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TECHNICAL MEMORANDUM

DATE: October 30, 2020 **PROJECT #:** 9090.0701

TO: Ad Hoc Sustainable Groundwater Planning Advisory Committee (GSU22 Committee)

CC: Brian Lockwood, P.G., C.Hg. and Casey Meusel, Pajaro Valley Water Management Agency

FROM: Patrick Wickham, Georgina King P.G., C.Hg., and Cameron Tana, P.E.

PROJECT: Basin Management Plan: Groundwater Sustainability Update 2022 (GSU22)

SUBJECT: Approach to Chronic Lowering of Groundwater Level Sustainable Management Criteria

INTRODUCTION

The Pajaro Valley Water Management Agency (PV Water) submitted a Groundwater Sustainability Plan (GSP) Alternative on December 31, 2016 per the Sustainable Groundwater Management Act (SGMA). The California Department of Water Resources (DWR) assessed the Alternative and approved PV Water's GSP-Alternative. DWR's assessment summary recommended PV Water clarify the criteria for chronic lowering of groundwater levels (GWL) sustainable management criteria (SMC) in its first five-year update to the Alternative. In response to DWR's recommendation, PV Water plans to define GWL SMC for inclusion in the Basin Management Plan: Groundwater Sustainability Update 2022 (GSU22). The GSU22 will be submitted as the five-year update to DWR by January 1, 2022.

Establishing and meeting the SMC will prevent the occurrence of an undesirable result for low groundwater elevations. Approaches taken to establish GWL SMC in submitted GSPs have varied across California and are largely dependent on hydrogeological conditions and stakeholder objectives. Select example approaches to GWL SMC taken in submitted GSPs are summarized in Appendix A. This technical memorandum proposes an approach for developing GWL SMC in the Pajaro Valley Subbasin based on the SGMA regulatory framework, hydrogeologic and land use factors in Pajaro Valley Subbasin, and DWR Best Management Practices (BMP) (DWR, 2017).

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PROPOSED APPROACH FOR GWL SMC DEVELOPMENT IN THE PAJARO VALLEY SUBBASIN

The recommended approach for GWL SMC development is summarized in the following numbered list. SMC are described following the proposed order of development, mirroring the DWR draft SMC Best Management Practices document (DWR, 2017 link). Development of each SMC is then described in detail in subsections following the numbered list, including data needs and current data availability.

1. In conjunction with PV Water and stakeholders, define significant and unreasonable chronic lowering of groundwater levels that causes undesirable conditions for the subbasin's groundwater beneficial users or uses.
2. Identify a subset of wells from the existing monitoring network with the following characteristics to serve as Representative Monitoring Points (RMPs) at which SMC are set:
    a. Long-term reliable record,
    b. Represents the subbasin both spatially and vertically for principal aquifers,
    c. Representative of nearby wells screened in the same aquifer, and
    d. Preferably a dedicated monitoring well located a sufficient distance from pumping wells to minimize pumping influences.
3. Define minimum thresholds for each RMP based on the definition of significant and unreasonable and historical groundwater elevations.
4. Define undesirable results of chronic lowering of groundwater levels based on groundwater management objectives and minimum threshold exceedances.
5. Define measurable objectives for each RMP based on groundwater management objectives and future implementation of projects and management actions that result in increased groundwater elevations.

Significant and Unreasonable Conditions

Significant and unreasonable conditions are qualitative statements describing groundwater conditions unacceptable to subbasin groundwater users. These describe what conditions are to be avoided and serve as an initial framework around which the quantitative SMC are constructed. As defined in the draft DWR SMC BMP (DWR, 2017), chronic lowering of groundwater levels constitutes a significant and unreasonable condition when an unreasonable depletion of supply continues over the planning and implementation horizon. While this general definition may be

sufficient, a more specific statement can be crafted to better define groundwater level goals in the Pajaro Valley Subbasin.

Typically, chronic lowering of groundwater levels indicates significant and unreasonable depletion of supply by either reducing the aquifer's saturated thickness available for pumping. Overdraft during a period of drought is not sufficient to establish undesirable chronic lowering of groundwater if extractions and groundwater recharge are managed as necessary to ensure that reductions in groundwater levels or storage during a period of drought are offset by increases in groundwater levels or storage during other periods. Below is an example statement of significant and unreasonable conditions for GSU22 Committee consideration.

> ***"Significant and unreasonable chronic lowering of groundwater levels occurs when groundwater falls to levels that negatively impact a significant number of domestic, agricultural, or municipal wells, and cause a long-term reduction in groundwater supply."***

As it considers this statement, GSU22 Committee members can provide input on whether they believe low groundwater elevations observed currently or historically have caused an unreasonable depletion in groundwater supply. This input will also provide guidance for defining groundwater levels that are a negative impact to wells and the number of negatively impacted wells that is considered significant.

We also recommend that the statement of significant and unreasonable conditions addresses effects of low groundwater levels on water supply independent of other sustainability indicators such as seawater intrusion, subsidence, and depletion of interconnected surface water. As a result, the sustainability management criteria would be focused on the direct impact of low groundwater levels on wells' ability to pump water. Groundwater elevation proxies specific to other sustainability indicators will be considered separately. Before recommending for the GSU22, the SMC for all sustainability indicators will be reviewed and any inconsistencies between the indicators will be resolved.

Minimum Thresholds

A minimum threshold (MT) is the quantitative value that represents the groundwater conditions at an RMP that, when exceeded individually or in combination with minimum thresholds at other RMPs, may cause an undesirable result in the basin. The MT metric for GWL SMC must be a groundwater elevation measured at RMPs selected specifically for this sustainability indicator. A conceptual example of GWL MT is illustrated on Figure 1, sourced from the draft DWR SMC BMP (DWR, 2017). MT development must consider the interests of beneficial uses and users of groundwater, land uses, and property interests in the basin. Per GSP regulations, sporting information for MTs must include the following items:

- Information and criteria used to establish and justify the MTs. This can include historical groundwater elevations, depths of nearby domestic and irrigation wells, land use data, hydrogeologic conditions including groundwater extraction, and any other pertinent information.
- Description of the relationship between MTs at different RMP sites, and description of how GWL MTs will not interfere with MTs for other sustainability indicators.
- Description of how MTs have been selected to avoid negatively affecting sustainability in adjacent basins.
- Description of how MTs may affect beneficial uses and users or groundwater, and how existing state, federal, or local standards relate to the MTs.

The proposed approach for Pajaro Valley Subbasin will focus on a thorough review of historical groundwater elevations, land use, and production well screen depths. Minimum thresholds will likely be set such that a high percentage of production wells will not dry out if groundwater elevations remain above minimum thresholds. This analysis will result in MTs that ensure groundwater remains accessible to domestic, agricultural, or municipal wells in the subbasin and groundwater supply remains reliable.

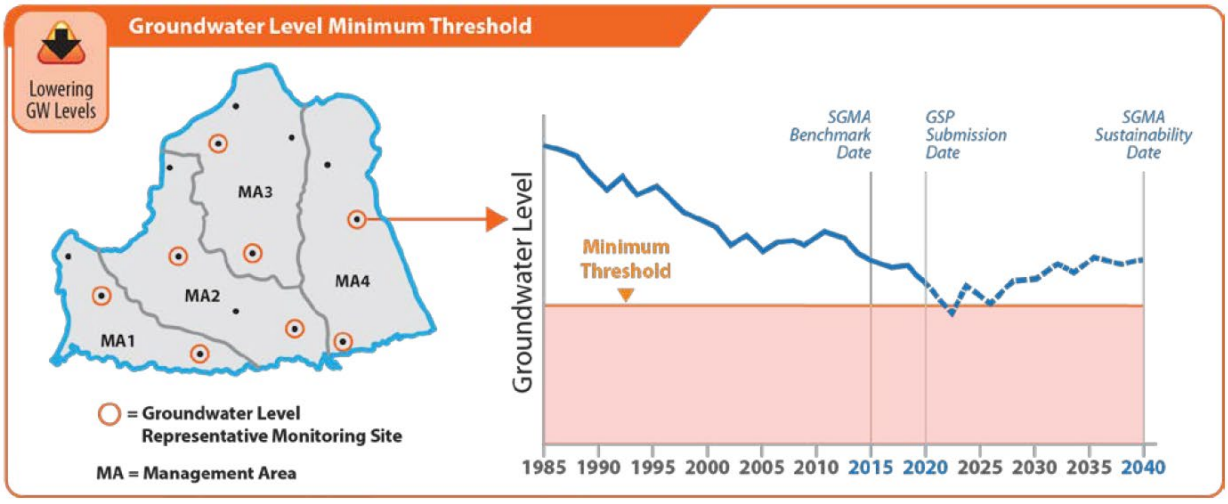

Figure 1. Conceptual GWL Minimum Threshold [DWR, 2017]

Undesirable Results

Undesirable results occur when conditions related to the sustainability indicator become significant and unreasonable. Undesirable results are tied directly to exceedances of MTs at RMPs, either at a single monitoring site, multiple monitoring sites, a portion of the basin, or across the entire subbasin. Undesirable results will be used by DWR to determine whether sustainability has been achieved in the basin.

As defined in the DWR draft SMC BMP, analysis of undesirable results must account for and describe the following components:

- Documentation of the factors that have led to, or may lead to, undesirable results. This may include overpumping of groundwater across the subbasin, overpumping of groundwater in select areas or aquifers, or other conditions conducive to the occurrence of undesirable results.
- Description of the criteria used to define when and where undesirable results occur, based on exceedances of MTs.
- Description of how undesirable results may affect the beneficial uses and users or groundwater.
- Description of how undesirable results have been selected to avoid negatively affecting sustainability in adjacent basins.

Much of the analysis performed to determine MTs will also be used to define proposed undesirable results, i.e., analysis of historical groundwater elevations, land use, production well screen depths, and spatial distribution of production wells. Undesirable results will likely be defined based on exceedances of MTs at multiple RMPs so that assessment of sustainability is based on more than a single local area.

Measurable Objectives

Measurable objectives (MO) are quantitative goals set at RMP that reflect the GSA's desired groundwater conditions. The MO groundwater levels are not enforceable but must be achievable. Since the groundwater level difference between MT and MO at a given RMP provides for operational flexibility, MOs should be set at levels which account for future droughts, climate change, and planned groundwater management activities, such as conjunctive use.

In addition to MOs, the GSA must also define interim milestones in five-year increments for each RMP, which will be used by the GSA and DWR to track progress towards reaching sustainability.

The proposed approach for establishing MOs will be based largely on historical groundwater elevations and results of the Basin Management Plan modeling with the updated Pajaro Valley Hydrologic Model currently being performed by the U.S. Geological Survey. Using this information will result in MOs that are achievable groundwater levels that provide for operational flexibility for avoiding undesirable results.

How Groundwater Data are to be used for Recommended Approach

The extensive data collected by PV Water will be instrumental in developing the GWL SMC. Specific uses of the data include the following:

- **Groundwater Elevation Data:** All available groundwater elevation measurements at wells with good quality records will be used to determine trends in groundwater elevation and frequency of groundwater elevation measurements at individual wells. Ideally, these data should include wells screened in multiple depths of the Subbasin's principal aquifer and cover the Subbasin spatially. Model simulated hydrographs can also be used for SMC development, mainly to fill gaps in historical records provided the model is well-calibrated in the area.
- **Monitoring Well Construction Data:** Screened intervals, aquifer screened, total well depth, and reference point elevation for all wells with groundwater elevation data will be used for determining SMC based on maintaining saturated thickness for pumping. These data will also be used to determine whether potential RMPs are representative of nearby non-RMP wells. Wells designated as RMPs must have complete data for submittal to DWR's SGMA Portal.
- **Non-Monitoring Well Construction Data:** Construction information including well depths and screenings will be used for MT development, to ensure MTs do not negatively impact a significant number of pumping wells.
- **Land Use Data:** Land use data will be used to determine the likely well type (domestic or irrigation), approximate groundwater usage, and to increase understanding of groundwater usage in the subbasin.

Data Availability

Historically, the PV Water groundwater level monitoring network included up to 233 wells, as described in the 2016 PV Water groundwater monitoring assessment. Surplus wells were removed from the monitoring network based on duplicate database entries, lack of screening information, and spatial and screening redundancy. Described in the Pajaro Valley Subbasin water year (WY) 2019 Annual Report, the current groundwater monitoring network contains "over 170" wells within the Subbasin. This includes wells monitored by PV Water staff on a semi-annual basis, with groundwater elevation measurements taking place at least once during each fall and spring season, and wells monitored by other agencies within the Subbasin. Of these monitoring sites, 158 wells have associated screening information (Figure 2). Of this extensive monitoring network, 25 wells are owned and operated by PV Water or another public entity (Figure 3). PV Water has already provided all data associated with groundwater elevation measurements in an MS Access database.

Data provided by PV Water includes an extensive GIS database containing land use designations, groundwater elevation contours, surface water delivery areas, and monitoring well networks for PV Water, the City of Watsonville, Aromas Water District, Monterey County Water Resources Agency, and Soquel Creek Water District. Further, PV Water provided a texture database developed in partnership with the USGS, which contains geologic texture and well depths for over 2,000 domestic and irrigation wells. This information can be used to help determine the water use type and total depth of production wells. Overall, currently available data are sufficient for a thorough analysis of existing and historical conditions and development of robust GWL SMC.

Schedule for Development of GWL SMC

We plan to present this approach to the Ad-hoc Groundwater Sustainability Planning Advisory Committee (GSU22 Committee) at its November 2020 meeting. After receiving the GSU22 Committee's feedback, we will implement the approach to propose SMC for the chronic lowering of groundwater level sustainability indicator at the GSU22 Committee's February 2021 meeting.

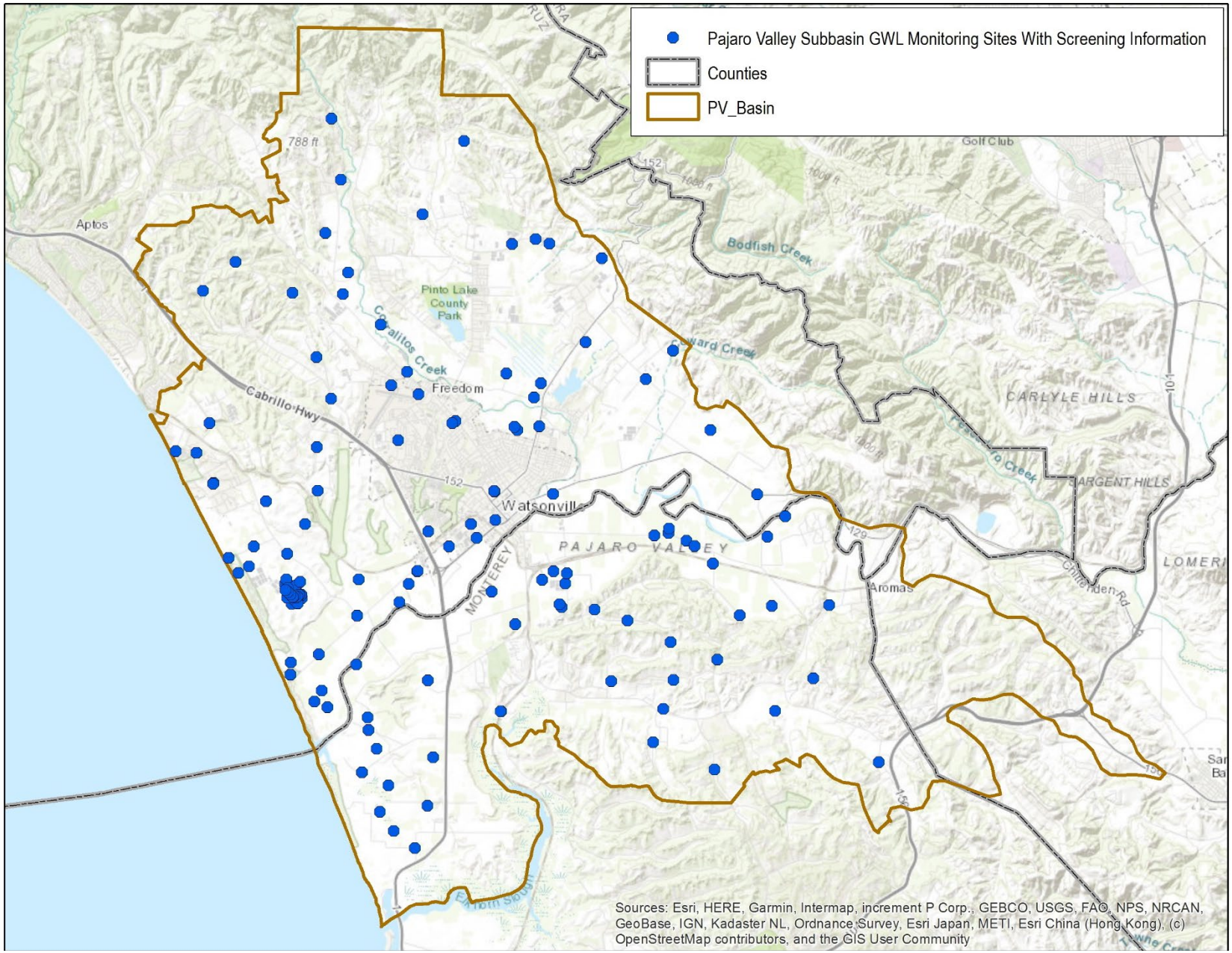

Figure 2. Pajaro Valley Subbasin Groundwater Elevation Monitoring Networks

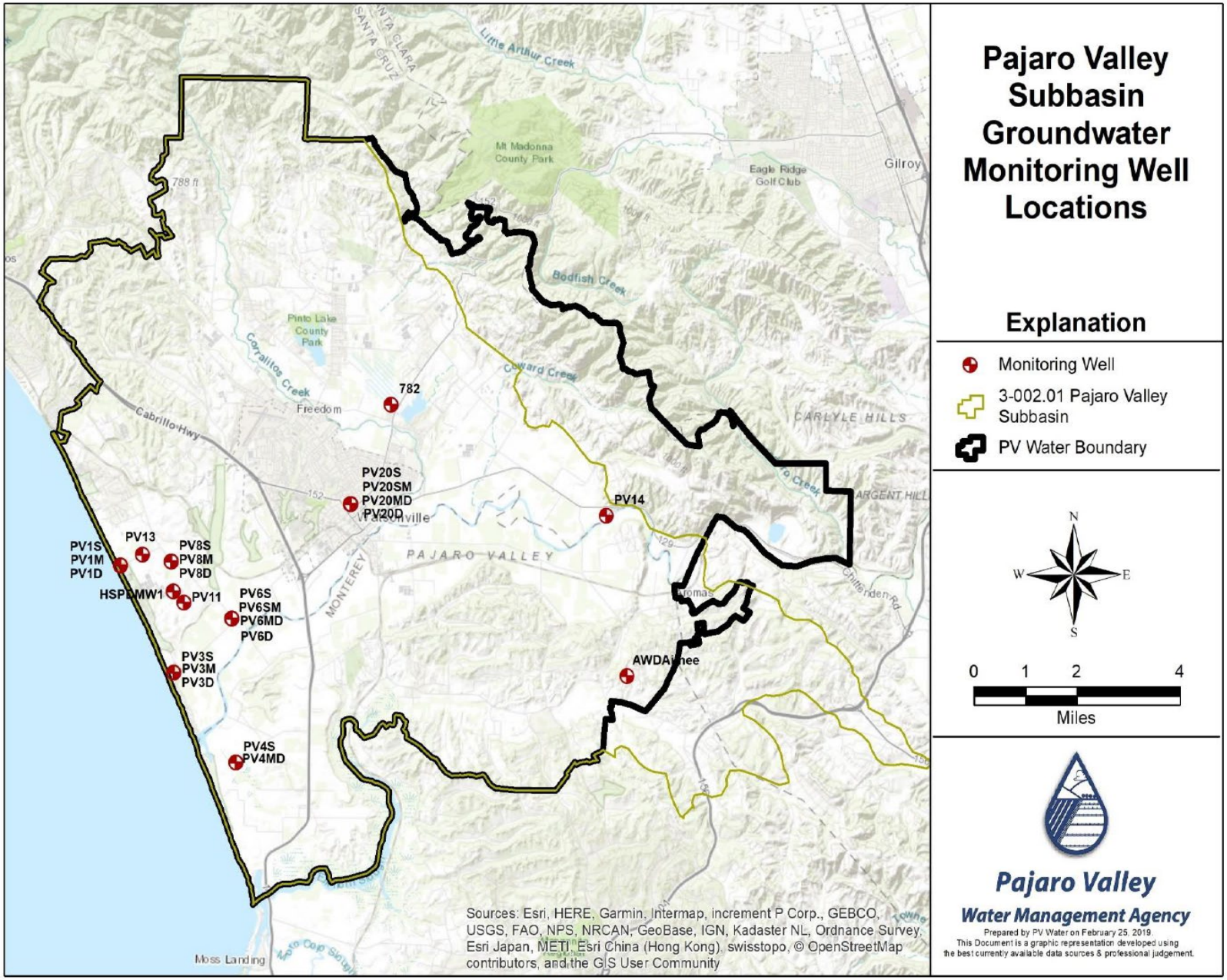

Figure 3. Pajaro Valley Subbasin Dedicated Groundwater Elevation Monitoring Wells

REFERENCE

California Department of Water Resources (DWR), 2017, Draft Best Management Practices for the Sustainable Management of Groundwater, Sustainable Management Criteria, Available Online at https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/BMP-6-Sustainable-Management-Criteria-DRAFT_ay_19.pdf.

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Appendix A

Approach to Chronic Lowering of Groundwater Levels Sustainable Management Criteria in Select GSPs

APPROACH TO CHRONIC LOWERING OF GROUNDWATER LEVELS SUSTAINABLE MANAGEMENT CRITERIA IN SELECT GSPS

Table A-1 summarizes the approaches to chronic lowering of groundwater levels (GWL) sustainable management criteria (SMC) taken in select completed GSPs including undesirable results, minimum thresholds (MT), and measurable objectives (MO). Approaches in the table are sorted from top to bottom based on potential applicability to stakeholder objectives and hydrogeology in the Pajaro Valley Subbasin. The paragraphs following Table A-1 provide more information on the rationale behind the GWL SMC. Locations of Basins where example approaches are presented are displayed on Figure A-1.

Table A-1. Summary of Chronic Lowering of Groundwater Level Sustainable Management Criteria in Select Groundwater Sustainability Plans

Basin or Subbasin	Undesirable Result	Minimum Threshold (MT)	Measurable Objective (MO)	Factors Applicable to Pajaro Valley Subbasin
Salinas Valley Subbasin (180/400)	Occur if either of the following criteria are met: -More than 15% of the groundwater elevation minimum thresholds are exceeded in any single aquifer over the course of a year. - MT in any one well is exceeded for more than two sequential years.	One foot above 2015 groundwater elevations.	Average 2003 groundwater elevations.	Coastal subbasin in critical overdraft with measured SWI, historical GWL decline, agricultural interests, and neighbor to Pajaro Valley.
Paso Robles Subbasin	Occur if either of the following criteria are met: -More than two exceedances of MT occur within a 5-mile radius or within a defined area of the Basin for any single aquifer over the course of two years. -A single monitoring well exceeds MT for two consecutive years.	Set for each representative monitoring point (RMP) based on sustainability goals and historical elevations.	Average 2017 groundwater elevations.	Subbasin in critical ovedraft with agricultural interests and historical GWL decline.
Santa Cruz Mid-County Basin	Any average monthly representative monitoring point's groundwater elevation falls below its minimum threshold.	Shallowest groundwater elevation required to meet overlying demand.	75th percentile of historical elevations	Coastal basin in critical overdraft with measured SWI and neighbor to Pajaro Valley.
Eastern San Joaquin Subbasin	At least 25% of representative monitoring wells used to monitor groundwater levels fall below their minimum level thresholds for two consecutive non-dry water years (below-normal, above-normal, or wet) according to the San Joaquin Valley Water Year Hydrologic Classification.	The deeper value between 1992 and 2015 groundwater levels with a buffer of 100% of the historical range, or the 10th percentile domestic well depth, whichever is shallower.	The deeper of either 1992 or 2015-2016 groundwater levels.	Subbasin in critical overdraft with agricultural interests and historical GWL decline.
Pleasant Valley Basin	Occur if any of the following criteria are met: -Four of the nine RMPs are below MT in one monitoring event -Groundwater elevations at any key well exceed historical low elevations -Any RMP is below MT for three consecutive monitoring events, or three nonconsecutive out of five consecutive monitoring events.	Set at each RMP based on post-2040 elevations in future simulations that predict recovery during multi-year cycles of drought and recovery, and limit migration of saline water impact front in the neighboring coastal Oxnard subbasin.	Set at each RMP based on post-2040 elevations in future simulations that predict minimal flow at the saltwater-freshwater interface in the neighboring coastal Oxnard subbasin.	Coastal subbasin in critical overdraft with historical GWL decline.

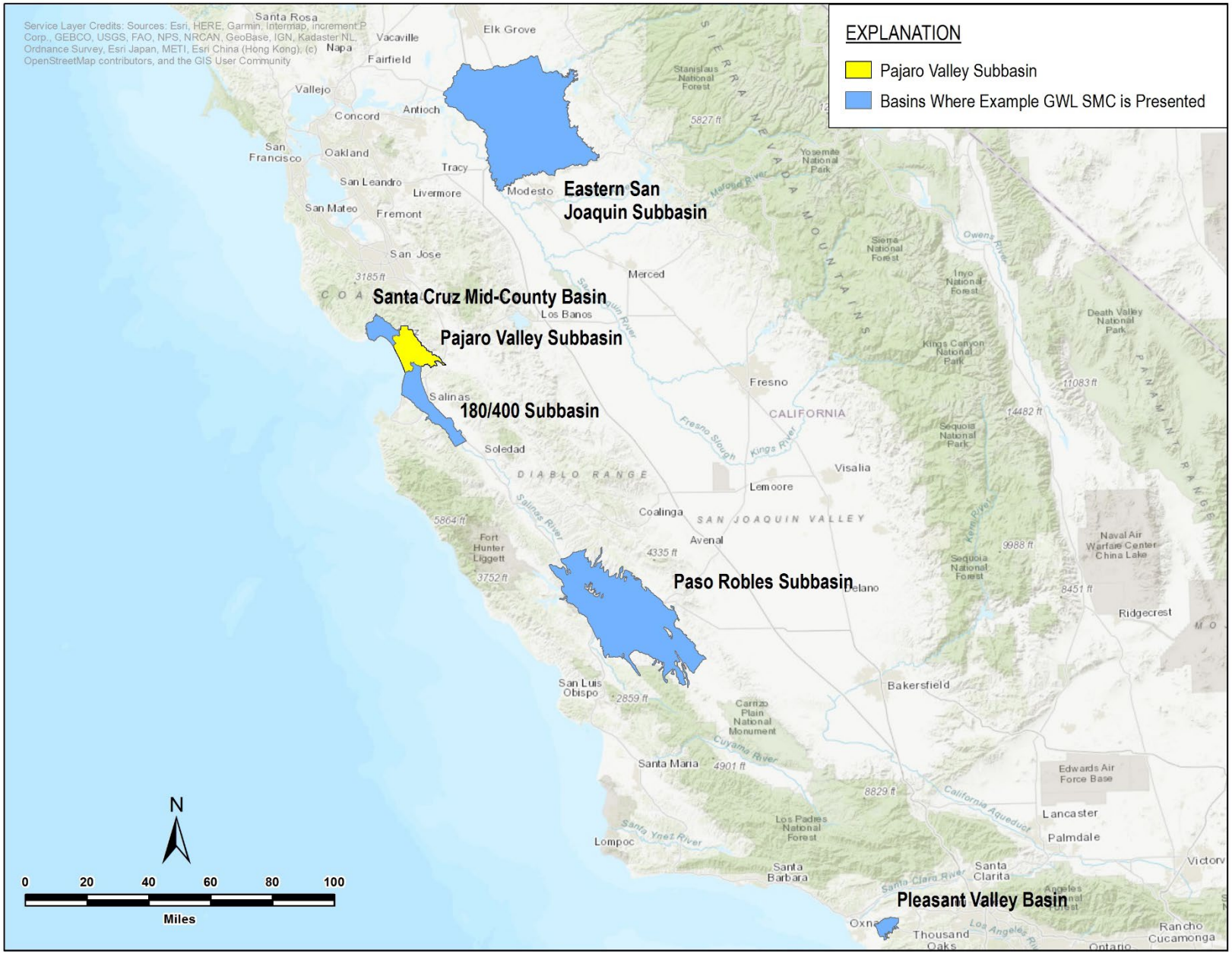

Figure A-1. Basin Where Example GWL SMC is Presented

Salinas Valley Subbasin (180/400-Foot Aquifer)

The Salinas Valley 180/400-Foot Aquifer Subbasin is a high priority basin in critical overdraft located southeast of Pajaro Valley in the Salinas Valley. Descriptions of the Salinas Valley 180/400-Foot Aquifer GWL SMC representative monitoring points (RMPs), significant and unreasonable conditions, undesirable results, measurable objective, and minimum threshold are summarized below. Groundwater elevations and corresponding minimum threshold for an example Salinas Valley 180/400-Foot Aquifer Subbasin RMP are shown on Figure A-2.

Representative Monitoring Points*:* Consists of all wells in the existing CASGEM monitoring well network.

Significant and Unreasonable Conditions: Groundwater elevations are at or below the lowest observed groundwater elevations. Public and stakeholder input identified historically low groundwater elevations as significant and unreasonable, representing significant financial burden to local agricultural interests, or as interfering with other sustainability indicators.

Undesirable Result: Occurs if either of the following criteria are met:

- More than 15% of the groundwater elevation minimum thresholds are exceeded in any single aquifer over the course of a year.
- MT in any one well is exceeded for more than two sequential years.

Minimum Threshold: Set for each RMP based on being 1 foot above 2015 groundwater elevations representing drought conditions.

Measurable Objective: Set for each RMP based on 2003 groundwater elevations, representing sustainable conditions.

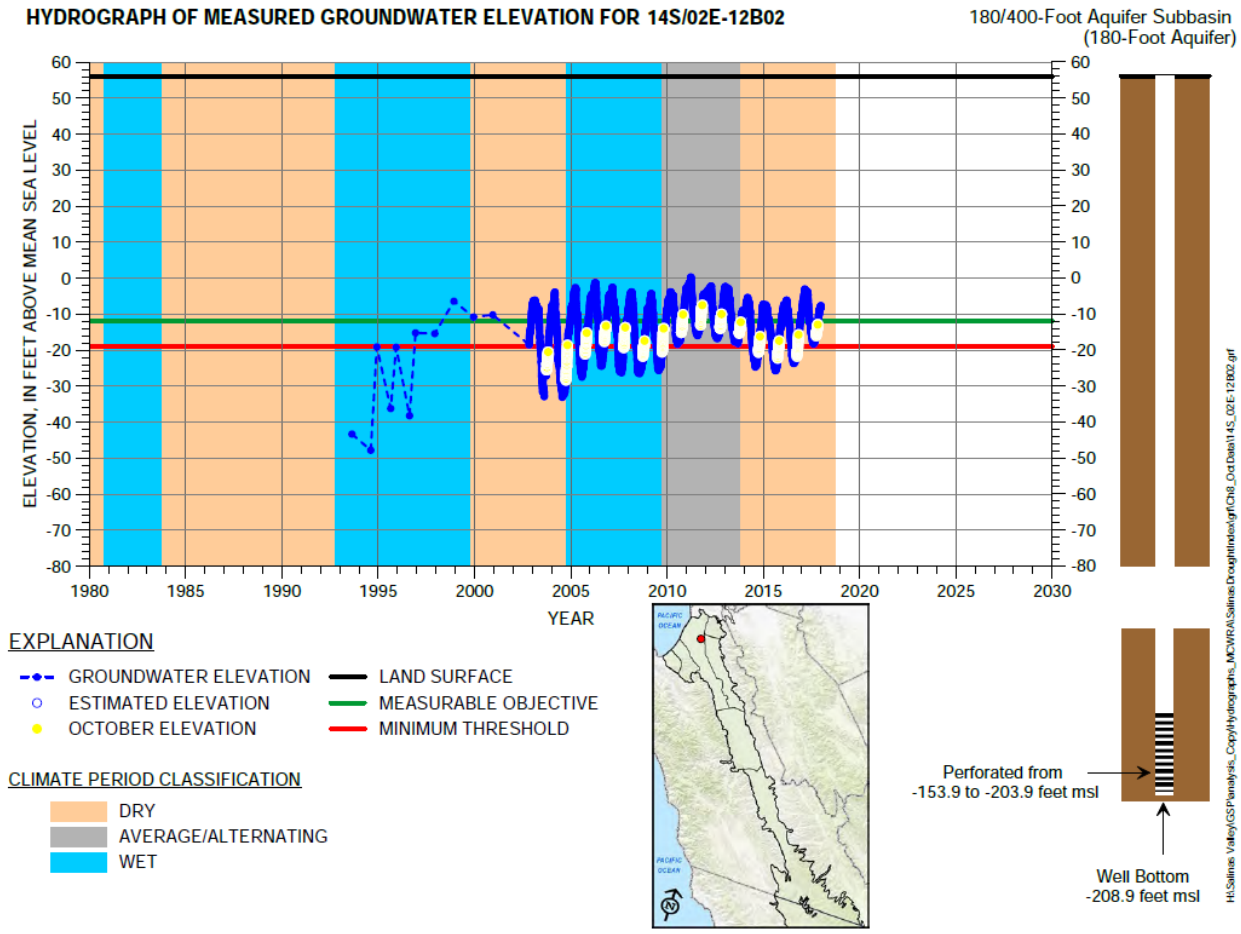

Figure A-2. Chronic Lowering of Groundwater Level Minimum Threshold and Measurable Objective at an Example Salinas Valley Subbasin Represenative Monitoring Point

Paso Robles Subbasin

The Paso Robles Subbasin is a high priority basin in critical overdraft located in the Salinas Valley. Descriptions of the Paso Robles GWL RMPs, undesirable results, measurable objective, and minimum threshold are summarized below. Groundwater elevations and corresponding minimum threshold for an example Paso Robles Subbasin RMP are shown on Figure A-3.

Representative Monitoring Points: All wells that are currently measured and have non-confidential data.

Significant and Unreasonable Conditions: Groundwater levels that impact the ability of existing domestic wells of average depth to produce adequate water for domestic purposes, cause significant financial burden to those who rely on the groundwater basin, or interfere with other SGMA sustainability indicators.

Undesirable Results: Occur if either of the following criteria are met:

- More than two exceedances of MT occur within a 5-mile radius or within a defined area of the Basin for any single aquifer over the course of two years.
- A single monitoring well exceeds MT for two consecutive years.

A single monitoring well in exceedance for two consecutive years represents an undesirable result for the area of the Basin represented by the monitoring well. Geographically isolated exceedances will require investigation to determine if local or Basin wide actions are required in response.

Minimum Threshold: Set for each RMP based on stakeholder sustainability goals and historical elevations.

Measurable Objective: Set for each RMP based on 2017 average groundwater elevations.

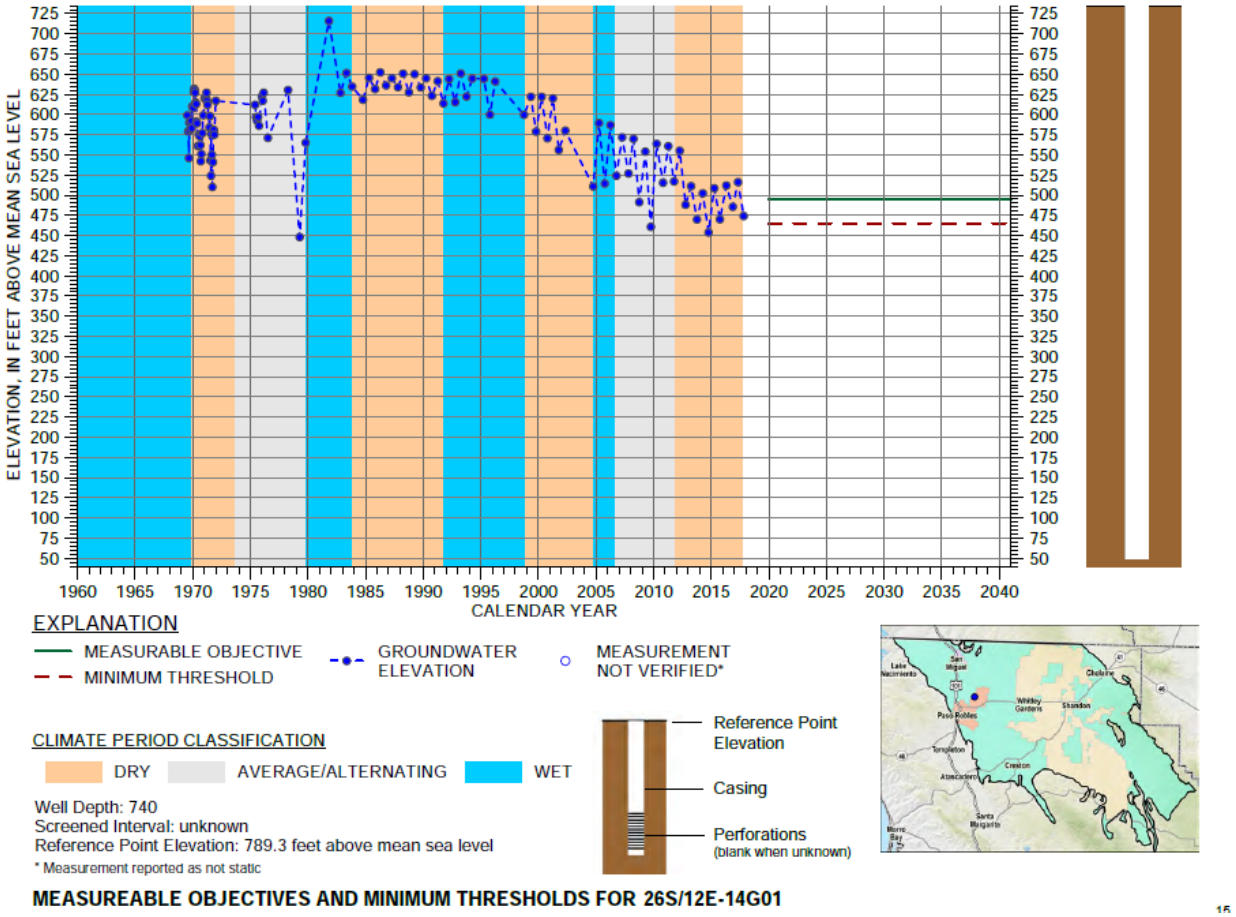

Figure A-3. Chronic Lowering of Groundwater Level Minimum Threshold and Measurable Objective at an Example Paso Robles Subbasin RMP

Santa Cruz Mid-County Basin

The Santa Cruz Mid-County Basin is a high priority basin in critical overdraft neighboring the Pajaro Valley Subbasin to the west. Descriptions of the Santa Cruz Mid-County Basin GWL RMPs, qualitative definition of significant and unreasonable conditions, undesirable results, measurable objective, and minimum threshold are summarized below. Groundwater elevations and corresponding minimum threshold for an example Santa Cruz Mid-County Basin RMP are shown on Figure A-4.

Representative Monitoring Points*:* Two private domestic wells located in the rural domestic area of the basin and 15 dedicated monitoring wells. Coastal RMPs used to monitor seawater intrusion by proxy groundwater elevations were not included in the GWL RMPs.

Significant and Unreasonable Conditions: A significant number of private, agricultural, industrial, and municipal production wells can no longer provide enough groundwater to supply beneficial uses.

Undesirable Result: Any average monthly representative monitoring point's groundwater elevation falls below its minimum threshold.

Minimum Threshold: Based on the groundwater elevation required to meet the typical overlying water demand in the shallowest well in the vicinity of the RMP. Essentially this approach calculates a minimum saturated thickness using overlying demand, nearby wells, and well/hydrogeological characteristics. The estimated minimum saturated thickness is used to calculate the minimum threshold.

Measurable Objective: Measurable objectives for RMPs are the 75th percentile of historical groundwater elevations for the period of record of each RMP. The 75th percentile is higher than median or average groundwater elevations and reflects where the Santa Cruz Mid-County Groundwater Agency would like groundwater elevations to be in the future whilst allowing for operational flexibility.

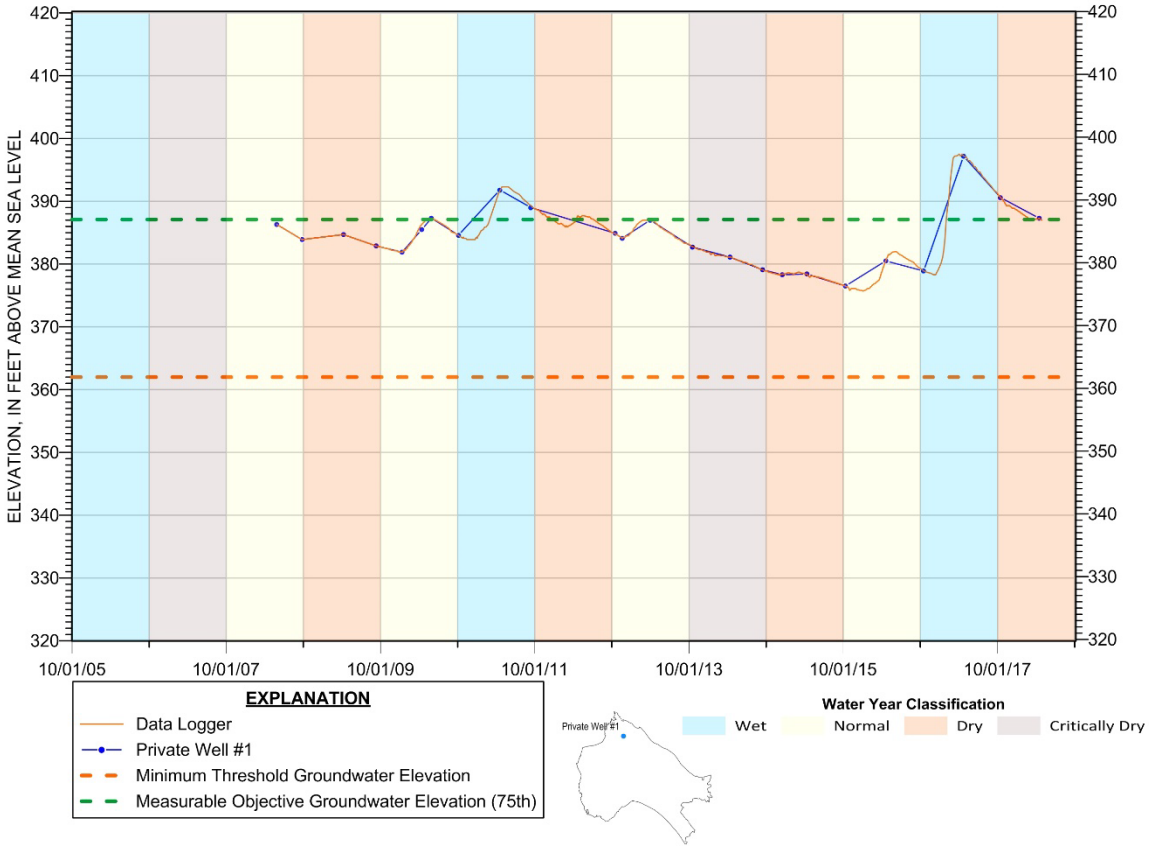

Figure A-4. Chronic Lowering of Groundwater Level Minimum Threshold and Measurable Objective at an Example Santa Cruz Mid-County Basin RMP

Eastern San Joaquin Subbasin

The Eastern San Joaquin Subbasin is a high priority subbasin in critical overdraft located northeast of the Pajaro Valley Subbasin. Descriptions of the Eastern San Joaquin Subbasin GWL RMPs, qualitative definition of significant and unreasonable conditions, undesirable results, measurable objective, and minimum threshold are summarized below. Groundwater elevations and corresponding minimum threshold for an example Eastern San Joaquin Subbasin RMP are shown on Figure A-5.

Representative Monitoring Points*:* Network of 20 wells that represent overall conditions in the Subbasin's production zone and reflect regional groundwater conditions in the vicinity.

Significant and Unreasonable Conditions: Defined as chronic lowering of groundwater levels that indicates a significant and unreasonable depletion of supply if continued over the planning and implementation horizon. Overdraft during a period of drought is not sufficient to establish a chronic lowering of groundwater levels if extractions and groundwater recharge are managed as

necessary to ensure that reductions in groundwater levels or storage during a period of drought are offset by increases in groundwater levels or storage during other periods.

Undesirable Result: An undesirable result is considered to occur during GSP implementation if at least 25% of representative monitoring wells used to monitor groundwater levels (five of 20 wells in the Subbasin) fall below their minimum level thresholds for two consecutive years that are categorized as non-dry years (below-normal, above-normal, or wet) according to the San Joaquin Valley Water Year Hydrologic Classification. The lowering of groundwater levels during consecutive dry or critically dry years is not considered to be unreasonable, and would therefore not be considered an undesirable result, unless the levels do not rebound to above the thresholds following those consecutive non-dry years.

Minimum Threshold: The minimum threshold is set at the deeper of 1992 and 2015-2016 groundwater levels with a buffer of 100% of historical range applied, or the shallowest 10th percentile of domestic well depths, whichever of these two elevations is shallower. In municipalities with ordinances requiring the use of municipal water, the 10th percentile municipal well depth is used in place of the 10th percentile domestic well depth criteria.

Measurable Objective: The measurable objective for chronic lowering of groundwater levels is defined as the deeper of 1992 or 2015-2016 groundwater level values.

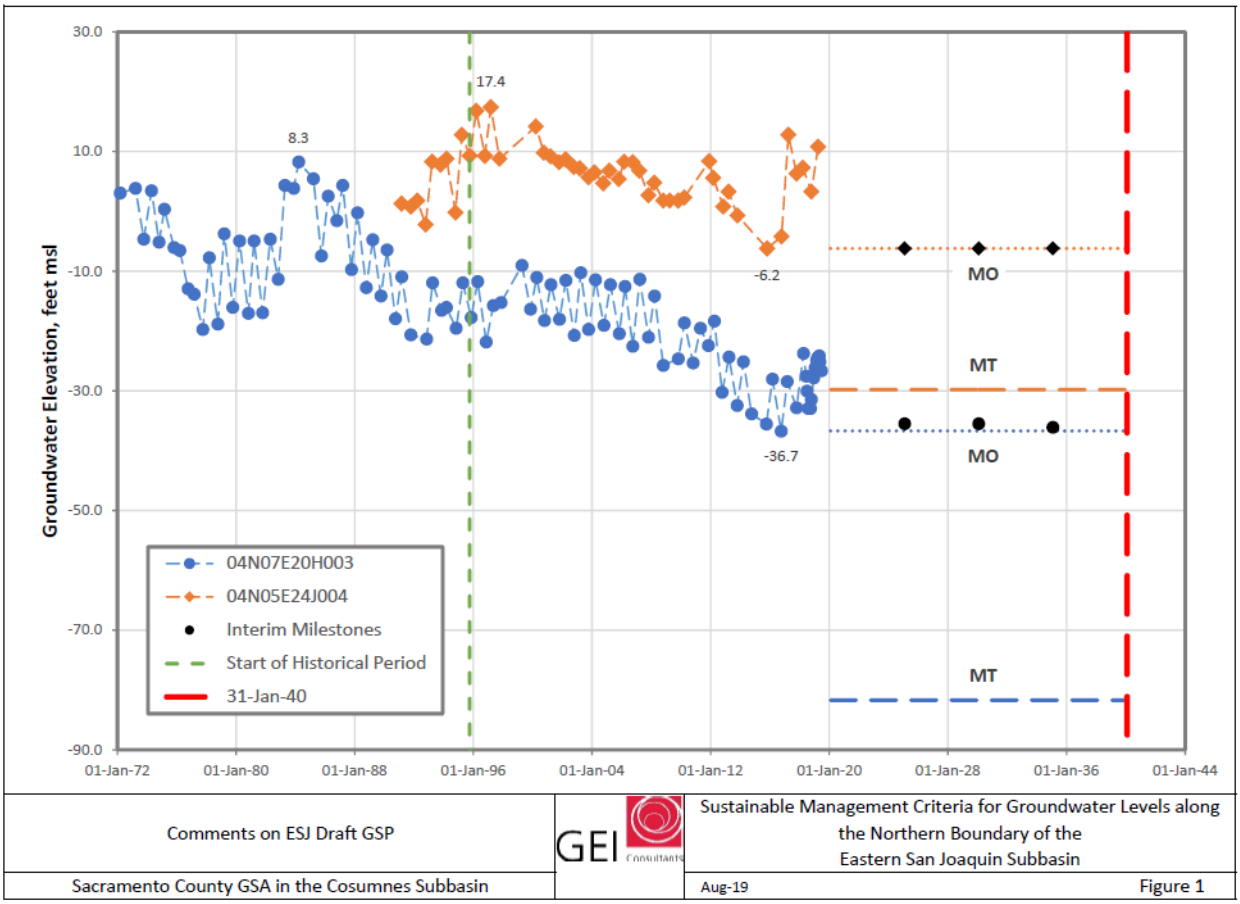

Figure A-5. Chronic Lowering of Groundwater Level Minimum Threshold and Measurable Objective at Two Example Eastern San Joaquin Subbasin RMPs

Pleasant Valley Basin

The Pleasant Valley Basin is a high priory basin in critical overdraft located east of the coastal Oxnard Subbasin in Ventura County. Descriptions of the Pleasant Valley Basin GWL RMPs, significant and unreasonable conditions, undesirable results, measurable objective, and minimum threshold are summarized below. Groundwater elevations and corresponding minimum threshold for an example Pleasant Valley Basin RMP are shown on Figure A-6.

Representative Monitoring Points: The Pleasant Valley Basin's groundwater level RMP network consists of 9 wells that adequately represent the Basin spatially and across aquifer units.

Significant and Unreasonable Conditions: Significant and unreasonable conditions occur when groundwater elevations are lowered to an elevation below which:

- Groundwater levels do not recover to pre-drought conditions during multi-year periods of above-average precipitation that follow a drought,
- Net landward migration of the saline water impact front occurs after 2040,
- The brine migration along the Bailey Fault and from underlying formations is measurably increased, or
- Subsidence that substantially interferes with surface land uses is induced.

Undesirable Result: Undesirable results occur when any of the following criteria are met:

- Four of the nine RMPs are below MT in one monitoring event,
- Groundwater elevations at any key well exceed historical low elevations, or
- Any RMP is below MT for three consecutive monitoring events, or three nonconsecutive out of five consecutive monitoring events.

Minimum Threshold: Minimum thresholds were designated at each RMP well based on post-2040 groundwater elevations in simulations of future conditions that allow for groundwater elevations to recover during wet periods following multi-year droughts. These elevations also limit migration of the saline water impact front in the neighboring coastal Oxnard Subbasin.

Measurable Objective: Measurable objectives were designated at each RMP well based on post-2040 groundwater elevations in simulations of future conditions where minimal flow occurs at the seawater-freshwater interface in the neighboring coastal Oxnard Subbasin.

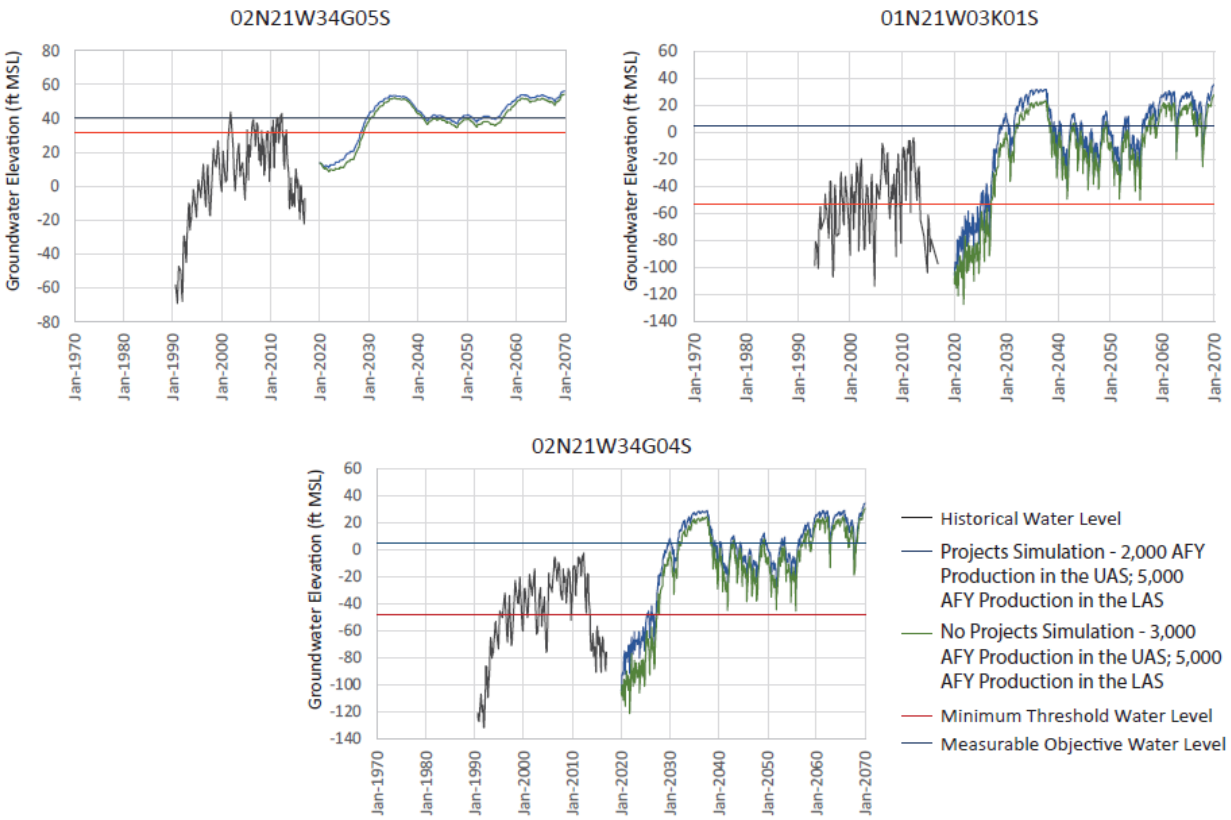

Figure A-6. Chronic Lowering of Groundwater Level Minimum Threshold and Measurable Objective at an Example Pleasant Valley Basin RMP including Simulations for Projected Production in Upper Aquifer System (UAS) and Lower Aquifer System (LAS)

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Paso Robles Subbasin Groundwater Sustainability Agencies, 2020, Paso Robles Subbasin Groundwater Sustainability Plan, Available Online at https://sgma.water.ca.gov/portal/gsp/preview/35

Santa Cruz Mid-County Groundwater Agency, 2019, Santa Crus Mid-County Groundwater Basin Groundwater Sustainability Plan, Available Online at https://sgma.water.ca.gov/portal/gsp/preview/11

Eastern San Joaquin Groundwater Authority, 2019, Eastern San Joaquin Groundwater Sustainability Plan, Available Online at https://sgma.water.ca.gov/portal/gsp/preview/47

Fox Canyon Groundwater Management Agency, 2019, Groundwater Sustainability Plan for the Pleasant Valley Basin, Available Online at https://sgma.water.ca.gov/portal/gsp/preview/17