6-16-2022 Draft of revised GSP
Portion of Chapter 6 only

6 Projects and Management Actions to Achieve Sustainability

Regulation Requirements:

§354.44(a) Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin.
(b) Each Plan shall include a description of the projects and management actions that include the following:
(1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent. The Plan shall include the following:
(A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management actions, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.
(B) The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.
(2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.
(3) A summary of the permitting and regulatory process required for each project and management action.
(4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.
(5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.
(6) An explanation of 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.
(7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.
(8) A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.
(9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.
(c) Projects and management actions shall be supported by best available information and best available science.
(d) An Agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.

No changes to Projects or Management Actions until addition of Section 6.3

Projects for Data Collection and Policy Development

Project Title: North Fork Group Site 6 Recharge Project Project ID: NFK19

The program would utilize high flow pre-1914 Kings River water, and perhaps CVP water if available. The program must be established by the GSA, but there would be no permitting or regulatory requirements for the program since it essentially is in-channel recharge.

Project Schedule - 354.44(b)(4) Anticipated Start & Completion, Timeframe to accrue benefits

The project recharge can occur whenever high flow water is available from the Kings River or from the CVP. Program development is anticipated to occur within 5 years of GSP submittal (by December 2021).

Evaluation of Benefits - 354.44(b)(5)

The volume of water delivered for recharge will be measured daily and summarized monthly by the local water delivery agency. The rate of accrual of benefits will depend on the availability and frequency of high flow water. The water level of groundwater wells in the area will be measured and water quality will be monitored. This data will be used to determine if there are changes to water quality that are occurring from project operation.

How will project be accomplished, and what is the water source? - 354.44(b)(6)

The project will be accomplished by Reed Ditch Company. The water source will be high flow pre-1914 Kings River water or CVP water that may be available.

Legal Authority - 354.44(b)(7)

The local water delivery agency has the legal authority to deliver high flow or pre-1914 Kings River water to the landowner fields, as well as CVP water since the NFKGSA area is within the CVP Place of use.

Project Cost - 354.44(b)(8) Estimated Capital Cost Estimated annual cost/AF

Project costs will not be accounted for in this GSP since the funding is being obtained by Reed Ditch Company and there are no expected direct GSA costs.

Funding Source - 354.44(b)(8)

Reed Ditch Company assessments and potential grant funding.

Management of Groundwater Extractions and Recharge - 354.44(b)(9)

The project would be managed by Reed Ditch Company under the oversight of the NFKGSA. Recharge volumes will be measured and reported by the local water delivery agency. Groundwater extraction will be by landowners in the area. Performance of the project would be a necessary part of the GSA's reporting requirements as well as evaluations of measurable objectives.

Level of Uncertainty - 354.44(d)

The level of uncertainty primarily involves the availability of high flow water. The level of uncertainty is considered medium for the volume of recharge water indicated.

6.3 Projects for Data Collection and Policy Development

The GSA has identified three different projects that include data collection, research and policy development that will directly aid in future development and implementation of sustainable management criteria.

6.3.1 Land Subsidence Data Gap Analysis

The following describes a project to perform additional research and data gathering to fill data gaps related to analysis of land subsidence. Note that specific details still need to be developed as part of the project, and a general description is provided below. This project will only be applicable to GSAs with significant areas

experiencing or subject to inelastic subsidence. The information will help to identify land subsidence impacts, monitor sustainable management criteria, and develop appropriate mitigation measures.

Project Title: Land Subsidence Data Gap Analysis	Project ID: NFK20

Project Type

Data collection and analysis

Project Location

The project will be implemented over any area subject to significant inelastic land subsidence. Existing data shows that significant subsidence generally correlates with the areal extent of the Corcoran Clay (E-clay) and other lacustrine clays of the San Joaquin Valley.

Implementing Agency

The GSA will be the implementing agency.

Project Description - 354.44(a)

The GSA currently lacks some information on the confined aquifer that would help improve prediction and management of land subsidence. Specifically, the quantity of water pumped from the confined aquifer, potentiometric surface maps, and confined aquifer flow patterns are not well known. This information can be used to evaluate the causes of land subsidence, estimate future subsidence, and identify appropriate mitigation measures.

The work will be comprised of five tasks:

Task 1: Define Study Area
Task 2: Estimate Groundwater Pumping from the Confined Aquifer
Task 3: Identify Wells Perforated in the Confined Aquifer for Monitoring
Task 4: Installation of Monitoring Wells
Task 5: Evaluate Potential Influence of Neighboring Areas

These five tasks are described below in more detail, including specific tasks that may be required to fill existing data gaps.

Task 1 – Define Study Area
This task includes identifying the limits of the study area based on historical subsidence, current subsidence, and mapped boundaries of significant clay layers. Only areas with potentially significant inelastic subsidence will be investigated. It is expected that the study area will include lands within James GSA, McMullin Area GSA and North Fork Kings GSA as well as some neighboring subbasins.

Task 2 - Estimate Groundwater Pumping from Confined Aquifer
The volume of water pumped from the confined aquifer is currently unknown since most wells are not metered, most active wells have not been inventoried, and the screened interval is not known for many wells. In many cases, even though a Well Completion Report was prepared for the well, the owner cannot locate the Report, or the well has not been matched up with the appropriate Report. In addition, many wells that tap the confined aquifer are also screened across the unconfined aquifer (i.e., composite wells).

In this preliminary phase, groundwater pumping from the confined aquifer will be estimated through evaluation of well data in the DWR Well Completion Report Map Application Database (https://data.cnra.ca.gov/showcase/well-completion-report-map-app). This database has tabular information on wells including depth, perforated interval, etc. and is the best available data at this time,

Project Title: Land Subsidence Data Gap Analysis	Project ID: NFK20

although it is known that the database is incomplete. This information will be used to estimate the percentage of wells tapping the confined aquifer, unconfined aquifer and those tapping both aquifers. Using information on total groundwater pumping, groundwater levels, perforated intervals, and relative yields in the different aquifers, the amount of pumping from the confined aquifer will be estimated. This exercise will also show the spatial distribution of confined aquifer wells, and provide temporal data on construction of confined aquifer wells. Since the status of individuals well are not currently known, only wells constructed after a certain year would be assumed active.

The process defined above will provide a preliminary assessment of confined aquifer pumping, yet it would also be the best estimate currently available. Over time, the active wells will be inventoried, and some may be investigated by video or matched to a Well Completion Report. As a result, it is expected that the pumping estimate will be refined throughout the SGMA planning period.

Task 3 - Identify Wells Perforated in the Confined Aquifer for Monitoring

This task includes identifying specific wells that only tap the confined aquifer for use in developing potentiometric surface maps. This will be accomplished in several ways:

- Existing monitoring networks include a few wells that are known to tap the confined aquifer. These wells have already been labeled and will be used in future analysis.
- Existing production wells in the monitoring network will be matched with Well Completion Reports, when possible. This method typically has limited success since many Well Completion Reports lack detailed well location data, or the well location data is poor quality.
- As funding is available, wells in the monitoring network will be inspected by video to verify the perforated interval.
- Identify new wells to add to the monitoring network, specifically, for this effort, any that are known to tap only the confined aquifer. This would require permission from the landowner to allow long-term monitoring. In addition, any well would need to be suitable for monitoring (i.e. accessible, desirable location, etc.).

This information will be used to develop potentiometric maps to determine confined aquifer flow patterns, and whether the potentiometric surface is falling and contributing to land subsidence.

Task 4 - Installation of Monitoring wells.

If necessary to fill in data gaps, and if funding is available, dedicated deep monitoring wells will be installed to monitor the potentiometric surface in the confined aquifer. These may include nested wells with casings at different depths to compare confined, semi-confined and unconfined water levels. Due to the large area to cover, and the potential costs, this will be an on-going effort throughout the entire planning period (i.e., through 2040).

An effort will also be made to work with DWR and/or USGS to evaluate and obtain funding for installation of one or more extensiometers in the Kings Subbasin and neighboring basins to measure subsidence.

Task 5 - Evaluate Potential Influence of Neighboring Areas

This task includes evaluating the influence of neighboring areas on land subsidence in the Kings Subbasin. Current data shows more severe subsidence in some surrounding areas. Subsidence in these areas could be encroaching into the Kings Subbasin, and deep groundwater pumping could be causing confined aquifer flows out of the Kings Subbasin. This evaluation will require collecting data on groundwater

Project Title: Land Subsidence Data Gap Analysis **Project ID: NFK20**

conditions outside of the Kings Subbasin, likely through coordination and data sharing agreements with other GSAs.

Measurable Objective(s) Addressed - 354.44(b)(1)

The project will provide information to help manage land subsidence in the GSA.

- ☐ Chronic Lowering of Groundwater Levels
- ☐ Seawater Intrusion – *not applicable*
- ☒ Land Subsidence
- ☐ Reduction of Groundwater Storage
- ☐ Degraded Water Quality
- ☐ Depletion of Interconnected Surface Water

Circumstances and Criteria for Implementation - 354.44(b)(1)(A)

This is a high priority project that is necessary to understand, manage and limit the impacts from surface land subsidence. The GSAs are committed to implementing this project.

Process to Provide Notice of Implementation - 354.44(b)(1)(B)

The public and relevant entities will be given the opportunity and time to comment on the results of any data analysis, which will be presented in Annual SGMA reports or 5-year GSP updates. The public will also be able to comment on any CEQA filings, if needed, for monitoring wells.

Estimated Annual Project Benefits (AF/yr) - 354.44(b)(2)

The project will help to provide information and data to better manage land subsidence and the local groundwater. Specific information will include estimates of annual groundwater pumping from confined aquifers and potentiometric surface data.

Permitting and Regulatory Requirements - 354.44(b)(3)

Well permits will be required if any monitoring wells are installed. Since the wells will not extract water, obtaining the well permits should not be a problem. Right-of-way agreements or easements may be needed depending on where the wells are located. No other permits or approvals are expected to be necessary.

Project Schedule - 354.44(b)(4) Anticipated Start & Completion, Timeframe to accrue benefits

A preliminary schedule for completing the project is provided below:

Task Description	Period
1 - Define Study Area	Jan 2023 – Apr 2023
2 - Estimate Groundwater Pumping from Confined Aquifer	May 2023 – Dec 2023
3 - Identify Wells Perforated in the Confined Aquifer for Monitoring	Jan 2024 – Dec 2025
4 - Installation of Monitoring Wells	2024 through 2040
5 - Evaluate Potential Influence of Neighboring Areas	Jan 2024- Dec 2025

Note: Tasks 2, 3 and 5 will include the initial phases shown above, but will be continually refined through 2040.

Evaluation of Benefits - 354.44(b)(5)

The project will help provide information and data to better manage land subsidence and the local groundwater. Specifically, the information could be used to evaluate the causes of subsidence, estimate future subsidence, and identify appropriate mitigation measures.

How will project be accomplished, and what is the water source? - 354.44(b)(6)

The project will be implemented by the GSA using available funding and funding from State and Federal Grants, if available. No surface water or groundwater source are required for implementation.

Legal Authority - 354.44(b)(7)

Project Title: Land Subsidence Data Gap Analysis	Project ID: NFK20

The GSA has the authority to implement a project such as this because the SGMA statute grants the GSA the powers and authorities to "perform any act necessary or proper" to implement SGMA regulations and allows the GSA to adopt rules, regulations, ordinances, and resolutions necessary for SGMA implementation (CWC 10725.2).

Project Cost - 354.44(b)(8) Estimated Capital Cost Estimated annual cost/AF

The estimated combined costs for Tasks 1-3 and Task 5 are between $10,000 and $50,000 for each GSA. Installation of monitoring wells could range from $0 to $1 million, depending on what data gaps need to be filled.

Funding Source - 354.44(b)(8)

Funding for initial investigations will be covered by existing GSA funds and reserves. Installation of a network of deep monitoring wells would likely require some outside funding and be performed over an extended period. The GSA will look for State and Federal grant opportunities for constructing monitoring wells.

Management of Groundwater Extractions and Recharge - 354.44(b)(9)

The project will not impact groundwater extractions or recharge. The project is meant to gain a better understanding of confined aquifer extraction to help better manage the groundwater supply.

Level of Uncertainty - 354.44(d)

The GSA is committed to the project and there is a high level of certainty this project will be performed. Some optional components of the project, including installation of a network of deep monitoring wells, could require up to $1 million and will be dependent on available funding, and State and Federal grant opportunities will be pursued. The other components of the project are expected to proceed without delay or significant funding restrictions.

6.3.2 Surface Water - Groundwater Interconnection Data Gap Analysis

The following describes a project to perform additional research and data gathering to fill data gaps related to interconnected surface water and groundwater. Note that specific details still need to be developed as part of the project, and a general description is provided below.

Project Title: Surface Water-Groundwater Interconnection Data Gap Analysis	Project ID: NFK21

Project Type

Data collection and analysis

Project Location

The project will be implemented in areas adjacent to rivers that potentially have interconnected surface water and groundwater.

Implementing Agency

The GSA will be the implementing agency.

Project Description - 354.44(a)

Project Title:	Surface Water-Groundwater Interconnection Data Gap Analysis	Project ID: NFK21

The GSA currently lacks sufficient information on where local rivers are interconnected with groundwater, to what extent groundwater pumping is depleting surface water, if at all, and how river management programs ameliorate impacts of surface water depletions.

The study described below will help provide a better picture of the extent groundwater pumping is impacting surface water and whether the GSA considers those impacts to be significant and unreasonable. This information can then be used to develop sustainable management criteria.

The work will be performed in three general phases:

Phase 1: Determine Interconnection Status
Phase 2: Coordinate with Water Rights Holders and River Management Programs
Phase 3: Evaluate Impacts of Groundwater Pumping on Surface Water

These three phases are described below in more detail, including specific tasks that may be required to fill existing data gaps.

Phase 1: Determine Interconnection Status
The purpose of this phase is to determine which reaches of the rivers, if any, are interconnected with groundwater. Some existing information was documented in the 2020 GSPs, but more research will be performed to better define reaches that may be interconnected. Reaches that are determined to be interconnected will be addressed in Phases II and III described later. Reaches that are not interconnected will not be evaluated further, and sustainable management criteria for surface water-groundwater interconnection will not be established in these areas.

Existing studies, reports and models will be reviewed to determine if interconnection has already been firmly established within the GSA area. Sources that will be reviewed include:

- USGS Reports
- San Joaquin River Restoration Project Reports
- Department of Water Resources Reports
- Central Valley Hydrologic Model
- ICONS Dataset Tool
- Groundwater Sustainability Plans for neighboring GSAs
- Other studies and models not listed above

The next step will include evaluating water level data from existing riverside wells, existing piezometers, and regional groundwater contour maps to assess interconnection. This will also include collecting data on river flows and river stage, when available. A comparison of river bottom to groundwater levels will be made, and in accordance with guidance documents an assumption of depth of unlikely interconnection may be made to determine areas of impact. River thalweg elevations will also be surveyed in specific locations, if needed.

If the presence of interconnection cannot be determined with existing information, then riverside piezometers may need to be installed to collect water level data for comparison to river flow and river stage. Due to the seasonal and annual variability of flows, the piezometers may need to be monitored for several years before conclusions on the interconnection status can be made.

Phase 2 - Coordinate with Water Rights Holders and River Management Programs

Project Title:	Surface Water-Groundwater Interconnection Data Gap Analysis	Project ID: NFK21

Several factors unique to the Kings River and San Joaquin River impact river releases, river seepage and depletion of surface waters. These include Holding Contracts along the San Joaquin River, San Joaquin River Restoration Program Flows, riparian water users along the Kings River, the Kings River Fisheries Management Program, and highly variable surface water supplies. The agencies involved with these programs will be contacted to discuss the SGMA requirements, existing data available, future data needs and sustainable management criteria. Working with these agencies and the water rights holders, the GSA will develop a framework for evaluating and managing river reaches that are interconnected with groundwater.

These existing river management programs currently account for river losses, which help to mitigate for surface water depletion. Consequently, the conclusions from these discussions may determine that groundwater pumping is not causing significant and unreasonable depletion of surface water, or they may conclude that additional efforts are needed to quantify surface water depletion (see Phase III below) to eventually develop sustainable management criteria.

Phase 3 – Evaluate Impacts of Groundwater Pumping on Surface Water
This phase would include estimating the impact of groundwater pumping on surface water depletions for use in ultimately establishing sustainable management criteria for the 2025 GSP update. This work would only be performed in areas known to be interconnected under Phase I, and determined to be potentially impacted based on discussions with other agencies described in Phase II.

The first step will be to select a model, analytical tool or calculation method for estimating groundwater pumping impacts on the rivers. The tool will be selected based on several factors, especially what is most practical and useful with the existing data available.

A zone of influence (distance from the river's border) will be established along interconnected areas to identify corridors along rivers where pumping could have a significant impact on river flows. These will define the study areas. Groundwater pumping from these areas will be estimated. Surface water depletion will be estimated using the selected tool. Surface water depletion will vary by season and different hydrologic year types. Investigations will also look at whether the study area is already fully developed (i.e., built-out), and the likelihood of any future increases in groundwater pumping in the corridor.

Development of sustainable management criteria is not included or described in this project, since it will depend on the results from the aforementioned tasks. However, sustainable management criteria will be developed based on the legal requirements established under SGMA.

Measurable Objective(s) Addressed - 354.44(b)(1)

The project will provide information to help manage interconnected surface water and groundwater in the GSA.

- ☐ Chronic Lowering of Groundwater Levels
- ☐ Seawater Intrusion – *not applicable*
- ☐ Land Subsidence
- ☐ Reduction of Groundwater Storage
- ☐ Degraded Water Quality
- ☒ Depletion of Interconnected Surface Water

Circumstances and Criteria for Implementation - 354.44(b)(1)(A)

This is a high priority project that is necessary to understand, manage and limit the impacts from depletion of surface waters from groundwater pumping. The GSAs are committed to implementing this project. The hydrogeologic analyses will be performed using standard methods and best practices.

Process to Provide Notice of Implementation - 354.44(b)(1)(B)

Project Title: Surface Water-Groundwater Interconnection Data Gap Analysis	Project ID: NFK21

The public and relevant entities will be given the opportunity and time to comment on the results of any data analysis, which will be discussed at GSA board meetings and presented in Annual SGMA reports or 5-year GSP updates.

Estimated Annual Project Benefits (AF/yr) - 354.44(b)(2)

The proposed study will collect data and perform analyses needed to establish which sections of the rivers are interconnected with groundwater, and whether surface water depletions from groundwater pumping are having adverse impacts. This information is needed to develop sustainable management criteria and meet the legal requirements of SGMA.

Permitting and Regulatory Requirements - 354.44(b)(3)

Permits will be required for new monitoring wells, if they are needed. Since the wells would not extract water, obtaining the well permits should not be a problem. Right-of-way agreements or easements may be needed depending on where the wells are located. No other permits or approvals are expected to be necessary for the program.

Project Schedule - 354.44(b)(4) Anticipated Start & Completion, Timeframe to accrue benefits

Following is a preliminary schedule for each of the three project phases:

Phase	Description	Period
1	Determine Interconnection Status	Jan 2023– December 2023*
2	Coordinate with Water Rights Holders and River Management Programs	January 2024 – December 2024
3	Evaluate Impacts of Groundwater Pumping on Surface Water	January 2024 – December 2025

* If piezometers need to be installed to evaluate interconnection, then several years of monitoring may be required to firmly establish the interconnection status. Preferably, data would be collected and analyzed for several hydrologic year types, including dry, normal and wet years. This could result in certain river sections falling behind the schedule shown in the table above.

Evaluation of Benefits - 354.44(b)(5)

The project will provide the data and information necessary to develop sustainable management criteria for interconnected surface water-groundwater. This could benefit surface water users by eliminating adverse impacts to their water supply from groundwater pumping, if any.

How will project be accomplished, and what is the water source? - 354.44(b)(6)

The project will be implemented by the GSA using available funding. No surface water or groundwater source are required for implementation.

Legal Authority - 354.44(b)(7)

The GSAs have the authority to implement a project such as this because the SGMA statute grants the GSA the powers and authorities to "perform any act necessary or proper" to implement SGMA regulations and allows the GSA to adopt rules, regulations, ordinances, and resolutions necessary for SGMA implementation (CWC 10725.2).

Project Cost - 354.44(b)(8) Estimated Capital Cost Estimated annual cost/AF

The total combined cost of the project for all seven GSAs in the Kings Basin is estimated to vary from $100,000 to $2 million. The actual cost for each individual GSA will vary based on their local conditions. Total costs will vary based on the length of river found to be interconnected, whether piezometers need

Project Title: Surface Water-Groundwater Interconnection Data Gap Analysis	Project ID: NFK21

to be installed, whether existing river management programs obviate the need for developing sustainable management criteria, and the type of analysis tool developed.

Installing piezometers could cost several hundred thousand dollars. Development of a numerical model for the San Joaquin and Kings Rivers could be as much as $500,000 to $1 million and would be of limited use until sufficient data is collected to calibrate the model. Other analytical methods would likely cost significantly less.

Funding Source - 354.44(b)(8)

Initial studies and investigations will be funded with existing GSA funds. Piezometers and a numerical model would likely require supplemental funding, such as State or Federal grants.

Management of Groundwater Extractions and Recharge - 354.44(b)(9)

The project will not impact groundwater extractions or recharge. The project is meant to gain a better understanding of the impact of extractions on surface water through data collection.

Level of Uncertainty - 354.44(d)

The GSA is committed to the project and there is a high level of certainty this project will be performed. The initial phase of the project is expected to proceed without delay or significant funding restrictions. Installation of an extensive piezometer network could require hundreds of thousands of dollars and may be dependent on available funding, and State and Federal grant opportunities may be pursued.

6.3.3 Domestic Well Mitigation Program

The following describes a project to develop policies and procedures for mitigating domestic wells that go dry or are in imminent threat of going dry due to declining water levels. Specific details still need to be developed as part of the project, and a general description is provided below. This program was developed with guidance from the *Framework for a Drinking Water Well Impact Mitigation Program* (Self Help Enterprises et al.). The Domestic Well Mitigation Program will initially be developed through a basin-wide effort, and each GSA will then refine the policy to meet their specific conditions, develop funding and implement their individual program.

Project Title: Domestic Well Mitigation Program	Project ID: NFK22

Project Type

Overdraft Mitigation

Project Location

The Domestic Well Mitigation Program (program) will occur throughout the entire GSA

Implementing Agency

The GSA will be the implementing agency.

Project Description - 354.44(a)

The Kings Basin and the North Fork Kings GSA have been in overdraft for many years resulting in a significant lowering of the regional and local groundwater elevations, and a significant reduction in the amount of useable groundwater in storage. The North Fork Kings GSA plans to correct the overdraft by 2040 as required by SGMA, however there will be a continued decline through 2040 until water

Project Title: Domestic Well Mitigation Program Project ID: NFK22

levels have stabilized. Stabilizing groundwater levels immediately or raising groundwater levels is not feasible without significant land fallowing given the current water supply conditions, and would have devastating immediate economic impacts. Although water levels will be stabilized by 2040 at the Measurable Objective level, they will likely reach lower levels during dry years. The maximum anticipated lower water level is called the Minimum Threshold. As a result, some domestic wells are expected to go dry during the SGMA implementation period (2020-2040). This is generally limited to shallow domestic wells, since most irrigation wells and agency-owned wells are typically deeper and have often been designed to account for declining water levels. However, some small water supply systems and certain agricultural wells may be impacted and may be considered for mitigation. As described within the GSP, most of the basin has several hundred feet of aquifer with suitable water quality below current water levels.

A Domestic Well Mitigation Program (Program) is proposed to be developed and implemented for wells that have gone dry or are in imminent threat of going dry. The policies and procedures for the Program will be developed through a basin-wide effort, then each GSA can modify the Program to meet their specific needs and will perform public outreach, develop funding, and implement the program for their GSA.

The overall process for developing and implementing a Domestic Well Mitigation Program is outlined below:

1. Review other existing and planned well mitigation programs within other GSAs throughout the State
2. Evaluate the merits of partnering with or expanding any current local or State programs.
3. Develop policies and procedures with input from GSAs and stakeholders
4. Develop detailed inventory of domestic wells
5. Predict number of potentially impacted wells and identify high priority areas
6. Secure long-term funding for the program
7. Perform public outreach to landowners and stakeholders
8. Develop database and registration system for wells owners to sign up
9. Develop criteria for qualifying wells
10. Evaluate each application and determine merits for funding

The program will include responding to applications as funding and staff are available.

Following are discussions on specific topics that will be investigated during program development:

Evaluation Process
An application form will be developed for landowners to request mitigation for domestic well impacts. A detailed step-by-step evaluation process will also be documented.

The following are some of the items that will be considered when evaluating applications for mitigation:

- What is causing loss of well capacity? Decline in water levels or other issues such as plugged screens, the well pump, etc.
- The appropriateness of the original well design and construction. Can the well be deepened, or would a new well be needed?
- The percentage (if any) of well owner's mitigation responsibility and other sources of potential funding.
- What is the best mitigation option? Installing a new well, well deepening, other option.

Project Title: Domestic Well Mitigation Program Project ID: NFK22

Mitigation

Once a potential well has been identified as adversely impacted by declining groundwater levels and requires mitigation, then several options may be considered including:

- Installing a new well
- Deepening the well if it has an open bottom
- Modifying pump equipment
- Modify current pumping practices (i.e., reduce or cycle pumping from a nearby well)

Deepening a well could be the most economical option but will only be technically feasible if the well is an open bottom well. When necessary, a new well may need to be constructed. The program may have different contribution levels for deepening a well versus construction of an entirely new well. The age and condition of the well impacted will be considered, and the GSA will develop standard depreciated value of wells by age based on published literature, guidelines and local understanding.

The need for short-term solutions, such as providing bottled water and water tanks while a well is being mitigated, will be considered as part of the program. Landowners will be encouraged to contact the GSA before their well goes completely dry to avoid these circumstances. In addition, protocols will be established to help process applications and approve well mitigation in an expedient manner.

Design Criteria

The GSA will develop minimum design criteria for new wells. New wells will need to meet State and GSA Well Standards to receive any reimbursement, and will be subject to routine monitoring by the GSA. Criteria will also be considered for materials used in construction of the well, and minimum depth beyond existing or anticipated future groundwater levels.

Outreach

Public outreach and education will be performed during development of the mitigation program and prior to implementation.

Comments on the draft mitigation program will be solicited during initial development of the policies and procedures. If a Proposition 218 election is needed to establish funding, then education on the program will be an integral part of garnering support for any new fees or assessments.

Prior to implementation, extensive outreach will be needed to notify landowners of the program requirements and how they can apply for assistance. Outreach may need to be performed in multiple languages as appropriate for the GSA. Outreach methods could include workshops, mailings, flyers, website postings, Board meeting announcements, etc.

The GSA is fully committed to developing a Domestic Well Mitigation Program. The GSA will seek funding from existing State and/or Federal programs to supplement local GSA funding after landowners approve a new tax or assessment to fund the program.

Measurable Objective(s) Addressed - 354.44(b)(1)

The program will directly address the impacts of the chronic lowering of groundwater levels and reduction in groundwater storage by providing funding for replacement wells or well modifications to eligible landowners.

- ☒ Chronic Lowering of Groundwater Levels
- ☐ Seawater Intrusion – *not applicable*
- ☒ Reduction of Groundwater Storage
- ☐ Degraded Water Quality

Project Title: Domestic Well Mitigation Program	Project ID: NFK22
☐ Land Subsidence	☐ Depletion of Interconnected Surface Water

Circumstances and Criteria for Implementation - 354.44(b)(1)(A)

This is a high priority program that is necessary to mitigate the impacts of declining water levels and provide water supply to meet basic health and safety needs. The GSAs are committed to implementing this program. No funding is currently available for the program, so various sources, such as grants, funding through existing state programs, and land-based assessment or water user fees, will be investigated. If the landowners do not approve funding the program through a ballot measure (such as Proposition 218 election), this would signify low public support for the program, and the lack of funding could jeopardize implementation. Any election-based assessment process will need to incorporate public outreach to educate voters on the project benefits.

Process to Provide Notice of Implementation - 354.44(b)(1)(B)

The public and relevant entities will be given the opportunity and time to comment on the Domestic Well Mitigation Program prior to adoption by the GSA Board. The GSA will also provide the public with an opportunity to comment on CEQA studies, if any.

Estimated Annual Project Benefits (AF/yr) - 354.44(b)(2)

The Domestic Well Mitigation Program will provide a direct benefit to beneficial users in the GSA who have had their domestic well go dry because of declining water levels during GSP implementation. The metric for measuring program benefits will be the number of domestic wells that are impacted and mitigated under this program.

Permitting and Regulatory Requirements - 354.44(b)(3)

The Domestic Well Mitigation Program may require a CEQA Initial Study but will more likely qualify for a CEQA exemption. The program could also qualify for a Programmatic EIR. If the wells owners are reimbursed for the well construction then the GSA would not be responsible for any permits. No other permits are expected to be necessary for the program.

Project Schedule - 354.44(b)(4) Anticipated Start & Completion, Timeframe to accrue benefits

The policies and procedures for the Domestic Well Mitigation Program will be developed as a Basin-wide effort by the end of 2024. This will likely include coordination with other local mitigation programs, evaluation of a range of potential policies and procedures, economic studies, and preparation of a final report. Each GSA will then modify the Program as needed for their specific conditions and seek to develop a funding mechanism for the Program. Funding development for the Program is anticipated to take 12-24 months. Once the program is funded, a public outreach program will be implemented and the Domestic Well Mitigation Program will be initiated. The GSAs have been and will be reviewing well construction permits to recommend future well construction below minimum threshold levels. Currently in the Kings Basin, domestic well mitigation programs are already being implemented by other entities for low-income residents. During program development, the GSAs will refer landowners to these local programs as well as other resources and funding programs from the County, State or non-profit organizations. Some of the programs include: California Safe and Affordable Drinking Water (SADW) Fund, Safe and Affordable Funding for Equity and Resilience (SAFER) program, Proposition 1 funding, and programs being administered by Self-Help Enterprises. These programs can assistance with well replacement, as well as interim support such as bottled water and storage tanks while waiting for a new well.

Evaluation of Benefits - 354.44(b)(5)

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The program will help to ensure that owners of domestic wells that have gone dry as a result of water levels declining to minimum threshold water levels are not impacted and maintain a reliable water supply for basic health, safety and consumption.

How will project be accomplished, and what is the water source? - 354.44(b)(6)

The project will be implemented by the GSA once fully developed and a funding source is identified. This program relies on available groundwater. There is no surface water source required for implementation.

Legal Authority - 354.44(b)(7)

DWR has indicated that GSAs have the authority to implement a program such as this because the SGMA statute grants the GSA the powers and authorities to "perform any act necessary or proper" to implement SGMA regulations and allows the GSA to adopt rules, regulations, ordinances, and resolutions necessary for SGMA implementation (CWC 10725.2).

Project Cost - 354.44(b)(8) Estimated Capital Cost Estimated annual cost/AF

Following are preliminary estimated costs for implementing the program. These will be refined during project development and finalized prior to efforts to secure funding.

Development of Policies and Procedures. The estimated cost to develop the Domestic Well Mitigation Program policies and procedures is $70,000, which will be split among the different GSAs in the Kings Groundwater Subbasin. Each GSA will then modify the Program, if needed, to be compatible with their specific conditions.

Develop Funding. The Subbasin will collaborate with programs and funding sources that already exist. Each GSA will need to develop long-term funding as needed for their specific GSA needs for expected impacted well within each GSA. This could include preparation of grant applications, a Proposition 218 election, user fees, or other options. These costs will vary by GSA.

Public Outreach. Public outreach will be performed in each GSA. These costs will vary by GSA and will be estimated during development of the Program.

Project Administration. General administration costs for the program will vary by GSA and will be determined during the development of the Program.

Well Mitigation. Well mitigation costs will vary by GSA and location within each GSA in accordance with groundwater levels and the specific minimum thresholds that have been determined. An estimate of well mitigation costs will be developed by each GSA as part of their Program development and funding plan development. For reference, in 2022, a local well driller quoted $60 to $75/lineal foot for a new domestic well, which does not include costs for the pump or other appurtenances. The cost to abandon a well is approximately $5,000. Assuming an estimated cost per well for mitigation of $40,000 and estimated 1,000 wells in the basin that might need to be mitigated during the implementation period until water levels stabilize, the total cost of this program could be $40,000,000. A contingency funding plan may need to be developed if the number of impacted wells is found to be significantly higher than estimated.

Funding Source - 354.44(b)(8)

The funding source for this Program is yet to be identified. The GSA will investigate several funding sources including grants, land-based assessment, and water use fees and collaborate with programs and funding sources that already exist. The State has many existing grant programs for community water systems and well construction funding. County, State and Federal assistance will be needed to successfully

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implement this program. Grants may help to defray some costs, but a local funding source will also be needed, so the GSA landowners will likely need to be taxed to fund the program. The GSAs or individual water agencies may need to perform a Proposition 218 election to increase fees to fund the program. The GSAs will also work with local NGOs that may be able to provide assistance or seek grant monies to help fund the program.

Management of Groundwater Extractions and Recharge - 354.44(b)(9)

The program will not impact groundwater extractions or recharge. The program is meant to maintain domestic well capacity and use as water levels continue to decline until sustainability has been reached.

Level of Uncertainty - 354.44(d)

The GSA is committed to the program and there is a high level of certainty a Domestic Well Mitigation Program will be developed. Implementing the program will be dependent upon securing funding assistance from existing State and/or Federal programs to supplement local GSA funding after landowners approve a new tax or assessment to fund the program.

~~6.3~~6.4 Management Actions

Some management actions, such as education and outreach, will be initiated early in the GSP implementation phase, while other management actions are envisioned to be employed to reduce water demand if project development is not proceeding sufficiently to achieve the sustainability required to meet the interim milestones. Discussed herein is a suite of management actions the GSA may consider during implementation of the GSP to achieve sustainability. The menu of management actions discussed below may not be implemented in a strictly linear fashion as numbered below as some management actions must be implemented before others can be achieved, and specific actions may not be implemented at all if sustainability is achieved through other actions. Some management actions identified below must be implemented before others can be achieved. In addition, the GSA could implement some management actions GSA area-wide, while the policies and programs for other management actions would be developed by the GSA but would be implemented by individual landowners. In some cases. the landowner will need to choose which management action they want to implement, such as choosing between crop conversion and fallowing land, because it is an economic decision that affects the livelihood of the landowner and there may not be a consistent answer across the entire GSA. If demand reduction is required in portions of the GSA to achieve sustainability, it will be important to maintain existing irrigation delivery infrastructure so those facilities are available to deliver water for recharge in years with high available surface water. Some management actions that may be undertaken by landowners and/or water rights holders, such as reevaluating operations to optimize surface water use, are outside the control of the GSA but will be monitored for impacts on sustainability. It is expected the GSA will further develop and craft management actions in response to stakeholder input on parallel timelines and adapt to the estimated schedules according to the best available information and best available science at any given time used to support the management actions.

The legal authority and basis for the management actions described in this GSP are outlined in the SGMA and related provisions. The SGMA describes the powers and authorities - financial authority and enforcement powers - of GSAs in Chapters 5, 8, and 9 respectively. These GSA authorities