirable results among the GSAs are coordinated to support the sustainable yield for the basin. The coordination agreement should also include a description of how groundwater conditions at or near MTs may affect beneficial uses and users of water throughout the subbasin, including how wells may be affected, and why those effects do not constitute an undesirable result at the subbasin scale.

Groundwater Levels and Potential Drinking Water Impacts

2. MTs defined by GSPs must be numeric values used to define undesirable results. However, in the subbasin GSPs evaluated here, MTs are not clearly linked to undesirable results, as is required. (Cal. Code Regs, tit. 23, §§351, subd. (t); §354.26, subd. (b)(2); §354.28, subd. (a).) The GSPs acknowledge that MTs for groundwater levels are higher than groundwater levels at which an undesirable result would still not occur. After reevaluating the subbasin definition for an undesirable result (see #3), the GSAs should set MTs that represent the definition. See also #4.

3. Staff is concerned that the GSAs' sustainable management criteria (SMC) do not appropriately consider beneficial users and uses of water in the subbasin. More specifically, staff has concerns with how the GSAs define an undesirable result, MTs, and MOs.

    a. As defined in the GSPs, an undesirable result would not occur until groundwater levels were too low to support any beneficial uses in the subbasin.[1] Staff disagrees that extraction of all usable groundwater in the subbasin represents an insignificant or reasonable depletion of supply and a likelihood that the plan will be implemented in a manner that will achieve sustainable groundwater management as defined under SGMA (Wat. Code, § 10721, subd. (v)). The undesirable result, as defined by the GSPs, is extreme and does not account for the beneficial uses and users that are affected in the near-term and would be affected before subbasin conditions reached this point.

    b. MOs are set by assuming historical rates of groundwater declines through 2040, adjusted for the GSPs' expected timelines for correcting overdraft through the implementation period. (McMullin Area GSP pp. 4-3 and 4-4; KREGSP p. 4-20; SKGSP p. 4-14; CKGSP p. 4-46; NKGSP pp. 4-18 and 4-19) MTs are then set

[1] For example, the McMulllin, North Kings, Kings River East, and South Kings GSPs define an undesirable result as occurring when "either the water level has declined to a depth that a new productive well cannot be constructed or when the water level has declined to a depth that water quality cannot be treated for beneficial use." The Central Kings GSP defines an undesirable result as "the lowering of groundwater levels at a faster rate than historical such that a level was realized that resulted in a majority of domestic wells associated with the farmsteads or in the rural residential neighborhoods within the GSA to become inoperable. To be clear, this is not meant to apply where pumping lowering or well deepening is possible."

to provide operational flexibility for MOs (McMullin Area GSP p. 4-4; KREGSP p. 4-21; SKGSP p. 4-14; CKGSP p. 4-26; NKGSP p. 4-19).

GSPs are required to include a description of how MOs are "intended to achieve the sustainability goal for the basin for long-term beneficial uses of groundwater." (Water Code §10727.2, subd. (b)(2).) It is not clear how beneficial users were considered in setting SMC (Water Code, § 10723.2), or if GSAs engaged domestic well users, public water systems, state small systems, or other stakeholders to define what constitutes an undesirable result. Engagement is essential to ensure that all necessary and relevant information is considered in development of the SMC and the GSP more generally. The GSAs, therefore, should engage with stakeholders to develop a definition of an undesirable result which includes a description of how beneficial uses and users were considered and is specific enough to allow for development of numeric MTs linked to beneficial users and uses. The GSAs should then set MTs which represent that undesirable result and MOs above those MTs that provide a reasonable margin of operation flexibility. MTs are further discussed in #4.

4. Only some GSPs describe how allowing water levels to decline to proposed MOs or MTs may impact domestic wells, public water systems, other beneficial users, or land use and property interests, and there is no effort to mitigate for impacts to wells. The North Kings, Central Kings, and Kings River East GSPs include estimates of the number and percentage of domestic wells that may fail if water levels decline to the MTs:

   - The North Kings GSP estimates 13 to 32 percent of domestic wells would go dry at MTs but does not describe the number of wells this percentage represents (NKGSP p. 4-13).

   - The Central Kings GSP estimates are limited to domestic wells within the disadvantaged communities (DACs)[2] of Tombstone, Bowles, Monmouth, and Caruthers.[3] The GSP estimates 19 to 95 wells (46% to 74%) would go dry at MTs (CKGSP p. 4-45).

[2] A community with a median household income less than 80 percent of the statewide average. (Pub. Resources Code, §75005, subd. (g).)

[3] For the Central Kings GSP, the estimated percentage of dry, post-1990 wells at MTs is calculated incorrectly. The denominator is currently the total number of wells. It should be the total number of post-1990 domestic wells.

- The Kings River East GSP estimates 22 percent of domestic wells would go dry at MTs but does not describe the number of wells this percentage represents (KREGSP p. 4-17).

The McMullin Area and South Kings GSPs do not provide any estimates.

Estimates of wells that may be affected at groundwater elevation MOs and MTs in Central Valley GSPs are publicly available.[4] These technical resources are available for consideration by the GSAs. Staff conducted its own analysis for domestic and public water system wells in the subbasin by comparing the depths of wells[5] with well completion reports in DWR's Online System for Well Completion Reports (OSWCR) database to the MOs and MTs presented in the GSP for the subbasin. This analysis excluded wells that were estimated to have already been dry in 2015.[6] Given uncertainties in the OSWCR data, staff presents a range of values based on domestic and public water system well records with location and depth information. The lower bounds represent wells installed after 1991[7] and the upper bounds represent all wells regardless of installation date. The results of this analysis for the Kings subbasin are summarized below:

- Of the 5,460 to 13,168 domestic wells, 563 to 1,474 (4% to 11%) may go dry at MOs and 1,818 to 4,033 (14% to 31%) may go dry at MTs.
- Of the 335 to 618 public water system wells, two to six (1%) may go dry at MOs and nine to 30 (3% to 5%) may go dry at MTs.

Note that this analysis assumed groundwater levels declining to MTs at all representative monitoring sites (RMSs), whereas the McMullin Area GSP states an undesirable result would only occur if water levels at more than one-third of RMS wells fall below MTs for two consecutive years at the same wells; accordingly, the GSP's definition of an undesirable result could allow for more wells to fail than described above, particularly in dry and critically dry years.

[4] See reports and analyses by Pauloo, R., Bostic, D., Monaco, A. and Hammond, K., The Water Foundation and EKI; and UC Davis Center for Regional Change
[5] Where available, staff used the bottom of the well screen to represent well depth; otherwise, staff used the bottom of the well.
[6] Detailed methodology available upon request.
[7] See discussion of well retirement age on page 12 of the UC Davis Center for Regional Change's analysis.

Staff strongly recommends that the GSAs, in revisiting the definition of an undesirable result and associated MTs (see #2 and #3), conduct an independent analysis of the potential impacts of proposed MOs and MTs and projected groundwater management outcomes on active domestic wells and public water supply wells at the subbasin scale, update the GSPs and coordination agreement with this information, and consider how those effects compare with the GSAs' definition of an undesirable result related to declining groundwater levels. Additionally, the GSAs should estimate and describe the population served by the wells in the subbasin which are not protected at MTs.

5. If a reasonable conclusion, drawn from (1) the GSAs' evaluation and projections including the analysis described in #4 and (2) consideration of beneficial users and uses, is that the proposed allowable decline in groundwater levels could constitute a significant and unreasonable depletion of supply, the GSAs should adjust MTs (and amend the analysis described in #4) or otherwise mitigate for impacts to wells. Implementation of mitigation could impact whether a potential undesirable result is significant and unreasonable. For mitigation, the GSAs could develop and implement a well mitigation plan that would lessen the significance of the impact by replacing or repairing domestic or drinking water system wells impacted by groundwater level declines. The GSAs could also support expansion of public water system boundaries to private well communities or consolidation of smaller drinking water systems dependent on at-risk wells with larger public water systems. This would involve identifying vulnerable areas where consolidation or extension of service is feasible. Consolidation efforts may include: (1) providing financial assistance, particularly for low-cost intertie projects that are adjacent to larger systems, (2) working with County Planning agencies to ensure that communities served by at-risk wells are annexed into the service areas of larger water systems to limit barriers to future interties, and (3) facilitating outreach and introductions between small water systems and owners of domestic wells and larger water systems to assist in developing future partnerships.

6. It is not clear if the proposed RMS wells for groundwater levels will provide the GSAs adequate spatial or depth coverage for monitoring impacts to groundwater users, because it is not clear that the GSAs have determined (1) which RMS wells are screened in each aquifer or (2) which aquifers each class of beneficial users extract from. Staff recommends that the GSA determine the well construction information for each monitoring well in order to adequately monitor the groundwater in the subbasin, and then re-evaluate data gaps to ensure the monitoring network appropriately covers all principal aquifers and monitors potential impacts to beneficial users of groundwater.

7. Staff suggests inclusion of vulnerable local public supply wells and representative vulnerable domestic wells in local groundwater level monitoring programs so that mitigation programs and re-evaluation of MT can be used where appropriate to avoid undesirable results before impacts occur.

Groundwater Quality

8. The GSPs include definitions of an undesirable result for water quality degradation, and most of the GSPs identify MTs and MOs for some number of groundwater analytes;[8] however, staff notes several issues with the SMC:

    a. According to the McMullin Area, North Kings, South Kings, and Central Kings GSPs' narrative definitions, undesirable results for groundwater quality would not occur until groundwater quality is degraded to the point at which groundwater could not generally be put to beneficial use.[9] The Kings River East GSP defines an undesirable result as a certain percentage of monitoring wells exceeding regulatory standards for a certain number of years.[10] None of the GSAs explain how their definitions consider beneficial users of water, including domestic well users or public water systems.

    b. As with the MTs for groundwater levels (see #2), the narrative definitions of undesirable results for the McMullin Area, North Kings, and South Kings GSPs are not clearly linked to the GSPs' own quantitative description of MT exceedances that would trigger management actions for water quality. SGMA requires the undesirable result be quantified by MT exceedances. (Cal. Code Regs, tit. 23, §354.26, subd. (b)(2), Cal. Code Regs, tit. 23, §354.28, subd. (a).)

[8] The Central Kings GSP did not develop MTs for water quality. See #29.

[9] For example, the McMullin Area and North Kings GSPs define an undesirable result as "significant and unreasonable reduction in groundwater quality as it relates to groundwater pumping and recharge projects such that the groundwater is no longer generally suitable for agricultural irrigation and domestic use." The South and Central Kings GSPs define an undesirable result as "the significant and unreasonable reduction in groundwater quality such that the groundwater is no longer generally suitable for agricultural irrigation and domestic use."

[10] The Kings River East GSP defines an undesirable result as a condition when 15 percent of the monitoring wells, for two consecutive years (in the same well), exhibit an MCL exceedance or a statistically significant increase in groundwater degradation where concentrations of chemicals of concern have a recent history of being above MCLs.

c. The GSPs do not explain the potential effects on public water systems or State Small Water Systems that may occur from undesirable results. (Cal. Code Regs., tit. 23, §354.26, subd. (b)(3).) Groundwater quality degradation resulting from groundwater management may result in violations or increased treatment costs for these groundwater users.

Staff recommends the GSAs work with beneficial users and stakeholders to resolve these issues.

9. In describing groundwater quality issues in the subbasin that may affect the supply and beneficial uses of groundwater and for making decisions on the SMC, the GSPs do not sufficiently consider available data from several State Water Board and Regional Water Quality Control Board (Water Boards) programs, including the State Water Board's Groundwater Ambient Monitoring and Assessment (GAMA) Program and State Water Board's Drinking Water Watch database.

Four of the GSPs only use three years of GAMA data (2015-2018) to establish existing conditions and one of the GSPs presents no GAMA data.[11] Evaluating only three years of data is insufficient given that the GSAs should have adequate understanding of existing plumes and groundwater quality contamination in order to monitor and manage future water quality degradation. Furthermore, the vertical distributions of contaminants are not defined by the GSPs, in part due to data gaps in well construction information (perforated interval) and shallow well sampling results.

Staff recommends the GSPs incorporate other sources of available data (e.g., the Fresno County Rural Domestic Well Program, ILRP and CV-SALTS) and historic GAMA data over a longer time span. The State Water Board Groundwater Ambient Monitoring and Assessment (GAMA) Program's database is available online (https://gamagroundwater.waterboards.ca.gov/). The GSPs should also fill in depth-related data gaps to improve its understanding of water quality conditions. Appendix A shows mapping of GAMA results (all years) for nitrate, arsenic, 1,2,3-TCP, DBCP, and uranium, and hexavalent chromium in domestic and public supply, and

[11] In the Kings River East GSP, the *Current and Historical Groundwater Conditions* section appears to only reference studies conducted by Department of Water Resources in the 1970s and two university research papers from the 1990s. No GAMA data is presented in the GSP. The GSP does not include any maps of the locations of known groundwater contamination sites and plumes. (Cal. Code Regs, tit. 23, §354.16.)

irrigation wells. These figures show impacts from these constituents are more widespread than otherwise discussed in the GSPs.

The GSAs may also bolster this discussion with data from the State Water Board's Drinking Water Watch database (https://sdwis.waterboards.ca.gov/PDWW/), which can be queried by public water system name or system number, and the Human Right to Water Violations Tool (https://www.waterboards.ca.gov/safer/dw_systems_violations_tool.html). These tools include information on public water system treatment technologies, water quality violations, historical and recent water quality monitoring data at public water system wells, and other information relevant to groundwater quality issues for drinking water users.

10. MTs are not clearly defined for RMS wells where MCLs will not be used. The GSPs indicate that, for wells with previous MCL exceedances, MTs will be determined by undefined "trends."[12] None of the GSPs list which wells will be evaluated by trends. Moreover, none of the GSPs clearly define the method of trend analysis or the upper bounds of seasonal or random variation for wells with MCL exceedances (i.e., non-MCL MTs). Also, the GSPs' lack of inclusion of long-term historic sampling results (see #9) will hinder the trend analysis process for wells with prior detections. The GSPs should clearly define MT concentrations in numeric values for RMSs with MCL exceedances. (Cal. Code Regs, tit. 23, §354.28, subd. (a).)

11. The South Kings, North Kings, and Kings River East GSPs do not demonstrate that the monitoring networks for water quality allow the GSAs to monitor impacts to domestic drinking water wells. The GSAs use public supply wells for all water quality RMSs.[13] Public supply wells are often deeper than domestic wells and are constructed in a way to avoid groundwater containing constituents of concern. As a

[12] For example, the McMullin Area, North Kings, and South Kings GSPs indicate that data will be "evaluated for groundwater quality trends with respect to the chemicals of concern if recent historical data has indicated chemicals of concern were initially above MCLs." The Kings River East GSP uses the same definition but refers to "constituents of concern" instead of "chemicals of concern." The Central Kings GSP does not establish MTs.

[13] The proposed RMS for the South Kings, North Kings, and Kings River East GSPs appear to rely exclusively on analytical data collected and analyzed by existing public water system wells. The McMullin Area RMS relies mostly on analytical data collected and analyzed by existing public water system wells but also includes four GAMA monitoring wells associated with the American Ave. Landfill. The Central Kings GSP does not include a proposed RMS.

result, the water quality readings in public supply wells are likely not representative of conditions in shallow domestic wells.

SGMA requires that monitoring networks have sufficient spatial density for each principal aquifer and evaluate the effectiveness of plan implementation, monitor impacts to beneficial uses and users or groundwater, and to determine groundwater quality trends. (Cal. Code Regs., tit. 23, §354.34.)

The GSPs should demonstrate how the groundwater quality monitoring network will be used or expanded to monitor impacts to shallow well users; this should include a more robust discussion of how the GSAs will leverage groundwater quality data from other programs (e.g., Irrigated Lands Regulatory Program, CV-SALTS) and the specific data gaps to be filled by new monitoring wells. If further evaluation indicates that groundwater quality at shallow wells is a data gap, the GSAs should develop a plan and timeline for monitoring water quality in the shallow aquifer.

It is also unclear whether missing well construction information will be collected for water quality monitoring wells. Consequently, it is difficult to evaluate how representative the monitoring network is of groundwater conditions in the subbasin.

12. SGMA requires that undesirable results are defined consistently throughout the subbasin. (Cal. Code Regs, tit. 23, §354.20, subd. (a).) Therefore, SMC and monitoring networks should be coordinated. Several constituents with MCL exceedances are generally widespread in the subbasin, including TDS, arsenic, nitrate, uranium, DBCP, and 1,2,3-TCP, as shown in Figures 1 through 6 (in Appendix); however, the GSPs do not share a consistent set of analyte MTs (see Table 1 below). Groundwater pumping and projects and management actions under the GSAs' authority may have the potential to influence groundwater concentrations and distributions of widespread contaminants within the subbasin, including these.

Table 1. Minimum Thresholds. Concentrations in mg/L unless otherwise noted.

Analyte	North Kings GSP	South Kings GSP	Kings River East GSP	McMullin Area GSP	Central Kings GSP
Chloride	no MT	no MT	no MT	500	no MT
Manganese	no MT	no MT	no MT	0.5	no MT
Sodium	no MT	no MT	no MT	50	no MT
TDS	no MT	no MT	no MT	1000	no MT
Arsenic	0.01	0.01	no MT	0.01	no MT
Nitrate as NO3	no MT	45	no MT	45	no MT
Nitrate as N	10	10	10	no MT	no MT
Uranium	20 pCi/L	20 pCi/L	no MT	20 pCi/L	no MT
Dibromo-Chloropropane (DBCP)	0.0002	0.0002	0.0002	0.0002	no MT
1,2,3-Trichloropropane (TCP)	0.005 ug/L	0.005 ug/L	no MT	0.005 ug/L	no MT
Methyl Tert-Butyl Ether (MTBE)	0.013	0.013	no MT	no MT	no MT
Tetrachloroethylene (PCE)	0.005	0.005	no MT	no MT	no MT
Trichloroethylene (TCE)	0.005	0.005	no MT	no MT	no MT
Hexavalent Chromium [Cr(VI)]	0.02 mg/L	0.05	no MT	no MT	no MT

Staff recommends the GSAs coordinate to define undesirable results consistently for the subbasin, manage for the same set of constituents in SMC, and have coordinated monitoring well locations and sampling frequencies. Based on their prevalence within the subbasin, all of the GSAs should include, at minimum, SMC for TDS, arsenic, nitrate, uranium, DBCP, and 1,2,3-TCP.

In deciding which water quality constituents to consider when setting SMC, a GSA should consider the best available water quality information for the basin, including data used to develop the hydrogeologic conceptual model, geochemistry of geological formations (for the potential of mobilization of natural constituents), and groundwater uses in the vicinity of the RMSs and the basin as a whole when determining which constituents to evaluate for MTs. Different constituents may cause undesirable degradation of water quality in different areas based on the purposes for which groundwater is beneficially used. Not all water quality impacts to

groundwater must be addressed in the GSPs, but significant and unreasonable water quality degradation that was not present prior to January 1, 2015, and that is due to groundwater management conditions occurring throughout the subbasin must be addressed in the GSPs' MTs. Both groundwater extraction and the implementation of projects to achieve sustainability may cause impacts from migration of contaminant plumes, changes in the concentration of contaminants due to reduction in the volume of water stored in the basin, or release of harmful naturally occurring constituents. A GSA should particularly consider whether any groundwater quality constituents in the basin may impact the established policy of the State that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes (Water Code, §106.3). Coordination by the GSAs with agencies that oversee the remediation of existing groundwater contamination is highly recommended, both in setting MTs and developing a plan of implementation.

Staff has attached maps from the State Water Board Groundwater Ambient Monitoring and Assessment (GAMA) Program's database (https://gamagroundwater.waterboards.ca.gov/) showing TDS, arsenic, nitrate, uranium, DBCP, and 1,2,3-TCP impacts in subbasin groundwater (Figures 1 through 6 in Appendix).

a. The McMullin Area GSP sets the MT concentrations for degraded water quality at 1000 milligrams per liter (mg/L) TDS. For TDS in drinking water, the secondary maximum contaminant level (SMCL) is 500 mg/L—the recommended maximum contaminant level—and the upper limit SMCL is 1,000mg/L.[14] Staff recommends that the GSPs explicitly discuss consideration of drinking water users in setting water quality SMC.

b. The South Kings GSP notes the South Kings GSA will monitor for nitrate as NO_3, despite providing maps of water quality exceedances in the basin using nitrate as N. The GSP notes both the MCL of 10 mg/L for nitrate as N as well as the outdated MCL of 45 mg/L for nitrate as NO_3. The McMullin Area GSA also proposes monitoring for nitrate as NO_3 rather than nitrate as N.

   While nitrate as NO_3 concentrations can be converted to nitrate as N concentrations and vice versa, staff recommends the GSAs revise the nitrate MTs to use the MCL for nitrate as N to be consistent with current monitoring

[14] California Code of Regulations, Title 22, Secondary Drinking Water Standards (https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/documents/ddw_secondary_standards.pdf)

protocols, prevent possible data analysis errors, and provide clarity in reporting going forward.

13. The GSPs do not specify whether the monitoring data will consist of raw untreated groundwater samples or post-treatment and blended samples. The GSAs should be evaluating in-situ groundwater to evaluate concentration trends in the subsurface as opposed to post treatment.

14. Recently published research by the US Geological Survey (USGS) speaks to how management of groundwater levels may affect groundwater quality at drinking water wells.[15] USGS scientists found that increased pumping from wells during drought can pull shallow, contaminated groundwater down to depths commonly tapped for public drinking-water supply. Staff recommends the GSAs consider these findings in discussions of how groundwater elevation SMC will guide groundwater management that may affect beneficial users of groundwater.

Depletions of Interconnected Surface Water and Groundwater Dependent Ecosystems

15. While the GSPs acknowledge groundwater-surface water interconnection is present in the subbasin, the GSPs do not define SMC for depletions of interconnected surface water (ISW). Staff does not agree that the GSPs have sufficiently demonstrated that depletions of ISW that have significant and unreasonable adverse impacts on beneficial uses of the surface water are not likely to occur in the subbasin. (Cal. Code Regs., tit. 23, §354.26.)

    a. The North Kings, South Kings, Central Kings, and Kings River East GSPs assume that reservoir operations under the Kings River Fisheries Management Program would ensure minimum flows for aquatic species in the Kings River, regardless of any increases in stream depletions from declining groundwater levels (e.g., KREGSP p. 4-67). Based on this information, the GSPs conclude that undesirable results to surface water related to groundwater pumping are not likely to occur and do not set SMC for depletions of ISW in Chapter 4.

    The GSPs' approach overlooks other possible effects of groundwater depletions, including the effects on surface water beneficial users of increased releases from Pine Flat Reservoir to compensate for additional depletions in maintaining minimum flows. The approach also ignores possible effects on aquatic species if depletions result in warmer water temperatures (due to reduced discharge of

[15] Levy, Zeno F., et al. "Critical aquifer overdraft accelerates degradation of groundwater quality in California's Central Valley during drought." *Geophysical Research Letters* (2021): e2021GL094398.

lower temperature groundwater) or longer periods of minimum flows each summer/fall.

b. The McMullin Area GSP notes that "it appears there may be seasonal connections between surface water and groundwater in at least a limited number of locations along the San Joaquin River", but that "the data does not provide significant evidence as to a continuous connection throughout the year, therefore it can be reasonable presumed that the system is not interconnected" (McMullin Area GSP p. 4-42). This conclusion is inconsistent with SGMA. The GSP Regulations define ISW 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" (emphasis added). Moreover, SMC for ISW must be supported in part by "the location, quantity, and *timing* of depletions of interconnected surface water" (emphasis added), implying the timing may be variable.

The GSPs also do not define what an undesirable result for depletions of interconnected surface water would be, making it hard to demonstrate that an undesirable result is not occurring and will not likely occur.

The GSAs should either: 1) more thoroughly demonstrate that undesirable results related to ISW are not occurring in the subbasin and are unlikely to occur in the future; or 2) develop SMC for depletions of ISW. If developing SMC, the GSAs should outline a plan and timeline to fill data gaps regarding the location (extent), quantity, and timing of interconnection in the subbasin. The GSAs should reach out to surface water users and the California Department of Fish and Wildlife for input in the development of these SMC.

16. Staff appreciates that the GSPs referenced The Nature Conservancy (TNC) Natural Communities Dataset Viewer for identifying groundwater-dependent ecosystems in the subbasin. However, the GSPs exclude from consideration any potential groundwater dependent ecosystems (GDEs) located in areas where shallow groundwater levels are greater than 30 feet below ground surface. The GSPs do not cite any reference for using 30 feet to represent the "deepest vegetative GDE rooting depth."[16] TNC's guidance includes reference to a 30-foot-depth threshold, but notes the threshold is intended to be used as a criterion for *in*clusion, not

[16] Kings River East GSP, p. 3-79; South Kings GSP, p. 3-68; Central Kings GSP, p. 3-91; McMullin Area GSP, p. 3-114; North Kings GSP, p. 3-81.

*ex*clusion.[17] TNC notes in its Plant Depth Rooting Database that the 30-foot threshold is based on global averages in phreatophytic vegetation root depth, and that specific groundwater-dependent species may have deeper roots; TNC advises using the reported maximum rooting depth for these deeper-rooted plants.[18] The GSPs' method for identifying GDEs may exclude ecological communities that rely on deeper groundwater. The GSAs should re-evaluate the locations of potential GDEs by revisiting the TNC guidance and considering best-available information.

Projects Reliant on New or Amended Water Rights

17. Implementing some of the projects identified in the GSPs may require new or amended water rights. If a project would rely on existing water rights, the GSPs should identify the water right identification numbers and other relevant details. It may be unreasonable for the GSPs to assume that projects that currently lack adequate water rights for implementation can obtain either new water rights or modifications to existing water rights within a timeframe that will allow the project to contribute to the GSPs achieving sustainability. For the GSPs to demonstrate a likelihood of attaining the sustainability goal, the GSPs should discuss the timing for obtaining approvals and describe any uncertainties, such as water availability in source streams (e.g., can potential protests be anticipated from downstream water users?). Below is information on obtaining new surface water rights or modifying existing rights:

    a. New surface water right permits: An applicant must gather all information necessary to complete the application; this could be extensive. Once the State Water Board publicly notices an application, other water right holders may protest the project based on potential injury to their water rights. The California Department of Fish and Wildlife, which is the trustee agency for the state's fish and wildlife resources (Fish & G. Code, § 711.7, subd. (a).), or other parties, may also protest if the project has the potential to harm public trust resources. The GSAs should contact the Division of Water Rights' Permitting and Licensing Division or consult the Division's

[17] See discussion on p. 13, Attachment B, in the TNC comment letter (https://sgma.water.ca.gov/portal/service/gspdocument/download/4067) on the final GSP.

[18] TNC Resources and Tools (https://groundwaterresourcehub.org/sgma-tools/gde-rooting-depths-database-for-gdes/)

Permitting and Licensing Frequently Asked Questions (https://www.waterboards.ca.gov/waterrights/water_issues/programs/applications/faqs.html) to develop an informed timeline for project implementation that includes necessary water right actions.

b. Amendment of an existing surface water right: The time required to amend an existing water right depends on multiple factors, including but not limited to whether the change is minor, major, or controversial. The GSAs can learn more from the Division of Water Rights' Petitions Frequently Asked Questions (https://www.waterboards.ca.gov/waterrights/water_issues/programs/petitions/faqs.html).

18. Some of the sources of water proposed in the GSPs are "fully appropriated" year-round (e.g., San Joaquin River upstream of the Mendota Pool, and Kings River), meaning those sources have insufficient supply for new water right applications. For projects reliant on new water rights on fully appropriated streams, the GSP should explain how the fully appropriated designation affects project timelines and feasibility.

19. Given there is no certainty that a particular water right permit or petition will ultimately be approved, or when, it is important the GSPs clarify proposed timelines for projects and management actions and consider how changes in those timelines could impact the subbasin's ability to achieve sustainability by 2040. The GSPs should also identify alternative groundwater management strategies to achieve sustainability (e.g., demand reduction), if anticipated water supplies such as purchases or new or amended water rights are unsuccessful. This would ensure the GSAs can effectively evaluate when they should move towards implementing such contingency projects or management actions if primary projects or management actions are not implemented on projected timelines.

    Proposed demand management actions are absent or lacking in necessary details in the GSPs. The Central Kings and Kings River East GSPs does not identify any demand management actions. South Kings GSP proposes possible pumping restrictions during specific intervals such as periods of extreme drought. North Kings GSP and McMullin Area GSP both identify groundwater allocations, including a ramp-down of pumping, if necessary, as possible management actions, but do not identify clear triggers for implementation. To this end, the Central Kings, South Kings, and Kings River East GSPs should also identify well-developed, scalable demand management options and all five GSPs should identify clearly defined triggers for demand management actions in the event that proposed supply augmentation volumes are not fully achieved.

20. The GSPs (excluding the Central Kings GSP) state that "pre-1914 supplies are not limited to a specific Place of Use." The GSPs should qualify this statement with a reference to Water Code section 1706, which imposes potential limitations on the place of use for pre-1914 rights. Changes may not be made to a place of use if they would cause injury to another legal user of water. Please note that pre-1914 right holders are required to submit a statement of water diversion and use to the State Water Board.

21. Staff appreciates that GSAs with urban areas coordinated with urban water suppliers to align GSP components, such as projects and management actions, with Urban Water Management Plans (UWMPs). Staff recommends that GSAs leverage SGMA as an opportunity to further strengthen water management by considering additional urban strategies, such as turf replacement incentive programs.

22. The GSPs describe well permitting processes in each applicable county, and several GSPs describe possible management actions that may involve coordination with county well-permitting programs:

    - The Kings River East GSP notes the Kings River East GSA "will be involved in reviewing proposed projects to determine what impacts, if any, a project may have on sustainable groundwater management" (KREGSP p. 2-26). Management actions include a well facility registration action that would involve "documentation of existing extraction facilities, correlation of well completion reports, and registration of new extraction facilities in order to better understand potential impacts from groundwater decline" (KREGSP p. 6-36).

    - The North Kings, South Kings, and McMullin Area GSPs note the GSAs may adopt policies "to augment the current well requirements set by the state/[Fresno County Environmental Health Department] and establish new permit criteria, enforce [GSA] policies, and require [GSA] approval of all permit paperwork for non-de minimis extractors before [Fresno County Environmental Health Department] permit issuance" (McMullin Area GSP p. 6-99; SKGSP p. 6-51; NKGSP p. 6-13). The policies may contain any of the following:
        - registration of pumping facilities with the GSAs
        - requiring installation of well flow meters, sounding tubes, and water quality sample ports
        - requiring self-reporting of groundwater pumping volumes, static water levels and water quality data
        - prohibiting construction of composite wells (South Kings GSP only)

However, the GSPs lack specific information regarding the events that would lead the GSAs to adopt these types of policies, how the GSAs will evaluate new permits, address possible impacts from new permits, or work with the county to address concerns. Staff recommends that GSAs work with county governments for alignment between the GSPs and county well permitting programs. As encouraged by the SGMA, GSAs should request counties forward permit requests for new wells, for enlarging of existing wells, or for reactivation of abandoned wells. (Water Code, §10726.4.) Shifting demand to sites near existing wells may cause groundwater level declines and effects on beneficial users of groundwater in areas of the subbasin not well represented by an RMS. Increased production from these wells may also make it more difficult for the GSAs to avoid undesirable results and achieve sustainability within the implementation period.

Engagement

23. While most of the GSPs describe public water systems that are members of the GSAs, the GSPs lack information on other public water system that are beneficial users of water in the subbasin and GSPs do not provide context for the location and extent of communities dependent on groundwater. Staff recommends the GSAs provide a more thorough description of the beneficial uses and users of groundwater in the subbasin, including the land uses and property interests potentially affected by the use of groundwater in the subbasin. In particular, the GSPs should include further description of the DACs and Severely Disadvantaged Communities (SDACs) [19] and the municipal systems, other Public Water Systems, State Small systems, or domestic wells that serve them, the types of parties representing those interests, and the nature of consultation with those parties. (Cal. Code Regs., tit. 23, §§354.8, subd. (a)(3)(4), 354.10, subd. (a).)

24. The GSPs do not describe the depth intervals from which various types of supply wells draw water in enough detail to communicate how basin management may affect different types of wells. Some of the GSPs (North Kings, South Kings, and Central Kings GSPs) do not even differentiate well types in their well density mapping. A clear, three-dimensional understanding of drinking water sources is necessary to understand water access and water quality issues. See also #9.

25. Staff recommends the GSPs describe past and current drinking water supply issues due to dry or underproductive wells, including the impacts of previous droughts on water quality or availability. The Public Policy Institute of California (PPIC)

[19] A community with a median household income less than 60 percent of the statewide average. Pub. Resources Code, § 75005, subd. (g).

estimated that roughly 2,300 domestic wells went dry in the San Joaquin Valley during the 2012-2016 drought and approximately two-thirds of them were in the Kings subbasin (Ellen Hanak et al., PPIC Water Policy Center, "A Review of Groundwater Sustainability Plans in the San Joaquin Valley," May 14, 2020). This information would help define the challenges that the subbasin is facing and could support development of the sustainability goal. Kings subbasin GSPs should evaluate the impacts of past droughts against narrative definitions of undesirable results to describe the conditions that may have caused previous undesirable results. (Cal. Code Regs, tit. 23, §354.26, subd. (b)(1).) Moreover, Kings subbasin GSPs should evaluate MTs against the rates and impacts of groundwater level declines during past droughts to help establish and justify MTs (Cal. Code Regs, tit. 23, §354.28, subd. (b)(1)); Cal. Code Regs, tit. 23, §354.28, subd. (c)(A)), especially because the subbasin GSAs did not develop a groundwater model to simulate groundwater conditions and SMC.

26. The GSPs note that federally recognized Tribal lands are not present within the GSP boundaries; however, this does not preclude Tribal interests in the subbasin. The GSPs should examine potential Tribal interests comprehensively. Without this information, it is difficult to discern whether the GSAs appropriately considered the interests of California Native American Tribes in developing the GSPs. (Water Code, §10723.2(h).) The GSPs should elaborate on the GSAs' tribal engagement effort. If the GSAs have not already done so, the GSAs should consult with the Native American Heritage Commission (NAHC) to obtain information about Tribes that have current and ancestral ties in the basin. To request this information, the GSAs can email the NAHC at nahc@nahc.ca.gov.

27. The GSPs should be more explicit about how the concerns of local beneficial users, particularly DACs reliant on groundwater and other stakeholders, were integrated into development of SMC and monitoring networks and selection of RMS and projects and management actions. The GSPs should describe specific input that was received from interested parties, which is, in some cases, absent from the GSPs.[20] SGMA requires encouraging active involvement of diverse social, cultural,

[20] For example, a comment from Community Water Center (KREGSP p. 820) states the local community "rejected" certain SMC concepts, thus seeking a vision that is different than what is reflected in the GSP. In staff's review of the Kings River East GSP, it isn't apparent if the GSP describes specific input received from stakeholders during GSP development. The GSP states that the GSA "uses information collected via the stakeholder survey to gauge involvement and primary concerns." However, the GSP doesn't state how the survey was distributed or who completed it and the survey doesn't appear to be available on the GSA website.

and economic elements of the populations within the basin during plan development. (Water Code §10727.8, subd. (a).) Collaborative and inclusive processes can make plans more resilient by increasing buy-in and trust, improving compliance, and enhancing the quality of information on which plans are based. It is important that GSAs send appropriate notices; hold meetings in times, places, and manners that support effective engagement; and integrate interested parties' concerns into subbasin management. GSAs should consult with individuals or groups when actions may impose direct or indirect costs on those entities. Good governance can build trust and reduce regulatory compliance risks. Consultation, for example, could help a GSA avoid or mitigate an action that might directly or indirectly cause a drinking water system to violate its permit or face new compliance costs due to reduced availability of water or lower water quality.

28. The GSAs should engage with all public water systems which rely on groundwater in the subbasin to ensure the GSP protects drinking water users. To facilitate this, State Water Board staff has attached a list of public water systems with wells in the subbasin as of November 2021. Please contact the Board's Division of Drinking Water at DDW-SAFER-NAU@waterboards.ca.gov with any questions.

Central Kings GSP Comments

Groundwater Quality

29. The Central Kings GSA does not identify groundwater quality SMC and instead proposes to develop SMC in the five-year update. The GSAs should propose initial SMC for groundwater quality degradation in coordination with the other GSAs in the basin (see #12).

Projects and Management Actions

30. The GSP proposes recharging 50,000 AFY through groundwater recharge projects. Water availability for this rate of recharge assumes two wet years per every five years, derived from the observed period. However, the expectations for drought in California under global warming scenarios is increased frequency and duration, so the GSA should not expect historical wet year frequencies to extend into the future. Staff recommends the GSAs better develop contingency planning should less water be available for recharge than expected (see #19).

31. Descriptions of projects and management actions are too vague to understand whether implementation is feasible and likely to prevent undesirable results in the subbasin, particularly in light of the informational deficiencies addressed above. Projects and management actions include demand reduction (voluntary fallowing, dry farming) and supply augmentation (groundwater recharge basins, surface

storage in ponds, canal/ditch improvements). If implemented, the GSP states that supply augmentation would add approximately 50,000 AFY. Descriptions of projects and management actions are conceptual and do not specify: the criteria that would trigger implementation (Cal. Code Regs., tit. 23, §354.44, subd. (b)(1)(A)); a timetable for implementation (Cal. Code Regs., tit. 23, §354.44, subd. (b)(4)); a description of how the GSAs plan to meet costs (Cal. Code Regs., tit. 23, §354.44, subd. (b)(8)); or an explanation of the source and reliability of the water on which the projects rely (§354.44, subd. (b)(6)). Staff recommends that the GSAs provide more information on the proposed projects and management actions, identify funding, identify water sources (where appropriate), and develop specific plans and timelines for implementation.

Kings River East GSP Comments

Groundwater Levels and Potential Drinking Water Impacts

32. Based on the monitoring network description and map, RMSs may not reflect impacts to beneficial uses and users in DACs. Most DACs don't have a monitoring site located within the DAC boundary. Therefore, groundwater elevations in the DACs are not directly measured by the monitoring program. Without this information, the GSA may not be appropriately considering the interests of DACs. (Water Code, §10723.2(i).) The GSP should explain how the network will monitor impacts to the wells that are located in the DACs. (Cal. Code Regs, tit. 23, §354.34, subd. (b)(2); §354.34 subd. (f)(3); §354.34, subd. (g)(1).) The GSA should provide evidence that conditions at the distant RMSs reflect conditions in the DACs (Cal. Code Regs, tit. 23, §354.36, subd. (c)) or develop a plan to fill this data gap.

Groundwater Quality

33. Baseline concentrations are not discussed for the 15 proposed monitoring wells. These data should be presented in the GSP to support development of SMC and be used to distinguish SGMA-related water quality changes from other water quality changes. The baseline concentrations are relevant to the following requirements:

    a. Significant and unreasonable water quality degradation due to groundwater conditions occurring throughout the basin/subbasin, and that were not present prior to January 1, 2015, must be addressed in the GSP's MTs.

    b. Changes in groundwater conditions relative to MOs and MTs must be monitored. (Cal. Code Regs, tit. 23, §354.34, subd. (b)(3).)

Depletions of Interconnected Surface Water and Groundwater Dependent Ecosystems

34. The GSP states "KREGSA is not aware of any environmental users of groundwater within KREGSA" (KREGSP, p. 2-35); however, there is evidence of environmental

users of groundwater in the subbasin (see comments on the GSP submitted by the Audubon Society, the Nature Conservancy, and the California Department of Fish and Wildlife). Additionally, the GSP includes a map of possible GDEs. The GSA should update the GSP with the best available information on environmental beneficial users in the subbasin and determine whether SMC are adequate given this new information.

Projects and Management Actions

35. Included in the list of projects in Chapter 6 is a project titled *Enhanced Utilization of High Flows from the Kings River*. This project is listed in addition to the eleven supply augmentation projects. The project, reportedly, is already being implemented and captured 50,000 AF in 2017. Chapter 3 also discusses that Kings subbasin GSA members submitted an application to the State Water Board in 2017 to expand the "Kings River Service Area" place of use for new projects to divert high flows. The GSP should clarify if these descriptions are all referring to the same project or how they may be related.

South Kings GSP Comments

Groundwater Quality

36. While the GSA sets MT concentrations for uranium, the GSP does not identify any monitoring wells at which uranium will be sampled (SKGSP Table 4-7), making it difficult to understand how the MTs are actionable.

Projects and Management Actions

37. The feasibility of supply projects is difficult to assess from the information provided in the GSP. Groundwater recharge projects do not clearly outline the source water. The GSP notes that the GSA has executed an agreement with Consolidated Irrigation District "for reliable access and delivery of surface water supply to utilize for groundwater recharge," but provides no explanation of the reliability of this water. Moreover, the GSP assumes water will be available four out of every five years and will result in recharge, after losses, of 7,848 AFY via 19 recharge basin projects listed in the GSP. In explaining the reliability of the source of water for the project, the GSP should provide information on the availability of Consolidated Irrigation District water to supply those projects, particularly under future climate scenarios. (Cal. Code Regs., tit. 23, §354.44, subd. (b)(6).) Also, see #19 above on contingency planning.

McMullin Area GSP Comments

Basin Setting

38. There are currently some discrepancies in the projected water budget that should be resolved or better explained. The North Kings GSA and Fresno Irrigation District indicate in GSP comments that the McMullin Area GSA is supposed to adjust its current 91,100 acre-feet per year (AFY) of groundwater inflow, caused by groundwater pumping gradients, to zero. The McMullin Area GSA responded to these comments indicating that this issue was addressed, and the GSP language indicates that water budgets have been adjusted accordingly,[21] but the groundwater inflow in the projected water budget is still 91,100 AFY.[22] Staff recommends that the McMullin Area GSA confirm their groundwater inputs in their water budget and revise if necessary.

39. Groundwater volume extractions for the water budget are estimated with two methods that provide significantly different values, and one method does not account for groundwater extraction from one of the principal aquifers. Extractions calculated from groundwater elevation changes differ significantly from those estimated from the water budget (-18,000 AFY v. -61,600 AFY, p. 3-131, Table 3-4). This variation appears to be caused by the groundwater elevation change volume extraction methodology (see Method 2, p. 3-131, Table 3-4), which ignores confined extractions (Technical Memorandum 4, p. 2, #4), despite the fact that well completion report data available from OSWCR suggest that agricultural wells are extracting from the confined aquifer. The GSAs should ensure that any volume extraction calculations from groundwater elevation changes (Method 2) account for confined aquifer extractions.

40. The GSP currently provides one average groundwater level hydrograph for the fall (p. 3-54) and one for the spring (p. 3-55), but the Basin Setting section describes

[21] The McMullin Area GSP indicates that “Through coordinated meetings with all subbasin GSAs, it was determined that groundwater pumping and lack of surface water in MAGSA has additional groundwater flow out of other GSAs… MAGSA is inducing large volumes of groundwater flow. This value is included in the historical water budget but is removed in the future water budget discussed later, since it is anticipated that these groundwater flows will be mitigated through water supply and demand reduction projects” (p. 3-132).

[22] The McMullin Area GSP historical, current, and projected water budgets each include the same groundwater inflow of 153,000 AFY.

both confined and unconfined aquifers. In order to adequately describe the basin, the GSP should provide groundwater level hydrographs that differentiate between depth to water in the unconfined aquifer and potentiometric surface in the confined aquifer.

Depletions of Interconnected Surface Water and Groundwater Dependent Ecosystems

41. The GSA notes potential groundwater dependent ecosystems identified in TNC's Natural Communities Dataset Viewer but, as noted in #16, eliminates potential GDEs where Spring 2017 groundwater levels are greater than 30 feet below ground surface. Potential GDEs eliminated include a large feature in the Fresno Slough area that stretches across the westernmost boundary of the McMullin Area GSA's extent into the Delta-Mendota subbasin (McMullin Area GSP pp. 3-114, 3-115, and 3-116). However, the County of Fresno GSA, in the Management Area A & Management Area B Delta-Mendota Subbasin GSP, identifies the same feature as a possible GDE. Staff recommends the McMullin Area GSA coordinate with the County of Fresno GSA and revisit the TNC guidance to ensure its discussion of GDEs considers the best-available information.

42. The GSP provides interpolated groundwater depth contour maps but lacks information on timing of ISW, as required by Cal. Code. Regs, tit. 23, §354.16, subd. (f). There are not enough maps provided (each representing one time-point) to assess potential ISW over time, and the maps do not include all publicly available hydrographs from the mapped area. The GSA should reconsider where ISW can occur in the subbasin using more time-points for evaluation, and the GSA should additionally include consideration of hydrographs from other United States Bureau of Reclamation wells along the San Joaquin River (p. 3-09, Figure 3-70).

North Kings GSP Comments

Basin Setting

43. The GSP presents only one well density map (i.e., NKGSP Figure 2-8), which does not distinguish among irrigation, public supply, and domestic wells. Staff recommends the GSP present well density maps and provide the general distribution for each well type and overlay with the location and extent of communities reliant on groundwater for drinking water. (Cal. Code. Regs, tit. 23, §354.8, subd. (a)(5).)

Water Levels

44. The GSP estimated the number of domestic wells that may go dry at MTs and MOs in Public Land Survey System sections that are outside of community water systems. The results are similar to the State Water Board's analysis of dry wells

(see #4). However, continued water level declines to the MTs may also impact shallow irrigation wells at the eastern portion of the North Kings GSA, which range from 100 to 200 feet deep (NKGSP p. 3-45). Staff recommends that the GSA consider the impact of SMC on these shallow wells and evaluate whether SMC are appropriate.

Water Quality

45. The water quality monitoring network appears to lack coverage at the north eastern area of the City of Fresno (i.e. north of Highway 180 and east of Highway 41, see NKGSP Figure 5-4). This area has 1,2,3-TCP MCL exceedances in public supply wells. The GSAs should propose a plan with a clear timeline for establishing water quality RMSs in this area.

46. Staff suggests the GSA fill data gaps in well construction information for water quality monitoring wells, in addition to what it commits to do for water level monitoring wells. Without this information, it is difficult to discern how representative the current monitoring network is of beneficial uses and users, including communities dependent on shallow drinking water wells.

Depletions of Interconnected Surface Water and Groundwater Dependent Ecosystems

47. The Basin Setting portion of the GSP provides evidence of interconnection with shallow groundwater and possibly regional aquifer system at some sections along the San Joaquin River (e.g., upstream of the Copper Avenue Alignment, and between Highway 145 and downstream of Gravelly Ford within the borders of North Kings GSA during wet periods, NKGSP p. 3-77 through 3-80). But the SMC section states that the "San Joaquin River does not appear to be hydraulically connected to groundwater." The GSP also states that undesirable results are "unlikely to occur" because "the San Joaquin River Restoration program will continue to ensure certain flow rates in the river along the North Kings GSA and release water to accommodate all river losses (evaporation, seepage, riparian diversions and groundwater pumping induced seepage)." Staff recommends the GSA plan on coordinating with the USBR's SJRRP to further investigate and identify potential pumping-induced seepage increase.

    In addition, this approach for dismissing undesirable result overlooks other possible effects of groundwater depletions, including the effects on surface water beneficial users of increased releases from Millerton Reservoir to compensate for additional depletions in maintaining minimum flows. The approach also ignores possible effects on aquatic species if depletions result in warmer water temperatures (due to reduced discharge of lower temperature groundwater) or longer periods of minimum flows each summer/fall.

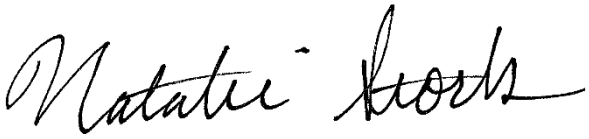
Projects and Management Actions

48. The surface water treatment facilities proposed as projects in the GSP use significant amounts of surface water and are not reflected in the current or projected water budgets. For example, the City of Fresno's Southeast Surface Water Treatment Facility, whose construction began in 2014 and was completed in 2019, yields approximately an 82,000 AFY benefit, but the differences between the current (2016 – 2017) or projected (2040) water budgets and the historic (1997 – 2011) water budget do not reflect such a large increase in municipal and industrial surface water use (see NKGSP Tables 3-8, 3-10, and 3-13). The water budget tables should incorporate water volumes for this project and any other projects not included in the water budget.

49. The GSP's surface water treatment facilities and groundwater recharge projects rely on surface water supplies from contracts or agreements with the Fresno Irrigation District (FID) and existing Kings River water rights. However, it is not clear whether these additional supplies come from underutilized water rights or will lead to reduction of surface water available for other beneficial uses (e.g., agriculture) of the FID. The GSP needs to have a clear understanding and accounting of FID's water rights and water availability for different water year types.

If you any have questions regarding these comments, please do not hesitate to contact State Water Board Groundwater Management Program staff by email at SGMA@waterboards.ca.gov or by phone at 916-322-6508.

Sincerely,



Natalie Stork
Senior Engineering Geologist
Groundwater Management Program
Office of Research, Planning, and Performance

Enclosures: Appendix – Select constituents in Kings Subbasin wells

Public water systems with wells in the Kaweah Subbasin as of November 2021 (see .xlsx attachment within PDF file)

Appendix – Select constituents in Kings Subbasin wells

Non-detects are green, detections are yellow and orange, and MCL exceedances are red. Figures developed from State Water Board Groundwater Ambient Monitoring and Assessment (GAMA) Program's database (https://gamagroundwater.waterboards.ca.gov/).

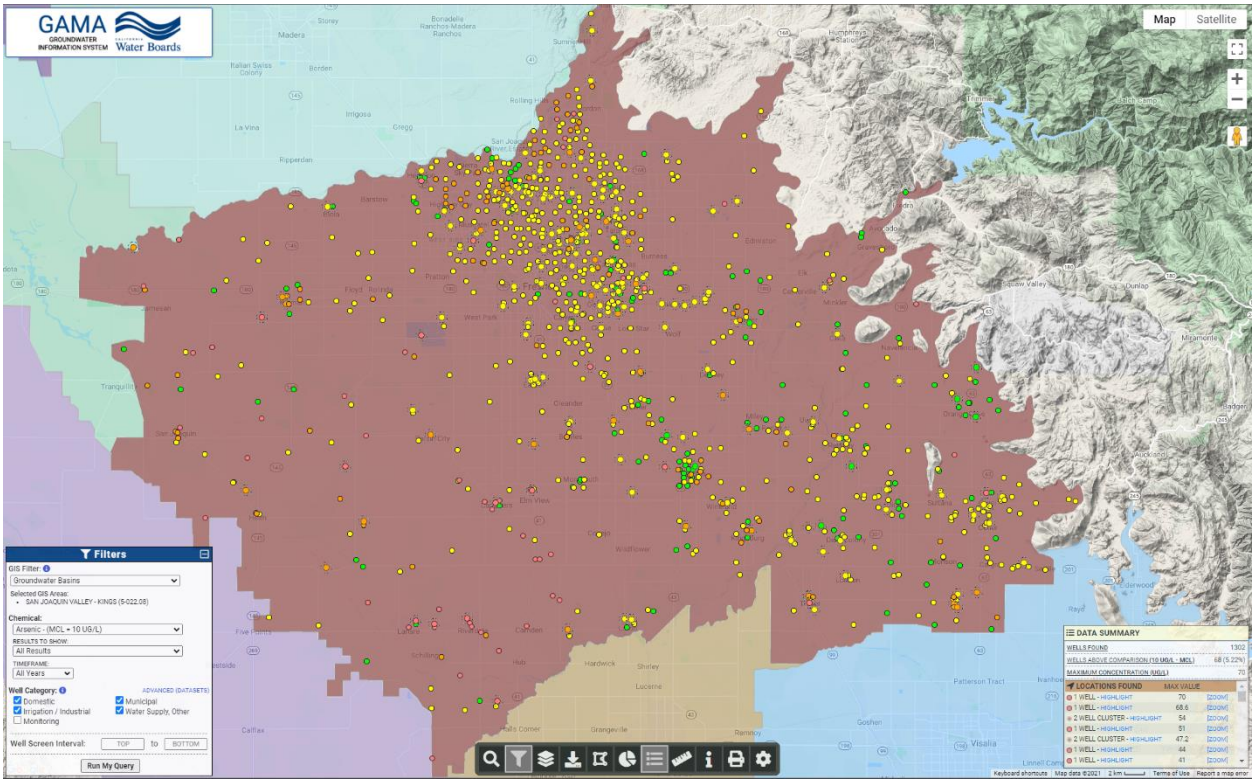


Figure 1. Arsenic in Kings Subbasin wells.

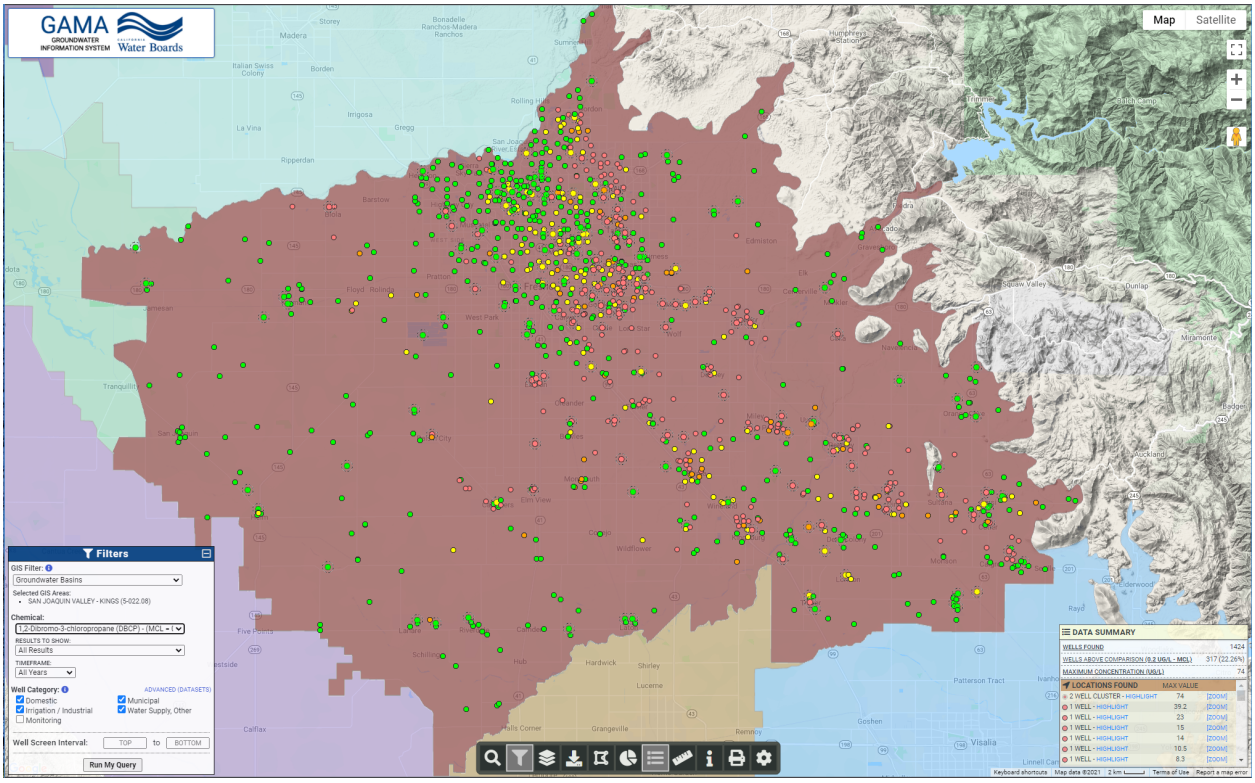


Figure 2. Dibromo-Chloropropane (DBCP) in Kings Subbasin wells.

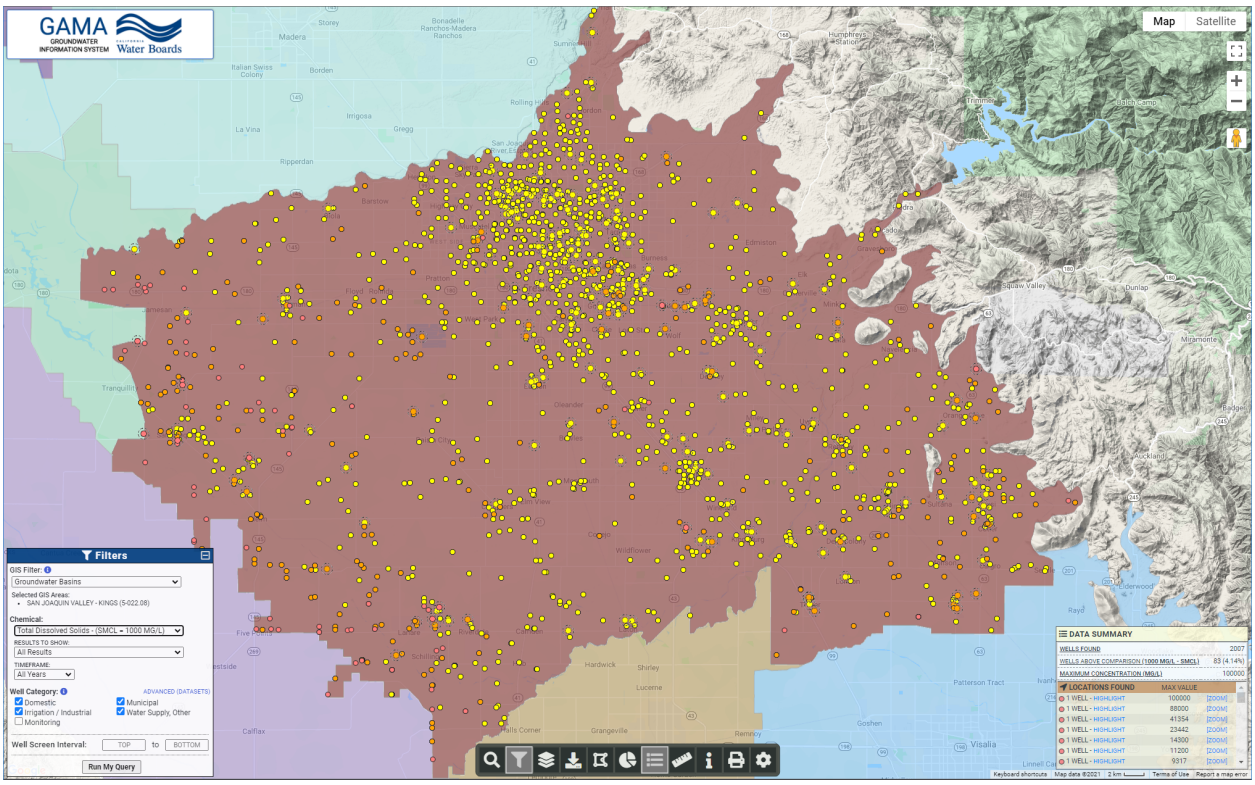


Figure 3. Total Dissolved Solids (TDS) in Kings Subbasin wells.

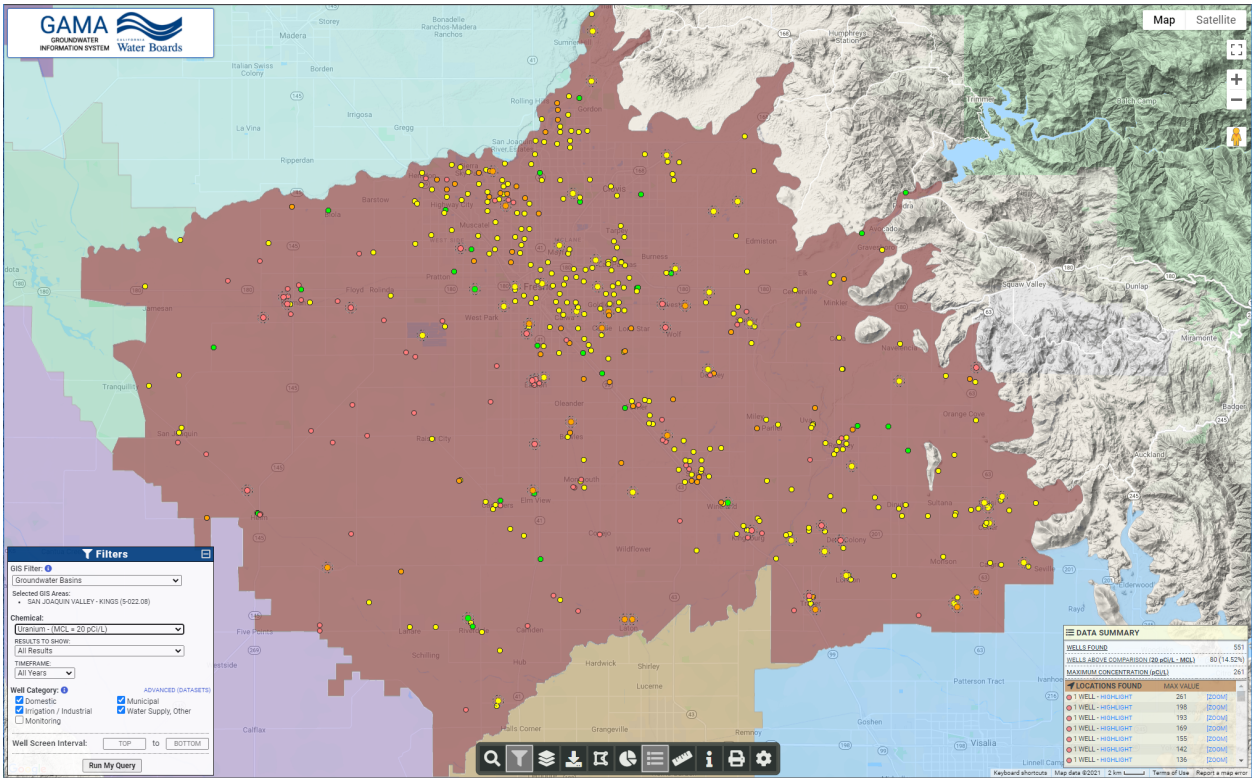


Figure 4. Uranium in Kings Subbasin wells.

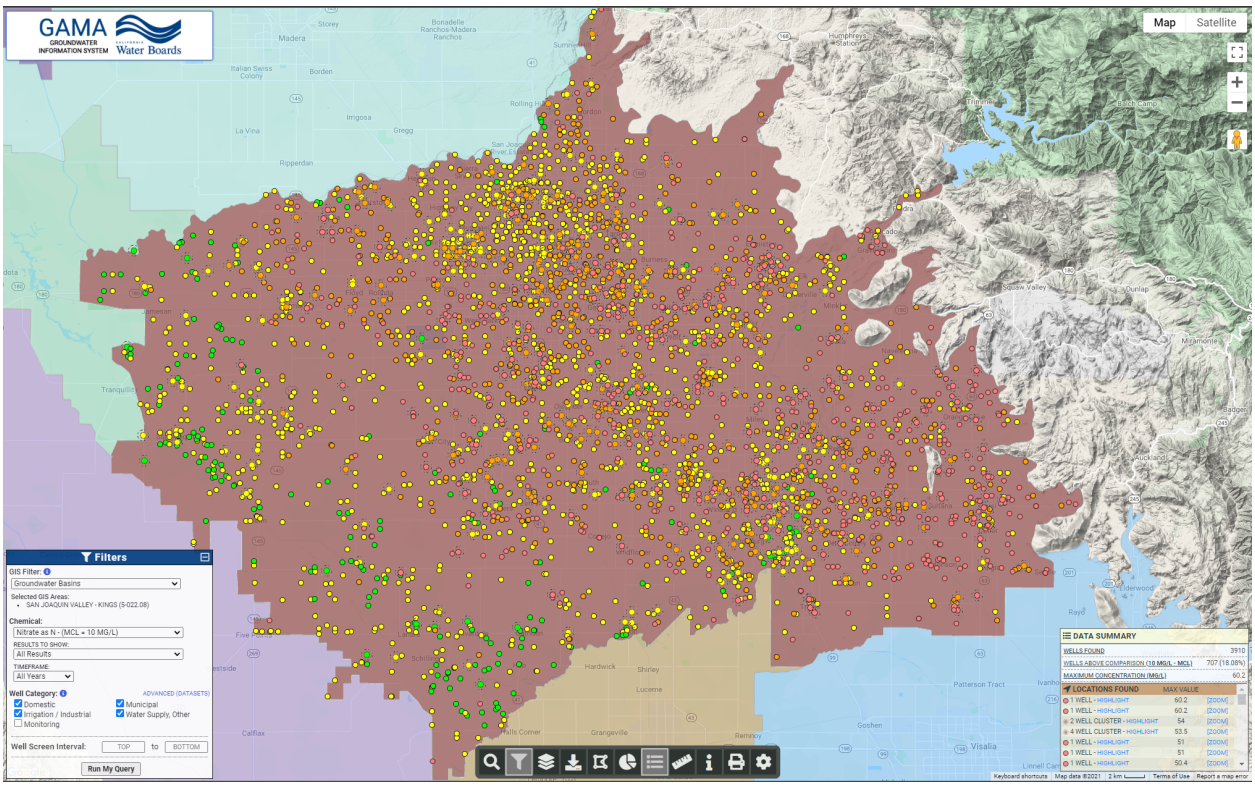


Figure 5. Nitrate as N in Kings Subbasin wells.

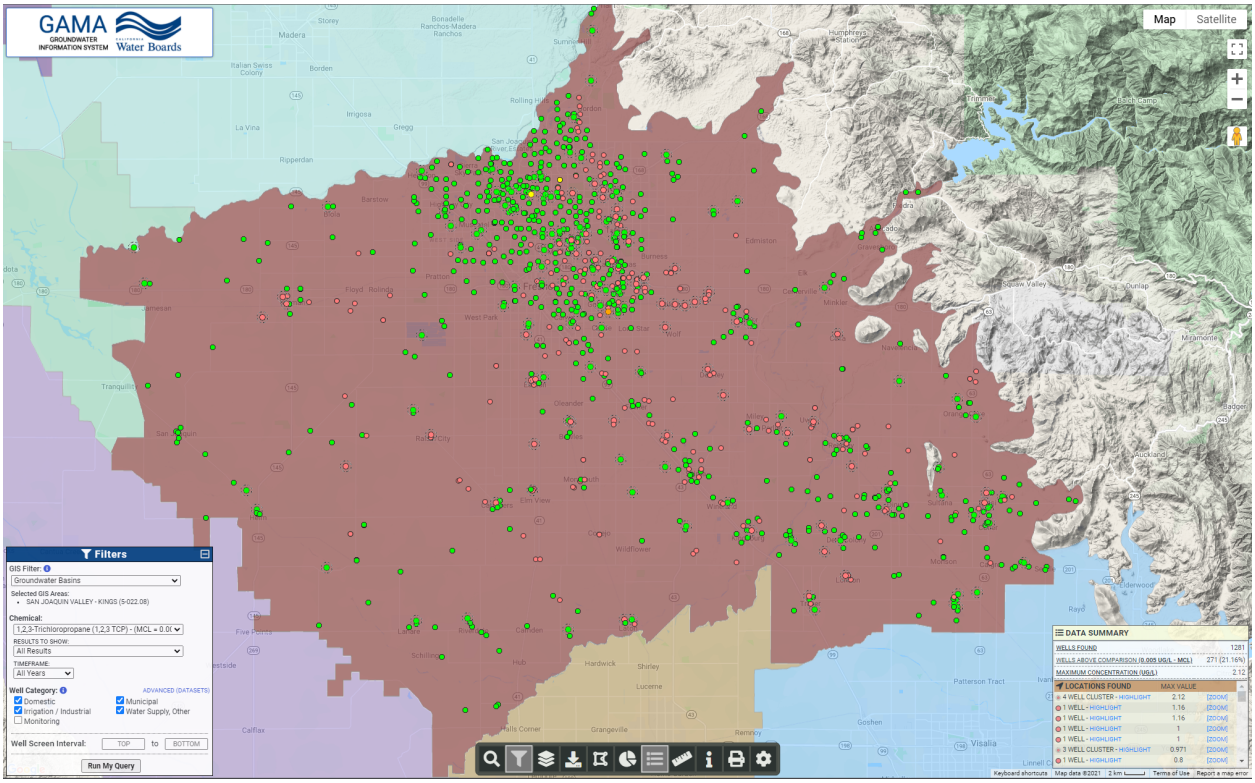


Figure 6. 1,2,3-Trichloropropane (TCP) in Kings Subbasin wells.