CALIFORNIA DEPARTMENT OF WATER RESOURCES
SUSTAINABLE GROUNDWATER MANAGEMENT OFFICE
715 P Street | Sacramento, CA 95814 | P.O. Box 942836 | Sacramento, CA 94236-0001

May 25, 2023

James Beck
Cuyama Basin GSA
1901 Royal Oaks Drive
Sacramento, CA 95815
jbeck@hgcpm.com

RE: Approved Determination of the July 2022 Groundwater Sustainability Plan Submitted for the Cuyama Valley Basin

Dear James Beck,

The Department of Water Resources (Department) has evaluated the resubmitted and revised July 2022 Groundwater Sustainability Plan (GSP) for the Cuyama Valley Basin in response to the Department's incomplete determination on January 21, 2022 and has determined the GSP is approved. The approval is based on recommendations from the Staff Report, included as an exhibit to the attached Statement of Findings, which describes that the Cuyama Valley GSP has taken sufficient action to correct deficiencies identified by the department and satisfies the objectives of the Sustainable Groundwater Management Act (SGMA) and substantially complies with the GSP Regulations. The Staff Report also proposes recommended corrective actions that the Department believes will enhance the GSP and facilitate future evaluation by the Department. The Department strongly encourages the recommended corrective actions be given due consideration and suggests incorporating all resulting changes to the GSP in future updates.

Recognizing SGMA sets a long-term horizon for groundwater sustainability agencies (GSAs) to achieve their basin sustainability goals, monitoring progress is fundamental for successful implementation. GSAs are required to evaluate their GSPs at least every five years and whenever the Plan is amended, and to provide a written assessment to the Department. Accordingly, the Department will evaluate approved GSPs and issue an assessment at least every five years. The Department will initiate the first periodic review of the Cuyama Valley GSP no later than January 28, 2025.

Please contact Sustainable Groundwater Management staff by emailing sgmps@water.ca.gov if you have any questions related to the Department's assessment or implementation of your GSP.

Sincerely,

Paul Gosselin

Paul Gosselin
Deputy Director
Sustainable Groundwater Management

Attachment:

1. Statement of Findings Regarding the Determination of Approval of the Cuyama Groundwater Sustainability Plan (May 25, 2023)

STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES

STATEMENT OF FINDINGS REGARDING THE APPROVAL OF THE CUYAMA VALLEY BASIN GROUNDWATER SUSTAINABILITY PLAN

The Department of Water Resources (Department) is required to evaluate whether a submitted groundwater sustainability plan (GSP or Plan) conforms to specific requirements of the Sustainable Groundwater Management Act (SGMA or Act), is likely to achieve the sustainability goal for the basin covered by the Plan, and whether the Plan adversely affects the ability of an adjacent basin to implement its GSP or impedes achievement of sustainability goals in an adjacent basin. (Water Code § 10733.) The Department is directed to issue an assessment of the Plan within two years of its submission. (Water Code § 10733.4.) If a Plan is determined to be Incomplete, the Department identifies deficiencies that preclude approval of the Plan and identifies corrective actions required to make the Plan compliant with SGMA and the GSP Regulations. The GSA has up to 180 days from the date the Department issues its assessment to make the necessary corrections and submit a revised Plan. (23 CCR § 355.2(e)(2)). This Statement of Findings explains the Department's decision regarding the revised July 2022 Plan submitted by the Cuyama Basin Groundwater Sustainability Agency (GSA or Agency) for the Cuyama Valley Basin (Basin No. 3-013).

Department management has discussed the Plan with staff, has reviewed the Department Staff Report, attached as Exhibit A, which recommends approval of the GSP. Department management is satisfied that staff have conducted a thorough evaluation and assessment of the Plan and concurs with staff's recommendation and all the recommended corrective actions. The Department therefore **APPROVES** the Plan and makes the following findings:

A. The initial Plan for the basin submitted by the GSA for the Department's evaluation satisfied the required conditions as outlined in § 355.4(a) of the GSP Regulations (23 CCR § 350 et seq.), and Department Staff therefore evaluated the initial Plan.

B. On January 21, 2022, the Department issued a Staff Report and Statement of Findings determining the initial GSP submitted by the Agency for the basin to be incomplete because the GSP did not satisfy the requirements of SGMA, nor did it substantially comply with the GSP Regulations. At that time, the Department provided corrective actions in the Staff Report that were intended to address the deficiencies that precluded approval. Consistent with the GSP Regulations, the Department provided the Agency with up to 180 days to address the deficiencies detailed in the Staff Report. On July 18, 2022, within 180 days of the Staff Report

related to the Department's initial incomplete determination, the Agency submitted a revised 2022 GSP to the Department for evaluation. When evaluating a revised GSP that was initially determined to be incomplete, the Department reviews the materials (e.g., revised or amended GSP) that were submitted within the 180-day deadline and does not review or rely on materials that were submitted to the Department by the GSA after the resubmission deadline. Part of the Department's review focuses on how the Agency has addressed the previously identified deficiencies that precluded approval of the initially submitted Plan. The Department shall find a Plan previously determined to be incomplete to be inadequate if, after consultation with the State Water Resources Control Board, the Department determines that the Agency has not taken sufficient actions to correct the deficiencies previously identified by the Department. (23 CCR § 355.2(e)(3)(C).) The Department shall approve a Plan previously found to be incomplete if the Department determines the Agency has sufficiently addressed the deficiencies that precluded approval. The Department may evaluate other components of the Plan, particularly to assess whether revisions to address deficiencies may have affected other components of a Plan or its likelihood of achieving sustainable groundwater management and may offer recommended corrective actions to deal with any issues of concern.

C. The Department's Staff Report, dated January 21, 2022, identified the deficiencies that precluded approval of the initially submitted Plan. After thorough evaluation of the revised Plan, the Department makes the following findings regarding the sufficiency of the actions taken by the Agency to correct those deficiencies:

    1. Deficiency 1: The corrective action advised the Agency to address several aspects of the Plan's discussion, analyses, and justification of groundwater level sustainable management criteria and potential impacts to groundwater uses and users. The Department found that the initial GSP did not adequately justify the established minimum thresholds or undesirable results for chronic lowering of groundwater levels nor discuss their impacts to beneficial uses and users.

        The 2023 Staff Report associated with the revised 2022 Plan indicates that the Agency has taken sufficient actions to correct this deficiency such that, at this time, although the Staff Report includes recommended corrective actions to further align this aspect of the Plan with the GSP Regulations, the Department finds Plan approval is not precluded, and further finds that the Agency has the ability to achieve the sustainability goal for the basin on SGMA timelines, and that the Department will be able to periodically monitor and evaluate the likelihood of Plan implementation to achieve sustainability.

2. Deficiency 2: The corrective action advised the Agency to address the Plan's discussion and monitoring of interconnected surface water sustainable management criteria. The initial GSP did not discuss why monitoring groundwater levels in all representative wells in the Basin, including wells located many miles away from the Cuyama River and its major tributaries, was appropriate to use as a proxy to monitor for depletions of interconnected surface water that would have significant and unreasonable impacts on beneficial uses of the surface water.

   The 2023 Staff Report indicates that the Agency has taken sufficient actions to correct this deficiency such that, at this time, although the Staff Report includes recommended corrective actions to further align this aspect of the Plan with the GSP Regulations, the Department finds Plan approval is not precluded, that the Agency has the ability to achieve the sustainability goal for the basin on SGMA timelines, and that the Department will be able to periodically monitor and evaluate the likelihood of Plan implementation to achieve sustainability.

3. Deficiency 3: The corrective action advised the Agency to address several aspects of the Plan's discussion and justification of water quality sustainable management criteria and potential impacts to groundwater users and uses. Based on comments submitted to the Department by the public and the State Water Resources Control Board, the initial GSP did not fully evaluate publicly available water quality data. This data may affect the GSA's initial analysis of degraded water quality in the Basin and require the development of sustainable management criteria and monitoring programs.

   The 2023 Staff Report indicates that the Agency has taken sufficient actions to correct this deficiency such that, at this time, although the Staff Report includes recommended corrective actions to further align this aspect of the Plan with the GSP Regulations, the Department finds Plan approval is not precluded, that the Agency has the ability to achieve the sustainability goal for the basin on SGMA timelines, and that the Department will be able to periodically monitor and evaluate the likelihood of Plan implementation to achieve sustainability.

4. Deficiency 4: The corrective action advised the Agency to clarify the Plan's rationale to not mitigate the projected overdraft in the Basin. The initial GSP did not provide sufficient explanation of whether or how overdraft would be mitigated in two primary management areas that experienced consistent declines in groundwater storage.

The 2023 Staff Report indicates that the Agency has taken sufficient actions to correct this deficiency such that, at this time, the Department finds Plan approval is not precluded, that the Agency has the ability to achieve the sustainability goal for the basin on SGMA timelines, and that the Department will be able to periodically monitor and evaluate the likelihood of Plan implementation to achieve sustainability.

D. The Plan satisfies the relevant conditions in § 355.4(a) of the GSP Regulations (23 CCR § 350 et seq.):

1. The Plan was complete, meaning it generally appeared to include the information required by the Act and the GSP Regulations sufficient to warrant a thorough evaluation and issuance of an assessment by the Department. (23 CCR § 355.4(a)(2).)

2. The Plan, either on its own or in coordination with other Plans, appears to cover the entire Basin sufficient to warrant a thorough evaluation. (23 CCR § 355.4(a)(3).)

E. The general standards the Department applied in its evaluation and assessment of the Plan are: (1) “conformance” with the specified statutory requirements, (2) “substantial compliance” with the GSP Regulations, (3) whether the Plan is likely to achieve the sustainability goal for the Basin within 20 years of the implementation of the Plan, and (4) whether the Plan adversely affects the ability of an adjacent basin to implement its GSP or impedes achievement of sustainability goals in an adjacent basin. (Water Code § 10733.) Application of these standards requires exercise of the Department’s expertise, judgment, and discretion when making its determination of whether a Plan should be deemed “approved,” “incomplete,” or “inadequate.”

The statutes and GSP Regulations require Plans to include and address a multitude and wide range of informational and technical components. The Department has observed a diverse array of approaches to addressing these technical and informational components being used by GSAs in different basins throughout the state. The Department does not apply a set formula or criterion that would require a particular outcome based on how a Plan addresses any one of SGMA’s numerous informational and technical components. The Department finds that affording flexibility and discretion to local GSAs is consistent with the standards identified above, the state policy that sustainable groundwater management is best achieved locally through the development, implementation, and updating of local plans and programs (Water Code § 113), and the Legislature’s express intent under SGMA that groundwater basins be managed through the actions of local governmental agencies to the greatest extent feasible, while minimizing state intervention to only when necessary to ensure

that local agencies manage groundwater in a sustainable manner. (Water Code § 10720.1(h).) The Department's final determination of a Plan's status is made based on the entirety of the Plan's contents on a case-by-case basis, considering and weighing factors relevant to the particular Plan and Basin under review.

F. In making these findings and Plan determination, the Department also recognized that: (1) it maintains continuing oversight and jurisdiction to ensure the Plan is adequately implemented; (2) the Legislature intended SGMA to be implemented over many years; (3) SGMA provides Plans 20 years of implementation to achieve the sustainability goal in a Basin (with the possibility that the Department may grant GSAs an additional five years upon request if the GSA has made satisfactory progress toward sustainability); and, (4) local agencies acting as GSAs are authorized, but not required, to address undesirable results that occurred prior to enactment of SGMA. (Water Code §§ 10721(r); 10727.2(b); 10733(a); 10733.8.)

G. The Plan conforms with Water Code §§ 10727.2 and 10727.4, substantially complies with 23 CCR § 355.4, and, at this time, appears likely to achieve the sustainability goal for the Basin.

1. The sustainable management criteria and the GSP's goal to maintain groundwater conditions at elevations that avoid excessive drawdown, minimize the amount of domestic wells going dry, and avoid adverse impacts on groundwater dependent ecosystems (GDEs) are sufficiently justified and explained. The Plan relies on credible information and science to quantify the groundwater conditions that the Plan seeks to avoid and provides an objective way to determine whether the Basin is being managed sustainably in accordance with SGMA. (23 CCR § 355.4(b)(1).)

2. The Plan demonstrates a thorough understanding of where data gaps exist (i.e., hydrogeological conceptual model, Ventucopa management area water budget, streamflow, and locations of GDEs) and demonstrates a commitment to eliminate those data gaps. The GSP also intends to address spatial gaps in the monitoring network and develop a coordinated groundwater monitoring schedule. Filling these known data gaps, and others described in the Plan, should lead to the refinement of the GSA's monitoring networks, the Basin's water model, and sustainable management criteria to better inform and guide future adaptive management strategies. (23 CCR § 355.4(b)(2).)

3. The sustainable management criteria and projects and management actions are commensurate with the level of understanding of the Basin setting. The projects and management actions described in the Plan provide a feasible approach to achieving the Basin's sustainability goal

and should provide the GSA with greater versatility to adapt and respond to changing conditions and future challenges during GSP implementation. (23 CCR § 355.4(b)(3).)

4. The Plan provides a detailed explanation of how the various interests of groundwater uses and users in the Basin were considered in developing the sustainable management criteria and how those interests, including domestic wells, would be impacted by the established minimum thresholds. (23 CCR § 355.4(b)(4).)

5. The Plan's proposed projects and management actions appear feasible at this time and, if implemented expeditiously, appear likely to prevent undesirable results and ensure that the Basin is operated within its sustainable yield on SGMA timelines. The Department will continue to monitor Plan implementation and reserves the right to change its determination if projects and management actions are not implemented or appear unlikely to prevent undesirable results or unlikely to achieve sustainability within SGMA timeframes. (23 CCR § 355.4(b)(5).)

6. The Plan includes a reasonable assessment of overdraft conditions and includes reasonable means to mitigate overdraft, if present. (23 CCR § 355.4(b)(6).)

7. At this time, it does not appear that the Plan will adversely affect the ability of an adjacent basin to implement its GSP or impede achievement of sustainability goals in an adjacent basin. The Plan states that adjacent basins will not be impacted by the established minimum thresholds based on the watershed and groundwater divides that exist between these areas. (23 CCR § 355.4(b)(7).)

8. If required, a satisfactory coordination agreement has been adopted by all relevant parties. (23 CCR § 355.4(b)(8).)

9. The GSA's member agencies are Kern County, San Luis Obispo County, Ventura County, Santa Barbara County Water Agency, Cuyama Basin Water District, and the Cuyama Community Services District. Given the legal authority and financial resources of the GSA's member agencies and the additional authorities granted the GSA under SGMA, the Department concludes the GSA likely has the legal authority and financial resources necessary to implement the Plan. (23 CCR § 355.4(b)(9).)

10. Through review of the Plan and consideration of public comments, the Department determines that the GSA adequately responded to comments that raised credible technical or policy issues with the Plan, sufficient to warrant approval of the Plan at this time. The Department also notes that the recommended corrective actions included in the Staff Report are

important to addressing certain technical or policy issues that were raised and, if not addressed before future, subsequent plan evaluations, may preclude approval of the Plan in those future evaluations. (23 CCR § 355.4(b)(10).)

H. In addition to the grounds listed above, DWR also finds that:

1. The Plan provides additional analyses conducted by the GSA which modeled potential impacts to beneficial uses and users based on the established sustainable management criteria. The first analysis evaluated potential well impacts if groundwater levels reached minimum thresholds in all representative monitoring wells and concluded that five wells out of about 250 wells in the Basin would be impacted under this potentially extreme scenario. The second analysis focused on impacts to beneficial uses and users in the Northwestern Threshold Region and utilized modeled groundwater level data from water years 2011 through 2020. The second analysis concluded that domestic well users in this region would not be impacted and that groundwater dependent ecosystems would be impacted at one monitoring location. The GSP intends to use Adaptive Management actions to prevent adverse impacts to beneficial uses and users in the event that monitoring data or local input indicate that these impacts are present. The Department developed its GSP Regulations consistent with and intending to further the policy through implementation of SGMA and the Regulations, primarily by achieving sustainable groundwater management in a basin. By ensuring substantial compliance with the GSP Regulations, the Department has considered the state policy regarding the human right to water in its evaluation of the Plan. (23 CCR § 350.4(g).)

2. The Plan acknowledges and identifies interconnected surface waters within the Basin. The GSA proposes initial sustainable management criteria to manage this sustainability indicator and intends to improve understanding and management of interconnected surface water. The GSA acknowledges, and the Department agrees, many data gaps related to interconnected surface water exist. The GSA should continue filling data gaps, collecting additional monitoring data, and coordinating with agencies and interested parties to understand beneficial uses and users that may be impacted by depletions of interconnected surface water caused by groundwater pumping. Future updates to the Plan should aim to improve the initial sustainable management criteria as more information and improved methodologies become available.

3. The California Environmental Quality Act (Public Resources Code § 21000 *et seq*.) does not apply to the Department's evaluation and assessment of the Plan.

Accordingly, the 2022 GSP submitted by the Agency for the Cuyama Valley Basin is hereby **APPROVED.** The recommended corrective actions identified in the Staff Report will assist the Department's future review of the Plan's implementation for consistency with SGMA, and the Department therefore recommends the Agency address them by the time of the Department's periodic review, which is set to begin on January 28, 2025, as required by Water Code § 10733.8. Failure to address the Department's Recommended Corrective Actions before future, subsequent Plan evaluations, may lead to the Plan being determined incomplete or inadequate.

Signed:

Karla Nemeth
Karla Nemeth, Director
Date: May 25, 2023

Exhibit A: Groundwater Sustainability Plan Assessment Staff Report – Cuyama Valley Basin (May 25, 2023)

State of California
Department of Water Resources
Sustainable Groundwater Management Program
Groundwater Sustainability Plan Assessment
Staff Report

Groundwater Basin Name:	Cuyama Valley Basin (No. 3-013)
Submitting Agency:	Cuyama Basin Groundwater Sustainability Agency
Submittal Type:	Revised Plan in Response to Incomplete Determination
Submittal Date:	July 18, 2022
Recommendation:	Approved
Date:	May 25, 2023

On July 18, 2022, the Cuyama Basin Groundwater Sustainability Agency (GSA or Agency) submitted the revised the Groundwater Sustainability Plan – July 2022 (GSP or Plan) for the Cuyama Valley Basin (Basin) to the Department of Water Resources (Department) in response to the Department's incomplete determination on January 21, 2022,[1] for evaluation and assessment as required by the Sustainable Groundwater Management Act (SGMA)[2] and GSP Regulations.[3]

After evaluation and assessment, Department staff conclude the GSAs have taken sufficient actions to correct deficiencies identified by the Department; however, Department staff have recommended additional corrective actions, which staff recommend the GSA should be required to address by the Plan's first periodic evaluation.[4]

Overall, Department staff believe at this time, the Plan contains the required components of a GSP; demonstrates a thorough understanding of the Basin based on what appears to be the best available science and information; sets reasonable and supported sustainable management criteria to prevent undesirable results as defined in the Plan; has a reasonable monitoring network; and proposes a set of projects and management actions that, if successfully implemented, are likely to achieve the sustainability goal defined for the Basin.[5] Department staff will continue to monitor and evaluate the Basin's progress toward achieving the sustainability goal through annual reporting[6] and future

[1] Water Code § 10733.4(b); 23 CCR § 355.4(a)(4). https://sgma.water.ca.gov/portal/service/gspdocument/download/6152.
[2] Water Code § 10720 *et seq*.
[3] 23 CCR § 350 *et seq*.
[4] 23 CCR § 356.4.
[5] 23 CCR § 354.24.
[6] 23 CCR § 356.2.

periodic evaluations of the GSP and its implementation. Department staff recommend approval of the Plan subject to recommended corrective actions described herein.

This assessment includes six sections:

- **Section 1 – Summary:** Provides an overview of the Department Staff's assessment and recommendations.
- **Section 2 – Evaluation Criteria:** Describes the legislative requirements and the Department's evaluation criteria.
- **Section 3 – Required Conditions:** Describes the submission requirements of a response to an incomplete determination to be evaluated by the Department.
- **Section 4 – Deficiency Evaluation:** Provides an assessment of whether and how the contents included in the GSP submittal addressed the deficiencies identified by the Department in the initial incomplete determination.
- **Section 5 – Plan Evaluation:** Provides a detailed assessment of the contents included in the GSP organized by each Subarticle outlined in the GSP Regulations.
- **Section 6 – Staff Recommendation:** Includes the staff recommendation for the Plan and any recommended corrective actions.

1 SUMMARY

Department staff conclude that the GSA took sufficient action to correct the deficiencies previously identified. Accordingly, Department staff recommend **approval** of the Groundwater Sustainability Plan for the Cuyama Valley Groundwater Basin, along with implementation of corrective actions described in this Staff Report, which Department staff recommend be addressed by the next periodic evaluation to further improve Plan implementation and achievement of basin sustainability in accordance with SGMA timelines.

The GSA has identified areas for improvement of its Plan (e.g, addressing data gaps related to hydrogeological conceptual model, including dedicated stream gaging; better understanding the water budget of the Ventucopa management area; verification of locations of groundwater-dependent ecosystems (GDEs); researching well construction details; addressing spatial gaps in monitoring; developing a coordinated groundwater sampling schedule; and monitoring land subsidence in the Central management area). Department staff concur that those items are important and recommend that the GSA address them as soon as possible. Department staff have also identified additional recommended corrective actions designed to address shortcomings of the Plan, as described in this Staff Report, that the GSA should consider for the first periodic evaluation of the Plan (see Section 6). The recommended corrective actions generally focus on the following:

(1) clarifying the rationale and methods of simulating impacts to beneficial uses and users in the Northwestern Region;

(2) continuing to fill data gaps, collect additional monitoring data, and coordinate with agencies and interested parties to understand beneficial uses and users that may be impacted by depletions of interconnected surface water caused by groundwater pumping; and

(3) providing an update on the status of the Improved Reliability of Water Supplies for Local Communities project or if this project is not effective or not implemented by the periodic evaluation, then the GSA should develop sustainable management criteria for arsenic;

(4) establishing sustainable management criteria for nitrate;

(5) clarifying the frequency of collecting samples to analyze for arsenic and nitrate.

Addressing the recommended corrective actions identified in Section 6 of this Staff Report will be important to demonstrate, on an ongoing basis, that implementation of the Plan is likely to achieve the sustainability goal.

2 EVALUATION CRITERIA

The Department evaluates whether a Plan conforms to the statutory requirements of SGMA[7] and is likely to achieve the basin's sustainability goal,[8] whether evaluating a basin's first Plan,[9] a Plan previously determined incomplete,[10] an amended Plan,[11] or a GSA's periodic evaluation to an approved Plan.[12] To achieve the sustainability goal, each version of the Plan must demonstrate that implementation will lead to sustainable groundwater management, which means the management and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results.[13] The Department is also required to evaluate, on an ongoing basis, whether the Plan will adversely affect the ability of an adjacent basin to implement its groundwater sustainability program or achieve its sustainability goal.[14]

The Plan evaluated in this Staff Report was previously determined to be incomplete. An incomplete Plan is one which Department staff identified one or more deficiencies that preclude its initial approval. Deficiencies may include a lack of supporting information that is sufficiently detailed or analyses that are sufficiently thorough and reasonable, or where Department staff determine it is unlikely the GSA(s) in the basin/subbasin could

[7] Water Code §§ 10727.2, 10727.4, 10727.6.
[8] Water Code § 10733; 23 CCR § 354.24.
[9] Water Code § 10720.7.
[10] 23 CCR § 355.2(e)(2).
[11] 23 CCR § 355.10.
[12] 23 CCR § 355.6.
[13] Water Code § 10721(v).
[14] Water Code § 10733(c).

achieve the sustainability goal under the proposed Plan. After GSAs have been afforded up to 180 days to address the deficiencies and based on the GSAs' efforts, the Department can either approve[15] the Plan or determine the Plan inadequate.[16]

The Department's evaluation and assessment of a Plan previously determined to be incomplete, as presented in this Staff Report, continues to follow Article 6 of the GSP Regulations[17] to determine whether the Plan, with revisions or additions prepared by the GSA, complies with SGMA and substantially complies with the GSP Regulations.[18] As stated in the GSP Regulations, "substantial compliance means that the supporting information is sufficiently detailed and the analyses sufficiently thorough and reasonable, in the judgment of the Department, to evaluate the Plan, and the Department determines that any discrepancy would not materially affect the ability of the Agency to achieve the sustainability goal for the basin, or the ability of the Department to evaluate the likelihood of the Plan to attain that goal."[19]

When reviewing a Plan that has previously been determined to be incomplete, Department staff primarily assess whether the GSA(s) have taken sufficient actions to correct any deficiencies identified by the Department.[20] A Plan approval does not signify that Department staff, were they to exercise the professional judgment required to develop a Plan for the basin, would make the same assumptions and interpretations as those contained in the revised Plan, but simply that Department staff have determined that the modified assumptions and interpretations relied upon by the submitting GSA(s) are supported by adequate, credible evidence, and are scientifically reasonable. The reassessment of a Plan previously determined to be incomplete may involve the review of new information presented by the GSA(s), including models and assumptions, and a reevaluation of that information based on scientific reasonableness. In conducting its reassessment, Department staff does not recalculate or reevaluate technical information or perform its own geologic or engineering analysis of that information.

The recommendation to approve a Plan previously determined to be incomplete is based on a determination that the GSA(s) have taken sufficient actions (e.g., amended or revised the Plan) to correct the deficiencies previously identified by the Department that precluded earlier approval.

3 REQUIRED CONDITIONS

For a Plan that the Department determined to be incomplete, the Department identifies corrective actions to address those deficiencies that preclude approval of the Plan as

[15] 23 CCR §§ 355.2(e)(1).
[16] 23 CCR §§ 355.2(e)(3).
[17] 23 CCR § 355 *et seq*.
[18] 23 CCR § 350 *et seq*.
[19] 23 CCR § 355.4(b).
[20] 23 CCR §§ 355.2(e)(3)(C).

initially submitted. The GSAs in a basin, whether developing a single GSP covering the basin or multiple GSPs, must attempt to sufficiently address those corrective actions within the time provided, not to exceed 180 days, for the Plan to be evaluated by the Department.

3.1 Incomplete Resubmittal

The GSP Regulations specify that the Department shall evaluate a revised GSP in which the GSA has taken corrective actions within 180 days from the date the Department issued an incomplete determination to address deficiencies.[21]

The Department issued the incomplete determination on January 21, 2022. The GSA submitted a revised GSP to the Department on July 18, 2022, in compliance with the 180-day deadline.

4 Deficiency Evaluation

As stated in Section 355.4 of the GSP Regulations, a basin "shall be sustainably managed within 20 years of the applicable statutory deadline consistent with the objectives of the Act." The Department's assessment is based on a number of related factors including whether the elements of a GSP were developed in the manner required by the GSP Regulations, whether the GSP was developed using appropriate data and methodologies and whether its conclusions are scientifically reasonable, and whether the GSP, through the implementation of clearly defined and technically feasible projects and management actions, is likely to achieve a tenable sustainability goal for the basin.

In its initial incomplete determination, the Department identified four deficiencies in the Plan related to groundwater levels, interconnected surface water, degraded water quality, and overdraft, which precluded the Plan's approval in January 2022.[22] The GSA was given 180 days to take corrective actions to remedy the identified deficiencies. Consistent with the GSP Regulations, Department staff are providing an evaluation of the resubmitted Plan to determine if the GSAs have taken sufficient actions to correct the deficiencies.

4.1 Deficiency 1. The GSP lacks justification for, and effects associated with, the sustainable management criteria for groundwater levels.

4.1.1 Corrective Action

The corrective actions issued by the Department in its January 21, 2022 assessment related to this deficiency are as follows:

[21] 23 CCR § 355.4(a)(4).
[22] https://sgma.water.ca.gov/portal/service/gspdocument/download/6152.

"The GSA must provide more detailed information, as required in the GSP Regulations, regarding undesirable results and minimum thresholds for all applicable threshold regions.[23] The GSA should describe the anticipated effects of the established minimum thresholds and undesirable results on the interests of beneficial uses and users and how the GSA determined that those thresholds would avoid undesirable results in the Basin. Department staff suggest the GSA consider and address the following:

1. The GSA should describe the specific undesirable results they aim to avoid through implementing the GSP. For example, if the long-term viability of domestic, agricultural, municipal, or environmental uses is a concern with respect to lowering of groundwater levels, then the GSA should describe the specific effects on those users that the GSA considers significant and unreasonable and define groundwater conditions that would lead to those effects. Clarify how the criteria defining when undesirable results occur in the Basin (i.e., 30 percent exceedance of minimum thresholds for two consecutive years) was established, the rationale behind the approach, and why it is consistent with avoiding the significant and unreasonable effects identified by the GSA.
2. The GSA should either explain how the existing minimum threshold groundwater levels are consistent with avoiding undesirable results or they should establish minimum thresholds at the representative monitoring wells that account for the specific undesirable results the GSA aims to avoid. For each threshold region, the GSA should evaluate and disclose the anticipated effects of the GSP's minimum thresholds and undesirable results on:
    a. Well infrastructure, including domestic wells, community and public water supply wells, and agricultural wells. The GSA may utilize the Department's well completion report dataset[24] or other similar data to estimate the number and kinds of wells expected to be impacted at the minimum thresholds identified in the GSP. Public water system well locations and water quality data can currently be obtained using the State Water Resource Control Board's (State Water Board) Geotracker website.[25] Administrative contact information for public water systems and well locations and contacts for state small water systems and domestic wells can be obtained by contacting the State

[23] 23 CCR §§ 354.26, 354.28.
[24] Well Completion Report Map Application. California Department of Water Resources, https://www.arcgis.com/apps/webappviewer/index.html?id=181078580a214c0986e2da28f8623b37.
[25] GeoTracker Application. California State Water Resources Control Board, https://geotracker.waterboards.ca.gov/map/#; select "Public Water Wells" under the "Other Sites" option and navigate to the area of interest.

Water Board's Needs Analysis staff.[26] The State Water Board is currently developing a database to allow for more streamlined access to this data in the future.

Should wells be identified as at risk of going dry at or near minimum threshold conditions, describe the extent of those impacts on beneficial users including: location, number, and type of wells impacted; the beneficial uses and users [affected]; and any identified project or management action that may be taken to address the condition. If the GSA identifies potential impacts to drinking water wells, including de minimis users and disadvantaged communities, those impacts should be described in the GSP.

By the first five-year update, the GSA should inventory and better define the location of active wells in the Basin. The GSA should document known impacts to drinking water users caused by groundwater management, should they occur, in annual reports and subsequent periodic updates.

b. Environmental uses and users of groundwater. If data are not available to support evaluation of the effects of established minimum thresholds on environmental uses and users, the GSA should clarify the strategy, mechanism, and timeline for acquiring that data and incorporating that data into management of the Basin."[27]

4.1.2 Evaluation

The revised GSP reiterates that the original GSP included a definition of the undesirable results that the GSA aimed to avoid—"a result that causes significant and unreasonable reduction in the long-term viability of domestic and agricultural, municipal, or environmental uses over the planning and implementation horizon of this GSP."[28]

In response to Deficiency 1, the revised GSP explains that the sustainable management criteria were established based on i) input from local interested parties and landowners; ii) the hydrogeologic conceptual model; iii) assessment of current and historical conditions and best available data; and iv) local knowledge and professional opinion. The revised GSP clarifies that the established definition of an undesirable result, occurring when minimum thresholds for groundwater levels have been exceeded in 30 percent of representative wells for 24 consecutive months, allows the GSA flexibility to identify the cause of minimum threshold exceedances, to develop a plan for response, and to implement projects and management actions, as needed. Furthermore, exceedances in 30 percent of representative wells are considered by the GSA to be more indicative of basin-scale decline instead of localized declines, whereas the 24-month criterion

[26] DDW-SAFER-NAU@Waterboards.ca.gov.
[27] 23 CCR §§ 355.4(b)(2), 355.4(b)(3).
[28] Cuyama Basin 2019 GSP, Section 3.2.1, p. 269; Section 5.2, p. 361.

correlates with a sustained exceedance of minimum thresholds, which are considered more significant than short-term exceedances.[29] The minimum thresholds were developed with the intent to avoid undesirable results of excessive drawdown in groundwater levels, to minimize the number of domestic wells that could go dry, and to avoid adverse impacts on groundwater dependent ecosystems (GDEs).[30]

The revised GSP describes two new analyses done by the GSA, which include modeling potential impacts to beneficial uses and users. The first analysis looked at potential well impacts if groundwater levels in all representative wells were to reach their respective minimum thresholds. The analysis utilized available County and public data and removed wells without pump depth or screen interval data from consideration. The simulation resulted in five out of 250 (two percent) production wells going dry. Of these five wells at risk of going dry, three are domestic wells that supply a total of four to five households. The GSP states that the GSA will strive to use adaptive management to prevent these domestic wells from going dry. The remaining two wells that could potentially go dry are agricultural wells that irrigate approximately two acres of vineyard, which the GSP estimates will result in a loss of about $10,000 to $15,000 per year. The GSP describes the potential loss of two agricultural wells that irrigate two acres out of the approximately 18,000 (0.01 percent) irrigated acres in the Basin to be less than a significant impact.[31]

The second analysis focused on impacts to beneficial uses and users specifically in the Northwestern Threshold Region by modeling groundwater levels reaching the minimum thresholds at two representative wells, Opti Well 841 and Opti Well 845. The modeled change in local groundwater levels between water years 2011 to 2020 resulted in no active domestic wells being affected. The modeled results indicate the groundwater conditions at the identified GDE located at the confluence of Cottonwood Creek and the Cuyama River would have a decline in groundwater level of fewer than five feet at the nearest representative monitoring well, Opti Well 832, resulting in the depth to water being less than 30 feet below ground surface at this location.[32] The GSP states that monitoring impacts to GDEs would occur at Opti Well 832.[33] The GSA intends to use adaptive management if monitoring data or local input indicates that groundwater management may be adversely affecting beneficial users.[34] The revised GSP concludes that established minimum thresholds in the Northwestern Region will result in no negative impact on domestic wells in the area and have a minimal impact on one GDE (i.e., groundwater level decline of fewer than five feet).[35]

[29] Cuyama Basin 2022 GSP, Appendix B, Section 2.1.3 pp. 1581-1582.
[30] Cuyama Basin 2022 GSP, Appendix B, Section 2.2.3, p. 1586.
[31] Cuyama Basin 2022 GSP, Section 5.2, p. 390; Appendix B, Section 2.2.3, pp. 1586-1588.
[32] Cuyama Basin 2022 GSP, Section 5.2, p. 392; Appendix B, Section 2.2.3, pp. 1589-1590.
[33] Cuyama Basin 2022 GSP, Appendix B, Section 2.2.3, pp. 1586-1587, 1589.
[34] Cuyama Basin 2022 GSP, Section 7.6, p. 436.
[35] Cuyama Basin 2022 GSP, Section 5.2, p. 389; Appendix B, Section 2.2.3, p. 1586.

4.1.3 Conclusion

Overall, Department staff believe the GSA has taken sufficient action to correct Deficiency 1 by further describing the undesirable results and performing new modeling and impact analyses, as described above and in the revised GSP. However, Department staff believe the GSA should consider the following recommended corrective actions to further their GSP by the periodic evaluation.

Department staff note that the potential effects to beneficial uses and users as discussed in the revised Plan are based on all representative wells being at their respective minimum thresholds, whereas the GSP defines an undesirable result occurring when 30 percent of representative wells have reached their minimum threshold for two consecutive years. Thus, Department staff understand the five wells that could potentially go dry appears to be an extreme scenario. Department staff conclude that the GSA took sufficient action to correct Deficiency 1 by performing new modeling and analysis of potential well impacts, as described in the revised GSP, and supporting and explaining its rationale for concluding that those impacts were not significant and unreasonable as it relates to chronic lowering of groundwater levels undesirable results. Department staff further note the GSA's adaptive management commitment in the Plan (see e.g., Supplemental Section 7.6) to attempt to minimize impacts to, and be protective of, all individual beneficial users of groundwater for domestic purposes by collecting and investigating reports of any domestic wells that are dewatered (i.e., go dry) during implementation of the Plan, and to establish a committee to investigate and develop appropriate responses to such occurrences, including implementing localized pumping management plans, installing additional monitoring wells, installing replacement wells, and developing other appropriate solutions. Given the inherent uncertainty regarding the Plan's projections of domestic well impacts, the importance of domestic beneficial uses of water, and the human hardship that dewatering of domestic wells could cause, Department staff encourage the GSA to monitor and report on this issue. The GSA may wish to review the Department's April 2023 guidance document titled *Considerations for Identifying and Addressing Drinking Water Well Impacts* guidance to assist its adaptive management efforts. (See Recommended Corrective Action 1a)

Department staff also note that for the second analysis, the description of impacts to beneficial uses and users did not clearly explain the rationale for only including the two representative wells in the Northwestern Region model simulations. Department staff are aware of additional representative monitoring wells in the region;[36] however, the GSP does not explain how simulating the two representative wells in the region being at their minimum threshold for groundwater levels is appropriate to convey the conditions of the entire Northwestern Region. The GSP also did not appear to account for groundwater levels occurring at their respective minimum thresholds in all available representative wells in the Northwestern Region; expanding that analysis to include more representative

[36] Cuyama Basin 2022 GSP, Figure 4-18, p. 326; Figure 5-1, p. 363; Figure 5-6, p. 393; Table 4-5, pp. 322-325; Table 5-1, pp. 371-374.

wells could potentially result in greater impacts to domestic wells, stream depletion, and GDEs, than described in the GSP. Department staff recommend the GSA further explain the methodologies applied to the analysis of impacts to beneficial uses and users in the Northwestern Region including the rationale for how using two wells represent the entire region (See Recommended Corrective Action 1b).

4.2 Deficiency 2. The GSP does not fully describe the use of groundwater levels as a proxy for depletion of interconnected surface water.

4.2.1 Corrective Action

The corrective action issued by the Department in January 2022 related to this deficiency stated that:

> "The GSA should provide a demonstration, with supporting evidence, for why using the basinwide groundwater level minimum thresholds is a reasonable proxy for thresholds for depletion of interconnected surface water. If the representative monitoring network for interconnected surface water is modified, discuss how the definition of an undesirable result is affected." [37]

4.2.2 Evaluation

The revised GSP describes efforts the GSA made to improve the understanding of interconnected surface water, by improving the monitoring network since initial GSP submittal, with the construction of nine monitoring wells at three locations along the Cuyama River and installation of a new streamflow gage on the Cuyama River, upstream of Ventucopa. To address the deficiency regarding the use of all representative monitoring wells for groundwater levels as a proxy for interconnected surface water, the GSA modified the monitoring network for interconnected surface water to be a subset of the basinwide representative wells.[38] The subset of wells, which still relies on the proxy relationship between groundwater levels and interconnected surface water, was selected based on:

i. proximity to major drainages—wells within 1.5 miles of the Cuyama River or within one mile of a major tributary, including Aliso Creek, Santa Barbara Creek, Quantal Canyon Creek, and Cuyama Creek;

ii. wells that have screen intervals within 100 feet of the ground surface, including some wells with an assumed depth to the top of the screen being shallower than 100 feet below ground surface.[39]

The GSP explains that these criteria result in a monitoring network that is more appropriate to represent interconnected surface water in the vicinity of the Cuyama River

[37] 23 CCR §§ 355.4(b)(2), 355.4(b)(3).
[38] Cuyama Basin 2022 GSP, Table 4-8, p. 357; Appendix B, Table 3.1, p. 1595.
[39] Cuyama Basin 2022 GSP, Section 4.10, pp. 354-356; Appendix B, Section 3.3.2, p. 1594.

system, rather than including wells that monitor conditions extending into higher elevation foothill areas. Furthermore, the shallow depths of the modified monitoring network are stated to provide more useful information regarding the interaction of surface water and groundwater.

Using these criteria and adjusted monitoring network, the revised GSP establishes the minimum threshold for depletions of interconnected surface water based on threshold regions and using groundwater levels as a proxy. The calculation method of minimum threshold for each threshold region varies and is described in the revised GSP.[40] An undesirable result for this sustainability indicator is defined as significant and unreasonable reductions in the viability of agriculture or riparian habitat in the Basin over the planning and implementation horizon of the GSP. An undesirable result would occur based on the same criteria as for the groundwater level sustainability indicator—when the minimum threshold is exceeded in 30 percent of representative wells for 24 consecutive months.[41] The GSP explains that by setting minimum thresholds on shallow groundwater wells near surface water and using groundwater levels as a proxy, the GSA can monitor and manage the hydraulic gradient between the surface water body and groundwater elevations.[42] The GSA will monitor shallow wells located closer to major drainages in the place of deep wells or wells that are far from major drainages is a reasonable approach to obtain better information about the correlation between surface flows and groundwater elevations.

While the GSA appears to have furthered its commitment to use groundwater levels as a proxy for interconnected surface water, the revisions do not demonstrate how monitoring will further the ultimate objective of determining the location, quantity, and timing of depletions of interconnected surface water due to groundwater pumping. The original GSP included a map showing the location of gaining and losing streams in the Basin.[43] The revised GSP improves on this by showing locations of potential stream interconnectivity along the Cuyama River and major tributaries within the Basin boundary.[44] The GSP explains that the figure was based on an analysis of the simulation of the Cuyama Basin Water Resources Model, which analyzed parameters including precipitation in the watershed, water infiltration, runoff, and interactions between surface water flows in the Basin.[45] Department staff acknowledge that historically measured streamflow data to evaluate the potential interconnected surface water systems in the Basin were limited, so inferred values from ungaged local small watersheds were utilized in the model simulation. Department staff note that the GSP tabulates modeled stream

[40] Cuyama Basin 2022 GSP, Section 5.2.1 and 5.2.2, pp. 361-369; Table 5-1, p. 371-374; Appendix B, Table 2-1, pp. 1584-1585.
[41] Cuyama Basin 2022 GSP, Section 3.2.6, p. 272; Table 4-8, p. 357; Appendix B, Table 3-1, p. 1595.
[42] Cuyama Basin 2022 GSP, Section 3.2.6, p. 272.
[43] Cuyama Basin 2022 GSP, Section 2.2.8, p. 227; Figure 2-61, p. 228.
[44] Cuyama Basin 2022 GSP, Figure 4-24, p. 355.
[45] Cuyama Basin 2022 GSP, Section 2.2.8, p. 227; Section 4.10, Figure 4.24, pp. 354-355; Appendix B, Section 3.3.1, pp. 1591-1593; Chapter 2 Appendix C, pp. 1165-1171.

depletion by river reach[46] and concludes the model is reasonably calibrated and reflects a reasonable representation of the Basin's hydrologic and hydrogeologic conditions.[47] The GSA appears to be making progress in identifying depletions; however, the correlation between groundwater levels and those depletions have not been established. While the efforts made to not preclude the Plan from approval, Department staff have provided recommended corrective actions below which will further the establishment of sustainable management criteria for interconnected surface water based on timing, location and volume as required by the GSP Regulations.

The GSP identifies data gaps that continue to limit the GSA's understanding of the timing and location of interconnectivity at the time of the GSP resubmittal.[48] Department staff recognize that the GSA has improved the Basin's monitoring network for this sustainability indicator since submission of the original GSP. The revised GSP describes a streamflow gage was installed along the Cuyama River in an identified data gap area, upstream of the Ventucopa management area, and describes the construction of nine monitoring wells along the Cuyama River utilizing technical assistance provided by the Department. Department staff encourage the GSA to continue addressing data gaps to improve the overall understanding of the conditions leading to depletions in the Basin.

4.2.3 Conclusion

At this time, Department staff conclude sufficient action has been taken on this deficiency and believe the GSA can work with the Department to further efforts on interconnected surface water. However, Department staff have provided recommended corrective actions in which the GSA should address within the periodic evaluation.

Department staff understand that quantifying depletions of interconnected surface water from groundwater extractions is a complex task that likely requires developing new, specialized tools, models, and methods to understand local hydrogeologic conditions, interactions, and responses. During the initial review of GSPs, Department staff have observed that most GSAs have struggled with this requirement of SGMA. However, staff believe that most GSAs will more fully comply with regulatory requirements after several years of Plan implementation that includes projects and management actions to address the data gaps and other issues necessary to understand, quantify, and manage depletions of interconnected surface waters. Department staff advise that at this stage in SGMA implementation, GSAs address deficiencies related to interconnected surface water depletion where GSAs are still working to fill data gaps and where these data will be used to inform and establish sustainable management criteria based on timing, volume, and depletion as required by the GSP Regulations.

The Department will continue to support GSAs in this regard by providing, as appropriate, financial and technical assistance to GSAs, including the development of guidance

[46] Cuyama Basin 2022 GSP, Table 2-2, p. 230; Section 2.2.8, p. 227; Figure 2-61, p. 228.
[47] Cuyama Basin 2022 GSP, Chapter 2 Appendix C, pp. 1161-1197.
[48] Cuyama Basin 2022 GSP, Section 2.2.10, p. 238; Section 4.10, p. 352, Appendix B, Section 3.3, pp. 1591-1595.

describing appropriate methods and approaches to evaluate the rate, timing, and volume of depletions of interconnected surface water caused by groundwater extractions. Once the Department's guidance related to depletions of interconnected surface water is publicly available, GSAs, where applicable, should consider incorporating appropriate guidance approaches into their future amendment and periodic evaluation of the GSP (Recommended Corrective Action 2a). GSAs should consider availing themselves of the Department's financial or technical assistance, but in any event must continue to fill data gaps, collect additional monitoring data, and implement strategies to better understand and manage depletions of interconnected surface water caused by groundwater extractions and define segments of interconnectivity and timing within their jurisdictional area (Recommended Corrective Action 2b). Furthermore, GSAs should coordinate with local, state, and federal resources agencies as well as interested parties to better understand the full suite of beneficial uses and users that may be impacted by pumping induced surface water depletion (Recommended Corrective Action 2c).

4.3 Deficiency 3. The GSP does not fully address degraded water quality.

4.3.1 Corrective Action

The corrective actions issued by the Department in January 2022 related to this deficiency stated that:

> "Having identified them as constituents of concern, the GSA should reasonably and thoroughly address nitrate and arsenic in the GSP using best available information. Specifically, the GSA should consider the following:
>
> 1. Groundwater conditions. The Department received comments that raise credible technical issues regarding groundwater quality data that apparently were not considered when developing the GSP but are available to the public and likely, in the opinion of Department staff, to alter the GSA's assessment of the Basin conditions. The GSA should coordinate with interested parties that submitted comments, in particular with the Regional Water Quality Control Board, to obtain best available information regarding basinwide water quality. The GSA should evaluate this data, along with their existing data, and update the description of basinwide water quality in the GSP as appropriate.
>
> 2. Sustainable management criteria. After updating the information regarding existing groundwater quality conditions, the GSA should revise its discussion of groundwater quality sustainable management criteria to either include criteria for arsenic and nitrate or provide thorough, evidence-based analysis and description for why groundwater management is not likely to cause significant and unreasonable degradation of groundwater by increasing concentrations of those constituents.

3. Monitoring networks. The GSA should appropriately revise its groundwater quality monitoring network based on updates to the GSP noted above. Department staff believe that, at a minimum, the GSA should include monitoring for arsenic and nitrates, as they have been identified as constituents of concern and both appear to be relatively widespread. Monitoring will be important for the GSA to assess whether groundwater quality degradation for those constituents is occurring throughout the planning and implementation horizon. The GSA may leverage existing programs that collect and disseminate water quality data and information. The GSA should address any data gaps in the groundwater quality monitoring network and provide specific schedules to address those data gaps."[49]

4.3.2 Evaluation

4.3.2.1 Groundwater Conditions

To address the first component of the corrective action, the revised GSP now describes its effort to compile available data for nitrate and arsenic that were not incorporated in the original GSP. The GSA compiled additional data from various public databases and coordinated with Regional Water Quality Control Board staff to confirm that all available data had been incorporated. All newly compiled data is summarized in a table and plotted on figures showing the distribution and concentrations of nitrate and arsenic samples collected from wells in the Basin.[50]

The GSP describes the analysis of the newly compiled data and concludes that nitrate and arsenic data from 2010 to 2020 show little change in concentrations from before and after 2015.[51] Department staff acknowledge that the revised GSP contains a more comprehensive dataset of groundwater samples analyzed for nitrate and arsenic, which was evaluated by the GSA and described in the GSP along with new figures and a table.[52] Department staff believe that the GSA has taken sufficient action to sufficiently address the groundwater conditions component of the corrective action.

4.3.2.2 Sustainable Management Criteria

To address the arsenic component of the sustainable management criteria corrective action, the GSP states that the area impacted by arsenic that exceeds the maximum contaminant level is south of the community of New Cuyama in wells screened deeper than 700 feet below ground surface. The GSP describes a planned project (named Improved Reliability of Water Supplies for Local Communities) to replace an abandoned production well impacted by arsenic and construct a new and more reliable production well that will be screened shallower than the zone with known high arsenic concentrations. The new well will be connected to an existing water supply distribution

[49] 23 CCR §§ 355.4(b)(2), 355.4(b)(3).
[50] Cuyama Basin 2022 GSP, Section 2.2.7, pp. 264-266.
[51] Cuyama Basin 2022 GSP, Section 2.2.7, p. 264.
[52] Cuyama Basin 2022 GSP, Section 5.5, pp. 394-395; Appendix B, Section 4.3.1, pp. 1597-1602.

system operated by the Cuyama Community Services District.[53] The GSP states that no domestic users are expected to rely on a well with arsenic concentrations that exceed the maximum contaminant level after the new production well is constructed.[54] Department staff believe the Plan's approach and discussion related to managing arsenic is appropriate, being that groundwater with elevated arsenic concentrations will be mitigated and that no known drinking water wells are anticipated by the GSA to be impacted by elevated arsenic concentrations. Department staff find that this method of mitigating high levels of arsenic in groundwater used for domestic supply is reasonable and sufficiently addresses this part of the corrective action and substantially complies with SGMA and GSP Regulations. Approval of this approach is dependent on the implementation of the project; however, the GSA must be able to quantitatively demonstrate, on an ongoing basis, that this project is achieving its intended effect of supplying groundwater that maintains arsenic concentrations below the water quality standard. Department staff recommend the GSA discuss the status, timeline, and effectiveness of the planned project to replace the production well that the GSP expects will result in no groundwater users relying on groundwater with high arsenic concentrations. If the project is not effective or not implemented by the periodic evaluation, Department staff recommend the GSA develop sustainable management criteria for arsenic (See Recommended Corrective Action 3).

To address establishing sustainable management criteria for the nitrate component of the corrective action, the GSA analyzed the available data and concludes that, although 40 percent of wells with nitrate data between 2010 and 2020 exceeded the maximum contaminant level,[55] the nitrate concentrations were relatively stable—no wells showed water quality degradation to an extent where a well that had not exceeded the maximum contaminant level prior to 2015 subsequently exceeded the maximum contaminant level after 2015.[56] Using this evidence-based analysis that nitrate concentrations have been relatively stable from 2010 to 2020, the GSA did not establish sustainable management criteria for nitrate, also stating that doing so would not be appropriate because the GSA has no mechanism to directly control nitrate concentrations or associated fertilizer application.[57]

Department staff find that the GSA's stance regarding its lack of authority to manage nitrate concentrations did not consider the potential for degraded groundwater, impacted by nitrate, to migrate toward previously unimpacted areas due to GSA groundwater management activities. Because the GSA has legal authority to regulate groundwater pumping, which affects hydraulic gradients and groundwater flow, the GSA could monitor for and influence the migration of groundwater and has the responsibility to prevent unimpacted areas from becoming significantly and unreasonably impacted by nitrate.

[53] Cuyama Basin 2022 GSP, Section 2.2.7, pp. 264-266; Section 7.4.4, pp. 427-430.
[54] Cuyama Basin 2022 GSP, Section 5.5, p. 394; Appendix B, Section 4.3.2, p. 1601.
[55] Cuyama Basin 2022 GSP, Appendix B, Section 4.3.1, pp. 1598-1599.
[56] Cuyama Basin 2022 GSP, Section 2.2.7, p. 264.
[57] Cuyama Basin 2022 GSP, Section 5.5, p. 394; Appendix B, Section 4.3.2, p. 1601.

However, Department staff acknowledge that because the analysis provided in the revised GSP indicates little change in nitrate concentrations, the likelihood of undesirable results associated with nitrate occurring before the next periodic update is low. Furthermore, because of regulatory oversight by existing water quality programs such as the Irrigated Lands Regulatory Program, California Code of Regulations Title 22 requirements, and SWRCB Groundwater Ambient Monitoring and Assessment Program,[58] Department staff find the lack of established sustainable management criteria does not preclude approval at this time but encourages the GSA to coordinate closely with existing water quality programs and agencies.

The GSP describes baseline analysis of nitrate to be completed in 2022 and ongoing monitoring of nitrate in the revised GSP,[59] which will be discussed below; however, Department staff note that the monitoring of nitrate described in the revised GSP needs to be compared to an established water quality standard or criteria (i.e., maximum contaminant level or minimum threshold) that allows the Department, the GSA, and interested parties to quantitatively determine if undesirable results are occurring. The expanded monitoring for nitrate during the next periodic evaluation (five-year update) described in the revised Plan is important and appropriate to demonstrate, on an ongoing basis, that previously unimpacted areas do not become impacted due to migration of groundwater from areas affected by nitrate. However, the Plan should include sustainable management criteria for nitrate because routine analysis of nitrate without a transparent quantitative standard to compare to does not convey to the Department, the GSA, and interested parties whether significant and unreasonable effects have impacted beneficial uses and users in previously unimpacted areas. Therefore, Department staff recommend the GSP establish sustainable management criteria for nitrate by the next periodic evaluation (see Recommended Corrective Action 4).

4.3.2.3 Monitoring Networks

To address the corrective action related to the monitoring network, a new component of the revised GSP is that in addition to monitoring public water system wells for Title 22 requirements,[60] which include arsenic and nitrate, the GSA intended to perform a baseline analysis of representative wells for arsenic and nitrate in 2022. The GSP also states that it may analyze arsenic and nitrate concentrations in representative wells at each periodic evaluation.[61] In regard to analyzing arsenic and nitrate in representative wells during the periodic evaluations, Department staff find this topic in the GSP to be not well described; the GSP states that "[a]dditional measurements may be considered by the GSA in the future in anticipation of five-year updates" and also states that "the GSA will reevaluate nitrate and arsenic concentrations at each 5-year GSP update."[62] Department staff note that during consultation meetings with the GSA in 2021 and 2022,

[58] Cuyama Basin 2022 GSP, Section 5.5, p. 394; Appendix B, Section 4.2, p. 1597.
[59] Cuyama Basin 2022 GSP, Section 5.5, pp. 394-395.
[60] Cuyama Basin 2022 GSP, Section 1.2.4, p. 70.
[61] Cuyama Basin 2022 GSP, Section 5.5, p. 394; Appendix B, Section 4.3.2, pp. 1601-1602.
[62] Cuyama Basin 2022 GSP, Section 5.5, p. 394; Appendix B, Section 4.3.2, pp. 1601-1602.

the Department emphasized to the GSA the need to be able to demonstrate, on an ongoing basis, that arsenic and nitrate are not significantly and unreasonably impacting beneficial uses and users. Department staff believe that if the GSA reevaluates historical data without new analytical measurements and data for arsenic and nitrate, the actual conditions and potential impacts to beneficial uses and users during periodic evaluations will not be known. Thus, ongoing monitoring of arsenic and nitrate will be important to comply with SGMA and GSP Regulations. Department staff interpret the GSP's discussion to mean that measurements of arsenic and nitrate will be performed at periodic evaluations; however, because of the ambiguous language in the GSP cited above, Department staff recommend the GSP reconcile the abovementioned statements and clarify the GSP's intent and frequency for ongoing quantitative monitoring (see Recommended Corrective Action 5).

4.3.3 Conclusion

Overall, Department staff believe the GSA has taken sufficient action to address this deficiency. However, as noted above, the GSA should discuss the status, timeline, and effectiveness of the planned project to replace the production well that the GSP expects will result in no groundwater users relying on groundwater with high arsenic concentrations (see Recommended Corrective Action 3), establish sustainable management criteria for nitrate (see Recommended Corrective Action 4); and reconcile and clarify the intent of ongoing measurements of arsenic and nitrate and what the periodic evaluation entails (see Recommended Corrective Action 5).[63] While the topics described in the corrective actions issued in this Staff Report do not, at this time, preclude approval of the Plan, the Department recommends that the issues be addressed to ensure the Plan's implementation continues to be consistent with SGMA and the Department is able to assess progress in achieving the sustainability goal within the Basin.[64]

4.4 Deficiency 4. The GSP does not provide explanation for how overdraft will be mitigated in the basin.

4.4.1 Corrective Action

The corrective actions issued by the Department in January 2022 related to this deficiency are stated as:

> "The GSA should explain the rationale for not implementing pumping reductions in the overdrafted Ventucopa management area or any other portion of the Basin where overdraft is expected to continue, and explain the timeline and criteria that may be used to determine whether future pumping reduction allocations are needed.[65] If the criteria to implement pumping reductions are related to the effects

[63] Cuyama Basin 2022 GSP, Section 5.5, pp. 394-395; Appendix B, Section 4.3.3, pp. 1601-1602.
[64] Water Code § 10733.8.
[65] 23 CCR §§ 355.2(e)(3)(C), 355.4(b)(3), 355.4(b)(4), 355.4(b)(5), 355.4(b)(6).

on beneficial uses and users, as mentioned in Corrective Action 1, the GSP should clarify what those effects are that would necessitate pumping reductions. If data gaps are known to exist, they should be explained and include a timeline to address them and how they may affect management actions for the Ventucopa management area.

The GSP states well failures occurred during the 2012-2016 drought and projects a lowering of groundwater levels beyond those observed during the drought and below 2015 conditions. If, after considering this deficiency and the deficiency associated with Corrective Action 1 [Section 4.1], the GSA retains minimum thresholds that allow for continued lowering of groundwater levels, then it is reasonable to assume that additional wells may be impacted during implementation of the Plan. While SGMA does not require all impacts to groundwater uses and users be mitigated, the GSA should consider including projects and management actions strategies describing how they may support drinking water impacts that may occur due to continued overdraft during the period between the start of GSP implementation and achievement of the sustainability goal will be addressed. If mitigation strategies are not included, the GSP should contain a thorough discussion, with supporting facts and rationale, explaining how and why the GSA determined not to include specific actions to mitigate drinking water impacts from continued groundwater lowering below 2015 levels."[66]

4.4.2 Evaluation

To address the first component of Deficiency 4, the revised GSP clarifies the rationale for not implementing pumping reductions in the Ventucopa management area, despite historical and projected groundwater level declines.[67] The revised GSP explains that pumping reductions for the Ventucopa area were not planned in the GSP due to uncertainties in the reliability of the modeled groundwater level declines:[68]

i. Limited groundwater level data were available for model calibration. Only three calibration wells were available for that area of the Basin at the time of GSP development. However, after submitting the original GSP, new multi-completion monitoring wells were constructed in this area to provide additional information for future model calibration.

ii. Characterization of streamflow and their effect on the groundwater aquifer was challenging because there were no streamflow gages on the Cuyama River with flow measurements. Since submission of the original GSP, a new streamflow gage was installed on the Cuyama River upstream of the Ventucopa Region.

[66] 23 CCR §§ 355.4(b)(2), 355.4(b)(3).
[67] Cuyama Basin 2022 GSP, Section 7.2, pp. 408-410.
[68] Cuyama Basin 2022 GSP, Appendix B, Section 5.3.1, pp. 1603-1604.

iii. Groundwater pumping was based on estimates from available land use information using satellite imagery and limited or no information from the necessary well locations were available. Since submission of the original GSP, the GSA has required landowners to install meters on production wells and to report pumping information to the GSA.

iv. The magnitude of the estimated water budget in the Ventucopa Region was relatively small, compared to the Basin's overall water budget, which was associated with high sensitivity and uncertainty in these water budget components, when estimating change in storage and long-term groundwater elevation changes for the Basin.

v. Due to time and budget constraints, groundwater modeling and calibration was prioritized for the central portion of the Basin where overdraft was known to occur.

Department staff find the discussion in the revised GSP justifying why the GSA does not currently plan to administer pumping reductions in the Ventucopa management area to be sufficiently detailed, thorough, and reasonable. Department staff acknowledge that historical surface water and groundwater data in the area are limited and recognize that the GSA has made efforts to improve data gaps in the area by installing a new streamflow gage and constructing multi-completion monitoring wells at three sites along the Cuyama River. Department staff encourage the GSA to continue monitoring the Ventucopa management area and to incorporate data from the new monitoring sites into the model, as they become available.

In response to the second component of Deficiency 4, the revised GSP states that the available information, based on the Cuyama Basin Water Resource Model, did not indicate a projected overdraft in the Northwestern Region. Furthermore, according to the revised GSP, a 2018 investigation that was utilized to establish minimum thresholds for the region indicated those groundwater levels would be protective of groundwater pumping capacity for production wells in the area.[69] Department staff note, however, that this 2018 investigation did not consider the potential effects on GDEs in its analysis of groundwater levels reaching the minimum thresholds, though these impacts are discussed in other portions of the GSP. In responding to Deficiency 4, the revised GSP refers to the modeled groundwater level conditions at two representative wells, Opti Well 841 and Opti Well 845, being at their minimum thresholds. As summarized in Deficiency 1 above, the GSP concludes that the resulting conditions would not affect any domestic wells in the area but would have relatively minimal impact on GDEs. As described above in Deficiency 1, the GSA will monitor impacts to GDEs at Opti Well 832.[70]

[69] Cuyama Basin 2022 GSP, Section 5.3.2, p. 1605; Cleath-Harris, 2018, Technical Memorandum: Sustainability Thresholds for Northwestern Region, Cuyama Valley Groundwater Sustainability Plan, https://cuyamabasin.org/assets/pdf/Cleath-Harris-Sustainability-Thresholds-for-Northwestern-Region.pdf.
[70] Cuyama Basin 2022 GSP, Appendix B, Section 2.2.3, pp. 1586-1587, 1589.

4.4.3 Conclusion

Department staff conclude the GSA has taken sufficient action to address the deficiency by describing, in sufficient detail, the rationale for not implementing pumping reductions in the Ventucopa management area and uses evidence-based analysis informed by new simulations of the Cuyama Basin Water Resource Model to discuss the anticipated impacts to beneficial uses and users in the Northwestern Region.

5 PLAN EVALUATION

As stated in Section 355.4 of the GSP Regulations, a basin "shall be sustainably managed within 20 years of the applicable statutory deadline consistent with the objectives of the Act." The Department's assessment is based on a number of related factors including whether the elements of a GSP were developed in the manner required by the GSP Regulations, whether the GSP was developed using appropriate data and methodologies and whether its conclusions are scientifically reasonable, and whether the GSP, through the implementation of clearly defined and technically feasible projects and management actions, is likely to achieve a tenable sustainability goal for the basin.

The Department staff's evaluation of the likelihood of the Plan to attain the sustainability goal for the Basin is provided below. Department staff consider the information presented in the Plan to satisfy the general requirements of the GSP Regulations.

5.1 ADMINISTRATIVE INFORMATION

The GSP Regulations require each Plan to include administrative information identifying the submitting Agency, describing the plan area, and demonstrating the legal authority and ability of the submitting Agency to develop and implement a Plan for that area.[71]

The Plan provides administrative information identifying the submitting agency, the Cuyama Basin GSA, and some details regarding the GSA's authority to manage groundwater in the Basin, which was generally presented in an understandable format using appropriate data. The GSP states that the Agency is the sole GSA covering the Basin and the Plan area. The Agency is a Joint Powers Authority comprised of agency representatives and is governed by a board that receives and considers recommendations from an advisory committee and a technical forum, comprised of and representing various local interests.[72] The advisory committee represents large and small landowners, agriculture growers, residents, disadvantaged community members, and Hispanic community members, [73] whereas the technical forum is comprised of consultants, local water districts, county representatives, and private interests.[74]

[71] 23 CCR § 354.2 *et seq*.
[72] Cuyama Basin 2022 GSP, Section 1.1.2, p. 41; Section 1.3.1, pp. 86-88.
[73] Cuyama Basin 2022 GSP, Executive Summary, p. 25.
[74] Cuyama Basin 2022 GSP, Section 1.3.1, p. 86.

The GSP describes the Plan area, which coincides with the Basin boundary and encompasses an area of about 378 square miles, which is displayed in various maps showing local agency jurisdictions, historical land use, and nearby groundwater basins.[75] Neighboring groundwater basins include Carrizo Plain and Mil Potrero Area—both identified as very low priority basins by the Department. The Caliente Range bounds the northwest and the Sierra Madre Mountains bound the southeast. The Basin is primarily located within the Cuyama Watershed and drained by the Cuyama River and its tributaries.[76]

A map displaying the Basin and adjacent basins is shown in Figure 1 below.

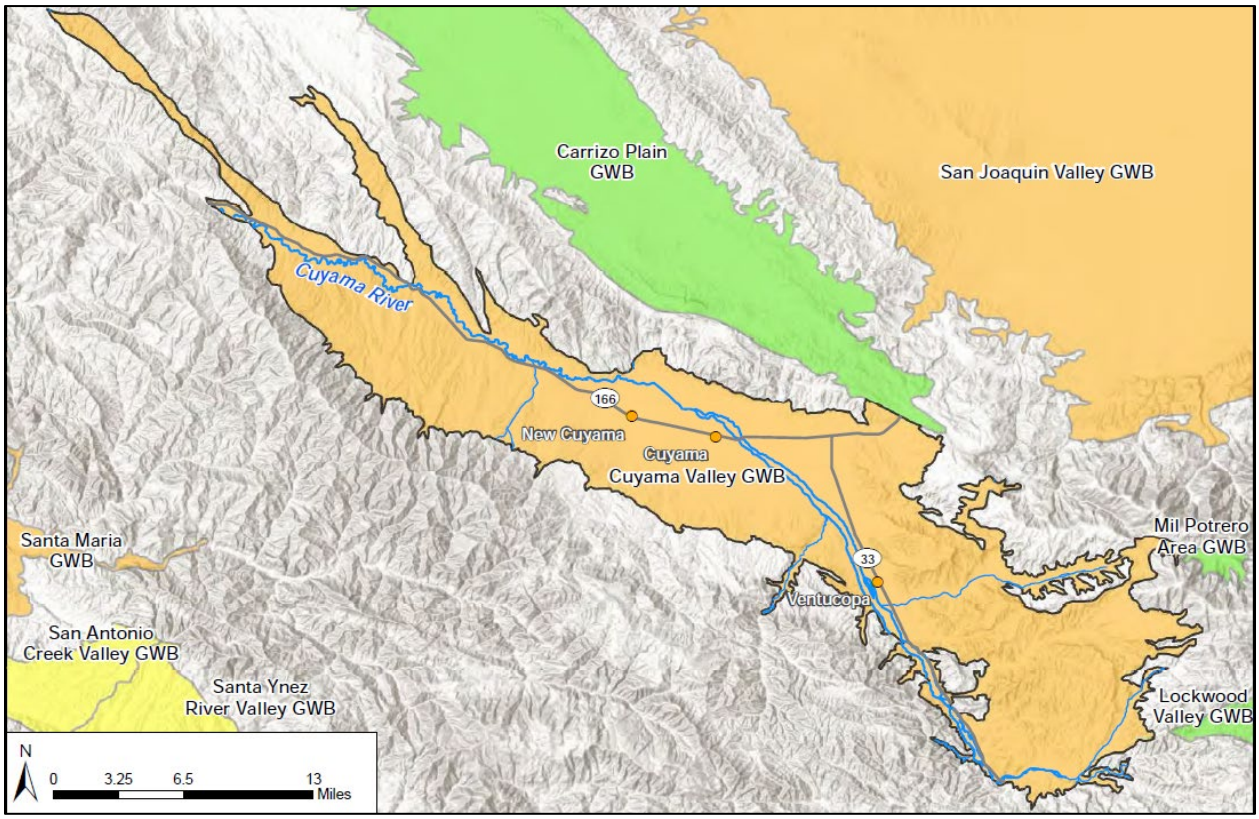

Figure 1: Cuyama Valley Location Map.

Department staff did not note any significant inconsistencies or contradicting information and consider the information presented in the Plan to satisfy the general requirements of the GSP Regulations. The Plan contains sufficient detail regarding the beneficial uses and users of groundwater,[77] water use types,[78] existing water monitoring and resource

[75] Cuyama Basin 2022 GSP, Section 1.2.1, pp. 46-47; Figures 1-3 to 1-14, pp. 49-60.
[76] Cuyama Basin 2022 GSP, Section 1.2.2, p. 48; Figure 1-19, p. 65.
[77] Cuyama Basin 2022 GSP, Section 1.3.1, p. 85.
[78] Cuyama Basin 2022 GSP, Tables 2-4 and 2-5, pp. 246-247.

programs,[79] and types and distribution of land use and land use plans for the Basin.[80] The Agency provides a list of public meetings, materials, and notifications on its website, and a table of public comments and how they were addressed by the GSA is included in the appendices of the GSP.[81] The administrative information included in the Plan substantially complies with the requirements outlined in the GSP Regulations.

5.2 Basin Setting

The GSP Regulations require information about the physical setting and characteristics of the basin and current conditions of the basin, including a hydrogeologic conceptual model; a description of historical and current groundwater conditions; and a water budget accounting for total annual volume of groundwater and surface water entering and leaving the basin, including historical, current, and projected water budget conditions.[82]

5.2.1 Hydrogeologic Conceptual Model

The GSP Regulations require a descriptive hydrogeologic conceptual model of the basin that includes a written description supported by cross sections and maps.[83] The hydrogeologic conceptual model is a non-numerical model of the physical setting, characteristics, and processes that govern groundwater occurrence within a basin, and represents a GSA's understanding of the geology and hydrology of the basin that support the geologic assumptions used in developing mathematical models, such as those that allow for quantification of the water budget.[84]

The GSP describes the regional geologic setting, geologic structures in the Basin, stratigraphy, and geologic formations; supported by cross-sections, stratigraphic columns, and maps.[85] The GSP discusses major faults in the Basin, their properties, and known or suspected impacts to groundwater flow.

The GSP identifies one principal aquifer in the Basin, composed of Pliocene to Pleistocene unconsolidated to semi-consolidated alluvial units and the Upper Morales Formation, with a total approximate thickness of 3,000 to 4,000 feet.[86] The Plan discusses the known aquifer properties[87] and identifies data gaps in the understanding of the hydrogeologic conceptual model. The primary data gaps include the lack of consistent historical data for groundwater levels and quality; subsidence monitoring in the Central

[79] Cuyama Basin 2022 GSP, Sections 4.3 to 4.10, pp. 284-352.
[80] Cuyama Basin 2022 GSP, Section 1.2.2, pp. 47-48, Figures 1-6 to 1-14, pp. 52-59.
[81] Cuyama Basin 2022 GSP, Chapter 1, Appendix D, pp. 520-640
[82] 23 CCR § 354.12 *et seq*.
[83] 23 CCR § 354.12 *et seq*.
[84] DWR Best Management Practices for the Sustainable Management of Groundwater: Hydrogeologic Conceptual Model, December 2016: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/BMP-3-Hydrogeologic-Conceptual-Model_ay_19.pdf.
[85] Cuyama Basin 2022 GSP, Section 2.1.2 to 2.1.5, pp. 98-119.
[86] Cuyama Basin 2022 GSP, Section 2.1.7, p. 121.
[87] Cuyama Basin 2022 GSP, Section 2.1.7, pp. 123-132.

management area; understanding vertical hydraulic gradients in most of the Basin due to spatial gaps in monitoring locations; and incomplete well construction information.[88]

The primary surface water feature is the Cuyama River and its perennial tributaries. The perennial Cuyama River is 55 miles long and crosses the length of the Basin.[89] The gaining and losing reaches of the river and major tributaries, as well as primary discharge areas, are shown on maps in the GSP.[90] However, water supply in the Basin does not include surface water; the Plan identifies groundwater as the sole source of water supply for the Basin. Water use sectors include municipal, agriculture, domestic, and native vegetation.[91]

The information provided in the GSP that comprises the hydrogeologic conceptual model substantially complies with the requirements outlined in the GSP Regulations. In general, the Plan's descriptions of the regional geologic setting, the Basin's physical characteristics, the principal aquifer, and hydrogeologic conceptual model appear to utilize the best available science. Department staff are aware of no significant inconsistencies or contrary technical information to that presented in the Plan.

5.2.2 Groundwater Conditions

The GSP Regulations require a written description of historical and current groundwater conditions for each of the six sustainability indicators and GDEs.[92]

The GSP includes nearly 500 well hydrographs depicting groundwater elevations for the principal aquifer and provides a description of groundwater level trends and the groundwater level monitoring network used to observe groundwater conditions in the Basin. Department staff note that the hydrograph data range from 1959 to 2019, but are mostly discontinuous and exhibit relatively short trends when compared to the overall length of data collection.[93]

Groundwater level conditions vary in the Basin and depend on precipitation and groundwater pumping. The two primary areas of pumping are in the Central and Ventucopa management areas. Groundwater level data and hydrographs show that groundwater levels have been declining in these areas for decades at an average rate of more than two feet per year.[94]

The GSP discusses calculating the change in groundwater in storage using an integrated hydrologic model for the Basin. Department staff reviewed documentation provided for the integrated hydrologic model and determined that it appears to have been prepared

[88] Cuyama Basin 2022 GSP, Section 2.2.10, p. 238.
[89] Cuyama Basin 2022 GSP, Section 2.1.9, p. 133; Figure 2-17, p. 135.
[90] Cuyama Basin 2022 GSP, Section 2.2.8, pp. 227-228.
[91] Cuyama Basin 2022 GSP, Section 1.3.1, pp.85-86; Table 2-4, p. 246.
[92] 23 CCR § 354.16(a-f).
[93] Cuyama Basin 2022 GSP, Chapter 2, Appendix A, pp. 663-1149.
[94] Cuyama Basin 2022 GSP, Figure 2-27, p. 152; Figures 2-31 to 2-35, pp. 160-164; Figure 4-2, p. 282; Section 7.2, pp. 408-410.

based on the Integrated Water Flow Model platform, which is designated in SGMA as a model supported by the Department for evaluating integrated surface water and groundwater resources. During 1998 to 2017, groundwater in storage declined 18 out of 20 years, with an average reduction of 23,000 acre-feet per year.[95]

Groundwater quality conditions also vary in the Basin, depending on groundwater recharge and pumping. Historical studies associate varying water quality with recharge location and nearby lithology, largely dependent on proximity to marine sediments. The Plan provides an assessment of existing groundwater quality programs in the Basin and includes maps[96] and descriptions of current and historical groundwater quality issues present in the Basin. The Plan acknowledges locally high concentrations of total dissolved solids, sulfates, nitrate, arsenic, sodium, boron, and hexavalent chromium, but focuses on total dissolved solids, nitrate, and arsenic because these were discussed during public meetings by interested parties as constituents of concern.[97]

Regarding seawater intrusion, the Basin is far from the coast and is not hydraulically connected to a sea or ocean. The Agency concludes that seawater intrusion is not a relevant sustainability indicator for the Basin[98] and given the physical location of the Basin, Department staff are aware of no significant inconsistencies or contrary technical information to the Agency's decision.

The GSP describes a United States Geological Survey (USGS) investigation done in 2015 that concluded inelastic subsidence has occurred in the Basin since the 1970s.[99] One monitoring station near Ventucopa did not record any subsidence since 1999, while another station in the Central management area recorded 12 inches of land subsidence between 1999 and 2019. The USGS investigation estimated total subsidence in the Basin ranged from 0 to 0.4 feet between 2000 and 2012.[100] The GSP provides maps showing the locations of monitoring stations, spatial data gaps, and Interferometric Synthetic Aperture Radar (InSAR) data.[101]

The GSP includes an evaluation of surface water hydrology from 1998 to 2017 using the integrated hydrologic model prepared for the Basin. In the model, the Cuyama River was divided into five reaches based on precipitation rates, runoff, and infiltration characteristics; four creeks that drain into the Cuyama River were also assigned reaches and modeled.[102] The gaining and losing reaches of the drainages and locations where

[95] Cuyama Basin 2022 GSP, Section 2.3, pp. 243-247, 250-259.
[96] Cuyama Basin 2022 GSP, Figures 2-11 to 2-15, p. 130-132; Figures 2-52 to 2-60, pp. 216-226; Figures 2-79 to 2-80, pp. 265-266.
[97] Cuyama Basin 2022 GSP, Section 2.1.8, p. 129; Section 2.2.7, p. 213.
[98] Cuyama Basin 2022 GSP, Section 2.2.5, p. 209.
[99] Cuyama Basin 2022 GSP, Section 2.2.6, p. 209.
[100] Cuyama Basin 2022 GSP, Section 2.2.6, p. 209.
[101] Cuyama Basin 2022 GSP, Figures 2-50 to 2-51, pp. 210-211; Figures 4-22 to 4-23, pp. 348, 351; Figure 5-4, p. 387.
[102] Cuyama Basin 2022 GSP, Section 2.2.8, pp. 227-228.

surface water may be connected to groundwater are shown on a map.[103] The Plan also discusses the conditions associated with GDEs in the Basin.[104]

Overall, Department staff believe the Plan sufficiently describes the historical and current groundwater conditions throughout the Basin, and the information included in the Plan substantially complies with the requirements outlined in the GSP Regulations.

5.2.3 Water Budget

The GSP Regulations require a water budget for the basin that provides an accounting and assessment of the total annual volume of groundwater and surface water entering and leaving the basin, including historical; current; and projected water budget conditions, and the change in the volume of water stored, as applicable.[105]

The GSP provided the required components for water budgets, including historical, current, and projected water budgets informed by the integrated hydrologic model for the Basin, which simulates surface water and groundwater flow in the Basin and was developed in consultation with the local technical forum.[106] The Plan includes an assessment of the total annual volume of groundwater and surface water entering and leaving the Basin and estimates the Basin's sustainable yield.[107]

The hydrologic model projects a continued decline of 23,000 to 27,000 acre-feet per year over the 50-year implementation horizon, based on pre-SGMA conditions with no implementation of projects and management actions. Considering the Basin's sustainable yield of 20,000 to 27,000 acre-feet per year[108] and the average annual volume of groundwater production,[109] Department staff conclude that the Basin is currently in and projected to be in overdraft if no projects and management actions are implemented. However, the projects and management actions described in the revised GSP are intended to allow the Basin to operate within its sustainable yield.

Department staff conclude the historical, current, and projected water budgets included in the Plan substantially comply with the requirements outlined in the GSP Regulations. The GSP provides the required historical, current, and future accounting and assessment of the total annual volume of groundwater and surface water entering and leaving the Basin including an estimate of the sustainable yield of the Basin and projected future water demands.

5.2.4 Management Areas

The GSP Regulations provide the option for one or more management areas to be defined within a basin if the GSA has determined that the creation of the management areas will

[103] Cuyama Basin 2022 GSP, Figure 3-1, p. 1593.
[104] Cuyama Basin 2022 GSP, Section 2.2.9, pp. 232-236; Appendix B, Section 2.2.3, pp. 1589-1596.
[105] 23 CCR § 354.18 *et seq*.
[106] Cuyama Basin 2022 GSP, Section 2.3, pp. 243-257.
[107] Cuyama Basin 2022 GSP, Section 2.3, pp. 257-259.
[108] Cuyama Basin 2022 GSP, Section 2.3, pp. 257-259.
[109] Cuyama Basin 2022 GSP, Table 2-6, p. 254.

facilitate implementation of the Plan. Management areas may define different minimum thresholds and be operated to different measurable objectives, provided that undesirable results are defined consistently throughout the basin.[110]

The GSP identifies two management areas within the Basin—Central and Ventucopa.[111] The management areas delineate the groundwater pumping centers with historical groundwater level declines and are identified for the GSA's consideration of projects and management actions. The management areas are not associated with differing sustainable management criteria; instead, the GSP proposes managed pumping reductions in the Central management area and states that the GSA will further investigate the need for pumping reductions in the Ventucopa management area, as described above in Deficiency 4.

To facilitate implementation of the Plan, the GSP identifies six threshold regions with varying sustainable management criteria (comparable to management areas as defined in the GSP Regulations).[112] The threshold regions are described and shown in Section 5.2.1 of the GSP.[113] The factors provided by the GSA for grouping representative wells and sustainable management criteria by threshold region include the saturated thickness of the aquifer, well depth, historical range of groundwater levels, and annual change in storage.[114] The justification for creating each threshold region and its respective method for calculating minimum thresholds for groundwater levels are summarized in Appendix B of the GSP.[115]

Based on review of the GSP's use of threshold regions, Department considers these to be equivalent to management areas. Department staff believe the GSP is utilizing the threshold regions consistent with the requirements of the GSP Regulations related to management areas.

5.3 SUSTAINABLE MANAGEMENT CRITERIA

The GSP Regulations require each Plan to include a sustainability goal for the basin and to characterize and establish undesirable results, minimum thresholds, and measurable objectives for each applicable sustainability indicator, as appropriate The GSP Regulations specify that an agency define conditions that constitute sustainable groundwater management for a basin, including the characterization of undesirable results and the establishment of minimum thresholds and measurable objectives for each applicable sustainability indicator.[116]

[110] 23 CCR § 354.20.
[111] Cuyama Basin 2022 GSP, Section 7.2, pp. 408-410.
[112] 23 CCR § 354.20.
[113] Cuyama Basin 2022 GSP, Section 5.2.1, pp. 361-369.
[114] Cuyama Basin 2022 GSP, Section 5.2.1, pp. 361-369; Appendix B, pp. 1584-1585.
[115] Cuyama Basin 2022 GSP, Appendix B, Table 2-1 and Figure 2-1, pp. 1583-1585.
[116] 23 CCR § 354.22 *et seq*.

5.3.1 Sustainability Goal

The GSP establishes a sustainability goal "[t]o maintain a sustainable groundwater resource for beneficial users now and into the future while being consistent with the California Constitution." [117] The GSA states that it intends to adaptively manage groundwater resources through evaluating annual reports and periodic evaluations to determine progress towards meetings its sustainability goals.[118]

5.3.2 Sustainability Indicators

Sustainability indicators are defined as any of the effects caused by groundwater conditions occurring throughout the basin that, when significant and unreasonable, cause undesirable results.[119] Sustainability indicators thus correspond with the six undesirable results – chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply if continued over the planning and implementation horizon; significant and unreasonable reduction of groundwater storage; significant and unreasonable seawater intrusion; significant and unreasonable degraded water quality, including the migration of contaminant plumes that impair water supplies; land subsidence that substantially interferes with surface land uses; and depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water[120] – but refer to groundwater conditions that are not, in and of themselves, significant and unreasonable. Rather, sustainability indicators refer to the effects caused by changing groundwater conditions that are monitored, and for which criteria in the form of minimum thresholds are established by the agency to define when the effect becomes significant and unreasonable, producing an undesirable result.

The following subsections include details about three facets of sustainable management criteria: undesirable results, minimum thresholds, and measurable objectives for each sustainability indicator. GSAs are not required to establish criteria for undesirable results that the agency can demonstrate are not present and are not likely to occur in a basin.[121]

5.3.2.1 Chronic Lowering of Groundwater Levels

The GSP Regulations require the minimum threshold for chronic lowering of groundwater levels to be the groundwater elevation indicating a depletion of supply at a given location that may lead to undesirable results.[122]

For the chronic lowering of groundwater levels, the GSP defines an undesirable result as a significant and unreasonable reduction in the long-term viability of domestic, agricultural, municipal, or environmental uses over the planning and implementation horizon of the GSP. The GSP describes the potential effects of chronic lowering of groundwater levels on beneficial uses and users including domestic, agricultural, and

[117] Cuyama Basin 2022 GSP, Section 3.1, p. 268.
[118] Cuyama Basin 2022 GSP, Section 7.6, p. 436.
[119] 23 CCR § 351(a-h).
[120] Water Code § 10721(x).
[121] 23 CCR § 354.26(d).
[122] 23 CCR § 354.28(c)(1).

ecological uses.[123] The undesirable result for chronic lowering of groundwater levels is defined as occurring when 30 percent of representative monitoring wells fall below their minimum groundwater elevation thresholds for two consecutive years. The explanation of anticipated effects on beneficial uses and users is described in the revised GSP and evaluated in Deficiency 1 and Deficiency 4.[124]

The GSA establishes minimum thresholds for chronic lowering of groundwater at 61 wells. The methodology to establish the minimum thresholds vary by threshold region, as discussed above in the Management Area section, and generally relate to historical groundwater elevations, groundwater use type, saturated thickness of aquifer, well depth, well screen intervals, and 2015 groundwater elevations.[125] Table 4-5 in the GSP lists the sustainable management criteria for all 61 representative monitoring wells, and a map shows the location of those wells.[126] The measurable objective for each representative well is based on when the threshold region was fully recharged or the early 2015 groundwater elevations or to build in a buffer of five years of change in storage. If data was not available for a criterion, the GSP extrapolated the value using a linear trendline. Interim milestones are set equal to the minimum thresholds in 2025.[127]

Department staff conclude that the sustainable management criteria for groundwater levels are commensurate with the understanding of current conditions, responsive to interested party feedback, and reasonably protective of the groundwater uses and users in the Basin. The revised Plan provides a credible and sufficient assessment of the impacts the minimum thresholds would have on supply wells – including domestic wells – by evaluating the well impact depth, affected households, irrigated acreage, and associated financial impact. However, as highlighted in Section 4.1 above, Department staff do provide a recommended corrective action related to chronic lowering of groundwater levels.

5.3.2.2 Reduction of Groundwater Storage

The GSP Regulations require the minimum threshold for the reduction of groundwater storage to be a total volume of groundwater that can be withdrawn from the basin without causing conditions that may lead to undesirable results. Minimum thresholds for reduction of groundwater storage shall be supported by the sustainable yield of the basin, calculated based on historical trends, water year type, and projected water use in the basin.[128]

The GSP describes a significant and unreasonable reduction of groundwater storage as conditions that would result in “unreasonable reduction in the viability of domestic, agricultural, municipal, or environmental uses over the planning and implementation

[123] Cuyama Basin 2022 GSP, Section 3.2.1, p. 269.
[124] Cuyama Basin 2022 GSP, Appendix B, pp. 1586-1590; 1603-1605.
[125] Cuyama Basin 2022 GSP, Appendix B, pp. 1583-1585.
[126] Cuyama Basin 2022 GSP, Section 4.5.5, p. 321-325, Table 4-5, pp. 322; Figure 4-18, p. 326.
[127] Cuyama Basin 2022 GSP, Section 5.2.2, pp. 366-369.
[128] 23 CCR § 354.28(c)(2).

horizon of [the] GSP."[129] The GSP uses the criteria for chronic lowering of groundwater levels as a proxy for groundwater storage sustainable management criteria, explaining that the change in storage is directly correlated to changes in groundwater elevation, and therefore, managing groundwater elevations effectively manages storage.[130]

As with the chronic lowering of groundwater levels, the GSP defines an undesirable result as occurring when 30 percent of representative monitoring wells fall below their minimum groundwater elevation thresholds for two consecutive years. Additionally, the GSP states that the measurable objectives and interim milestones are the same as those established for the chronic lowering of groundwater.[131] The GSP provides a description of the potential causes of the reduction of groundwater storage undesirable results and the possible effects on beneficial uses and users in the Basin.[132]

Based on review of the materials referenced in the GSP, staff conclude that the GSP's discussion and presentation of information related to significant and unreasonable reduction of groundwater storage, including the rationale that maintaining stable groundwater levels indicates groundwater storage is not being reduced, covers the specific items listed in the GSP Regulations in an understandable format using appropriate data.

5.3.2.3 Seawater Intrusion

The GSP states that due to the geographic location of the Basin, seawater intrusion is not a concern, and thus, sustainable management criteria for this sustainability indicator are not required.[133] Department staff agree that this sustainability indicator does not apply to the Basin and sustainable management criteria are not required.

5.3.2.4 Degraded Water Quality

The GSP Regulations require the minimum threshold for degraded water quality to be the degradation of water quality, including the migration of contaminant plumes that impair water supplies or other indicator of water quality as determined by the Agency that may lead to undesirable results. The minimum threshold shall be based on the number of supply wells, a volume of water, or a location of an isocontour that exceeds concentrations of constituents determined by the Agency to be of concern for the basin. In setting minimum thresholds for degraded water quality, the Agency shall consider local, state, and federal water quality standards applicable to the basin.[134]

Three constituents of concern – arsenic, nitrate, and total dissolved solids – were identified by the GSA and are included in the GSP based on previous studies of the Basin and discussions during public meetings among interested parties in the Basin.[135]

[129] Cuyama Basin 2022 GSP, Section 3.2.2, p. 270.
[130] Cuyama Basin 2022 GSP, Section 3.2.2, p. 270.
[131] Cuyama Basin 2022 GSP, Section 5.3, p. 375.
[132] Cuyama Basin 2022 GSP, Section 3.2.2, p. 270.
[133] Cuyama Basin 2022 GSP, Section 5.4, p. 375.
[134] 23 CCR § 354.28(c)(4).
[135] Cuyama Basin 2022 GSP, Section 2.2.7, p. 213.

However, the GSP only established a minimum threshold for total dissolved solids in representative monitoring wells based on the historical range of concentrations in each respective well. The GSP discusses in detail, provides data and maps, and has established sustainable management criteria and routine monitoring for total dissolved solids.[136] Because rainfall percolates through marine sediments adjacent to the Basin, some local areas naturally contain large amounts of salt, with concentrations ranging in the Basin from 84 to 4,400 milligrams per liter.[137]

The GSP defines an undesirable result for total dissolved solids water quality conditions as "a causal nexus between SGMA-related groundwater quantity management activities and groundwater quality that causes significant and unreasonable reduction in long-term viability of domestic, agricultural, municipal, or environmental uses over the planning and implementation horizon of this GSP."[138] The GSP states a water quality undesirable result occurs when 30 percent of the 64 representative monitoring points exceed the minimum threshold for a constituent for two consecutive years. As mentioned above, a GSA's stance regarding its lack of authority to manage based on a causal nexus does not consider the potential for degraded groundwater to migrate toward previously unimpacted areas due to GSA groundwater management activities. Because the GSA has legal authority to regulate groundwater pumping, which affects hydraulic gradients and groundwater flow, the GSA can monitor for and influence the migration of groundwater and has the responsibility to prevent unimpacted areas from becoming significantly and unreasonably impacted by constituents of concern.

The minimum threshold for total dissolved solids does not utilize threshold regions and does not utilize a proxy. The same approach is used for all representative wells in the Basin. The minimum threshold for total dissolved solids in each representative well is established at 20 percent of the total range of measured values in each respective well above the 90th percentile of measurements. An example of the calculation method is provided in the GSP.[139] The minimum thresholds, measurable objectives, interim milestones, and monitoring locations are tabulated and shown in the GSP.[140]

The GSP states that an acceptable margin of operational flexibility is applied towards the measurable objective, which is established in each representative well based on whichever is lower: the most recent measurement as of 2018, when the majority of data compilation and analysis concluded, or the California Division of Drinking Water and United States Environmental Protection Agency Secondary Drinking Water Standard for short-term use of 1,500 milligrams per liter.[141]

[136] Cuyama Basin 2022 GSP, Section 2.1.8, pp. 129-132; Section 2.2.7, pp. 212-218 and 223-226 and 264; Section 3.3.4, p. 274; Section 4.3.3, p. 301; Section 4.8, pp. 332-346; Section 5.5, p. 375-383.
[137] Cuyama Basin 2022 GSP, Section 1.2.1, p. 42; Section 2.1 pp. 100-108; Section 5.5.3, p. 379.
[138] Cuyama Basin 2022 GSP, Section 3.2.4, p. 271.
[139] Cuyama Basin 2022 GSP, Section 5.5.3, p. 379.
[140] Cuyama Basin 2022 GSP, Figure 5-3, p. 377; Table 5-2, pp. 381-383.
[141] Cuyama Basin 2022 GSP, Section 5.5.3, p. 379.

Department staff note that some established minimum thresholds in the Basin exceed the temporary secondary maximum contaminant level of 1,500 milligrams per liter. However, due to the naturally elevated concentration of total dissolved solids being associated with a marine depositional setting as described in the GSP,[142] and based on the Department not receiving substantive public comments regarding the values of the established minimum thresholds for total dissolved solids, Department staff believe this substantially complies with the requirements outlined in the GSP Regulations. GSAs should note that compliance with SGMA and the GSP Regulations does not supersede other drinking water standards, such as those set by the California Division of Drinking Water and United States Environmental Protection Agency.

Regarding arsenic, the GSP did not establish sustainable management criteria; however, as evaluated in Section 4.3.2, the revised GSP performed additional work and analyses to comply with the Department's incomplete determination, including the comprehensive compilation of available data for arsenic; describing an analysis of the available data that show no wells exhibited a degradation from being below the maximum contaminant level prior to 2015 to an exceedance of the maximum contaminant level after 2015; and the intent to mitigate groundwater impacted by arsenic by constructing a replacement production well.[143]

Regarding nitrate, neither the original nor resubmitted GSPs set sustainable management criteria for this constituent. As discussed in Section 4.3.2, the GSA utilized available data and an evidence-based approach to show that nitrate concentrations have not substantively changed between 2010 and 2020 and that the Agency will perform additional monitoring for nitrate while leveraging existing regulatory programs for nitrate. As previously discussed above, at this time, Department staff conclude the lack of established sustainable management criteria does not preclude approval and have provided recommended corrective actions.

5.3.2.5 Land Subsidence

SGMA defines the undesirable result for subsidence to be significant and unreasonable land subsidence that substantially interferes with surface land uses, caused by groundwater conditions occurring throughout the basin.[144] The GSP Regulations require the minimum threshold for land subsidence to be the rate and extent of subsidence that substantially interferes with surface land uses and may lead to undesirable results.[145] Minimum thresholds for subsidence shall be supported by the identification of land uses and property interests that have been affected or are likely to be affected by land subsidence in the basin, including an explanation of how the Agency has determined and considered those uses and interests, and the Agency's rationale for establishing minimum thresholds in light of those effects and maps and graphs showing the extent and rate of

[142] Cuyama Basin 2022 GSP, Section 1.2.1, p. 42; Section 2.1 pp. 100-108; Section 5.5.3, p. 379.
[143] Cuyama Basin 2022 GSP, Section 2.2.7, p. 264.
[144] Water Code § 10721(x)(5).
[145] 23 CCR § 354.28(c)(5).

land subsidence in the basin that defines the minimum threshold and measurable objectives.[146]

The GSP defines significant and unreasonable conditions as it relates to land subsidence to be the reduction in the viability of the use of infrastructure over the planning and implementation horizon of the GSP, with the potential to damage infrastructure, including water conveyance and flood control facilities, roads, utilities, buildings, and pipelines.[147] The GSP describes the historical subsidence rates, elastic and inelastic subsidence, and the associated factors in the Basin such as natural geologic processes, oil pumping, and groundwater pumping. An undesirable result is described in the GSP to occur when 30 percent of representative monitoring sites exceed the minimum threshold for subsidence for longer than two years.[148] The minimum threshold for subsidence is two inches per year, whereas the measurable objective is zero lowering of ground surface elevations. Of the five monitoring sites in the vicinity, two sites are within the Basin boundary; thus, the GSP states that an exceedance of the minimum threshold at either of those two stations would lead to an undesirable result.[149]

Based on review of the GSP, Department staff are aware of no significant inconsistencies or contrary information to what was presented in the GSP and therefore have no significant concerns regarding the quality, data, and discussion of land subsidence and the associated sustainable management criteria.

5.3.2.6 Depletions of Interconnected Surface Water

SGMA defines undesirable results for the depletion of interconnected surface water as those that have significant and unreasonable adverse impacts on beneficial uses of surface water and are caused by groundwater conditions occurring throughout the basin.[150] The GSP Regulations require that a Plan identify the presence of interconnected surface water systems in the basin and estimate the quantity and timing of depletions of those systems.[151] The GSP Regulations further require that minimum thresholds be set based on the rate or volume of surface water depletions caused by groundwater use, supported by information including the location, quantity, and timing of depletions, that adversely impact beneficial uses of the surface water and may lead to undesirable results.[152]

Department staff have partially evaluated this sustainability indicator in Section 4.2.2 of this Staff Report. In addition to that evaluation, Department staff note the monitoring network for interconnected surface water includes 12 wells—nine of which are representative wells with defined minimum thresholds and measurable objectives. The

[146] 23 CCR § 354.28(c)(5)(A-B).
[147] Cuyama Basin 2022 GSP, Section 5.6.3, p. 385.
[148] Cuyama Basin 2022 GSP, Section 3.2.5, pp. 271-272.
[149] Cuyama Basin 2022 GSP, Section 3.3.5, p. 274; Section 5.6.3, p. 385.
[150] Water Code § 10721(x)(6).
[151] 23 CCR § 354.16(f).
[152] 23 CCR § 354.28(c)(6).

GSP states that the minimum thresholds at the representative well locations are protective of GDE locations.[153] The GSP acknowledges that the primary beneficial uses of streamflow in the Basin are GDEs and that lowering groundwater levels could result in increased depletion of surface water and reduced streamflow. The intent of the monitoring network for interconnected surface water and established sustainability criteria are to ensure that long-term groundwater level declines do not occur in the vicinity of the potential GDEs upstream of Ventucopa, downstream of the Russell Fault, and on the four major streams contributing to the Cuyama River.[154] At this time, Department staff are satisfied that the GSA has adopted a reasonable approach to identify the location of interconnected surface waters in the Basin and to utilize a reasonable monitoring network.

Based on new analysis by the GSA, one of the impacts to surface water that was not described above in Section 4.2 is simulated stream depletion. In the simulation of impacts to beneficial uses and users based on two representative wells in the Northwestern Threshold Region being at their minimum thresholds, the revised GSP estimates stream depletion of about 1,200 acre-feet per year in the Northwestern Region, which is approximately 12 percent of the total streamflow at this location—10,200 acre-feet per year. The revised GSP states that the actual inflows to the downstream Lake Twitchell would be less than 1,200 acre-feet per year because of stream depletions that would occur between Cottonwood Creek and Lake Twitchell.[155] The GSP acknowledges that additional streamflow gages along the Cuyama River would improve the numerical model used to estimate the depletions of interconnected surface water.[156]

Overall, Department staff believe the GSA has provided sufficient information at this time and have provided recommended corrective actions for improvement in the future.

5.4 MONITORING NETWORK

The GSP Regulations describe the monitoring network that must be developed for each basin including monitoring objectives, monitoring protocols, and data reporting requirements. Collecting monitoring data of a sufficient quality and quantity is necessary for the successful implementation of a groundwater sustainability plan. The GSP Regulations require a monitoring network of sufficient quality, frequency, and distribution to characterize groundwater and related surface water conditions in the basin and evaluate changing conditions that occur through implementation of the Plan.[157] Specifically, a monitoring network must be able to monitor impacts to beneficial uses and users,[158] monitor changes in groundwater conditions relative to measurable objectives

[153] Cuyama Basin 2022 GSP, Section 3.2.6, p. 272; Appendix B, Section 3.3, pp. 1591-1596.
[154] Cuyama Basin 2022 GSP, Appendix B, Section 3.3.1, pp. 1591-1592.
[155] Cuyama Basin 2022 GSP, Appendix B, Section 5.2, p. 392; Section 2.2.3, pp. 1589-1590; Section 5.3.2, p. 1605.
[156] Cuyama Basin 2022 GSP, Section 2.2.10, p. 238; Section 4.10, p. 352.
[157] 23 CCR § 354.32.
[158] 23 CCR § 354.34(b)(2).

and minimum thresholds,[159] capture seasonal low and high conditions,[160] include required information such as location and well construction and include maps and tables clearly showing the monitoring site type, location and frequency.[161] Department staff encourage GSAs to collect monitoring data as specified in the GSP, fill data gaps identified in the GSP prior to the first periodic evaluation,[162] update monitoring network information as needed, follow monitoring best management practices,[163] and submit all monitoring data to the Department's Monitoring Network Module immediately after collection including any additional groundwater monitoring data that is collected within the Plan area that is used for groundwater management decisions. Staff note that if GSAs do not fill their identified data gaps, the GSA's basin understanding may not represent the best available science for use to monitor basin conditions.

The GSP leverages existing monitoring efforts by various agencies to monitor groundwater conditions in the Basin. The monitoring network includes 101 wells, and a subset of those wells are chosen as representative wells that have sustainable management criteria. The groundwater level monitoring network includes 61 representative wells screened at various depths in the principal aquifer.[164] The GSP proposes to use the representative groundwater level monitoring network as a proxy for the groundwater storage monitoring network because it states that changes in groundwater storage are directly dependent on changes in groundwater levels.[165]

The groundwater quality monitoring network includes 64 representative monitoring wells.[166] The revised GSP states that the GSA intends to analyze these wells for total dissolved solids, arsenic, and nitrate at each periodic evaluation, in addition to the wells subject to California Code of Regulations Title 22 requirements.[167] As mentioned above, Department staff have provided Recommended Corrective Action 5 as it relates to water quality monitoring.

The land subsidence monitoring network includes five continuous global positioning satellite stations in the vicinity of the Basin. The two stations overlying the Basin are considered by the GSA to be representative, whereas the three stations outside the Basin boundary provide a measure of tectonic movement.[168]

The interconnected surface water network utilizes a subset of the groundwater level monitoring network, as described above in Section 4.2.2 and Section 5.3.2 of this Staff Report. Nine of the twelve wells in the interconnected surface water monitoring network

[159] 23 CCR § 354.34(b)(3).
[160] 23 CCR § 354.34(c)(1)(B).
[161] 23 CCR §§ 354.34(g-h).
[162] 23 CCR § 354.38(d).
[163] Department of Water Resources, 2016, Best Management Practices and Guidance Documents.
[164] Cuyama Basin 2022 GSP, Section 4.5.5, p. 321.
[165] Cuyama Basin 2022 GSP, Section 3.2.2, p. 270.
[166] Cuyama Basin 2022 GSP, Section 3.2.4, p. 271; Section 4.8.2, p. 333.
[167] Cuyama Basin 2022 GSP, Section 1.2.4, p. 70; Appendix B, Section 4.3.3, p. 1601.
[168] Cuyama Basin 2022 GSP, Section 4.3.4, p. 311.

are considered by the GSA to be representative wells. In addition to the wells, surface water in the vicinity is measured via three stream gages, one of which is in the Basin, upstream of Ventucopa.[169]

Although the GSP provides a robust monitoring network that will monitor the sustainability indicators relevant to the Basin and assist in achieving the sustainability goal, there are some components of the GSP Regulations that the GSP does not address. While the information included in the GSP for the monitoring network does not preclude plan approval, Department staff have recommended corrective actions for further improvement of the Plan, as discussed below.

Surface water monitoring in the Basin relies on a stream gage installed upstream of Ventucopa, after submission of the original GSP, and a stream gage along Santa Barbara Creek. Another stream gage along the Cuyama River is downgradient, but outside of the Basin, and, therefore, influenced by drainages from non-Cuyama Basin watershed areas. Department staff encourage the GSA to improve on the data gap acknowledged in the GSP regarding gaging the Cuyama River within the Basin boundary,[170] so the GSA can better understand the surface flow component of the Basin's water budget and the location, quantity, and timing of stream depletion.[171] As indicated in Recommended Corrective Action 2b, Department staff recommend the GSA continue to fill data gaps related to interconnected surface water.

The GSP acknowledges a temporal data gap associated with the lack of a coordinated and synchronized schedule across various agencies for collecting groundwater level and water quality data that would provide representative and comparable basinwide conditions.[172] Department staff encourages the filling of data gaps to work towards filling the temporal data gap.

The GSP provided scientific rationale for the representative monitoring site selections for the chronic lowering of groundwater levels, groundwater in storage, groundwater quality, land subsidence, and surface water monitoring networks. The GSP describes the rationale of selecting monitoring sites, including using a tiered approach to evaluate the quantity and quality of data for each site to determine representative monitoring sites.[173]

Department staff conclude the GSP provides suitable rationale for selecting sites within each of the relevant sustainability indicator monitoring networks. The data management system is described in detail in the GSP.[174] The data management system was constructed to support sustainable groundwater management, to create transparent reporting on collected data and analysis results, and to be flexible enough to be

[169] Cuyama Basin 2022 GSP, Section 4.3.5, pp. 311-312; Appendix B, Section 3.2, p. 1591; Section 3.3.2, pp. 1594-1596.
[170] Cuyama Basin 2022 GSP, Section 2.2.10, p. 238; Section 4.10, p. 352.
[171] 23 CCR § 354.16(f).
[172] Cuyama Basin 2022 GSP, Section 4.5.8, p. 328; Section 4.8.3, p. 333; Section 4.8.8, p. 342.
[173] Cuyama Basin 2022 GSP, Sections 4.4 through 4.10, pp. 313-352.
[174] Cuyama Basin 2022 GSP, Section 6, pp. 396-407.

configured in the future for additional tools and functionality based on the needs of the GSA over time.[175]

The description of the monitoring network included in the Plan substantially complies with the requirements outlined in the GSP Regulations. Overall, the Plan describes in sufficient detail a monitoring network that promotes the collection of data of sufficient quality, frequency, and distribution to characterize groundwater and related surface water conditions in the Basin and evaluate changing conditions that occur through Plan implementation. The GSP provides a good explanation for the conclusion that the monitoring network is supported by the best available information and data and is designed to ensure adequate coverage of sustainability indicators. The Plan also describes existing data gaps and the steps that will be taken to fill data gaps and improve the monitoring network.[176] Department staff consider the information presented in the Plan to satisfy the general requirements of the GSP Regulations regarding the monitoring network.

5.5 Projects and Management Actions

The GSP Regulations require a description of the projects and management actions the submitting agency has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin.[177]

To reach the sustainability goal, the GSP outlines a collection of projects and management actions that the GSA will rely on to eliminate the projected groundwater overdraft and to maintain groundwater levels. The Plan's primary method to achieving the sustainability goal is the management action to reduce groundwater production by 50 to 67 percent—to be implemented only in the Central management area using a tiered approach beginning in 2023.[178] The Plan also describes four projects aimed at enhancing precipitation, increasing infiltration of stormwater to enhance recharge into the aquifer, utilizing water transfers with downstream users, and improving the reliability of water supplies by replacing a public supply well and expanding and upgrading water conveyance infrastructure in the two primary pumping centers in the Basin.[179]

To achieve the sustainability goal and avoid undesirable results, the GSP proposes projects and management actions in a manner that is consistent and substantially complies with the GSP Regulations.[180] The projects and management actions are directly related to the sustainable management criteria and present a generally feasible approach

[175] Cuyama Basin 2022 GSP, Section 6.1, pp. 396-397.
[176] Cuyama Basin 2022 GSP, Section 2.2.10, p. 238; Section 4.10, p. 352; Appendix B, Section 3.3, pp. 1591-1595.
[177] 23 CCR § 354.44 *et seq.*
[178] Cuyama Basin 2022 GSP, Section 7.5.2, pp. 432-436.
[179] Cuyama Basin 2022 GSP, Section 7.4, pp. 416-430.
[180] 23 CCR §§ 354.44(a), 354.44(b), 354.44(c), 354.44(d).

to achieving the sustainability goal of the Basin. As projects and management actions are implemented, the Department expects that the GSA will continue to communicate with interested parties regarding progress of projects and intention to implement projects per the GSP Regulations,[181] and that progress reports will be included in annual reports and any addition or removal of project and management actions be documented in periodic evaluation.

Department staff believe that the GSP's management action to reduce groundwater pumping is an integral component of achieving sustainability and understand that pumping reductions are scheduled to begin in 2023.[182] The Department will continue to evaluate the progress and effectiveness of the pumping reduction management action in annual reports, periodic evaluations, and amendments.

5.6 Consideration of Adjacent Basins/Subbasins

SGMA requires the Department to "…evaluate whether a groundwater sustainability plan adversely affects the ability of an adjacent basin to implement their groundwater sustainability plan or impedes achievement of sustainability goals in an adjacent basin."[183] Furthermore, the GSP Regulations state that minimum thresholds defined in each GSP be designed to avoid causing undesirable results in adjacent basins or affecting the ability of adjacent basins to achieve sustainability goals.[184]

Cuyama Valley has two adjacent groundwater basins: Carrizo Plain and Mil Potrero Area. These adjacent basins are designated very low priority and are not required to be managed under SGMA and a GSP. The adjacent Carrizo Plain basin is separated by a watershed divide and groundwater divide, which exhibit divergent groundwater flow and are generally considered a barrier to groundwater flow across the boundary. The Badlands Threshold Region of the Basin adjacent to Mil Potrero basin is relatively high in elevation, does not have active wells, and is separated from the adjacent basin by a groundwater divide. The Plan does not anticipate any impacts to adjacent basins resulting from the minimum thresholds defined in the Plan.[185]

5.7 Consideration of Climate Change and Future Conditions

The GSP Regulations require a GSA to consider future conditions and project how future water use may change due to multiple factors including climate change.[186]

Since the original GSP was adopted and submitted in 2020, climate change conditions have advanced faster and more dramatically. It is anticipated that the hotter, dryer conditions will result in a loss of 10 percent of California's water supply. As California

[181] 23 CCR § 354.10(d).
[182] Cuyama Basin 2022 GSP, Executive Summary, p. 37; Section 7.5.2, pp. 433-434.
[183] Water Code § 10733(c).
[184] 23 CCR § 354.28(b)(3).
[185] Cuyama Basin 2022 GSP, Section 2.1.6, p. 120.
[186] 23 CCR § 354.18.

adapts to a hotter, drier climate, GSAs should be preparing for these changing conditions as they work to sustainably manage groundwater within their jurisdictional areas. Specifically, the Department encourages GSAs to explore how the proposed groundwater level thresholds have been established in consideration of groundwater level conditions in the Basin based on current and future drought conditions. The Department encourages GSAs to also explore how groundwater level data from the existing monitoring network will be used to make progress towards sustainable management of the Basin given increasing aridification and effects of climate change, such as prolonged drought. Lastly, the Department encourages GSAs to continually coordinate with the appropriate groundwater users, including but not limited to domestic well owners and state small water systems, and the appropriate overlying county jurisdictions developing drought plans and establishing local drought task forces [187] to evaluate how the Agency's groundwater management strategy aligns with drought planning, response, and mitigation efforts within the Basin.

6 STAFF RECOMMENDATION

Department staff recommend approval of the GSP with the recommended corrective actions listed below. The Cuyama Valley Basin GSP conforms with Water Code Sections 10727.2 and 10727.4 of SGMA and substantially complies with the GSP Regulations. Implementation of the GSP will likely achieve the sustainability goal for the Cuyama Valley Basin. The GSAs have identified several areas for improvement of the Plan, and Department staff concur that those items are important and should be addressed as soon as possible. Department staff have identified recommended corrective actions that will further improve the manner in which the deficiencies were addressed and are expected to be addressed by the first periodic evaluation (due no later than January 28, 2025). Addressing these recommended corrective actions will be important to demonstrate that implementation of the Plan is likely to achieve the sustainability goal.

The recommended corrective actions include:

RECOMMENDED CORRECTIVE ACTION 1

a. Monitor impacts to beneficial uses and users, including impacts to domestic wells, as Plan implementation continues. Provide the Department with an update of impacts and the adaptive management strategies implemented in annual reports and periodic evaluations. Department staff recommend that the GSA review the Department's April 2023 guidance document titled *Considerations for Identifying and Addressing Drinking Water Well Impacts* guidance to assist its adaptive management efforts.

b. Explain and justify how and why using a subset of representative wells available in the region is appropriate to simulate the potential impacts to all beneficial uses

[187] Water Code § 10609.50.

and users in the region. Consider including additional wells within the region to further assess the impacts to the Northwestern Region and downstream users. If it is identified that overdraft will occur in this scenario, the GSA should clarify whether the implementation of proposed projects and management actions will avoid or mitigate significant and unreasonable impacts to beneficial users.

RECOMMENDED CORRECTIVE ACTION 2

Department staff understand that estimating the location, quantity, and timing of stream depletion due to ongoing, basinwide pumping is a complex task and that developing suitable tools may take additional time; however, it is critical for the Department's ongoing and future evaluations of whether GSP implementation is on track to achieve sustainable groundwater management. The Department plans to provide guidance on methods and approaches to evaluate the rate, timing, and volume of depletions of interconnected surface water and support for establishing specific sustainable management criteria in the near future. This guidance is intended to assist GSAs to sustainably manage depletions of interconnected surface water.

In addition, the GSA should work to address the following items by the first periodic evaluation:

a. Consider utilizing the interconnected surface water guidance, as appropriate, when issued by the Department to establish quantifiable minimum thresholds, measurable objectives, and management actions.
b. Continue to fill data gaps, collect additional monitoring data, and implement the current strategy to manage depletions of interconnected surface water and define segments of interconnectivity and timing.
c. Prioritize collaborating and coordinating with local, state, and federal regulatory agencies, as well as interested parties, to better understand the full suite of beneficial uses and users that may be impacted by pumping-induced surface water depletion within the GSA's jurisdictional area.

RECOMMENDED CORRECTIVE ACTION 3

Provide an update regarding the status of the planned project to construct a new replacement production well near the community of New Cuyama, including whether wellhead treatment of arsenic will be performed and whether routine analysis of groundwater samples will be performed to monitor the effectiveness of the arsenic mitigation. If this project is not effective or not implemented by the periodic evaluation, then the GSA should develop sustainable management criteria for arsenic.

RECOMMENDED CORRECTIVE ACTION 4

By the periodic evaluation to be submitted by 2025, Department staff recommend the GSA develop sustainable management criteria for nitrate.

RECOMMENDED CORRECTIVE ACTION 5

Clarify the GSA's intent to perform ongoing measurements and analysis of groundwater samples for arsenic and nitrate, which will be important for the GSA to quantitatively demonstrate, using evidence-based analysis, that implementation of the GSP is achieving the intended effect of avoiding significant and unreasonable impacts to beneficial uses and users of groundwater. Discuss the frequency of the ongoing measurements for nitrate and arsenic.