Appendix A

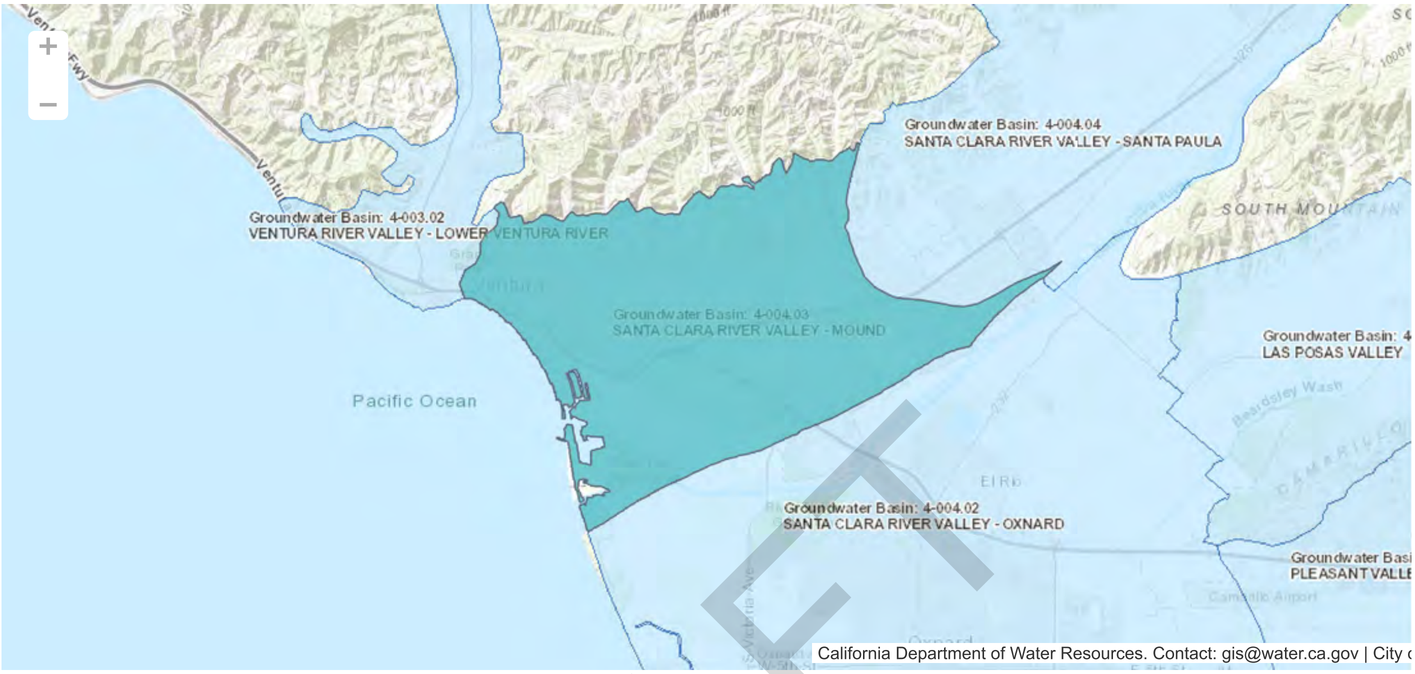
GSP Initial Notification

GSP Initial Notification

4-004.03 SANTA CLARA RIVER VALLEY

Mound Basin GSA

*Date Submitted: **09/17/2018** Last Mo*



1. How many GSPs are planned for the basin?

   Single GSP for the entire basin

2. Select GSA(s) that will develop the GSP(s)

   Mound Basin GSA (Exclusive)

   a. (Optional) If one or more GSAs have identified a representative to submit an initial notification on their behalf, the designated representative shou evidence of that identified.

3. Select or add the point of contact for your GSP area or Plan Manager if identified.

   Bryan Bondy
   (Mound Basin GSA)
   P.O. Box 3544, Ventura, CA93006-3544
   805-212-0484
   bryan@bondygroundwater.com

4. Please provide general information about the Agency's process for developing the GSP, including the manner in which interested parties may conta Agency and participate in the development and implementation of the GSP as required by Water Codes §10723.4 and §10727.8
   (Fill in the text box AND/OR attach a file).

   Interested parties may contact the Mound Basin GSA through its website (https://moundbasingsa.org) or by email (Bryan@BondyGroundwater.co phone (805) 212-0484
   2018-09-17 MBGSA DWR Notice of Intent to Prepare GSP - submitted.pdf (518.7kB) Uploaded on 09/17/2018 at 07:11PM

5. Please provide link(s) to the Agency's website where relevant information regarding the GSP is posted or will be posted.

   http://moundbasingsa.org/gsp/

Post Office Box 3544
Ventura, CA 93006-3544
(805) 525-4431
https://moundbasingsa.org

September 17, 2018

Mr. Trevor Joseph
Sustainable Groundwater Management Section Chief
Department of Water Resources
9001 P Street, Room 213
P.O. Box 942836
Sacramento, CA 94236

Subject: Initial Notification of Groundwater Sustainability Plan Development for the Mound Subbasin (4-004.03)

Dear Mr. Joseph:

This letter is to provide initial notification that the Mound Basin Groundwater Sustainability Agency (Agency) intends to develop a Groundwater Sustainability Plan (GSP) for the subject basin pursuant to Water Code Section 10727.8 and GSP Regulations Section 353.6. The Agency filed notice of intent to serve as the Groundwater Sustainability Agency (GSA) for the subject basin in June 2017.

The Mound subbasin (4-004.03) has a wide variety of stakeholders, as evidenced by the composition of the Agency Board of Directors. The five-member Board of Directors consists of one member from United Water Conservation District (a wholesale water agency and water conservation district), the County of Ventura (land use entity), the City of Ventura (a land use entity and municipal water purveyor), a stakeholder director from the Mound Basin Agricultural Water Group (MBAWG), and a stakeholder director from Environmental Interest Groups (to represent interests of environmental organizations performing work in the basins).

The Agency is currently in the process of developing a GSP, assisted by its Executive Director (Bryan Bondy of Bondy Groundwater Consulting, Inc.) and United Water Conservation District. A plan for stakeholder engagement will be developed to interface with the public on activities needed to develop the GSPs. The stakeholder engagement strategy will address outreach challenges, including: building trust among water agencies, agricultural interests, and environmental interests; and determining the need for—and potential composition of—an advisory committee or facilitation support. The stakeholder engagement plan will address noticing, time and place of meetings, roles and responsibilities of any committees, how stakeholder input will be documented and addressed, as well as target audiences and key messaging.

As part of the stakeholder engagement plan, the Agency will implement a public outreach plan. This will involve developing materials for public outreach and then holding forums on the GSPs at critical junctures. Materials will be developed to provide consistent messaging. Informational materials will be developed that can be used to inform the stakeholders and the community about basin status, GSP goals, objectives, process, and outcomes. These materials will be suitable for both printed distribution and via the internet.

The Agency has established a website (https://moundbasingsa.org/) and a Facebook page (https://www.facebook.com/moundbasingsa/) for stakeholders and interested parties to stay abreast of GSA activities, GSP development progress, and meeting announcement notification.

Draft GSP chapters and other relevant Sustainable Groundwater Management Act (SGMA) information will be posted to the Agency's website. Additionally, updates on GSP development will be provided at publicly noticed Agency Board meetings. Stakeholders should send an email to info@moundbasingsa.org with questions regarding GSP development or to request to be placed on the Agency's interested parties list.

Please feel free to contact me, via email at Bryan@BondyGroundwater.com or by phone at 805-212-0484, if you should have any questions about this initial notification of GSP development.

Sincerely,

Bryan Bondy
Executive Director

Cc: Ventura County Board of Supervisors
City of San Buenaventura City Council
United Water Conservation District
Interested Parties List

Appendix B

Elements of the Plan Table

APPENDIX B

Article 5				Section Number(s)
§ 354.			**Introduction to Plan Contents**	**1.0**
			This Article describes the required contents of Plans submitted to the Department for evaluation, including administrative information, a description of the basin setting, sustainable management criteria, description of the monitoring network, and projects and management actions.	1.0
			Note: Authority cited: Section 10733.2, Water Code.	
			Reference: Section 10733.2, Water Code.	
SubArticle 1.			**Administrative Information**	**2.0**
§ 354.2.			**Introduction to Administrative Information**	2.0
			This Subarticle describes information in the Plan relating to administrative and other general information about the Agency that has adopted the Plan and the area covered by the Plan.	2.0
			Note: Authority cited: Section 10733.2, Water Code.	
			Reference: Section 10733.2, Water Code.	
§ 354.4.			**General Information**	
			Each Plan shall include the following general information:	
(a)			An executive summary written in plain language that provides an overview of the Plan and description of groundwater conditions in the basin.	ES
(b)			A list of references and technical studies relied upon by the Agency in developing the Plan. Each Agency shall provide to the Department electronic copies of reports and other documents and materials cited as references that are not generally available to the public.	8.0
			Note: Authority cited: Section 10733.2, Water Code.	
			Reference: Sections 10733.2 and 10733.4, Water Code.	
§ 354.6.			**Agency Information**	2.1
			When submitting an adopted Plan to the Department, the Agency shall include a copy of the information provided pursuant to Water Code Section 10723.8, with any updates, if necessary, along with the following information:	2.1
(a)			The name and mailing address of the Agency.	2.1.1
(b)			The organization and management structure of the Agency, identifying persons with management authority for implementation of the Plan.	2.1.2
(c)			The name and contact information, including the phone number, mailing address and electronic mail address, of the plan manager.	2.1.3
(d)			The legal authority of the Agency, with specific reference to citations setting forth the duties, powers, and responsibilities of the Agency, demonstrating that the Agency has the legal authority to implement the Plan.	2.1.4
(e)			An estimate of the cost of implementing the Plan and a general description of how the Agency plans to meet those costs.	7.1:7.4
			Note: Authority cited: Section 10733.2, Water Code.	
			Reference: Sections 10723.8, 10727.2, and 10733.2, Water Code.	
§ 354.8.			**Description of Plan Area**	2.2
			Each Plan shall include a description of the geographic areas covered, including the following information:	2.2
(a)			One or more maps of the basin that depict the following, as applicable:	2.2.1
	(1)		The area covered by the Plan, delineating areas managed by the Agency as an exclusive Agency and any areas for which the Agency is not an exclusive Agency, and the name and location of any adjacent basins.	2.2.1
	(2)		Adjudicated areas, other Agencies within the basin, and areas covered by an Alternative.	2.2.1
	(3)		Jurisdictional boundaries of federal or state land (including the identity of the agency with jurisdiction over that land), tribal land, cities, counties, agencies with water management responsibilities, and areas covered by relevant general plans.	2.2.1
	(4)		Existing land use designations and the identification of water use sector and water source type.	2.2.1

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Article 5				Section Number(s)
	(5)		The density of wells per square mile, by dasymetric or similar mapping techniques, showing the general distribution of agricultural, industrial, and domestic water supply wells in the basin, including de minimis extractors, and the location and extent of communities dependent upon groundwater, utilizing data provided by the Department, as specified in Section 353.2, or the best available information.	2.2.1
(b)			A written description of the Plan area, including a summary of the jurisdictional areas and other features depicted on the map.	2.2.1
(c)			Identification of existing water resource monitoring and management programs, and description of any such programs the Agency plans to incorporate in its monitoring network or in development of its Plan. The Agency may coordinate with existing water resource monitoring and management programs to incorporate and adopt that program as part of the Plan.	2.2.2
(d)			A description of how existing water resource monitoring or management programs may limit operational flexibility in the basin, and how the Plan has been developed to adapt to those limits.	2.2.2
(e)			A description of conjunctive use programs in the basin.	2.2.2.3
(f)			A plain language description of the land use elements or topic categories of applicable general plans that includes the following:	Various (see below)
	(1)		A summary of general plans and other land use plans governing the basin.	2.2.3.1
	(2)		A general description of how implementation of existing land use plans may change water demands within the basin or affect the ability of the Agency to achieve sustainable groundwater management over the planning and implementation horizon, and how the Plan addresses those potential effects	2.2.3.1
	(3)		A general description of how implementation of the Plan may affect the water supply assumptions of relevant land use plans over the planning and implementation horizon.	2.2.3.1
	(4)		A summary of the process for permitting new or replacement wells in the basin, including adopted standards in local well ordinances, zoning codes, and policies contained in adopted land use plans.	2.2.3.2
	(5)		To the extent known, the Agency may include information regarding the implementation of land use plans outside the basin that could affect the ability of the Agency to achieve sustainable groundwater management.	2.2.3.1.3
(g)			A description of any of the additional Plan elements included in Water Code Section 10727.4 that the Agency determines to be appropriate.	2.2.4
			Note: Authority cited: Section 10733.2, Water Code.	
			Reference: Sections 10720.3, 10727.2, 10727.4, 10733, and 10733.2, Water Code.	
§ 354.10.			**Notice and Communication**	2.3
			Each Plan shall include a summary of information relating to notification and communication by the Agency with other agencies and interested parties including the following:	2.3
(a)			A description of the beneficial uses and users of groundwater in the basin, including the land uses and property interests potentially affected by the use of groundwater in the basin, the types of parties representing those interests, and the nature of consultation with those parties.	2.3.1
(b)			A list of public meetings at which the Plan was discussed or considered by the Agency.	2.3.2
(c)			Comments regarding the Plan received by the Agency and a summary of any responses by the Agency.	2.3.3
(d)			A communication section of the Plan that includes the following:	2.3.4
	(1)		An explanation of the Agency's decision-making process.	2.3.4.1
	(2)		Identification of opportunities for public engagement and a discussion of how public input and response will be used.	2.3.4.2
	(3)		A description of how the Agency encourages the active involvement of diverse social, cultural, and economic elements of the population within the basin.	2.3.4.2
	(4)		The method the Agency shall follow to inform the public about progress implementing the Plan, including the status of projects and actions.	2.3.4.3
			Note: Authority cited: Section 10733.2, Water Code.	

Article 5				Section Number(s)
			Reference: Sections 10723.2, 10727.8, 10728.4, and 10733.2, Water Code	
SubArticle 2.			**Basin Setting**	3.0
§ 354.12.			**Introduction to Basin Setting**	3.0
			This Subarticle describes the information about the physical setting and characteristics of the basin and current conditions of the basin that shall be part of each Plan, including the identification of data gaps and levels of uncertainty, which comprise the basin setting that serves as the basis for defining and assessing reasonable sustainable management criteria and projects and management actions. Information provided pursuant to this Subarticle shall be prepared by or under the direction of a professional geologist or professional engineer.	3.0
			Note: Authority cited: Section 10733.2, Water Code.	
			Reference: Section 10733.2, Water Code.	
§ 354.14.			**Hydrogeologic Conceptual Model**	3.1
(a)			Each Plan shall include a descriptive hydrogeologic conceptual model of the basin based on technical studies and qualified maps that characterizes the physical components and interaction of the surface water and groundwater systems in the basin.	3.1
(b)			The hydrogeologic conceptual model shall be summarized in a written description that includes the following:	Various (see below)
	(1)		The regional geologic and structural setting of the basin including the immediate surrounding area, as necessary for geologic consistency.	3.1.2
	(2)		Lateral basin boundaries, including major geologic features that significantly affect groundwater flow.	3.1.4.1.1
	(3)		The definable bottom of the basin.	3.1.4.1.1
	(4)		Principal aquifers and aquitards, including the following information:	Various (see below)
		(A)	Formation names, if defined.	3.1.4
		(B)	Physical properties of aquifers and aquitards, including the vertical and lateral extent, hydraulic conductivity, and storativity, which may be based on existing technical studies or other best available information.	3.1.4.1.3
		(C)	Structural properties of the basin that restrict groundwater flow within the principal aquifers, including information regarding stratigraphic changes, truncation of units, or other features.	3.1.4.1.2
		(D)	General water quality of the principal aquifers, which may be based on information derived from existing technical studies or regulatory programs.	3.1.4.3
		(E)	Identification of the primary use or uses of each aquifer, such as domestic, irrigation, or municipal water supply.	3.1.4.4
	(5)		Identification of data gaps and uncertainty within the hydrogeologic conceptual model	3.1.5
(c)			The hydrogeologic conceptual model shall be represented graphically by at least two scaled cross-sections that display the information required by this section and are sufficient to depict major stratigraphic and structural features in the basin.	3.1.3.1.1
(d)			Physical characteristics of the basin shall be represented on one or more maps that depict the following:	Various (see below)
	(1)		Topographic information derived from the U.S. Geological Survey or another reliable source.	3.1.1.1
	(2)		Surficial geology derived from a qualified map including the locations of cross-sections required by this Section.	3.1.2
	(3)		Soil characteristics as described by the appropriate Natural Resources Conservation Service soil survey or other applicable studies.	3.1.3
	(4)		Delineation of existing recharge areas that substantially contribute to the replenishment of the basin, potential recharge areas, and discharge areas, including significant active springs, seeps, and wetlands within or adjacent to the basin.	3.1.4.2
	(5)		Surface water bodies that are significant to the management of the basin.	3.1.1.2
	(6)		The source and point of delivery for imported water supplies.	3.1.1.3
			Note: Authority cited: Section 10733.2, Water Code.	
			Reference: Sections 10727.2, 10733, and 10733.2, Water Code.	

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Article 5				Section Number(s)
§ 354.16.			**Groundwater Conditions**	3.2
			Each Plan shall provide a description of current and historical groundwater conditions in the basin, including data from January 1, 2015, to current conditions, based on the best available information that includes the following:	Various (see below)
(a)			Groundwater elevation data demonstrating flow directions, lateral and vertical gradients, and regional pumping patterns, including:	Various (see below)
	(1)		Groundwater elevation contour maps depicting the groundwater table or potentiometric surface associated with the current seasonal high and seasonal low for each principal aquifer within the basin.	3.2.1.1
	(2)		Hydrographs depicting long-term groundwater elevations, historical highs and lows, and hydraulic gradients between principal aquifers.	3.2.1.2
(b)			A graph depicting estimates of the change in groundwater in storage, based on data, demonstrating the annual and cumulative change in the volume of groundwater in storage between seasonal high groundwater conditions, including the annual groundwater use and water year type.	3.2.2
(c)			Seawater intrusion conditions in the basin, including maps and cross-sections of the seawater intrusion front for each principal aquifer.	3.2.3
(d)			Groundwater quality issues that may affect the supply and beneficial uses of groundwater, including a description and map of the location of known groundwater contamination sites and plumes.	3.2.4
(e)			The extent, cumulative total, and annual rate of land subsidence, including maps depicting total subsidence, utilizing data available from the Department, as specified in Section 353.2, or the best available information.	3.2.5
(f)			Identification of interconnected surface water systems within the basin and an estimate of the quantity and timing of depletions of those systems, utilizing data available from the Department, as specified in Section 353.2, or the best available information.	3.2.6
(g)			Identification of groundwater dependent ecosystems within the basin, utilizing data available from the Department, as specified in Section 353.2, or the best available information.	3.2.7
			Note: Authority cited: Section 10733.2, Water Code.	
			Reference: Sections 10723.2, 10727.2, 10727.4, and 10733.2, Water Code.	
§ 354.18.			**Water Budget**	3.3
(a)			Each Plan shall include 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. Water budget information shall be reported in tabular and graphical form.	3.3
(b)			The water budget shall quantify the following, either through direct measurements or estimates based on data:	Various (see below)
	(1)		Total surface water entering and leaving a basin by water source type.	3.3
	(2)		Inflow to the groundwater system by water source type, including subsurface groundwater inflow and infiltration of precipitation, applied water, and surface water systems, such as lakes, streams, rivers, canals, springs and conveyance systems.	3.3
	(3)		Outflows from the groundwater system by water use sector, including evapotranspiration, groundwater extraction, groundwater discharge to surface water sources, and subsurface groundwater outflow.	3.3
	(4)		The change in the annual volume of groundwater in storage between seasonal high conditions.	3.3
	(5)		If overdraft conditions occur, as defined in Bulletin 118, the water budget shall include a quantification of overdraft over a period of years during which water year and water supply conditions approximate average conditions.	3.3.4
	(6)		The water year type associated with the annual supply, demand, and change in groundwater stored.	3.3
	(7)		An estimate of sustainable yield for the basin.	3.3.4
(c)			Each Plan shall quantify the current, historical, and projected water budget for the basin as follows:	Various (see below)

Article 5				Section Number(s)
	(1)		Current water budget information shall quantify current inflows and outflows for the basin using the most recent hydrology, water supply, water demand, and land use information.	3.3.2
	(2)		Historical water budget information shall be used to evaluate availability or reliability of past surface water supply deliveries and aquifer response to water supply and demand trends relative to water year type. The historical water budget shall include the following:	3.3.1
		(A)	A quantitative evaluation of the availability or reliability of historical surface water supply deliveries as a function of the historical planned versus actual annual surface water deliveries, by surface water source and water year type, and based on the most recent ten years of surface water supply information.	3.3.1.2
		(B)	A quantitative assessment of the historical water budget, starting with the most recently available information and extending back a minimum of 10 years, or as is sufficient to calibrate and reduce the uncertainty of the tools and methods used to estimate and project future water budget information and future aquifer response to proposed sustainable groundwater management practices over the planning and implementation horizon.	3.3.1.1
		(C)	A description of how historical conditions concerning hydrology, water demand, and surface water supply availability or reliability have impacted the ability of the Agency to operate the basin within sustainable yield. Basin hydrology may be characterized and evaluated using water year type.	3.3.1.2
	(3)		Projected water budgets shall be used to estimate future baseline conditions of supply, demand, and aquifer response to Plan implementation, and to identify the uncertainties of these projected water budget components. The projected water budget shall utilize the following methodologies and assumptions to estimate future baseline conditions concerning hydrology, water demand and surface water supply availability or reliability over the planning and implementation horizon:	3.3.3
		(A)	Projected hydrology shall utilize 50 years of historical precipitation, evapotranspiration, and streamflow information as the baseline condition for estimating future hydrology. The projected hydrology information shall also be applied as the baseline condition used to evaluate future scenarios of hydrologic uncertainty associated with projections of climate change and sea level rise.	3.3.3.1.1
		(B)	Projected water demand shall utilize the most recent land use, evapotranspiration, and crop coefficient information as the baseline condition for estimating future water demand. The projected water demand information shall also be applied as the baseline condition used to evaluate future scenarios of water demand uncertainty associated with projected changes in local land use planning, population growth, and climate.	3.3.3.1.2
		(C)	Projected surface water supply shall utilize the most recent water supply information as the baseline condition for estimating future surface water supply. The projected surface water supply shall also be applied as the baseline condition used to evaluate future scenarios of surface water supply availability and reliability as a function of the historical surface water supply identified in Section 354.18(c)(2)(A), and the projected changes in local land use planning, population growth, and climate.	3.3.3.1.3
(d)			The Agency shall utilize the following information provided, as available, by the Department pursuant to Section 353.2, or other data of comparable quality, to develop the water budget:	3.3.3.1
	(1)		Historical water budget information for mean annual temperature, mean annual precipitation, water year type, and land use.	3.3.3.1
	(2)		Current water budget information for temperature, water year type, evapotranspiration, and land use.	3.3.3.1
	(3)		Projected water budget information for population, population growth, climate change, and sea level rise.	3.3.3.1

Article 5				Section Number(s)
(e)			Each Plan shall rely on the best available information and best available science to quantify the water budget for the basin in order to provide an understanding of historical and projected hydrology, water demand, water supply, land use, population, climate change, sea level rise, groundwater and surface water interaction, and subsurface groundwater flow. If a numerical groundwater and surface water model is not used to quantify and evaluate the projected water budget conditions and the potential impacts to beneficial uses and users of groundwater, the Plan shall identify and describe an equally effective method, tool, or analytical model to evaluate projected water budget conditions.	3.3.3.1
(f)			The Department shall provide the California Central Valley Groundwater-Surface Water Simulation Model (C2VSIM) and the Integrated Water Flow Model (IWFM) for use by Agencies in developing the water budget. Each Agency may choose to use a different groundwater and surface water model, pursuant to Section 352.4.	3.3.3.1
			Note: Authority cited: Section 10733.2, Water Code.	
			Reference: Sections 10721, 10723.2, 10727.2, 10727.6, 10729, and 10733.2, Water Code.	
§ 354.20.			**Management Areas**	3.4
(a)			Each Agency may define one or more management areas within a basin if the Agency has determined that creation of management areas will facilitate implementation of the Plan. Management areas may define different minimum thresholds and be operated to different measurable objectives than the basin at large, provided that undesirable results are defined consistently throughout the basin.	3.4
(b)			A basin that includes one or more management areas shall describe the following in the Plan:	na
	(1)		The reason for the creation of each management area.	na
	(2)		The minimum thresholds and measurable objectives established for each management area, and an explanation of the rationale for selecting those values, if different from the basin at large.	na
	(3)		The level of monitoring and analysis appropriate for each management area.	na
	(4)		An explanation of how the management area can operate under different minimum thresholds and measurable objectives without causing undesirable results outside the management area, if applicable.	na
(c)			If a Plan includes one or more management areas, the Plan shall include descriptions, maps, and other information required by this Subarticle sufficient to describe conditions in those areas.	na
			Note: Authority cited: Section 10733.2, Water Code.	
			Reference: Sections 10733.2 and 10733.4, Water Code.	
SubArticle 3.			**Sustainable Management Criteria**	4
§ 354.22.			**Introduction to Sustainable Management Criteria**	4.1
			This Subarticle describes criteria by which an Agency defines conditions in its Plan that constitute sustainable groundwater management for the basin, including the process by which the Agency shall characterize undesirable results, and establish minimum thresholds and measurable objectives for each applicable sustainability indicator.	4.1
			Note: Authority cited: Section 10733.2, Water Code.	
			Reference: Section 10733.2, Water Code.	
§ 354.24.			**Sustainability Goal**	4.2
			Each Agency shall establish in its Plan a sustainability goal for the basin that culminates in the absence of undesirable results within 20 years of the applicable statutory deadline. The Plan shall include a description of the sustainability goal, including information from the basin setting used to establish the sustainability goal, a discussion of the measures that will be implemented to ensure that the basin will be operated within its sustainable yield, and an explanation of how the sustainability goal is likely to be achieved within 20 years of Plan implementation and is likely to be maintained through the planning and implementation horizon.	4.2
			Note: Authority cited: Section 10733.2, Water Code.	

Article 5				Section Number(s)
			Reference: Sections 10721, 10727, 10727.2, 10733.2, and 10733.8, Water Code.	
§ 354.26.			**Undesirable Results**	Various (see below)
(a)			Each Agency shall describe in its Plan the processes and criteria relied upon to define undesirable results applicable to the basin. Undesirable results occur when significant and unreasonable effects for any of the sustainability indicators are caused by groundwater conditions occurring throughout the basin.	4.3, 4.4.1, 4.5.1, 4.6.1, 4.7.1, 4.8.1
(b)			The description of undesirable results shall include the following:	Various (see below)
	(1)		The cause of groundwater conditions occurring throughout the basin that would lead to or has led to undesirable results based on information described in the basin setting, and other data or models as appropriate.	4.4.1, 4.5.1, 4.6.1, 4.7.1, 4.8.1
	(2)		The criteria used to define when and where the effects of the groundwater conditions cause undesirable results for each applicable sustainability indicator. The criteria shall be based on a quantitative description of the combination of minimum threshold exceedances that cause significant and unreasonable effects in the basin.	4.4.1, 4.5.1, 4.6.1, 4.7.1, 4.8.1
	(3)		Potential effects on the beneficial uses and users of groundwater, on land uses and property interests, and other potential effects that may occur or are occurring from undesirable results.	4.4.1, 4.5.1, 4.6.1, 4.7.1, 4.8.1
(c)			The Agency may need to evaluate multiple minimum thresholds to determine whether an undesirable result is occurring in the basin. The determination that undesirable results are occurring may depend upon measurements from multiple monitoring sites, rather than a single monitoring site.	4.4.1, 4.5.1, 4.6.1, 4.7.1, 4.8.1
(d)			An Agency that is able to demonstrate that undesirable results related to one or more sustainability indicators are not present and are not likely to occur in a basin shall not be required to establish criteria for undesirable results related to those sustainability indicators.	4.4.1, 4.5.1, 4.6.1, 4.7.1, 4.8.1
			Note: Authority cited: Section 10733.2, Water Code.	
			Reference: Sections 10721, 10723.2, 10727.2, 10733.2, and 10733.8, Water Code.	
§ 354.28.			**Minimum Thresholds**	Various (see below)
(a)			Each Agency in its Plan shall establish minimum thresholds that quantify groundwater conditions for each applicable sustainability indicator at each monitoring site or representative monitoring site established pursuant to Section 354.36. The numeric value used to define minimum thresholds shall represent a point in the basin that, if exceeded, may cause undesirable results as described in Section 354.26.	4.4.2.1, 4.5.2.1, 4.6.2.1, 4.7.2.1, 4.8.2.1
(b)			The description of minimum thresholds shall include the following:	Various (see below)
	(1)		The information and criteria relied upon to establish and justify the minimum thresholds for each sustainability indicator. The justification for the minimum threshold shall be supported by information provided in the basin setting, and other data or models as appropriate, and qualified by uncertainty in the understanding of the basin setting.	4.4.2.1, 4.5.2.1, 4.6.2.1, 4.7.2.1, 4.8.2.1
	(2)		The relationship between the minimum thresholds for each sustainability indicator, including an explanation of how the Agency has determined that basin conditions at each minimum threshold will avoid undesirable results for each of the sustainability indicators.	4.4.2.2, 4.5.2.2, 4.6.2.2, 4.7.2.2, 4.8.2.2
	(3)		How minimum thresholds have been selected to avoid causing undesirable results in adjacent basins or affecting the ability of adjacent basins to achieve sustainability goals.	4.4.2.3, 4.5.2.3, 4.6.2.3, 4.7.2.3, 4.8.2.3
	(4)		How minimum thresholds may affect the interests of beneficial uses and users of groundwater or land uses and property interests.	4.4.2.4, 4.5.2.4, 4.6.2.4, 4.7.2.4, 4.8.2.4
	(5)		How state, federal, or local standards relate to the relevant sustainability indicator. If the minimum threshold differs from other regulatory standards, the Agency shall explain the nature of and basis for the difference.	4.4.2.6, 4.5.2.5, 4.6.2.5, 4.7.2.5, 4.8.2.5
	(6)		How each minimum threshold will be quantitatively measured, consistent with the monitoring network requirements described in Subarticle 4.	4.4.2.7, 4.5.2.6, 4.6.2.6, 4.7.2.6, 4.8.2.6

Article 5				Section Number(s)
(c)			Minimum thresholds for each sustainability indicator shall be defined as follows:	Various (see below)
	(1)		Chronic Lowering of Groundwater Levels. The minimum threshold for chronic lowering of groundwater levels shall be the groundwater elevation indicating a depletion of supply at a given location that may lead to undesirable results. Minimum thresholds for chronic lowering of groundwater levels shall be supported by the following:	4.4.2.1, 4.4.2.5
		(A)	The rate of groundwater elevation decline based on historical trends, water year type, and projected water use in the basin.	4.4.2.1
		(B)	Potential effects on other sustainability indicators.	4.4.2.1, 4.4.2.5
	(2)		Reduction of Groundwater Storage. The minimum threshold for reduction of groundwater storage shall 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.	4.5.2.1
	(3)		Seawater Intrusion. The minimum threshold for seawater intrusion shall be defined by a chloride concentration isocontour for each principal aquifer where seawater intrusion may lead to undesirable results. Minimum thresholds for seawater intrusion shall be supported by the following:	4.6.2.1
		(A)	Maps and cross-sections of the chloride concentration isocontour that defines the minimum threshold and measurable objective for each principal aquifer.	4.6.2.1
		(B)	A description of how the seawater intrusion minimum threshold considers the effects of current and projected sea levels.	4.6.2.1
	(4)		Degraded Water Quality. The minimum threshold for degraded water quality shall 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.	4.7.2.1
	(5)		Land Subsidence. The minimum threshold for land subsidence shall be the rate and extent of subsidence that substantially interferes with surface land uses and may lead to undesirable results. Minimum thresholds for land subsidence shall be supported by the following:	4.8.2.1
		(A)	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.	4.8.2.1
		(B)	Maps and graphs showing the extent and rate of land subsidence in the basin that defines the minimum threshold and measurable objectives.	4.8.2.1
	(6)		Depletions of Interconnected Surface Water. The minimum threshold for depletions of interconnected surface water shall be the rate or volume of surface water depletions caused by groundwater use that has adverse impacts on beneficial uses of the surface water and may lead to undesirable results. The minimum threshold established for depletions of interconnected surface water shall be supported by the following:	na
		(A)	The location, quantity, and timing of depletions of interconnected surface water.	na
		(B)	A description of the groundwater and surface water model used to quantify surface water depletion. If a numerical groundwater and surface water model is not used to quantify surface water depletion, the Plan shall identify and describe an equally effective method, tool, or analytical model to accomplish the requirements of this Paragraph.	na

Article 5				Section Number(s)
(d)			An Agency may establish a representative minimum threshold for groundwater elevation to serve as the value for multiple sustainability indicators, where the Agency can demonstrate that the representative value is a reasonable proxy for multiple individual minimum thresholds as supported by adequate evidence.	4.4.2.1.1, 4.5.2.1.1, 4.6.2.1.1, 4.7.2.1.1, 4.8.2.1.1
(e)			An Agency that has demonstrated that undesirable results related to one or more sustainability indicators are not present and are not likely to occur in a basin, as described in Section 354.26, shall not be required to establish minimum thresholds related to those sustainability indicators.	4.4.2.1, 4.5.2.1, 4.6.2.1, 4.7.2.1, 4.8.2.1
			Note: Authority cited: Section 10733.2, Water Code.	
			Reference: Sections 10723.2, 10727.2, 10733, 10733.2, and 10733.8, Water Code.	
§ 354.30.			**Measurable Objectives**	Various (see below)
(a)			Each Agency shall establish measurable objectives, including interim milestones in increments of five years, to achieve the sustainability goal for the basin within 20 years of Plan implementation and to continue to sustainably manage the groundwater basin over the planning and implementation horizon.	4.4.3, 4.5.3, 4.6.3, 4.7.3, 4.8.3
(b)			Measurable objectives shall be established for each sustainability indicator, based on quantitative values using the same metrics and monitoring sites as are used to define the minimum thresholds.	4.4.3, 4.5.3, 4.6.3, 4.7.3, 4.8.3
(c)			Measurable objectives shall provide a reasonable margin of operational flexibility under adverse conditions which shall take into consideration components such as historical water budgets, seasonal and long-term trends, and periods of drought, and be commensurate with levels of uncertainty.	4.4.3, 4.5.3, 4.6.3, 4.7.3, 4.8.3
(d)			An Agency may establish a representative measurable objective for groundwater elevation to serve as the value for multiple sustainability indicators where the Agency can demonstrate that the representative value is a reasonable proxy for multiple individual measurable objectives as supported by adequate evidence.	4.4.3, 4.5.3, 4.6.3, 4.7.3, 4.8.3
(e)			Each Plan shall describe a reasonable path to achieve the sustainability goal for the basin within 20 years of Plan implementation, including a description of interim milestones for each relevant sustainability indicator, using the same metric as the measurable objective, in increments of five years. The description shall explain how the Plan is likely to maintain sustainable groundwater management over the planning and implementation horizon.	4.4.3.4, 4.5.3.4, 4.6.3.4, 4.7.3.4, 4.8.3.4, 4.9.3.4
(f)			Each Plan may include measurable objectives and interim milestones for additional Plan elements described in Water Code Section 10727.4 where the Agency determines such measures are appropriate for sustainable groundwater management in the basin.	4.10
(g)			An Agency may establish measurable objectives that exceed the reasonable margin of operational flexibility for the purpose of improving overall conditions in the basin, but failure to achieve those objectives shall not be grounds for a finding of inadequacy of the Plan.	4.4.3, 4.5.3, 4.6.3, 4.7.3, 4.8.3
			Note: Authority cited: Section 10733.2, Water Code.	
			Reference: Sections 10727.2, 10727.4, and 10733.2, Water Code.	
SubArticle 4.			**Monitoring Networks**	5
§ 354.32.			**Introduction to Monitoring Networks**	5.1
			This Subarticle describes the monitoring network that shall be developed for each basin, including monitoring objectives, monitoring protocols, and data reporting requirements. The monitoring network shall promote 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 implementation of the Plan.	5.1
			Note: Authority cited: Section 10733.2, Water Code.	
			Reference: Section 10733.2, Water Code.	

APPENDIX B

Article 5				Section Number(s)
§ 354.34.			**Monitoring Network**	5.2
(a)			Each Agency shall develop a monitoring network capable of collecting sufficient data to demonstrate short-term, seasonal, and long-term trends in groundwater and related surface conditions, and yield representative information about groundwater conditions as necessary to evaluate Plan implementation.	5.2
(b)			Each Plan shall include a description of the monitoring network objectives for the basin, including an explanation of how the network will be developed and implemented to monitor groundwater and related surface conditions, and the interconnection of surface water and groundwater, with sufficient temporal frequency and spatial density to evaluate the affects and effectiveness of Plan implementation. The monitoring network objectives shall be implemented to accomplish the following:	5.2
	(1)		Demonstrate progress toward achieving measurable objectives described in the Plan.	5.2
	(2)		Monitor impacts to the beneficial uses or users of groundwater.	5.2
	(3)		Monitor changes in groundwater conditions relative to measurable objectives and minimum thresholds.	5.2
	(4)		Quantify annual changes in water budget components.	5.2
(c)			Each monitoring network shall be designed to accomplish the following for each sustainability indicator:	Various (see below)
	(1)		Chronic Lowering of Groundwater Levels. Demonstrate groundwater occurrence, flow directions, and hydraulic gradients between principal aquifers and surface water features by the following methods:	5.3.1
		(A)	A sufficient density of monitoring wells to collect representative measurements through depth-discrete perforated intervals to characterize the groundwater table or potentiometric surface for each principal aquifer.	5.3.1
		(B)	Static groundwater elevation measurements shall be collected at least two times per year, to represent seasonal low and seasonal high groundwater conditions.	5.3.1
	(2)		Reduction of Groundwater Storage. Provide an estimate of the change in annual groundwater in storage.	5.4.1
	(3)		Seawater Intrusion. Monitor seawater intrusion using chloride concentrations, or other measurements convertible to chloride concentrations, so that the current and projected rate and extent of seawater intrusion for each applicable principal aquifer may be calculated.	5.5.1
	(4)		Degraded Water Quality. Collect sufficient spatial and temporal data from each applicable principal aquifer to determine groundwater quality trends for water quality indicators, as determined by the Agency, to address known water quality issues.	5.6.1
	(5)		Land Subsidence. Identify the rate and extent of land subsidence, which may be measured by extensometers, surveying, remote sensing technology, or other appropriate method.	5.7.1
	(6)		Depletions of Interconnected Surface Water. Monitor surface water and groundwater, where interconnected surface water conditions exist, to characterize the spatial and temporal exchanges between surface water and groundwater, and to calibrate and apply the tools and methods necessary to calculate depletions of surface water caused by groundwater extractions. The monitoring network shall be able to characterize the following:	na
		(A)	Flow conditions including surface water discharge, surface water head, and baseflow contribution.	na
		(B)	Identifying the approximate date and location where ephemeral or intermittent flowing streams and rivers cease to flow, if applicable.	na
		(C)	Temporal change in conditions due to variations in stream discharge and regional groundwater extraction.	na
		(D)	Other factors that may be necessary to identify adverse impacts on beneficial uses of the surface water.	na

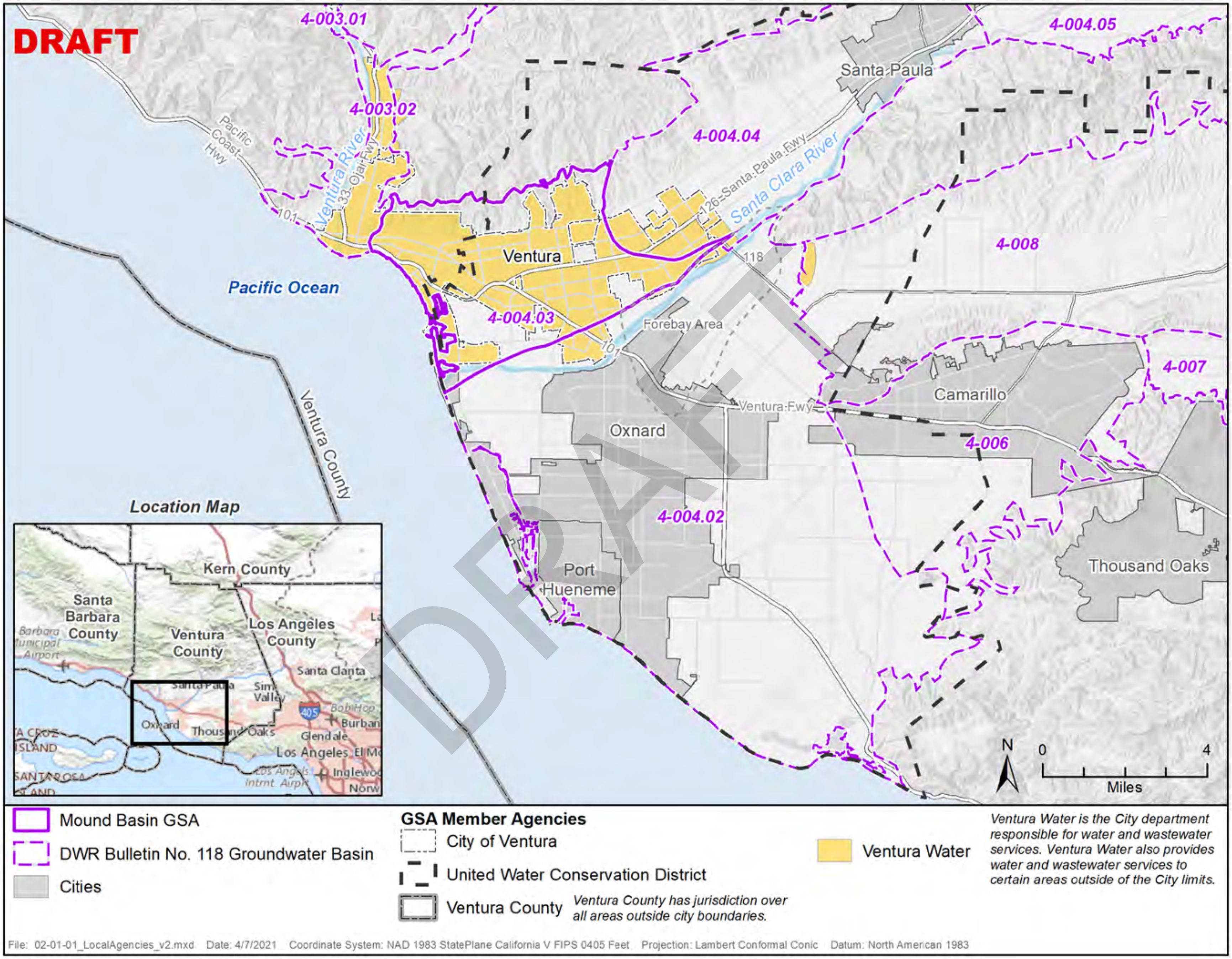
Article 5				Section Number(s)
(d)			The monitoring network shall be designed to ensure adequate coverage of sustainability indicators. If management areas are established, the quantity and density of monitoring sites in those areas shall be sufficient to evaluate conditions of the basin setting and sustainable management criteria specific to that area.	5.2
(e)			A Plan may utilize site information and monitoring data from existing sources as part of the monitoring network.	5.3, 5.4, 5.5, 5.6, 5.7, 5.8
(f)			The Agency shall determine the density of monitoring sites and frequency of measurements required to demonstrate short-term, seasonal, and long-term trends based upon the following factors:	5.2
	(1)		Amount of current and projected groundwater use.	5.2
	(2)		Aquifer characteristics, including confined or unconfined aquifer conditions, or other physical characteristics that affect groundwater flow.	5.2
	(3)		Impacts to beneficial uses and users of groundwater and land uses and property interests affected by groundwater production, and adjacent basins that could affect the ability of that basin to meet the sustainability goal.	5.2
	(4)		Whether the Agency has adequate long-term existing monitoring results or other technical information to demonstrate an understanding of aquifer response.	5.2
(g)			Each Plan shall describe the following information about the monitoring network:	Various (see below)
	(1)		Scientific rationale for the monitoring site selection process.	5.3.1, 5.4.1, 5.5.1, 5.6.1, 5.7.1
	(2)		Consistency with data and reporting standards described in Section 352.4. If a site is not consistent with those standards, the Plan shall explain the necessity of the site to the monitoring network, and how any variation from the standards will not affect the usefulness of the results obtained.	5.3.2, 5.4.2, 5.5.2, 5.6.2, 5.7.2
	(3)		For each sustainability indicator, the quantitative values for the minimum threshold, measurable objective, and interim milestones that will be measured at each monitoring site or representative monitoring sites established pursuant to Section 354.36.	4.3, 5.3, 5.4, 5.5, 5.6, 5.7, 5.8
(h)			The location and type of each monitoring site within the basin displayed on a map, and reported in tabular format, including information regarding the monitoring site type, frequency of measurement, and the purposes for which the monitoring site is being used.	5.3, 5.4, 5.5, 5.6, 5.7, 5.8
(i)			The monitoring protocols developed by each Agency shall include a description of technical standards, data collection methods, and other procedures or protocols pursuant to Water Code Section 10727.2(f) for monitoring sites or other data collection facilities to ensure that the monitoring network utilizes comparable data and methodologies.	5.3.3, 5.4.3, 5.5.3, 5.6.3, 5.7.3
(j)			An Agency that has demonstrated that undesirable results related to one or more sustainability indicators are not present and are not likely to occur in a basin, as described in Section 354.26, shall not be required to establish a monitoring network related to those sustainability indicators.	5.3, 5.4, 5.5, 5.6, 5.7, 5.8
			Note: Authority cited: Section 10733.2, Water Code.	
			Reference: Sections 10723.2, 10727.2, 10727.4, 10728, 10733, 10733.2, and 10733.8, Water Code	
§ 354.36.			**Representative Monitoring**	5.9
			Each Agency may designate a subset of monitoring sites as representative of conditions in the basin or an area of the basin, as follows:	5.9
(a)			Representative monitoring sites may be designated by the Agency as the point at which sustainability indicators are monitored, and for which quantitative values for minimum thresholds, measurable objectives, and interim milestones are defined.	5.9
(b)			(b) Groundwater elevations may be used as a proxy for monitoring other sustainability indicators if the Agency demonstrates the following:	5.9
	(1)		Significant correlation exists between groundwater elevations and the sustainability indicators for which groundwater elevation measurements serve as a proxy.	5.9

Article 5				Section Number(s)
	(2)		Measurable objectives established for groundwater elevation shall include a reasonable margin of operational flexibility taking into consideration the basin setting to avoid undesirable results for the sustainability indicators for which groundwater elevation measurements serve as a proxy.	5.9
(c)			The designation of a representative monitoring site shall be supported by adequate evidence demonstrating that the site reflects general conditions in the area.	5.9
			Note: Authority cited: Section 10733.2, Water Code.	
			Reference: Sections 10727.2 and 10733.2, Water Code	
§ 354.38.			**Assessment and Improvement of Monitoring Network**	5.3.4, 5.4.4, 5.5.4, 5.6.4, 5.7.4
(a)			Each Agency shall review the monitoring network and include an evaluation in the Plan and each five-year assessment, including a determination of uncertainty and whether there are data gaps that could affect the ability of the Plan to achieve the sustainability goal for the basin.	5.3.4, 5.4.4, 5.5.4, 5.6.4, 5.7.4
(b)			Each Agency shall identify data gaps wherever the basin does not contain a sufficient number of monitoring sites, does not monitor sites at a sufficient frequency, or utilizes monitoring sites that are unreliable, including those that do not satisfy minimum standards of the monitoring network adopted by the Agency.	5.3.4, 5.4.4, 5.5.4, 5.6.4, 5.7.4
(c)			If the monitoring network contains data gaps, the Plan shall include a description of the following:	5.3.4, 5.4.4, 5.5.4, 5.6.4, 5.7.4
	(1)		The location and reason for data gaps in the monitoring network.	5.3.4, 5.4.4, 5.5.4, 5.6.4, 5.7.4
	(2)		Local issues and circumstances that limit or prevent monitoring.	5.3.4, 5.4.4, 5.5.4, 5.6.4, 5.7.4
(d)			Each Agency shall describe steps that will be taken to fill data gaps before the next five-year assessment, including the location and purpose of newly added or installed monitoring sites.	5.3.4, 5.4.4, 5.5.4, 5.6.4, 5.7.4
(e)			Each Agency shall adjust the monitoring frequency and density of monitoring sites to provide an adequate level of detail about site-specific surface water and groundwater conditions and to assess the effectiveness of management actions under circumstances that include the following:	5.3.4, 5.4.4, 5.5.4, 5.6.4, 5.7.4
	(1)		Minimum threshold exceedances.	5.3.4, 5.4.4, 5.5.4, 5.6.4, 5.7.4
	(2)		Highly variable spatial or temporal conditions.	5.3.4, 5.4.4, 5.5.4, 5.6.4, 5.7.4
	(3)		Adverse impacts to beneficial uses and users of groundwater.	5.3.4, 5.4.4, 5.5.4, 5.6.4, 5.7.4
	(4)		The potential to adversely affect the ability of an adjacent basin to implement its Plan or impede achievement of sustainability goals in an adjacent basin.	5.3.4, 5.4.4, 5.5.4, 5.6.4, 5.7.4
			Note: Authority cited: Section 10733.2, Water Code.	
			Reference: Sections 10723.2, 10727.2, 10728.2, 10733, 10733.2, and 10733.8, Water Code	
§ 354.40.			**Reporting Monitoring Data to the Department**	5.10
			Monitoring data shall be stored in the data management system developed pursuant to Section 352.6. A copy of the monitoring data shall be included in the Annual Report and submitted electronically on forms provided by the Department.	5.10
			Note: Authority cited: Section 10733.2, Water Code.	
			Reference: Sections 10728, 10728.2, 10733.2, and 10733.8, Water Code.	
SubArticle 5.			**Projects and Management Actions**	6
§ 354.42.			**Introduction to Projects and Management Actions**	6.1
			This Subarticle describes the criteria for projects and management actions to be included in a Plan to meet the sustainability goal for the basin in a manner that can be maintained over the planning and implementation horizon.	6.1
			Note: Authority cited: Section 10733.2, Water Code.	
			Reference: Section 10733.2, Water Code.	

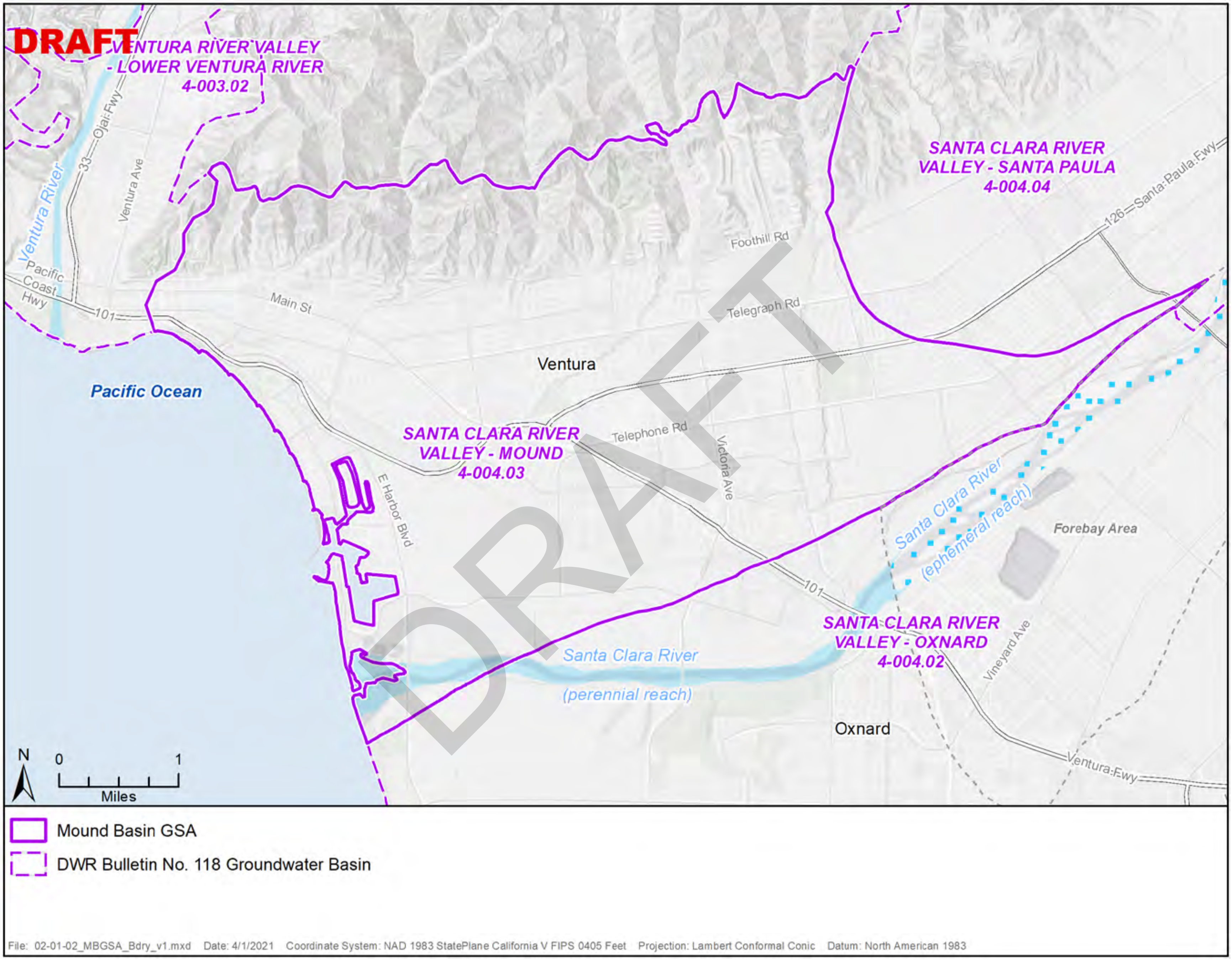
Article 5				**Section Number(s)**
§ 354.44.			**Projects and Management Actions**	
(a)			Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin.	6.1
(b)			Each Plan shall include a description of the projects and management actions that include the following:	Various (see below)
	(1)		A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent. The Plan shall include the following:	6.2.1, 6.3.1, 6.4.1, 6.5.1, 6.6.1
		(A)	A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management actions, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.	6.2.2, 6.3.2, 6.4.2, 6.5.2, 6.6.2
		(B)	The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.	6.2.3, 6.3.3, 6.4.3, 6.5.3, 6.6.3
	(2)		If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.	6.1
	(3)		A summary of the permitting and regulatory process required for each project and management action.	6.2.4, 6.3.4, 6.4.4, 6.5.4, 6.6.4
	(4)		The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.	6.2.5, 6.3.5, 6.4.5, 6.5.5, 6.6.5
	(5)		An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.	6.2.6, 6.3.6, 6.4.6, 6.5.6, 6.6.6
	(6)		An explanation of how the project or management action will be accomplished. If the projects or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.	6.2.7, 6.3.7, 6.4.7, 6.5.7, 6.6.7
	(7)		A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.	6.2.8, 6.3.8, 6.4.8, 6.5.8, 6.6.8
	(8)		A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.	6.2.9, 6.3.9, 6.4.9, 6.5.9, 6.6.9
	(9)		A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.	6.1
(c)			Projects and management actions shall be supported by best available information and best available science.	6.1
(d)			An Agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.	6.1, 6.2, 6.3, 6.4, 6.5, 6.6
			Note: Authority cited: Section 10733.2, Water Code.	
			Reference: Sections 10727.2, 10727.4, and 10733.2, Water Code.	

Appendix C

GSA Formation, MBGSA JPA and MBGSA Bylaws



Local Agency Boundary Map



Mound Basin Groundwater Sustainability Agency Boundary Map

BOARD OF DIRECTORS

MOUND BASIN GROUNDWATER SUSTAINABILITY AGENCY

RESOLUTION NO. 2017-01

A RESOLUTION OF THE MOUND BASIN GROUNDWATER SUSTAINABILITY AGENCY TO BE ELECTED AS THE GROUNDWATER SUSTAINABILITY AGENCY FOR THE MOUND BASIN PURSUANT TO THE SUSTAINABLE GROUNDWATER MANAGEMENT ACT

WHEREAS, the California Legislature has adopted, and the Governor has signed into law, the Sustainable Groundwater Management Act of 2014 ("Act"), which authorizes local agencies to manage groundwater in a sustainable fashion; and

WHEREAS, the legislative intent of the Act is to provide for sustainable management of groundwater basins, to enhance local management of groundwater, to establish minimum standards for sustainable groundwater management, and to provide local agencies with the authority and the technical and financial assistance necessary to sustainably manage groundwater; and

WHEREAS, in order to exercise the authority granted in the Act, a local agency or combination of local agencies must elect to become a groundwater sustainability agency ("GSA"); and

WHEREAS, the Mound Groundwater Sustainability Agency ("Agency") is a local agency, as the Act defines that term; and

WHEREAS, the Agency exercises jurisdiction upon land overlying the entire Mound Basin (designated basin number 4-4.03 Department of Water Resources' ("DWR") CASGEM groundwater basin system) ("Basin"); and

WHEREAS, the Agency is committed to sustainable management of the Basin's groundwater resources; and

WHEREAS, the Act requires that a GSA be formed for all basins designated by DWR as a medium- or high-priority basins by June 30, 2017; and

WHEREAS, the Basin is designated as a medium-priority sub-basin of the Santa Clara River Valley Basin pursuant to the DWR's initial prioritization; and

WHEREAS, it is the intent of the Agency to work cooperatively with other local GSAs and stakeholders, as may be appropriate, to sustainably manage the Basin and ensure that the Act's goals are satisfied; and

WHEREAS, notice of a hearing on the Agency's election to become a GSA for the Basin ("Notice") has been published in the Ventura County Star as provided by law; and

WHEREAS, on this day, the Agency held a public hearing to consider whether it should elect to become a GSA for the Basin; and

WHEREAS, it would be in the best interest of the Basin for the Agency to become a GSA for the Basin, and to begin the process of preparing a groundwater sustainability plan ("Sustainability Plan"); and

WHEREAS, the Agency's process to develop the Sustainability Plan for the Basin will include stakeholder outreach and will provide multiple opportunities for public involvement; and

WHEREAS, adoption of this resolution does not constitute a "project" under California Environmental Quality Act Guidelines Section 15378(b)(5), including organization and administrative activities of government, because there would be no direct or indirect physical change in the environment.

THEREFORE, BE IT RESOLVED by the Board of Directors of the Mound Basin Groundwater Sustainability Agency, as follows:

1. All the recitals in this resolution are true and correct and the Agency so finds, determines and represents.

2. The Agency hereby elects to become the GSA for the Basin.

3. Within thirty days of the date of this resolution, but no later than June 30, 2017, the Agency's interim Executive Director is directed to provide notice to DWR of the Agency's election to be the GSA for the Basin ("Notice of GSA Election") in the manner required by law.

4. One of the elements of the Notice of GSA Election is the boundaries the Agency intends to manage as the GSA for the Basin. Until further action of the Agency, the boundaries of the GSA shall be the external boundaries of the Basin, the entirety of which currently falls within the Agency's jurisdiction.

5. Upon submission of the Notice of GSA Election, the Agency's Board of Director's shall begin discussions with interested stakeholders and beneficial users within the Basin in order to begin the process of developing a Sustainability Plan for the Basin.

6. The Agency's Executive Director is directed to report back to the Agency's Board of Directors at least quarterly on the progress toward developing the Sustainability Plan.

7. This resolution shall take effect immediately upon passage and adoption.

WE, THE UNDERSIGNED, do hereby certify that the above and foregoing Resolution No. 2017- 01 was duly adopted and passed by the Board of Directors of the Mound Basin Groundwater Sustainability Agency at a meeting held on the 22nd day of June, 2017, by the following vote:

AYES: DIRECTORS MOBLEY, SHEPHARD, AND MCDERMOTT
NOES: NONE.
ABSENT: NONE.

Interim Board Chair
Mound Basin Groundwater Sustainability Agency

ATTEST:

Interim Executive Director
Mound Basin Groundwater Sustainability Agency

AYES:
NOES:
ABSENT:

Interim Board Chair
Mound Basin Groundwater Sustainability Agency

ATTEST:

Interim Executive Director
Mound Basin Groundwater Sustainability Agency

Certificate of Publication

Ventura Water
Received
JUN 19 2017

Ad #1637550

In Matter of Publication of:

Public Notice

State of California)
))§
County of Ventura)

I, **Maria Rodriguez**, hereby certify that the **Ventura County Star Newspaper** has been adjudged a newspaper of general circulation by the Superior Court of California, County of Ventura within the provisions of the Government Code of the State of California, printed in the City of Camarillo, for circulation in the County of Ventura, State of California; that I am a clerk of the printer of said paper; that the annexed clipping is a true printed copy and publishing in said newspaper on the following dates to wit:

June 07, 14, 2017

I, Maria Rodriguez certify under penalty of perjury, that the foregoing is true and correct.

Dated this June 14, 2017; in Camarillo, California, County of Ventura.

Maria Rodriguez
(Signature)

NOTICE OF PUBLIC HEARING

NOTICE IS HEREBY GIVEN that a Public Hearing of the Mound Basin Groundwater Sustainability Agency Board of Directors will be held:

--June 22, 2017 at 10:00 am--
MOUND BASIN GROUNDWATER SUSTAINABILITY AGENCY
City of Ventura City Hall, Community Meeting Room
501 Poli Street, Ventura, California 93001

The purpose of this Public Hearing is to accept public comment regarding the Mound Basin Groundwater Sustainability Agency's ("Agency") election to become the designated Groundwater Sustainability Agency ("GSA") pursuant to the Sustainable Groundwater Management Act ("SGMA") for the Mound Groundwater Basin ("Basin"). It is expected the County of Ventura, United Water Conservation District, and the City of San Buenaventura will execute a Joint Exercise of Powers Agreement to form the Agency. Under SGMA, a local agency is required to elect to become a GSA for the Basin by June 30, 2017. Failure to comply with this deadline subjects the Basin to state intervention under SGMA. Once a GSA is formed for the Basin, the GSA will begin holding public meetings to discuss development of a Groundwater Sustainability Plan. Additional information can be found at www.water.ca.gov/groundwater/sgm or by contacting:

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JOINT EXERCISE OF POWERS AGREEMENT

by and among

THE CITY OF SAN BUENAVENTURA

THE COUNTY OF VENTURA

and

UNITED WATER CONSERVATION DISTRICT

creating

THE MOUND BASIN GROUNDWATER SUSTAINABILITY AGENCY

JUNE 2017

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JOINT EXERCISE OF POWERS AGREEMENT
THE MOUND BASIN GROUNDWATER SUSTAINABILITY AGENCY

This **Joint Exercise of Powers Agreement ("Agreement")** is made and effective on the last date executed ("**Effective Date**"), by and among the City of San Buenaventura, the County of Ventura, and United Water Conservation District, sometimes referred to herein individually as a "**Member**" and collectively as the "**Members**" for purposes of forming the Mound Basin Groundwater Sustainability Agency ("**Authority**") and setting forth the terms pursuant to which the Authority shall operate. Capitalized defined terms used herein shall have the meanings given to them in Article 1 of this Agreement.

RECITALS

A. Each of the Members is a local agency, as defined by the Sustainable Groundwater Management Act of 2014 ("**SGMA**"), duly organized and existing under and by virtue of the laws of the State of California, and each Member can exercise powers related to groundwater management.

B. For groundwater basins designated by the Department of Water Resources ("**DWR**") as medium- and high-priority but that have not been designated by DWR as subject to critical conditions of overdraft, SGMA requires establishment of a groundwater sustainability agency ("**GSA**") by June 30, 2017 and adoption of a groundwater sustainability plan ("**GSP**") by January 31, 2022.

C. The Mound Basin (designated basin number 4-4.03 in the DWR's Bulletin No. 118) ("**Basin**") is designated as a medium-priority sub-basin of the Santa Clara River Valley Basin. DWR has not identified the Basin as being in a condition of critical overdraft.

D. Under SGMA, a combination of local agencies may form a GSA through a joint powers agreement.

E. The Members have determined that the sustainable management of the Basin pursuant to SGMA may best be achieved through the cooperation of the Members operating through a joint powers agreement.

F. The Joint Exercise of Powers Act of 2000 ("Act") authorizes the Members to create a joint powers authority, and to jointly exercise any power common to the Members and to exercise additional powers granted under the Act.

G. The Act, including the Marks-Roos Local Bond Pooling Act of 1985 (Government Code sections 6584, *et seq.*), authorizes an entity created pursuant to the Act to issue bonds, and under certain circumstances, to purchase bonds issued by, or to make loans to, the Members for financing public capital improvements, working capital, liability and other insurance needs or projects whenever doing so would result in significant public benefits, as determined by the Members. The Act further authorizes and empowers a joint powers authority to sell bonds so issued or purchased to public or private purchasers at public or negotiated sales.

H. Based on the foregoing legal authority, the Members desire to create a joint powers authority for the purpose of taking all actions deemed necessary by the joint powers authority to ensure sustainable management of the Basin as required by SGMA.

I. The governing body of each Member has determined it to be in the Member's best interest and in the public interest that this Agreement be executed.

TERMS OF AGREEMENT

In consideration of the mutual promises and covenants herein contained, the Members agree as follows:

ARTICLE 1
DEFINITIONS

The following terms have the following meanings for purposes of this Agreement:

1.1 "Act" means the Joint Exercise of Powers Act, set forth in Chapter 5 of Division 7 of Title 1 of the Government Code, sections 6500, *et seq.*, including all laws supplemental thereto.

1.2 "Agreement" has the meaning assigned thereto in the Preamble.

1.3 "Auditor" means the auditor of the financial affairs of the Authority appointed by the Board of Directors pursuant to Section 13.3 of this Agreement.

1.4 "Authority" has the meaning assigned thereto in the Preamble.

1.5 "Basin" has the meaning assigned thereto in Recital C.

1.6 "Board of Directors" or "Board" means the governing body of the Authority as established by Article 6 of this Agreement.

1.7 "Bylaws" means the bylaws, if any, adopted by the Board of Directors pursuant to Article 11 of this Agreement to govern the day-to-day operations of the Authority.

1.8 "Director" shall mean a Member or Stakeholder Director appointed pursuant to Article 6 of this Agreement.

1.9 "DWR" has the meaning assigned thereto in Recital B.

1.10 "Effective Date" has the meaning assigned thereto in the Preamble.

1.11 "Executive Director" means the chief administrative officer of the Authority to be appointed by the Board of Directors pursuant to Article 10 of this Agreement.

1.12 “Farm Bureau” means the Farm Bureau of Ventura County.

1.13 “GSA” has the meaning assigned thereto in Recital B.

1.14 “GSP” has the meaning assigned thereto in Recital B.

1.15 “Hazardous Materials Law” means any and all federal, state, or local laws, ordinances, rules, decrees, orders, regulations, or court decisions relating to hazardous substances, hazardous materials, hazardous waste, toxic substances, environmental conditions on, under or about any real property owned, leased, or controlled by the Authority, or soil and groundwater conditions, including, but not limited to, the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (“CERCLA”), as amended, 42 U.S.C. § 9601, *et seq.*, the Resource Conservation and Recovery Act (“RCRA”), 42 U.S.C. § 6901, *et seq.*, the Hazardous Materials Transportation Act, 49 U.S.C. § 1801, *et seq.*, the California Hazardous Waste Control Act, Cal. Health and Safety Code § 25100, *et seq.*, the Carpenter-Presley-Tanner Hazardous Substances Account Act, Cal. Health and Safety Code § 25300, *et seq.*, the Safe Drinking Water and Toxic Enforcement Act, Cal. Health and Safety Code § 25249.5, *et seq.*, the Porter-Cologne Water Quality Control Act, Cal. Water Code § 13000, *et seq.*, any amendments to the foregoing, and any similar federal, state, or local laws, ordinances, rules, decrees, orders, or regulations.

1.16 “Hazardous Materials” means any chemical, compound, material, substance or other matter that: (a) is defined as a hazardous substance, hazardous material, hazardous waste or toxic substance under any Hazardous Materials Law; (b) is controlled or governed by any Hazardous Materials Law or gives rise to any reporting, notice or publication requirements hereunder, or gives rise to any liability, responsibility or duty on the part of the Authority, with respect to any third person hereunder; or (c) is flammable or explosive material, oil, asbestos, urea formaldehyde, radioactive material, nuclear medicine material, drug, vaccine, bacteria, virus, hazardous waste, toxic substance, or related injurious or potentially injurious material (by itself or in combination with other materials).

1.17 “MBAWG” means the Mound Basin Ag Water Group, a registered corporation in the State of California.

1.18 “Member” has the meaning assigned thereto in the Preamble and further means each party to this Agreement that satisfies the requirements of Section 5.1 of this Agreement, including any new members as may be authorized by the Board, pursuant to Section 5.2 of this Agreement.

1.19 “Member Director” means a Director appointed pursuant to Section 6.3 of this Agreement that represents a Member.

1.20 “Officer(s)” means the chair and vice chair/secretary to be appointed by the Board of Directors pursuant to Article 7 of this Agreement.

1.21 “SGMA” has the meaning assigned thereto in Recital A.

1.22 “Stakeholder Director” means a Director appointed pursuant to Section 6.3 that represents stakeholder interests.

1.23 “State” means the State of California.

1.24 “Representative” means an employee of the County of Ventura authorized to act on behalf of the Board of Supervisors or an employee of the City of San Buenaventura authorized to act on behalf of the City Council or an employee of United Water Conservation District authorized to act on behalf of the United Water Conservation District Board of Directors.

ARTICLE 2
CREATION OF THE AUTHORITY

2.1 Creation of Authority. There is hereby created pursuant to the Act a joint powers authority, which will be a public entity separate from the Members to this Agreement and shall be known as the Mound Basin Groundwater Sustainability Agency (“**Authority**”). Within thirty (30) days after the Effective Date of this Agreement and after any amendment, the Authority shall cause a notice of this Agreement or amendment to be prepared and filed with the office of the California Secretary of State containing the information required by Government Code section 6503.5. Within seventy (70) days after the Effective Date of this Agreement, the Authority shall cause a statement of the information concerning the Authority, required by Government Code section 53051, to be filed with the office of the California Secretary of State and with the County Clerk for the County of Ventura, setting forth the facts required to be stated pursuant to Government Code section 53051(a).

2.2 Purpose of the Authority. Each Member to this Agreement has in common the power to study, plan, develop, finance, acquire, construct, maintain, repair, manage, operate, control, and govern water supply projects and exercise groundwater management authority within the Basin either alone or in cooperation with other public or private non-member entities, and each is a local agency eligible to serve as the GSA in the Basin, either alone or jointly through a joint powers agreement as provided for by SGMA. This Agreement is being entered into in order to jointly exercise some or all of the foregoing common powers, as appropriate, and for the exercise of such additional powers as may be authorized by law in the manner herein set forth, in order to effectuate the purposes of this Agreement. The purpose of the Authority is to serve as the GSA for the Basin and to develop, adopt, and implement the GSP for the Basin pursuant to SGMA and other applicable provisions of law.

ARTICLE 3
TERM

This Agreement shall become effective upon execution by each of the Members and shall remain in effect until terminated pursuant to the provisions of Article 16 of this Agreement.

ARTICLE 4
POWERS

The Authority shall possess the power in its own name to exercise any and all common powers of its Members reasonably related to the purposes of the Authority, including but not limited to the powers set forth below, together with such other powers as are expressly set forth in the Act or in SGMA or as it may be amended in the future. For purposes of Government Code section 6509, and unless the Authority has adopted applicable rules, regulations, policies, bylaws and procedures, the powers of the Authority shall be exercised subject to the restrictions upon the manner of exercising such powers as are imposed on the County of Ventura, and in the event of the withdrawal of the County of Ventura as a Member under this Agreement, then the powers of the Authority shall be exercised subject to the restrictions upon the manner of exercising such powers as are imposed on the City of San Buenaventura.

4.1 To exercise all powers afforded to the Authority under SGMA or any amendment thereto, including without limitation:

4.1.1 To adopt rules, regulations, policies, bylaws and procedures governing the operation of the Authority.

4.1.2 To develop, adopt and implement a GSP for the Basin, and to exercise jointly the common powers of the Members in doing so.

4.1.3 To obtain rights, permits and other authorizations for, or pertaining to, implementation of a GSP for the Basin.

4.1.4 To collect and monitor data on the extraction of groundwater from, and the quality of groundwater in, the Basin.

4.1.5 To acquire property and other assets by grant, lease, purchase, bequest, devise, gift, or eminent domain, and to hold, enjoy, lease or sell, or otherwise dispose of, property, including real property, water rights, and personal property, necessary for the full exercise of the Authority's powers.

4.1.6 To establish and administer a conjunctive use program for the purposes of maintaining sustainable yields in the Basin consistent with the requirements of SGMA or any amendment thereto.

4.1.7 To exchange and distribute water.

4.1.8 To regulate groundwater extractions as permitted by SGMA.

4.1.9 To spread, sink and inject water into the Basin.

4.1.10 To store, transport, recapture, recycle, purify, treat or otherwise manage and control water for beneficial use.

4.1.11 To develop and facilitate market-based solutions for the use and management of water rights.

4.1.12 To impose assessments, groundwater extraction fees or other charges, and to undertake other means of financing the Authority as authorized by Chapter 8 of SGMA, commencing at section 10730 of the Water Code.

4.1.13 To perform other ancillary tasks relating to the operation of the Authority pursuant to SGMA, including without limitation, environmental review, engineering, and design.

4.2 To apply for, accept and receive licenses, permits, water rights, approvals, agreements, grants, loans, contributions, donations or other aid from any agency of the United States, the State of California or other public agencies or private persons or entities necessary for the Authority's purposes

4.3 To develop, collect, provide, and disseminate information that furthers the purposes of the Authority.

4.4 To make and enter contracts necessary to the full exercise of the Authority's power.

4.5 To employ, designate, or otherwise contract for the services of, agents, officers, employees, attorneys, engineers, planners, financial consultants, technical specialists, advisors, and independent contractors.

4.6 To incur debts, liabilities or obligations, to issue bonds, notes, certificates of participation, guarantees, equipment leases, reimbursement obligations and other indebtedness, as authorized by the Act.

4.7 To cooperate, act in conjunction and contract with the United States, the State of California, or any agency thereof, counties, municipalities, public and private corporations of any kind (including without limitation, investor-owned utilities), and individuals, or any of them, for any and all purposes necessary or convenient for the full exercise of the powers of the Authority.

4.8 To sue and be sued in the Authority's own name.

4.9 To provide for the prosecution of, defense of, or other participation in, actions or proceedings at law or in public hearings in which the Members, pursuant to this Agreement, have an interest and employ counsel and other expert assistance for these purposes.

4.10 To accumulate operating and reserve funds for the purposes herein stated.

4.11 To invest money that is not required for the immediate necessities of the Authority, as the Authority determines is advisable, in the same manner and upon the same conditions as Members, pursuant to Government Code section 53601, as that section now exists or may hereafter be amended.

4.12 To undertake any investigations, studies, and matters of general administration.

4.13 To perform all other acts necessary or proper to carry out fully the purposes of this Agreement.

ARTICLE 5
MEMBERSHIP

5.1 Members. The Members of the Authority shall be the City of San Buenaventura, the County of Ventura, and United Water Conservation District, as long as they have not, pursuant to the provisions hereof, withdrawn from this Agreement.

5.2 New Members. Any local agency (as defined by SGMA) that is not a Member on the Effective Date of this Agreement may become a Member upon appropriate amendment of this Agreement pursuant to Section 17.3.

ARTICLE 6
BOARD OF DIRECTORS

6.1 Formation of the Board of Directors. The Authority shall be governed by a Board of Directors ("**Board of Directors**" or "**Board**"). The Board shall consist of five (5) Directors comprised of representatives who shall be appointed in the manner set forth in Section 6.3.

6.1.1 Three (3) Member Directors appointed by the governing body of each Member.

6.1.2 One (1) Agricultural Stakeholder Director representative of agricultural interests within the Basin. The Agricultural Stakeholder Director need not be a member of the MBAWG or the Farm Bureau. The Agricultural Stakeholder Director shall meet either or both of the following qualifications:

a) Own, as an individual or shareholder, trustee, limited liability company member or manager, or as a member of any other owner entity, land overlying the Basin (at least partially) that is utilized for a commercial agricultural business that produces groundwater from the Basin for its agricultural operation; or

b) Operate a commercial agricultural business that itself produces groundwater from the Basin for its agricultural operations on land overlying the Basin and be an approved stakeholder representative by that property's owner.

6.1.3 One (1) Environmental Stakeholder Director representative of environmental interests within the Basin. The Environmental Stakeholder Director shall be an active member of a nonprofit, 501(c)(3) organization which has an adopted budget and, at the sole discretion of the Member Directors, meets the following requirements: (i) is currently active within lands overlying the Mound Basin; and (ii) has a mission that advances, or is furthered by, groundwater sustainability.

6.2 Duties of the Board of Directors. The business and affairs of the Authority, and all of the powers of the Authority, including without limitation all powers set forth in Article 4 (Powers), are reserved to and shall be exercised by and through the Board of Directors, except as may be expressly delegated to the Executive Director or others pursuant to this Agreement, Bylaws, or by specific action of the Board of Directors.

6.3 Appointment of Directors. The Directors shall be appointed as follows:

6.3.1 One (1) Member Director for the City of San Buenaventura shall be appointed by the City of San Buenaventura City Council. The Member Director will be a City Councilmember or Representative.

6.3.2 One (1) Member Director for the County of Ventura shall be appointed by the County of Ventura Board of Supervisors. The Member Director will be a County Supervisor or Representative.

6.3.3 One (1) Member Director for the United Water Conservation District shall be appointed by the United Water Conservation District Board of Directors. The Member Director will be a member of the United Water Conservation District Board of Directors or a Representative.

6.3.4 One (1) Agricultural Stakeholder Director unanimously selected by the Member Directors from a list of one or more qualified nominees submitted by the MBAWG, or the Farm Bureau if the MBAWG is unwilling or unable to nominate potential directors. The MBAWG, or the Farm Bureau, shall submit its nominee(s) to the Member Directors pursuant to a process specified in the Bylaws, unless directed otherwise by the Member Directors until such time as the Bylaws have been adopted. The Member Directors shall consider the nominee(s) at a regular meeting and at that meeting shall approve and appoint the Agricultural Stakeholder Director. In the absence of a unanimous vote of approval and appointment by the Member Directors, the Member Directors can request different nominations.

6.3.5 One (1) Environmental Stakeholder Director unanimously selected by the Member Directors from a nominee nominated by the following environmental organizations collectively:

1. Friends of the Santa Clara River
2. California Trout
3. National Audubon Society
4. Sierra Club
5. Santa Clara River Watershed Conservancy
6. Los Padres ForestWatch
7. Central Coast Alliance United for a Sustainable Economy
8. The Nature Conservancy
9. Wishtoyo Foundation
10. Keep Sespe Wild
11. Surfrider Foundation

12. CFROG (Citizens for Responsible Oil & Gas)

or, The Nature Conservancy if, and only if, the aforementioned list of organizations is unwilling or unable to nominate a potential Environmental Stakeholder Director. If the Member Directors do not accept a potential Environmental Stakeholder Director nominated by the aforementioned list of organizations or The Nature Conservancy, as applicable, the Member Directors shall request an additional nomination, as necessary. The aforementioned list of organizations shall submit its nominee to the Member Directors pursuant to a process specified in the Bylaws, unless directed otherwise by the Member Directors. The Member Directors shall consider the nominee(s) at a regular meeting and at that meeting shall approve and appoint the Environmental Stakeholder Director.

6.4 Director Terms and Removal. Each Member Director shall be appointed by resolution of that Member's governing body to serve for a term of two (2) years. To stagger the terms of the Directors, the initial terms of the Member Directors from the City of San Buenaventura and the United Water Conservation District shall be three (3) years. Subsequent terms for those Directors will be two (2) years. A Member's Director may be removed during his or her term or reappointed for multiple terms at the pleasure of the Member that appointed him or her. Stakeholder Directors shall serve for a term of one (1) year and may serve for more than one term.

6.5 Vacancies. A vacancy on the Board of Directors shall occur when a Director resigns or at the end of the Director's term as set forth in Section 6.4. For Member Directors, a vacancy shall also occur when he or she is (a) removed by his or her appointing Member; or (b) ceases to be a member of the Member's governing body; or (c) ceases to be an employee of the Member. Upon the vacancy of a Director, the seat shall remain vacant until a replacement Director is appointed as set forth in Section 6.3. Members shall submit any changes in Director positions to the Executive Director by written notice signed by an authorized representative of the Member. The written notice shall include a resolution of the governing body of the Member directing such change in the Director position.

6.6 Conflicts of Interest. Notwithstanding Section 8.5, no Director shall be allowed to participate in any matter before the Board in which he or she has a conflict of interest. A Member Director is deemed to have a conflict of interest and disqualified from participating in related matters before the Board if that Member Director (i) is personally, or (ii) was appointed by a Member that is, named as an adverse party in any litigation in which the Authority is a party. A Stakeholder Director is deemed to have a conflict of interest and disqualified from participating in related matters before the Board if that Stakeholder Director (i) is personally, (ii) is employed by, or (iii) acts as a manager or executive director to, or sits on the board of, an entity that is named as, an adverse party in litigation in which the Authority is a party, except that the Authority's intervention or participation in an "adjudication action," as defined by Water Code section 10721, shall not give rise to a conflict of interest under this section. In such an event, the Director shall be deemed disqualified in all matters related to the issue being litigated, shall not be eligible to receive confidential information relating to the litigation from the Authority or its legal counsel, and shall not be eligible to attend any closed session where the litigation is discussed. In the event a Director deemed to have a conflict of interest refuses to withdraw from matters related to the conflict, the other Directors shall jointly seek a court order preventing the conflicted Director from participating in those related matters.

ARTICLE 7
OFFICERS

7.1 Officers. Officers of the Authority shall be a chair and vice chair/secretary. An additional Officer of the Authority shall be a treasurer appointed consistent with the provisions of Section 13.3. The vice chair/secretary shall exercise all powers of the chair in the chair's absence or inability to act.

7.2 Appointment of Officers. Officers shall be elected annually by, and serve at the pleasure of, the Board of Directors. Officers shall be elected at the first Board meeting, and thereafter at the first Board meeting following January 1st of each year. An Officer may serve for multiple consecutive terms, with no term limit. Any Officer may resign at any time upon written notice to the Board, and may be removed and replaced by a simple majority vote of the full Board.

7.3 Principal Office. The principal office of the Authority shall be established by the Board of Directors, and may thereafter be changed by a simple majority vote of the full Board. The principal office of the Authority shall be located within the jurisdictional boundaries of one or more of the Members.

ARTICLE 8
DIRECTOR MEETINGS

8.1 Initial Meeting. The initial meeting of the Board of Directors shall be held in the County of Ventura, California within thirty (30) days of the Effective Date of this Agreement.

8.2 Time and Place. The Board of Directors shall meet at least quarterly, at a date, time and place set by the Board within the jurisdictional boundaries of one or more of the Members, and at such times as may be determined by the Board.

8.3 Special Meetings. Special meetings of the Board of Directors may be called in accordance with the Ralph M. Brown Act (Government Code sections 54950, *et seq.*).

8.4 Conduct. All meetings of the Board of Directors, including special meetings, shall be noticed, held, and conducted in accordance with the Ralph M. Brown Act (Government Code sections 54950, *et seq.*). The Board may use teleconferencing in connection with any meeting in conformance with and to the extent authorized by applicable law.

8.5 Local Conflict of Interest Code. The Board of Directors shall adopt a local conflict of interest code pursuant to the provisions of the Political Reform Act of 1974 (Government Code sections 81000, *et seq.*).

ARTICLE 9
VOTING

9.1 Quorum. A quorum of any meeting of the Board of Directors shall consist of a majority of the Directors. In the absence of a quorum, any meeting of the Directors may be adjourned by a vote of a simple majority of Directors present, but no other business may be transacted. For purposes of this Article, a Director shall be deemed present if the Director appears at the meeting in person or participates telephonically, provided the telephone appearance is consistent with the requirements of the Ralph M. Brown Act.

9.2 Director Votes. Voting by the Board of Directors shall be made on the basis of one vote for each Director. A Director may vote on all matters of Authority business unless disqualified because of a conflict of interest pursuant to California law or the local conflict of interest code adopted by the Board of Directors.

9.3 Affirmative Decisions of the Board of Directors. Except as otherwise specified in this Agreement, all decisions of the Board of Directors shall require the affirmative vote of a minimum of three (3) Directors, except for the following matters which require special voting procedures from the Board to pass: (i) the Authority's annual budget and amendments thereto; (ii) the GSP for the Basin or any amendments thereto; (iii) the Authority's adoption of groundwater extraction fees or charges; (iv) the Authority's adoption of any taxes, fees, or assessments subject to Proposition 218; or (v) any stipulation to resolve litigation concerning groundwater rights within, or groundwater management for, the Basin. For these matters requiring special voting procedures, the matter may be approved on the first reading of the matter pursuant to a unanimous vote of all Directors; if unanimity is not obtained on the first reading of a matter, the Board shall continue a final vote on the matter for a second reading at the next regular meeting of the Board, unless the Board votes to continue the second reading of the matter to another regular or special meeting of the Board; the matter may be approved on the second reading of the matter by the affirmative vote of a minimum of three (3) Directors, if, and only if, at least one (1) of the affirmative votes is by the City of San Buenaventura's Director or the Agricultural Stakeholder Director.

ARTICLE 10
EXECUTIVE DIRECTOR AND STAFF

10.1 Appointment. The Board of Directors shall appoint an Executive Director, who may be, though need not be, an officer, employee, or representative of one of the Members. The Executive Director's compensation, if any, shall be determined by the Board of Directors.

10.2 Duties. If appointed, the Executive Director shall be the chief administrative officer of the Authority, shall serve at the pleasure of the Board of Directors, and shall be responsible to the Board for the proper and efficient administration of the Authority. The Executive Director shall have the powers designated by the Board, or otherwise as set forth in the Bylaws.

10.3 Term and Termination. The Executive Director shall serve until he/she resigns or the Board of Directors terminates his/her appointment.

10.4 Staff and Services. The Executive Director may employ such additional full-time and/or part-time employees, assistants and independent contractors who may be necessary from time to time to accomplish the purposes of the Authority, subject to the approval of the Board of

Directors. The Authority may contract with a Member or other public agency or private entity for various services, including without limitation, those related to the Authority's finance, purchasing, risk management, information technology and human resources. A written agreement shall be entered between the Authority and the Member or other public agency or private entity contracting to provide such service, and that agreement shall specify the terms on which such services shall be provided, including without limitation, the compensation, if any, that shall be made for the provision of such services.

ARTICLE 11
BYLAWS

The Board of Directors shall cause to be drafted and approve Bylaws of the Authority to govern the day-to-day operations of the Authority. The Bylaws shall be adopted at or before the first anniversary of the Board's first meeting and may be amended from time to time.

ARTICLE 12
COMMITTEES

The Board of Directors may from time to time appoint one or more advisory committees or establish standing or ad hoc committees to assist in carrying out the purposes and objectives of the Authority. The Board shall determine the purpose and need for such committees and the necessary qualifications for individuals appointed to them. Each standing or ad hoc committee shall include a Director as the chair thereof. However, no committee or participant on such committee shall have any authority to act on behalf of the Authority.

ARTICLE 13
ACCOUNTING PRACTICES

13.1 General. The Board of Directors shall establish and maintain such funds and accounts as may be required by generally accepted public agency accounting practices. The Authority shall maintain strict accountability of all funds and report of all receipts and disbursements of the Authority.

13.2 Fiscal Year. Unless the Board of Directors decides otherwise, the fiscal year for the Authority shall run from July 1 to June 30.

13.3 Appointment of Treasurer and Auditor; Duties. The treasurer and Auditor shall be appointed in the manner, and shall perform such duties and responsibilities, specified in sections 6505, 6505.5 and 6505.6 of the Act. The treasurer shall be bonded in accordance with the provisions of section 6505.1 of the Act.

ARTICLE 14
BUDGET AND EXPENSES

14.1 Budget. Within one hundred and twenty (120) days after the first meeting of the Board of Directors, and thereafter prior to the commencement of each fiscal year, the Board shall adopt a budget for the Authority for the ensuing fiscal year. In the event that a budget is not so approved, the prior year's budget shall be deemed approved for the ensuing fiscal year, and any groundwater extraction fee or assessment(s) of contributions by Members, or both, approved by the Board during the prior fiscal year shall again be assessed in the same amount and terms for the ensuing fiscal year.

14.2 Authority Funding and Contributions. For the purpose of funding the expenses and ongoing operations of the Authority, the Board of Directors shall maintain a funding account in connection with the annual budget process. The Board of Directors may fund the Authority and the GSP as provided in Chapter 8 of SGMA (commencing with section 10730 of the Water Code), through voluntary contributions from Members. The Members agree that the Authority, and not the Members, have the sole responsibility to develop and implement a funding program to fiscally and fully implement the Authority's SGMA compliance efforts and ongoing operations.

14.3 Return of Contributions. In accordance with Government Code section 6512.1, the Authority may reimburse Members for all or any part of any contributions made by Members, and any revenues by the Authority may be distributed by the Board of Directors at such time and upon such terms as the Board of Directors may decide; provided that (1) any distributions shall be made in proportion to the contributions paid by each Member to the Authority, and (2) any capital contribution paid by a Member voluntarily, and without obligation to make such capital contribution pursuant to Section 14.2, shall be returned to the contributing Member, together with accrued interests at the annual rate published as the yield of the Local Agency Investment Fund administered by the California State Treasurer, before any other return of contributions to the Members is made. The Authority shall hold title to all funds and property acquired by the Authority during the term of this Agreement.

14.4 Issuance of Indebtedness. The Authority may issue bonds, notes or other forms of indebtedness, as permitted under Section 4.6, provided such issuance is approved at a meeting of the Board.

ARTICLE 15
LIABILITIES

15.1 Liability. In accordance with Government Code section 6507, the debt, liabilities and obligations of the Authority shall be the debts, liabilities and obligations of the Authority alone, and not the individual Members.

15.2 Indemnity. Funds of the Authority may be used to defend, indemnify, and hold harmless the Authority, each Member, each Director, and any officers, agents and employees of the Authority for their actions taken within the course and scope of their duties while acting on behalf of the Authority. To the fullest extent permitted by law, the Authority agrees to save, indemnify, defend and hold harmless each Member from any liability, claims, suits, actions, arbitration proceedings, administrative proceedings, regulatory proceedings, losses, expenses or costs of any kind, whether actual, alleged or threatened, including attorney's fees and costs, court costs, interest, defense costs, and expert witness fees, where the same arise out of, or are in any way attributable in whole or in part to, acts or omissions of the Authority or its employees, officers or agents or negligent acts or omissions (not including gross negligence or wrongful conduct) of the employees, officers or agents of any Member, while acting within the course and scope of a Member relationship with the Authority.

15.3 Privileges and Immunities. All of the privileges and immunities from liability, exemption from laws, ordinances and rules, all pension, relief, disability, workers compensation, and other benefits which apply to the activity of officers, agents, or employees of any of the Members when performing their respective functions shall apply to them to the same degree and extent while engaged in the performance of any of the functions and other duties under this Agreement. None of the officers, agents, or employees appointed by the Board of Directors shall be deemed, by reason of their employment by the Board of Directors, to be employed by any of the Members or, by reason of their employment by the Board of Directors to be subject to any of the requirements of such Members.

15.4 Hazardous Materials. The Authority shall indemnify, protect, defend, and hold harmless the Members (and their respective officers, directors, employees and agents) from and against any and all liabilities, claims, suits, judgments, actions, investigations, proceedings, costs and expenses (including reasonable attorneys' fees and court costs) to the extent arising out of or in connection with any breach of any provisions of this Section directly or indirectly arising out of the use, generation, storage, release, disposal or transportation of Hazardous Materials by the Authority, or any successor of the Authority, or their respective agents, contractors, employees, licensees, or invitees, including, but not limited to, all foreseeable and unforeseeable consequential damages and the cost of any Remedial Work. The foregoing indemnity shall be in addition to and not a limitation of the indemnification provisions of Section 15.2 hereof. The foregoing indemnity extends beyond the term of this Agreement and is intended to operate as an agreement pursuant to Section 107(e) of the Comprehensive Environmental Response, Compensation, and Liability Act, 'CERCLA,' 42 U.S.C. Section 9607(e), and California Health and Safety Code Section 25364, and their successor statutes, to insure, protect, defend, hold harmless, and indemnify the Members from liability.

15.5 Liability Insurance. The Board of Directors shall obtain, and maintain in effect, appropriate liability insurance to cover the activities of the Authority's Directors and staff in the ordinary course of their duties.

ARTICLE 16
WITHDRAWAL OF MEMBERS

16.1 Unilateral Withdrawal. Subject to the Dispute Resolution provisions set forth in Section 17.9, a Member may unilaterally withdraw from this Agreement without causing or requiring termination of this Agreement, effective upon sixty (60) days written notice to the Executive Director.

16.2 Rescission or Termination of Authority. This Agreement may be rescinded and the Authority terminated by unanimous written consent of all Members, except during the outstanding term of any Authority indebtedness.

16.3 Effect of Withdrawal or Termination. Upon termination of this Agreement or unilateral withdrawal, a Member shall remain obligated to pay its share of all debts, liabilities and obligations of the Authority required of the Member pursuant to terms of this Agreement, and that were incurred or accrued prior to the effective date of such termination or withdrawal, including, without limitation, those debts, liabilities and obligations pursuant to Sections 4.6 and 14.4. Any Member who withdraws from the Authority shall have no right to participate in the business and affairs of the Authority or to exercise any rights of a Member under this Agreement or the Act, but shall continue to share in distributions from the Authority on the same basis as if such Member had not withdrawn, provided that a Member that has withdrawn from the Authority shall not receive distributions in excess of the contributions made to the Authority while a Member. The right to share in distributions granted under this Section 16.3 shall be in lieu of any right the withdrawn Member may have to receive a distribution or payment of the fair value of the Member's interest in the Authority.

16.4 Return of Contribution. Upon termination of this Agreement, any surplus money on-hand shall be returned to the Members in proportion to their contributions made. The Board of Directors shall first offer any property, works, rights and interests of the Authority for sale to the Members on terms and conditions determined by the Board of Directors. If no such sale to Members is consummated, the Board of Directors shall offer the property, works, rights, and interest of the Authority for sale to any non-member for good and adequate consideration. The net proceeds from any sale shall be distributed among the Members in proportion to their contributions made.

ARTICLE 17
MISCELLANEOUS PROVISIONS

17.1 No Predetermination or Irretrievable Commitment of Resources. Nothing herein shall constitute a determination by the Authority or any of its Members that any action shall be undertaken or that any unconditional or irretrievable commitment of resources shall be made, until such time as the required compliance with all local, state, or federal laws, including without limitation the California Environmental Quality Act, National Environmental Policy Act, or permit requirements, as applicable, has been completed.

17.2 Notices. Notices to a Director or Member hereunder shall be sufficient if delivered to the Board Clerk, City Clerk or Board Secretary of the respective Director or Member and addressed to the Director or Member. Delivery may be accomplished by U.S. Postal Service, private mail service or electronic mail.

17.3 Amendments to Agreement. This Agreement may be amended or modified at any time only by subsequent written agreement approved and executed by all of the Members.

17.4 Agreement Complete. The foregoing constitutes the full and complete Agreement of the Members. This Agreement supersedes all prior agreements and understandings, whether in writing or oral, related to the subject matter of this Agreement that are not set forth in writing herein.

17.5 Severability. Should any part, term or provision of this Agreement be decided by a court of competent jurisdiction to be illegal or in conflict with any applicable Federal law or any law of the State of California, or otherwise be rendered unenforceable or ineffectual, the validity of the remaining parts, terms, or provisions hereof shall not be affected thereby, provided, however, that if the remaining parts, terms, or provisions do not comply with the Act, this Agreement shall terminate.

17.6 Withdrawal by Operation of Law. Should the participation of any Member to this Agreement be decided by the courts to be illegal or in excess of that Member's authority or in conflict with any law, the validity of the Agreement as to the remaining Members shall not be affected thereby.

17.7 Assignment. The rights and duties of the Members may not be assigned or delegated without the written consent of all other Members. Any attempt to assign or delegate such rights or duties in contravention of this Agreement shall be null and void.

17.8 Binding on Successors. This Agreement shall inure to the benefit of, and be binding upon, the successors and assigns of the Members.

17.9 Dispute Resolution. In the event that any dispute arises among the Members relating to (i) this Agreement, (ii) the rights and obligations arising from this Agreement, (iii) a Member proposing to withdraw from membership in the Authority, or (iv) a Member proposing to initiate litigation in relation to legal rights to groundwater within the Basin or the management of the Basin, the aggrieved Member or Members proposing to withdraw from membership shall provide written notice to the other Members of the controversy or proposal to withdraw from membership. Within forty-five (45) days after such written notice, the Members shall attempt in good faith to resolve the controversy through informal means. If the Members cannot agree upon a resolution of the controversy within forty-five (45) days from the providing of written notice specified above, the dispute shall be submitted to mediation prior to commencement of any legal action or prior to withdrawal of a Member proposing to withdraw from membership. The mediation shall be no less than a full day (unless agreed otherwise among the Members) and the cost of mediation shall be paid in equal proportion among the Members. The mediator shall be either voluntarily agreed to or appointed by the Superior Court upon a suit and motion for appointment of a neutral mediator. Upon completion of mediation, if the controversy has not been resolved, any Member may exercise all rights to bring a legal action relating to the controversy or withdraw from membership as otherwise authorized pursuant to this Agreement. The Authority may, at its discretion, participate in mediation upon request by a Stakeholder Director concerning a dispute alleged by the Stakeholder Director concerning the management of the Basin or rights to extract groundwater from the Basin, with the terms of such mediation to be determined in the sole discretion of the Member Directors.

17.10 Counterparts. This Agreement may be executed in counterparts. No counterpart shall be deemed to be an original or presumed delivered unless and until the counterpart executed by the other Members to this Agreement is in the physical possession of the Member seeking enforcement thereof.

17.11 Singular Includes Plural. Whenever used in this Agreement, the singular form of any term includes the plural form and the plural form includes the singular form.

17.12 No Third-Party Rights. Nothing in this Agreement, whether express or implied, is intended to confer any rights or remedies under, or by reason of, this Agreement on any person other than the Members and their respective successors and assigns, nor is anything in this

Agreement intended to relieve or discharge the obligations or liability of any third person to any Member, nor shall any provision give any third person any right of subrogation or action over or against any Member.

17.13 Member Authorization. The governing bodies of the Members have each authorized execution of this Agreement, as evidenced by the signatures below.

IN WITNESS WHEREOF, the Members hereto have executed this Agreement by authorized officials thereof on the dates indicated below, which Agreement may be executed in counterparts.

[Signatures on Following Page]

CITY OF SAN BUENAVENTURA

DATED: June 12, 2017

APPROVED AS TO FORM:

By: E. Jaramillo

Title: Mayor

By: Miles Hogan

Title: Assistant City Attorney II

COUNTY OF VENTURA

DATED:____________________

APPROVED AS TO FORM:

By: ______________________________

Title: ______________________________

By: ______________________________

Title: ______________________________

UNITED WATER CONSERVATION DISTRICT

DATED:____________________

APPROVED AS TO FORM:

By: ______________________________

Title: ______________________________

By: ______________________________

Title: ______________________________

CITY OF SAN BUENAVENTURA

DATED:____________________

APPROVED AS TO FORM:

By: ________________________ By: ________________________

Title:________________________ Title:________________________

COUNTY OF VENTURA

DATED: 6/6/17

APPROVED AS TO FORM:

By: ________________________ By: ________________________

Title: Chair, Board of Supervisors Title:________________________

UNITED WATER CONSERVATION DISTRICT

DATED: June 14, 2017

APPROVED AS TO FORM:

By: ________________________ By: ________________________

Title: UWCD Board President Title: UWCD Legal Counsel

BYLAWS

of the

Mound Basin Groundwater Sustainability Agency

August 16, 2018

Contents

PREAMBLE

These Bylaws are adopted and effective as of **[DATE]**, pursuant to the Joint Exercise of Powers Agreement of the Mound Basin Groundwater Sustainability Agency of June 2017 (the "Agreement" or “JPA”) by and among the City of San Buenaventura, County of Ventura, and United Water Conservation District (“Members”).

ARTICLE 1. THE AUTHORITY

1.1 NAME OF AUTHORITY. The name of the Authority created by the Agreement shall be the MOUND BASIN GROUNDWATER SUSTAINABILITY AGENCY ("Authority"). JPA, Preamble.

1.2 OFFICE OF AUTHORITY. The principal office of the Authority shall be [**ADDRESS]**, or at such other location as the Board may designate by resolution. JPA, 7.3.

1.3 POWERS. The powers of the Authority are vested in the governing board who reserve unto themselves the right to delegate by resolution such powers as are appropriate and permissible by law. JPA, Art. 4. The governing board (“Board” or “Board of Directors”) consists of: one (1) Member Director appointed by the City Council of the City of San Buenaventura who is a member of the City Council of San Buenaventura or a representative; one (1) Member Director appointed by the County of Ventura Board of Supervisors, who is a Supervisor or representative; one (1) Member Director appointed by the Board of Directors for United Water Conservation District, who is a member of United Water Conservation District’s Board of Directors or a representative; one (1) Agricultural Stakeholder Director; and one (1) Environmental Stakeholder Director, to be nominated by the environmental organizations outlined in the Article 6.3.5 of the Agreement and unanimously selected by the Member Directors. JPA, 6.3.1-3.5.

ARTICLE 2. BOARD OF DIRECTORS

2.1 BOARD. The Authority shall be governed by a Board of Directors ("Board of Directors" or "Board"). The Board shall consist of five (5) Directors comprised of representatives who shall be appointed in the manner set forth in Article 6 of the Agreement. JPA, 6.1, 6.3.

2.2 POWERS. The business and affairs of the Authority, and all of the powers of the Authority, including without limitation all powers set forth in Article 4 of the Agreement, are reserved to, and shall be exercised by and through the Board of Directors, except as may be expressly delegated to the Executive Director pursuant to the Bylaws, or by specific action of the Board of Directors.

2.3 MEMBER DIRECTORS.

2.3.1 Terms, Removal and Vacancies. Member Directors will be appointed to serve for a term of two (2) years, except as set forth in Section 6.4 of the Joint Exercise of Powers Agreement. A Member Director may be removed during his or her term or reappointed for multiple terms at the pleasure of the Member's governing agency. The Member Director shall cease to be a Director when he or she is no longer a member of their governing Agency's board or ceases to be an employee of the Member. JPA, 6.5. No individual Member Director may be removed in any other manner, including by affirmative vote of the other Directors. A Member Director vacancy shall occur when a Director resigns, at the end of the Director's term, or when he or she is removed by his or her appointing governing body. Upon the vacancy of a Member Director, the seat shall remain open and vacant until a replacement Director is appointed as set forth in Section 6.3 of the Joint Exercise of Powers Agreement. Members shall submit any changes in Director positions to the Executive Director by written notice signed by an authorized representative of the Member. The written notice shall include a resolution of the governing body of the Member directing such change in the Director position. JPA, 6.5.

2.4 AGRICULTURAL STAKEHOLDER DIRECTOR

2.4.1 Terms, Removal and Vacancies. The term for the Agricultural Stakeholder Director shall be one (1) year. A vacancy of an Agricultural Stakeholder Director's seat shall occur upon a Director's resignation or at the end of the Director's term. JPA, 6.5. Upon the vacancy of the Agricultural Stakeholder Director, the seat shall remain vacant until a replacement Director is appointed as set forth in Section 6.3 of the Joint Exercise of Powers Agreement. JPA, 6.5.

2.5 ENVIRONMENTAL STAKEHOLDER DIRECTORS

2.5.1 Terms, Removal and Vacancies. The term for the Environmental Stakeholder Director shall be one (1) year. JPA, 6.4. A vacancy of an Environmental Stakeholder Director's seat shall occur upon a Director's resignation or at the end of the Director's term. JPA, 6.5. Upon the vacancy of the Environmental Director, the seat shall remain vacant until a replacement Director is appointed as set forth in Section 6.3 of the Joint Exercise of Powers Agreement. JPA, 6.5.

ARTICLE 3. MEETINGS

3.1 REGULAR MEETINGS. The regular meetings of the Authority shall be held at least quarterly on a date and time which the Authority may designate as determined by the Board. The Board will set the time and place of meetings in accordance with Government Code Section 54954. JPA, 8.2.

3.2 QUORUM. A majority of the Directors of the Board shall constitute a quorum for the purpose of conducting Authority business, exercising Authority powers, and for all other purposes. However, a smaller number may adjourn from time-to-time until the quorum is obtained. JPA, 9.1.

3.3 AGENDA. Authority staff shall prepare the agenda. At least seventy-two hours before a regular meeting, or at least twenty-four hours prior to a special meeting, the Board Secretary shall post an agenda containing a brief, general description of each item of business to be transacted or discussed at the meeting, including the items to be discussed in closed session. The posting shall be freely accessible to the public. The agenda shall include the opportunity for the public to address the Board prior to taking action on any matter. The agenda for regular and adjourned regular meetings shall include the opportunity for the public to address the Board on matters within the jurisdiction of the Authority but not on the agenda. During public comment, a Director may request a matter be included on the agenda for a future meeting. Authority staff shall arrange for the matter to be placed on a future agenda as promptly as feasible. No action shall be taken on matters not shown on the posted agenda, except that Directors may briefly respond to statements made or questions posed during public comment; respond to a request for clarification; provide a reference to staff or other resources for factual information; request staff to report back to the Board at a subsequent meeting or direct staff to place a matter of business on a future agenda. The Board may add matters to the agenda upon a majority finding that an emergency exists or upon at least a two-thirds vote finding there is a need to take immediate action and the need for action came to the attention of the Authority subsequent to the posting of the agenda.

3.4 VOTING. Voting by the Board of Directors shall be made on the basis of one vote for each Director. All decisions of the Board shall require the affirmative vote of a minimum of three (3) Directors, except for the matters specified in Article 9.3 of the JPA which require special voting. JPA, 9.3.

3.5 RULES OF ORDER. All rules of order not otherwise provided for in the Bylaws shall be determined, to the extent practicable, in accordance with "Rosenberg's Rules of Order", provided, however, that no action shall be invalidated, or its legality otherwise affected by the failure or omission to observe or follow "Rosenberg's Rules of Order."

ARTICLE 4. OFFICERS

4.1 OFFICERS. The officers of the Authority shall consist of a Chair, a Vice Chair/Secretary, and a Treasurer. JPA, 7.1. Officers shall be elected annually by, and serve at the pleasure of, the Board of Directors. Officers shall be elected at the first Board meeting, and thereafter at the first Board meeting following January 1st of each year. JPA, 7.2.4.2 CHAIR. The Chair shall preside at meetings of the Authority. The Chair shall sign contracts, deeds, and other instruments made by the Authority.

4.3 VICE CHAIR. The Vice Chair shall perform the duties of the Chair in the absence or incapacity of the Chair. JPA, 7.1. The Vice Chair shall also act as Secretary and shall keep the administrative records of the Authority, act as secretary at meetings of the Authority, record all votes, and keep a record of the proceedings of the Authority to be kept for such purpose, and perform all duties incident to the Secretary's office. The Secretary shall maintain a record of all official proceedings of the board.

4.4 TREASURER AND AUDITOR. The Treasurer and Auditor shall be appointed in the manner, and shall perform those functions required by Government Code Sections 6505, 6505.5, and all other applicable laws and regulations, including any subsequent amendments thereto. The Treasurer shall be bonded in accordance with the provisions of section 6505.1. JPA, 13.3.

4.5 GENERAL COUNSEL. The General Counsel shall be the chief legal officer of the Authority. The General Counsel shall give advice or opinions in writing to the Chairman or other Authority officers and shall prepare proposed resolutions, laws, rules, contracts, and other legal documents for the Authority when requested to do so by the Authority. The General Counsel shall attend to all lawsuits and other matters to which the Authority is a part or in which the Authority may be legally interested and do such other things pertaining to the General Counsel's office as the Authority may request.

4.6 OFFICER COMPENSATION. The officers of the Authority shall receive such compensation as the Authority prescribes and in addition, shall receive their actual and necessary expenses, including traveling expenses incurred in the discharge of their duties.

4.7 EXPENSES. If previously approved by the Board, a Director shall receive actual, reasonable, and necessary reimbursement for travel, meals, lodging, registration, and similar expenses incurred on Authority business. The reimbursement rates for lodging shall not exceed the posted rates for a trade conference, but if a lodging at the posted rates is not available, the reimbursement rate shall be comparable to the posted rates. For travel of 250 miles or less, Directors shall be reimbursed at the IRS rate. For travel over 250 miles, Directors shall be reimbursed at the lowest available rate for public air transportation, as determined by the Administrator, or actual cost, whichever is less. As used herein, "transportation" includes travel to and from terminals. Automobile rental expenses shall be approved in advance. Reimbursement for meals, other than alcoholic beverages, shall be at the rate established by the IRS or actual reasonable cost not to exceed $60 per day. Directors may declare the amount of the meal under penalty of perjury in lieu of receipts if the amount is less than the IRS rate. Claims for expense reimbursement shall be submitted to the Administrator of the Board on forms provided by the Authority within 30-days after the expense has been incurred. The Administrator shall determine whether the claim satisfies the requirements of this section and if the claim is denied, the claimant may appeal to the Board.

ARTICLE 5. COMMITTEES

5.1 Pursuant to Article 12 of the Agreement, the Board of Directors may from time to time appoint one or more advisory committees or establish standing or ad hoc committees to assist in carrying out the purposes and objectives of the Authority. The Board shall determine the purpose and need for such committees and the necessary qualifications for individuals appointed to them. Each standing or ad hoc committee shall include a Director as the chair thereof. Other members of each committee may be composed of those individuals approved by the Board of Directors for participation on the committee. However, no committee or participant on such committee shall have any authority to act on behalf of the Authority. Permanent Committees will be given a specific role and, regardless of the number of Directors appointed, shall be subject to compliance with the Brown Act. All Committees will provide regular updates to the full Board about their activities and the progress of their work.

ARTICLE 6. EXECUTIVE DIRECTOR AND STAFF

6.1 EXECUTIVE DIRECTOR. The Board of Directors may appoint an Executive Director, who may be, though need not be an officer, employee, or representative of one of the Members. The Executive Director shall have general supervision over the administration of Authority business and affairs, subject to the direction of the Authority. The Executive Director shall have the powers designated by the Board, and may execute contracts, deeds, and other documents and instruments as authorized by the Authority. The Executive Director's compensation, if any, shall be determined by the Board of Directors. JPA, 10.1-10.2.

6.2 STAFF. The Executive Director may employ such additional full-time and/or part-time employees, assistants, and independent contractors who may be necessary from time to time to accomplish the purposes of the Authority, subject to the approval of the Board of Directors. JPA, 10.4.

ARTICLE 7. FINANCES

7.1 DEPOSIT AND DISBURSEMENT OF FUNDS. All funds of the Authority shall be deposited in one or more depository accounts as may be designated by the Board. Such accounts shall be independent of any account owned by or exclusively controlled by any of the Members. No disbursements of such funds shall be made unless the same shall have been approved in the annual operating budget, or otherwise specifically approved by the Board. Monthly, or at a time established by the Board, all disbursements shall be listed on a report by check number, vendor and amount, and approved by the Board prior to the issuance of a payment. All check disbursements shall require dual signature that will include the Treasurer and Board Chair or Vice Chair.

7.2 BUDGET. The Authority shall operate pursuant to an operating budget to be adopted prior to the beginning of each new fiscal year. JPA, 14.1. The Agency shall endeavor to operate each year pursuant to an annually balanced budget so that projected annual expenses do not exceed projected annual revenues. Budget adjustments to the annual budget shall be reviewed and acted upon by the Board at a regularly scheduled Board meeting occurring after January 1 of each calendar year. The Board may take action to amend the budget at other times if circumstances require more immediate action.

ARTICLE 8. DEBTS AND LIABILITIES

8.1 The debts, liabilities, and obligations of the Authority are not and will not be the debts, liabilities, or obligations of any or all of the Members. JPA, 15.1. However, nothing in this Article or in the Agreement prevents, or impairs the ability of, a Member or Members, from agreeing, in a separate agreement, to be jointly and/or severally liable, in whole or in part, for any debt, obligation, or liability of the Authority, including but not limited to, any bond or other debt instrument issued by the Authority.

ARTICLE 9. REGISTRATION OF FACILITIES

9.1 The Authority may require registration of all groundwater extraction facilities within its management area pursuant to Wat. Code, § 10725.6. The Authority shall keep a register of wells drilled within its management area. It shall be the policy of the Authority to have a standing request with the County of Ventura to be notified of any application or plan for a well or groundwater extraction facility within the Authority's jurisdiction.

ARTICLE 10. FEE ENFORCEMENT

10.1 Fee Enforcement is based on Wat. Code, § 10730.6:

(a) Groundwater fees will be due and payable to the Authority semi-annually by the Owner or Operator. If the Owner or Operator fails to pay a groundwater fee within thirty (30) days of it becoming due, the Owner or Operator shall be liable to the Authority for interest at the rate of one (1) percent per month on the delinquent amount of the groundwater fee and a ten (10) percent penalty.

(b) In the event of an overpayment of groundwater fees and charges by the Owner or Operator, unless the payor requests a refund, the Agency shall apply the overpaid amount to the Owner or Operator's next billing statement or payment cycle.

(c) Should the Authority decide not to bring suit, the Authority may collect any delinquent groundwater charge and any civil penalties and interest on the delinquent groundwater charge pursuant to the laws applicable to United Water Conservation District, County of Ventura, and City of Buenaventura. Collection shall be in the same manner as it would be applicable to the collection of delinquent assessments, water charges, or tolls.

(d) Additionally, the Authority may, after a public hearing, order an Owner or Operator to cease extraction of groundwater until all delinquent fees are paid. The Authority shall give notice to the Owner or Operator by certified mail at least fifteen (15) days in advance of the public hearing.

(e) All remedies specified in this section for collecting and enforcing fees are cumulative and may be pursued alternatively or may be used consecutively as determined by the Authority's Board of Directors.

(f) By an affirmative vote of three (3) Directors, the Authority may, in its sole discretion, waive any interest payments, penalties, or overdue fees.

ARTICLE 11. RECORDS RETENTION

11.1 MAINTENANCE OF THE AUTHORITY RECORDS. The Authority will keep:

(a) All public records, as defined in Cal. Gov. Code Section 6252.

(b) All such records will be kept at the Authority's principal office.

11.2 RECORDS RETENTION POLICY AND SCHEDULE. By December 31, 2018, the Board will review and adopt a Records Retention Policy and Schedule that specifies the retention period of different categories of materials. Implementation of this Policy will be the responsibility of Authority staff.

11.3 INSPECTION RIGHTS.

(a) Any member may inspect the accounting books and records and minutes of the proceedings of the Board and committees of the Board, at any reasonable time, for a purpose reasonably related to such person's interest.

(b) Any inspection and copying under this Section may be made in person or by an agent or attorney or the entity entitled thereto and the right of inspection includes the right to copy.

11.4 MAINTENANCE AND INSPECTION OF AGREEMENT AND BYLAWS. The Authority will keep at its principal executive office the original or copy of the Agreement and these Bylaws as amended to date, which will be open to inspection by the Authority or any Member at all reasonable times during office hours.11.5 INSPECTION BY DIRECTORS. Every Director has the absolute right at any reasonable time to inspect all non-confidential books, records, and documents of every kind and the physical properties of the Authority. This inspection by a Director may be made in person or by an agent or attorney, and the right of inspection includes the right to copy and make extracts of documents.

ARTICLE 12. CODE OF ETHICS AND CONFLICTS OF INTEREST

12.1 DECLARATION OF POLICY. The proper operation of democratic government requires that public officials and employees be independent, impartial and responsible to the people; that government decisions and policy be made in the proper channels of the governmental structure; that public office not be used for personal gain; and the public have confidence in the integrity of its government. In recognition of these goals, there is hereby established a Code of Ethics for all officers and employees, whether elected or appointed, paid or unpaid. This Article establishes ethical standards of conduct for Authority officers and employees by setting forth those acts or actions that are incompatible with the best interests of the Authority and by directing the officers' disclosure of private financial or other interests in matters affecting the Authority.

12.2 CONFLICT OF INTEREST CODE. The Political Reform Act (Government Code Section 81000, et seq.) requires state and local government agencies to adopt and promulgate conflict of interest codes. Pursuant to this, the Authority adopted and promulgated a Resolution which constitutes the Conflict of Interest Code for the Authority, and sets forth designations of officials and employees, and establishes economic disclosure categories. The Authority will review its Conflict of Interest Code every other year as required by the Political Reform Act.

12.3 RESPONSIBILITIES OF PUBLIC OFFICE. Public officials and employees are agents of public purpose and hold office for the benefit of the public. They are bound to uphold the United States and State Constitution and to carry out impartially the laws of the nation, State, and the Authority, thus to foster respect for all governments. They are bound to observe, in their official acts, the highest standards of performance and to discharge faithfully the duties of their office, regardless of personal considerations. Recognizing that the public interests must be their primary concern, their conduct in both their official and private affairs should be above reproach.

12.4 DEDICATED SERVICE. Officers and employees owe a duty of loyalty to the political objectives expressed by the electorate and the programs developed by the Board to attain those objectives. Appointive officers and employees should adhere to the rules of work and performance established as the standards for their positions by the appropriate Authority. Officers and employees should not exceed their Authority or breach the law, or ask others to do so, and owe a duty to cooperate fully with other public officers and employees unless prohibited from so doing by law or by the officially recognized confidentiality of their work.

12.5 FAIR AND EQUAL TREATMENT. Officers and employees shall not request or permit the use of Authority-owned vehicles, equipment, materials, or property for personal convenience or profit, except when such services are available to the public generally or are provided for the use of such officer or employee in the conduct of official business. Officers and employees shall not grant special consideration, treatment or advantage to a member of the public beyond what is available to every other member of the public.

12.6 POLITICAL ACTIVITIES. Officers and employees shall not solicit or participate in soliciting assessment; subscription of contribution to a political party during working hours on property owned by the Authority and shall conform to Government Code Sections 3202 and 3203. Officers and employees shall not promise appointment to a position with the Authority.

12.7 EX PARTE COMMUNICATIONS. Any written communication received by an officer or employee relating to a matter to be discussed by the Authority Board shall be made part of the record of decision. A communication concerning only the status of a pending matter shall not be regarded as an ex parte communication.

12.8 AVOIDANCE OF IMPRESSIONS OF CORRUPTIBILITY. Officers and employees shall conduct their official and private affairs so as not to give a reasonable basis for the impression that they can be improperly influenced in performance of public duties. Officers and employees should maintain public confidence in their performance of the public trust in the Authority. They should not be a source of embarrassment to the Authority and should avoid even the appearance of conflict between their public duties and private interests.

12.9 NO DISCRIMINATION IN APPOINTMENTS. No person shall be appointed to, removed from, or in any way favored or discriminated against with respect to any appointive administrative office because of such person's race, color, age, religion, gender identification, national origin, political opinions, affiliations, or functional limitation as defined by applicable State or federal laws, if otherwise qualified for the position or office. This provision shall not be construed to impair administrative discretion in determining the requirements of a position or in a job assignment of a person holding such a position, subject to review by the Board.

12.10 AUTHORITY ALLEGIANCE AND PROPER CONDUCT. Officers and employees shall not engage in or accept any private employment, or render services for private interest, when such employment or service is incompatible with proper discharge of official duties or would tend to impair independence or judgment or action in the performance of those duties. Officers and employees shall not disclose confidential information concerning the property, government, or affairs of the Authority and shall not use confidential information for personal financial gain. Officers and employees shall not accept a gift in excess of limits established by state law. Officers and employees shall not accept any gift contingent upon a specific action by the Board. Officers and employees shall not appear on behalf of business or private interests of another before the Board where such appearance would create a potential of having to abstain from officers participating on that matter or be incompatible with official duties. Officers and employees shall not represent a private interest of another person or entity in any action or proceeding against the interest of the Authority in any litigation to which the Authority is a party. A Director may appear before the Authority on behalf of constituents in the course of duties as a representative of the electorate or in the performance of public or civic obligations.

12.11 PENALTIES. In addition to any other penalties or remedies provided by law, violation of this Article shall constitute a cause for suspension, removal from office or employment or other disciplinary action after notice and hearing conducted by the appropriate appointing Member or, in the case of the Board, an affirmative vote of four (4) Directors, or three (3) Directors in the event a Director is absent, conflicted or prohibited from voting pursuant to 9.3 of the JPA agreement.

ARTICLE 13. AMENDMENT

13.1 These Bylaws may be amended from time to time by resolution of the Board duly adopted upon majority of the Board at a regular or special meeting of the Board, provided, however, that no such amendment shall be adopted unless at least thirty (30) days written notice thereof has previously been given to all members of the Board. Such notice shall identify the Article to be amended, the proposed amendment, and the reason for the proposed amendment. JPA, 11. The Board may, upon unanimous consent, waive the thirty (30) day written notice period.

ARTICLE 14. PURCHASING POLICY

14.1 POLICY. The Authority will procure Goods and Services in support of its administrative, operational and capital improvement requirements. It is the intent of the Authority to engage in procurements that ensure it will receive Goods and Services of the appropriate quantity, of a satisfactory level of quality, delivered in a timely manner, and at a price that represents the best value to the Authority, its Members, and other affected parties. Furthermore, it will employ procurement processes that are fair and equitable and will allow providers of Goods and Services the greatest opportunity to participate and compete for the Authority's procurement engagements.

14.2 DEFINITIONS.

The following definitions shall apply to this Article:

(a) <u>Contract</u>. A written document establishing terms and conditions between buyer and seller for the provision of Goods or Services, and includes Professional Service Agreements, General Service Agreements, and Purchase Orders.

(b) <u>Critical Repairs</u>. Services performed on Agency facilities that are unplanned, unexpected and which are essential to the continued operation of the facilities, but do not rise to the level of "Emergency."

(c) <u>Formal Competitive Solicitation</u>. The issuance of a written Request for Bids, proposals or quotations.

(d) <u>Goods</u>. Refers to all types of tangible personal property including materials, supplies, and equipment.

(e) <u>Material Change</u>. A change to essential terms in a contract including, not limited to, consideration, scope of Services, insurance and indemnity obligations, and assignment.

(f) <u>Informal Competitive Solicitation</u>. A written request for a bid, proposal, or quotation in accordance with written terms and conditions included in the request.

(g) <u>Public Works Construction Agreement.</u> Agreement for the erection, construction, alteration, repair, or improvement of any public structure, building, road, or other public improvement of any kind and awarded in compliance with competitive bidding statutes.

(h) <u>Requisition</u>. A document generated by staff to identify and establish a requirement for, and request authorization of, the procurement of Goods and Services.

(i) Service(s). The labor, intellectual property or other work product provided by a Contractor or Consultant that is not tangible personal property.

14.3 PROCUREMENT OF GOODS AND SERVICES.

(a) Procurement Authority. Procurement authority shall be exercised and performed by the Board of Directors through the approval of warrants presented to the Board. This authority includes both the authority to approve procurements and the authority to commit the Agency to procurements. The Board of Directors may delegate certain authorities to the Agency's management and staff. These delegated authorities shall be exercised and performed in accordance with applicable federal, state, and local laws and the polices contained herein.

(b) Procurement of Goods, Professional Services and Non-Professional Services. The Agency may procure Goods and Services as authorized below:

(1) Procurements of Goods, Professional Services and Non-Professional Services Less than $500:

(i) The Executive Director may expend up to $500 to purchase necessary supplies and equipment without secondary approval.

(2) Procurement of Goods, Professional Services and Non-Professional Services over $500:

(i) Requires Board approval of a Purchase Order.

(ii) Signed by both the Board Chair and Treasurer.

(3) Amendments/ Change Orders / Revisions: Material Changes to a contract document require authorization. Approval and execution is subject to the thresholds established above and based on the final value of the Contract document after the change is incorporated.

(c) Leasing of Goods. Leasing of Goods is subject to the same requirements established for the procurement of Goods, as defined in section (b).

(d) Public Works. The procurement of Goods and Services for the construction of public works by the Agency shall be governed by California Public Contract Code sections 20640 et seq.

(e) Amendments/ Change Orders/ Revisions: Material Changes to a Contract document require authorization. Approval and execution is subject to the thresholds established above and based on the final value of the Contract document after the change is incorporated. Change Orders within preapproved funding amounts require execution by the Board of Directors.

14.4 EMERGENCY PURCHASES AND SERVICES. In the event of an emergency, the Executive Director may make immediate purchases of Goods and Services pursuant to California Public Contract Code section 20640 *et seq*. Emergency purchases include any purchase required to prevent imminent danger or to prevent or mitigate the loss or impairment of life, health, property, or essential public services. Every effort shall be made to obtain advance approvals or to obtain approvals as soon as possible following the purchase.

14.5 PROCUREMENT OF CRITICAL GOODS AND SERVICES. When expenditures are made for the procurement of Critical Goods and Services, staff will use its best efforts to conform to the Informal Solicitation process, and shall not exceed $1,000 per each critical repair or critical acquisition. Any expenditure for these types of repairs will be brought to the Board of Directors at the next regularly scheduled Board meeting for ratification.

ARTICLE 15. DEFINITIONS AND CONSTRUCTION

15.1 Unless specifically defined in these Bylaws, all defined terms shall have the same meaning ascribed to them in the Agreement. If any term of these Bylaws conflicts with any term of the Agreement, the Agreement's terms shall prevail, and these Bylaws shall be amended to eliminate such conflict of terms. Unless the context or reference to the Agreement requires otherwise, the general provisions, rules of construction, and definitions in the California Civil Code will govern the construction of these Bylaws.

EFFECT. These bylaws shall take effect immediately upon adoption.

PASSED, APPROVED AND ADOPTED on August 16, 2018, by the following votes:

AYES: Four (Brown, Chambers, Mobley, Shephard)

NOES: None

ABSTAIN: None

ABSENT: one (Everts)

Chair

ATTEST:

Secretary

[Seal]

LIST OF ALL BENEFICIAL USES AND USERS OF GROUNDWATER

Pursuant to Water Code Sections 10723.8(a)(4) and 10723.2, the Agency will consider the interests of all beneficial uses and users of groundwater, as well as those responsible for implementing a Groundwater Sustainability Plan ("Plan").

The Mound Basin Groundwater Sustainability Agency ("Agency") has engaged stakeholders in the development of the Agency to serve as the groundwater sustainability agency ("GSA"). For example, during development of the joint powers authority agreement ("JPA Agreement") forming the Agency, the signatory members held public meetings to educate stakeholders within the Mound Basin ("Basin") about the requirements of the Sustainable Groundwater Management Act ("SGMA"), the JPA Agreement, and the Agency's intention to form a GSA for the Basin. In addition to the Agency's public outreach efforts, it also designated two seats on its five-seat Board of Directors for Stakeholder Directors: one seat is reserved for an Agricultural Stakeholder Director and one seat is reserved for an Environmental Stakeholder Director.

The Agency plans to continue its practice of seeking broad stakeholder engagement in management of the Basin's groundwater resources as it undertakes the process to develop and implement the Plan for the Basin over the next several years. The Agency will solicit and welcome participation from the following stakeholder groups:

Holders of Overlying Groundwater Rights, including:

- **Agricultural Users.** There are agricultural users of groundwater operating on land overlying the Basin. To account for these users' interests, the Agency designated a seat on its five-member governing board to be filled by an Agricultural Stakeholder Director. The Agricultural Stakeholder Director will be appointed from nominations received by the Mound Basin Ag Water Group (MBAWG) or the Ventura County Farm Bureau. The Agricultural Stakeholder Director is responsible for engaging the Basin's agricultural users of groundwater and representing their interests before the Agency.
- **Domestic Well Owners.** There are domestic wells overlying the Basin. It is believed that the majority of these domestic well owners are de minimus users, as defined by SGMA. The Agency anticipates that the Plan will address the collective interests of domestic users of groundwater wells and plans to engage in outreach to domestic well owners throughout the development of the Plan through inviting their participation in the Agency's public meetings.

Municipal Well Operators. The Agency is a joint powers authority created by three local public agencies. Two of the Agency's signatory members—the City of San Buenaventura and the County of Ventura (irrigation)—operate wells within the Basin and are represented on the Agency's Board of Directors.

Public Water Systems. The following public water systems are located within the Agency's boundaries:

- Ventura Water (City of San Buenaventura)

The City of San Buenaventura is a signatory member to the JPA Agreement forming the Agency and is represented on the Agency's Board of Directors.

Local Land Use Planning Agencies. Both the County of Ventura ("County") and the City of San Buenaventura have land use planning authority on land overlying the Basin. Both are signatory members to the JPA Agreement forming the Agency and are represented on the Agency's Board of Directors.

Environmental Users of Groundwater. There are several environmental organizations dedicated to preserving and maintaining environmental values operating within the boundaries of the Basin. To account for these users' interests, the Agency designated a seat on its five-member governing board to be filled by an Environmental Stakeholder Director. The Environmental Stakeholder Director will be appointed from nominations received from local environmental nonprofit organizations supportive of the Basin's groundwater sustainability. The Environmental Stakeholder Director is responsible for engaging stakeholders within the Basin and representing environmental interests before the Agency.

Surface Water Users, if there is a hydrologic connection between surface and groundwater bodies. N/A.

Federal Government, including, but not limited to, the military and managers of federal lands. N/A. No land overlying the Basin is managed by the Federal Government.

California Native American Tribes. The Agency will ensure that a representative of overlying California Native American tribes is on the Agency's interested parties list, in order to receive notices of all Agency meetings and other stakeholder involvement opportunities.

Disadvantaged Communities, including, but not limited to those served by private domestic wells or small community water systems. N/A.

Entities Listed in Section 10927 that are Monitoring and Reporting Groundwater Elevations in all or a part of the Groundwater Basin Managed by the GSA. The County is the designated California Statewide Groundwater Elevation Monitoring ("CASGEM") entity for the Basin. The County is a signatory member to the JPA Agreement forming the Agency and represented on the Agency's Board of Directors.

The Agency's and other stakeholders' roles and responsibilities will be further developed and defined in the Sustainability Plan. The Agency's staff welcomes feedback during this process from the State, any of the agencies or organizations listed herein, and any other interested stakeholders.

If the Department of Water Resources ("DWR") requires anything further prior to the acceptance of this notification of the Agency's election to serve as the GSA for the Basin, please address your inquiry to:

Jennifer Tribo, Interim Executive Director
Mound Basin GSA
501 Poli Street
Ventura, California 93001

Appendix D

MBGSA Stakeholder Engagement Plan

STAKEHOLDER ENGAGEMENT PLAN

MOUND BASIN

(4-004.03) VENTURA COUNTY, CALIFORNIA

SUSTAINABLE GROUNDWATER MANAGEMENT ACT (SGMA) PROGRAM

PREPARED BY THE MOUND BASIN GROUNDWATER SUSTAINABILITY AGENCY

UPDATED AND ADOPTED OCTOBER 15, 2020

Table of Contents

1 INTRODUCTION

This Stakeholder Engagement Plan (Engagement Plan) summarizes the strategies to educate and involve stakeholders (those individuals and representatives of organizations who have a direct stake in the outcome of the planning process) and other interested parties in the preparation and implementation of a Groundwater Sustainability Plan (GSP) for the Mound Basin – Department of Water Resources (DWR) Basin No. 4-004.03 (Figure 1). This GSP will be prepared in accordance with the Sustainable Groundwater Management Act (SGMA), which was signed by Governor Brown in September 2014 and became effective January 1, 2015.

SGMA provides a framework to regulate groundwater for the first time in California's history. SGMA's intent is to strengthen local management of specified groundwater basins that are most critical to the state's water needs by regulating groundwater and land use management activities. SGMA also aims to preserve the jurisdictional authorities of cities, counties and water agencies within groundwater basins while protecting existing surface water and groundwater rights.

The Mound Basin Groundwater Sustainability Agency (MBGSA or Agency), a Groundwater Sustainability Agency (GSA), was formed by three local agencies: County of Ventura (County), City of San Buenaventura (City), and United Water Conservation District (UWCD). There was extensive stakeholder engagement during that process. The governing board consists of one representative from each of those agencies plus two stakeholder directors representing environmental and agricultural interests. The GSA is responsible for developing a GSP for the Mound Basin to achieve long-term groundwater sustainability. Additionally, SGMA requires and directs GSAs to encourage active involvement of stakeholders and interested parties in the process to sustainability manage the basin.

2 PURPOSE

The purpose of the outreach activities described in this Engagement Plan is to encourage the active involvement of individual stakeholders and stakeholder organizations, and other interested parties in the development and implementation of the GSP for the Mound Basin. This GSP is required under SGMA to be completed no later than January 31, 2022. The projects and management actions necessary to implement the GSP could affect individuals and groups who have a stake in ensuring the basin is sustainably managed as required by SGMA.

In an effort to understand and involve stakeholders and their interests in the decision- making and activities, the MBGSA has prepared this Engagement Plan to encourage broad, enduring and productive involvement during the GSP development and implementation phases. This Engagement Plan will assist the MBGSA in providing timely information to stakeholders and receive input from interested parties during GSP development. This Engagement Plan will identify stakeholders who have an interest in groundwater in the Mound Basin, and recommend outreach, education, and communication strategies for engaging those stakeholders during the development and implementation of the GSP. The plan also includes an approach for evaluating the overall success of stakeholder engagement and education of both stakeholders and the public. In consideration of the interests of all beneficial uses and users of groundwater in the basin, this Engagement Plan has been developed pursuant to California Water Code Section 10723.2. Additionally, this Engagement Plan has been developed to encourage the active involvement of diverse social, cultural, and economic elements of the population within the Mound Basin, in accordance with GSP Regulations Section 354.10.

3 GENERAL INFORMATION

The following personnel will serve as contacts for the public during GSA formation and GSP preparation.

3.1 Clerk of the Board

For general information about MBGSA and the GSP status, contact:

Jackie Lozano, Clerk of the Board, (805) 525-4431, email jackiel@unitedwater.org.

3.2 Executive Director

MBGSA's Executive Director will be available for stakeholders and the public seeking specific detailed information about the GSP, contact:

Bryan Bondy, Executive Director, (805) 212-0484, email bryan@bondygroundwater.com.

4 OUTREACH ACTIVITIES

MBGSA will implement the following outreach activities to maximize stakeholder involvement during the development of the GSP and throughout SGMA implementation.

4.1 Public Notices

To ensure that the general public is apprised of local activities and allow stakeholders to access information, SGMA specifies several public notice requirements for GSAs. Refer to Table 1 in Appendix A for a summary of statutory requirements. Three sections of the California Water Code require public notice before establishing a GSA, adopting (or amending) a GSP, or imposing or increasing fees:

- Section 10723(b). "Before electing to be a groundwater sustainability agency, and after publication of notice pursuant to Section 6066 of the Government Code, the local agency or agencies shall hold a public hearing in the county or counties overlying the basin." In accordance with California Water Code Section 10723(b), the following was noticed to the public: On June 22, 2017, the MBGSA held a public hearing to consider becoming a GSA for the Mound Basin. The public hearing was noticed in the *Ventura County Star* in accordance with Government Code Section 6066.
- Section 10728.4. "A groundwater sustainability agency may adopt or amend a groundwater sustainability plan after a public hearing, held at least 90 days after providing notice to a city or county within the area of the proposed plan or amendment. …"
- Section 10730(b)(1). "Prior to imposing or increasing a fee, a groundwater sustainability agency shall hold at least one public meeting, at which oral or written presentations may be made as part of the meeting....(3) At least 10 days prior to the meeting, the groundwater sustainability agency shall make available to the public data upon which the proposed fee is based." In accordance with California Water Code Section 10730(b)(1), the following was noticed to the public: On August 23, 2018, the MBGSA held a public hearing to consider establishing a groundwater extraction fee. The public hearing was noticed in the *Ventura County Star* in accordance with Government Code Section 6066 and data upon which the fee is based was posted to the MBGSA website and mailed to all entities on the interested parties list prior to the meeting.
- Future noticing will occur as required by SGMA.

4.2 Stakeholder Identification

Pursuant to Water Code Sections 10723.8(a)(4) and 10723.2, the Agency will consider the interests of all beneficial uses and users of groundwater, as well as those responsible for implementing a GSP.

MBGSA has engaged stakeholders in the development of the Agency to serve as the GSA. For example, during development of the joint powers authority agreement ("JPA Agreement") forming the Agency, the signatory members held numerous public meetings to discuss important terms to be included in the JPA Agreement. The signatory members also held multiple stakeholder outreach meetings to engage and educate stakeholders within the Mound Basin about the SGMA requirements the JPA Agreement, and the Agency's intention to form a GSA for the Mound Basin. In addition to the Agency's public outreach efforts, it also designated two seats on its five-seat Board of Directors for Stakeholder Directors: one seat is reserved for an Agricultural Stakeholder Director and one seat is reserved for an Environmental Stakeholder Director.

The Agency plans to continue its practice of seeking broad stakeholder engagement in management of the Mound Basin's groundwater resources as it undertakes the process to develop and implement the Plan for the Mound Basin over the next several years.

SGMA mandates that a GSA establish and maintain a list of persons interested in receiving notices regarding plan preparation, meeting announcements, and availability of draft plans, maps, and other relevant documents. The MBGSA compiled a list of interested persons for this purpose that will be maintained throughout the GSA formation and GSP development phases. An initial list of stakeholders and interested parties include, but are not limited to, the following:

a) Holders of overlying groundwater rights, including:

   1) Agricultural well owners - There are agricultural users of groundwater operating on land overlying the Basin. To account for these users' interests, the Agency designated a seat on its five-member governing board to be filled by an Agricultural Stakeholder Director. The Agricultural Stakeholder Director will be appointed from nominations received by the Mound Basin Ag Water Group (MBAWG) or the Ventura County Farm Bureau. The Agricultural Stakeholder Director is responsible for engaging the Basin's agricultural users of groundwater and representing their interests before the Agency.

   2) Domestic well owners - There are domestic wells overlying the Basin. It is believed that the majority of these domestic well owners are de minimus users, as defined by SGMA. The Agency anticipates that the Plan will address the collective interests of domestic users of groundwater wells and plans to engage in outreach to domestic well owners throughout the development of the Plan through inviting their participation in the Agency's public meetings.

   3) Industrial well owners - Two industrial wells have been identified in the basin: Saticoy Lemon Association (lemon packing facility cooperative) and Ivy Lawn Cemetery Association. Given Saticoy Lemon Association's ties to agriculture, the Agricultural Stakeholder Director will be responsible for engaging this stakeholder. The Executive Director will be responsible for engaging Ivy Lawn Memorial.

   4) Other - The County of Ventura operates a well for landscape irrigation at the County Government Center. The County is represented on the Agency's Board of Directors.

b) Municipal Well Operators - The Agency is a joint powers authority created by three local public agencies. One of the Agency's signatory members—the City of San Buenaventura operates municipal wells within the Basin and is represented on the Agency's Board of Directors.

c) Public water systems

   1) Ventura Water (City of San Buenaventura)

   The City of San Buenaventura is a signatory member to the JPA Agreement forming the Agency and is represented on the Agency's Board of Directors.

d) Local land use planning agencies - Both the County of Ventura ("County") and the City of San Buenaventura have land use planning authority on land overlying the Basin. Both are signatory members to the JPA Agreement forming the Agency and are represented on the Agency's Board of Directors.

e) Environmental - There are several environmental organizations dedicated to preserving and maintaining environmental values operating within the boundaries of the Basin. To account for these users' interests, the Agency designated a seat on its five-member governing board to be filled by an Environmental Stakeholder Director. The Environmental Stakeholder Director will be appointed from nominations received from local environmental nonprofit organizations supportive of the Basin's groundwater sustainability. The Environmental Stakeholder Director is responsible for engaging stakeholders within the Basin and representing environmental interests before the Agency.

f) Surface Water Users if there is a hydrologic connection between surface and groundwater. Not applicable.

g) The federal government - No land overlying the Mound Basin is managed by the Federal Government.

h) California Native American Tribes - The Agency will ensure that a representative of overlying California Native American tribes is on the Agency's interested parties list, in order to receive notices of all Agency meetings and other stakeholder involvement opportunities.

i) Disadvantaged communities, including, but not limited to, those served by private domestic wells or small community water systems. The City of San Buenaventura (City) serves the areas indicated by DWR as Disadvantaged Communities (DACs) and Severely Disadvantaged Communities (SDACs). Outreach to DAC's shall be accomplished via bill stuffers or other means through the City's water department (Ventura Water), including materials provided in Spanish.

j) Entities listed in Section 10927 that are monitoring and reporting groundwater elevations in all or a part of a groundwater basin managed by the groundwater sustainability agency. The County is the designated California Statewide Groundwater Elevation Monitoring ("CASGEM") entity for the Basin. The County is a signatory member to the JPA Agreement forming the Agency and represented on the Agency's Board of Directors.

k) Casitas Municipal Water District (CMWD) - CMWD is a wholesale water agency that provides a portion of the potable water supplied by Ventura Water within the Basin. CMWD does not operate any facilities in the Basin. CMWD's service area overlaps with a western portion of the Basin.

MBGSA intends to work cooperatively with partner agencies, stakeholders, and interested parties to develop and implement the GSP for the Mound Basin and will maintain a list of stakeholders and interested parties to be included in the formation of the GSP.

A person can be added to the interested parties list by submitting an inquiry via the MBGSA website: http://moundbasingsa.org/contact-us/ or by contacting the Clerk of the Board.

4.3 Integrated Regional Water Management

The Watershed Coalition of Ventura County (WCVC) prepared an Integrated Regional Water Management Plan in 2006 and has been updated multiple times since. The Santa Clara River Watershed Committee, a sub organization of WCVC, is actively involved in the community on a wide range of issues affecting the watershed, including the Mound Basin. Since this group provides a forum for the discussion of issues that are important to the community, it is important for this group to be well informed throughout GSP development. Representatives from the MBGSA attend Council meetings and provide up-to-date information and hear feedback from Council members.

4.4 Public Hearings/Meetings

4.4.1 Planning Commission

Periodic updates on SGMA implementation will be provided to the City of Ventura Planning Commission and the Ventura County Planning Commission and the public will be invited to listen.

4.4.2 Public Meetings

Comprehensive stakeholder involvement will include regularly scheduled public meetings to aid in developing and implementing the GSP. Logical subdivisions of the GSP will be the subject of public meetings to receive comments prior to approval. In addition to signing up to receive information about GSP development at the MBGSA webpage, interested parties may participate in the development and implementation of the GSP by attending and participating in public meetings (Water Code Section 10727.8(a)). Public meetings are generally been held at Ventura City Hall, 501 Poli Street, Ventura, California 93001. Future public meetings will generally be held at this location, although some meetings may be moved to other locations depending on meeting room availability. Each meeting will have a scheduled time for public comments. While the California Governor's Executive Stay at Home Order and the County of Ventura Health Officer Declared Local Health Emergency and Be Well at Home Order remain in effect, meetings will be held on-line. When appropriate, on-line meetings will include polling features to facilitate stakeholder input. Information about upcoming meetings can be found on the MBGSA website: http://moundbasingsa.org.

4.4.3 Local Agency Meetings

To ensure their constituency is kept informed of the progress of GSP development and implementation, the Directors representing MBGSA member agencies, which consist of County of Ventura, City of San Buenaventura, and United Water Conservation District have committed to providing periodic updates during their regularly scheduled board meetings. These meetings offer a chance for the public to receive information and provide comment. Information about upcoming meetings is provided on the following agency websites, or by the means each agency currently meets its legal noticing requirements, whichever is appropriate:

http://cityofventura.ca.gov

http://ventura.org (Board of Supervisors)

https://www.unitedwater.org/

4.5 Direct Mailings/Email

Public meetings and project information will be disseminated through email, from the Agency office, or direct mail under special circumstances if requested. This communication will provide information for the community, public agencies, and other interested persons/organizations about milestones, meetings, and the progress of GSP development. Property owners with groundwater wells within the basin are notified via email and/or direct mailings about the establishment of an interested persons list and given the opportunity to receive future notices.

4.6 Newsletters/Columns

Periodic GSP newsletters will be developed and sent to the interested parties and posted on the website. Periodic updates may be provided to the *Ventura County Star* newspapers to advise, educate, and inform the public on SGMA implementation.

4.7 MBGSA Website

Regular updates on the GSP development and implementation will be provided on the MBGSA website. This information will include maps, timelines, frequently asked questions, groundwater information, and schedules/agenda of upcoming meetings and milestones. This information will be accessible on the MBGSA website: http://moundbasingsa.org. MBGSA staff will update the website regularly and invite users to request information or be added to the interested persons list. In addition, general information about SGMA and groundwater conditions will be available on UWCD's website.

4.8 Database

To distribute information about GSP development, an email list has been compiled into a database of interested persons and stakeholders. The database will be updated regularly to add names of attendees at public meetings along with those requesting information via email or the through the MBGSA website.

4.9 Tribal Engagement

Portions of the Barbareno-Ventureno Band of Chumash are located within the Mound Basin. Although the tribe is not subject to the requirements of SGMA, any federally recognized Indian tribe may voluntarily participate with GSAs in the preparation or administration of a GSP. MBGSA will inform the Tribal Elder, Julie Tumamait, and Tribal representative Walter Viar throughout the GSP development process and GSP implementation.

4.10 Additional Opportunities

Additional opportunities for stakeholder participation (e.g., an advisory committee) will be considered as GSP development progresses and as stakeholder interests evolve.

5 EVALUATION

To determine the level of success of the Engagement Plan, the MBGSA will implement the following measures:

5.1 Attendance/Participation

A record of those attending public meetings will be maintained throughout the GSP development process. MBGSA will utilize sign-in sheets and request feedback from attendees to determine adequacy of public education and productive engagement in the GSP development and implementation process. Meeting minutes will also be prepared and will be provided on the MBGSA website once approved.

5.2 Polling

Polls will be used to determine how stakeholders are receiving notices about GSP status and meetings and if any stakeholder categories require additional outreach. Polls will also be used to determine topics of most interest and the level of information that is desired for specific topics. Outreach methods will be tailored based on polling response.

5.3 Adherence to Schedule

Public participation in developing sustainable management criteria and projects and management actions for inclusion in the GSP is instrumental to the success of the GSP. Keeping these tasks on schedule will be an important indicator of stakeholder involvement. GSP development updates will be provided at each Regular Board of Directors meeting. A GSP development schedule will be developed and updated monthly.

5.4 Plan Update

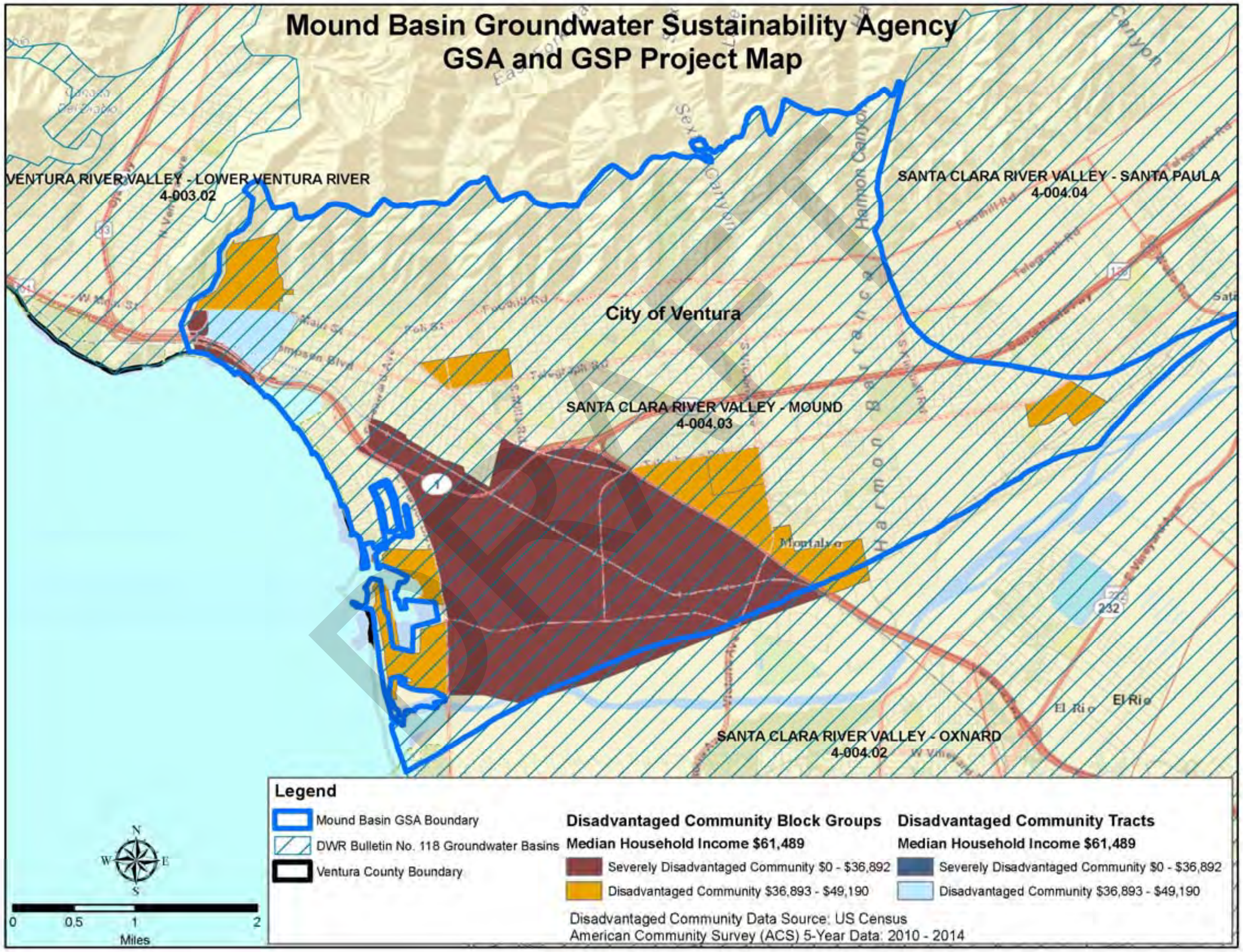
This Plan will be updated at least annually.

APPENDIX A

TABLE 1

During GSA Formation:	
"Before electing to be a groundwater sustainability agency... the local agency or agencies shall hold a public hearing."	Water Code Sec. 10723 (b)
"A list of interested parties [shall be] developed [along with] an explanation of how their interests will be considered."	Water Code Sec. 10723.8.(a)(4)
During GSP Development and Implementation:	
"A groundwater sustainability agency may adopt or amend a groundwater sustainability plan after a public hearing."	Water Code Sec. 10728.4
"Prior to imposing or increasing a fee, a groundwater sustainability agency shall hold at least one public meeting."	Water Code Sec. 10730(b)(1)
"The groundwater sustainability agency shall establish and maintain a list of persons interested in receiving notices regarding plan preparation, meeting announcements, and availability of draft plans, maps, and other relevant documents."	Water Code Sec. 10723.4
"Any federally recognized Indian Tribe... may voluntarily agree to participate in the preparation or administration of a groundwater sustainability plan or groundwater management plan... A participating Tribe shall be eligible to participate fully in planning, financing, and management under this part."	Water Code Sec. 10720.3(c)
"The groundwater sustainability agency shall make available to the public and the department a written statement describing the manner in which interested parties may participate in the development and implementation of the groundwater sustainability plan."	Water Code Sec. 10727.8(a)
Throughout SGMA Implementation:	
"The groundwater sustainability agency shall consider the interests of all beneficial uses and users of groundwater."	Water Code Sec. 10723.2
"The groundwater sustainability agency shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the groundwater basin."	Water Code Sec. 10727.8(a)

FIGURE 1


Mound Basin Groundwater Sustainability Agency
GSA and GSP Project Map
VENTURA RIVER VALLEY - LOWER VENTURA RIVER
4-003.02
SANTA CLARA RIVER VALLEY - SANTA PAULA
4-004.04
City of Ventura
SANTA CLARA RIVER VALLEY - MOUND
4-004.03
SANTA CLARA RIVER VALLEY - OXNARD
4-004.02
Montalvo
El Rio
Legend
Mound Basin GSA Boundary
DWR Bulletin No. 118 Groundwater Basins
Ventura County Boundary
Disadvantaged Community Block Groups
Median Household Income $61,489
Severely Disadvantaged Community $0 - $36,892
Disadvantaged Community $36,893 - $49,190
Disadvantaged Community Tracts
Median Household Income $61,489
Severely Disadvantaged Community $0 - $36,892
Disadvantaged Community $36,893 - $49,190
Disadvantaged Community Data Source: US Census
American Community Survey (ACS) 5-Year Data: 2010 - 2014
0 0.5 1 2
Miles

Appendix E

List of Public Meetings (Reg. §354.10)

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(805) 525-4431
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Groundwater Sustainability Plan (GSP)

Historical Information on Public Meetings Related to the GSP Development

(Time Period: 2018-October through 2021-April)

MEETING DATE	MEETING TYPE (Regular, Special, Workshop)	ITEM TYPE (Informational or Motion)	TOPIC (Agenda Item Title)	RECOMMENDED ACTION (Agenda Item Description)	ACTION TAKEN (Approved, No Motion, Deferred, Continued)
2018-10-18	Regular	Motion	Approval of Stakeholder Engagement Plan	The Board will consider approving the proposed Stakeholder Engagement Plan.	Approved
2018-10-18	Regular	Informational	GSP Development Options	Executive Director Bryan Bondy will lead the Directors in a discussion of the various options relating to the development of the Agency's Groundwater Sustainability Plan.	No motion
2019-01-17	Regular	Motion	GSP Development Options (Grant Category (c): Planning Activities; Task 2: Organizational Activities)	The Executive Director will provide an update on discussions with United Water Conservation District (UWCD) concerning technical support services for the GSP, discuss options for servicing various GSP elements, and provide direction to staff.	Approved
2019-01-17	Regular	Motion	Isotope Study (Grant Category (b): Models and Studies)	The Board will consider approving professional services by S.S. Papadopulos and Associates to assist the Agency with completing the isotope study described in the GSP Grant application.	Approved
2019-02-21	Regular	Motion	Agreement with United Water Conservation District for GSP Technical Services	The Board will consider conditionally authorizing the Chair to execute an agreement with United Water Conservation District for groundwater modeling and other technical services related to GSP development.	Approved
2019-03-21	Regular	Motion	GSP As-Needed Support Services (Grant Category (c): Planning Activities; Task 2: Organizational Activities)	Board will consider authorizing the Chair to execute a professional services agreement with Intera, Inc., subject to negotiation of agreement terms to the satisfaction of the Chair, Agency Counsel, and Executive Director.	Approved

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2019-05-16	Regular	Motion	Approval of Intera Work Order No. 1	The Board will consider approving Work Order No. 1 for Intera, for the review of background information, creation of a GSP document template, and other preparatory activities outlined in work order.	Approved
2019-10-17	Regular and Public Hearing	Motion	GSP Development Update	The Board will receive an update from the Executive Director concerning GSP development and consider providing feedback to staff.	Approved
2019-10-17	Regular and Public Hearing	Motion	Approval of Intera, Inc. Work Order Nos. 2 and 3	The Board will consider approving two work orders for Inter, Inc. Work Order No. 2 will address development of options for a MBGSA data management system, a required element of the GSP. Work Order No. 3 will provide budget for Intera, Inc. to review the hydrogeologic conceptual model (HCM) developed by UWCD, support the Executive Director with preliminary review of sustainability management criteria, and assit with a public workshop concerning the aforementioned topics.	Approved
2019-12-19	Regular	Motion	Approval of Intera, Inc. Work Order No. 4	The Board will consider approving Intera Work Order No. 4 for an amount not-to-exceed $15,640 to develop the MBGSA Data Management System and populate it with data for GSP development and up to $5,000 in contingency, to be authorized at the discretion of the Executive Director.	Approved

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(Time Period: 2018-October through 2021-April)

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2020-02-20	Regular	Informational	Executive Director Update	Executive Director will provide an informational update on Agency activities since the previous Board meeting, including a recurring GSP Development update.	No motion required.
2020-02-20	Regular	Informational	GSP Monthly Update (Grant Category (d), Task 4)	The Board will receive an update from the Executive Director concerning development of the Agency's Groundwater Sustainability Plan and may provide feedback or direction to staff.	No motion required.
2020-02-20	Regular	Motion	Data Management System Update (Grant Category (d), Task 4)	The Board will receive an update from the Executive Director concerning development of the Agency's data management system and may provide feedback or direction to staff.	No motion required.
2020-02-20	Regular	Motion	Isotope Study Report (Grant Category (b))	The Board will consider receiving and filing the Isotope study report.	Approved
2020-04-16	Regular	Motion	GSP Monthly Update (Grant Category (d), Task 4)	The Board will receive an update from the Executive Director concerning development of the Agency's Groundwater Sustainability Plan and grant status. The Board may provide feedback or direction to staff.	Approved
2020-05-21	Regular	Motion	GSP Monthly Update (Grant Category (d), Task 4)	The Board will receive an update from the Executive Director concerning development of the Agency's Groundwater Sustainability Plan and grant status. The Board may provide feedback or direction to staff.	Approved
2020-05-21	Regular	Motion	Intera Work Order No. 5 for GSP Development (Grant Category (d), Task 4)	The Board will consider approving Work Order No. 5 for Intera for an amount not to exceed $256,760 for GSP development.	Approved
2020-06-18	Regular and Public Hearing	Informational	Executive Director Update	Executive Director will provide an informational update on Agency activities since the previous Board meeting, including a recurring GSP Development update.	No motion required.

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2020-06-18	Regular and Public Hearing	Motion	GSP Monthly Update (Grant Category (d), Task 4)	The Board will receive an update from the Executive Director concerning development of the Agency's Groundwater Sustainability Plan and grant status. The Board may provide feedback or direction to staff.	Approved
2020-06-18	Regular and Public Hearing	Motion	Sustainable Management Criteria Overview and Sustainability Goal Discussion (Grant Category (d), Task 4)	The Board will receive background information concerning development of sustainable management criteria and consider approving a process for developing the sustainability goal description.	Approved
2020-07-16	Regular	Informational	Executive Director Update	Executive Director will provide an informational update on Agency activities since the previous Board meeting, including a recurring GSP Development update.	No motion required.
2020-07-16	Regular	Motion	GSP Monthly Update (Grant Category (c), Task 3 and Category (d), Task 4) *Note: Draft Newsletter, July 2020, Volume 1, Issue 2 included with GSP Monthly Update*	The Board will receive an update from the Executive Director concerning development of the Agency's Groundwater Sustainability Plan and grant status. The Board may provide feedback or direction to staff.	Approved
2020-07-16	Regular	Motion	Sustainability Goal Public Draft Release (Grant Category (d), Task 4)	The Board will consider approving the draft sustainability goal description for public comment release.	Approved
2020-07-16	Regular	Motion	Set Date and Time for GSP Stakeholder Workshop - Webinar (Grant Category (c), Task 3)	The Board will consider setting the date and time for Stakeholder Workshop No. 1.	Approved
2020-08-20	Regular	Informational	Groundwater Model Presentation	The Board will receive a presentation from United Water Conservation District staff concerning groundwater model development.	No motion required.

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2020-08-20	Regular	Motion	GSP Monthly Update (Grant Category (c), Task 3 and Category (d), Task 4)	The Board will receive an update from the Executive Director concerning development of the Agency's Groundwater Sustainability Plan and grant status. The Board may provide feedback or direction to staff.	Approved
2020-08-20	Regular	Motion	Sustainability Goal (Grant Category (d), Task 4)	The Board will consider approving the sustainability goal for the Agency's Groundwater Sustainability Plan.	Continued
2020-08-20	Regular	Motion	Sustainable Management Criteria Screening (Grant Category (d), Task 4)	The Board will review sustainable management criteria screening results and consider providing feedback to staff.	Approved
2020-08-20	Regular	Motion	GSP Stakeholder Workshop Webinar Agenda (Grant Category (c), Task 3)	The Board will discuss the draft agenda for Stakeholder Workshop No. 1 and consider providing feedback to staff.	No motion required.
2020-09-30	Workshop	Informational	Mound Basin Groundwater Sustainability Plan (GSP) Online Public Workshop No. 1	Presented to public/stakeholders: • Introduction to SGMA and GSPs • Overview of Basin Setting • Groundwater Model Summary • Next Steps for GSP Development • Stakeholder Questions and Feedback • Director Comments • Q&A built in throughout	No motion required.
2020-09-17	Regular	Informational	GSP Stakeholder Workshop No. 1 Recap (Grant Category (c), Task 3)	The Executive Director will summarize insights gained from GSP Workshop No. 1.	No motion required.
2020-09-17	Regular	Motion	GSP Monthly Update (Grant Category (c), Task 3 and Category (d), Task 4)	The Board will receive an update from the Executive Director concerning development of the Agency's Groundwater Sustainability Plan and grant status. The Board may provide feedback or direction to staff.	Approved

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2020-09-17	Regular	Motion	Sustainability Goal (Grant Category (d), Task 4)	The Board will consider approving the sustainability goal for the Agency's Groundwater Sustainability Plan.	Approved
2020-10-15	Regular	Motion	GSP Monthly Update (Grant Category (c), Task 3 and Category (d), Task 4)	The Board will receive an update from the Executive Director concerning development of the Agency's Groundwater Sustainability Plan and grant status. The Board may provide feedback or direction to staff.	Approved
2020-11-19	Regular	Motion	GSP Monthly Update (Grant Category (c), Task 3 and Category (d), Task 4)	The Board will receive an update from the Executive Director concerning development of the Agency's Groundwater Sustainability Plan and grant status. The Board may provide feedback or direction to staff.	Approved
2020-12-17	Regular	Motion	GSP Monthly Update (Grant Category (c), Task 3 and Category (d), Task 4)	The Board will receive an update from the Executive Director concerning development of the Agency's Groundwater Sustainability Plan and grant status. The Board may provide feedback or direction to staff.	Approved
2020-12-17	Regular	Motion	Degraded Water Quality Sustainable Management Criteria	The Board will discuss proposed sustainable management criteria for the water quality sustainability indicator and consider providing feedback to staff.	Approved
2021-01-21	Regular	Motion	GSP Monthly Update (Grant Category (c), Task 3 and Category (d), Task 4)	The Board will receive an update from the Executive Director concerning development of the Agency's Groundwater Sustainability Plan and grant status. The Board may provide feedback or direction to staff.	Approved
2021-01-21	Regular	Motion	GSP Workshop No. 2 (Grant Category (c); Task 3: Stakeholder Outreach and Engagement)	The Board will consider scheduling the second GSP public workshop.	Approved
2021-01-21	Regular	Motion	GSP Newsletter Volume 2, Issue 1 (Grant Category (c); Task 3: Stakeholder Outreach and Engagement)	The Board will consider approving GSP Newsletter Volume 2, Issue 1 for public release.	Approved

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2021-02-18	Regular	Motion	Review of Future Groundwater Conditions Modeling Results and Implications for Sustainable Management (Grant Category (c), Task 3 and Category (d), Task 4)	The Board will receive a presentation from the GSP Development Team concerning modeling results and implications for sustainable management. The Board will consider providing feedback or direction to staff concerning sustainable management criteria.	Approved
2021-02-18	Regular	Motion	GSP Monthly Update (Grant Category (c), Task 3 and Category (d), Task 4)	The Board will receive an update from the Executive Director concerning development of the Agency's Groundwater Sustainability Plan and grant status. The Board may provide feedback or direction to staff.	Approved
2021-03-04	Workshop	Informational	Mound Basin Groundwater Sustainability Plan (GSP) Online Public Workshop No. 2	Presented to public/stakeholders: • Introduction to Sustainable Management Criteria • Groundwater Modeling and Water Budgets • Proposed Sustainable Management Criteria • Stakeholder Questions and Feedback • Director Comments • Q&A built in throughout	No motion required.
2021-03-18	Regular	Motion	GSP Monthly Update (Grant Category (c), Task 3 and Category (d), Task 4)	The Board will receive an update from the Executive Director concerning development of the Agency's Groundwater Sustainability Plan and grant status. The Board may provide feedback or direction to staff.	Approved

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2021-03-18	Regular	Motion	Sustainable Management Criteria (Category (d), Task 4)	The Board will consider directing staff to prepare the draft groundwater sustainability plan using the proposed sustainable management criteria or provide other direction.	Approved
2021-04-15	Regular	Motion	GSP Monthly Update (Grant Category (c), Task 3 and Category (d), Task 4)	The Board will receive an update from the Executive Director concerning development of the Agency's Groundwater Sustainability Plan and grant status. The Board may provide feedback or direction to staff.	Approved
2021-05-20	Regular	Motion	GSP Monthly Update (Grant Category (c), Task 3 and Category (d), Task 4)	The Board will receive an update from the Executive Director concerning development of the Agency's Groundwater Sustainability Plan and grant status. The Board may provide feedback or direction to staff.	Approved
2021-05-20	Regular	Motion	GSP 20-Year Implementation Budget Projection, Fiscal Year 2021/2022 Budget, and Multi-Year Budget Projection	The Board will review a 20-year GSP implementation budget projection, consider approving the Fiscal Year 2021/2022 budget and the multi-year budget projection, and consider scheduling a public hearing to consider adoption of groundwater extraction fees for Fiscal Year 2021/2022.	Approved
2021-05-20	Regular	Motion	Monitoring Well Access Agreement	The Board will review a draft access agreement for the planned monitoring well at the Ventura Water Reclamation Facility and consider authorizing the Executive Director or Board Officer to execute a final access agreement, subject to terms agreeable to Agency Counsel.	Approved

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2021-06-17	Regular	Motion	GSP Monthly Update (Grant Category (d), Task 4)	The Board will receive an update from the Executive Director concerning development of the Agency's Groundwater Sustainability Plan and grant status. The Board may provide feedback or direction to staff.	Approved
2021-06-17	Regular	Motion	Review of Preliminary Draft GSP, Schedule Draft GSP Public Comment Period, and Schedule GSP Workshop (Grant Category (d), Task 4)	The Board will discuss the preliminary draft GSP and consider scheduling a 60-day public comment period for the draft GSP and a public workshop.	Approved
2021-06-17	Regular	Resolution	PUBLIC HEARING	Resolution 2021-01: A Resolution of the Board of Directors of the Mound Basin Groundwater Sustainability Agency Determining and Establishing Groundwater Extraction Fees Against All Persons Operating Groundwater Extraction Facilities Within the Mound Basin for the 8th and 9th Semiannual Billing Periods (JulyDecember 2021 and January-June 2022).	Approved
2021-06-17	Regular	Motion	PUBLIC HEARING	The Board will open a PUBLIC HEARING to discuss potential extraction fees, based on the Fiscal Year 2020-21 Budget and the updated 5-year financial projection posted on the Agency's website. The Board welcomes public comment and testimony regarding the proposed groundwater extraction fees. After receiving public comment and testimony, the Board will close the PUBLIC HEARING and consider adopting Resolution 2021-01 establishing the proposed groundwater extraction fees within the Mound Basin for the 8th and 9th Semiannual Billing Periods (July-December 2021 and January-June 2022).	Approved

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2021-07-15	Regular and Public GSP Workshop	Motion	Technical Support Services Agreement	The Board will consider authorizing the Executive Director to finalize and execute an agreement with the State of California Department of Water Resources for the Technical Support Services Monitoring Well.	Approved
2021-07-15	Regular and Public GSP Workshop	Motion	Site Use Agreement for the Technical Support Services Monitoring Well	The Board will consider authorizing the Executive Director to finalize and execute a site use agreement for the Technical Support Services Monitoring Well.	Approved
2021-07-15	Regular and Public GSP Workshop	Motion	GSP Monthly Update (Grant Category (d), Task 4)	The Board will receive an update from the Executive Director concerning development of the Agency's Groundwater Sustainability Plan (GSP) and grant status. The Board may provide feedback or direction to staff.	Approved
2021-07-15	Regular and Public GSP Workshop	Informational	Mound Basin Groundwater Sustainability Plan (GSP) Online Public Workshop No. 3	The GSP Public Workshop No. 3 will provide an overview of the draft GSP contents. The workshop is an opportunity for the public and Board members to ask questions and give verbal feedback on the draft GSP. Presented to public/stakeholders: • Introduction to SGMA and GSPs • Summary of Draft GSP Comments • Questions and Stakeholder Feedback	No motion required.
2021-08-19	Regular	Motion	GSP Monthly Update (Grant Category (d), Task 4)	The Board will receive an update from the Executive Director concerning development of the Agency's Groundwater Sustainability Plan (GSP) and grant status. The Board may provide feedback or direction to staff.	Approved

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2021-09-02	Special	Motion	Rincon Consultants, Inc. Master Services Agreement and Work Order No. 1 for GSP Development Support (Grant Category (d), Task 4)	The Board will consider authorizing the Executive Director and Agency Counsel to negotiate and execute a master services agreement with Rincon Consultants, Inc., and issue Work Order No. 1 for GSP development support for an amount not-toexceed $25,000.	Approved
2021-09-16	Regular	Motion	GSP Monthly Update (Grant Category (d), Task 4)	The Board will receive an update from the Executive Director concerning development of the Agency's Groundwater Sustainability Plan (GSP) and grant status. The Board may provide feedback or direction to staff.	Approved

Appendix F

GSP Comments and Responses (Reg. §354.10)

Appendix F

GSP Comments and Responses

This appendix documents comments received on the draft Groundwater Sustainability Plan (GSP) and a summary of responses by Mound Basin Groundwater Sustainability Agency (MBGSA), as required pursuant to GSP Emergency Regulations Section 354.10(c). Included below is a summary of responses to major comment themes shared between the California Department of Fish and Wildlife (CDFW), National Marine Fisheries Service (NMFS), and a consortium of non-governmental organizations (NGOs). In addition, a comment matrix is attached to this appendix (Attachment F-1), which includes detailed responses to comments from all reviewers; however, the comments which share the major themes from the three aforementioned parties are not included in the comment matrix due to their volume and repetition and are otherwise introduced in the discussion below and addressed in a new appendix to the draft GSP (Appendix G). In order to distinguish the comments from CDFW, NGOs, and NMFS, which do not follow the major themes discussed below, they have been identified and labeled with numbers and boxes in each of their respective comment letter (see Attachment F-2) and correspond with the numbers in the comment matrix table (see Attachment F-1 comments #6-9 [CDFW], #10-16 [NGOs], and #31-48 [NMFS]).

Major Comment Themes and Summary Response

<u>Major Comment Theme No. 1:</u>
In general, the comments from CDFW, NMFS, and NGOs express shared concerns about the draft GSP's treatment of shallow groundwater occurring within the Shallow Alluvial Deposits and interconnected surface water of the Santa Clara River and its estuary, including related potential groundwater dependent ecosystems (GDEs) as beneficial uses and users of groundwater and surface water. In summary, the comments expressed concerns about the absence of sustainable management criteria (SMC) and limited monitoring of the Shallow Alluvial Deposits to address concerns about GDEs, both riparian and aquatic, including the "depletions of interconnected surface water" sustainability indicator.

<u>Summary Response No. 1:</u>
The Draft GSP explained that the riparian GDEs may, in some cases, utilize groundwater from the Shallow Alluvial Deposits (particularly within the floodplain of the Santa Clara River). Similarly, the Draft GSP stated that the Shallow Alluvial Deposits discharge minor amounts of groundwater to Santa Clara River and its estuary. However, the Draft GSP also explained that there is no current or planned groundwater extraction from wells screened in the Shallow Alluvial Deposits and that groundwater extractions from the deep, confined aquifers of the Basin do not materially affect groundwater levels in the Shallow Alluvial Deposits or surface flows in the Santa Clara River. For this reason, there are no impacts to the riparian and aquatic GDE beneficial uses that needed to be considered during SMC formulation. Similarly, owing to the lack of impacts, the need for detailed monitoring of Shallow Alluvial Deposits and Santa Clara River flows is limited.

In review of the comments, it was clear that the Draft GSP could be improved by providing more information about groundwater conditions in the Shallow Alluvial Deposits and further information to support the conclusion that shallow groundwater levels and Santa Clara River flows are not materially affected by groundwater pumping in the Mound Basin. To address this need, MBGSA developed and added Appendix G to the final GSP to provide further information and clarification around these issues. Appendix G provided additional documentation of the technical data that support the conclusions that the Shallow Alluvial Deposits hydrostratigraphic unit (HSU) is not a principal aquifer and that shallow groundwater levels and Santa Clara River flows are not materially affected by groundwater pumping in the Mound Basin. Specifically, Appendix G provides the following information:

1. The characteristics of the Shallow Alluvial Deposits HSU and explanation of why it is not considered a principal aquifer in Mound Basin.

2. Additional evidence supporting the conclusion that there is a lack of material hydraulic connection between the shallow groundwater with the much deeper principal aquifers used for water supply in Mound Basin (the Mugu and Hueneme aquifers).

3. Additional evidence supporting the conclusion that there is a lack of material hydraulic connection between the Santa Clara River (and its estuary) and the principal aquifers used for water supply in Mound Basin (the Mugu and Hueneme aquifers).

In addition, an interim study consisting of shallow groundwater data collection via City of Ventura shallow monitoring wells has been added to the GSP to help confirm the conclusions presented in Appendix G (See updated GSP Sections 5.3.1 and 6.6).

<u>Major Comment Theme No. 2:</u>
Several commenters (CDFW, NGOs, California Trout, and NMFS) expressed concerns about the determination that potential GDEs in Area Nos. 1 through 10 are not actual GDEs.

<u>Summary Response No. 2:</u>
MBGSA reviewed the screening results in light of the comments and hired Rincon Consultants, Inc., to further investigate the potential GDEs, including site visits to each publicly accessible area. The field visits and historical air photo reviews provide additional evidence that the vegetation in Area Nos. 1 through 10 are not likely groundwater dependent. This information was added to the updated GSP and Appendix H (formerly Appendix G in prior draft versions).

Attachment F-1

Comment Matrix

Attachment F-1

Groundwater Sustainability Plan
Public Comment Period: June 23 through August 23, 2021
Updated October 14, 2021

Note: comments which share the major themes from the Appendix F introduction are not included in the comment matrix below due to their volume and repetition and are addressed in a new appendix to the draft GSP (Appendix G). In order to distinguish the comments from CDFW, NGOs, and NMFS, which do not follow the major themes discussed below, they have been identified and labeled with numbers and boxes in each of their respective comment letter (see Attachment 2) and correspond with the numbers in the comment matrix table below (see comments #6-9 [CDFW], #10-16 [NGOs], and #31-48 [NMFS]).

MoundBasin
GROUNDWATER SUSTAINABILITY AGENCY

Comment Number	Entry Date	First Name	Last Name	Email Address	Phone Number	Mailing Address	GSP Referenced	Comment/Question	Response
1	26-Jul-21	Burt	Handy	burthandy@gmail.com			Section 3.1 Hydrogeologic Conceptual Model	On Figures 3.1-03 and 3.1-04 the Ventura-Santa Clara River Syncline are shown on different locations on these Figures; The Ventura-Santa Clara River Syncline and the Montalvo-South Mtn -Oak Ridge Fault Anticline are not shown on figures (Ventura Syncline) B-3.1-06, C 3.1-07, D 3.1-08 (Montalvo Anticline) b-3.1-06, 3.1-07	Synclines/anticlines labeled.
2	16-Aug-21	Michael Kelley	Flood Dyer	mflood@casitaswater.com kdyer@casitaswater.com	805-649-2251 ext. 111	Casitas Municipal Water District 1055 Ventura Ave. Oak View, CA 93022	ES 2.2.1 Summary of Jurisdictional Areas and Other Features	Page ES-iii second paragraph, the City of Ventura's Ventura River surface diversions should also be mentioned here (Note: this relationship is correctly mentioned in paragraph six on page 32 and the last paragraph on page 73). Page ES-vi, fourth paragraph the City of Ventura's Ventura River surface diversions should also be mentioned here. Page 7, fourth paragraph, the City of Ventura's Ventura River surface diversions should also be mentioned here.	The City of Ventura operates wells, including a subsurface intake, in the Ventura River floodplain, which is already noted in this paragraph. Page 32, "surface" deleted. Page 73, edits to clarify Foster Park facilities are groundwater extraction facilities.
3	16-Aug-21	Michael Kelley	Flood Dyer	mflood@casitaswater.com kdyer@casitaswater.com	805-649-2251 ext. 111	Casitas Municipal Water District 1055 Ventura Ave. Oak View, CA 93022	Section 2.2.2.2 Existing Water Resource Management Programs	Page 10, second section (Casitas MWD Urban Water Management and Agricultural Water Management Plan), Casitas recently adopted its 2020 Urban Water Management Plan (UWMP), elements of which should be included in this section (link: https://www.casitaswater.org/your-water/urban-water-management-plans).	The 2020 WSCP and UWMP for City of Ventura (Kennedy/Jenks, 2021a&b) and the 2020 UWMP for CMWD (CMWD, 2021) have been included in the GSP and the text has been updated to reflect the differences/updates.
4	16-Aug-21	Michael Kelley	Flood Dyer	mflood@casitaswater.com kdyer@casitaswater.com	805-649-2251 ext. 111	Casitas Municipal Water District 1055 Ventura Ave. Oak View, CA 93022	Section 2.3.1 Beneficial Uses and Users	Page 24, first paragraph states: "As a wholesale water provider to Ventura Water, Casitas MWD's interests were represented via the City's participation on the MGBSA Board of Directors". No proof of this statement has been located by Casitas Staff and thus it should be removed. Further, as a separate Special District of the State of California, Casitas MWD has a responsibility to its stakeholders that is separate to that of the City of Ventura and it should not be seen as Casitas MWD surrendering this authority without an action of the Casitas Board of Directors. Although Casitas does not have facilities within the Mound Basin currently nor sit on the MB GSA Board of Directors, it should still be viewed as an active stakeholder in the basin.	Sentence in question was deleted.
5	16-Aug-21	Michael Kelley	Flood Dyer	mflood@casitaswater.com kdyer@casitaswater.com	805-649-2251 ext. 111	Casitas Municipal Water District 1055 Ventura Ave. Oak View, CA 93022	Section 3.3.1.2 Reliability of Historical Surface Water Supplies	Page 83, fourth paragraph notes 'exceptional drought' from 2012 to 2016. This is an accurate statewide metric but not for the local drought conditions that have caused a relatively steady decline in Lake Casitas' storage levels from 2011 through the present day. Mandated conservation goals along with the associated penalties should also be mentioned as reasons for lowering of demands.	Sentence added: "The lower than anticipated surface water deliveries were related to a combination of factors, including mandated conservation goals along with the associated penalties."
6	17-Aug-21	Erinn Steven	Wilson-Olgin Slack	steven.slack@wildlife.ca.gov	805-467-4201	CA Dept. of Fish and Wildlife 2493 Portola Rd # B, Ventura, CA 93003	n/a	**COMMENT OVERVIEW** CDFW supports ecosystem preservation and enhancement in compliance with SGMA and its implementing regulations based on CDFW expertise and best available information and science. CDFW understands the Mound basin (Basin) and is adjacent to the Santa Paula basin and the Oxnard basin. These three basins sit within the larger Oxnard Plain area. CDFW offers the following comments and recommendations below to assist MB-GSA in identifying and evaluating impacts on biological resources including GDEs within the adjacent groundwater basins. Additional suggestions are included for MB-GSA's consideration during revisions of the Draft GSP.	Comment noted. The Mound and Santa Paula Basins are not part of "the larger Oxnard Plain area". No such area is recognized by DWR or others to MGGSA's knowledge.

Attachment F-1

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7	17-Aug-21	Erinn Steven	Wilson-Olgin Slack	steven.slack@wildlife.ca.gov	805-467-4201	CA Dept. of Fish and Wildlife 2493 Portola Rd # B, Ventura, CA 93003	Section 3.3 Water Budget	**Comment #3:** Impacts of United Water Conservation District's Diversion Operations at the Vern Freeman Diversion on the SCRE (Water Budget Section 3.3 Starting on Page 70) **Issue:** The SCRE is located at the western portion of the Basin and is the terminus of the SCR. The protection and preservation of the SCRE for many species is a high priority for CDFW. United Water Conservation District's (UWCD) Vern Freeman Diversion (VFD), which is located in the Santa Paula Subbasin, plays a major role in limiting the amount of surface water that ultimately reaches the SCRE in the Mound Subbasin. As previously mentioned in Comment #2, GDEs do exist in the Basin and the VFD and recharge operations negatively impact these ecosystems. The VFD diverts surface water that would have continued to flow into the Mound Subbasin, but the water is instead diverted to the Oxnard Subbasin for groundwater storage. The water budget does not consider or analyze the VFD amounts in the Draft GSP. **Concern:** The SCRE provides open water, sand dune, nearshore, riparian, mudflat, and other habitats that support a number of sensitive species throughout their life cycles, including the tidewater goby (Eucclogobius newberryi), steelhead, California least tern (Sterna antillarum browni), and western snowy plover (Charadrius nivosus) (CDFW 2019). SCRE is a core resource area strategically located along the coast that provides food, shelter, stopover, and safety for wildlife. The Ventura Wastewater Reclamation Facility (VWRF) currently discharges recycled water into the SCRE but will be reducing the amount of effluent discharge (from 4.7 MGD to 1.9 MGD) into the SCRE in the near future. Discharge reduction has the potential to significantly improve water quality conditions in the SCRE at the expense of a reduction in open water habitat. The surface water diverted from the VFD reduces flows needed to sustain the open water habitat for the SCRE. The VFD and spreading basin has altered the natural surface flow and groundwater recharge patterns in the SCR watershed (NMFS 2020, p.3). **Comment #3 Recommendation:** CDFW recommends the amounts and timing of streamflow depletions at the Vern Freeman Diversion should be included in the Draft GSP to complete the water budget. Additionally, CDFW recommends the MB-GSA identify the estimated quantity and timing of streamflow depletions in the subbasin. If this information is not available, CDFW recommends the MB-GSA identify a proposed plan to estimate these values. The final GSP should address the UWCD VFD diversion and recharge operations and their effects on surface flows and groundwater elevations along the SCR and SCRE.	GSP Emergency Regulations only require MBGSA to quantify the "total surface water entering and leaving a basin by water source type." (GSP Emerg. Regs. 354.18(b)(1)). MBGSA is not required to quantify diversions upstream or outside of the Basin in the GSP; however, the VFD is inherently included because it is a component of the regional numerical groundwater model used to quantify the water budget. Text was added to Section 3.3 to make clear that the water budget accounts for Vern Freeman Diversion operations. It is noted that the commenter incorrectly refers to surface water diversions as depletions. In the SGMA context, "depletions" are caused by groundwater use (GSP Emerg. Regs. 354.28(c)(6)).
8	17-Aug-21	Erinn Steven	Wilson-Olgin Slack	steven.slack@wildlife.ca.gov	805-467-4201	CA Dept. of Fish and Wildlife 2493 Portola Rd # B, Ventura, CA 93003	Section 6.0 Projects and Management Actions	CDFW recommends that the MB-GSA commit to Arundo (Arundo donax) removal in the SCRE and along the SCR within the Basin to improve groundwater supply and enhance habitat quality for nesting birds. Arundo removal is one example of a project and management action to minimize groundwater overdraft. If groundwater depletion results in reduced streamflow due to interconnected surface waters, the nesting and foraging success of the SSC yellow warbler (Dendroica petechia), the SSC yellow breasted chat (Icteria virens), least Bell's vireo, southwestern willow flycatcher and other bird species may be diminished due to the reduced nesting habitat and food availability.	The GSP concludes that the Basin is not in overdraft (Section 3.3.4.1) and groundwater extraction does not have a material influence on shallow groundwater levels or Santa Clara River flows (see new Appendix G for expanded information on this topic). Further, MBGSA is not responsible for habitat improvement. Therefore, it is unclear why MBGSA would pursue this costly project.

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9	17-Aug-21	Erinn Steven	Wilson-Olgin Slack	steven.slack@wildlife.ca.gov	805-467-4201	CA Dept. of Fish and Wildlife 2493 Portola Rd # B, Ventura, CA 93003	n/a	**CONCLUSION** In conclusion, the Draft GSP does not comply with all aspects of SGMA statute and regulations, and CDFW deems the Draft GSP inadequate to protect fish and wildlife beneficial users of groundwater for the following reasons: 1. The assumptions, criteria, findings, and objectives, including the sustainability goal, undesirable results, minimum thresholds, measurable objectives, and interim milestones are not reasonable and/or not supported by the best available information and best available science. [CCR § 355.4(b)(1)] (See Comments # 1, 2, and 3); 2. The Draft GSP does not identify reasonable measures and schedules to eliminate data gaps. [CCR § 355.4(b)(2)] (See Comments # 1, 2, and 3); 3. The sustainable management criteria and projects and management actions are not commensurate with the level of understanding of the basin setting, based on the level of uncertainty, as reflected in the Draft GSP. [CCR § 355.4(b)(3)] (See Comments # 1, 2, and 3); and, 4. The interests of the beneficial uses that are potentially affected by the use of groundwater in the basin, have not been considered. [CCR § 355.4(b)(4)] (See Comments # 1, 2, 3 and see Additional Comments).	While MBGSA, understands CDFW's concerns about habitat and species, MGGSA disagrees with the conclusion that the Draft GSP does not comply with SGMA. The GSP was developed consistent with SGMA regulations and requirements with specific regulatory text highlighted in each section. MBGSA has added an appendix (Appendix G) providing further technical data to more clearly demonstrate the lack of a material effect of groundwater extraction on shallow groundwater levels and Santa Clara River flows. Given the lack of a material relationship between groundwater pumping and shallow groundwater levels and Santa Clara River flows, it is not necessary to include criteria or data gaps for GDEs or interconnected surface water in the GSP.
10	18-Aug-21	Ngodoo Water Policy Analyst	Atume	ngos.sgma@gmail.com		NGO Consortium	n/a	Based on our review, we have significant concerns regarding the treatment of key beneficial users in the Draft GSP and consider the GSP to be **insufficient** under SGMA. We highlight the following findings: 1. Beneficial uses and users **are not sufficiently** considered in GSP development. a. Human Right to Water considerations **are not sufficiently** incorporated. b. Public trust resources **are not sufficiently** considered. c. Impacts of Minimum Thresholds, Measurable Objectives and Undesirable Results on beneficial uses and users **are not sufficiently** analyzed. 2. Climate change **is not sufficiently** considered. 3. Data gaps **are not sufficiently** identified and the GSP does not have a plan to eliminate them. 4. Projects and Management Actions **do not sufficiently** consider potential impacts or benefits to beneficial uses and users.	1. Beneficial uses and users have been incorporated in the Draft GSP according to each SGMA requirement (CCR §354.10, §354.16, §354.18, §354.26, §354.28, §354.34, §354.38). a. Assembly bill 685 applies to DWR. §350.4(g) states, "The Department shall consider the state policy regarding the human right to water when implementing these regulations". MBGSA is not responsible for water supply and no active domestic wells are located in the Basin. However, the established MTs and MOs were designed to protect the beneficial use of groundwater. b. The GSP demonstrates that surface water and the Shallow Alluvial Deposits that riparian habitats rely on are not materially affected by groundwater extraction or proposed GSP projects (see new Appendix G); therefore, there are no public trust issues to consider in the Mound Basin. c. SGMA regulations §354.28(b)(4) [how Minimum Thresholds affect beneficial uses/users] and §354.26(b)(3) [Undesirable Results potential effects on beneficial uses/users] are addressed in Chapter 4. 2. Climate change was addressed in accordance with §354.18 in section 3.3. 3. Data gaps are identified in sections 5.3, 5.4, 5.5, 5.6, and 5.7, and cover the requirements of §354.38. 4. MBGSA provided all the information for each project and management action in the Basin based on the requirements under §354.44 in Section 6.0.

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11	18-Aug-21	Ngodoo Water Policy Analyst	Atume			NGO Consortium	Section 2.0 Administrative Information	**Disadvantaged Communities, Drinking Water Users, and Tribes** The identification of Disadvantaged Communities (DACs), drinking water users, and tribes is **insufficient**. We note the following deficiencies with the identification of these key beneficial users. ● The GSP provides a map of DAC block groups and DAC tracts within the basin (Figure 1 in Appendix D) but does not include any other identifying information for DACs. ● The adopted Stakeholder Engagement Plan (Appendix D) states that there are domestic wells overlying the basin; however, the main body of the GSP states that there are no domestic wells within the basin due to availability of potable water from Ventura Water. The GSP does not provide the location and depth of the domestic wells within the basin, nor does it provide a well density map of domestic wells in the basin. Additionally, the GSP fails to identify the population dependent on groundwater as their source of drinking water in the basin. ● The GSP states that portions of the Barbareno-Ventureno Band of Chumash are located within the Mound Basin, but does not include a map of tribal areas within the basin. These missing elements are required for the GSA to fully understand the specific interests and water demands of these beneficial users, to support the development of water budgets using the best available information, and to support the development of sustainable management criteria and projects and management actions (PMAs) that are protective of these users. **RECOMMENDATIONS** ● Provide clarification on the status of domestic wells within the basin. DWR Well Completion Report Map 1 shows that there are some domestic wells within the basin. Include a map showing the domestic wells in the basin by location and depth. even if they are not currently in use. Wells previously in use may have been impacted by poor water quality or declining groundwater elevations. ● Provide an estimate of the population dependent on groundwater within the Mound Basin. The GSP states that "The City of Ventura (Ventura Water) serves the areas indicated by DWR as Disadvantaged Communities (DACs) and Severely Disadvantaged Communities (SDACs)." The GSP does not, however, currently provide clear information on how and to what extent DAC members rely on groundwater. ● Include a map of tribal lands within the basin.	DACs are shown on Figure 1 in the SEP (Appendix D). Drinking water in the Basin is provided by the City of Ventura, as shown on Figures 2.1-01, 2.1-03, and 2.2-01. The City of Ventura has a diverse water supply portfolio (Section 3.1.1), meaning that no potable water users are exclusively dependent on Mound Basin groundwater. There are no domestic wells currently being used in the Basin (see Section 2.3.1). MBGSA has verified this with Ventura County Watershed Protection District (8/24/2021 email communication with James Maxwell and Kim Loeb of VCWPD). There are no tribal trust lands within the Basin (see Section 2.2.1).
12	18-Aug-21	Ngodoo Water Policy Analyst	Atume	ngos.sgma@gmail.com		NGO Consortium	Section 3.3 Water Budget	**Native Vegetation** Native vegetation is a water use sector that is required 2 , 3 to be included into the water budget. The integration of this ecosystem into the water budget is **insufficient**. The water budget did not include the current, historical, and projected demands of native vegetation. The omission of explicit water demands for native vegetation is problematic because key environmental uses of groundwater are not being accounted for as water supply decisions are made using this budget, nor will they likely be considered in project and management actions. **RECOMMENDATIONS** Quantify and present all water use sector demands in the historical, current, and projected water budgets with individual line items for each water use sector, including native vegetation.	Native vegetation is included in the evapotranspiration term of the water budget.

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13	18-Aug-21	Ngodoo Water Policy Analyst	Atume	ngos.sgma@gmail.com		NGO Consortium	Appendix D - MBGSA Stakeholder Engagement Plan	**Stakeholder Engagement during GSP Development** Stakeholder engagement during GSP development is **insufficient**. SGMA's requirement for public notice and engagement of stakeholders is not fully met by the description in the Stakeholder Engagement Plan included in the GSP (Appendix D). We acknowledge and commend the clear description of the inclusion of an environmental stakeholder on the governing board of the GSA. The Environmental Stakeholder Director is responsible for engaging environmental stakeholders within the Basin and representing environmental interests before the GSA, including during GSP implementation. However, the engagement plan describes only a minimum amount of outreach to DACs. Stakeholder engagement has primarily occurred via Ventura Water bill stuffers and newsletters, including materials provided in Spanish. Noted deficiencies in the stakeholder engagement process include: • As the water supplier for DACs in the Basin, the City represented DAC interests through its participation on the MBGSA Board of Directors. However, it does not give more information about how their interests were represented. ● The opportunities for public involvement and engagement are limited to MBGSA regular board meetings, review of the MBGSA's website, and providing comments via the website. ● The GSP states that the GSA "has held several public workshops to provide in-depth discussion of the GSP and obtain stakeholder feedback. The workshops include polls to help facilitate public input on key issues and identify which outreach methods are most effective." The GSP gives no further information about how the workshops were advertised or if DACs were engaged to attend. ● The GSP states that portions of the Barbareno-Ventureno Band of Chumash are located within the Mound Basin and the MBGSA will inform the Tribal Elder, Julie Tumamait, throughout the GSP development process and GSP implementation. However, there are no further details on the engagement with the tribe. ● Domestic well owners are specifically mentioned in the Stakeholder Engagement Plan as holders of overlying groundwater rights, however no information is provided other than stating that their participation is invited in the Agency's public meetings.● The Stakeholder Engagement Plan does not include a plan for continual opportunities for engagement through the implementation phase of the GSP for DACs. **RECOMMENDATIONS** • Include a more detailed and robust Stakeholder Engagement Plan that details how the GSA will actively target and engage DAC community members during the remainder of the GSP development process and throughout the GSP implementation phase. Include plans to directly engage the DAC population for inclusion on the Board of Directors instead of having DACs represented by the City of Ventura. Refer to Attachment B for specific recommendations on Stakeholder Communication and Engagement. ● Conduct outreach at frequented locations such as farmers markets and schools across the plan area, providing translation services and technical assistance where needed.Refer to Attachment B for specific recommendations on how to actively engage community stakeholders. ● Consult and engage with the Barbareno-Ventureno Band of Chumash Tribe. Refer to "DWR guidance for engagement with tribal governments" for specific guidance.	MBGSA has met or exceeded the SGMA requirements for stakeholder outreach and engagement. MBGSA will consider the recommended enhancements offered in the comment going forward during GSP implementation. There are no active or recently active domestic wells in the Basin (see Section 2.3.1). There are no tribal trust lands within the Basin (see Section 2.2.1).

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14	18-Aug-21	Ngodoo Water Policy Analyst	Atume	ngos.sgma@gmail.com		NGO Consortium	Section 4.0 Sustainable Management Criteria	**Considering Beneficial Uses and Users When Establishing Sustainable Management Criteria and Analyzing Impacts on Beneficial Uses and Users** The consideration of beneficial uses and users when establishing sustainable management criteria (SMC) is **insufficient**. The consideration of potential impacts on all beneficial users of groundwater in the basin are required when defining undesirable results6 and establishing minimum thresholds7 , 8 **Disadvantaged Communities and Drinking Water Users** The GSP states that the City of Ventura (Ventura Water) serves DAC communities in the basin. It also states that there are domestic wells in the basin, but that the majority of these domestic well owners are de minimus users. It does not provide the location of the domestic wells, the screened interval, or the most recent reported date of well usage. Because the location of domestic wells is not provided in the GSP, the impacts to the domestic well user population are unknown. Because the GSP has not established SMC for the shallow principal aquifer, the GSP neither describes nor analyzes direct or indirect impacts on DACs or domestic drinking wells when defining undesirable results for chronic lowering of groundwater levels or water quality. Therefore, the SMC provided in the GSP are not protective of domestic drinking water well users. **RECOMMENDATIONS** **Chronic Lowering of Groundwater Levels** ● Establish chronic lowering of groundwater level SMC for the shallow principal aquifer that are protective of DACs and domestic well users. Even though the shallow principal aquifer is not currently pumped or treated for domestic drinking water, it could be in the future. ● Consider and evaluate the impacts of selected minimum thresholds and measurable objectives on drinking water users within the basin. **Degraded Water Quality** ● Establish water quality SMC for the shallow principal aquifer that are protective of drinking water users. Even though the shallow principal aquifer is not currently pumped or treated for domestic drinking water, it could be in the future. ● Establish minimum thresholds at the representative monitoring wells that avoid the specific undesirable result of impacting water quality for potable use. For each of the two deep principal aquifers, the GSP states that undesirable results occur when all representative monitoring wells in a principal aquifer exceed the minimum threshold concentration for a constituent for two consecutive years. Because the minimum thresholds are set to the MCL, or in some cases higher than the Secondary MCL (see Table 4.1-02), this does not appear to satisfy the stated minimum threshold goal of protecting water quality for potable uses. ● Evaluate the cumulative or indirect impacts of proposed minimum thresholds on drinking water users, including domestic wells and municipal water suppliers. The GSP states that potential effects on municipal beneficial uses would be increased costs for treatment or blending to meet drinking water standards, however this is the only impact discussed.	There are no active or recently active domestic wells in the Basin and all DACs in the Basin are served water by the City of Ventura, which has a diverse water supply portfolio of several sources in addition to Mound Basin wells (see Section 3.1.1.3). Therefore, there are no impacts to DACs and drinking water uses for the GSP to consider at this time. SMC for the shallow aquifer are not required because it is not a principal aquifer (see Appendix G). There are no wells that extract groundwater from the shallow aquifer in the Basin. SMC can be added during GSP updates, as needed, if significant pumping from the shallow aquifer is initiated in the future. Minimum thresholds that are equal to or in excess of water quality standards in the principal aquifers are not an issue because there are no direct potable uses of groundwater and the City of Ventura manages water quality through blending within its system.

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15	18-Aug-21	Ngodoo Water Policy Analyst	Atume	ngos.sgma@gmail.com		NGO Consortium	Section 3.3 Water Budget	**Climate Change** The SGMA statute identifies climate change as a significant threat to groundwater resources and one that must be examined and incorporated in the GSPs. The GSP Regulations13 require integration of climate change into the projected water budget to ensure that projects and management actions sufficiently account for the range of potential climate futures.The integration of climate change into the projected water budget is **insufficient.** The GSP does incorporate climate change into the projected water budget using DWR change factors for 2030 and 2070. However, the GSP did not consider the 2070 extremely wet and extremely dry climate scenarios in the projected water budget. The GSP should clearly and transparently incorporate the extremely wet and dry scenarios provided by DWR into projected water budgets or select more appropriate extreme scenarios for their basins. While these extreme scenarios may have a lower likelihood of occurring, their consequences could be significant, therefore they should be included in groundwater planning.We acknowledge and commend the inclusion of climate change into key inputs (precipitation, evaporation, surface water flow, and sea level inputs) of the projected water budget. Additionally, the sustainable yield is calculated based on the projected pumping for all three future projections (baseline, 2030, and 2070). However, if the water budgets are incomplete, including the omission of extremely wet and dry scenarios, then there is increased uncertainty in virtually every subsequent calculation used to plan for projects, derive measurable objectives, and set minimum thresholds. Plans that do not adequately include climate change projections may underestimate future impacts on vulnerable beneficial users of groundwater such as ecosystems and domestic well owners. **RECOMMENDATIONS** • Integrate extreme wet and dry scenarios into the projected water budget to form the basis for development of sustainable management criteria and projects andmanagement actions. ● Climate change was addressed when describing the minimum threshold for seawater intrusion. We recommend incorporating climate change considerations into other projects and management actions.	SGMA regulations §354.18(c)(3)(A),(d)(3),(e) are covered in the Water Budget section 3.3 which provides climate change impacts for historical, current, and projected quantities. The extremely dry/wet climate change scenarios are "recommended", but not "required" per SGMA regulations and BMP (Climate Change Guidance) and the Draft GSP included the DWR-provided scenarios (see Section 3.3). Furthermore, the relative insensitivity of the calculated water budget components to the climate change scenarios (e.g., the 2070 scenario) included in the Draft GSP indicates that a similar insensitivity would be observed under the extremely dry/wet scenarios and would therefore not be informative. MBGSA will assess the need for additional uncertainty analysis for climate change impacts every 5 years.

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16	18-Aug-21	Ngodoo Water Policy Analyst	Atume	ngos.sgma@gmail.com		NGO Consortium	Section 6.0 Projects and Management Actions	**Addressing Beneficial Users in Projects and Management Actions** The consideration of beneficial users when developing projects and management actions is **insufficient.**The GSP states there is no need for project and management actions to address gaps between current and projected sustainable yield. However, groundwater sustainability under SGMA is defined not just by sustainable yield, but by the avoidance of undesirable results for all beneficial users. These beneficial users such as GDEs, aquatic habitats, surface water users, DACs, and drinking water users were not sufficiently identified in the GSP. Therefore, potential project and management actions have not been designed or proposed to protect these vulnerable users of the shallow principal aquifer. **RECOMMENDATIONS** Because GDEs, aquatic habitats, surface water users, DACs, and shallow domestic well water users were not sufficiently identified in the GSP, please consider including the following related to potential project and management actions in the GSP: ● For GDEs and ISWs, recharge ponds, reservoirs and facilities for managed stormwater recharge can be designed as multi-benefit projects to include elements that act functionally as wetlands and provide a benefit for wildlife and aquatic species. For guidance on how to integrate multi-benefit recharge projects into your GSP refer to the "Multi-Benefit Recharge Project Methodology Guidance Document"15. ● For DACs, monitor the impacts of projects and management actions on communities and drinking water users. For example, provide locations of the improperly constructed or abandoned wells, as discussed in Section 6.5, that create conduits for migration of poor-quality water from shallow water-bearing units into the principal aquifers. Discuss how sealing these wells will benefit DACs and domestic wells users. ● For DACs and domestic well owners, take a full accounting of the locations and screened intervals of domestic wells in the basin, even those with de minimus use. Implement a drinking water well mitigation program to protect drinking water users. ● Develop management actions that incorporate climate and water delivery uncertainties to address future water demand and prevent future undesirable results.	GDEs that rely on shallow groundwater and surface water (located at or adjacent to the Santa Clara River) are not materially impacted by pumping in the Basin (see Appendix G); therefore, no projects or management actions are needed to prevent significant and unreasonable effects to those beneficial uses. DACs are supplied water by the City of Ventura, which has multiple sources of water in addition Mound Basin groundwater. There are no known active or recently active domestic wells in the Basin (see Section 2.3.1).
17	19-Aug-21	John	Lindquist	johnl@unitedwater.org	805-525-4431	United Water Conservation District 1701 N. Lombard St. Suite 200 Oxnard, CA 93030	Section 1.0	The Mound Basin GSP is well organized and written—United staff found the text boxes describing required plan elements at the beginning of each GSP section to be especially helpful for understanding the context of the text, tables, and figures that follow.	Thank you for your comments. MBGSA agrees that it is important to be clear about what SGMA requirements are addressed in each section.
18	19-Aug-21	John	Lindquist	johnl@unitedwater.org	805-525-4431	United Water Conservation District 1701 N. Lombard St. Suite 200 Oxnard, CA 93030	Section 3.0	United staff appreciated the opportunity to contribute to the data summary and analysis provided in Section 3. As new data become available in the future, we look forward to collaborating with the Mound Basin GSA to continually improve our understanding of groundwater conditions and refine the hydrogeologic conceptual model for the basin, as appropriate.	Thank you for the collaboration to make the Draft GSP a local community effort.

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19	19-Aug-21	John	Lindquist	johnl@unitedwater.org	805-525-4431	United Water Conservation District 1701 N. Lombard St.Suite 200Oxnard, CA 93030	Section 4.0	United staff believe the sustainable management criteria described in the GSP, including measurable objectives and minimum thresholds, are well-defined and reasonable. Although the current understanding of present-day and future groundwater uses in Mound Basin does not suggest that significant and unreasonable impacts should be expected for the six SGMA sustainability indicators, we were impressed to see measurable objectives and minimum thresholds for relevant indicators included in the GSP, in case conditions change in the future. We agree that "depletion of inter-connected surface water" is not an applicable sustainable management criterion in Mound Basin as described in Section 3 of the GSP, for several reasons, including:1) Historical records indicate that no pumping from the shallow alluvial aquifer (the sole aquifer that is potentially in hydraulic connection with perennial or intermittent surface water bodies or GDEs in Mound Basin) has occurred since 1983 and we are not aware of any plans to resume pumping from that aquifer in the future;2) A low-permeability aquitard (the fine-grained Pleistocene deposits) that is 100 to 400 feet thick in most areas of Mound Basin separates the shallow alluvial aquifer from the underlying principal aquifers (primarily Mugu and Hueneme Aquifers) that are pumped for water supply;3) Data from City of Ventura monitoring wells screened in the shallow alluvial aquifer near the Santa Clara River estuary (wells GW-1, GW-2, and GW-3 [data are presented in the Stillwater Sciences report referenced in the GSP]) indicate that groundwater level changes in the shallow alluvial aquifer did not discernibly change in response to significant declines in groundwater levels in the underlying principal aquifers during the 2012-16 drought (this may be worth further discussion in the GSP); and4) Modeling results shown in the GSP (Figure 3.3-02) indicate no discernible relationship between groundwater extractions from the principal aquifers within Mound Basin and interaction of surface water in the Santa Clara River with the shallow alluvial aquifer. This lack of a discernible relationship is consistent with the observation that groundwater elevations in the principal aquifers do not appear to have significant impacts on groundwater elevations (which could theoretically impact surface water flows) in the shallow alluvial aquifer. Furthermore, groundwater withdrawals in Mound Basin have diminished during the past 20 years and there are no plans to significantly increase pumping from the basin in the future. Stable or reduced extractions relative to past pumping rates seem like they could only have a net positive impact on groundwater and surface-water conditions in the basin.	Thank you for your comments. An appendix has been added to further document the technical data that demonstrate, 1) the characteristics of the Shallow Alluvial Deposits, which do not fit the definition of a "principal aquifer", and 2) the lack of material influence by pumping in the principal aquifers (Mugu and Hueneme Aquifers) on shallow groundwater levels and flows in the Santa Clara River or the Santa Clara River Estuary.
20	19-Aug-21	John	Lindquist	johnl@unitedwater.org	805-525-4431	United Water Conservation District 1701 N. Lombard St. Suite 200 Oxnard, CA 93030	Section 5.0	United staff agree with the proposed locations, frequency, and potential expansion of the monitoring network for the five sustainable management criteria for which sustainable management criteria have been developed, and look forward to supporting efforts to collect additional data in the future.	Thank you for your comments. The monitoring network expansion is intended to provide additional data to ensure the sustainability of the groundwater resources for the Basin.
21	19-Aug-21	John	Lindquist	johnl@unitedwater.org	805-525-4431	United Water Conservation District 1701 N. Lombard St. Suite 200 Oxnard, CA 93030	Section 6.0	United staff agree with the GSP's proposed "Projects and Management Actions." Specifically, we agree that it is prudent to develop contingency plans for seawater intrusion and land subsidence, and to coordinate with Ventura County's Watershed Protection District to identify and address improperly constructed or abandoned wells that potentially create conduits for vertical migration of poor-quality groundwater within Mound Basin.	Thank you for your comments.
22	23-Aug-21	Kimball GW Mgr.	Loeb	kim.loeb@ventura.org	805-650-4083	Fox Canyon GMA 800 S. Victoria Ave. Ventura, CA 93009	ES	**Executive Summary**: **Page ES-v:** There is a typo "The principal aquifers are believed to be ~~projected~~ protected from seawater…." **Page ES-vii:** Discussion of "increasing the sustainable yield of the Mound Basin" includes additional production that could impact the sustainable management of the adjacent basin, so that increased pumping is "not included in the sustainable yield estimate at this time." Does this mean additional pumping may be considered in the future? If so, that pumping must be assessed to determine impacts to adjacent basins, consistent with CCR Title 23 §354.28. **Page ES-xviii:** There is a typo "Fox Canyon Groundwater Management ~~Area~~ Agency."	Typo corrections made. Any increase in pumping relative to the projections included in the GSP will be evaluated during the required GSP assessments.

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23	23-Aug-21	KimballGW Mgr.	Loeb	kim.loeb@ventura.org	805-650-4083	Fox Canyon GMA 800 S. Victoria Ave.Ventura, CA 93009	Section 3.3 Water Budget	**Section 3.3 – Water BudgetsSection 3.1.1.3 Imported Water:** Discussion is missing of groundwater imported from the Oxnard Subbasin into the Mound Basin by Jam Mutual Water Company, Coastal Berry Farms and operators of the farmland owned by The Nature Conservancy which straddles the boundary separating the basins.Jam Mutual Water Company (JMWC) has been in existence since at least 1975 and is currently associated with a 318- acre service area which is split approximately 50/50 between the Mound and Oxnard subbasins. JMWC operates two wells in the Oxnard subbasin to provide water for irrigation within its service area. Since 1985 the average annual groundwater extractions from the Oxnard Subbasin are 555.371 acre-feet per year (AFY).Coastal Berry Farms is a FCGMA recognized exporter of groundwater extracted from the Oxnard Subbasin and used to irrigate approximately 29 acres in the Mound Subbasin. Coastal Berry Farms has been exporting water to the Mound Subbasin since before the establishment of the FCGMA. The land owned by The Nature Conservancy and operated by Ocean Breeze Ag Management LLC irrigate approximately 93 acres, split approximately 50/50 between the subbasins, utilizing groundwater extracted from the Oxnard and Mound subbasins.	Text added: "Jam Mutual Water Company (agricultural) and several ranches straddle the basin boundary shared with the Oxnard Basin. It is assumed that small quantities of groundwater move across the basin boundary within these entities/parcels. The details of water movement across the basin boundary within these entities/parcels is not known."
24	23-Aug-21	Kimball GW Mgr.	Loeb	kim.loeb@ventura.org	805-650-4083	Fox Canyon GMA 800 S. Victoria Ave. Ventura, CA 93009	Section 3.3 Water Budget	**Page 37:** There is a typo in the first paragraph of the bullet at the top of the page "Fox Canyon Groundwater Management ~~Area~~ Agency." **Page 73 Imported Water:** The first sentence mentions that groundwater is imported from adjacent basins, but the remainder of the paragraph discusses surface water imported by water purveyors. There is no direct discussion of water imported from the Oxnard Subbasin. Groundwater pumped in the Oxnard Subbasin and imported to the Mound Basin is not specifically called out in any of the water budget tables. **Table 3.3-03:** Average flow between the Mound Basin and the Oxnard Subbasin in the Upper Aquifer System (UAS) matches reasonably well between the models used for each GSP. The Oxnard Subbasin GSP indicates average flow from 1986-2015 is 207 AFY from Oxnard to Mound. The Mound Basin GSP indicates average flow from 1986-2015 is 983 AFY from Mound to Oxnard. The two GSPs are off by about 1,200 AFY on average. The discrepancy appears to occur during drought years when the Mound Basin GSP shows higher outflows to the Oxnard Subbasin than the Oxnard GSP reports as inflows. Overall, the Mound Basin inflows/outflows are more varied in the Mound GSP than in the Oxnard GSP. [SEE GRAPH, PG 2 of LETTER] **Table 3.3-08**: In the Mound GSP, the average UAS flow between the Mound Basin and the Oxnard Subbasin in the future baseline scenario is anticipated to be 3,252 AFY from the Oxnard Subbasin to the Mound Basin in the first through 20th year of implementation, and 3,842 AFY from the Oxnard Subbasin to the Mound Basin in the 30-year sustaining period. However, in the Oxnard GSP scenarios the range of UAS outflows projected from the Oxnard Subbasin is ~1,000 AFY (in the baseline scenarios) to ~1,500 AFY (in the projects and reduction scenarios). This leaves ~1,500 AFY to 2,000 AFY of water that both basins appear to be relying on in the UAS. The projected flows in the Lower Aquifer System (LAS) appears to be closer, but the Mound Basin doesn't include the Fox Canyon Aquifer as a primary aquifer for the GSP. **Table 3.3-12**: The average UAS flow in the 2030 climate change and sea level rise scenario is 3,180 AFY in year one through 20, and 3,841 AFY in the following 30-year sustaining period. These are similar to the flows without the climate change factors. The 2070 flows are also similar (Table 3.3-14).	Typo corrections made. The discrepancy between the water budget estimates is due to several factors. First, different model versions being used for the Oxnard and Mound GSPs (i.e., the groundwater model used for quantification has been updated for Mound Basin). In addition, the time periods for the projected water budgets are not equivalent. There is a different sequence of historical hydrology for Mound Basin. For these reasons the baseline quantities are not comparable.

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25	23-Aug-21	KimballGW Mgr.	Loeb	kim.loeb@ventura.org	805-650-4083	Fox Canyon GMA 800 S. Victoria Ave.Ventura, CA 93009	4.4.2.3 Minimum Thresholds in Relation to Adjacent Basins	**Section 4.4.2.3 Minimum Thresholds in Relation to Adjacent Basins**: The draft Mound GSP states "deeper groundwater levels could potentially increase underflow into the Mound Basin from the Oxnard and/or Santa Paula Basins (or decrease underflow to the Oxnard Basin), which could potentially contribute to undesirable results in those Basins." First, the average anticipated flow in the future in the draft Mound GSP is from the Oxnard Subbasin to the Mound Basin, so decreasing underflow from the Mound Basin to the Oxnard Subbasin is less of a concern than continuing to increase the flows from the Oxnard Subbasin to the Mound Basin in the GSP scenarios. Second, the minimum thresholds for the Mound Basin adjacent to the Oxnard Subbasin are 15 to 90 feet lower than the minimum thresholds in the Oxnard Subbasin Forebay in the Oxnard GSP. [SEE TABLE, PG 3 of LETTER] Note – The difference between minimum thresholds is calculated between one Mound Basin well in the Mugu Aquifer and two Mugu Aquifer wells in the Oxnard Subbasin; and between three Mound Basin wells in the Hueneme Aquifer and one Oxnard Subbasin well in the Hueneme Aquifer. The Oxnard Subbasin well in the Hueneme Aquifer is the lowest of the three screened in the Forebay, with the highest Hueneme Aquifer well in the Forebay having a minimum threshold of 17 ft MSL. Additionally, the minimum thresholds set for the Mound Basin wells listed in the table are (with the exception of 02N22W16K01) for land subsidence. The Mound GSP has lower minimum thresholds for chronic declines in groundwater levels. Presumably, if the water levels reach the thresholds for subsidence and subsidence is not observed the Mound Basin would argue that it could have water levels decline even lower. The difference of 15 feet between the minimum thresholds in the Hueneme Aquifer is not much of a concern, but the difference of greater than 80 feet in the Mugu Aquifer and greater than 90 feet for one well adjacent to the Forebay is of concern to the Agency. There is a significant chance the proposed minimum thresholds in the Mound GSP could negatively impact the ability of the Agency achieving its sustainability goal in the Oxnard Subbasin.	Minimum thresholds for the chronic lowering of groundwater levels have been updated to be equal to the historical low groundwater levels, which are much shallower than the previous values. The combination of minimum threshold exceedances, which lead to undesirable results is >50% of monitoring wells in either aquifer. This will prevent groundwater levels from lowering to elevations that could significantly impact the Oxnard Subbasin.
26	23-Aug-21	Russell Senior Project Manager	Marlow	rmarlow@caltrout.org		California Trout, Inc. 360 Pine St., Floor 4 San Francisco, CA 94104	Appendix G - Review of Areas Mapped as Containing iGDEs	The Santa Clara River Estuary (Estuary) and immediate upstream portion of the Santa Clara River (River) are clearly identified as falling within the basin boundary of the Mound Basin Groundwater Sustainability Agency (MBGSA) management area. However, not once does the MBGSA Groundwater Sustainability Plan (MBGSP) even acknowledge the presence of federally listed Southern California Steelhead in these vital ecosystems. This plan also fails to indicate that both of these groundwater dependent ecosystems (GDEs) are protected critical habitat for southern steelhead and essential habitat for other native species. Both the Estuary and River serve as important public resources with multiple beneficial uses and users and must be accounted for and protected from adverse impacts associated with groundwater pumping.	The draft GSP concluded that surface water beneficial uses, such as steelhead, are not impacted because there is no pumping of shallow groundwater and deeper aquifer pumping does not significantly impact surface water flows (see Appendix G); therefore, detailed discussion of the beneficial uses of surface water was not warranted. Nonetheless, the GDE Appendix (now Appendix H) has been updated to include additional details on species within the habitat of the River and Estuary.

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27	23-Aug-21	Russell Senior Project Manager	Marlow	rmarlow@caltrout.org		California Trout, Inc. 360 Pine St., Floor 4 San Francisco, CA 94104	Section 3.2.6 Interconnected Surface Water Systems	The MBGSP must meet the requirements of the California Sustainability Groundwater Management Act (SGMA), at this time CalTrout does not find this plan to meet the state specified standards. SMGA clearly specifics the requirement to identify and consider impacts to GDEs that have significant and unreasonable adverse impacts for all recognized beneficial uses and users of groundwater including aquatic ecosystems and species dependent on interconnected waters. If hydrologic connectivity exists between a terrestrial aquatic ecosystem and groundwater, then this habitat is a potential GDE and must be identified in a GSP. That this GSP does not identify a single GDE within its boundaries is illogical and not supported by data. The MBGSP clearly acknowledges that they are not able to characterize the interconnection of the surface water and groundwater that fall within their basin boundary due to lack of data. This acknowledgement by the MBGSP establishes that the MBGSA does not have the information needed to make any determination on what is or isn't a GDE in their basin boundary. Without be able to fully characterize the nature and condition of these hydrologically connected systems, this MBGSP cannot ensure that significant and unreasonable adverse impacts from groundwater depletion are avoided.	The commentor erroneously concludes that no GDEs are identified within the GSP. Area 11 (riparian and aquatic habitat associated with the Santa Clara River) is clearly identified as a GDE in the GSP. The GSP identifies that shallow groundwater and the surface water of the Santa Clara River, and its estuary are interconnected. The shallow groundwater system (Shallow Alluvial Deposits) are comprised of several distinct geologic formations. Statements about the uncertainty concerning which specific young formation is interconnected with surface water are being taken out of context here to claim that the GSP cannot conclude whether there are GDEs. This is not the case, as the GSP clearly identifies Area 11 as a GDE and that shallow groundwater is interconnected with surface water of the Santa Clara River. The GSP does not focus on the Area 11 GDE and interconnected surface water because groundwater pumping does not materially impact it either. An appendix (Appendix G) has been added to further document the technical data that demonstrate the lack of material influence by pumping in the principal aquifers (Mugu and Hueneme Aquifers) on shallow groundwater levels and flows in the Santa Clara River or the Santa Clara River Estuary. Furthermore, there are no wells in the Basin that extract from the Shallow Alluvial Deposits. Given the lack of material influence of pumping on GDEs associated with the Santa Clara River, there is no potential for significant and unreasonable impacts on the GDEs at present. Given the lack of a material relationship and hydrological connection between groundwater pumping and shallow groundwater and Santa Clara River flows, it is not necessary to focus criteria or data gaps for GDEs or interconnected surface water in the GSP. Simply stated, it is not a priority of the MBGSA to study aspects of the Basin that do not active require management. Having said this, the GSP has been updated to include interim shallow groundwater data collection in GDE Area No. 11 to provide data to further demonstrate the points made above (see Section 6.6).

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28	23-Aug-21	Russell Senior Project Manager	Marlow	rmarlow@caltrout.org		California Trout, Inc. 360 Pine St., Floor 4 San Francisco, CA 94104	Section 3.3 Water Budget	The surface water diversion operations by United Water Conservation District (UWCD) at Vern Freeman Diversion (VFD) have drastically altered the natural stream flow conditions and groundwater recharge patterns in the lower Santa Clara River watershed. The diversion operations at VFD have adverse impacts on the aquatic environment and water-dependent species. These effects are longitudinally connected to the sections of the River and Estuary that fall within the MBGSA. This plan also does not address that UWCD has been federally mandated to provide for effective and efficient passage at VFD and the changes in regional groundwater management that will be a part of this project. The Federal Courts has repeatedly reiterated that the restoration plan at VFD that most fully meets National Marine Fisheries Service and California Department of Fish and Game recommendations for passage restoration is the harden ramp option. This option will significantly change UWCD operations within the Fox Canyon Groundwater Agency boundary. The MBGSP does not acknowledge this federally mandated change will need to be prepared for and actively managed by the MBGSA. The change at VFD will alter the MBGSA's proposed water budget and will have a profound effect on GDEs within their basin. The installation of a harden ramp at VFD will partially restore the natural flow regime of the lower River corridor to the benefit of the lower River reaches, Estuary, and community.	The Vern Freeman Diversion is included in the regional numerical model used for the GSP, so diversions are reflected in the water budget for the Basin (section 3.3). Text was added to Section 3.3 to make clear that the water budget accounts for Vern Freeman Diversion operations. Potential changes in Freeman Diversion operations and the resulting impact on the Mound Basin water budget will be evaluated during each required GSP assessment.
29	23-Aug-21	Russell Senior Project Manager	Marlow	rmarlow@caltrout.org		California Trout, Inc.360 Pine St., Floor 4San Francisco, CA 94104	Section 3.2.6 Interconnected Surface Water Systems Section 3.2.7 Groundwater Dependent Ecosystems Appendix G - Review of Areas Mapped as Containing iGDEs	The MBGSA decision that the shallow surface aquifer is a groundwater resource that falls within their discretion are not connected to their "principal" aquifer is a failure to meet the requirements of SGMA. This decision again is not supported by the data they don't have and seems counter intuitive to the water budget they have presented. The MBGSA identifies significant inputs in their water budget from both areal recharge and stream channel recharge, both of which will pass through the shallow surface aquifer first before entering their "principal" aquifer. This signifies that groundwater level in the "principal" aquifer is partial dependent on the condition and management of the shallow water aquifer. Additionally, management of a groundwater source is not contingent upon the current use, but potential for use in the time horizon established under SGMA. Sustainability as SGMA outlines it captures the need to address increasing impacts from climate crisis and the requirement to build in resiliency of groundwater processes to mitigate for adverse impacts for all beneficial uses and users. That the GSA does not want to account for the shallow water aquifer in the MBGSP would seem to be an expedient choice to dismiss the presence of GDEs and the potential for adverse impacts to these habitats. This choice is a serious harm to the public by failing to protect aquatic habitats, native species, and the long-term groundwater integrity. CalTrout is focused on advancing process-based watershed restoration to support the recovery of southern steelhead through collaborated decision making. We find this plan fails to meet the requirement for ensuring groundwater sustainability or protecting groundwater dependent ecosystems. We look forward to the next draft of the plan where the MBGSA outlines how they will collect the data needed to clearly understand inter-connected waters in their basin and what management actions they will take to protect vital GDEs in this basin.	As mentioned in the above response, the new appendix (Appendix G) presents additional information pertaining to the Shallow Alluvial Deposits. The appendix provides further discussion of the technical data that demonstrate, 1) the characteristics of the Shallow Alluvial Deposits, which do not fit the definition of a "principal aquifer", and 2) the lack of material influence by pumping in the principal aquifers (Mugu and Hueneme Aquifers) on shallow groundwater levels and flows in the Santa Clara River or the Santa Clara River Estuary. Pumping effects on shallow groundwater and surface water will be evaluated during each required GSP assessment. The GSP can be updated, as needed, if significant pumping from the shallow aquifer is initiated in the future. Given the lack of material influence of pumping on GDEs associated with the Santa Clara River, there is no potential for significant and unreasonable impacts on the GDEs at present. Given the lack of a material relationship and hydrological connection between groundwater pumping and shallow groundwater and Santa Clara River flows, it is not necessary to focus criteria or data gaps for GDEs or interconnected surface water in the GSP. Simply stated, it is not a priority of the MBGSA to study aspects of the Basin that do not active require management. Having said this, the GSP has been updated to include interim shallow groundwater data collection in GDE Area No. 11 to provide data to further demonstrate the points made above (see Section 6.6).

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30	23-Aug-21	Merrill CFROG Board Chair	Berge	merrillberge@gmail.com	805-208-6058	Climate First: Replacing Oil and Gas PO Box 114 Ojai, CA 93024	Section 3.2.4 Groundwater Quality Impacts Section 3.2.3 Seawater Intrusion	With oil well infrastructure in Ventura County existing in close proximity to our groundwater supplies and oftentimes intersecting with aquifers directly, we are submitting the attached map and information to include in the MBGSP for a comprehensive consideration of the Mound Basin setting. [SEE Map, attachment to LETTER] This map illustrates the proximity of Mound Basin water wells to abandoned oil well sites in the Mound Basin area specifically. The sources for the data is: **1.** Department of Conservation, Geologic Energy Management Decision (CalGEM). "Oil and Gas Wells GIS, California." Gis.conservation.ca.gov, 14 Aug. 2021, gis.conservation.ca.gov/portal/home/item.html?id=335e036c6a4f4cc39148ca2a9e0389c7 **2.** Department of Conservation, Geologic Energy Management Division (CalGEM). WellFinder (WellSTAR), maps.conservation.ca.gov/doggr/wellfinder **Of note:** **1.** 30 abandoned well sites located in the vicinity of the Mound Basin water wells have been designated as poorly abandoned due to age. **2.** 8 of those wells have documented problems as reported in the CalGEM WellSTAR (Well Statewide Tracking and Reporting System). These older abandoned oil wells were not capped to today's standards. As they continue to age, they are at greater risk of cracks and leaks due to cement degradation; possibly providing for migratory pathways through the layers of caprock. As noted in the United States Geological Survey (USGS) "Supplemental Information to the Groundwater Quality of Aquifers Overlying the Oxnard Oil Field, Ventura County, CA" to the "Groundwater quality results from the Regional Monitoring Program study of the Oxnard oil field" published in 2019: Additional pathways of poor water quality from the semi-perched zone to the Oxnard aquifer include movement through abandoned or improperly constructed wells (Izbicki,1996), and lateral seawater intrusion along the coast resulting from landward pressure gradients (United Water Conservation District, 2016). With seawater intrusion, earthquake faults, contamination sites and plumes referenced and/or reviewed in the MBGSP, in order to reflect the Mound Basin setting in its entirety, it is critically important that oil well infrastructure information also be included in the MBGSP.	Contamination plumes have not been identified in the Mound Basin principal aquifers (see Section 3.2.4). GSP assessments will reflect any new contamination issues that may arise in the future. Mound Basin does not show evidence of seawater intrusion (see Section 3.2.3).
31	23-Aug-21	Anthony VIA: Mark Andres	Spina Capelli Ticlavilca	mark.capelli@noaa.gov andres.ticlavilca@noaa.gov	805-963-6478	U.S. Dept. of Commerce - NOAA - National Marine Fisheries Service West Coast Region 501 West Ocean Blvd, Suite 4200 Long Beach, CA 90802-4213	ES-1 Plan Area, Land Use, and Water Sources (pp. ES-ii-iii)	**Specific Comments** "The beneficial uses of groundwater extracted from the principal aquifers of Mound Basin include municipal, industrial, and agricultural water supply corresponding to the land use categories above." The listed beneficial uses within the boundaries of the Mound Groundwater Basin include only out-of-stream beneficial uses, and largely ignores the instream beneficial uses, including those linked to with GDE, including, but not limited to Area 11 (i.e., the lower Santa Clara River and Santa Clara River Estuary). The Draft GSP should be revised to explicitly acknowledge the instream beneficial uses supported by the groundwater basin, including the GDE associated with the lower Santa Clara River and Santa Clara River Estuary. The recognized instream beneficial uses for the portion of the lower Santa Clara River within the Mound Basin include: warm freshwater habitat, cold freshwater habitat, wildlife habitat, habitat for rare, threatened and endangered species, fish migration, and wetland habitat. Santa Clara River Estuary instream beneficial uses include: estuarine habitat, marine habitat, wildlife habitat, habitat for rare, threatened and endangered species, fish migration, spawning habitat, and wetland habitat.	The beneficial uses in question were not detailed in the GSP because there is no pumping from the shallow groundwater system and principal aquifer pumping does not have a material effect on shallow groundwater (GDEs) or interconnected surface water (Santa Clara River) flows. The GSP has been updated to note the beneficial uses described in the comment exist relative to the Shallow Alluvial Deposits (See ES-1, ES-2 and Section 2.3.1). However, it is noted that the Shallow Alluvial Deposits are not a principal aquifer, are not pumped, and groundwater pumping form the principal aquifers in the Basin do not materially affect the GDEs or deplete interconnected surface water. Please see new appendix (Appendix G) for further information.

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32	23-Aug-21	Anthony VIA: Mark Andres	Spina Capelli Ticlavilca	mark.capelli@noaa.gov andres.ticlavilca@noaa.gov	805-963-6478	U.S. Dept. of Commerce - NOAA - National Marine Fisheries Service West Coast Region 501 West Ocean Blvd, Suite 4200 Long Beach, CA 90802-4213	ES-2 Basin Setting and Groundwater Conditions (pp. ES-iii-iv)	"Despite the interconnection with shallow groundwater, there is no depletion of interconnected surface water in the Basin because there are no groundwater extractions from the shallow groundwater units and groundwater in the principal aquifers is physically separated from the surface water bodies by several hundred feet of fine-grained materials. No groundwater dependent ecosystems (GDEs) have been identified in the Basin that appear to be relying on groundwater from a principal aquifer." The regulations governing SGMA do not stipulate that the provisions of SGMA cover only "principal aquifers" as the Draft GSP appears to presume. The regulations define interconnected surface water as "surface water that is hydraulically connected at any point by a continuous saturated zone to the underlying aquifer and the overlying surface water . . ." (23 CCR Section 351(0). Significantly, "continuous" refers specifically to hydrologic connection, not a continuous temporal connection. The Draft GSP does not adequately recognize the potential role of groundwater in the lower reaches of the Santa Clara River or the Santa Clara River Estuary, or the role of groundwater elevations in ensuring surface flows water surface elevations and supporting the life-cycle of steelhead, including their migratory, spawning and rearing phases (See additional comments on Appendix A to the Draft Mound Basin GSP below.). Both the Santa Clara River estuary and the portion of the Santa Clara River upstream of Harbor Boulevard within the boundaries of the Oxnard Subbasin should be fully addressed in the revised Draft GSP. Further, because groundwater-management activities within the Santa Clara River watershed involve the United Water Conservation District's (UWCD) diversion operations at the Vern Freeman Diversion, the relationship between these diversion activities and groundwater elevations along the affected portion of the Santa Clara River (and estuary) should be addressed in the revised Draft GSP.	The draft GSP recognizes the Santa Clara River and Estuary as interconnected with the Shallow Alluvial Deposits (see Section 3.1.4.2); however, there is no pumping of shallow groundwater in the Basin and neither the surface water nor the shallow groundwater is materially affected by principal aquifer pumping. The new appendix (Appendix G) provides further details concerning these topics. Given the lack of material influence of pumping on GDEs associated with the Santa Clara River, there is no potential for significant and unreasonable impacts on the GDEs at present. Given the lack of a material relationship and hydrological connection between groundwater pumping and shallow groundwater and Santa Clara River flows, it is not necessary to focus criteria or data gaps for GDEs or interconnected surface water in the GSP. Simply stated, it is not a priority of the MBGSA to study aspects of the Basin that do not active require management. Having said this, the GSP has been updated to include interim shallow groundwater data collection in GDE Area No. 11 to provide data to further demonstrate the points made above (see Section 6.6). The Vern Freeman diversion is located outside of the Mound Basin, so an evaluation of its impacts to the streamflow are not required; however, the diversions are included in the numerical model, so flows are accounted for in the water budget (Draft GSP Section 3.3). Text was added to Section 3.3 to make clear that the water budget accounts for Vern Freeman Diversion operations.
33	23-Aug-21	Anthony VIA: Mark Andres	Spina Capelli Ticlavilca	mark.capelli@noaa.gov andres.ticlavilca@noaa.gov	805-963-6478	U.S. Dept. of Commerce - NOAA - National Marine Fisheries Service West Coast Region 501 West Ocean Blvd, Suite 4200 Long Beach, CA 90802-4213	ES-3 Water Budget (pp. ES-vi-vii)	"The primary sources of recharge to the Mound Basin groundwater system are underflow from the Santa Paula Basin, areal recharge (the sum of infiltration of precipitation, M&I return flows, and agricultural irrigation return flows), and mountain-front recharge. Stream channel recharge is a minor component." The revised Draft GSP should acknowledge that both the direct surface flow and the underflow from the Santa Paula Basin are influenced by the upstream diversion of surface flows in the Santa Clara River watershed and the artificial recharge of ground water as a result of the Vern Freeman Diversion located approximately 10 miles upstream of the Mound Basin.	Please see responses regarding the Vern Freeman diversion for other comments.

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34	23-Aug-21	Anthony VIA: Mark Andres	Spina Capelli Ticlavilca	mark.capelli@noaa.gov andres.ticlavilca@noaa.gov	805-963-6478	U.S. Dept. of Commerce - NOAA - National Marine Fisheries Service West Coast Region 501 West Ocean Blvd, Suite 4200 Long Beach, CA 90802-4213	ES-4 Sustainable Management Criteria (pp. ES-vii-x)	The sustainable criteria are expressed explicitly and exclusively in terms of groundwater levels, water chemistry, and land subsidence, and do not explicitly recognize the important relationship between groundwater levels and the surface flows (particularly base flows) or water quality parameters (such as temperature, dissolved oxygen, etc.) that contribute to the maintenance of GDE within the Mound Basin (including, but not limited to, the lower Santa Clara River and the Santa Clara River Estuary). There is no specific criterion in the Draft Criteria that deals with the GDE associated with the federally listed species (or the designated critical habitat) which utilize the Mount Basin3. In fact, the word "steelhead", "trout", or even "fish" do not appear in the Draft GSP. This is an important omission that should be corrected in the revised Draft GSP because GDE for the Mound Basin includes the use of surface flow by the federally listed endangered southern California steelhead for migration, spawning and rearing. Specifically, the revised Draft GSP should include a description of the extent of designated critical habitat for endangered steelhead (as well as other listed or recognized sensitive species) that occur within the boundaries of the Mound Basin (See Figures 1 and 3).	The GSP and GDE appendix (now Appendix H) have been revised to provide additional details around the iGDE habitats. Following the TNC guidance, each of the iGDEs within Area 11 was analyzed and slightly revised to reflect the vegetation communities and critical habitats more accurately. The GSP does not focus on the Area 11 GDE and interconnected surface water in the sustainable management criteria formulation because groundwater pumping does not materially impact either. There is no shallow groundwater pumping in the Basin. An appendix (Appendix G) has been added to further document the technical data that demonstrate the lack of material influence by pumping in the principal aquifers (Mugu and Hueneme Aquifers) on shallow groundwater levels and flows in the Santa Clara River or the Santa Clara River Estuary. Given the lack of material influence of pumping on GDEs (riparian or aquatic) associated with the Santa Clara River, there is no potential for significant and unreasonable impacts on the GDEs at present. A map showing critical habit has been added to the GDE appendix (Appendix G).
35	23-Aug-21	Anthony VIA: Mark Andres	Spina Capelli Ticlavilca	mark.capelli@noaa.gov andres.ticlavilca@noaa.gov	805-963-6478	U.S. Dept. of Commerce - NOAA - National Marine Fisheries Service West Coast Region 501 West Ocean Blvd, Suite 4200 Long Beach, CA 90802-4213	2.2.2.2 Existing Water Resource Management Programs [§354.8(c) and (d)] Pages 9-11.	One of the largest and most significant water-resource-management program within the Santa Clara River watershed, the UWCD's groundwater recharge program, consisting of the combined facilities of the Santa Felicia Dam, Piru Diversion, Vern Freeman Diversion and a series of groundwater settling basins. This program and its related facilities should be included in this section because it affects not only the artificial recharge to the Fox Canyon aquifer, but the natural recharge to the other groundwater basins on the Oxnard Plain, including the Mound and Santa Paula Basins; see NMFS comments on the Fox Canyon GSP (2020)	The facilities mentioned in the comment are not located within the Basin and do not operate within the Basin, which is why they are not mentioned here.
36	23-Aug-21	Anthony VIA: Mark Andres	Spina Capelli Ticlavilca	mark.capelli@noaa.gov andres.ticlavilca@noaa.gov	805-963-6478	U.S. Dept. of Commerce - NOAA - National Marine Fisheries Service West Coast Region 501 West Ocean Blvd, Suite 4200 Long Beach, CA 90802-4213	2.2.2.3 Conjunctive Use Programs [§354.8(e)] Page 11	The City of Ventura's water supply includes groundwater extractions (as well as surface diversions) that are subject to a separate GSP, and this fact should be noted in the revised Draft Mound GSP.	MBGSA recognizes the City of Ventura's water supply sources but is not required (per SGMA regulations) to mention other basin's GSPs. Nonetheless, the City of Ventura's other water supply sources are noted in the GSP (see Section 3.1.1.3). Any changes to those supplies and the associated impact, if any, on its Mound Basin groundwater pumping demands will be addressed during the required periodic GSP assessments.
37	23-Aug-21	Anthony VIA: Mark Andres	Spina Capelli Ticlavilca	mark.capelli@noaa.gov andres.ticlavilca@noaa.gov	805-963-6478	U.S. Dept. of Commerce - NOAA - National Marine Fisheries Service West Coast Region 501 West Ocean Blvd, Suite 4200 Long Beach, CA 90802-4213	2.3 Notice and Communication [§354.10] Page 22-24	The Draft GSP is focused out-of-stream users of the Mound Basin and does not adequately recognize the public trust natural resources that may be affected by the extractions of groundwater from the Mound Basin, and therefore be of interest to state and federal natural resource regulatory agencies such as NMFS, U.,S. Fish and Wildlife Service, and the California Department of Fish and Wildlife, and the California Department of Parks and Recreation (which owns a portion of the Santa Clara River Estuary wetlands).	The GSP demonstrates that surface water and Shallow Alluvial Deposits groundwater that riparian habitats may rely on are not materially affected by pumping or proposed GSP projects (see new Appendix G), so there are no public trust issues to consider in the Mound Basin.

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38	23-Aug-21	Anthony VIA: Mark Andres	Spina Capelli Ticlavilca	mark.capelli@noaa.gov andres.ticlavilca@noaa.gov	805-963-6478	U.S. Dept. of Commerce - NOAA - National Marine Fisheries Service West Coast Region 501 West Ocean Blvd, Suite 4200 Long Beach, CA 90802-4213	2.3.1 Beneficial Uses and Users [§354.10(a)] Pages 23-24	We would note that the listed beneficial uses within the boundaries of the Mound Basin identify only out-of-stream beneficial uses, and largely ignore instream beneficial uses. The revised Draft GSP should be revised to explicitly acknowledge the instream beneficial uses supported by the groundwater basin, including, but not limited to, the GDE associated with the lower Santa Clara River and Santa Clara River Estuary. See comment above.	The beneficial uses in question were not detailed in the GSP because there is no pumping from the shallow groundwater system and principal aquifer pumping does not have a material effect on shallow groundwater (GDEs) or interconnected surface water (Santa Clara River) flows. The GSP has been updated to note the beneficial uses described in the comment exist relative to the Shallow Alluvial Deposits (See ES-1, ES-2 and Section 2.3.1). However, it is noted that the Shallow Alluvial Deposits are not a principal aquifer, are not pumped, and groundwater pumping form the principal aquifers in the Basin do not materially affect the GDEs or deplete interconnected surface water. Please see new appendix (Appendix G) for further information.
39	23-Aug-21	Anthony VIA: Mark Andres	Spina Capelli Ticlavilca	mark.capelli@noaa.gov andres.ticlavilca@noaa.gov	805-963-6478	U.S. Dept. of Commerce - NOAA - National Marine Fisheries Service West Coast Region 501 West Ocean Blvd, Suite 4200 Long Beach, CA 90802-4213	3.1.4.1 Physical Properties of Aquifers and Aquitards Pages 36-45	"At the time of writing of this GSP, no aquifer test results for hydraulic conductivity or storativity were found in available references. However, well information collected over the past several decades by United . . . is considered the best available information concerning aquifer and aquitard properties. . . However, it is recognized that on a local scale, hydraulic conductivity can vary by orders of magnitude over short distances, and there may be areas in Mound Basin where hydraulic conductivity is higher or lower than the values shown on Table 3.1-01." The lack of specific information regarding hydraulic conductivity or storativity in the Mound Basin and the overlying shallow alluvial aquifer does not allow the categorical conclusions relied upon in the Draft GSP to eliminate consideration of GDE within the Mound Basin. The information and model used by United was focused on water conductivity and storativity that is more relevant to out-of-stream water supply and beneficial uses than the smaller values that may be relevant to support GDE. Without . . . field-based measurements it is impossible to conduct credible aquifer simulations such as the one found in the Draft GSP dealing with groundwater levels driven by climate-change scenarios through 2070 (See, e.g., Figure 4.6-03 of the Draft GSP.)	The GSP does not focus on the Area 11 GDE and interconnected surface water in the sustainable management criteria formulation because groundwater pumping does not materially impact either. There is no shallow groundwater pumping in the Basin. An appendix (Appendix G) has been added to further document the technical data that demonstrate the lack of material influence by pumping in the principal aquifers (Mugu and Hueneme Aquifers) on shallow groundwater levels and flows in the Santa Clara River or the Santa Clara River Estuary. Given the lack of material influence of pumping on GDEs (riparian or aquatic) associated with the Santa Clara River, there is no potential for significant and unreasonable impacts on the GDEs at present.

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40	23-Aug-21	Anthony VIA: Mark Andres	Spina Capelli Ticlavilca	mark.capelli@noaa.gov andres.ticlavilca@noaa.gov	805-963-6478	U.S. Dept. of Commerce - NOAA - National Marine Fisheries Service West Coast Region 501 West Ocean Blvd, Suite 4200 Long Beach, CA 90802-4213	3.1.4.2 Groundwater Recharge and Discharge Areas [§354.14(d)(4)] Page 45	"The Santa Clara River is the only major stream in Mound Basin, and the reach of the Santa Clara River in [the] Mound Basin is considered to usually be the site of groundwater discharge, rather than recharge (Stillwater Sciences, 2011[b]; United, 2018). However, the lower Santa Clara River in the area of its estuary is reported to fluctuate from gaining to losing cycles as water levels rise and fall in response to breaching of the barrier sand at the mouth of the river (Stillwater Sciences, 2011[b[). When the elevation of surface water in the estuary rises (following closure of the barrier bar), some of the rising water infiltrates (recharges) the shallow deposits adjacent to the river. Then, typically in the following winter or spring, a large storm will produce sufficient flows in the river that it will breach the barrier bar and cause rapid decline of surface water levels in the estuary, causing groundwater in the adjacent shallow deposits to discharge back into the river over a sustained period." First, the distinction between discharge and recharge is misleading; the surface flows in the lower reaches of the Santa Clara River are in direct contact with the alluvial aquifer (which is described elsewhere in the draft GSP as being up to a 100 feet thick). Second, river discharge (particularly base flows influence by underlying groundwater levels in the Mound Basin) support the GDE in this portion of the Mound Basin. Third, recharge is not limited to periods when the water surface elevations in the estuary rises following the closure of the sand bar at the mouth of the Santa Clara River Estuary. Lastly, the draft GSP does not accurately characterize the groundwater contribution to the Santa Clara River Estuary or the lower reaches of the Santa Clara River. According to a water balance assessment conducted by Stillwater Sciences (2011a, 2011b) for the fall/winter period of 2010, "groundwater was estimated to contribute approximately 15% of the inflow volume . . .". For the summer/spring 2010 period, "the groundwater contribution was estimated at 10 percent . . ." The Stillwater study also indicates that in the "Santa Clara River reach upstream of the estuary, groundwater provides the dry summer baseflow, if it exists, and is a quarter of the winter flow, based on the 2010 water year assessment." (TNC 2017, pp. 3-4).	MBGSA respectfully disagrees and believes the quoted text appropriately describes the dynamics of the Santa Clara River within the Mound Basin.
41	23-Aug-21	Anthony VIA: Mark Andres	Spina Capelli Ticlavilca	mark.capelli@noaa.gov andres.ticlavilca@noaa.gov	805-963-6478	U.S. Dept. of Commerce - NOAA - National Marine Fisheries Service West Coast Region 501 West Ocean Blvd, Suite 4200 Long Beach, CA 90802-4213	3.2 Groundwater Conditions [§354.16] p. 54	"Groundwater elevation data are available for nearly 60 wells located within Mound Basin. However, not all of these wells are being monitored at present. The distribution of wells is heavily skewed towards the southern half of the Basin, with relatively few wells existing in the northern half of the Basin (north of Highway 126)." The Draft GSP does not provide details regarding the well construction showing the intervals of the well through which groundwater enters the wells. Also, it is unclear if there are "sanitary plugs" installed in the wells that retard or prevent flow through shallow and deep aquifers. See comment above regarding the assertion that "No data gaps or significant uncertainties were identified."	The monitoring network well construction information is provided in the Draft GSP Table 5.3-01, water levels are presented in Appendix I (formerly Appendix H), and cross-sectional views of the aquifers are presented in the Draft GSP Section 3.1.2 – together these provide all the available information for the wells in relation to the groundwater and hydrostratigraphic units.
42	23-Aug-21	Anthony VIA: Mark Andres	Spina Capelli Ticlavilca	mark.capelli@noaa.gov andres.ticlavilca@noaa.gov	805-963-6478	U.S. Dept. of Commerce - NOAA - National Marine Fisheries Service West Coast Region 501 West Ocean Blvd, Suite 4200 Long Beach, CA 90802-4213	3.2.1 Groundwater Elevations [§354.16(a)] p. 54	"The contouring of groundwater levels in Mound Basin is complicated by the sparse data, particularly in the northern portion of the Basin." See comment above regarding the assertion that "No data gaps or significant uncertainties were identified."	There is no groundwater production in these portions of the basins, so this is not considered to be a significant data limitation for the GSP and sustainable management of the Basin.

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43	23-Aug-21	Anthony VIA: Mark Andres	Spina Capelli Ticlavilca	mark.capelli@noaa.gov andres.ticlavilca@noaa.gov	805-963-6478	U.S. Dept. of Commerce - NOAA - National Marine Fisheries Service West Coast Region 501 West Ocean Blvd, Suite 4200 Long Beach, CA 90802-4213	3.2.2 Change in Storage [§354.16(b)] p. 60	"Similar to contouring of groundwater levels in Mound Basin (as described above), estimation of historical changes in groundwater stored in the Basin is complicated by sparse groundwater elevation data, particularly in the northern portion of the Basin and in HSUs with few monitoring points. Due to these limitations, annual and cumulative changes in groundwater in storage were estimated using United's (2018 and 2021a, 2021b) groundwater flow model, which is generally well calibrated on a regional scale to groundwater elevation measurements." Groundwater models that are aimed at a "regional scale" are not likely to adequately describe changes in groundwater and surface water elevations (particularly base flows) that support localized GDE such as those associated with the lower Santa Clara River and the Santa Clara River Estuary, as well as other GDE within the Mound Basin identified by the California Department of Fish and Wildlife (2021). See comment above regarding the assertion that "No data gaps or significant uncertainties were identified."	Detailed consideration of the groundwater – surface water interaction is not warranted for this GSP because groundwater pumping does not materially impact shallow groundwater or interconnected surface water flows. There is no shallow groundwater pumping in the Basin. An appendix (Appendix G) has been added to further document the technical data that demonstrate the lack of material influence by pumping in the principal aquifers (Mugu and Hueneme Aquifers) on shallow groundwater levels and flows in the Santa Clara River or the Santa Clara River Estuary.
44	23-Aug-21	Anthony VIA: Mark Andres	Spina Capelli Ticlavilca	mark.capelli@noaa.gov andres.ticlavilca@noaa.gov	805-963-6478	U.S. Dept. of Commerce - NOAA - National Marine Fisheries Service West Coast Region 501 West Ocean Blvd, Suite 4200 Long Beach, CA 90802-4213	3.3.1 Historical Water Budget [§354.18(c)(2)(B)] p. 79 p. 83-84 3.3.2 Current Water Budget [§354.18(c)(1)] p. 84-86 3.3.3 Projected Water Budget p. 86-94 4.3 Pages 104-105 4.4.2.3 Page 108	"The SGMA Regulations require that the historical surface water and groundwater budget be based on a minimum of 10 years of historical data." The GSP does not refer to or account for the effects of the operation of the UWCD Vern Freeman Diversion on the lower Santa Clara River, which diverts, on average, over 62,000 acre-feet per year (AFY) from the main stem of the Santa Clara River (NMFS 2018). This diversion operation affects recharge to all of the lower Santa Clara River groundwater basins, not just the Fox Canyon Basin, including the shallow alluvial aquifer and the other deeper aquifers in within the Mound Basin. These operations have the potential to impact endangered adult and juvenile steelhead in the lower Santa Clara River and Santa Clara River Estuary (NMFS 2008a, 2018). The Draft GSP should therefore include as part of its water-budget analysis the operations of the Vern Freeman Diversion. Specifically, the relationship of groundwater management activities (including both recharge and groundwater extraction activities) and the effects of the related Vern Freeman Diversion on surface flows below the diversion and the maintenance of surface flows supported by groundwater should be explicitly addressed and disclosed in the revised GSP.	The Vern Freeman diversion is located outside of the Mound Basin, so an evaluation of its impacts to the streamflow are not required; however, the diversions are included in the numerical model, so flows are accounted for in the water budget (see Draft GSP section 3.3). Text was added to Section 3.3 to make clear that the water budget accounts for Vern Freeman Diversion operations.
45	23-Aug-21	Anthony VIA: Mark Andres	Spina Capelli Ticlavilca	mark.capelli@noaa.gov andres.ticlavilca@noaa.gov	805-963-6478	U.S. Dept. of Commerce - NOAA - National Marine Fisheries Service West Coast Region 501 West Ocean Blvd, Suite 4200 Long Beach, CA 90802-4213	3.3.4.1 Overdraft Assessment p. 96	"Review of the historical, current and projected groundwater budgets indicate small amounts of declining groundwater storage over time (469 and 147 for the historical and current periods, respectively), as shown in Table 3.3-03. These results suggest a minor amount of overdraft may have occurred during the historical and current period of 6.3% and 2.3%, respectively, of the groundwater pumping during that timeframe." While the Draft GSP does not identify any significant impacts to out-of-stream water supply beneficial uses of the Mound Basin (and in fact projects a slight increase of 68 to 84 AF/yr) between 2022 and 2096, under the assumed future-precipitation rates modeled), the implications from this slight overdraft or increase in storage for any of the GDE associated with the Mount Basin, including the lower Santa Clara River and Santa Clara River Estuary, are unclear	Groundwater pumping does not materially impact shallow groundwater or interconnected surface water flows. There is no shallow groundwater pumping in the Basin. An appendix (Appendix G) has been added to further document the technical data that demonstrate the lack of material influence by pumping in the principal aquifers (Mugu and Hueneme Aquifers) on shallow groundwater levels and flows in the Santa Clara River or the Santa Clara River Estuary.
46	23-Aug-21	Anthony VIA: Mark Andres	Spina Capelli Ticlavilca	mark.capelli@noaa.gov andres.ticlavilca@noaa.gov	805-963-6478	U.S. Dept. of Commerce - NOAA - National Marine Fisheries Service West Coast Region 501 West Ocean Blvd, Suite 4200 Long Beach, CA 90802-4213	4.2 Sustainability Goal [§354.24] p. 100	"The goal of this Groundwater Sustainability Plan (GSP) is to sustainably manage the groundwater resources of the Mound Basin for the benefit of current and anticipated future beneficial users of groundwater and the welfare of the general public who rely directly or indirectly on groundwater. Sustainable groundwater management will ensure the long-term reliability of the Mound Basin groundwater resources by avoiding undesirable results pursuant to the Sustainable Groundwater Management Act (SGMA) no later than 20 years from GSP adoption through implementation of a data-driven and performance-based adaptive management framework." Nothing in the language of the goals specifically refers to the protection of instream beneficial uses associated with GDE of the Mount Basin, such as the lower Santa Clara River or the Santa Clara River Estuary. This appears to be the result, in part, of not recognizing any interconnected surface waters or GDE within the boundaries of the Mound Basin. However, as noted above, the Mound Basin contains interconnected surface water and GDE. See comments above regarding the physical properties of the Mound Basin.	Component 4c of the sustainability goal addresses GDEs, which included those listed in the comment.

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47	23-Aug-21	Anthony VIA: Mark Andres	Spina Capelli Ticlavilca	mark.capelli@noaa.gov andres.ticlavilca@noaa.gov	805-963-6478	U.S. Dept. of Commerce - NOAA - National Marine Fisheries Service West Coast Region 501 West Ocean Blvd, Suite 4200 Long Beach, CA 90802-4213	4.4.3.1 Description of Measurable Objectives Western Half of Basin Page 112	"The chronic lowering of groundwater levels minimum thresholds in the western half of the Basin are superseded by the land subsidence proxy minimum thresholds. Therefore, the land subsidence proxy measurable objectives and interim milestones are adopted for the chronic lowering of groundwater levels measurable objectives in the western half of the Basin." It is not clear how, or if, the land subsidence proxy for minimum thresholds is appropriate for instream beneficial uses associated by GDE supported by interconnected waters. See also, general comment above regarding Minimum Thresholds.	This comment is not applicable due to the lack of material influence by pumping in the principal aquifers (Mugu and Hueneme Aquifers) on shallow groundwater levels and flows in the Santa Clara River or the Santa Clara River Estuary.
48	23-Aug-21	Anthony VIA: Mark Andres	Spina Capelli Ticlavilca	mark.capelli@noaa.gov andres.ticlavilca@noaa.gov	805-963-6478	U.S. Dept. of Commerce - NOAA - National Marine Fisheries Service West Coast Region 501 West Ocean Blvd, Suite 4200 Long Beach, CA 90802-4213	4.5.2.2 Relationships Between Minimum Thresholds and Sustainability Indicators [§354.28(b)(2)] p. 118 4.6 & 4.7	"The minimum thresholds for the reduction of groundwater storage sustainability indicator allow groundwater levels to decline below historical low levels in the eastern half of the Basin. Deeper groundwater levels could potentially increase underflow into the Mound Basin from the Oxnard and/or Santa Paula Basins (or decrease underflow to the Oxnard Basin), which could potentially contribute to undesirable results in those Basins. However, as noted above and in Section 4.4.2.1, the length of time that groundwater levels could remain below historical lows would be limited in order to prevent undesirable results for land subsidence in the western half of the Mound Basin; therefore, the potential effect on the adjacent basins is considered small." This approach and analysis may be appropriate when considering groundwater supplies for out-of-stream beneficial uses for which there may be alternatives. However, it does not take into account the adverse effects of periodic reduction of groundwater on GDE, including the use by migrating, spawning or rearing steelhead. The effects of periodic groundwater reductions on out-of-stream beneficial uses (e.g., domestic or agricultural water supplies) may be addressed with alternative water sources. However, instream uses such as GDE are more vulnerable to periodic groundwater reductions, because there is generally no alternative water source to sustain the GDE, and even a short-term depletion or limitation of stream flow or water surface elevation can be lethal to aquatic species.	This comment is not applicable due to the lack of material influence by pumping in the principal aquifers (Mugu and Hueneme Aquifers) on shallow groundwater levels and flows in the Santa Clara River or the Santa Clara River Estuary.
49	23-Aug-21	James	Maxwell			Ventura County Public Works Water Resources Division	Section 2.2.1	**Section 2.2.1** discusses water usages throughout the Mound Subbasin but does not reference individual, domestic/private well usage. The Draft states that "There are no known de minimus extractors in the Mound Basin." County records show that there is one known, active domestic-designated water well and several potentially abandoned domestic wells. Also reference Section 5.2.	It has been agreed upon that this comment is an error and that there are currently no active domestic wells in the Basin (MBGSA email communication with James Maxwell and Kim Loeb of VCWPD, 8/24/2021). VCWPD updated their records to accurately reflect that.
50	23-Aug-21	James	Maxwell			Ventura County Public Works Water Resources Division	Section 2.2.2.1	**Section 2.2.2.1** references the Ventura County Public Works Agency, Watershed Protection (VCPWA-WP) Groundwater Resources monitoring program. The number of wells monitored by groundwater resources varies but is usually between two and four groundwater wells within the Subbasin.	Text revised: "VCWPD variably monitors ~~three~~ two to four wells. . . "
51	23-Aug-21	James	Maxwell			Ventura County Public Works Water Resources Division	Section 2.2.2.2	**Section 2.2.2.2** references the previous versions of the Urban Water Management Plans (UWMPs) and Water Shortage Contingency Plans (WSCPs) for the City of Ventura (2016) and Casitas Municipal Water District (2016). It should be reflected in the Draft that 2020 UWMP updates have been released and/or adopted. Figures, data, and other relevant information should be updated in the Draft from the most recent UWMPs. There is no discussion of United Water Conservation District's (UWCD's) 2015 and 2020 UWMPs and 2020 WSCP.	The 2020 WSCP and UWMP for City of Ventura (Kennedy/Jenks, 2021a&b) and the 2020 UWMP for CMWD (CMWD, 2021) have been included in the Draft GSP and it has been updated to reflect the differences. There are no figure/table updates necessary.
52	23-Aug-21	James	Maxwell			Ventura County Public Works Water Resources Division	Section 2.2.3.2	**Section 2.2.3.2** discusses water well permitting through the VCPWA-WP. It should be noted that the County oversees compliance with the County Water Well Ordinance No. 4468 which is inclusive of the California Water Well Standards Bulletins 74-9,74-81 and 74-90 with future revisions currently under discussion.	Comment noted. Text updated: "The Ventura County Groundwater Section ~~enforces~~ oversees compliance with County Water Well Ordinance No. 4468 which is inclusive of California's Water Well Standards Bulletins 74-9, 74-81, and 74-90."

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53	23-Aug-21	James	Maxwell			Ventura County Public WorksWater Resources Division	Section 4.7	There is no discussion of potential impacts to groundwater from septic systems or wastewater treatment systems and abandoned wells that potentially serve as conduits for contaminant migration to the underlying aquifers (**Section 4.7**).	Seepage from septic systems are discharged to the Shallow Alluvial Deposits, which is not a principal aquifer. Treated wastewater is discharged to surface water (the Santa Clara River estuary, which is underlain by the Shallow Alluvial Deposits, which is not a principal aquifer. Unused or abandoned domestic wells are addressed in the groundwater quality protection measures under the projects and management actions (see Section 6.5). In addition, water quality is monitored across the basin to detect any elevated contaminant levels.
54	23-Aug-21	James	Maxwell			Ventura County Public Works Water Resources Division	Section 3.0 Basin Setting	There is minimal or no discussion of the Mound Subbasin and the Oxnard Subbasin boundary and any long-term operational interactions between the Fox Canyon Groundwater Management Agency (FCGMA) and MBGSA.	Faults along the basin boundary are characterized in the Regional Geology Section 3.1.2. Additionally, the Groundwater Flow Barriers Section 3.1.4.1.2 and the Water Budget Section 3.3 (historical, current, and projected) provides the estimated groundwater exchange across the boundary.
55	23-Aug-21	James	Maxwell			Ventura County Public Works Water Resources Division	Section 3.1.4.1.2	Faulting is discussed in **Section 3.1.4.1.2** and identifies the absence of monitoring wells on opposing sides of known faults. Known and monitored groundwater wells could provide information regarding potential impedance to groundwater movement across these faults.	Effects of faults were evaluated during model calibration and will be revisited during each GSP update. We agree that additional monitoring is helpful, but is not necessary at this stage.
56	23-Aug-21	James	Maxwell			Ventura County Public Works Water Resources Division	Section 3.1.4.1	The Figures shown in the Executive Summary on pages ES-iv and -v should be placed in and would better illustrate the subsections of **Section 3.1.4.1.**	The appropriate figures are referenced in the text and are only embedded in the Executive Summary for consistency.
57	23-Aug-21	James	Maxwell			Ventura County Public Works Water Resources Division	Section 3.1.4.2	**In Section 3.1.4.2**, it would be beneficial to include estimated and separate quantities of M&I and agricultural return flows within the Subbasin.	Quantities are presented in the Water Budget section (Section 3.3.1, Section 3.3.2, and Table 3.3-02). Section 3.1.4.2 presents the types of recharge and discharge for the Basin.
58	23-Aug-21	James	Maxwell			Ventura County Public Works Water Resources Division	Section 3.1.4.3	**In Section 3.1.4.3**, the Draft mentions using groundwater quality data from VCPWA-WP. The most recently used data was from 2017. The County has more recent water quality data through 2020.	Data updates will be included in the first annual GSP update.
59	23-Aug-21	James	Maxwell			Ventura County Public Works Water Resources Division	Section 3.1.4.4	**Section 3.1.4.4** could include a brief section discussing domestic groundwater wells and the limited use of these types of wells in the Subbasin. Ventura County records indicate that there is one active domestic well.	MBGSA has verified with Ventura County Watershed Protection District (8/24/2021 email communication with James Maxwell and Kim Loeb of VCWPD) that there are no domestic wells currently being used in the Basin. VCWPD updated their records to accurately reflect that.
60	23-Aug-21	James	Maxwell			Ventura County Public Works Water Resources Division	Section 3.2.1.1	**Section 3.2.1.1** includes groundwater level information up to 2019. There is current water level elevation data from Ventura County through 2020.	Data updates will be included in the first annual GSP update.
61	23-Aug-21	James	Maxwell			Ventura County Public WorksWater Resources Division	Section 3.2.4	**Section 3.2.4** discusses groundwater quality impacts to several agricultural water wells screened in the Mugu and Hueneme aquifers. The Draft suggests that elevated concentrations of nitrates in these wells would implicate the migration of contaminants to these aquifers from compromised well seals or casings. The section should include a discussion of the use of wastewater treatment systems in the vicinity of these wells.	There are no wastewater treatment facilities located near the wells in question.
62	23-Aug-21	James	Maxwell			Ventura County Public Works Water Resources Division	Sections 4.4.2.2.5 and 8	**Sections 4.4.2.5 and 4.8** discusses land subsidence in the western and eastern halves of the Subbasin. There is sufficient InSAR data for monitoring subsidence in the eastern half but not the western. Daniel B. Stephens & Associates, Inc. (a Geo-Logic Company) developed the *Fillmore and Piru Basins Land Subsidence Evaluation Technical Memorandum* for the Fillmore and Piru Basins Groundwater Sustainability Agency dated February 4,2021. The memo addresses land subsidence within the Fillmore and Piru Subbasins. Consider development of a similar technical evaluation for the Mound Subbasin to assess conditions in the western half of the Subbasin and any correlations to existing data for the eastern half.	Groundwater levels are used as a proxy for the land subsidence minimum thresholds, which is more protective.

Attachment F-1

Comment Number	Entry Date	First Name	Last Name	Email Address	Phone Number	Mailing Address	GSP Referenced	Comment/Question	Response
63	23-Aug-21	James	Maxwell			Ventura County Public Works Water Resources Division	Sections 5.2.3 and 5.3.3	**Sections 5.2.3 and 5.3.3** discuss the design of a monitoring network and collection of data and mentions that monitoring will be affected by implementation of the Oxnard Groundwater Sustainability Plan. Consider noting that future monitoring information from the FCGMA could be used to supplement the MBGSA reporting data.	Comment noted.
64	23-Aug-21	James	Maxwell			Ventura County Public Works Water Resources Division	Section 6.5	**Section 6.5** states the MBGSA will coordinate with the County to identify and address improperly constructed and abandoned wells. It should be noted that this is also to maintain compliance with the Ventura County Well Ordinance No. 4468.	Comment noted.
65	1-Sep-21	Neal	Maguire	nmaguire@fcoplaw.com	805-659-6800	1050 S. Kimball Rd. Ventura, CA 93004	Section 3.3.4.1	First, the draft GSP provides, in section 3.3.4.1, an overdraft assessment required by section 354.18(b)(5) of the GSP Emergency Regulations. The draft GSP utilizes the characterization of overdraft from the Department of Water Resources' Bulleting 118, which provides in part: "Overdraft can be characterized by groundwater levels that decline over a period of years and never fully recover, even in wet years." Section 3.3.4.1 of the draft GSP further notes, "Review of the historical, current and projected groundwater budgets indicate small amounts of declining groundwater storage over time (469 and 147 for the historical and current periods, respectively), as shown in Table 3.3-03." In light of this discussion, we would appreciate clarification regarding the following: 1. Are the values provided in Table 3.3-03 within the error range for the various referenced water budgets? 2. Have the above estimates regarding groundwater storage been accompanied by any reports or accounts of any undesirable results in the Basin?	1. Yes 2. No Text will be updated based on these questions.
66	1-Sep-21	Neal	Maguire	nmaguire@fcoplaw.com	805-659-6800	1050 S. Kimball Rd. Ventura, CA 93004	Section 3.3.4.1	Second and lastly, the draft GSP discusses, in several areas, the lack of a relationship between the Mound Basin's shallow aquifer, which is not utilized for groundwater production, and other aquifers that are being utilized by the Basin's landowners and the City of Ventura. For example, page 68 of the draft GSP notes, with regard to surface water connectivity issues, that the shallow aquifer does not have "any known groundwater extractions within Mound Basin." MBAWG is similarly unaware of any groundwater production from the shallow aquifer. MBAWG also agrees that the shallow aquifer does not seem to interact with the aquifers that are beneficially used, in part because we do not see any associated diminished water quality in the deeper aquifers. With that said, it might be helpful for the GSP to provide further confirmation regarding the connectivity, or lack thereof, between the Basin's aquifers.	An appendix (Appendix G) has been added to further document the technical data that demonstrate the lack of material influence by pumping in the principal aquifers (Mugu and Hueneme Aquifers) on shallow groundwater levels and flows in the Santa Clara River or the Santa Clara River Estuary.

Attachment F-2

Labeled Comment Letters

State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
South Coast Region
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San Diego, CA 92123
(858) 467-4201
www.wildlife.ca.gov

GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

Note: comments which share the major themes from the Appendix F introduction are not included in the comment matrix (Attachement 1) due to their volume and repetition and are addressed in a new appendix to the draft GSP (Appendix G). In order to distinguish the comments from CDFW, NGOs, and NMFS, which do not follow the major themes discussed below, they have been identified and labeled with numbers and boxes below and correspond with the numbers in the comment matrix table (see Attachment 1, comments #6-9).

August 17, 2021

Via Electronic Mail and Online Submission

Mr. Bryan Bondy, P.G.
Executive Director
Mound Basin Groundwater Sustainability Agency
P.O. Box 3544
Ventura, CA 93006-3544
bryan@bondygroundwater.com

Subject: Comments on the Mound Basin Draft Groundwater Sustainability Plan

Dear Mr. Bondy:

The California Department of Fish and Wildlife (CDFW) is providing comments on the Mound Basin Groundwater Sustainability Agency's (MB-GSA) Draft Groundwater Sustainability Plan (Draft GSP). The Draft GSP was prepared pursuant to the Sustainable Groundwater Management Act (SGMA). As trustee agency for the State's fish and wildlife resources, CDFW has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and the habitat necessary for biologically sustainable populations of such species (Fish & Game Code §§ 711.7 and 1802).

Development and implementation of groundwater sustainability plans (GSPs) under SGMA represents a new era of California groundwater management. CDFW has an interest in the sustainable management of groundwater, as many sensitive ecosystems and species depend on groundwater and interconnected surface waters, including ecosystems on CDFW-owned and managed lands within SGMA-regulated basins. SGMA and its implementing regulations afford ecosystems and species-specific statutory and regulatory consideration, including the following as pertinent to GSPs:

- GSPs must **identify and consider impacts to groundwater dependent ecosystems (GDEs)** [23 CCR § 354.16(g) and Water Code § 10727.4(l)];
- Groundwater Sustainability Agencies must **consider all beneficial uses and users of groundwater**, including environmental users of groundwater [Water Code §10723.2 (e)];
- GSPs must **identify and consider potential effects on all beneficial uses and users of groundwater** [23 CCR §§ 354.10(a), 354.26(b)(3), 354.28(b)(4), 354.34(b)(2), and 354.34(f)(3)];
- GSPs must **establish sustainable management criteria that avoid undesirable results** within 20 years of the applicable statutory deadline, including **depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water** [23 CCR § 354.22 *et seq*. and Water Code §§ 10721(x)(6) and 10727.2(b)], and **describe monitoring networks** that can identify adverse impacts to beneficial uses of interconnected surface waters [23 CCR § 354.34(c)(6)(D)]; and,

- GSPs must **account for groundwater extraction for all water use sectors** including managed wetlands, managed recharge, and native vegetation [23 CCR §§ 351(al) and 354.18(b)(3)].

Furthermore, the Public Trust Doctrine imposes a related but distinct obligation to consider how groundwater management affects public trust resources, including navigable surface waters and fisheries. Groundwater hydrologically connected to surface waters are also subject to the Public Trust Doctrine to the extent that groundwater extractions or diversions affect or may affect public trust uses (*Environmental Law Foundation v. State Water Resources Control Board* (2018), 26 Cal. App. 5th 844; *National Audubon Society v. Superior Court* (1983), 33 Cal. 3d 419). Accordingly, groundwater plans should consider potential impacts to and appropriate protections for interconnected surface waters and their tributaries, and interconnected surface waters that support fisheries, including the level of groundwater contribution to those waters.

In the context of SGMA statutes and regulations, and Public Trust Doctrine considerations, groundwater planning should carefully consider and protect environmental beneficial uses and users of groundwater, including fish and wildlife and their habitats, groundwater dependent ecosystems, and interconnected surface waters.

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COMMENT OVERVIEW

CDFW supports ecosystem preservation and enhancement in compliance with SGMA and its implementing regulations based on CDFW expertise and best available information and science. CDFW understands the Mound basin (Basin) and is adjacent to the Santa Paula basin and the Oxnard basin. These three basins sit within the larger Oxnard Plain area. CDFW offers the following comments and recommendations below to assist MB-GSA in identifying and evaluating impacts on biological resources including GDEs within the adjacent groundwater basins. Additional suggestions are included for MB-GSA's consideration during revisions of the Draft GSP.

COMMENTS AND RECOMMENDATIONS

Comment #1: Data Gaps for Interconnected Surface Water (Section 3.2.6 of Mound Basin Draft GSP, Starting on Page 67)

Issue: Page 67 of the Draft GSP states, *"Data are not available to characterize the interconnection of Santa Clara River surface water and groundwater. Although the frequent perennial baseflow conditions imply that surface and groundwater is interconnected, it is not known specifically which groundwater in which units are connected and where. Of importance for this GSP, it is unknown whether the water table of the shallow alluvial aquifer in Mound Basin extends beneath the stream terrace deposits and intersects surface water in the Santa Clara River channel within the limits of Mound Basin."*

Concern: There are many unknowns as to the interaction of surface water in the Santa Clara River (SCR), Santa Clara River Estuary (SCRE) and the shallow alluvial aquifer of the Basin, and the adjacent Oxnard and Santa Paula basins. Studies have indicated that although the SCRE is within the Mound Basin, it may potentially be hydrologically connected to the upper aquifers of the Oxnard Plain area. This connection may be through semi-perched or shallow groundwater aquifers. The MB-GSA has not provided enough data to conclude that there isn't hydrologic connectivity between these various shallow aquifers.

While most of the water flowing into the SCRE comes from the Ventura Wastewater Treatment Plant (VWWTP) and SCR discharge there is still a fair amount of groundwater inflow from the semi-perched aquifer. According to a water balance assessment conducted by Stillwater Sciences in their Santa Clara River Estuary Subwatershed Study for the fall/winter water year 2009- 2010, “The combined measured groundwater flow from the southern floodplain area and the unmeasured groundwater flow, which is presumed to be dominated by groundwater flow from upstream of the Harbor Blvd. bridge, had a combined contribution of approximately 15% of the total inflow volume” (Stillwater Sciences 2011b, p.78).

For the summer/spring 2010 period “The remaining 10% of the inflow volume came from an equal contribution of unmeasured groundwater flow from upstream of the Harbor Blvd. bridge and Santa Clara River flow” (Stillwater Sciences 2011b, p.78).

The Department of Water Resources regulations define interconnected surface water as “surface water that is hydraulically connected at any point by a continuous saturated zone to the underlying aquifer and the overlying surface water is not completely depleted [23 CCR § 351(o).].” The regulations do not state that the aquifer needs to be a “principal” aquifer as suggested by the Draft GSP.

GDEs can rely on groundwater for some or all of its requirements, relying on multiple water sources simultaneously and at different temporal or spatial scales (e.g., precipitation, river water, reservoir water, soil moisture in the vadose zone, groundwater, applied water, treated wastewater effluent, urban stormwater, irrigated return flow).

Recommendation: There are data gaps regarding the shallow aquifer and its hydraulic connectivity to the surface waters of the SCR and the SCRE. CDFW recommends the installation of shallow groundwater monitoring wells near potential GDEs and interconnected surface waters, potentially pairing multiple-completion wells with additional streamflow gages. This will facilitate an improved understanding of surface water-groundwater interconnectivity and subsurface recharge channels. A streamflow gage at the SCRE would provide valuable data on the amount of surface water feeding the estuary. CDFW agrees with the recommendation that the MB-GSA collect and analyze the data obtained from the future monitoring well planned for construction at the proposed VWWTP (as stated in the Draft GSP) to address the data gaps. Additional monitoring wells may be needed in other areas of the Basin before making the assertion that there is no interconnectivity between the shallow aquifer and the SCR. There is not enough information provided in the Draft GSP about the interconnectivity between the shallow aquifer and the principal aquifer. Additional clarification is needed in the final GSP.

Comment #2: Groundwater Dependent Ecosystems Do Not Exist in Mound Basin under SGMA (Section 3.2.7 of Mound Basin Draft GSP, Starting on Page 68 and Appendix G)

Issue: Page 69 of the Draft GSP states, *“As presented in Appendix G, iGDE areas 1 through 10 have been screened out and are not considered GDEs...Given the lack of potential for significant impacts to GDEs by principal aquifer pumping, Area 11 will not be considered further in the development of sustainable management criteria for the principal aquifers.”*

Concern: CDFW is concerned with the Draft GSP’s disregard for GDEs in the Basin. Essentially, there are zero GDEs identified for SGMA protection. Eleven areas within the Basin were mapped as containing indicators of potential GDEs. GDEs that were selected by the MB-GSA are as follows:

Area 1 – Harmon Canyon coast live oak trees;
Area 2 – Sexton Canyon coast live oak trees, wetland habitat, and riverine features;
Area 3 – Barlow Canyon (Arroyo Verde Park) riparian mixed hardwood;
Area 4 – Sanjon Barranca coast live oak trees;
Area 5 – Kennebec Linear Park mixed riparian forest and North Bank of Santa Clara River near Saticoy mixed willow forest;
Area 6 – Harmon Barranca and Park mixed riparian hardwood;
Area 7 – Arundell Barranca (northern) riverine features;
Area 8 – Arundell Barranca (central) wetland and riverine features;
Area 9 – Prince Barranca wetland and marsh features;
Area 10 – Alessandro Lagoon willow shrub; and,
Area 11 – Lower Santa Clara River and Estuary estuarine habitat and wetland features.

The MS-GSA determined these 11 areas are not reliant on water from a principal aquifer in the Basin. The MB-GSA is arguing that the primary sources of water for these habitats come from the shallow alluvial aquifer, perched zones, irrigation return flows and tile drain discharges. CDFW believes the shallow aquifer and perched zones rely on surplus water from other external sources to keep them recharged. There is concern that these external sources could diminish or dry up which would adversely affect these GDEs. These are important contributions to sustaining these habitats and should be reinstated in the Draft GSP as GDEs.

The SCR along the Basin is designated critical habitat for the federal Endangered Species Act (FESA) listed southern California steelhead (*Oncorhynchus mykiss* or steelhead). Steelhead and the FESA-listed and California Endangered Species Act (CESA) listed least Bell's vireo (*Vireo bellii pusillus*), the FESA-listed and CESA-listed southwestern willow flycatcher (*Empidonax traillii extimus*) utilize the various habitats identified in the draft GSP as estuarine, wetland, and riverine features, that the MB-GSA has excluded as GDEs.

Water Code § 10721 (x)(6) requires GSPs avoid significant and unreasonable adverse impacts to beneficial uses of surface water including aquatic ecosystems reliant on interconnected surface water. If hydrologic connectivity exists between a terrestrial or aquatic ecosystem and groundwater, then that ecosystem is a potential GDE and must be identified in a GSP. [23 CCR§354.16 (g).] Hydrologic connectivity between surface water and groundwater, as well as groundwater accessibility to terrestrial vegetation, must, therefore, be evaluated carefully, and conclusions should be well-supported. Hydrologic connectivity considerations include connected surface waters, disconnected surface waters and transition surface waters.

Recommendation: CDFW believes the shallow alluvial "aquifer" although rarely used for a water supply is extremely important to the ecological communities or species that depend on groundwater emerging from all aquifers or from groundwater occurring near the surface within the Basin. The 11 areas within the Basin that were mapped as containing potential GDEs should be included in the Draft GSP as they do rely on the shallow alluvial "aquifer" within the Basin, and the MB-GSA has not provided enough data to disregard interconnected surface waters. This shallow alluvial "aquifer" needs to be protected under SGMA. If these GDEs are adversely impacted, groundwater plans should be in place to facilitate appropriate and timely monitoring and management response actions.

Mapping GDEs and other beneficial uses is an essential component in the consideration, development and implementation of GSPs (Water Code §10723.2) and in assessing the potential effects on groundwater beneficial uses. GSAs must also include sustainable management criteria and monitoring to detect adverse impacts on all groundwater beneficial users. CDFW believes it was premature to eliminate a large portion of the GDEs-related data. We recommend that the best scientific data on depth to groundwater be included in the analysis of interconnected surface waters before any data is excluded. Other scientific data to include (but not be limited to): USGS mapped springs/seep and comparing recent groundwater level contours to vegetation root zones. CDFW does not recommend relying solely on soils information. For example, the presence of sandy, dry, and friable soils, does not mean that existing plant species do not rely on groundwater for some portion of their life cycle. Capillary fringe associated with root networks from native plants could be accessing groundwater from deeper depths.

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Comment #3: Impacts of United Water Conservation District's Diversion Operations at the Vern Freeman Diversion on the SCRE (Water Budget Section 3.3 Starting on Page 70)

Issue: The SCRE is located at the western portion of the Basin and is the terminus of the SCR. The protection and preservation of the SCRE for many species is a high priority for CDFW. United Water Conservation District's (UWCD) Vern Freeman Diversion (VFD), which is located in the Santa Paula Subbasin, plays a major role in limiting the amount of surface water that ultimately reaches the SCRE in the Mound Subbasin. As previously mentioned in Comment #2, GDEs do exist in the Basin and the VFD and recharge operations negatively impact these ecosystems. The VFD diverts surface water that would have continued to flow into the Mound Subbasin, but the water is instead diverted to the Oxnard Subbasin for groundwater storage. The water budget does not consider or analyze the VFD amounts in the Draft GSP.

Concern: The SCRE provides open water, sand dune, nearshore, riparian, mudflat, and other habitats that support a number of sensitive species throughout their life cycles, including the tidewater goby (*Eucclogobius newberryi),* steelhead, California least tern (*Sterna antillarum browni*), and western snowy plover (*Charadrius nivosus)* (CDFW 2019). SCRE is a core resource area strategically located along the coast that provides food, shelter, stopover, and safety for wildlife. The Ventura Wastewater Reclamation Facility (VWRF) currently discharges recycled water into the SCRE but will be reducing the amount of effluent discharge (from 4.7 MGD to 1.9 MGD) into the SCRE in the near future. Discharge reduction has the potential to significantly improve water quality conditions in the SCRE at the expense of a reduction in open water habitat. The surface water diverted from the VFD reduces flows needed to sustain the open water habitat for the SCRE. The VFD and spreading basin has altered the natural surface flow and groundwater recharge patterns in the SCR watershed (NMFS 2020, p.3).

Recommendation: CDFW recommends the amounts and timing of streamflow depletions at the Vern Freeman Diversion should be included in the Draft GSP to complete the water budget. Additionally, CDFW recommends the MB-GSA identify the estimated quantity and timing of streamflow depletions in the subbasin. If this information is not available, CDFW recommends the MB-GSA identify a proposed plan to estimate these values. The final GSP should address the UWCD VFD diversion and recharge operations and their effects on surface flows and groundwater elevations along the SCR and SCRE.

ADDITIONAL COMMENTS

Sensitive Species and Habitats: The SCRE contains important steelhead spawning and rearing habitat in Southern California. Threats to steelhead, such as excessively high-water temperatures in the spring, summer, and early fall, reduce available juvenile rearing habitat. Low flows in the fall and winter can delay adult passage to critical spawning areas.

Steelhead trout depend on the SCRE for vital life-history and ecological function and should be at the forefront of MB GSA's protection plan. This species utilizes all areas of the SCRE including the open water habitat. The SCRE has long been recognized as important steelhead rearing habitat for fingerling and smolt until they reach maturity as adults to survive the tough conditions of the Pacific Ocean.

The SCRE receives groundwater inflow upstream in the SCR. Water quality conditions in the SCRE have the potential to affect juvenile steelhead. The SCRE currently has approximately 108 acres of open water which provides a combination of fairly shallow open water and water that is generally deep enough to provide some protection from terrestrial and larger avian predators.

Southwestern pond turtle (*Actinemys pallida*) was designated as a California Species of Special Concern (SSC) in 1994. Southwestern pond turtle's preferred habitat is permanent ponds, lakes, streams, or permanent pools along intermittent streams associated with standing and slow-moving water. A potentially important limiting factor for western pond turtle is the relationship between water level and flow in off-channel water bodies, which can both be affected by groundwater pumping.

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CDFW recommends that the MB-GSA commit to Arundo *(Arundo donax)* removal in the SCRE and along the SCR within the Basin to improve groundwater supply and enhance habitat quality for nesting birds. Arundo removal is one example of a project and management action to minimize groundwater overdraft. If groundwater depletion results in reduced streamflow due to interconnected surface waters, the nesting and foraging success of the SSC yellow warbler (*Dendroica petechia*), the SSC yellow breasted chat (*Icteria virens*), least Bell's vireo, southwestern willow flycatcher and other bird species may be diminished due to the reduced nesting habitat and food availability.

Proper management of both shallow and deep groundwater pumping combined with reduced surface water pumping and diverting such as that from the would ensure that the SCRE and lower SCR are not negatively impacted. Unsustainable use of groundwater can impact the shallow aquifers and interconnected surface waters on which these species and GDEs reply on for survival. This may lead to adverse impacts on fish and wildlife and the habitat they need to survive. Determining the effects groundwater levels have on surface water flows in the Mound Basin will inform how the groundwater levels may be associated with the health and abundance of riparian vegetation. Poorly managed groundwater pumping, and surface water flows have the potential to reduce the abundance and quality of riparian vegetation, reducing the amount of shade provided by the vegetation, and ultimately leading to increased water temperatures in the SCR and SCRE. CDFW highly recommends the MB-GSA map out locations where there are interconnected surface waters and document aquatic habitats and other GDEs as required under SGMA.

The biological resources within the SCRE were completely eliminated from this Draft GSP and the MB-GSA should provide appropriate consideration to the SCRE. Fish and wildlife resources within the Basin should also be considered in the water budget. Additionally, shallow groundwater levels near interconnected surface waters should be monitored to ensure that groundwater use is not depleting surface water and adversely affecting fish and wildlife resources in the Basin.

9 **CONCLUSION**

In conclusion, the Draft GSP does not comply with all aspects of SGMA statute and regulations, and CDFW deems the Draft GSP inadequate to protect fish and wildlife beneficial users of groundwater for the following reasons:

1. The assumptions, criteria, findings, and objectives, including the sustainability goal, undesirable results, minimum thresholds, measurable objectives, and interim milestones are not reasonable and/or not supported by the best available information and best available science. [CCR § 355.4(b)(1)] (See Comments # 1, 2, and 3);

2. The Draft GSP does not identify reasonable measures and schedules to eliminate data gaps. [CCR § 355.4(b)(2)] (See Comments # 1, 2, and 3);

3. The sustainable management criteria and projects and management actions are not commensurate with the level of understanding of the basin setting, based on the level of uncertainty, as reflected in the Draft GSP. [CCR § 355.4(b)(3)] (See Comments # 1, 2, and 3); and,

4. The interests of the beneficial uses that are potentially affected by the use of groundwater in the basin, have not been considered. [CCR § 355.4(b)(4)] (See Comments # 1, 2, 3 and see Additional Comments).

CDFW appreciates the opportunity to provide comments. Additionally, we appreciate MB-GSA's continued coordination with CDFW while MB-GSA develops a final GSP. If you have any questions or comments regarding this letter, please contact Steve Slack, Environmental Scientist, at Steven.Slack@wildlife.ca.gov.

Sincerely,

DocuSigned by:
Erinn Wilson-Olgin
B6E58CFE24724F5...

Erinn Wilson-Olgin
Environmental Program Manager I
South Coast Region

Enclosures (Literature Cited)

ec: California Department of Fish and Wildlife

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Literature Cited

CDFW. 2019. California Natural Diversity Data Base (CNDDB). (https://www.wildlife.ca.gov/data/cnddb)

National Marine Fisheries Service. 2020. Comment Letter for the Proposed Groundwater Sustainability Plan for the Oxnard Basin dated May 15, 2020. National Marine Fisheries Service, West Coast Region, Long Beach, California

Stillwater Sciences. 2011b. Estuary Sub Watershed Study Assessment of the Physical and Biological Condition of the Santa Clara River Estuary, Ventura County, California. Amended Final Report. September 2011.Prepared for the City of Ventura.

The Nature Conservancy. 2017.Technical Memorandum–Draft Assessment of Groundwater Dependent Ecosystems for the Oxnard Subbasin Groundwater Sustainability Plan.

Note: comments which share the major themes from the Appendix F introduction are not included in the comment matrix (Attachement 1) due to their volume and repetition and are addressed in a new appendix to the draft GSP (Appendix G). In order to distinguish the comments from CDFW, NGOs, and NMFS, which do not follow the major themes discussed below, they have been identified and labeled with numbers and boxes below and correspond with the numbers in the comment matrix table (see Attachment 1, comments #10-16).

August 23, 2021

Mound Basin GSA
P.O. Box 3544
Ventura, CA 93006-3544
Submitted via email: jackiel@unitedwater.org.

Re: Public Comment Letter for the Mound Groundwater Basin Draft GSP

DRAFT

Dear Bryan Bondy,

On behalf of the above-listed organizations, we appreciate the opportunity to comment on the Draft Groundwater Sustainability Plan (GSP) for the Mound Groundwater Basin being prepared under the Sustainable Groundwater Management Act (SGMA). Our organizations are deeply engaged in and committed to the successful implementation of SGMA because we understand that groundwater is critical for the resilience of California's water portfolio, particularly in light of changing climate. Under the requirements of SGMA, Groundwater Sustainability Agencies (GSAs) must consider the interests of all beneficial uses and users of groundwater, such as domestic well owners, environmental users, surface water users, federal government, California Native American tribes and disadvantaged communities (Water Code 10723.2).

As stakeholder representatives for beneficial users of groundwater, our GSP review focuses on how well disadvantaged communities, tribes, climate change, and the environment were addressed in the GSP. While we appreciate that some basins have consulted us directly via focus groups, workshops, and working groups, we are providing public comment letters to all GSAs as a means to engage in the development of 2022 GSPs across the state. Recognizing that GSPs are complicated and resource intensive to develop, the intention of this letter is to provide constructive stakeholder feedback that can improve the GSP prior to submission to the State.

10

Based on our review, we have significant concerns regarding the treatment of key beneficial users in the Draft GSP and consider the GSP to be **insufficient** under SGMA. We highlight the following findings:

1. Beneficial uses and users **are not sufficiently** considered in GSP development.
   a. Human Right to Water considerations **are not sufficiently** incorporated.
   b. Public trust resources **are not sufficiently** considered.
   c. Impacts of Minimum Thresholds, Measurable Objectives and Undesirable Results on beneficial uses and users **are not sufficiently** analyzed.
2. Climate change **is not sufficiently** considered.
3. Data gaps **are not sufficiently** identified and the GSP **does not have a plan** to eliminate them.

10 4. Projects and Management Actions **do not sufficiently consider** potential impacts or benefits to beneficial uses and users.

Our specific comments related to the deficiencies of the Mound Groundwater Basin Draft GSP along with recommendations on how to reconcile them, are provided in detail in **Attachment A.**

Please refer to the enclosed list of attachments for additional technical recommendations:

Attachment A	GSP Specific Comments
Attachment B	SGMA Tools to address DAC, drinking water, and environmental beneficial uses and users
Attachment C	Freshwater species located in the basin
Attachment D	The Nature Conservancy's "Identifying GDEs under SGMA: Best Practices for using the NC Dataset"

Thank you for fully considering our comments as you finalize your GSP.

Best Regards,

Ngodoo Atume
Water Policy Analyst
Clean Water Action/Clean Water Fund

J. Pablo Ortiz-Partida, Ph.D.
Western States Climate and Water Scientist
Union of Concerned Scientists

Samantha Arthur
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E.J. Remson
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The Nature Conservancy

Melissa M. Rohde
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Attachment A

Specific Comments on the Mound Groundwater Basin Draft Groundwater Sustainability Plan

1. Consideration of Beneficial Uses and Users in GSP development

Consideration of beneficial uses and users in GSP development is contingent upon adequate identification and engagement of the appropriate stakeholders. The (A) identification, (B) engagement, and (C) consideration of disadvantaged communities, drinking water users, tribes, groundwater dependent ecosystems, streams, wetlands, and freshwater species are essential for ensuring the GSP integrates existing state policies on the Human Right to Water and the Public Trust Doctrine.

A. Identification of Key Beneficial Uses and Users

11

Disadvantaged Communities, Drinking Water Users, and Tribes

The identification of Disadvantaged Communities (DACs), drinking water users, and tribes is **insufficient**. We note the following deficiencies with the identification of these key beneficial users.

- The GSP provides a map of DAC block groups and DAC tracts within the basin (Figure 1 in Appendix D) but does not include any other identifying information for DACs.
- The adopted Stakeholder Engagement Plan (Appendix D) states that there are domestic wells overlying the basin; however, the main body of the GSP states that there are no domestic wells within the basin due to availability of potable water from Ventura Water. The GSP does not provide the location and depth of the domestic wells within the basin, nor does it provide a well density map of domestic wells in the basin. Additionally, the GSP fails to identify the population dependent on groundwater as their source of drinking water in the basin.
- The GSP states that portions of the Barbareno-Ventureno Band of Chumash are located within the Mound Basin, but does not include a map of tribal areas within the basin.

These missing elements are required for the GSA to fully understand the specific interests and water demands of these beneficial users, to support the development of water budgets using the best available information, and to support the development of sustainable management criteria and projects and management actions (PMAs) that are protective of these users.

RECOMMENDATIONS

- Provide clarification on the status of domestic wells within the basin. DWR Well Completion Report Map[1] shows that there are some domestic wells within the basin. Include a map showing the domestic wells in the basin by location and depth. even if they are not currently in use. Wells previously in use may have been impacted by poor water quality or declining groundwater elevations.
- Provide an estimate of the population dependent on groundwater within the Mound Basin. The GSP states that "The City of Ventura (Ventura Water) serves the areas indicated by DWR as Disadvantaged Communities (DACs) and Severely Disadvantaged

[1] DWR Well Completion Report Map https://dwr.maps.arcgis.com/apps/webappviewer/index.html?id=181078580a214c0986e2da28f8623b37

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Communities (SDACs).” The GSP does not, however, currently provide clear information on how and to what extent DAC members rely on groundwater.

- Include a map of tribal lands within the basin.

Interconnected Surface Waters

The identification of Interconnected Surface Waters (ISWs) is **insufficient**. ISWs were inadequately dismissed based on the incorrect assertion that the shallow aquifer is not a principal aquifer, despite the recognition in the Basin Setting section of the GSP that there is a likely connection between shallow groundwater and surface water. Groundwater in the shallow aquifer is likely providing baseflow to the Santa Clara River in this basin. The GSP states on p. 51: “In addition to groundwater production from the principal aquifers, discharge of small quantities of groundwater from the shallow alluvial aquifer to the lower reach of the Santa Clara River and possibly one other area in Mound Basin may contribute to groundwater-dependent ecosystems (GDEs).” SGMA defines principal aquifers as “aquifers or aquifer systems that store, transmit, and yield significant or economic quantities of groundwater to wells, springs, or surface water systems” [23 CCR § 351 (aa)].

The GSP states that it is unknown whether there is a connection between the shallow and underlying principle aquifers in the basin. Even if pumping is concentrated in deeper aquifers, SGMA still requires GSAs to sustainably manage groundwater resources in shallow aquifers that can support springs, surface water, and groundwater dependent ecosystems. This is because the goal of SGMA is to sustainably manage groundwater resources for current and future social, economic, and environmental benefits, and while groundwater pumping may not be currently occurring in a shallow aquifer, it could be in the future.

The GSP states on p. 67: “Data are not available to characterize the interconnection of Santa Clara River surface water and groundwater. Although the frequent perennial baseflow conditions imply that surface and groundwater is interconnected, it is not known specifically which groundwater in which units are connected and where.” However, the GSP should not ignore ISWs just because there is a lack of data to support their characterization. The absence of evidence is not the evidence of absence. Therefore, potential ISWs are not being identified, described, nor managed in the GSP. Until a disconnection can be proven, include all potential ISWs in the GSP. This is necessary to assess whether surface water depletions caused by groundwater use are having an adverse impact on environmental beneficial users of surface water.

RECOMMENDATIONS

- Include the shallow groundwater system as a principal aquifer in this GSP to ensure adequate monitoring and management of this critical groundwater resource for current and future beneficial users.

- Provide depth-to-groundwater contour maps using the best practices presented in Attachment D, to aid in the determination of ISWs. Specifically, ensure that the first step is contouring groundwater elevations, and then subtracting this layer from land surface elevations from a DEM to estimate depth-to-groundwater contours across the

- landscape. This will provide accurate contours of depth to groundwater along streams and other land surface depressions where GDEs are commonly found.

- Use seasonal data over multiple water year types to capture the variability in environmental conditions inherent in California's climate, when mapping ISWs.

- Reconcile ISW data gaps with specific measures (shallow monitoring wells (especially in the shallow aquifer), stream gauges, and nested/clustered wells) along surface water features in the Monitoring Network section of the GSP.

Groundwater Dependent Ecosystems

The identification of Groundwater Dependent Ecosystems (GDEs) is **insufficient**. The GSP took initial steps to identify and map GDEs using the Natural Communities Commonly Associated with Groundwater dataset (NC dataset) and other sources. However, we found that mapped features in the NC dataset were improperly disregarded, as described below.

- The GSP uses the same incorrect rationale used in the ISW section to state that GDEs are not present in the Basin because they do not rely on groundwater from a principal aquifer. As noted above, GSP Regulations define principal aquifers as "aquifers or aquifer systems that store, transmit, and yield significant or economic quantities of groundwater to wells, springs, or surface water systems" [23 CCR §351(aa)] regardless of pumping rates. Shallow aquifers that have the potential to support well development, support ecosystems, or provide baseflow to streams are principal aquifers, even if the majority of the basin's pumping is occurring in deeper principal aquifers. If there are no data to characterize groundwater conditions in the shallow principal aquifer, then the GDE should be retained as a potential GDE and data gaps reconciled in the Monitoring Network section of the GSP.
- GDEs were incorrectly removed in areas adjacent to irrigated fields due to the presence of surface water. However, GDEs can rely on multiple water sources – including shallow groundwater receiving inputs from irrigation return flow from nearby irrigated fields - simultaneously and at different temporal/spatial scales. NC dataset polygons adjacent to irrigated land can still potentially be reliant on shallow groundwater aquifers, and therefore should not be removed solely based on their proximity to irrigated fields.

RECOMMENDATIONS

- Provide depth-to-groundwater contour maps, noting the best practices presented in Attachment D. Specifically, ensure that the first step is contouring groundwater elevations, and then subtracting this layer from land surface elevations from a DEM to estimate depth-to-groundwater contours across the landscape.

- If insufficient data are available to describe groundwater conditions within or near polygons from the NC dataset, include those polygons as "Potential GDEs" in the GSP until data gaps are reconciled in the monitoring network.

- In addition to providing maps of the vegetation and wetland communities from the NC dataset in the GSP area (as provided in Appendix G of the GSP), please also provide an inventory, map, or description of fauna (e.g., birds, fish, amphibian) species in the basin and note any threatened or endangered species. See Attachment C of this letter for a list of freshwater species located in the Mound Basin.

12 **Native Vegetation**

Native vegetation is a water use sector that is required[2,3] to be included into the water budget. The integration of this ecosystem into the water budget is **insufficient**. The water budget did not include the current, historical, and projected demands of native vegetation. The omission of explicit water demands for native vegetation is problematic because key environmental uses of groundwater are not being accounted for as water supply decisions are made using this budget, nor will they likely be considered in project and management actions.

RECOMMENDATION
• Quantify and present all water use sector demands in the historical, current, and projected water budgets with individual line items for each water use sector, including native vegetation.

B. Engaging Stakeholders

13 **Stakeholder Engagement during GSP development**

Stakeholder engagement during GSP development is **insufficient**. SGMA's requirement for public notice and engagement of stakeholders[4] is not fully met by the description in the Stakeholder Engagement Plan included in the GSP (Appendix D).

We acknowledge and commend the clear description of the inclusion of an environmental stakeholder on the governing board of the GSA. The Environmental Stakeholder Director is responsible for engaging environmental stakeholders within the Basin and representing environmental interests before the GSA, including during GSP implementation. However, the engagement plan describes only a minimum amount of outreach to DACs. Stakeholder engagement has primarily occurred via Ventura Water bill stuffers and newsletters, including materials provided in Spanish. Noted deficiencies in the stakeholder engagement process include:

- As the water supplier for DACs in the Basin, the City represented DAC interests through its participation on the MBGSA Board of Directors. However, it does not give more information about how their interests were represented.
- The opportunities for public involvement and engagement are limited to MBGSA regular board meetings, review of the MBGSA's website, and providing comments via the website.
- The GSP states that the GSA "has held several public workshops to provide in-depth discussion of the GSP and obtain stakeholder feedback. The workshops include polls to help facilitate public input on key issues and identify which outreach methods are most

[2] "'Water use sector' refers to categories of water demand based on the general land uses to which the water is applied, including urban, industrial, agricultural, managed wetlands, managed recharge, and native vegetation." [23 CCR §351(al)]

[3] "The water budget shall quantify the following, either through direct measurements or estimates based on data: (3) Outflows from the groundwater system by water use sector, including evapotranspiration, groundwater extraction, groundwater discharge to surface water sources, and subsurface groundwater outflow." [23 CCR §354.18]

[4] "A communication section of the Plan shall include a requirement that the GSP identify how it encourages the active involvement of diverse social, cultural, and economic elements of the population within the basin." [23 CCR §354.10(d)(3)]

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effective." The GSP gives no further information about how the workshops were advertised or if DACs were engaged to attend.

- The GSP states that portions of the Barbareno-Ventureno Band of Chumash are located within the Mound Basin and the MBGSA will inform the Tribal Elder, Julie Tumamait, throughout the GSP development process and GSP implementation.However, there are no further details on the engagement with the tribe.
- Domestic well owners are specifically mentioned in the Stakeholder Engagement Plan as holders of overlying groundwater rights, however no information is provided other than stating that their participation is invited in the Agency's public meetings.
- The Stakeholder Engagement Plan does not include a plan for continual opportunities for engagement through the implementation phase of the GSP for DACs.

RECOMMENDATIONS

- Include a more detailed and robust Stakeholder Engagement Plan that details how the GSA will actively target and engage DAC community members during the remainder of the GSP development process and throughout the GSP implementation phase. Include plans to directly engage the DAC population for inclusion on the Board of Directors instead of having DACs represented by the City of Ventura. Refer to Attachment B for specific recommendations on Stakeholder Communication and Engagement.
- Conduct outreach at frequented locations such as farmers markets and schools across the plan area, providing translation services and technical assistance where needed. Refer to Attachment B for specific recommendations on how to actively engage community stakeholders.
- Consult and engage with the Barbareno-Ventureno Band of Chumash Tribe. Refer to "DWR guidance for engagement with tribal governments" for specific guidance.[5]

14

C. Considering Beneficial Uses and Users When Establishing Sustainable Management Criteria and Analyzing Impacts on Beneficial Uses and Users

The consideration of beneficial uses and users when establishing sustainable management criteria (SMC) is **insufficient**. The consideration of potential impacts on all beneficial users of groundwater in the basin are required when defining undesirable results[6] and establishing minimum thresholds[7,8]

[5] DWR guidance on Engagement with Tribal Governments https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/Guidance-Doc-for-SGM-Engagement-with-Tribal-Govt_ay_19.pdf

[6] "The description of undesirable results shall include [...] potential effects on the beneficial uses and users of groundwater, on land uses and property interests, and other potential effects that may occur or are occurring from undesirable results." [23 CCR §354.26(b)(3)]

[7] "The description of minimum thresholds shall include [...] how minimum thresholds may affect the interests of beneficial uses and users of groundwater or land uses and property interests." [23 CCR §354.28(b)(4)]

[8] "The description of minimum thresholds shall include [...] how state, federal, or local standards relate to the relevant sustainability indicator. If the minimum threshold differs from other regulatory standards, the agency shall explain the nature of and the basis for the difference." [23 CCR §354.28(b)(5)]

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Disadvantaged Communities and Drinking Water Users

The GSP states that the City of Ventura (Ventura Water) serves DAC communities in the basin. It also states that there are domestic wells in the basin, but that the majority of these domestic well owners are *de minimus* users. It does not provide the location of the domestic wells, the screened interval, or the most recent reported date of well usage. Because the location of domestic wells is not provided in the GSP, the impacts to the domestic well user population are unknown. Because the GSP has not established SMC for the shallow principal aquifer, the GSP neither describes nor analyzes direct or indirect impacts on DACs or domestic drinking wells when defining undesirable results for chronic lowering of groundwater levels or water quality. Therefore, the SMC provided in the GSP are not protective of domestic drinking water well users.

RECOMMENDATIONS

Chronic Lowering of Groundwater Levels

- Establish chronic lowering of groundwater level SMC for the shallow principal aquifer that are protective of DACs and domestic well users. Even though the shallow principal aquifer is not currently pumped or treated for domestic drinking water, it could be in the future.
- Consider and evaluate the impacts of selected minimum thresholds and measurable objectives on drinking water users within the basin.

Degraded Water Quality

- Establish water quality SMC for the shallow principal aquifer that are protective of drinking water users. Even though the shallow principal aquifer is not currently pumped or treated for domestic drinking water, it could be in the future.
- Establish minimum thresholds at the representative monitoring wells that avoid the specific undesirable result of impacting water quality for potable use. For each of the two deep principal aquifers, the GSP states that undesirable results occur when all representative monitoring wells in a principal aquifer exceed the minimum threshold concentration for a constituent for two consecutive years. Because the minimum thresholds are set to the MCL, or in some cases higher than the Secondary MCL (see Table 4.1-02), this does not appear to satisfy the stated minimum threshold goal of protecting water quality for potable uses.
- Evaluate the cumulative or indirect impacts of proposed minimum thresholds on drinking water users, including domestic wells and municipal water suppliers. The GSP states that potential effects on municipal beneficial uses would be increased costs for treatment or blending to meet drinking water standards, however this is the only impact discussed.

Groundwater Dependent Ecosystems and Interconnected Surface Waters

Because the shallow aquifer is disregarded as a principal aquifer in the GSP, sustainable management criteria provided in the GSP do not consider potential impacts to environmental beneficial users. The GSP neither describes nor analyzes direct or indirect impacts on environmental users of groundwater or surface water when defining undesirable results. This is problematic because without identifying potential impacts to GDEs and beneficial users of interconnected surface waters, minimum thresholds may compromise, or even irreparably destroy, environmental beneficial users. Since potential GDEs are present in the basin, they must be considered when developing SMC for the basin. The comments above provide recommendations for re-evaluating the extent of GDEs and ISW in the basin by first considering the shallow aquifer as a principal aquifer.

RECOMMENDATIONS

- Establish SMC for the shallow principal aquifer that are protective of environmental uses and users. When defining undesirable results for chronic lowering of groundwater levels, water quality, and depletions of interconnected surface waters, please provide specifics on what biological responses (e.g., extent of habitat, growth, recruitment rates) would best characterize a significant and unreasonable impact to GDEs. Undesirable results to environmental users occur when 'significant and unreasonable' effects on beneficial users are caused by one of the sustainability indicators (i.e., chronic lowering of groundwater levels, degraded water quality, or depletion of interconnected surface water). Thus, potential impacts on environmental beneficial uses and users need to be considered when defining undesirable results[9] in the basin. Defining undesirable results is the crucial first step before the minimum thresholds[10] can be determined.

- For the interconnected surface water SMC, the undesirable results should include a description of potential impacts on instream habitats within ISWs when defining minimum thresholds in the basin[11]. The GSP should confirm that minimum thresholds for ISWs avoid adverse impacts to environmental beneficial users of interconnected surface waters as these environmental users could be left unprotected by the GSP (See Attachment C for a list of freshwater species in your basin). These recommendations apply especially to environmental beneficial users that are already protected under pre-existing state or federal law[6,12].

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2. Climate Change

The SGMA statute identifies climate change as a significant threat to groundwater resources and one that must be examined and incorporated in the GSPs. The GSP Regulations[13] require integration of climate change into the projected water budget to ensure that projects and management actions sufficiently account for the range of potential climate futures.

The integration of climate change into the projected water budget is **insufficient**. The GSP does incorporate climate change into the projected water budget using DWR change factors for 2030 and 2070. However, the GSP did not consider the 2070 extremely wet and extremely dry climate scenarios in the projected water budget. The GSP should clearly and transparently incorporate the extremely wet and

[9] "The description of undesirable results shall include [...] potential effects on the beneficial uses and users of groundwater, on land uses and property interests, and other potential effects that may occur or are occurring from undesirable results". [23 CCR §354.26(b)(3)]
[10] The description of minimum thresholds shall include [...] how minimum thresholds may affect the interests of beneficial uses and users of groundwater or land uses and property interests." [23 CCR §354.28(b)(4)]
[11] "The minimum threshold for depletions of interconnected surface water shall be the rate or volume of surface water depletions caused by groundwater use that has adverse impacts on beneficial uses of the surface water and may lead to undesirable results." [23 CCR §354.28(c)(6)]
[12] Rohde MM, Seapy B, Rogers R, Castañeda X, editors. 2019. Critical Species LookBook: A compendium of California's threatened and endangered species for sustainable groundwater management. The Nature Conservancy, San Francisco, California. Available at: https://groundwaterresourcehub.org/public/uploads/pdfs/Critical_Species_LookBook_91819.pdf
[13] "Each Plan shall rely on the best available information and best available science to quantify the water budget for the basin in order to provide an understanding of historical and projected hydrology, water demand, water supply, land use, population, climate change, sea level rise, groundwater and surface water interaction, and subsurface groundwater flow." [23 CCR §354.18(e)]

15 dry scenarios provided by DWR into projected water budgets or select more appropriate extreme scenarios for their basins. While these extreme scenarios may have a lower likelihood of occurring, their consequences could be significant, therefore they should be included in groundwater planning.

We acknowledge and commend the inclusion of climate change into key inputs (precipitation, evaporation, surface water flow, and sea level inputs) of the projected water budget. Additionally, the sustainable yield is calculated based on the projected pumping for all three future projections (baseline, 2030, and 2070). However, if the water budgets are incomplete, including the omission of extremely wet and dry scenarios, then there is increased uncertainty in virtually every subsequent calculation used to plan for projects, derive measurable objectives, and set minimum thresholds. Plans that do not adequately include climate change projections may underestimate future impacts on vulnerable beneficial users of groundwater such as ecosystems and domestic well owners.

RECOMMENDATIONS

- Integrate extreme wet and dry scenarios into the projected water budget to form the basis for development of sustainable management criteria and projects and management actions.
- Climate change was addressed when describing the minimum threshold for seawater intrusion. We recommend incorporating climate change considerations into other projects and management actions.

3. Data Gaps

The consideration of beneficial users when establishing monitoring networks is **insufficient**. Our comments above note that the principal shallow aquifer was disregarded in the GSP. The lack of monitoring wells in the shallow aquifer and/or the lack of plans for future monitoring threatens GDEs, aquatic habitats, surface water users and shallow domestic well water. Potential GDEs are located in areas of the subbasin where no shallow groundwater monitoring currently exists or is proposed, leaving data gaps unfilled. Potential ISWs have been dismissed in the GSP, without proposed recommendations to improve ISW identification, mapping, and estimates of depletions. Appropriate monitoring is necessary so that groundwater conditions within GDEs and ISWs are characterized and surface-shallow groundwater interactions are fully integrated into the GSP.

Without adequate monitoring and identification of data gaps in the shallow aquifer, GDEs, ISWs, DACs, and domestic well users will remain unprotected by the GSP. The Plan therefore fails to meet SGMA's requirements for the monitoring network[14].

[14] "The monitoring network objectives shall be implemented to accomplish the following: [...] (2) Monitor impacts to the beneficial uses or users of groundwater." [23 CCR §354.34(b)(2)]

RECOMMENDATIONS

- Include representative monitoring sites (RMSs) in the shallow principal aquifer across the basin for all groundwater condition indicators. The GSP states that water quality in the shallow principal aquifer is poor, but provides no monitoring data. Prioritize proximity to GDEs and domestic wells when identifying new RMPs.
- Provide maps that overlay monitoring well locations with the locations of DACs, domestic wells, and GDEs to clearly identify potentially impacted areas.
- Evaluate how the gathered data will be used to identify and map GDEs and ISWs, and to identify DACs and shallow domestic well users that are vulnerable to undesirable results.
- Determine what ecological monitoring can be used to assess the potential for significant and unreasonable impacts to GDEs or ISWs due to groundwater conditions in the subbasin.

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4. Addressing Beneficial Users in Projects and Management Actions

The consideration of beneficial users when developing projects and management actions is **insufficient**. The GSP states there is no need for project and management actions to address gaps between current and projected sustainable yield. However, groundwater sustainability under SGMA is defined not just by sustainable yield, but by the avoidance of undesirable results for all beneficial users. These beneficial users such as GDEs, aquatic habitats, surface water users, DACs, and drinking water users were not sufficiently identified in the GSP. Therefore, potential project and management actions have not been designed or proposed to protect these vulnerable users of the shallow principal aquifer.

RECOMMENDATIONS

Because GDEs, aquatic habitats, surface water users, DACs, and shallow domestic well water users were not sufficiently identified in the GSP, please consider including the following related to potential project and management actions in the GSP:

- For GDEs and ISWs, recharge ponds, reservoirs and facilities for managed stormwater recharge can be designed as multiple-benefit projects to include elements that act functionally as wetlands and provide a benefit for wildlife and aquatic species. For guidance on how to integrate multi-benefit recharge projects into your GSP refer to the "Multi-Benefit Recharge Project Methodology Guidance Document"[15].

[15] The Nature Conservancy. 2021. Multi-Benefit Recharge Project Methodology for Inclusion in Groundwater Sustainability Plans. Sacramento. Available at: https://groundwaterresourcehub.org/sgma-tools/multi-benefit-recharge-project-methodology-guidance/

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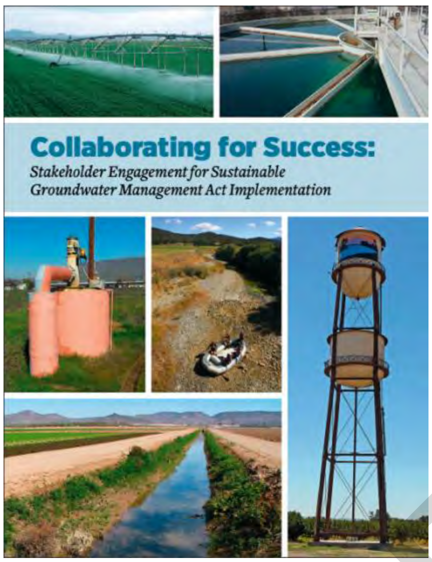
- For DACs, monitor the impacts of projects and management actions on communities and drinking water users. For example, provide locations of the improperly constructed or abandoned wells, as discussed in Section 6.5, that create conduits for migration of poor-quality water from shallow water-bearing units into the principal aquifers. Discuss how sealing these wells will benefit DACs and domestic wells users.
- For DACs and domestic well owners, take a full accounting of the locations and screened intervals of domestic wells in the basin, even those with de minimus use. Implement a drinking water well mitigation program to protect drinking water users.
- Develop management actions that incorporate climate and water delivery uncertainties to address future water demand and prevent future undesirable results.

Attachment B

SGMA Tools to address DAC, drinking water, and environmental beneficial uses and users

Stakeholder Engagement and Outreach



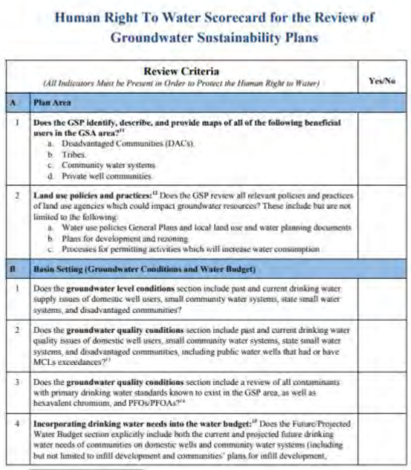
Clean Water Action, Community Water Center and Union of Concerned Scientists developed a guidance document called Collaborating for success: Stakeholder engagement for Sustainable Groundwater Management Act Implementation. It provides details on how to conduct targeted and broad outreach and engagement during Groundwater Sustainability Plan (GSP) development and implementation. Conducting a targeted outreach involves:

- Developing a robust Stakeholder Communication and Engagement plan that includes outreach at frequented locations (schools, farmers markets, religious settings, events) across the plan area to increase the involvement and participation of disadvantaged communities, drinking water users and the environmental stakeholders.

- Providing translation services during meetings and technical assistance to enable easy participation for non-English speaking stakeholders.

- GSP should adequately describe the process for requesting input from beneficial users and provide details on how input is incorporated into the GSP.

The Human Right to Water

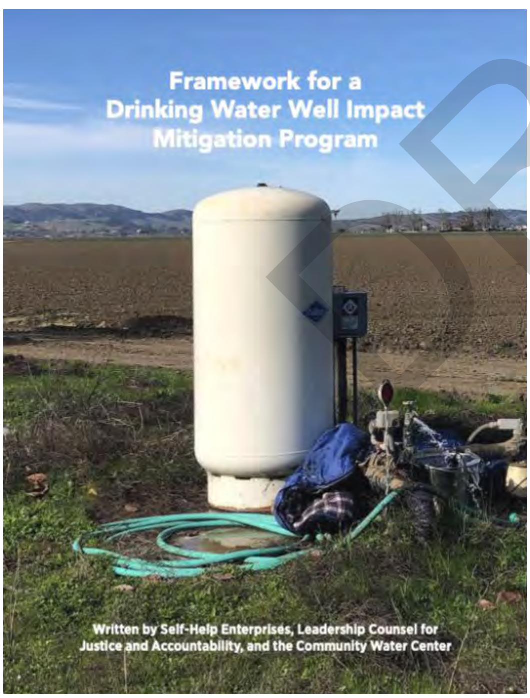


Human Right To Water Scorecard for the Review of Groundwater Sustainability Plans

	Review Criteria *(All Indicators Must be Present in Order to Protect the Human Right to Water)*	Yes/No
A	**Plan Area**	
1	**Does the GSP identify, describe, and provide maps of all of the following beneficial users in the GSA area?**[11] a. Disadvantaged Communities (DACs). b. Tribes. c. Community water systems d. Private well communities	
2	**Land use policies and practices:**[12] Does the GSP review all relevant policies and practices of land use agencies which could impact groundwater resources? These include but are not limited to the following: a. Water use policies General Plans and local land use and water planning documents b. Plans for development and rezoning c. Processes for permitting activities which will increase water consumption	
B	**Basin Setting (Groundwater Conditions and Water Budget)**	
1	Does the **groundwater level conditions** section include past and current drinking water supply issues of domestic well users, small community water systems, state small water systems, and disadvantaged communities?	
2	Does the **groundwater quality conditions** section include past and current drinking water quality issues of domestic well users, small community water systems, state small water systems, and disadvantaged communities, including public water wells that had or have MCLs exceedances?[13]	
3	Does the **groundwater quality conditions** section include a review of all contaminants with primary drinking water standards known to exist in the GSP area, as well as hexavalent chromium, and PFOs/PFOAs?[14]	
4	**Incorporating drinking water needs into the water budget:**[15] Does the Future/Projected Water Budget section explicitly include both the current and projected future drinking water needs of communities on domestic wells and community water systems (including but not limited to infill development and communities' plans for infill development.	

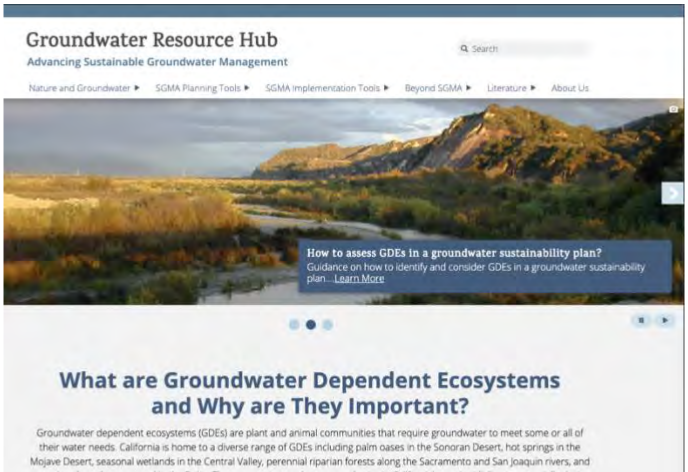
The Human Right to Water Scorecard was developed by Community Water Center, Leadership Counsel for Justice and Accountability and Self Help Enterprises to aid Groundwater Sustainability Agencies (GSAs) in prioritizing drinking water needs in SGMA. The scorecard identifies elements that must exist in GSPs to adequately protect the Human Right to Drinking water.

Drinking Water Well Impact Mitigation Framework



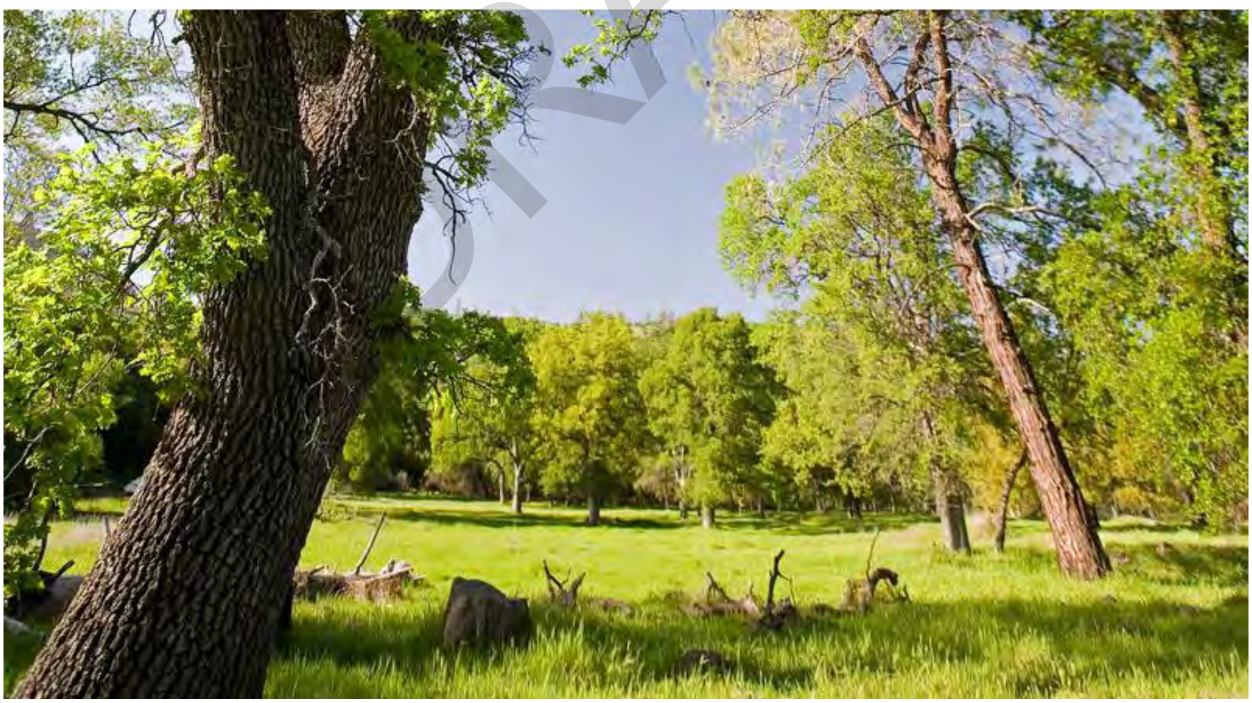
The Drinking Water Well Impact Mitigation Framework was developed by Community Water Center, Leadership Counsel for Justice and Accountability and Self Help Enterprises to aid GSAs in the development and implementation of their GSPs. The framework provides a clear roadmap for how a GSA can best structure its data gathering, monitoring network and management actions to proactively monitor and protect drinking water wells and mitigate impacts should they occur.

Groundwater Resource Hub



The Nature Conservancy has developed a suite of tools based on best available science to help GSAs, consultants, and stakeholders efficiently incorporate nature into GSPs. These tools and resources are available online at GroundwaterResourceHub.org. The Nature Conservancy's tools and resources are intended to reduce costs, shorten timelines, and increase benefits for both people and nature.

Rooting Depth Database



The Plant Rooting Depth Database provides information that can help assess whether groundwater-dependent vegetation are accessing groundwater. Actual rooting depths will depend on the plant species and site-specific conditions, such as soil type and availability of other water sources. Site-specific knowledge of depth to groundwater combined with rooting depths will help provide an understanding of the potential groundwater levels are needed to sustain GDEs.

How to use the database

The maximum rooting depth information in the Plant Rooting Depth Database is useful when verifying whether vegetation in the Natural Communities Commonly Associated with Groundwater (NC Dataset) are connected to groundwater. A 30 ft depth-to-groundwater threshold, which is based on averaged global rooting depth data for phreatophytes[1], is relevant for most plants identified in the NC Dataset since most plants have a max rooting depth of less than 30 feet. However, it is important to note that deeper thresholds are necessary for other plants that have reported maximum root depths that exceed the averaged 30 feet threshold, such as valley oak (*Quercus lobata*), Euphrates poplar (*Populus euphratica*), salt cedar (*Tamarix spp.*), and shadescale (*Atriplex confertifolia*). The Nature Conservancy advises that the reported max rooting depth for these deeper-rooted plants be used. For example, a depth-to groundwater threshold of 80 feet should be used instead of the 30 ft threshold, when verifying whether valley oak polygons from the NC Dataset are connected to groundwater. It is important to re-emphasize that actual rooting depth data are limited and will depend on the plant species and site-specific conditions such as soil and aquifer types, and availability to other water sources.

The Plant Rooting Depth Database is an Excel workbook composed of four worksheets:

1. California phreatophyte rooting depth data (included in the NC Dataset)
2. Global phreatophyte rooting depth data
3. Metadata
4. References

How the database was compiled

The Plant Rooting Depth Database is a compilation of rooting depth information for the groundwater-dependent plant species identified in the NC Dataset. Rooting depth data were compiled from published scientific literature and expert opinion through a crowdsourcing campaign. As more information becomes available, the database of rooting depths will be updated. Please Contact Us if you have additional rooting depth data for California phreatophytes.

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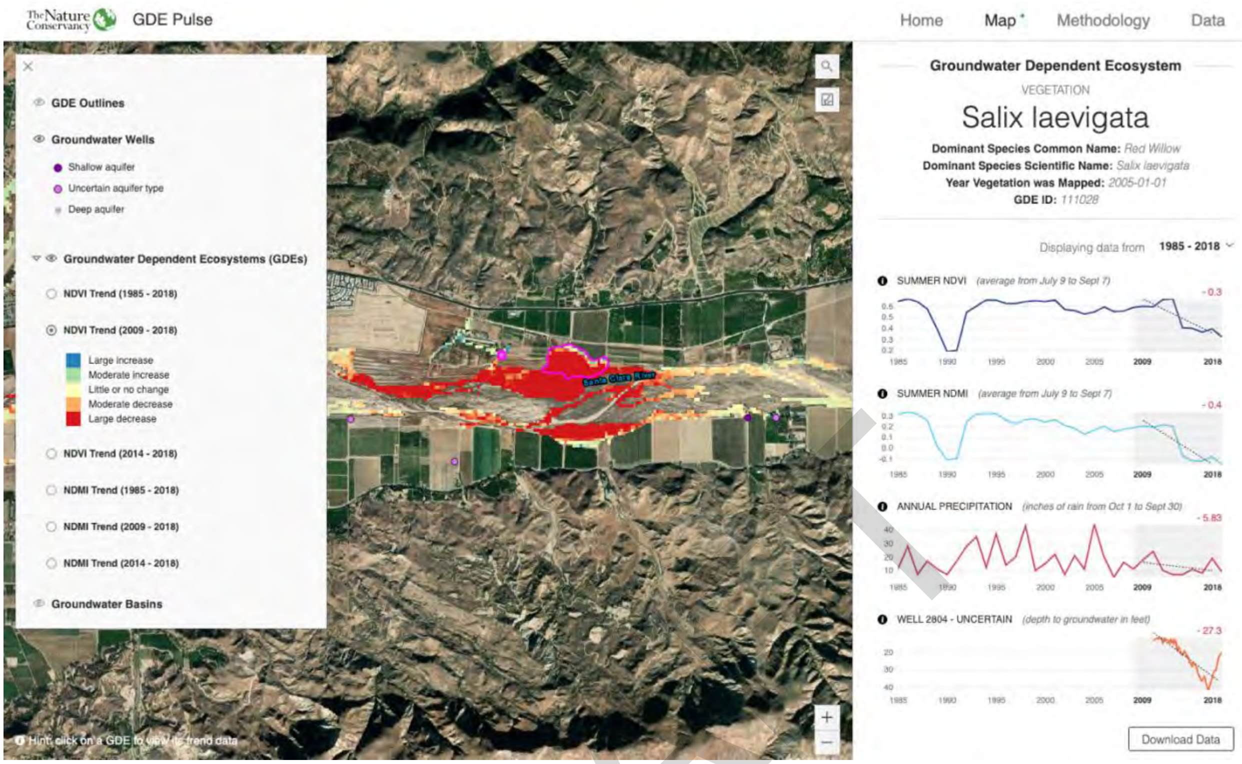
[1] Canadell, J., Jackson, R.B., Ehleringer, J.B. et al. 1996. Maximum rooting depth of vegetation types at the global scale. Oecologia 108, 583–595. https://doi.org/10.1007/BF00329030

GDE Pulse



GDE Pulse is a free online tool that allows Groundwater Sustainability Agencies to assess changes in groundwater dependent ecosystem (GDE) health using satellite, rainfall, and groundwater data. Remote sensing data from satellites has been used to monitor the health of vegetation all over the planet. GDE pulse has compiled 35 years of satellite imagery from NASA's Landsat mission for every polygon in the Natural Communities Commonly Associated with Groundwater Dataset. The following datasets are available for downloading:

Normalized Difference Vegetation Index (NDVI) is a satellite-derived index that represents the greenness of vegetation. Healthy green vegetation tends to have a higher NDVI, while dead leaves have a lower NDVI. We calculated the average NDVI during the driest part of the year (July - Sept) to estimate vegetation health when the plants are most likely dependent on groundwater.

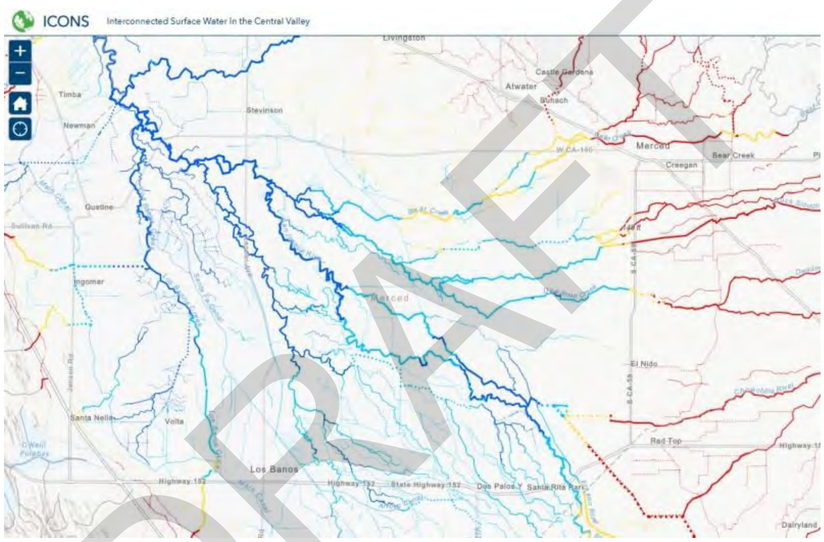
Normalized Difference Moisture Index (NDMI) is a satellite-derived index that represents water content in vegetation. NDMI is derived from the Near-Infrared (NIR) and Short-Wave Infrared (SWIR) channels. Vegetation with adequate access to water tends to have higher NDMI, while vegetation that is water stressed tends to have lower NDMI. We calculated the average NDVI during the driest part of the year (July–September) to estimate vegetation health when the plants are most likely dependent on groundwater.

Annual Precipitation is the total precipitation for the water year (October 1st – September 30th) from the PRISM dataset. The amount of local precipitation can affect vegetation with more precipitation generally leading to higher NDVI and NDMI.

Depth to Groundwater measurements provide an indication of the groundwater levels and changes over time for the surrounding area. We used groundwater well measurements from nearby (<1km) wells to estimate the depth to groundwater below the GDE based on the average elevation of the GDE (using a digital elevation model) minus the measured groundwater surface elevation.

ICONOS Mapper

Interconnected Surface Water in the Central Valley



ICONS maps the likely presence of interconnected surface water (ISW) in the Central Valley using depth to groundwater data. Using data from 2011-2018, the ISW dataset represents the likely connection between surface water and groundwater for rivers and streams in California's Central Valley. It includes information on the mean, maximum, and minimum depth to groundwater for each stream segment over the years with available data, as well as the likely presence of ISW based on the minimum depth to groundwater. The Nature Conservancy developed this database, with guidance and input from expert academics, consultants, and state agencies.

We developed this dataset using groundwater elevation data available online from the California Department of Water Resources (DWR). DWR only provides this data for the Central Valley. For GSAs outside of the valley, who have groundwater well measurements, we recommend following our methods to determine likely ISW in your region. The Nature Conservancy's ISW dataset should be used as a first step in reviewing ISW and should be supplemented with local or more recent groundwater depth data.

Attachment C

Freshwater Species Located in the Mound Basin

To assist in identifying the beneficial users of surface water necessary to assess the undesirable result "depletion of interconnected surface waters", this attachment provides a list of freshwater species located in the Mound Basin. To produce the freshwater species list, we used ArcGIS to select features within the California Freshwater Species Database version 2.0.9 within the basin boundary. This database contains information on ~4,000 vertebrates, macroinvertebrates and vascular plants that depend on fresh water for at least one stage of their life cycle. The methods used to compile the California Freshwater Species Database can be found in Howard et al. 2015[1]. The spatial database contains locality observations and/or distribution information from ~400 data sources. The database is housed in the California Department of Fish and Wildlife's BIOS[2] as well as on The Nature Conservancy's science website[3].

Scientific Name	Common Name	Legal Protected Status		
		Federal	State	Other
BIRDS				
Actitis macularius	Spotted Sandpiper			
Aechmophorus clarkii	Clark's Grebe			
Aechmophorus occidentalis	Western Grebe			
Agelaius tricolor	Tricolored Blackbird	Bird of Conservation Concern	Special Concern	BSSC - First priority
Aix sponsa	Wood Duck			
Anas acuta	Northern Pintail			
Anas americana	American Wigeon			
Anas clypeata	Northern Shoveler			
Anas crecca	Green-winged Teal			
Anas cyanoptera	Cinnamon Teal			
Anas discors	Blue-winged Teal			
Anas platyrhynchos	Mallard			
Anas strepera	Gadwall			
Anser albifrons	Greater White-fronted Goose			
Ardea alba	Great Egret			
Ardea herodias	Great Blue Heron			
Aythya affinis	Lesser Scaup			
Aythya americana	Redhead		Special Concern	BSSC - Third priority

[1] Howard, J.K. et al. 2015. Patterns of Freshwater Species Richness, Endemism, and Vulnerability in California. PLoSONE, 11(7). Available at: https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0130710

[2] California Department of Fish and Wildlife BIOS: https://www.wildlife.ca.gov/data/BIOS

[3] Science for Conservation: https://www.scienceforconservation.org/products/california-freshwater-species-database

Aythya collaris	Ring-necked Duck			
Aythya marila	Greater Scaup			
Aythya valisineria	Canvasback		Special	
Botaurus lentiginosus	American Bittern			
Bucephala albeola	Bufflehead			
Bucephala clangula	Common Goldeneye			
Butorides virescens	Green Heron			
Calidris alpina	Dunlin			
Calidris mauri	Western Sandpiper			
Calidris minutilla	Least Sandpiper			
Chen caerulescens	Snow Goose			
Chen rossii	Ross's Goose			
Chlidonias niger	Black Tern		Special Concern	BSSC - Second priority
Chroicocephalus philadelphia	Bonaparte's Gull			
Cistothorus palustris palustris	Marsh Wren			
Cygnus columbianus	Tundra Swan			
Egretta thula	Snowy Egret			
Empidonax traillii	Willow Flycatcher	Bird of Conservation Concern	Endangered	
Fulica americana	American Coot			
Gallinago delicata	Wilson's Snipe			
Himantopus mexicanus	Black-necked Stilt			
Icteria virens	Yellow-breasted Chat		Special Concern	BSSC - Third priority
Ixobrychus exilis hesperis	Western Least Bittern		Special Concern	BSSC - Second priority
Limnodromus scolopaceus	Long-billed Dowitcher			
Lophodytes cucullatus	Hooded Merganser			
Megaceryle alcyon	Belted Kingfisher			
Mergus serrator	Red-breasted Merganser			
Numenius americanus	Long-billed Curlew			
Numenius phaeopus	Whimbrel			
Nycticorax nycticorax	Black-crowned Night-Heron			
Oxyura jamaicensis	Ruddy Duck			

Pelecanus erythrorhynchos	American White Pelican		Special Concern	BSSC - First priority
Phalacrocorax auritus	Double-crested Cormorant			
Phalaropus tricolor	Wilson's Phalarope			
Piranga rubra	Summer Tanager		Special Concern	BSSC - First priority
Plegadis chihi	White-faced Ibis		Watch list	
Pluvialis squatarola	Black-bellied Plover			
Podiceps nigricollis	Eared Grebe			
Podilymbus podiceps	Pied-billed Grebe			
Porzana carolina	Sora			
Rallus limicola	Virginia Rail			
Recurvirostra americana	American Avocet			
Riparia riparia	Bank Swallow		Threatened	
Rynchops niger	Black Skimmer			
Setophaga petechia	Yellow Warbler			BSSC - Second priority
Tachycineta bicolor	Tree Swallow			
Tringa melanoleuca	Greater Yellowlegs			
Tringa semipalmata	Willet			
Vireo bellii	Bell's Vireo			
Xanthocephalus xanthocephalus	Yellow-headed Blackbird		Special Concern	BSSC - Third priority
CRUSTACEANS				
Hyalella spp.	Hyalella spp.			
FISH				
Eucyclogobius newberryi	Tidewater goby	Endangered	Special Concern	Vulnerable - Moyle 2013
Oncorhynchus mykiss - Southern CA	Southern California steelhead	Endangered	Special Concern	Endangered - Moyle 2013
HERPS				
Actinemys marmorata marmorata	Western Pond Turtle		Special Concern	ARSSC
Anaxyrus boreas boreas	Boreal Toad			
Pseudacris cadaverina	California Treefrog			ARSSC
Rana boylii	Foothill Yellow-legged Frog	Under Review in the Candidate or Petition Process	Special Concern	ARSSC
Rana draytonii	California Red-legged Frog	Threatened	Special Concern	ARSSC

Spea hammondii	Western Spadefoot	Under Review in the Candidate or Petition Process	Special Concern	ARSSC
Thamnophis hammondii hammondii	Two-striped Gartersnake		Special Concern	ARSSC
Thamnophis sirtalis sirtalis	Common Gartersnake			
INSECTS & OTHER INVERTS				
Apedilum spp.	Apedilum spp.			
Chironomidae fam.	Chironomidae fam.			
Chironomus spp.	Chironomus spp.			
Cricotopus spp.	Cricotopus spp.			
Dicrotendipes spp.	Dicrotendipes spp.			
Enochrus carinatus				Not on any status lists
Ephydridae fam.	Ephydridae fam.			
Eukiefferiella spp.	Eukiefferiella spp.			
Micropsectra spp.	Micropsectra spp.			
Paracladopelma spp.	Paracladopelma spp.			
Parametriocnemus spp.	Parametriocnemus spp.			
Pentaneura spp.	Pentaneura spp.			
Polypedilum spp.	Polypedilum spp.			
Pseudochironomus spp.	Pseudochironomus spp.			
Rheotanytarsus spp.	Rheotanytarsus spp.			
Simulium donovani				Not on any status lists
Simulium spp.	Simulium spp.			
Simulium tescorum				Not on any status lists
MOLLUSKS				
Physa spp.	Physa spp.			
Physella cooperi	Olive Physa			V
PLANTS				
Arundo donax	NA			
Bolboschoenus maritimus paludosus	NA			Not on any status lists
Datisca glomerata	Durango Root			
Ludwigia peploides peploides	NA			Not on any status lists
Lythrum californicum	California Loosestrife			
Phyla nodiflora	Common Frog-fruit			

Platanus racemosa	California Sycamore			
Potentilla anserina pacifica				Not on any status lists
Salix lasiandra lasiandra				Not on any status lists

Attachment D

The Nature Conservancy

July 2019

IDENTIFYING GDEs UNDER SGMA
Best Practices for using the NC Dataset

The Sustainable Groundwater Management Act (SGMA) requires that groundwater dependent ecosystems (GDEs) be identified in Groundwater Sustainability Plans (GSPs). As a starting point, the Department of Water Resources (DWR) is providing the Natural Communities Commonly Associated with Groundwater Dataset (NC Dataset) online[1] to help Groundwater Sustainability Agencies (GSAs), consultants, and stakeholders identify GDEs within individual groundwater basins. To apply information from the NC Dataset to local areas, GSAs should combine it with the best available science on local hydrology, geology, and groundwater levels to verify whether polygons in the NC dataset are likely supported by groundwater in an aquifer (Figure 1)[2]. This document highlights six best practices for using local groundwater data to confirm whether mapped features in the NC dataset are supported by groundwater.

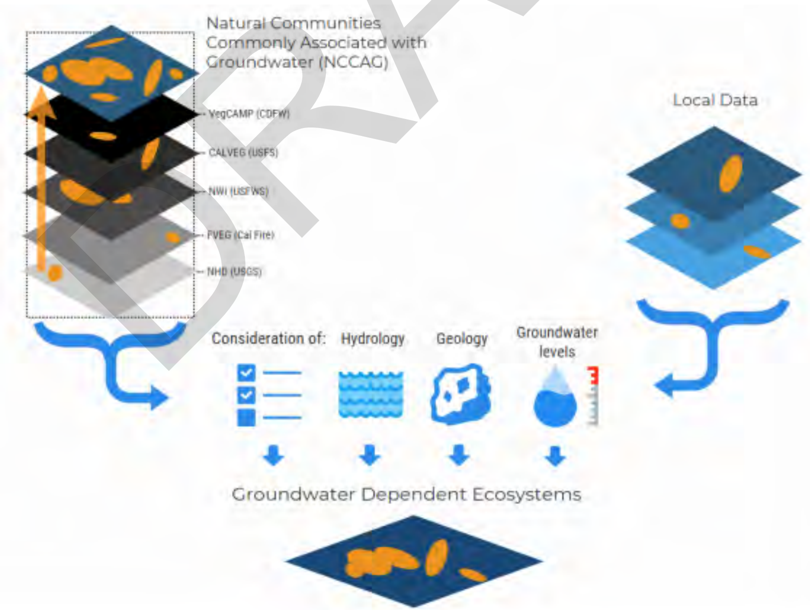


Figure 1. Considerations for GDE identification.
Source: DWR[2]

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[1] NC Dataset Online Viewer: https://gis.water.ca.gov/app/NCDatasetViewer/

[2] California Department of Water Resources (DWR). 2018. Summary of the "Natural Communities Commonly Associated with Groundwater" Dataset and Online Web Viewer. Available at: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Data-and-Tools/Files/Statewide-Reports/Natural-Communities-Dataset-Summary-Document.pdf

The NC Dataset identifies vegetation and wetland features that are good indicators of a GDE. The dataset is comprised of 48 publicly available state and federal datasets that map vegetation, wetlands, springs, and seeps commonly associated with groundwater in California[3]. It was developed through a collaboration between DWR, the Department of Fish and Wildlife, and The Nature Conservancy (TNC). TNC has also provided detailed guidance on identifying GDEs from the NC dataset[4] on the Groundwater Resource Hub[5], a website dedicated to GDEs.

BEST PRACTICE #1. Establishing a Connection to Groundwater

Groundwater basins can be comprised of one continuous aquifer (Figure 2a) or multiple aquifers stacked on top of each other (Figure 2b). In unconfined aquifers (Figure 2a), using the depth-to-groundwater and the rooting depth of the vegetation is a reasonable method to infer groundwater dependence for GDEs. If groundwater is well below the rooting (and capillary) zone of the plants and any wetland features, the ecosystem is considered disconnected and groundwater management is not likely to affect the ecosystem (Figure 2d). However, it is important to consider local conditions (e.g., soil type, groundwater flow gradients, and aquifer parameters) and to review groundwater depth data from multiple seasons and water year types (wet and dry) because intermittent periods of high groundwater levels can replenish perched clay lenses that serve as the water source for GDEs (Figure 2c). Maintaining these natural groundwater fluctuations are important to sustaining GDE health.

Basins with a stacked series of aquifers (Figure 2b) may have varying levels of pumping across aquifers in the basin, depending on the production capacity or water quality associated with each aquifer. If pumping is concentrated in deeper aquifers, SGMA still requires GSAs to sustainably manage groundwater resources in shallow aquifers, such as perched aquifers, that support springs, surface water, domestic wells, and GDEs (Figure 2). This is because vertical groundwater gradients across aquifers may result in pumping from deeper aquifers to cause adverse impacts onto beneficial users reliant on shallow aquifers or interconnected surface water. The goal of SGMA is to sustainably manage groundwater resources for current and future social, economic, and environmental benefits. While groundwater pumping may not be currently occurring in a shallower aquifer, use of this water may become more appealing and economically viable in future years as pumping restrictions are placed on the deeper production aquifers in the basin to meet the sustainable yield and criteria. Thus, identifying GDEs in the basin should done irrespective to the amount of current pumping occurring in a particular aquifer, so that future impacts on GDEs due to new production can be avoided. A good rule of thumb to follow is: *if groundwater can be pumped from a well - it's an aquifer*.

[3] For more details on the mapping methods, refer to: Klausmeyer, K., J. Howard, T. Keeler-Wolf, K. Davis-Fadtke, R. Hull, A. Lyons. 2018. Mapping Indicators of Groundwater Dependent Ecosystems in California: Methods Report. San Francisco, California. Available at: https://groundwaterresourcehub.org/public/uploads/pdfs/iGDE_data_paper_20180423.pdf
[4] "Groundwater Dependent Ecosystems under the Sustainable Groundwater Management Act: Guidance for Preparing Groundwater Sustainability Plans" is available at: https://groundwaterresourcehub.org/gde-tools/gsp-guidance-document/
[5] The Groundwater Resource Hub: www.GroundwaterResourceHub.org

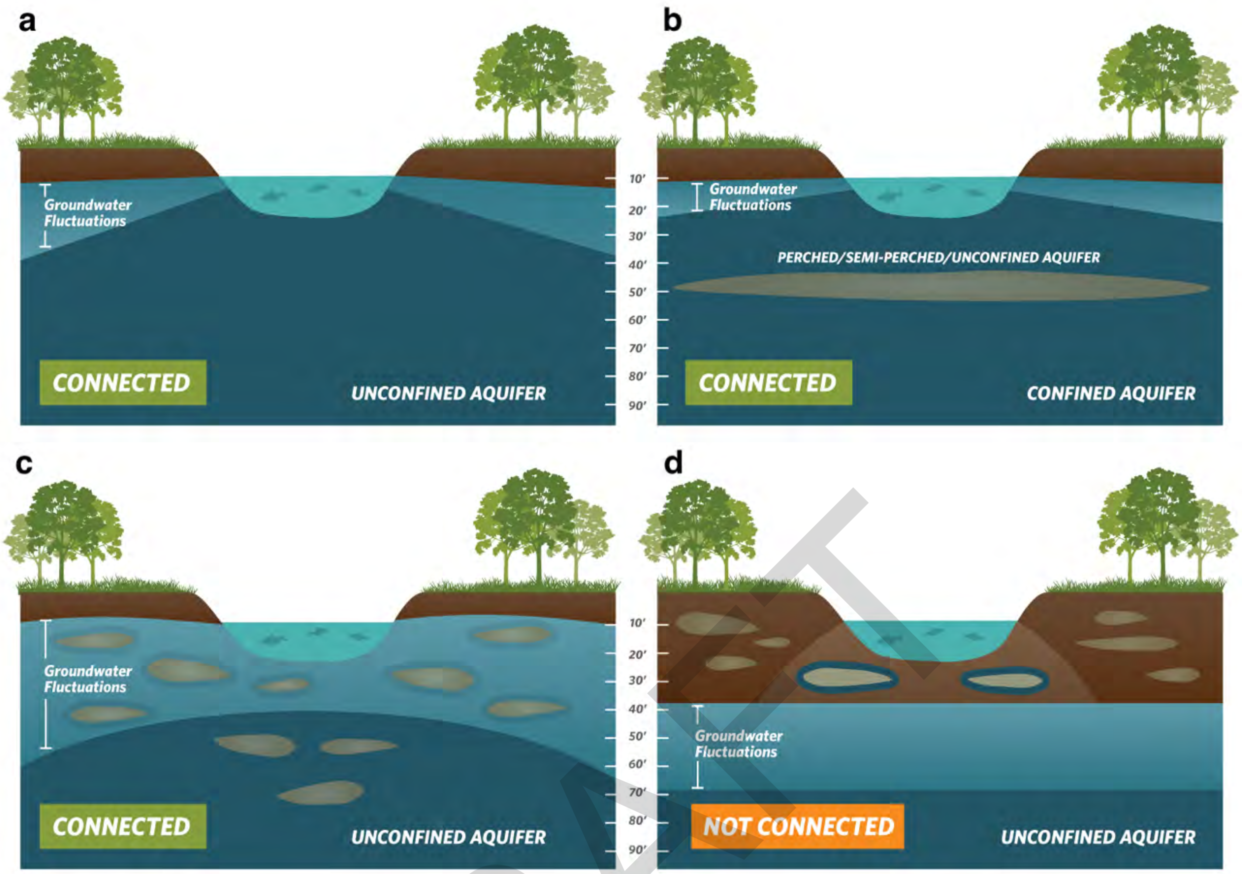

Figure 2. Confirming whether an ecosystem is connected to groundwater. Top: (a) Under the ecosystem is an unconfined aquifer with depth-to-groundwater fluctuating seasonally and interannually within 30 feet from land surface. (b) Depth-to-groundwater in the shallow aquifer is connected to overlying ecosystem. Pumping predominately occurs in the confined aquifer, but pumping is possible in the shallow aquifer. Bottom: (c) Depth-to-groundwater fluctuations are seasonally and interannually large, however, clay layers in the near surface prolong the ecosystem's connection to groundwater. (d) Groundwater is disconnected from surface water, and any water in the vadose (unsaturated) zone is due to direct recharge from precipitation and indirect recharge under the surface water feature. These areas are not connected to groundwater and typically support species that do not require access to groundwater to survive.

BEST PRACTICE #2. Characterize Seasonal and Interannual Groundwater Conditions

SGMA requires GSAs to describe current and historical groundwater conditions when identifying GDEs [23 CCR §354.16(g)]. Relying solely on the SGMA benchmark date (January 1, 2015) or any other single point in time to characterize groundwater conditions (e.g., depth-to-groundwater) is inadequate because managing groundwater conditions with data from one time point fails to capture the seasonal and interannual variability typical of California's climate. DWR's Best Management Practices document on water budgets[6] recommends using 10 years of water supply and water budget information to describe how historical conditions have impacted the operation of the basin within sustainable yield, implying that a baseline[7] could be determined based on data between 2005 and 2015. Using this or a similar time period, depending on data availability, is recommended for determining the depth-to-groundwater.

GDEs depend on groundwater levels being close enough to the land surface to interconnect with surface water systems or plant rooting networks. The most practical approach[8] for a GSA to assess whether polygons in the NC dataset are connected to groundwater is to rely on groundwater elevation data. As detailed in TNC's GDE guidance document[4], one of the key factors to consider when mapping GDEs is to contour depth-to-groundwater in the aquifer that is supporting the ecosystem (see Best Practice #5).

Groundwater levels fluctuate over time and space due to California's Mediterranean climate (dry summers and wet winters), climate change (flood and drought years), and subsurface heterogeneity in the subsurface (Figure 3). Many of California's GDEs have adapted to dealing with intermittent periods of water stress, however if these groundwater conditions are prolonged, adverse impacts to GDEs can result. While depth-to-groundwater levels within 30 feet[4] of the land surface are generally accepted as being a proxy for confirming that polygons in the NC dataset are supported by groundwater, it is highly advised that fluctuations in the groundwater regime be characterized to understand the seasonal and interannual groundwater variability in GDEs. Utilizing groundwater data from one point in time can misrepresent groundwater levels required by GDEs, and inadvertently result in adverse impacts to the GDEs. Time series data on groundwater elevations and depths are available on the SGMA Data Viewer[9]. However, if insufficient data are available to describe groundwater conditions within or near polygons from the NC dataset, include those polygons in the GSP until data gaps are reconciled in the monitoring network (see Best Practice #6).

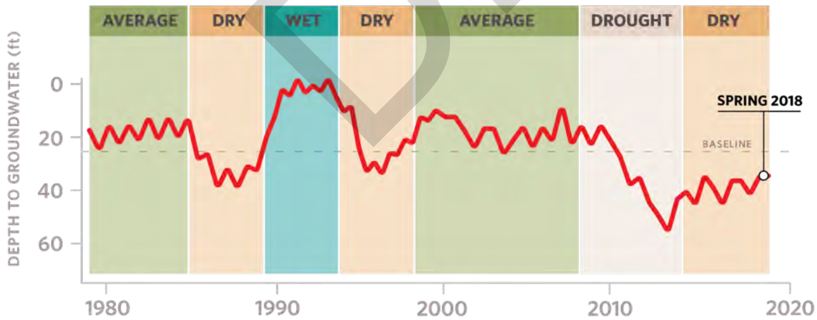

Figure 3. Example seasonality and interannual variability in depth-to-groundwater over time. Selecting one point in time, such as Spring 2018, to characterize groundwater conditions in GDEs fails to capture what groundwater conditions are necessary to maintain the ecosystem status into the future so adverse impacts are avoided.

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[6] DWR. 2016. Water Budget Best Management Practice. Available at: https://water.ca.gov/LegacyFiles/groundwater/sgm/pdfs/BMP_Water_Budget_Final_2016-12-23.pdf

[7] Baseline is defined under the GSP regulations as "historic information used to project future conditions for hydrology, water demand, and availability of surface water and to evaluate potential sustainable management practices of a basin." [23 CCR §351(e)]

[8] Groundwater reliance can also be confirmed via stable isotope analysis and geophysical surveys. For more information see The GDE Assessment Toolbox (Appendix IV, GDE Guidance Document for GSPs[4]).

[9] SGMA Data Viewer: https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer

BEST PRACTICE #3. Ecosystems Often Rely on Both Groundwater and Surface Water

GDEs are plants and animals that rely on groundwater for all or some of its water needs, and thus can be supported by multiple water sources. The presence of non-groundwater sources (e.g., surface water, soil moisture in the vadose zone, applied water, treated wastewater effluent, urban stormwater, irrigated return flow) within and around a GDE does not preclude the possibility that it is supported by groundwater, too. SGMA defines GDEs as "ecological communities and species that depend on groundwater emerging from aquifers or on groundwater occurring near the ground surface" [23 CCR §351(m)]. Hence, depth-to-groundwater data should be used to identify whether NC polygons are supported by groundwater and should be considered GDEs. In addition, SGMA requires that significant and undesirable adverse impacts to beneficial users of surface water be avoided. Beneficial users of surface water include environmental users such as plants or animals[10], which therefore must be considered when developing minimum thresholds for depletions of interconnected surface water.

GSAs are only responsible for impacts to GDEs resulting from groundwater conditions in the basin, so if adverse impacts to GDEs result from the diversion of applied water, treated wastewater, or irrigation return flow away from the GDE, then those impacts will be evaluated by other permitting requirements (e.g., CEQA) and may not be the responsibility of the GSA. However, if adverse impacts occur to the GDE due to changing groundwater conditions resulting from pumping or groundwater management activities, then the GSA would be responsible (Figure 4).

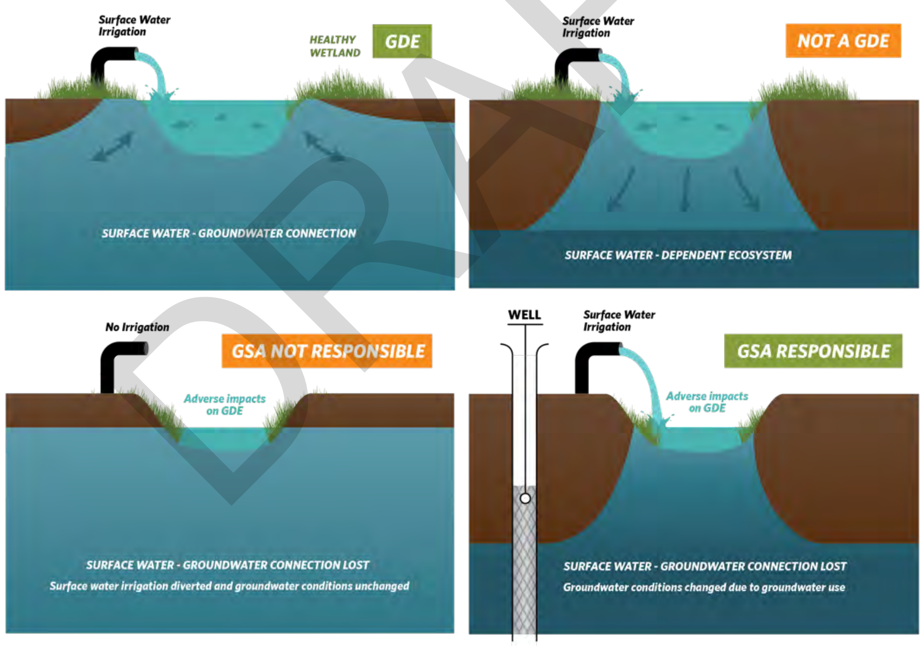

Figure 4. Ecosystems often depend on multiple sources of water. Top: (Left) Surface water and groundwater are interconnected, meaning that the GDE is supported by both groundwater and surface water. (Right) Ecosystems that are only reliant on non-groundwater sources are not groundwater-dependent. Bottom: (Left) An ecosystem that was once dependent on an interconnected surface water, but loses access to groundwater solely due to surface water diversions may not be the GSA's responsibility. (Right) Groundwater dependent ecosystems once dependent on an interconnected surface water system, but loses that access due to groundwater pumping is the GSA's responsibility.

[10] For a list of environmental beneficial users of surface water by basin, visit: https://groundwaterresourcehub.org/gde-tools/environmental-surface-water-beneficiaries/

BEST PRACTICE #4. Select Representative Groundwater Wells

Identifying GDEs in a basin requires that groundwater conditions are characterized to confirm whether polygons in the NC dataset are supported by the underlying aquifer. To do this, proximate groundwater wells should be identified to characterize groundwater conditions (Figure 5). When selecting representative wells, it is particularly important to consider the subsurface heterogeneity around NC polygons, especially near surface water features where groundwater and surface water interactions occur around heterogeneous stratigraphic units or aquitards formed by fluvial deposits. The following selection criteria can help ensure groundwater levels are representative of conditions within the GDE area:

- Choose wells that are within 5 kilometers (3.1 miles) of each NC Dataset polygons because they are more likely to reflect the local conditions relevant to the ecosystem. If there are no wells within 5km of the center of a NC dataset polygon, then there is insufficient information to remove the polygon based on groundwater depth. Instead, it should be retained as a potential GDE until there are sufficient data to determine whether or not the NC Dataset polygon is supported by groundwater.

- Choose wells that are screened within the surficial unconfined aquifer and capable of measuring the true water table.

- Avoid relying on wells that have insufficient information on the screened well depth interval for excluding GDEs because they could be providing data on the wrong aquifer. This type of well data should not be used to remove any NC polygons.

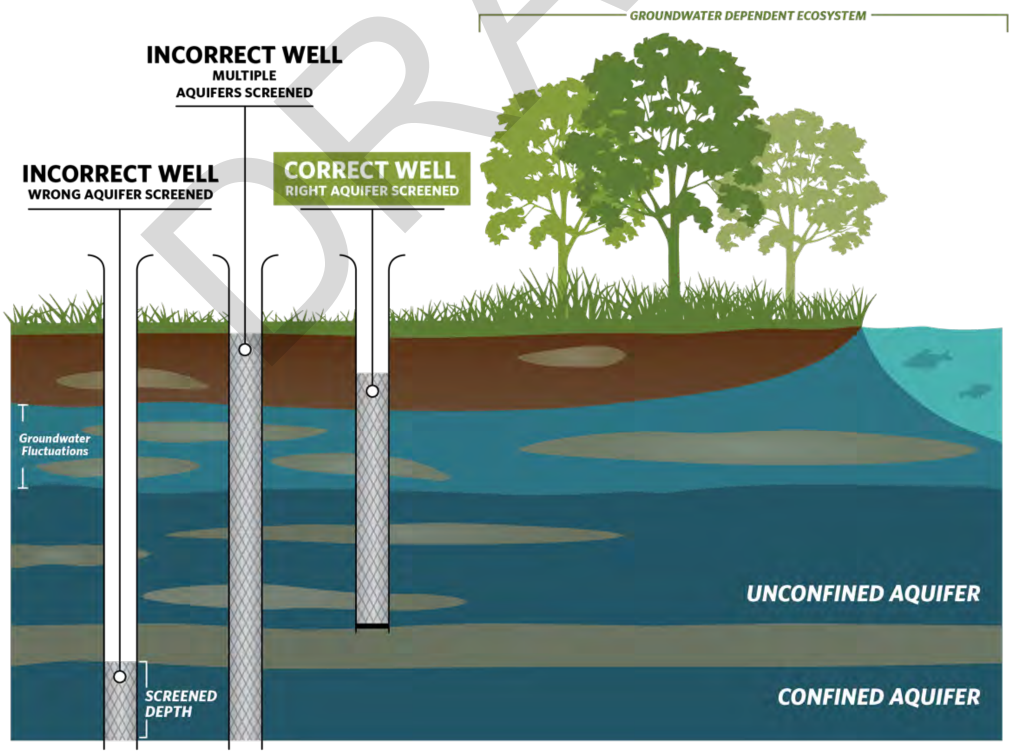

Figure 5. Selecting representative wells to characterize groundwater conditions near GDEs.

BEST PRACTICE #5. Contouring Groundwater Elevations

The common practice to contour depth-to-groundwater over a large area by interpolating measurements at monitoring wells is unsuitable for assessing whether an ecosystem is supported by groundwater. This practice causes errors when the land surface contains features like stream and wetland depressions because it assumes the land surface is constant across the landscape and depth-to-groundwater is constant below these low-lying areas (Figure 6a). A more accurate approach is to interpolate groundwater elevations at monitoring wells to get groundwater elevation contours across the landscape. This layer can then be subtracted from land surface elevations from a Digital Elevation Model (DEM)[11] to estimate depth-to-groundwater contours across the landscape (Figure b; Figure 7). This will provide a much more accurate contours of depth-to-groundwater along streams and other land surface depressions where GDEs are commonly found.

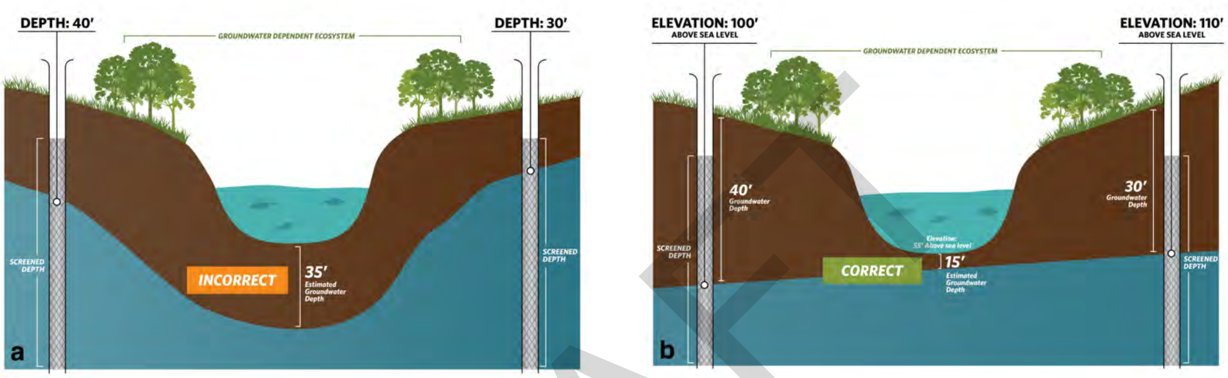

Figure 6. Contouring depth-to-groundwater around surface water features and GDEs. (a) Groundwater level interpolation using depth-to-groundwater data from monitoring wells. (b) Groundwater level interpolation using groundwater elevation data from monitoring wells and DEM data.

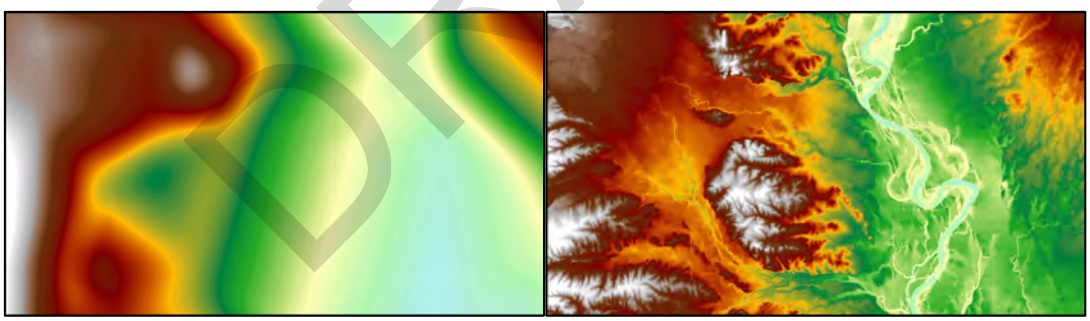

Figure 7. Depth-to-groundwater contours in Northern California. (Left) Contours were interpolated using depth-to-groundwater measurements determined at each well. (Right) Contours were determined by interpolating groundwater elevation measurements at each well and superimposing ground surface elevation from DEM spatial data to generate depth-to-groundwater contours. The image on the right shows a more accurate depth-to-groundwater estimate because it takes the local topography and elevation changes into account.

[11] USGS Digital Elevation Model data products are described at: https://www.usgs.gov/core-science-systems/ngp/3dep/about-3dep-products-services and can be downloaded at: https://iewer.nationalmap.gov/basic/

BEST PRACTICE #6. Best Available Science

Adaptive management is embedded within SGMA and provides a process to work toward sustainability over time by beginning with the best available information to make initial decisions, monitoring the results of those decisions, and using the data collected through monitoring programs to revise decisions in the future. In many situations, the hydrologic connection of NC dataset polygons will not initially be clearly understood if site-specific groundwater monitoring data are not available. If sufficient data are not available in time for the 2020/2022 plan, The Nature Conservancy strongly advises that questionable polygons from the NC dataset be included in the GSP until data gaps are reconciled in the monitoring network. Erring on the side of caution will help minimize inadvertent impacts to GDEs as a result of groundwater use and management actions during SGMA implementation.

KEY DEFINITIONS

Groundwater basin is an aquifer or stacked series of aquifers with reasonably well-defined boundaries in a lateral direction, based on features that significantly impede groundwater flow, and a definable bottom. *23 CCR §341(g)(1)*

Groundwater dependent ecosystem (GDE) are ecological communities or species that depend on groundwater emerging from aquifers or on groundwater occurring near the ground surface. *23 CCR §351(m)*

Interconnected surface water (ISW) surface water that is hydraulically connected at any point by a continuous saturated zone to the underlying aquifer and the overlying surface water is not completely depleted. *23 CCR §351(o)*

Principal aquifers are aquifers or aquifer systems that store, transmit, and yield significant or economic quantities of groundwater to wells, springs, or surface water systems. *23 CCR §351(aa)*

ABOUT US

The Nature Conservancy is a science-based nonprofit organization whose mission is *to conserve the lands and waters on which all life depends*. To support successful SGMA implementation that meets the future needs of people, the economy, and the environment, TNC has developed tools and resources (www.groundwaterresourcehub.org) intended to reduce costs, shorten timelines, and increase benefits for both people and nature.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
501 West Ocean Boulevard, Suite 4200
Long Beach, California 90802-4213

August 23, 2021

Bryan Bondy
Executive Director
Mound Basin Groundwater Sustainability Agency
P.O. Box 3544
Ventura, CA 93006-3544

Re: Preliminary Draft Mound Basin Groundwater Sustainability Plan (July 2021)

Dear Mr. Bondy:

Enclosed with this letter are NOAA National Marine Fisheries Service's (NMFS) comments on the Preliminary Draft Mound Basin Groundwater Sustainability Plan (Draft GSP) prepared by the Mound Basin Groundwater Sustainability Agency (MBGSA).

The Draft GSP was developed pursuant to, and intended to meet the requirements of the California Sustainable Groundwater Management Act (SGMA). The SMGA includes specific requirements to identify and consider adverse impacts on all recognized beneficial uses of groundwater and related interconnected surface waters, including Groundwater Dependent Ecosystems (GDE). (*See* Cal. Water Code §§ 10720.1, 10721, 10727.2.)

As explained more fully in the enclosure, the Draft GSP does not, but should, adequately address the recognized instream beneficial uses of the lower Santa Clara River and Santa Clara River Estuary (as well as other GDE), potentially affected by the management of groundwater within the Mound Groundwater Basin. Additionally, the Draft GSP should also recognize the important relationship between the extensive groundwater extractions and recharge program in the Fox Canyon Groundwater Basin (including the conjunctively operated Fillmore and Piru Groundwater Basins) and its potential adverse effects on the amount and extent of surface flows and other water dependent habitat features utilized by the federally listed endangered southern California steelhead (*Oncorhynchus mykiss*).

The revised Draft GSP should be re-circulated to give NMFS, and other interested parties, an opportunity to review the revisions before the Draft GSP is finalized.

NMFS appreciates the opportunity to comment on the Draft GSP. If you have a question regarding this letter or enclosure, please contact Mr. Mark H. Capelli in our Santa Barbara Office (805) 963-6478 or mark.capelli@noaa.gov, or Mr. Andres Ticlavilca in our Santa Rosa Office (707) 575-6-54 or andres.ticlavilca@noaa.gov.

Sincerely,

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Note: comments which share the major themes from the Appendix F introduction are not included in the comment matrix (Attachement 1) due to their volume and repetition and are addressed in a new appendix to the draft GSP (Appendix G). In order to distinguish the comments from CDFW, NGOs, and NMFS, which do not follow the major themes discussed below, they have been identified and labeled with numbers and boxes below and correspond with the numbers in the comment matrix table (see Attachment 1, comments #31-48).

NOAA's National Marine Fisheries Service's Comments on Preliminary Draft Mound Basin Groundwater Sustainability Plan (2021)

August 23, 2021

Overview

NOAA's National Marine Fisheries Service (NMFS) provides the following comments on the Draft Mound Basin Groundwater Sustainability Plan (Draft GSP), with a focus on Area 11 (*i.e.*, the lower Santa Clara River and Santa Clara River Estuary). Prior to presenting the comments, NMFS first provides background information on the endangered steelhead (*Oncorhynchus mykiss*), which reside in the Santa Clara River watershed, including the reach of the mainstem of the Santa Clara River and Santa Clara River Estuary underlain by the Mound Groundwater Basin. That background information includes the status of the species, life history and habitat requirements, and actions that are essential for recovery of the species. That information is essential for understanding the potential implications of operating the Mound Basin in the Santa Clara River for the endangered Southern California Distinct Population Segment (DPS) of steelhead. Our general and specific comments on the Draft GSP are presented in subsequent sections.

Status of Steelhead, Life History and Habitat Requirements, and Recovery Needs

Status of steelhead and habitat for the species in the Santa River Watershed

NMFS listed southern California steelhead, including the populations in the Santa Clara River watershed (which includes the Mound Groundwater Basin), as endangered in 1997 (62 FR 43937), and reaffirmed the endangered listing in 2006 (71 FR 5248).

NMFS designated critical habitat for southern California steelhead in 2005 (70 FR 52488). Within the Mound Basin, this designation includes the mainstem of the Santa Clara River and the Santa Clara River Estuary (*See* Figures 1 and 2).

Critical habitat for endangered steelhead includes: 1) freshwater spawning habitat with water quality and quantity conditions and substrate that support spawning, incubation, and larval development; 2) freshwater rearing sites with water quality and floodplain connectivity to form and maintain physical habitat conditions that support juvenile growth and mobility, and natural cover such as shade, submerged and overhanging vegetation that provide forage and refugia opportunities; and 3) freshwater migration corridors free of anthropogenic passage impediments that promote adult and juvenile mobility and survival.

Of particular relevance to the Draft GSP for the Mound Basin are the functions of the Santa Clara River Estuary. NMFS Southern California Steelhead Recovery Plan (2012) noted:

> "Each stream system terminates at the coast with some type of estuary-lagoon system. In southern California, seasonal lagoons currently tend to form each summer when decreased streamflows allow marine processes to build a sand berm at the mouth of each system. Juvenile steelhead over-summer in these lagoons, where they often grow so rapidly that they can undergo smoltification at age 1 and enter the ocean large enough to experience enhanced survival to adulthood (Hayes *et al*. 2008, Bond 2006)." P. 2-19.

NMFS Southern California Steelhead Recovery Plan further noted:

> "The timing of emigration is influenced by a variety of factors such as photoperiod, streamflow, temperature, and breaching of the sandbar at the river's mouth. These out-migrating juveniles, termed smolts [reference to Figure omitted]), live and grow to maturity in the ocean for two to four years before returning to freshwater to reproduce (citations omitted)." p. 2--2,

Steelhead populations in the SCS Recovery Planning area have not been extensively investigated; however, steelhead smolts have been documented in southern California estuaries, including the Santa Clara River Estuary *(e.g.*, Kelley 2008).

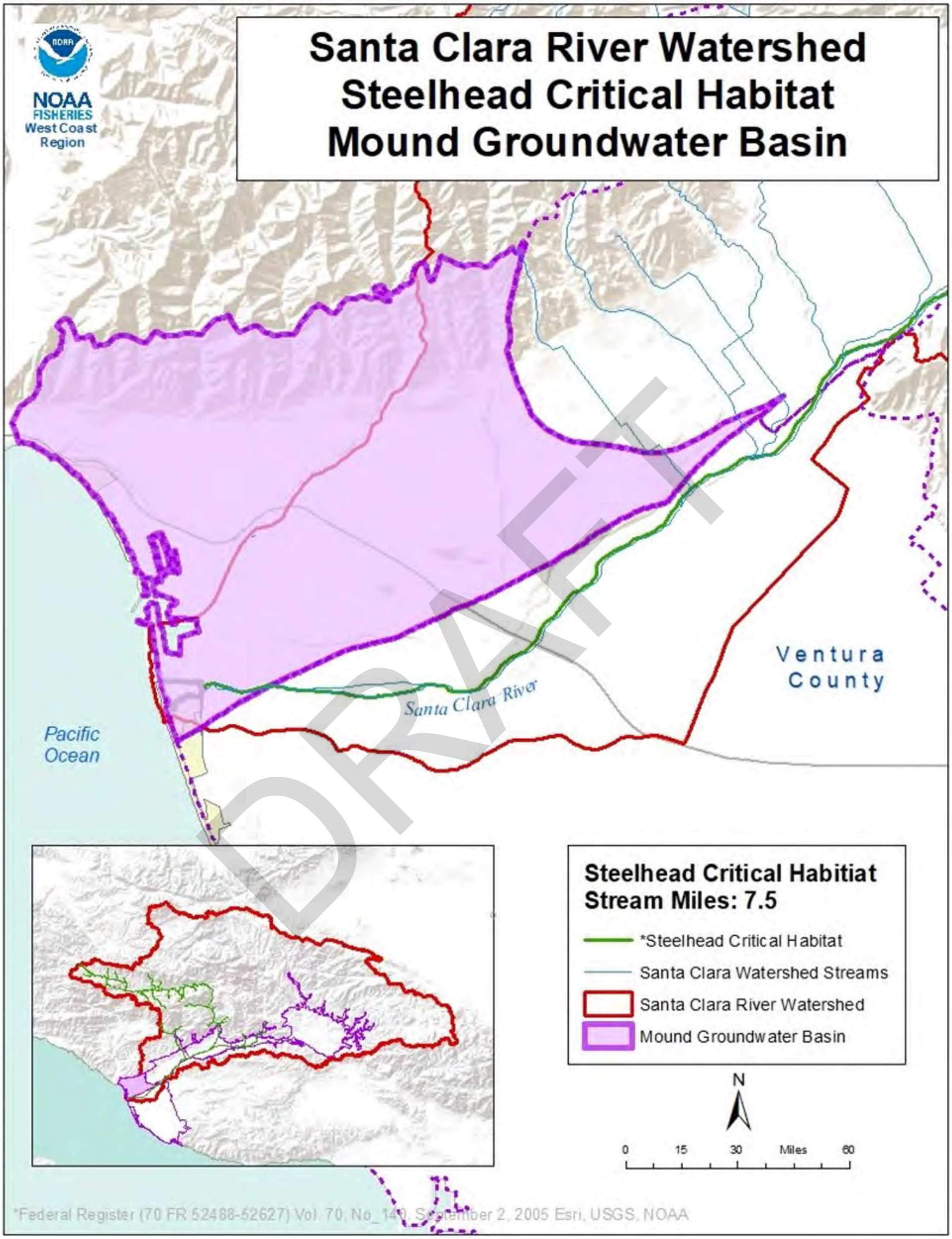

Figure 1. Lower Santa Clara River and Santa Clara River Estuary Steelhead Critical Habitat within the Mound Groundwater Basin.

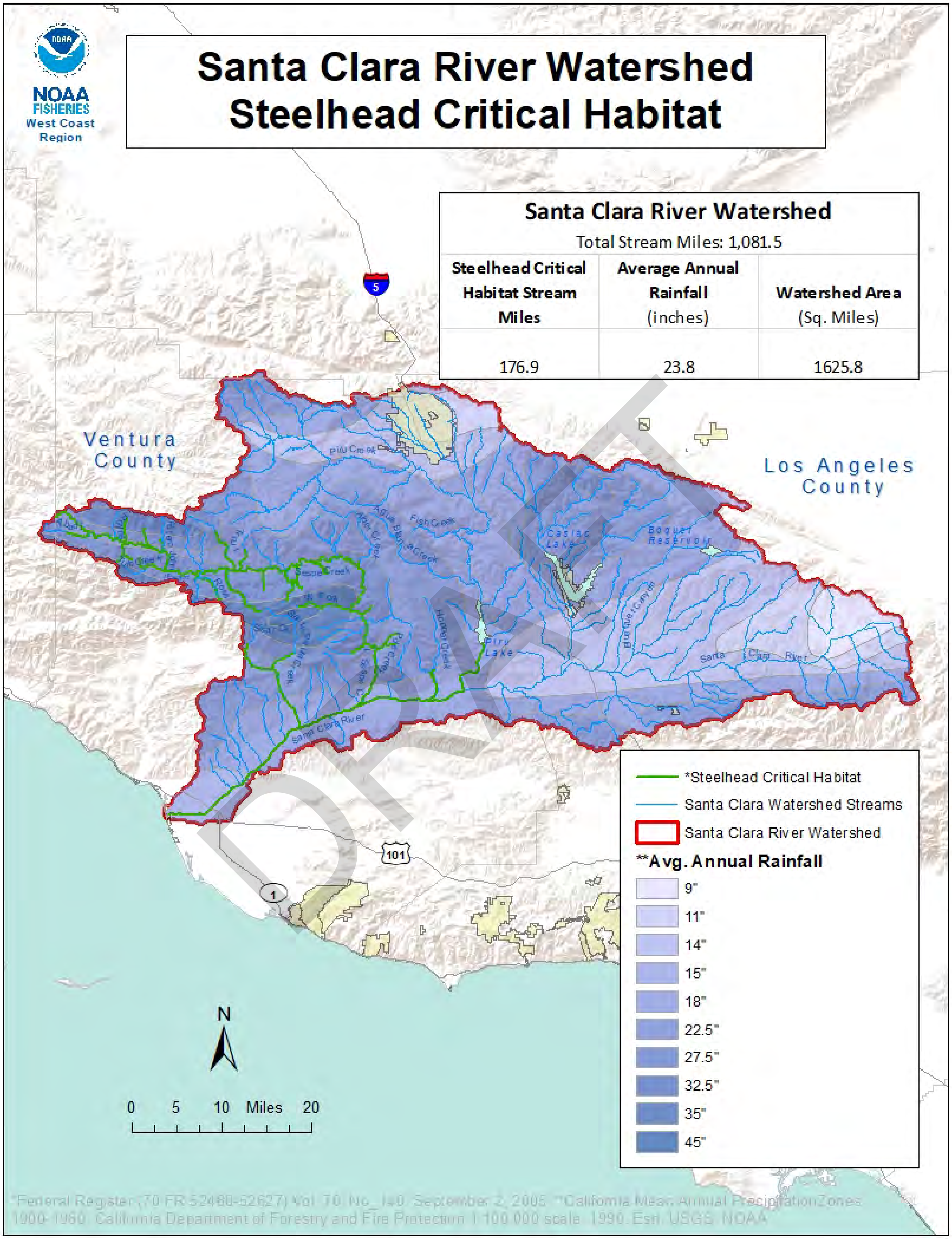

Figure 2. Santa Clara River Watershed Steelhead Critical Habitat.

Habitat for this species has been adversely affected by loss and modification of physical or biological features (substrate, water quality and quantity, water temperature channel morphology and complexity, passage conditions, riparian vegetation, introduction of non-native invasive species, etc.) through activities such as surface-water diversions and groundwater extractions (*See* “Current DPS-Level Threats Assessment”, pp. 4-1 – 4-11, and “Threats and Threat Sources”, pp. 9-14 – 9-17, in NMFS 2012). Additionally, estuaries in southern California have been reduced in size through filling and there habitat functions have been degraded through a variety of anthropogenic activities, such as water diversions and extractions and point and non-point waste discharges. The size of the pre-historic Santa Clara River Estuary is estimated to have been reduced by over half (U.S. Coast Survey 1855a, 1855b, Capelli 2007, Beller *et al*. 2011, Stein *et al.* 2014). Thus many of the physical and biological features of designated critical habitats have been significantly degraded (and in some cases lost) in ways detrimental to the biological needs of steelhead. These habitat modifications have hindered the ability of designated critical habitat to provide for the survival and ultimately recovery of this species.

NMFS has also modeled and mapped potential intrinsic potential spawning and rearing habitat in the Santa Clara watershed, using the “envelop method”, as part of its recovery planning process for the endangered Southern California DPS of Steelhead (*See* Figure 3). This method uses observed associations between fish distribution and the quantitative values of environmental parameters such as stream gradient, summer mean discharge and air temperature, valley width to mean discharge, and the presence of alluvial deposits – habitat features that are critical to steelhead spawning and rearing (Boughton and Goslin 2006, Map 5, Santa Barbara to Point Dume, pp. 20-21).

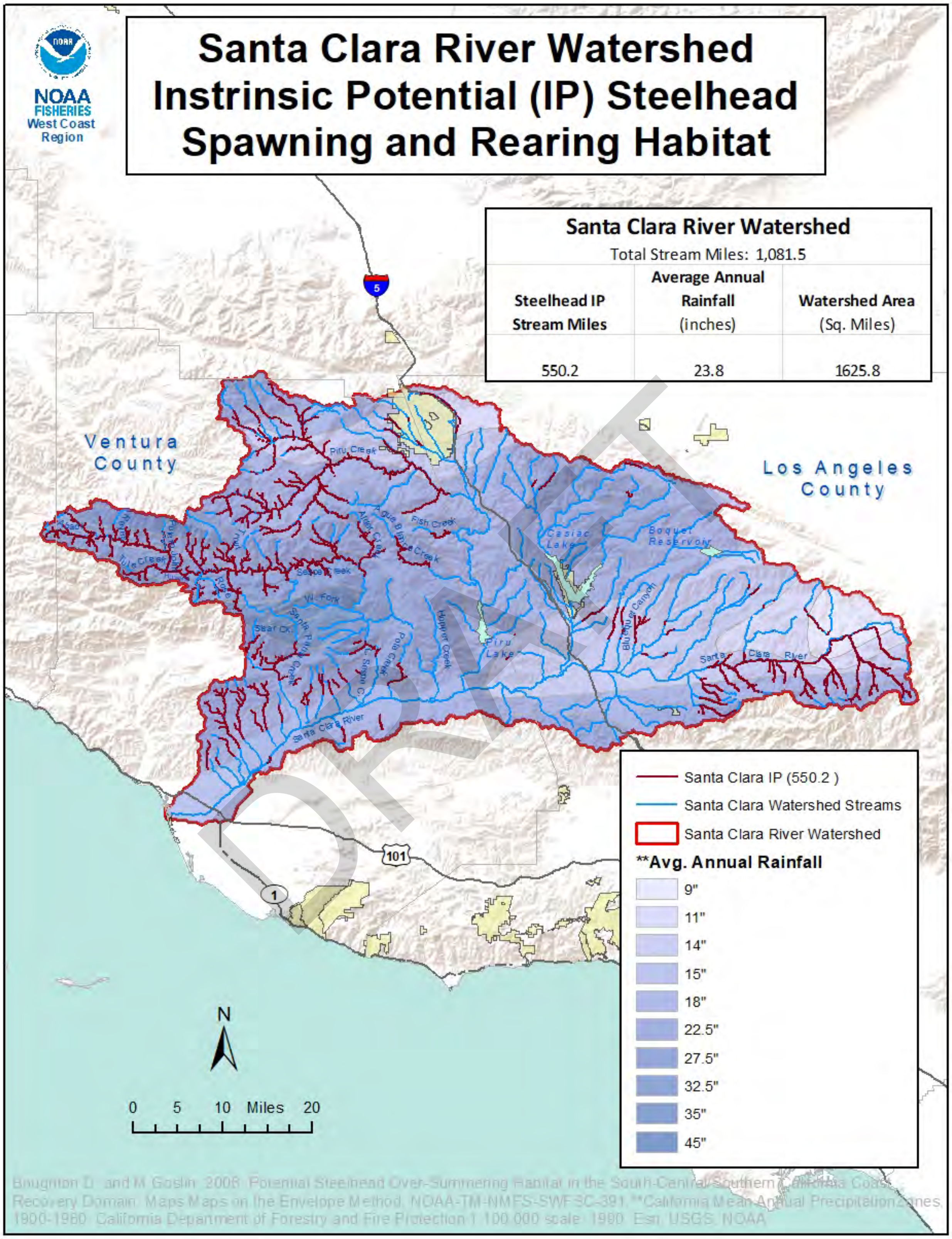

Figure 3. Santa Clara River Watershed Intrinsic Potential Steelhead Spawning and Rearing Habitat.

Steelhead life history and habitat requirements

Adult steelhead spend a majority of their adult life in the marine environment. However, the reproductive and early development stages of this species' life history occurs in the freshwater environment (migration to and from spawning areas, spawning, incubation of eggs and the rearing of juveniles), including in the main stem and tributaries such as those in the Santa Clara River watershed. Many of the natural variables (such as seasonal surface flow patterns, water quality, including water temperature) are significantly impacted by the artificial modification of these freshwater habitats. This includes both surface and sub-surface extractions that lower the water table and can, in turn, affect the timing, duration, and magnitude of surface flows essential for steelhead migration, spawning and rearing. In southern California, warm, dry summers require that juvenile steelhead have access to perennial stream reaches (including coastal estuaries) with tolerable water temperature (*See*, for example, Boughton *et al*. 2009). The over-summering period can be challenging to juvenile steelhead survival and growth. Surface diversions in combination with lowered groundwater tables during the dry season can *indirectly* affect rearing individuals by reducing vegetative cover, and *directly* by reducing or eliminating the summertime surface flows (or pool depths) in parts of the watershed. These conditions have been and are being exacerbated by global climate change (Beighley *et al*. 2008, Feng *et al*. 2019, Gudmundsson *et al*. 2021).

Recovery needs of endangered steelhead

Among other federally mandated responsibilities, NMFS is responsible for administering the U.S. Endangered Species Act for the protection and conservation of endangered steelhead utilizing the Santa Clara River Watershed. As part of this responsibility, NMFS developed the Southern California Steelhead Recovery Plan (NMFS 2012)[1]. Through a comprehensive analysis of systemic threats to this species, diversion of surface-flow and groundwater extractions were identified as "very high" threats to the long-term survival of endangered steelhead in the Santa Clara River (NMFS 2012, pp. 9-1 through 9-17).

To address the identified threats to endangered steelhead in the Santa Clara River Watershed, NMFS' Southern California Steelhead Recovery Plan identifies a number of recovery actions targeting surface diversions and groundwater extraction (NMFS 2012, p. 8-6, Table 9-7, p. 9-61). These include:

SCR-SCS-4.2 Develop and implement a water management plan to identify the appropriate diversion rates for all surface water diversions that will maintain surface flow necessary to support all *O. mykiss* life history stages, including adult and juvenile *O. mykiss* migration, and suitable spawning, incubation, and rearing habitat.

[1] National Marine Fisheries Service. 2012. Southern California Coast Steelhead Recovery Plan. West Coast Region, California Coastal Area Office, Long Beach, California; *see* also, Keir Associates and National Marine Fisheries Service. 2008, Hunt & Associates Biological Consulting Services 2000.

SCR-SCS-6.1 Conduct groundwater extraction analysis and assessment. Conduct hydrological analysis to identify groundwater extraction rates, effects on the natural stream pattern (timing, duration and magnitude) of surface flows in the mainstem and tributaries, *and the estuary*, and effects on all *O. mykiss* life history stages, including adult and juvenile *O. mykiss* migration, spawning, incubation, and rearing habitats. (emphasis added)

SAC-SCR-6.2 Develop and implement groundwater monitoring and management program. Develop and implement groundwater monitoring program to guide management of groundwater extractions to ensure surface flows provide essential support for all *O. mykiss* life history stages, including adult and juvenile *O. mykiss* spawning, incubation and rearing habitats.

SAC-SCR-12.1 Develop and implement an estuary restoration and management plan.

GSPs developed under SGMA provide an important mechanism for implementing these recovery actions for the Santa Clara River watershed. The GSP for the Mound Basin is an essential mechanism for the implementation specific recovery actions for the lower Santa Clara River and the Santa Clara River Estuary.

General Comments on the Draft GSP

Impacting the natural process of groundwater inputs to surface flows and water surface elevations is of concern because the inputs can buffer daily water temperature fluctuations (Heath 1983, Brunke *et al.* 1996, Barlow and Leake 2012, Hebert 2016). Artificially reducing the groundwater inputs can expand or shrink the amount of fish habitat and feeding opportunities for rearing juvenile steelhead (Fetter 1997, Sophocleous 2002, Glasser *et al.* 2007, Croyle 2009,), and reduce opportunities for juveniles to successfully emigrate to the estuary and the ocean (Bond 2006, Hayes *et al.* 2008). Low summer baseflow, likely caused by both surface water diversions and pumping hydraulically connected groundwater, is noted as a significant stress to steelhead survival in the Santa Clara River and tributaries (*See*, for example, Table 9-2, p. 9-15 in NMFS 2012).

Management of the groundwater resources within the Santa Clara River watershed has affected the water resources and other related natural resources throughout the Santa Clara River watershed. For example, extraction of groundwater from these basins has lowered groundwater levels causing the elimination of artesian springs that formerly supported a wide variety of plant and animal species, and affected surface flows that support the migrations of endangered steelhead, as well as other aquatic species in the Santa Clara River watershed (Stillwater Sciences 2005. 2007a, 2007b, 2011a, 2011b, 2017).

The development and operation of surface water supply facilities throughout the Santa Clara River are integral in the management of the groundwater resources associated with the Santa Clara River. Facilities such as Pyramid Reservoir, Santa Felicia Dam, Piru Creek Diversion and spreading basins, and the Vern Freeman Diversion Dam and spreading basin have profoundly altered the natural surface flow and groundwater recharge patterns in the Santa Clara River watershed, from the headwaters to the Pacific Ocean (*e.g.*, NMFS 2008a, 2008b, 2016, 2020, 2021). Unless the Draft GSP is revised to reflect the operation of these integral components of the groundwater management program for the Santa Clara River, the future adopted GSP will be unable to meet the requirement of SGMA to effectively provide for the protection of habitats, including those recognized instream beneficial uses that are dependent on groundwater such as fish migration, spawning and rearing, as well as other GDE within the Mound Basin.

When analyzing impacts on steelhead or other aquatic organisms resulting from groundwater and related streamflow diversions, identifying flow levels that effectively support essential life functions of this organism is critical (Barlow and Leake 2012). Specifically, it is essential to determine what flows adequately supports steelhead migration during the winter and spring, and juvenile rearing year round. Without an understanding of these hydrologic/biotic relationships, a GSP cannot ensure that significant and unreasonable adverse impacts from groundwater depletion (and in the case of the Santa Clara River, the integrally related surface water diversion/groundwater recharge program) are avoided (Heath 1983, California Department of Water Resources 2016).

Specific Comments on the Draft GSP

The following comments on the Executive Summary of the Draft GSP are arranged by page and paragraph number; additional comments on individual Draft GSP elements are presented subsequently.

31 **Executive Summary**

ES-1 Plan Area, Land Use, and Water Sources

Pages ES-ii-iii

The Draft Plan states:

> "The beneficial uses of groundwater extracted from the principal aquifers of Mound Basin include municipal, industrial, and agricultural water supply corresponding to the land use categories above." p. ES-ii

The listed beneficial uses within the boundaries of the Mound Groundwater Basin include only out-of-stream beneficial uses, and largely ignores the instream beneficial uses, including those linked to with GDE, including, but not limited to Area 11 (*i.e.*, the lower Santa Clara River and Santa Clara River Estuary). The Draft GSP should be revised to explicitly acknowledge the instream beneficial uses supported by the groundwater basin, including the GDE associated with the lower Santa Clara River and Santa Clara River Estuary. The recognized instream beneficial uses for the portion of the lower Santa Clara

31 River within the Mound Basin include: warm freshwater habitat, cold freshwater habitat, wildlife habitat, habitat for rare, threatened and endangered species, fish migration, and wetland habitat. Santa Clara River Estuary instream beneficial uses include: estuarine habitat, marine habitat, wildlife habitat, habitat for rare, threatened and endangered species, fish migration, spawning habitat, and wetland habitat.[2]

32 **ES-2 Basin Setting and Groundwater Conditions**

Pages ES-iii-vi

The Draft GSP asserts that:

> "Despite the interconnection with shallow groundwater, there is no depletion of interconnected surface water in the Basin because there are no groundwater extractions from the shallow groundwater units and groundwater in the principal aquifers is physically separated from the surface water bodies by several hundred feet of fine-grained materials. No groundwater dependent ecosystems (GDEs) have been identified in the Basin that appear to be relying on groundwater from a principal aquifer."
> P. ES-vi

The regulations governing SGMA do not stipulate that the provisions of SGMA cover only "principal aquifers" as the Draft GSP appears to presume. The regulations define interconnected surface water as "surface water that is hydraulically connected at any point by a continuous saturated zone to the underlying aquifer and the overlying surface water . . ." (23 CCR Section 351(0). Significantly, "continuous" refers specifically to hydrologic connection, not a continuous temporal connection.

The Draft GSP does not adequately recognize the potential role of groundwater in the lower reaches of the Santa Clara River or the Santa Clara River Estuary, or the role of groundwater elevations in ensuring surface flows water surface elevations and supporting the life-cycle of steelhead, including their migratory, spawning and rearing phases (*See* additional comments on Appendix A to the Draft Mound Basin GSP below.). Both the Santa Clara River estuary and the portion of the Santa Clara River upstream of Harbor Boulevard within the boundaries of the Oxnard Subbasin should be fully addressed in the revised Draft GSP. Further, because groundwater-management activities within the Santa Clara River watershed involve the United Water Conservation District's (UWCD) diversion operations at the Vern Freeman Diversion, the relationship between these diversion activities and groundwater elevations along the affected portion of the Santa Clara River (and estuary) should be addressed in the revised Draft GSP.

See additional comments below on interconnected groundwater and surface flows water surface elevations in Area 11 (*i.e.*, the lower Santa Clara River and Santa Clara River Estuary) of the Mound Basin.

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[2] Table 2. Beneficial Use of Inland Surface Waters, Los Angeles Regional Water Quality Control Board (2011). p. 2-7

33 **ES-3 Water Budget**

Pages ES-vi-vii

The Draft GSP notes that:

> "The primary sources of recharge to the Mound Basin groundwater system are underflow from the Santa Paula Basin, areal recharge (the sum of infiltration of precipitation, M&I return flows, and agricultural irrigation return flows), and mountain-front recharge. Stream channel recharge is a minor component." p. ES-vi

The revised Draft GSP should acknowledge that both the direct surface flow and the underflow from the Santa Paula Basin are influenced by the upstream diversion of surface flows in the Santa Clara River watershed and the artificial recharge of ground water as a result of the Vern Freeman Diversion located approximately 10 miles upstream of the Mound Basin.

34 **ES-4 Sustainable Management Criteria**

Pages ES-vii-x

The sustainable criteria are expressed explicitly and exclusively in terms of groundwater levels, water chemistry, and land subsidence, and do not explicitly recognize the important relationship between groundwater levels and the surface flows (particularly base flows) or water quality parameters (such as temperature, dissolved oxygen, *etc*.) that contribute to the maintenance of GDE within the Mound Basin (including, but not limited to, the lower Santa Clara River and the Santa Clara River Estuary).

There is no specific criterion in the Draft Criteria that deals with the GDE associated with the federally listed species (or the designated critical habitat) which utilize the Mount Basin[3]. In fact, the word "steelhead", "trout", or even "fish" do not appear in the Draft GSP. This is an important omission that should be corrected in the revised Draft GSP because GDE for the Mound Basin includes the use of surface flow by the federally listed endangered southern California steelhead for migration, spawning and rearing.

Specifically, the revised Draft GSP should include a description of the extent of designated critical habitat for endangered steelhead (as well as other listed or recognized sensitive species) that occur within the boundaries of the Mound Basin (*See* Figures 1 and 3).

ES-5 **Monitoring Networks**

Pages x-xii

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[3] For a discussion of the terrestrial and as well as aquatic listed species, see, Stillwater (2007a) and California Department of Fish and Wildlife (2021).

The monitoring is primarily aimed at addressing the limited Sustainable Management Criteria. There is little in the monitoring program that specifically addresses the potential effects of groundwater extractions on GDE, including, but not limited to, the lower Santa Clara River channel and the Santa Clara River Estuary. *See* additional comments below regarding the inadequacies of the proposed monitoring program for the Mound Basin GSP.

Draft Mound Basin GSP

1.0 Introduction to Plan Contents [Article 5 §354]

The following comments are addressed to the specific sections and provisions of the draft GSP, arranged by the GSP section headings.

35 **2.2.2.2 Existing Water Resource Management Programs [§354.8(c) and (d)]**

Pages 9-11.

One of the largest and most significant water-resource-management program within the Santa Clara River watershed, the UWCD's groundwater recharge program, consisting of the combined facilities of the Santa Felicia Dam, Piru Diversion, Vern Freeman Diversion and a series of groundwater settling basins. This program and its related facilities should be included in this section because it affects not only the artificial recharge to the Fox Canyon aquifer, but the natural recharge to the other groundwater basins on the Oxnard Plain, including the Mound and Santa Paula Basins; *see* NMFS comments on the Fox Canyon GSP (2020)

36 **2.2.2.3 Conjunctive Use Programs [§354.8(e)]**

Page 11

The City of Ventura's water supply includes groundwater extractions (as well as surface diversions) that are subject to a separate GSP, and this fact should be noted in the revised Draft Mound GSP.

37 **2.3 Notice and Communication [§354.10]**

Page 22-24

The Draft GSP is focused out-of-stream users of the Mound Basin and does not adequately recognize the public trust natural resources that may be affected by the extractions of groundwater from the Mound Basin, and therefore be of interest to state and federal natural resource regulatory agencies such as NMFS, U.,S. Fish and Wildlife Service, and the California Department of Fish and Wildlife, and the California Department of Parks and Recreation (which owns a portion of the Santa Clara River Estuary wetlands).

2.3.1 Beneficial Uses and Users [§354.10(a)]

38 Pages 23-24

We would note that the listed beneficial uses within the boundaries of the Mound Basin identify only out-of-stream beneficial uses, and largely ignore instream beneficial uses. The revised Draft GSP should be revised to explicitly acknowledge the instream beneficial uses supported by the groundwater basin, including, but not limited to, the GDE associated with the lower Santa Clara River and Santa Clara River Estuary. *See* comment above.

3.0 Basin Setting [Article 5, SubArticle 2]

3.1.2 Regional Geology [§354.14(b)(1) and (d)(2)]

Pages 32-43

> "Some clay-rich soils within the Holocene and Pleistocene alluvial deposits present in Mound Basin may be of sufficiently low vertical permeability to allow the formation of thin, discontinuous lenses or layers of shallow, "perched" groundwater above the primary saturated zone of the shallow alluvial aquifer (described in the next subsection of this GSP)." p. 34

The variable permeability also characterizes the shallow upper alluvial aquifer that lays above the Mound Basin and allows connectivity between the upper alluvial aquifer and portion of the Mound Basin. See additional comments below regarding the physical properties of the Mound Basin and its multiple-layered aquifers.

3.1.4 Principal Aquifers and Aquitards [§354.14(b)(4)(A)]

> "The SGMA defines "principal aquifers" as "aquifers or aquifer systems that store, transmit, and yield significant or economic quantities of groundwater to wells, springs, or surface water systems." p. 35

While the shallow alluvial aquifer laying above the Mound Basin may be "rarely used for water supply", it does not follow that the provisions of the Draft GSP should only be limited to the Mound Basin. Because water in the overlying shallow alluvial aquifer can percolate to the aquifer below, reducing the groundwater level in the Mound Basin can result in lower groundwater levels in the shallow alluvial aquifer, thus affecting GDE associated with the shallow alluvial aquifer, including, but not limited to, surface water in the lower Santa Clara River, and the Santa Clara River Estuary. *See* additional comments below regarding the physical properties of the Mound Basin and the groundwater contribution the Santa Clara River Estuary.

39 **3.1.4.1 Physical Properties of Aquifers and Aquitards**

Pages 36-45

The Draft GSP notes:

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> "At the time of writing of this GSP, no aquifer test results for hydraulic conductivity or storativity were found in available references. However, well information collected over the past several decades by United . . . is considered the best available information concerning aquifer and aquitard properties. . . However, it is recognized that on a local scale, hydraulic conductivity can vary by orders of magnitude over short distances, and there may be areas in Mound Basin where hydraulic conductivity is higher or lower than the values shown on Table 3.1-01." p. 39

The lack of specific information regarding hydraulic conductivity or storativity in the Mound Basin and the overlying shallow alluvial aquifer does not allow the categorical conclusions relied upon in the Draft GSP to eliminate consideration of GDE within the Mound Basin. The information and model used by United was focused on water conductivity and storativity that is more relevant to out-of-stream water supply and beneficial uses than the smaller values that may be relevant to support GDE.

We would also note that there are groundwater technologies that permits aquifer testing in individual layers of a multi-layered aquifers such as found in the Mound Basin. Pumping tests are essential for determining the hydrological conductivity and storativity of aquifer layers. Such tests must be at a fine enough scale to assess the significance for instream beneficial uses associated with GDE, including, but not limit to, those of the lower Santa Clara River and Santa Clara River Estuary, and not be limited to traditional out-of-stream beneficial uses such as domestic, municipal or agricultural water supply. Without these field-based measurements it is impossible to conduct credible aquifer simulations such as the one found in the Draft GSP dealing with groundwater levels driven by climate-change scenarios through 2070 (*See, e.g.*, Figure 4.6-03 of the Draft GSP.)

The Draft GSP further notes:

> "Since 1979, when reporting of groundwater extraction from wells was mandated within United's service area, no pumping has been reported from the shallow alluvial aquifer for water supply in Mound Basin (pumping data for water-supply wells are included in the Mound Basin Data Management System [DMS]), likely due to insufficient saturated thickness and/or poor water quality. Because it is not used for water supply, the shallow alluvial aquifer is not considered a "principal aquifer" at this time for the purpose of groundwater sustainability planning." p. 40

However, the Draft GSP also acknowledges that:

> "Based on calibration of its regional groundwater flow model, United (2021a) estimated the horizontal hydraulic conductivity of the shallow alluvial aquifer to be 200 ft/d in Mound Basin, and the vertical hydraulic conductivity to be 20 ft/d. The specific yield of the shallow alluvial aquifer in the groundwater flow model is 15% (United, 2021a). p. 40

The Mound Basin is a series of layered aquifers with variable hydraulic properties within and across layers. This is clearly depicted in the longitudinal cross-section A-A’ in Figure 3.1-05 of the Draft GSP) (Figures, Section 2) depicting the formations constituting the various aquifer layers of the Mound Basin. The “aquitards” have fault discontinuities, and there is hydraulic connection between aquifers and aquitards”. The hydraulic head that prevails in the layered aquifer system, including those in the “aquitards”, are all interconnected. The lowering of the hydraulic head in deep aquifers will induce a vertical downward movement of groundwater from the shallow aquifer, which in turn is hydraulically connected to the Santa Clara River and the Santa Clara River Estuary.

As noted above, because water in the shallow alluvial aquifer can percolate to the lower Mount Basin aquifers, reducing the groundwater level in the Mound Basin can result in lower groundwater levels in the shallow alluvial aquifer, thus affecting GDE associated with the overlying shallow alluvial aquifer, including surface water in the lower Santa Clara River, and the Santa Clara River Estuary. Consequently, while the shallow alluvial aquifer may not be considered a “principal aquifer”, pumping from the Mound Basin can affect the GDE associated with the shallow aquifer, including the lower reaches of the Santa Clara River and the Santa Clara River Estuary, and therefore cannot be omitted from the analysis of the Draft GSP for the Mound Basin. *See* additional comments below regarding groundwater contribution the Santa Clara River Estuary.

40 **3.1.4.2 Groundwater Recharge and Discharge Areas [§354.14(d)(4)]**

Pages 44-45

The Draft GSP notes that:

> “The Santa Clara River is the only major stream in Mound Basin, and the reach of the Santa Clara River in [the] Mound Basin is considered to usually be the site of groundwater discharge, rather than recharge (Stillwater Sciences, 2011[b]; United, 2018). However, the lower Santa Clara River in the area of its estuary is reported to fluctuate from gaining to losing cycles as water levels rise and fall in response to breaching of the barrier sand at the mouth of the river (Stillwater Sciences, 2011[b[). When the elevation of surface water in the estuary rises (following closure of the barrier bar), some of the rising water infiltrates (recharges) the shallow deposits adjacent to the river. Then, typically in the following winter or spring, a large storm will produce sufficient flows in the river that it will breach the barrier bar and cause rapid decline of surface water levels in the estuary, causing groundwater in the adjacent shallow deposits to discharge back into the river over a sustained period.” p. 45

This statement warrants several comments:

First, the distinction between discharge and recharge is misleading; the surface flows in the lower reaches of the Santa Clara River are in direct contact with the alluvial aquifer (which is described elsewhere in the draft GSP as being up to a 100 feet thick).

40 Second, river discharge (particularly base flows influence by underlying groundwater levels in the Mound Basin) support the GDE in this portion of the Mound Basin.

Third, recharge is not limited to periods when the water surface elevations in the estuary rises following the closure of the sand bar at the mouth of the Santa Clara River Estuary.

Lastly, the draft GSP does not accurately characterize the groundwater contribution to the Santa Clara River Estuary or the lower reaches of the Santa Clara River. According to a water balance assessment conducted by Stillwater Sciences (2011a, 2011b) for the fall/winter period of 2010, "groundwater was estimated to contribute approximately 15% of the inflow volume . . .". For the summer/spring 2010 period, "the groundwater contribution was estimated at 10 percent . . ." The Stillwater study also indicates that in the "Santa Clara River reach upstream of the estuary, groundwater provides the dry summer baseflow, if it exists, and is a quarter of the winter flow, based on the 2010 water year assessment." (TNC 2017, pp. 3-4).

3.1.4.3 Groundwater Quality [§354.14(b)(4)(D)]

Pages 45-50

The Draft GSP notes that:

> "SSP&A (2020) further concluded that there is no significant evidence for interactions between groundwater in the principal aquifers and shallow groundwater (CWP-510 is included here) or deeper, mineralized water. SSP&A (2020) also concluded that groundwater at the sample locations in the Basin is at least 1,000 years old. These conclusions together suggest that vertical movement of water percolating from land surface is not a major source of recharge to the principal aquifers, except where they are exposed at land surface in the northern portion of the basin." p. 46

The analysis and conclusion articulated here reflects a water supply for out-of-stream beneficial uses perspective that is pervasive throughout the Draft GSP. However, groundwater-surface interactions on smaller scale than would normally be considered in a traditional groundwater management program are relevant in considering the effects of groundwater management actions (including the timing, rate, and amount of groundwater extractions) on GDE such as the exist in the lower reaches of the Santa Clara River and the Santa Clara River Estuary.

3.1.4.4 Primary Beneficial Uses [§354.14(b)(4)(E)]

Pages 50-54

The Draft GSP recognizes that:

> "In addition to groundwater production from the principal aquifers, discharge of small quantities of groundwater from the shallow alluvial aquifer to the lower reach of the Santa Clara River and possibly one other

> area in Mound Basin may contribute to groundwater-dependent ecosystems (GDEs). This potential beneficial groundwater use is further described in Section 3.2.6." p. 51

Despite the acknowledgement of groundwater-surface water interconnections, the Draft GSP concludes that because the shallow alluvial aquifer overlaying the Mound Basin is "rarely used for water supply", and the "likely limited, connection between Mound Basin shallow groundwater" there are not impacts to the GDEs by principal aquifer pumping, and therefore potential adverse Impacts will not be considered in the development of sustainable management criteria for the principal aquifers within the Mound Basin. For the reasons indicated above, this conclusion is not supported by the data presented in the Draft GSP. *See* additional Comments below regarding Appendix A, "Area 11- Lower Santa Clara River and Estuary."

The Draft GSP asserts:

"No data gaps or significant uncertainties were identified." p. 54

This claim is contradicted by the acknowledgement that "no aquifer test results for hydraulic conductivity or storativity were found in available references." p.39 *See* additional comments bellow on Monitoring Networks.

41 **3.2 Groundwater Conditions [§354.16]**

Pages 54-69

The Draft GSP notes that:

> "Groundwater elevation data are available for nearly 60 wells located within Mound Basin. However, not all of these wells are being monitored at present. The distribution of wells is heavily skewed towards the southern half of the Basin, with relatively few wells existing in the northern half of the Basin (north of Highway 126)." p. 54

The Draft GSP does not provide details regarding the well construction showing the intervals of the well through which groundwater enters the wells. Also, it is unclear if there are "sanitary plugs" installed in the wells that retard or prevent flow through shallow and deep aquifers. *See* comment above regarding the assertion that "No data gaps or significant uncertainties were identified."

42 **3.2.1 Groundwater Elevations [§354.16(a)]**

Page 54

The Draft GSP acknowledges that:

> "The contouring of groundwater levels in Mound Basin is complicated by the sparse data, particularly in the northern portion of the Basin." p. 54

42 *See* comment above regarding the assertion that "No data gaps or significant uncertainties were identified."

43 **3.2.2 Change in Storage [§354.16(b)]**

> "Similar to contouring of groundwater levels in Mound Basin (as described above), estimation of historical changes in groundwater stored in the Basin is complicated by sparse groundwater elevation data, particularly in the northern portion of the Basin and in HSUs with few monitoring points. Due to these limitations, annual and cumulative changes in groundwater in storage were estimated using United's (2018 and 2021a, 2021b) groundwater flow model, which is generally well calibrated on a regional scale to groundwater elevation measurements." p. 60

Groundwater models that are aimed at a "regional scale" are not likely to adequately describe changes in groundwater and surface water elevations (particularly base flows) that support localized GDE such as those associated with the lower Santa Clara River and the Santa Clara River Estuary, as well as other GDE within the Mound Basin identified by the California Department of Fish and Wildlife (2021). *See* comment above regarding the assertion that "No data gaps or significant uncertainties were identified."

3.2.3 Seawater Intrusion [§354.16(c)]

Pages 61-62

The Draft GSP notes that:

> "Due to the lack of evidence of seawater intrusion in onshore portions of the Basin and lack of data concerning the location of any offshore seawater intrusion front in the principal aquifers, the maps and cross-sections of the seawater intrusion front required pursuant to §354.16(c) cannot be prepared." p. 62

See comment above regarding the assertion that "No data gaps or significant uncertainties were identified."

3.2.6 Interconnected Surface Water Systems [§354.16(f)]

Pages 67-68

The Draft GSP notes that:

> "Data are not available to characterize the interconnection of Santa Clara River surface water and groundwater. Although the frequent perennial baseflow conditions imply that surface and groundwater is interconnected, it is not known specifically which groundwater in which units are

> connected and where. Of importance for this GSP, it is unknown whether the water table of the shallow alluvial aquifer in Mound Basin extends beneath the stream terrace deposits and intersects surface water in the Santa Clara River channel within the limits of Mound Basin." p. 67

However, the Draft GSP concludes that:

> "Regardless of the questions and uncertainty surrounding interconnection of shallow aquifer and/or stream terrace groundwater with the Santa Clara River baseflow, it can be concluded that there is no depletion of interconnected surface water in this area because neither unit has any known groundwater extractions within Mound Basin." p. 68.

As noted above, while the shallow alluvial aquifer laying about the Mound Basin may be "rarely used for water supply", it does not follow that there is "no depletion of interconnected surface water within the boundaries of the Mound Basin." Because water in the shallow alluvial aquifer can percolate to the aquifer below, reducing the groundwater level in the Mound Basin can result in lower groundwater levels in the shallow alluvial aquifer, thus affecting GDE associated with the shallow alluvial aquifer, including surface water in the lower Santa Clara River, and the Santa Clara River Estuary. *See* additional comments above regarding the physical properties of the Mound Basin, as well as those below regarding groundwater contribution the Santa Clara River Estuary.

3.2.7 Groundwater-Dependent Ecosystems [§354.16(g)]

Pages 68-69

The Draft GSP states that:

> " . . .it is noted that there is no known shallow groundwater extraction within Mound Basin. . . . Given the lack of potential for significant impacts to the GDEs by principal aquifer pumping, Area 11 [*i.e.*, lower Santa Clara River and Santa Clara River Estuary] will not be considered further in the development of sustainable management criteria for the principal aquifers." p. 69

As noted above the data presented in the Draft GSP does not support this assessment and conclusion. *See* additional comment above regarding the physical properties of the Mound Basin and those below regarding Appendix A, "Area 11- Lower Santa Clara River and Estuary."

3.3 Water Budget [§354.18]

Pages 70-97

See comments below regarding individual sub-sections of the Water Budget.

44

3.3.1 Historical Water Budget [§354.18(c)(2)(B)]

Pages 79-82

The Draft GSP notes that:

"The SGMA Regulations require that the historical surface water and groundwater budget be based on a minimum of 10 years of historical data." p. 79

The GSP does not refer to or account for the effects of the operation of the UWCD Vern Freeman Diversion on the lower Santa Clara River, which diverts, on average, over 62,000 acre-feet per year (AFY) from the main stem of the Santa Clara River (NMFS 2018). This diversion operation affects recharge to all of the lower Santa Clara River groundwater basins, not just the Fox Canyon Basin, including the shallow alluvial aquifer and the other deeper aquifers in within the Mound Basin. These operations have the potential to impact endangered adult and juvenile steelhead in the lower Santa Clara River and Santa Clara River Estuary (NMFS 2008a, 2018). The Draft GSP should therefore include as part of its water-budget analysis the operations of the Vern Freeman Diversion. Specifically, the relationship of groundwater management activities (including both recharge and groundwater extraction activities) and the effects of the related Vern Freeman Diversion on surface flows below the diversion and the maintenance of surface flows supported by groundwater should be explicitly addressed and disclosed in the revised GSP.

3.3.1.3 Impact of Historical Conditions on Basin Operations [§354.18(c)(2)(C)]

Pages 83-84

See comments above regarding Historical Water Budget.

3.3.2 Current Water Budget [§354.18(c)(1)]

Pages 84-86

As noted above, the GSP does not refer to or account for the effects of the operation of the UWCD Vern Freeman Diversion on the Lower Santa Clara River, but should as part of its current water budget. See comments above regarding the UWCD Vern Freeman Diversion.

3.3.3 Projected Water Budget

Pages 86-94

As noted above, the GSP does not refer to or account for the effects of the operation of the Vern Freeman Diversion on the Lower Santa Clara River, but should as part of its projected water budget. See comments above regarding the UWCD Vern Freeman Diversion.

45 **3.3.4.1 Overdraft Assessment**

Pages 95-96

The Draft GSP notes that:

> "Review of the historical, current and projected groundwater budgets indicate small amounts of declining groundwater storage over time (469 and 147 for the historical and current periods, respectively), as shown in Table 3.3-03. These results suggest a minor amount of overdraft may have occurred during the historical and current period of 6.3% and 2.3%, respectively, of the groundwater pumping during that timeframe." p. 96

While the Draft GSP does not identify any significant impacts to out-of-stream water supply beneficial uses of the Mound Basin (and in fact projects a slight increase of 68 to 84 AF/yr) between 2022 and 2096, under the assumed future-precipitation rates modeled), the implications from this slight overdraft or increase in storage for any of the GDE associated with the Mount Basin, including the lower Santa Clara River and Santa Clara River Estuary, are unclear

3.4 Management Areas [§354.20]

Page 97

The Draft GSP indicates that:

"No management areas were established for this GSP". p. 97.

This decision appears to be the result, in part, of not recognizing any significant interconnected surface water or GDE within the boundaries of the Mound Basin. However, as noted above, the Mound Basin contains interconnected water and GDE. Additionally, the analysis in the Draft GSP is largely from a water supply perspective, with an emphasis on out-of-stream beneficial uses, and does not recognized water conductivity and storativity that is more relevant to instream beneficial uses associated with GDE, including but not limited to those in Area 11 (*i.e*., the lower Santa Clara River and Santa Clara River Estuary) .*See* comments above regarding the physical properties of the Mound Basin.

4.0 Sustainable Management Criteria [Article 5, SubArticle 3]

Pages 98-148 *See* comments below on individual sub-sections.

4.2 Sustainability Goal [§354.24]

Pages 90-100

The Draft GSP states, in part, that:

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> "The goal of this Groundwater Sustainability Plan (GSP) is to sustainably manage the groundwater resources of the Mound Basin for the benefit of current and anticipated future beneficial users of groundwater and the welfare of the general public who rely directly or indirectly on groundwater. Sustainable groundwater management will ensure the long-term reliability of the Mound Basin groundwater resources by avoiding undesirable results pursuant to the Sustainable Groundwater Management Act (SGMA) no later than 20 years from GSP adoption through implementation of a data-driven and performance-based adaptive management framework." P. 100

Nothing in the language of the goals specifically refers to the protection of instream beneficial uses associated with GDE of the Mount Basin, such as the lower Santa Clara River or the Santa Clara River Estuary. This appears to be the result, in part, of not recognizing any interconnected surface waters or GDE within the boundaries of the Mound Basin. However, as noted above, the Mound Basin contains interconnected surface water and GDE. *See* comments above regarding the physical properties of the Mound Basin.

4.3 Process for Establishing Sustainable Management Criteria [§354.26(a), §354.34(g)(3)]

Pages 101-102

See comments above regarding the interest of state and federal natural resource regulatory agencies such as NMFS, U.S. Fish and Wildlife Service, and the California Department of Fish and Wildlife, and the California Department of Parks and Recreation (which owns a portion of the Santa Clara River Estuary wetlands).

Evaluation of Potential Effects on Beneficial Uses and Users, Land Uses, and Property Interests [§354.26(b)(3)]

Pages 103-104

The discussion in this section is focused on out-of-stream beneficial uses of the groundwater resources of the Mount Basin, and does not directly address the instream beneficial uses of interest to state and federal natural resource regulatory agencies such as NMFS, U.S. Fish and Wildlife Service, and the California Department of Fish and Wildlife, and the California Department of Parks and Recreation. These would include, but are not limited to, the GDE associated with the lower Santa Clara River and the Santa Clara River Estuary.

Cause of Groundwater Conditions That Could Lead to Undesirable Results [§354.26(b)(1)]

Pages 104-105

The causes that could lead to undesirable results should include the operations of UWCD Vern Freeman Diversion on the lower Santa Clara River. *See* comments above, particularly regarding GDE.

4.4.2 Minimum Thresholds [§354.28]

Pages 105-107

None of the minimum thresholds in the Draft GSP deal specifically with the GDE associated with the Mound Basin, which include the lower Santa Clara River and the Santa Clara River Estuary. This is a significant omission from the Draft GSP that should be addressed in the revised Draft GSP for the Mound Basin.

4.4.2.2 Relationships Between Minimum Thresholds and Sustainability Indicators [§354.28(b)(2)]

Page 108

See general comment above regarding "Minimum Thresholds" and those below regarding "Criteria Used to Define Undesirable Results".

4.4.2.3 Minimum Thresholds in Relation to Adjacent Basins [§354.28(b)(3)]

Page 108

See general comment above regarding Minimum Thresholds and the operation of the UWCD Vern Freeman Diversion.

4.4.2.4 Impact of Minimum Thresholds on Beneficial Uses and Users [§354.28(b)(4)]

Page 108

See general comment above regarding "Minimum Thresholds" and those below regarding Criteria Used to Define Undesirable Results" below.

Groundwater Beneficial Users (All Types)

Page 109

Land Uses and Property Interests (All Types)

Page 109

See comments above regarding the interest of state and federal natural resource regulatory agencies such as NMFS, U.S. Fish and Wildlife Service, and the California Department of Fish and Wildlife, and the California Department of Parks and Recreation (which owns a portion of the Santa Clara River Estuary wetlands).

4.4.2.5 Potential Effects on other Sustainability Indicators [§354.28(c)(1)(B)]

Pages 109-110

See general comment above regarding "Minimum Thresholds" and those below regarding Criteria Used to Define Undesirable Results".

Depletion of Interconnected Surface Water

Page 110

The Draft GSP states that:

> "This sustainability indicator is not applicable to the Mound Basin." (p. 110)

As noted above, while the shallow alluvial aquifer laying about the Mound Basin may be "rarely used for water supply", it does not follow that there is "no depletion of interconnected surface water within the boundaries of the Mound Basin." Because water in the shallow alluvial aquifer can percolate to the aquifer below, reducing the groundwater level in the Mound Basin can result in lower groundwater levels in the shallow alluvial aquifer, thus affecting GDE associated with the shallow alluvial aquifer, including surface water in the lower Santa Clara River, and the Santa Clara River Estuary. *See* additional comments above the physical properties of the Mound Basin and the groundwater contribution the Santa Clara River Estuary.

4.4.2.6 Current Standards Relevant to Sustainability Indicator [§354.28(b)(5)]

Page 111

> "MBGSA [Mound Basin Groundwater Sustainability Agency] is unaware of any federal, state, or local standards for chronic lowering of groundwater levels." p. 110

While there is no general numeric standards for chronic lowering of groundwater levels, this statement fails to recognize the over-arching standards established by SGMA, particularly those intended to protect GDE.

4.4.2.7 Measurement of Minimum Thresholds [§354.28(b)(6)]

Page 111

> "Groundwater elevations will be directly measured to determine their relation to minimum thresholds. Groundwater level monitoring will be conducted in accordance with the monitoring plan outlined in Section 5." p. 111

The groundwater-monitoring plan only provides for annual monitoring. A more appropriate approach would be to monitor seasonally to account for the strong effect of seasonal changes in hydrologic and hydraulic conditions that are of significant to GDE, including, but not limited to, those associated with the lower Santa Clara River and the Santa Clara River Estuary. For example, monitoring towards the end of summer or beginning of fall, as well as the beginning of Spring each year could help inform groundwater and other natural resource managers of the effects of both recharge (natural and artificial) as well as groundwater pumping patterns on GDE within the Mound Basin such as the lower Santa Clara River and Santa Clara River Estuary.

Without shallow groundwater wells that would provide specific data on the relationship between groundwater levels and surface flows, a reliable assessment of the effects of extracting groundwater from these areas on GDE is not possible. This is a significant data gap that could be addressed by the installation of shallow groundwater wells (or piezometers) to better describe these relationships.

Additionally, data gathered from groundwater well monitoring should be correlated with stream flow in the lower Santa Clara River and surface water elevations in the Santa Clara River Estuary. This can and should be accomplished by added a stream flow gauges capable of monitoring base flows in the lower Santa Clara River between U.S. Highway 101 and the Harbor Boulevard Bridge, as well as one or more water surface elevation gauges within the Santa Clara River Estuary.

See general comment above regarding "Minimum Thresholds" and those below regarding "Criteria Used to Define Undesirable Results".

4.4.3 Measurable Objectives and Interim Milestones [§354.30(a),(b),(c),(d),(e),(g)]

Page 111

See general comment above regarding "Minimum Thresholds" and those below regarding "Criteria Used to Define Undesirable Results".

47 **4.4.3.1 Description of Measurable Objectives**
Western Half of Basin

Page 112

The Draft GSP notes that:

> "The chronic lowering of groundwater levels minimum thresholds in the western half of the Basin are superseded by the land subsidence proxy minimum thresholds. Therefore, the land subsidence proxy measurable objectives and interim milestones are adopted for the chronic lowering of groundwater levels measurable objectives in the western half of the Basin." p. 112

It is not clear how, or if, the land subsidence proxy for minimum thresholds is appropriate for instream beneficial uses associated by GDE supported by interconnected waters. *See* also, general comment above regarding Minimum Thresholds.

Eastern Half of the Basin

4.4.3.2 Interim Milestones [§354.30(e)]

Page 113

See general comment above regarding "Minimum Thresholds" and those below regarding "Criteria Used to Define Undesirable Results".

Western Half of Basin

Page 113

See general comment above regarding "Minimum Thresholds" and those below regarding "Criteria Used to Define Undesirable Results".

Eastern Half of Basin

Page 113

See general comment above regarding "Minimum Thresholds" and those below regarding "Criteria Used to Define Undesirable Results".

4.5 Reduction of Groundwater Storage

4.5.1 Undesirable Results [§354.26]

Pages 114-116

See general comment above regarding Minimum Thresholds.

Evaluation of Potential Effects on Beneficial Uses and Users, Land Uses, and Property Interests [§354.26(b)(3)]

The Draft GSP states that:

> "The evaluation of potential effects on beneficial uses and users, land uses, and property interests for the reduction of groundwater storage sustainability indicator is the same as for the other sustainability indicators and is incorporated herein by reference to Sections 4.4.2.4, 4.6.2.4, and 4.7.2.4.

And,

> "Reduction of groundwater storage has the potential to impact the beneficial uses and users of groundwater in the Mound Basin by limiting the volume of groundwater available that can be economically extracted for agricultural, municipal, industrial, and domestic use. These impacts

> can affect all users of groundwater in the Mound Basin. Groundwater elevations are used to determine whether significant and unreasonable reduction of groundwater in storage is occurring." p. 115

As noted previously, the Draft GSP should be revised to explicitly acknowledge the instream beneficial uses supported by the Mound Basin and its individual aquifers, including, but not limited to, the GDE associated with the lower Santa Clara River and Santa Clara River Estuary. The recognized instream beneficial uses for the portion of the lower Santa Clara River within the Mound Basin include: warm freshwater habitat, cold freshwater habitat, wildlife habitat, habitat for rare, threatened and endangered species, fish migration, and wetland habitat. Santa Clara River Estuary instream beneficial uses include: estuarine habitat, marine habitat, wildlife habitat, habitat for rare, threatened and endangered species, fish migration, spawning habitat, and wetland habitat.

Criteria Used to Define Undesirable Results [§354.26(b)(2)]

The Draft GSP states that:

> "The criteria used to define undesirable results for the reduction of groundwater storage sustainability indicator are based on the qualitative description of undesirable results, which is causing other sustainability indicators to have undesirable results. As explained in Section 4.5.2, groundwater levels will be used as a proxy for the reduction of groundwater storage sustainability indicator minimum thresholds. Based on the foregoing, the combination of minimum threshold exceedances that is deemed to cause significant and unreasonable effects in the basin for the reduction of groundwater storage sustainability indicator is the same as the combinations deemed to cause undesirable results for the land subsidence sustainability indicator (western half of the Basin) and chronic lowering of groundwater levels sustainability indicator (eastern half of the Basin) (Table 4.1-01)." p. 116

While groundwater levels are important indicator of the general condition of the groundwater basin, such metrics are not a substitute for metrics that are specifically aimed at informing management of the Mound Basin for the purpose of protecting instream beneficial associated with GDE within Mound Basin, including the lower Santa Clara River and the Santa Clara River Estuary. Specifically, these criteria do not address whether there may be significant stream flow depletion or lowered water surface elevation (from a biological perspective) caused by groundwater pumping within the Mound Basin. *See* general comment above regarding "Minimum Thresholds" regarding GDE.

48 **4.5.2.2 Relationships Between Minimum Thresholds and Sustainability Indicators [§354.28(b)(2)]**

> "The minimum thresholds for the reduction of groundwater storage sustainability indicator allow groundwater levels to decline below

48

historical low levels in the eastern half of the Basin. Deeper groundwater levels could potentially increase underflow into the Mound Basin from the Oxnard and/or Santa Paula Basins (or decrease underflow to the Oxnard Basin), which could potentially contribute to undesirable results in those Basins. However, as noted above and in Section 4.4.2.1, the length of time that groundwater levels could remain below historical lows would be limited in order to prevent undesirable results for land subsidence in the western half of the Mound Basin; therefore, the potential effect on the adjacent basins is considered small." p. 118

This approach and analysis may be appropriate when considering groundwater supplies for out-of-stream beneficial uses for which there may be alternatives. However, it does not take into account the adverse effects of periodic reduction of groundwater on GDE, including the use by migrating, spawning or rearing steelhead. The effects of periodic groundwater reductions on out-of-stream beneficial uses (*e.g.*, domestic or agricultural water supplies) may be addressed with alternative water sources. However, instream uses such as GDE are more vulnerable to periodic groundwater reductions, because there is generally no alternative water source to sustain the GDE, and even a short-term depletion or limitation of stream flow or water surface elevation can be lethal to aquatic species.

4.5.2.4 Impact of Minimum Thresholds on Beneficial Uses and Users [§354.28(b)(4)]

Page 119

"The effects on beneficial users and land uses in the Basin are the same as analyzed for the land subsidence sustainability indicator (western half of Basin) and chronic lowering of groundwater levels sustainability indicator (eastern half of Basin) and are incorporated herein by reference to Sections 4.4.2.4 and 4.8.2.4." p. 119

See the comments above regarding "Criteria Used to Define Undesirable Results" and Relationship Between Minimum Thresholds and Sustainability Indicators".

4.5.2.5 Current Standards Relevant to Sustainability Indicator [§354.28(b)(5)]

Page 119

"MBGSA is unaware of any federal, state, or local standards for reduction of groundwater storage." p. 119

As noted above, while there are no numeric standards, this statement does not appear to recognize the standards that that are established by SGMA, particularly regarding GDE.

4.5.2.6 Measurement of Minimum Thresholds [§354.28(b)(6)]

Page 119

See the comments above regarding “Minimum Thresholds”, “Criteria Used to Define Undesirable Results” and “Relationship Between Minimum Thresholds and Sustainability Indicators.”

4.5.3 Measurable Objectives and Interim Milestones [§354.30(a),(b),(c),(d),(e),(g)]

Page 120

See the comments above regarding “Minimum Thresholds”, “Criteria Used to Define Undesirable Results” and “Relationship Between Minimum Thresholds and Sustainability Indicators.”

4.5.3.1 Description of Measurable Objectives

Page 120

See the comments above regarding “Minimum Thresholds”, “Criteria Used to Define Undesirable Results” and “Relationship Between Minimum Thresholds and Sustainability Indicators.”

Western Half of Basin

See general comment above regarding “Minimum Thresholds” regarding GDE.

Eastern Half of Basin

See general comment above regarding “Minimum Thresholds” regarding GDE.

4.6 Seawater Intrusion

Pages 120-121

See comment above regarding the assertion that “No data gaps or significant uncertainties were identified.”

4.6.1 Undesirable Results [§354.26]

Pages 122-124

See comment above regarding the assertion that “No data gaps or significant uncertainties were identified.”

Process and Criteria for Defining Undesirable Results [§354.26(a)]

Page 122

See comments above regarding the interest of state and federal natural resource regulatory agencies such as NMFS, U.S. Fish and Wildlife Service, and the California

Department of Fish and Wildlife, and the California Department of Parks and Recreation (which owns a portion of the Santa Clara River Estuary wetlands).

Evaluation of Potential Effects on Beneficial Uses and Users, Land Uses, and Property Interests [§354.26(b)(3)]

Page 122

As noted previously, the Draft GSP should be revised to explicitly acknowledge the instream beneficial uses supported by the groundwater basin, including the GDE associated with the lower Santa Clara River and Santa Clara River Estuary. *See* comment above regarding “Process and Criteria for Defining Undesirable Results”.

Criteria Used to Define Undesirable Results [§354.26(b)(2)]

Pages 123-124

See the comments above regarding “Minimum Thresholds”, “Criteria Used to Define Undesirable Results” and “Relationship Between Minimum Thresholds and Sustainability Indicators.”

4.6.2 Minimum Thresholds [§354.28]

4.6.2.1 Information and Criteria to Define Minimum Thresholds [§354.28(a), (b)(1),(c)(3)(A),(c)(3)(B), and (e)]

Page 124-125

See the comments above regarding “Minimum Thresholds”, “Criteria Used to Define Undesirable Results” and “Relationship Between Minimum Thresholds and Sustainability Indicators.”

4.6.2.2 Relationships Between Minimum Thresholds and Sustainability Indicators [§354.28(b)(2)]

Pages 125-126

See the comments above regarding “Minimum Thresholds”, “Criteria Used to Define Undesirable Results” and “Relationship Between Minimum Thresholds and Sustainability Indicators.”

4.6.2.3 Minimum Thresholds in Relation to Adjacent Basins [§354.28(b)(3)]

Page 126

See the comments above regarding “Minimum Thresholds”, “Criteria Used to Define Undesirable Results”, “Relationship Between Minimum Thresholds and Sustainability Indicators”, the UWCD Vern Freeman Diversion.

4.6.2.4 Impact of Minimum Thresholds on Beneficial Uses and Users [§354.28(b)(4)]

Pages 126-127

See the comments above regarding "Minimum Thresholds", "Criteria Used to Define Undesirable Results" and "Relationship Between Minimum Thresholds and Sustainability Indicators."

4.6.2.5 Current Standards Relevant to Sustainability Indicator [§354.28(b)(5)]

Page 127

> "MBGSA is unaware of any federal, state, or local standards for seawater intrusion other than the WQOs included in the RWQCB-LA Basin Plan (RWQCB-LA, 2019). The minimum threshold for seawater intrusion is equal to the RWQCB Basin Plan WQO for chloride." p. 127

This statement does not appear to recognize the broad standards that that are established by SGMA.

4.6.2.6 Measurement of Minimum Thresholds [§354.28(b)(6)]

Page 127

See the comments above regarding "Minimum Thresholds", "Criteria Used to Define Undesirable Results" and "Relationship Between Minimum Thresholds and Sustainability Indicators."

4.6.3 Measurable Objectives and Interim Milestones [§354.30(a),(b),(c),(d),(e),(g)]

Page 128

See the comments above regarding "Minimum Thresholds", "Criteria Used to Define Undesirable Results" and "Relationship Between Minimum Thresholds and Sustainability Indicators."

4.7 Degraded Water Quality

Pages 128-136

See the comments above regarding "Minimum Thresholds", "Criteria Used to Define Undesirable Results" and "Relationship Between Minimum Thresholds and Sustainability Indicators."

4.7.1 Undesirable Results [§354.26]

Page 130

See the comments above regarding “Minimum Thresholds”, “Criteria Used to Define Undesirable Results” and “Relationship Between Minimum Thresholds and Sustainability Indicators.”

Process and Criteria for Defining Undesirable Results [§354.26(a)]

Page 130

See comments above regarding the interest of state and federal natural resource regulatory agencies such as NMFS, U.S. Fish and Wildlife Service, and the California Department of Fish and Wildlife, and the California Department of Parks and Recreation (which owns a portion of the Santa Clara River Estuary wetlands).

Evaluation of Potential Effects on Beneficial Uses and Users, Land Uses, and Property Interests [§354.26(b)(3)]

Page 130

As noted previously, the Draft GSP should be revised to explicitly acknowledge the instream beneficial uses supported by the groundwater basin, including the GDE associated with the lower Santa Clara River and Santa Clara River Estuary. *See* comment above regarding “Process and Criteria for Defining Undesirable Results.”

Cause of Groundwater Conditions That Could Lead to Undesirable Results [§354.26(b)(

Page 131

See the comments above regarding “Minimum Thresholds”, “Criteria Used to Define Undesirable Results” and “Relationship Between Minimum Thresholds and Sustainability Indicators.”

Criteria Used to Define Undesirable Results [§354.26(b)(2)]

Page 131

See the comments above regarding “Minimum Thresholds”, “Criteria Used to Define Undesirable Results” and “Relationship Between Minimum Thresholds and Sustainability Indicators.”

4.7.2 Minimum Thresholds [§354.28]

Page 131

See the comments above regarding “Minimum Thresholds”, “Criteria Used to Define Undesirable Results” and “Relationship Between Minimum Thresholds and Sustainability Indicators.”

4.7.2.2 Relationships Between Minimum Thresholds and Sustainability Indicators [§354.28(b)(2)]

Page 133

See the comments above regarding "Minimum Thresholds", "Criteria Used to Define Undesirable Results" and "Relationship Between Minimum Thresholds and Sustainability Indicators."

4.7.2.3 Minimum Thresholds in Relation to Adjacent Basins [§354.28(b)(3)]

Page 134

See the comments above regarding "Minimum Thresholds", "Criteria Used to Define Undesirable Results" and "Relationship Between Minimum Thresholds and Sustainability Indicators."

4.7.2.5 Current Standards Relevant to Sustainability Indicator [§354.28(b)(5)]

Page 135

As noted above, while there is are no numeric standard, this statement does not appear to recognize the standards that that are established by SGMA, particularly regarding GDE.

4.7.3 Measurable Objectives and Interim Milestones [§354.30(a),(b),(c),(d),(e),(g)]

Page 136

See the comments above regarding "Minimum Thresholds", "Criteria Used to Define Undesirable Results" and "Relationship Between Minimum Thresholds and Sustainability Indicators."

4.7.3.1 Interim Milestones [§354.30(e)]

Page 136

See the comments above regarding "Minimum Thresholds", "Criteria Used to Define Undesirable Results" and "Relationship Between Minimum Thresholds and Sustainability Indicators."

4.8 Land Subsidence

Page 137-148

As noted above, it is not clear how, or if, the land subsidence proxy for minimum thresholds is appropriate for within-stream beneficial uses associated by GDE supported by interconnected waters. *See* also, general comment above regarding Minimum Thresholds.

4.9 Depletions of Interconnected Surface Water

Page 148

The Draft GSP asserts that:

> "Depletions of interconnected surface water is not an applicable indicator of groundwater sustainability in the Mound Basin and, therefore, no SMC [Sustainable Management Criteria] are set. Section 3.2.6 Interconnected Surface Water Systems provides the evidence for the inapplicability of this sustainability indicator.| p. 148

As noted in the comments above, this statement and the conclusion associated with it are not supported by either the evidence or the analysis presented in the Draft GSP. Rather, the Draft GSP either ignores or mis-interprets the physical properties of the Mound Basin, and applies an inappropriate standard for the evaluation of potential effects of groundwater extraction from the Mound Basin on GDE within the Mound Basin, including, but not limited to the Area 11 (i.e., the lower Santa Clara River and Santa Clara River Estuary). Further, the Draft GSP fails to acknowledge or take into account the effects of the operation of the UWCD Vern Freeman Diversion on the lower Santa Clara River, which diverts, on average, over 62,000 acre-feet per year (AFY) from the main stem of the Santa Clara River (NMFS 2018). This diversion operation affects recharge to all of the lower Santa Clara River groundwater basins, not just the Fox Canyon Basin, including the shallow alluvial aquifer and the other deeper aquifers in within the Mound Basin.

4.10 Measurable Objectives and Interim Milestones for Additional Plan Elements [§354.30(f)]

Page 148

> "No measurable objectives were developed for the additional plan elements included in the GSP." p. 148

See the comments above regarding "Minimum Thresholds", "Criteria Used to Define Undesirable Results" and "Relationship Between Minimum Thresholds and Sustainability Indicators"

5.0 Monitoring Networks [Article 5, SubArticle 4]

Pages 149-177

The Draft GSP notes:

> "Surface flows in the Santa Clara River are measured daily by the VCWPD [Ventura County Watershed Protection District] at flow-gaging station '723 - Santa Clara River at Victoria Ave' located outside of the Basin. Data from this station are available online and can be downloaded

> annually to update this surface water component of the Mound Basin water budget (VCWPD, 2021). MBGSA intends to continue using data from these existing sources as input to United's model, which will in turn be used periodically to quantify changes in water-budget components. At present, this GSP does not contemplate development of a new monitoring network or modification of existing monitoring networks to obtain data regarding groundwater pumping, imported water, or recharge quantities because it is MBGSA's opinion that these water budget components are currently adequate for sustainable management of the Basin." p. 53

However, the Draft GSP earlier (p. 67) acknowledges that gauge 723 is poorly calibrated to measure low flows in the Santa Clara River. These lower flows, while of less importance from traditional water supply perspective, do provide important support for GDE such as those associated with the lower Santa Clara River and the Santa Clara River Estuary within the Mound Basin.

As noted above, the monitoring proposed is aimed at addressing the limited Sustainable Management Criteria. There is nothing identified in the monitoring program that addresses the potential effects of groundwater extractions on GDE, including the lower Santa Clara River channel and the Santa Clara River Estuary. Shallow groundwater wells within the alluvial overlaying the Mound Basin would provide specific data on relationship between groundwater levels and surface flows. This appears to be a significant data gap that should be addressed by the installation of shallow groundwater wells (or piezometers) to better described these relationships.

6.0 Projects and Management Actions [Article 5, SubArticle 5]

Pages 178-191

The Draft GSP indicates that"

> "No management areas were established for this GSP".

This decision appears to be the result, in part, on not recognizing any interconnected surface water or GDE within the boundaries of the Mound Basin. However, as noted above, the Mound Basin does contain interconnected water and GDE.

In addition to monitoring the effects of groundwater (and related surface water diversions) within the Mound Basin, the Draft GSP should recognized other management activities that affect both water supply for out-of-stream beneficial uses and GDE, including, but not limited to, the lower Santa Clara River and the Santa Clara River Estuary.

The introduction and spread of the non-native, invasive giant reed *Arundo donax* has degraded both terrestrial and aquatic habitats within the Mound Basin, including GDE associated with lower Santa Clara River and Santa Clara River Estuary. In addition to displacing native riparian habitat important to a number of terrestrial and aquatic species, including steelhead, *Arundo donax* draws heavily on groundwater, and can reduce stream flow (particularly bae flows) due to the interconnected nature of surface flows within the Mound Basin (The Nature Conservancy 2019, Stover *et al.* 2018, Dudley and Cole 2018). As part of its over-all groundwater management project, therefore, the MGBSA should include an aggressive Arundo donax removal program, coordinated with adjacent landowners, including the California Department of Parks and Recreation and the Ventura County Watershed Protection District.

See the comments above regarding "Minimum Thresholds", "Criteria Used to Define Undesirable Results" and "Relationship Between Minimum Thresholds and Sustainability Indicators."

7.0 GSP Implementation

Pages 192-198

See comment above regarding "Projects and Management Actions".

Appendix A to Draft Mound Basin GSP

Area 11 – Lower Santa Clara River and Estuary

Pages 7-8

The description of the lower reaches of the Santa Clara River and Santa Clara River Estuary is based almost entirely on Grossinger, *et al* (2011), which was largely limited to a description of the vegetative characteristics of the wetlands of the Southern California Coast. That study, while providing valuable information on the type and distribution of various vegetative communities, does not provide comparable information on aquatic species associated with the Santa Clara River or its Estuary. The habitats covered here are principally riparian and terrestrial, omitting coverage of various types of aquatic habitats. Also, the characterization did not reference the more focused historical investigation prepared by Beller *et al*. (2011), which provided additional information on the wetland resources of the lower Santa Clara River and Santa Clara River Estuary, though it also did not provide significant information on fish, wildlife, and other species associated with the GDEs within the Mount Basin.

As a result, the characterization of the habitats and species associated with the lower Santa Clara River and Santa Clara River Estuary is incomplete and misleading. For example, while the pre-historic size and complexity of the Santa Clara River Estuary has been substantially reduced significant habitats and habitat functions remain. These have been described in various publications that were not cited, and apparently not consulted, in preparing the draft GSP for the Mound Basin. For an overview of the species that currently utilize the lower Santa Clara River and Santa Clara River Estuary, *see* Stillwater Sciences (2011a) Focal Species Analysis and Habitat Characterization for the Lower Santa Clara River and Major Tributaries. Additional habitat and species information on the Santa Clara River Estuary can be can be found in Stillwater Sciences (2011b) Geomorphic Assessment of the Santa Clara River Watershed: Synthesis of the Lower and Upper Watershed Studies and CBEC (2015), Santa Clara River Estuary Habitat Restoration and Enhancement and Feasibility Study: Existing Conditions Technical Report, and Kelley (2004), Information synthesis and priorities regarding steelhead (*Oncorhynchus mykiss)* on the Santa Clara River." p. 148

Figure 5. Lower Santa Clara River – Looking northwest from Harbor Boulevard 11-4-04

The Santa Clara Estuary is known to support rearing juvenile steelhead (Kelley 2008). Steelhead that rear with in estuary have the potential for accelerated growth because of the abundance of food sources in the estuary; this accelerated growth prior to entering the ocean has been shown to increase ocean survival and growth (Bond 2006, Hayes, *et al*. 2008,).

The necessity of addressing the estuary is corroborated through studies that indicate the Santa Clara River Estuary is hydrologically connected to the upper aquifers within the Oxnard Subbasin (whether semi-perched, or simply shallow groundwater aquifers). According to a water balance assessment conducted by Stillwater Sciences (2011a, 2011b) for the fall/winter period of 2010, “groundwater was estimated to contribute approximately 15% of the inflow volume . . .” For the summer/spring 2010 period, “the groundwater contribution was estimated at 10 percent . . .”. The Stillwater study also indicates that in the “Santa Clara River reach upstream of the estuary, groundwater provides the dry summer baseflow, if it exists, and is a quarter of the winter flow, based on the 2010 water year assessment.” (TNC 2017, pp. 3-4).

The current conditions described in the TNS study and reflected in the Draft GSP do not represent the unimpaired groundwater elevations or surface flow conditions with the boundaries of the Mound Basin. Groundwater (whether semi-perched, or simply shallow groundwater aquifers) can also contribute to surface flows, influencing in the timing, duration, and magnitude of surface flows, particularly base flows. Groundwater that only seasonally supports surface flows can also contribute to the life-cycle of migratory fishes, such as steelhead, that can make use of intermittent flows for both migration and rearing.

Figure 6. Santa Clara River Estuary – Looking southwest from Harbor Boulevard 8-21-21

The Draft GSP also relies heavily on the Nature Conservancy's guidance for GDE analysis (TNC 2018, 2019, 2020)   According to this guidance, GDE are defined on their dependence on groundwater for all or a portion of their water needs. This method involves mapping vegetation that can tap groundwater through their root systems, assessing where the depth of groundwater is within the rooting depth of that vegetation, and mapping the extent of surface water that is interconnected with groundwater. The method used by The Nature Conservancy in identifying GDE is based on statewide data on "vegetation known to use groundwater", and therefore does not adequately reflect the uses made of groundwater by other biological resources, such as seasonal migration of fishes, or other organisms such as invertebrates that have differing life-cycle than plants (TNC 2018, 2019, 2020). While changes to riparian or other aquatic vegetation is an important component in assessing the ecological health aquatic habitats (Capelli and Stanley 1984, Faber *et al*. 1989), as it is used in the Draft GSP, it essentially as a substitute for other metrics, *e.g.,* such as measured effects on surface flows, or depth or extent of pool habitat (including estuarine habitat) in response to artificial depletion of groundwater levels.

In addition to supplying water to the root zone of plants, groundwater can also contribute to surface flows, influencing the timing, duration, and magnitude of surface flows, particularly base flows. These baseflows provide essential support to aquatic invertebrates, avian fauna, and fish species, including native resident and anadromous fishes.[4] Groundwater that only seasonally supports surface flows can still contribute to the life-cycle of migratory fishes, such as steelhead, and other native aquatic species. We would note that the pattern of alternating perennial and intermittent/or ephemeral surface flows are known as an "interrupted" surface flow regime, and is common in southern California watersheds, particularly where groundwater play a role in maintaining surface flows. These surface flows are important for juvenile *O. mykiss* attempting to emigrate out of the Santa Clara River watershed. Interrupting the timing, magnitude, and duration of these flows as a result of groundwater extraction can be deleterious to juvenile *O. mykiss*, and this potential effect should be addressed in the revised Draft Memorandum.

Figure 7. Santa Clara River Steelhead Smolts – From Santa Clara River Estuary 9-17-10

[4] The Santa Clara River also supports the anadromous Pacific lamprey (*Entosphenus tridentatus*) which currently falls under the jurisdiction of the U.S. Fish and Wildlife Service and the California Department of Fish and Wildlife (Reid 2015, Booth 2015, 2017).

It should also be recognized that groundwater levels can be and often are exacerbated by groundwater extractions, as well as droughts. One of the primary purposes of SGMA is to identify these anthropogenic effects on groundwater levels (and the related GDE) so that groundwater resources may be managed in a way to protect all beneficial uses of groundwater, including fish and wildlife, such a southern California steelhead (as well as other native aquatic resources). Therefore, when revising the Draft GSP, every effort should be made to ensure that (1) all anthropogenic effects on the amount and extent of groundwater are properly and accurately cataloged, (2) practices are defined to remedy the cataloged effects on GDE, and (3) the practices are instituted and the effects adaptively managed to ensure GDE receive sufficient protection in accordance with the SGMA.

In addition to designating critical habitat for the federally listed endangered Southern California Steelhead DPS, NMFS identified intrinsic potential habitat in the watershed for this species as part of its recovery planning process (*See* Figure 3). As noted above, this habitat includes migration corridors to spawning and rearing habitat. Within the Mound Basin, NMFS identified intrinsic potential habitat in lower Santa Clara River and Santa Clara River Estuary. The ability of these habitats to provide a migratory corridor to spawning rearing opportunities (including within the Santa Clara River Estuary) has been negatively affected by surface water diversions and groundwater extractions. Reducing the connectivity between the mainstem of the Santa Clara River and the Santa Clara River Estuary impairs the intrinsic potential of these designated critical habitats. Restoring and maintaining surface hydrologic connectivity for steelhead attempting to migrate to or emigrate out of these major tributaries to the middle and lower reaches of the Santa Clara River is an important objective of NMFS's Southern California Steelhead Recovery Plan.

Ensuring groundwater recharge (and control of groundwater extraction for out-of-stream uses) can be an important mechanism for protecting base flows that are critical for the rearing phase of juvenile steelhead (as well as other native aquatic resources). Maintaining groundwater levels can serve as a buffer against projected climate change effects on stream flow. For a recent assessment of the effects of climate change of mean and extreme river flows, and effects of over pumping of groundwater basins on stream flow, *see* Burke *et al.* (2021), Gudmundsson *et al*. (2021), Jasechko (2021).

While groundwater-influenced flows by themselves may not be sufficient to support perennial flows in the lower Santa Clara River, or maintain appropriate water levels in the Santa Clara River Estuary, they can nevertheless support seasonal use of this reach of the Santa Clara River for migratory or rearing purposes, depending on the amount and timing of annual rainfall and runoff and the groundwater elevation. Recognition of these GDE should be explicit, and the GSP should ensure that these GDE are not unreasonably impacted by groundwater extraction from the Mound Basin.

The statements that "neither geologic units [*i.e.*, shallow alluvial aquifer and stream terrace deposits] has any know groundwater extractions within the Mound Basin" and "there is not significant evidence for interactions between the groundwater in the principal aquifers and shallow groundwater" is not supported by the analysis or the applicable regulations. As noted above, while there may be no regular withdrawals form the shallow alluvial aquifer, withdrawals from the deeper geologic units can, because of the fault discontinuities, create a hydraulic connection between aquifers and "aquitards". Lowering the hydraulic head in deep aquifers will induce a vertical downward movement of groundwater from the shallow aquifer, which in turn, is hydraulically connected to the Santa Clara River and the Santa Clara River Estuary.

The Draft GSP notes that:

> Given the possible, but likely limited, connection between Mound Basin shallow groundwater and the iGDEs, Area 11 is retained as a GDE pursuant to TNC's 'precautionary principle' (TNC 2018). However, given the lack of potential for significant impacts to the GDE by principle aquifer pumping, Area 11 will not be considered further in the development of sustainable management criteria for the principal aquifers. p. 8.

And adds:

> "However, the GSP will include a management action to monitor well permit applications for proposed uses of shallow groundwater in the vicinity of Area 11. If any shallow wells are proposed, MBGSA will require the applicant to evaluate impacts to the Area 11 GDEs pursuant to the California Environmental Quality Act prior to issuing a permit. Proposed uses that would have a significant impact to Area 11 GDEs would be required to mitigate those impacts as a condition of MBGSA permit approval" p. 8

These statements warrants several comments:

First, the TNS "precautionary principle" is focused, as is the general approach, on GDE that are defined largely by vegetative characteristics, and does not provide specific guidance for other types of GDE such as aquatic habitats that are dependent in or in part on groundwater inputs, such as the lower Santa Clara River and the Santa Clara Estuary;

Second, the conclusion that there is little potential for significant impacts to the Area 11 GDE (or the other 10 GDE within the Mound Basin) is not supported by the evidence presented in the Draft GSP, and in fact is inconsistent with the evidence (see, in particular, the longitudinal cross-section A-A' in Figure 3.1-05 of the Draft GSP); and

Third, the related proposal to limit consideration of impacts only to wells drawing directly from the shallow alluvial aquifer overlying the Mound Basin is not consistent with the requirements of SGMA. The proposal to rely on the procedures of the California Environmental Quality Act (CEQA) to identify and mitigate any impacts is also inappropriate. CEQA is not a substitute for SGMA (Belin 2018, Rohde *et al*. 2018, California Department of Fish and Wildlife 2019)

GSPs are required to: a) identify and consider impacts to GDE; b) consider all beneficial uses and users of groundwater; c) identify and consider potential effects on all beneficial uses and users of groundwater; d), establish sustainable management criteria that avoid undesirable results, including depletion of interconnected surface waters that have a significant and unreasonable adverse impact on the beneficial uses of surface waters (including instream beneficial uses), e) describe monitoring networks that can identify adverse impacts to beneficial uses of interconnected surface waters; and f).account for groundwater extraction for all uses or sectors, including wetlands such as those associated with the lower Santa Clara River and Santa Clara River Estuary. (23 CCR, Sections 354.10 et. Seq.)

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Appendix G

Assessment of Shallow Alluvial Deposits and Interconnected Surface Water in the Mound Basin

Appendix G

Assessment of Shallow Alluvial Deposits and Interconnected Surface Water in the Mound Basin

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1.0 Introduction

This appendix was prepared in response to comments on the draft version of the Mound Basin Groundwater Sustainability Plan (Draft GSP) that was released for public review in June 2021. In general, the comments received from several resource agencies and non-governmental organizations expressed concerns about the absence of sustainable management criteria (SMC) and limited monitoring of the Shallow Alluvial Deposits to address concerns about groundwater dependent ecosystems (GDEs, both riparian and aquatic), including the “depletions of interconnected surface water” sustainability indicator. The Draft GSP explained that the riparian GDEs may, in some cases, utilize groundwater from the Shallow Alluvial Deposits (particularly within the floodplain of the Santa Clara River). Similarly, the Draft GSP stated that the Shallow Alluvial Deposits discharge minor amounts of groundwater to Santa Clara River and its estuary. However, the Draft GSP also explained that there is no current or planned groundwater extraction from wells screened in the Shallow Alluvial Deposits and that groundwater extractions from the deep, confined aquifers of the Basin do not materially affect groundwater levels in the Shallow Alluvial Deposits or surface flows in the Santa Clara River. For this reason, there are no impacts to the riparian and aquatic GDE beneficial uses that needed to be considered during SMC formulation. Similarly, owing to the lack of impacts, the need for detailed monitoring of Shallow Alluvial Deposits and Santa Clara River flows is limited. In review of the comments, it was clear that the Draft GSP could be improved by providing more information about groundwater conditions in the Shallow Alluvial Deposits and further information to support the conclusion that shallow groundwater levels and Santa Clara River flows are not materially affected by groundwater extraction in the Mound Basin. Hence, the development of this appendix.

The purpose of this appendix is to provide additional documentation of the technical data that support the conclusions that the Shallow Alluvial Deposits hydrostratigraphic unit (HSU) is not a principal aquifer and that that shallow groundwater levels and Santa Clara River flows are not materially affected by groundwater extraction in the Mound Basin. Specifically, this appendix provides the following information:

1) The characteristics of the Shallow Alluvial Deposits HSU and explanation of why it is not considered a principal aquifer in Mound Basin.
2) Additional evidence supporting the conclusion that there is a lack of material hydraulic connection between the shallow groundwater with the much deeper principal aquifers used for water supply in Mound Basin (the Mugu and Hueneme Aquifers).
3) Additional evidence supporting the conclusion that there is a lack of material hydraulic connection between the Santa Clara River (and its estuary) and the principal aquifers used for water supply in Mound Basin (the Mugu and Hueneme Aquifers).

These topics are meant to provide further explanation as to why the Shallow Alluvial Deposits HSU is not a principal aquifer and why SMC included in the GSP do not have significant effects on beneficial uses of shallow groundwater and interconnected surface water in the Mound Basin GSP. This appendix addresses the approximately 1-mile reach of the Santa Clara River within Mound Basin between the estuary and the Oxnard Basin boundary, as shown on Figures G-1 and G-2, where a GDE has been identified. The sources of data and interpretations provided in this appendix largely consist of the references cited in the Draft GSP document and the groundwater modeling conducted by United Water Conservation District (United) in support of GSP development. Additional sources of information that were not referenced or included in the Draft GSP are referenced in this appendix.

2.0 Comparison of Shallow Alluvial Deposits to Principal Aquifer Criteria

The Sustainable Groundwater Management Act (SGMA) defines "principal aquifers" as "aquifers or aquifer systems that store, transmit, and yield significant or economic quantities of groundwater to wells, springs, or surface water systems." Review of hydrogeologic studies ranging in publication date from six decades ago (DWR, 1959; John F. Mann & Associates, 1959) to just 1 year ago (Hopkins, 2020) indicate that groundwater from the Shallow Alluvial Deposits of Mound Basin has rarely, if ever, been extracted for water supply. Groundwater-use data from Ventura County and United confirm that no significant groundwater extraction has occurred in the Shallow Alluvial Deposits in the available period of record (starting in 1980; included in the GSP dataset submitted to DWR). This appears to be because these shallow deposits are thin, discontinuous, and provide unreliable quantity and quality of groundwater due to natural conditions; specifically, the depositional history and environments for the sediments present in the shallow zone, exacerbated by the lack of hydraulic connection of these deposits with deeper aquifers that could otherwise provide a significant source of acceptable quality groundwater.

United and a few other investigators (referenced below) have occasionally referred to the shallow, relatively coarse-grained Holocene alluvial fan deposits, stream-terrace deposits, and active wash (or floodplain) deposits along the Santa Clara River and smaller barrancas in the basin as an "aquifer." However, the Shallow Alluvial Deposits in Mound Basin have never been reported to store, transmit, or yield significant or economic quantities of groundwater to wells or springs, and the most recent comprehensive investigation of the lower Santa Clara River to date (Stillwater Sciences, 2018) indicates that the contribution of groundwater from this HSU to surface water is small compared to other sources of surface flow; this comports with the GSP water budget calculations (GSP Section 3.3), which are discussed further below.

Based on these assessments and comparisons, in addition to the review of historical references below, the Shallow Alluvial Deposits HSU does not fit the definition of a principal aquifer.

2.1 Review of Historical References to the Shallow Alluvial Deposits HSU

As was noted in the GSP, the Shallow Alluvial Deposits HSU is composed of moderately to poorly sorted interbedded sandy clay with some gravel (See GSP Section 3.1). An early comprehensive investigation of hydrogeologic conditions in the groundwater basins along the Santa Clara River (John F. Mann Jr. & Associates, 1959) did not recognize the Shallow Alluvial Deposits within Mound Basin as an aquifer, nor were extraction rates reported from the depth-equivalent "Semi-perched Aquifer" in the adjacent Oxnard Basin. Also in 1959, DWR's Bulletin No. 75 noted that the alluvial deposits in Mound Basin "consist of yellow clay that has intercalated lenses of sand and gravel," and noted that the upper part of the San

Pedro Formation (which includes the Hueneme and Fox Canyon Aquifers) “form the principal sources of ground water in this basin.”

In 1972, Geotechnical Consultants, Inc. (GTC), conducted a hydrogeologic investigation of the Mound Basin “for the purpose of locating well sites for additional groundwater supplies for the City of San Buenaventura.” GTC did not identify the Shallow Alluvial Deposits as a potential source of developable groundwater in their report. The GTC (1972) investigation tabulated water quality data for wells less than 300 feet deep, noting that the data indicated the presence of “exceptionally high concentrations of sulfate, chloride, nitrate, boron, and total dissolved solids (TDS) for all time periods considered” (1950-1969), implying that groundwater in the Shallow Alluvial Deposits and underlying clay-rich strata were unsuitable for water supply purposes.

In 1996, Fugro West, Inc. (Fugro), provided an update on an investigation they were conducting on behalf of the City of Ventura for further development of groundwater supplies in Mound Basin. In their update report, Fugro stated that the “aquifers in Mound Basin are confined by an approximate 300-foot-thick layer of low permeability, aquiclude materials . . . Recharge occurs as subsurface underflow from the Santa Paula Basin and as local recharge from the Ventura foothills” (Fugro, 1996). Fugro’s update report did not mention the Shallow Alluvial Deposits as an aquifer.

In the 1990s, the U.S. Geological Survey (USGS) investigated hydrogeologic conditions throughout the Santa Clara River and Calleguas Creek watersheds, including Mound Basin, for the purpose of developing a regional-scale groundwater flow model (Hanson et al., 2003). The USGS investigation report did not describe the Shallow Alluvial Deposits specifically within Mound Basin as an “aquifer,” but did extend the area they mapped as “Alluvium (Shallow Aquifer)” across their entire model domain, which includes the Mound Basin. They noted that “With the exception of recent coarse-grained channel deposits along the Santa Clara River and Calleguas Creek, the thin layer of Holocene deposits that are not coincident with minor tributaries are relatively fine grained and relatively low in permeability,” indicating that they would not likely yield much water to wells, springs, or surface water systems. Hanson et al. (2003) added that “water quality (in the shallow aquifer) is poor throughout most of the Oxnard Plain and Pleasant Valley subbasins and consequently few wells are perforated opposite this aquifer.” Water quality in the Shallow Alluvial Deposits in Mound Basin was not explicitly called out by Hanson et al. (2003) in their report; however, data reviewed for this GSP demonstrate that shallow water quality conditions are also poor in the Mound Basin. As noted above, this line of thinking (that poor groundwater quality and yield makes the shallow groundwater unusable as an aquifer for water supply) applies to the Mound Basin as well as the Oxnard and Pleasant Valley Basins.

In 2018, Stillwater Sciences conducted a detailed analysis of “Physical and Biological Conditions of the Santa Clara River Estuary” (the estuary is abbreviated as “SCRE” throughout the Stillwater Sciences report), including investigation of groundwater conditions within the Shallow Alluvial Deposits underlying and adjacent to the lower Santa Clara River in Mound Basin and the adjacent Oxnard Basin. Stillwater Sciences (2018) notes that, ”The lowermost reach” (of the Santa Clara River) “leading into the SCRE supports perennial, albeit low volume, flow during most water-year types. This baseflow, which is driven by inputs from the semi-perched aquifer, is partly enhanced by seasonal agricultural runoff, particularly on the northern floodplain.” The Stillwater Sciences reference to the Semi-perched Aquifer in this sentence suggests that the source of the observed perennial flow is primarily upstream from Mound Basin, in Oxnard Basin, where the Semi-perched Aquifer is present. As discussed later in this appendix, the quantity of groundwater discharged from the Shallow Alluvial Deposits in Mound Basin to the Santa Clara River is very small in relation to other sources.

The most recent investigation of groundwater production and hydrogeologic conditions in Mound Basin was conducted by Hopkins Groundwater Consultants, Inc. (Hopkins), in 2020. The Hopkins investigation refers to "shallow confined zones," sometimes referred to in the Hopkins report as a "shallow aquifer," that are not used as a source of groundwater for water supply in the basin, and therefore do not meet the SGMA definition of a principal aquifer. Hopkins (2020) further notes that the HSUs used for water supply in Mound Basin are those HSUs identified in the GSP as the Mugu, Hueneme, and Fox Canyon aquifers.

In summary, historical investigators of the Mound Basin have not identified the Shallow Alluvial Deposits as an important water-bearing unit in the Mound Basin that would fit the SGMA definition of a "principal aquifer."

2.2 Distinct Lithologic Facies of the Shallow Alluvial Deposits

As noted in Section 3.1 of the GSP, the Shallow Alluvial Deposits HSU is present across much of Mound Basin (absent only in the foothills in the north part of the basin). Considered in their entirety, the thickness of these deposits ranges from 50 to 100 feet, and they consist mostly of Holocene alluvial fan deposits (USGS, 2003a, 2003b, 2004; Gutierrez et al., 2004), including moderately to poorly sorted interbedded sandy clay with some gravel. Such poorly sorted deposits dominated by clay are not a suitable target for groundwater development, explaining why no wells are known to target the Shallow Alluvial Deposits in Mound Basin for water supply. However, some important distinctions are worth noting with regard to the lithologic facies present within the near-surface deposits along the Santa Clara River in Mound Basin.

Stillwater Sciences (2018) reported that the piezometers installed for the City of Ventura's estuary studies along the Santa Clara River encountered varying lithologies, including silty sand, gravelly sand, and clay layers, as well as clayey, silty, and gravelly sands, with highly variable hydraulic conductivities (ranging from 1 to 100 feet per day). Geologic maps (USGS, 2003a, 2003b, 2004; Gutierrez et al., 2004) indicate that surficial and near-surface sediments in this area consist of the following (shown on Figure 3.1-03 of the Draft GSP; attached herein as Figure G-3):

- Recent active wash deposits within the main channel of the Santa Clara River containing abundant sand and gravel, and up to 40 feet thick.
- Up to three levels of Holocene stream terrace deposits adjacent to and within ½ mile of the north and south banks of the Santa Clara River, including point bar and overbank deposits consisting of poorly sorted clayey sand and sandy clay with gravel, typically several feet thick, but potentially up to 20 feet thick or more in some locations.
- Holocene alluvial and colluvial deposits associated with the Santa Clara River but located ¼ to ½ mile from the river between the Holocene stream terrace deposits and the Holocene alluvial fan deposits.
- Recent artificial fill, typically less than 10 feet thick, but up to 15 feet thick in some locations, consisting of sand, asphalt, and concrete (Hopkins, 2018).

As described in Section 3.1 of the Draft GSP, some of these thin terrace and other alluvial deposits associated with the Santa Clara River can be expected to contain shallow perched zones where agricultural return flows and infiltrated rainfall have collected above low-permeability layers (e.g., clay). Groundwater in these perched zones can flow laterally toward the Santa Clara River to contribute very small amounts (relative to the total Mound Basin groundwater budget, as described in Section 3.3 of the Draft GSP) to surface water flows or to meeting the evapotranspiration (ET) demands of vegetation near the river. In addition to water in these shallow perched zones, perched groundwater within saturated layers and lenses of the Holocene alluvial fan deposits in Mound Basin (north of the active channel and stream terrace deposits along the Santa Clara River) likely flows southward toward the river and may be able to enter the stream-terrace deposits or active channel deposits, possibly contributing to surface flows. Specific quantities of groundwater estimated by previous investigators to discharge to the Santa Clara River are discussed below.

2.3 Groundwater Discharge to the Santa Clara River

As noted in the most recent and detailed study specific to the Santa Clara River estuary (Stillwater Sciences, 2018), the Shallow Alluvial Deposits along the lower Santa Clara River in Mound Basin and the adjacent Oxnard Basin are “underlain by a clay layer, thereby disconnecting the SCRE (estuary) from the deeper subbasin aquifers…” Because the lower reach of the river is hydraulically disconnected from principal aquifers in Mound and Oxnard basins, the “low volume” of perennial baseflow observed in this reach during most years “is driven by inputs from the semi-perched aquifer” (the referenced “semi-perched aquifer” is only present in the Oxnard Basin, and is believed to discharge some groundwater to the Santa Clara River upstream from Mound Basin) and “is partly enhanced by seasonal agricultural runoff, particularly on the northern floodplain” (Stillwater Sciences, 2018).

Stillwater Sciences (2018) provided details regarding surface-water flows in the Santa Clara River and its estuary in Mound Basin, including an estimate of the quantity of groundwater discharge to surface flows in the river. Stillwater Sciences (2018) summarized flows in the portion of the river in Mound Basin as follows: “Overall, the river and SCRE (estuary) naturally experience a wide variation of flows, punctuated episodically by short-duration but intensive channel-/lagoon-adjusting flood events.” They also note that “Over the long-term record, February has experienced the highest monthly flows (~750 cfs [cubic feet per second] in the lower river) while August and September have experienced the lowest flows (~1 cfs in the lower river).” The high flows (750 cfs) represent storm flows occurring during and immediately following precipitation events, usually in winter, while the low flows (1 cfs, equivalent to 724 acre-feet per year [AF/yr]) generally occur in summer and fall, and include, among other sources, a small component of groundwater discharge to surface water (Stillwater Sciences, 2018).

Stillwater Sciences (2018) estimated groundwater discharge to the Santa Clara River from Mound Basin during the period from January 2015 to December 2016 to be 0.2 to -0.3 cfs (negative values represent flow of surface water to groundwater, as recharge). These discharge and recharge quantities occurred along the area designated “North Bank Floodplain-West” in the Stillwater Sciences (2018) report, located along the north bank of the river between Harbor Boulevard and the boundary with the Oxnard Basin.

Stillwater Sciences (2018) listed other, higher-volume discharges to the Santa Clara River along other reaches of the Santa Clara River in Mound Basin as “groundwater.” However, the sources for these larger discharge volumes include treated wastewater (0.7 to 1.6 cfs) from the Ventura Water Reclamation

Facility wildlife/polishing ponds ("North Bank Floodplain-Ponds"), and river bank storage changes (-5 to +5 cfs, averaging approximately 0 cfs) resulting from short-term, groundwater-surface water exchanges in response to changes in surface-water levels in the estuary following breaching or formation of the barrier berm ("South Bank Floodplain [GW-1 through GW-3]"). Stillwater Sciences (2018) also estimated "unmeasured flows" consisting of groundwater discharging to surface water in the Santa Clara River between the Victoria Avenue bridge (in Oxnard Basin) to the estuary (in Mound Basin) ranging from a minimum of 0.08 cfs (July 2017) to 2.1 cfs (2009 and 2010).

The Stillwater Sciences' (2018) summary of contributors to surface flow in the lower Santa Clara River in Mound Basin indicates that groundwater discharge from the Shallow Alluvial Deposits is a small component of total flow in the river, compared to other flow components entering and exiting Mound Basin. This conclusion is further supported by modeling, as discussed below. Moreover, a significant portion of the groundwater discharge reported above is likely tile drain and/or perched groundwater associated with agricultural return flows in the irrigated fields, which border the Santa Clara River.

Groundwater modeling conducted by United in support of GSP development (United, 2021; detailed tables, figures, and additional references provided in the main text of the GSP) indicate that groundwater discharge to the Santa Clara River within Mound Basin is typically 0.2 to 0.6 cfs during low-rainfall ("dry") years, and -2 to -3 cfs (representing recharge, rather than discharge) during high-rainfall ("wet") years (see Figure 3.3-02 of the Draft GSP for annual model-estimated groundwater/surface water exchanges in the Santa Clara River in Mound Basin; attached herein as Figure G-4). These values are much smaller than the estimated average of 197 cfs entering Mound Basin from Oxnard Basin as surface flows in the Santa Clara River from 1986 through 2019 (Draft GSP Table 3.3-02, flows converted from acre-feet).

3.0 Lack of Material Influence of Principal Aquifer Pumping on Shallow Groundwater Levels and Santa Clara River Flows

Prior investigations and available data clearly indicate negligible influence of groundwater extraction from the principal aquifers on shallow groundwater levels and interconnected surface water along the Santa Clara River within the Mound Basin.

3.1 Summary of Hydrogeologic Investigations

As described in the GSP and supported by multiple references cited in the Draft GSP (e.g., John F. Mann Jr. & Associates, 1959; GTC, 1972; Fugro, 1996; United, 2012; Stillwater Sciences, 2018; Hopkins, 2018), a 100- to 400-foot thick, low-permeability aquitard consisting largely of silt and clay referred to as "fine-grained Pleistocene deposits" separates the Shallow Alluvial Deposits from the underlying Mugu Aquifer both physically and hydraulically in the Mound Basin. A similar, albeit thinner, fine-grained zone known as the "clay cap" separates the semi-perched aquifer from the underlying Oxnard Aquifer in the adjacent Oxnard Basin (Hanson et al., 2018; United, 2018). Plate 10 in the Hopkins (2018) report, included herein as Figure G-5, provides a detailed hydrogeological cross section (F-F') depicting the stratigraphy of the Shallow Alluvial Deposits and fine-grained Pleistocene deposits under the Santa Clara River and its estuary in Mound Basin. The Mugu Aquifer occurs below the base of cross-section F-F’, separated from the Shallow Alluvial Deposits by at least 250 feet of clay and sandy clay, as determined from well and boring logs in the area.

For reference, cross-section D-D’ from the GSP, included herein as Figure G-6, depicts the depths of the HSUs in Mound Basin under the Santa Clara River and its estuary, but with less detail than shown on cross-section F-F’. From cross-section D-D’, it can be seen that the Hueneme and Fox Canyon aquifers are further disconnected from the Shallow Alluvial Deposits (compared to the Mugu Aquifer) by a maximum of 2,000 feet of vertical separation and additional aquitards. Importantly, most of the groundwater extraction in the Mound Basin is by wells screened in the Hueneme Aquifer, which is separated from the Shallow Alluvial Deposits and Santa Clara River by two aquitards that are approximately 300 to 400 feet in total thickness.

Based on calibration of its regional groundwater flow model, United (2021) estimated the horizontal hydraulic conductivity of the Shallow Alluvial Deposits to be 200 ft/d in Mound Basin, and the vertical hydraulic conductivity to be 20 ft/d. The specific yield of the Shallow Alluvial Deposits in the groundwater flow model is 15% (United, 2021). These values do not apply to localized stream terrace deposits along the Santa Clara River where shallow groundwater interconnects with the Santa Clara River and GDEs are present (i.e. GDE Area No. 11). The presence of tile drains on agricultural lands situated on the stream terrace deposits (see GSP Figures 2.1-03 and 3.1-09) suggests that the stream terrace deposits are poorly permeable and, therefore, are not considered to be an aquifer, but may contain perched groundwater zones. No estimates of the vertical hydraulic conductivity of the fine-grained Pleistocene Deposits from field investigations were found during review of available reports; however, United (2021) achieved good calibration of its groundwater flow model by applying a vertical hydraulic conductivity of 0.001 feet per day, which is a reasonable value for silt and clay deposits in alluvial aquitards (Heath, 1983). This hydraulic conductivity value is three orders of magnitude smaller than what is generally considered a minimum acceptable value for hydraulic conductivity in a water supply aquifer (1 foot per day or larger).

Given the substantial area (approximately 11,000 acres) where the fine-grained Pleistocene deposits underlie the Shallow Alluvial Deposits, even a relatively low degree of hydraulic communication between these HSUs can still allow downward infiltration of groundwater from the Shallow Alluvial Deposits to the fine-grained Pleistocene deposits. As indicated in Table 3.3-04 of the Draft GSP and the zone budget analysis below (Section 3.5), groundwater modeling indicates that approximately 1,600 AF/yr (~130 AF/month) of groundwater moved downward from the Shallow Alluvial Deposits to the fine-grained Pleistocene deposits, on average, from 1986 through 2019. The zone budget analysis (see section 3.5 below) shows the historical variability of the vertical flows (in AF/month) from layer 1 to layer 2 of the groundwater model. If this downward migration were distributed equally across the 11,000-acre extent of the fine-grained Pleistocene deposits, that would imply 0.15 AF/yr of downward groundwater flux per acre. However, most of this downward flux occurs in the central and eastern portions of Mound Basin, and much smaller vertical fluxes occur near the hydraulic low point of Mound Basin, along the lower Santa Clara River. Downward vertical flow of water across the fine-grained Pleistocene deposits does not mean that principal aquifer pumping has a significant influence on shallow groundwater levels or interconnected Santa Clara River flows, because the significant thickness and low permeability of the fine-grained Pleistocene deposits greatly limits propagation of head changes between the Shallow Alluvial Deposits and the principal aquifers and flows. This is further verified with the model sensitivity analysis below (Section 3.4).

3.2 Groundwater Elevation Data

Review of available groundwater elevation data for piezometers screened in the Shallow Alluvial Deposits and in wells screened in the principal aquifers in Mound Basin confirm that there is no discernible effect of groundwater-level declines in the principal aquifers on shallow-alluvial groundwater levels during the recent (2012-16) drought. Figure G-7 shows significant declines (up to 50 feet) in measured groundwater elevations at wells screened in the Mugu and Hueneme Aquifers in Mound Basin near the Santa Clara River during the 2012-2016 drought, while groundwater elevations in the piezometers screened in shallow alluvial or stream terrace deposits adjacent to and underlying the Santa Clara River estuary remain relatively constant near 10 feet relative to the 1988 North American vertical datum (NAVD88), with occasional sharp departures and returns from that base elevation in response to river-mouth breaching events. Locations for these wells are shown on Figure G-1. Total groundwater extractions from the Mound and Oxnard basins are also shown on Figure G-7, for reference. As shown on Figure 3.1-26 of the Draft GSP (included herein as Figure G-8), there is just one active water supply well screened in the Mugu Aquifer, and one active water supply well with an unknown screened interval, located within 1 mile of the reach of the Santa Clara River within Mound Basin. A total of 155 AF of groundwater was extracted from the Mugu Aquifer well (02N22W19M04S) in 2019 and a total of 2 AF was extracted from the unknown-screened-interval well (02N23W24F01S) during 2019, as summarized in Table 3.1-02 of the Draft GSP. Two Hueneme Aquifer wells are also located within 1 mile of the Santa Clara River in Mound Basin, but as noted above, the Hueneme Aquifer is hydraulically disconnected from the Shallow Alluvial Deposits (and Santa Clara River) not just by the fine-grained Pleistocene deposits, but also by the Mugu Aquifer and the Mugu-Hueneme aquitard. Indeed, there is no relationship between groundwater extraction in Mound or Oxnard Basins and groundwater elevations measured in the piezometers screened in the Shallow Alluvial Deposits in Mound Basin that can be discerned in Figure G-7.

In summary, the groundwater levels data demonstrate the lack of material influence of principal aquifer groundwater levels on shallow groundwater levels and, by extension, Santa Clara River flows.

3.3 Geochemical Data

As explained in the GSP (Section 3.2), geochemical data do not indicate significant interactions between groundwater in the principal aquifers and shallow groundwater. Results of a recent geochemical investigation in Mound Basin conducted by S.S. Papadopulos & Associates, Inc. (SSP&A, 2020) include the following key conclusions regarding potential interactions of surface water, shallow groundwater, and the principal aquifers of Mound Basin (which are typically present at depths of hundreds of feet below land surface):

- “There appear to be limited interactions vertically between aquifers, regardless of formation. Shallower groundwater (≤500 ft.-bgs) is geochemically- and isotopically distinct.”
- “There is no evidence for significant interactions between shallower groundwater (≤500 ft.-bgs) and the Santa Clara River. In fact, δ18O and δD signatures of shallower groundwater are distinctly different than the Santa Clara River.”

3.4 Numerical Modeling Analysis

The groundwater elevation and geochemical data described provide clear evidence that the principal aquifers do not materially influence conditions in the shallow alluvial deposits and Santa Clara River. Additional evaluation was completed using United's (2021) numerical model to conduct a sensitivity analysis to evaluate whether hypothetical large changes in groundwater extraction rates in Mound Basin could cause significant changes in groundwater elevations in the shallow aquifer or impact rates of shallow groundwater discharge to surface water.

The sensitivity analysis assumed changes in overall groundwater extraction rates throughout the historical and current water budget periods (January 1985 through December 2019) relative to the actual extraction rates over the same periods (base case scenario), with the following adjustments:

- 125 percent of historical/current Mound Basin extraction rates.
- 75 percent of historical/current Mound Basin extraction rates.
- No Mound Basin pumping (0 percent) during the historical/current period.

The differences in groundwater discharge to surface water under all three sensitivity runs are nearly identical to the base case (Figure G-9), suggesting that groundwater extraction in the principal aquifers has a negligible influence on groundwater levels in the Shallow Alluvial Deposits and flows in the Santa Clara River. The differences between average groundwater discharge to surface water throughout the modeled period (1985-2019) in the base case versus the sensitivity runs that assume 75 and 125 percent of historical groundwater extraction range from 15 AF/yr more to 15 AF/yr less than the base case values, respectively (15 AF/yr is equal to 0.02 cfs). As noted in Section 2.3 of this appendix, these values are a very small fraction of the total flow in the lower reach of the Santa Clara River, which ranges from 1 to 750 cfs (Stillwater Sciences, 2018). In the sensitivity run where no groundwater is extracted from Mound Basin, simulated groundwater discharge to surface water increases by 61 AF/yr (0.08 cfs), which again is a very small fraction of total flow in the lower reach of the river. The small change in simulated surface water flows demonstrates that groundwater conditions in the principal aquifers (Mugu and Hueneme aquifers), including groundwater extraction, do not materially influence surface water flows, consistent with the data summarized in preceding sections of this appendix.

The differences in groundwater elevations for the sensitivity runs compared to the base case are mostly less than 0.1 feet, except for the no-pumping sensitivity run, as shown on Figure G-10. The locations where these differences in groundwater elevations were calculated are shown on Figure G-11. In the no-pumping sensitivity run, simulated groundwater elevations in the Shallow Alluvial Deposits increase 0.2 to 0.4 feet compared to the base case. The small change in simulated shallow groundwater levels demonstrates that groundwater conditions in the principal aquifers (Mugu and Hueneme aquifers), including groundwater extraction, do not materially influence groundwater conditions in the Shallow Alluvial Deposits. The model estimated groundwater elevation changes are considered negligible and additionally are conservative because the United (2021) model may overestimate the degree of hydraulic connection between the saturated sediments in contact with the Santa Clara River and the deeper principal aquifers in Mound Basin. This is because the model uses a single layer to represent the entire thickness of the Shallow Alluvial Deposits, and therefore, the model assumes instantaneous and direct responses occur throughout Layer 1 (from land surface to the base of the Shallow Alluvial Deposits) to changes in extraction rates and recharge in deeper layers or HSUs. The Shallow Alluvial Deposits actually consist of multiple layers and lenses with varying storativity, vertical leakance, and degrees of interconnection, which buffers shallow groundwater level responses to changes in groundwater extraction rates in the principal aquifers of Mound Basin.

3.5 Zone Budget Analysis

A zone budget analysis for the baseline historical numerical model utilized MODFLOW's zone budget tool to focus on the modeled flows between the Santa Clara River and the upper layers of the model. Three zones were delineated (Figure G-12):

1. Model cells coincident with the Santa Clara River boundary condition (STR) cells within layer 1
2. Non-STR cells in layer 1
3. Layer 2 model cells

Stream leakage flows from the Santa Clara River STR cells to zone 1 were also included in the analysis, computed from the STR boundary condition package from the numerical model. Observing the top chart in Figure G-12, during most of the simulated historical period lateral flows between zones 1 and 2 are negative (flow from zone 2 to zone 1) and are generally less than 100 AF/month. During high-stage, short-term storm events, flows are positive (flow from zone 1 to zone 2), with maximum rates for two events at approximately 1,000 AF/month. Overall, the net exchange (average flow) is essentially zero (5 AF/month). The upper graph also shows that flows from zone 1 to zone 3 (vertical exchange between the groundwater cells coincident with the Santa Clara STR boundary and layer 2) are negligible. Flows from zone 2 to zone 3 are notable and are always positive (from zone 2 to zone 3; downward from layer 1 to layer 2). These downward flows are usually greater in magnitude than the lateral flows between zones 1 and 2 except during a few peak events but are overall generally small (average 136 AF/month) and unevenly distributed across the 11,000-acre extent of the layer, with the highest rates in the central and eastern portions of the model, away from the Santa Clara River. For context, the overall average rate of inflows/outflows for the combined historical and current surface water budget is ~13,000 AF/month (~160,000 AF/yr; see GSP sections 3.3.1/3.3.2, Table 3.3-02).

The bottom chart on Figure G-12 is similar to the top chart flow between zone 1 and zone 2, and similarly indicates that during most of the historical time period flow is from zone 1 to the STR boundary cells, feeding it at low volumes. During peak events, the direction reverses and the stream is providing larger volumes to the cells directly beneath. In addition, the net exchange is zero.

The zone budget analysis validates the conceptual model that the Shallow Alluvial Deposits HSU (zone 2, layer 1) is hydraulically connected to the Santa Clara River (zone 1, STR cells) with very low flow rates, but is disconnected from the deeper aquifers (zone 3, layer 2).

4.0 Conclusions

The results of this assessment are as follows:

1. The Shallow Alluvial Deposits HSU has not been considered an important water-bearing unit by historical investigators and does not meet the definition of a principal aquifer, as defined in the GSP Emergency Regulations, because MBGSA has concluded that this HSU does not store, transmit, and yield significant or economic quantities of groundwater to wells, springs, or surface water systems.

2. Available data and numerical modeling analysis indicate that groundwater conditions in the principal aquifers (Mugu and Hueneme Aquifers), including groundwater extraction, do not materially influence groundwater levels in the Shallow Alluvial Deposits. Therefore, groundwater-dependent ecosystems (GDEs) present in Area 11 of the GSP (i.e., GDEs associated with the Santa Clara River and its estuary) will not be materially impacted by groundwater extraction or GSP implementation and, therefore, do not need to be considered in the SMC for the GSP.

3. Available data indicate that the Santa Clara River and its estuary are interconnected with shallow groundwater present in the Shallow Alluvial Deposits. However, available data and numerical modeling analysis indicate that groundwater conditions in the principal aquifers (Mugu and Hueneme aquifers), including groundwater extraction, do not materially influence interconnected surface water flows. Therefore, depletion of interconnected surface water is not an applicable sustainability indicator for the GSP.

4. MBGSA will partner with the City of Ventura and United to collect interim shallow groundwater levels and perform a hydrogeologic study to further assess the hydraulic connection of the river with the Shallow Alluvial Deposits and the Shallow Alluvial Deposits and the deeper principal aquifers, providing further data to support the current HCM and Appendix G. The interim water level study will also analyze shallow groundwater levels against pumping data from the principal aquifers to confirm the lack of groundwater extraction impacts in the deeper principal aquifers on groundwater in the Shallow Alluvial Deposits.

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Figures

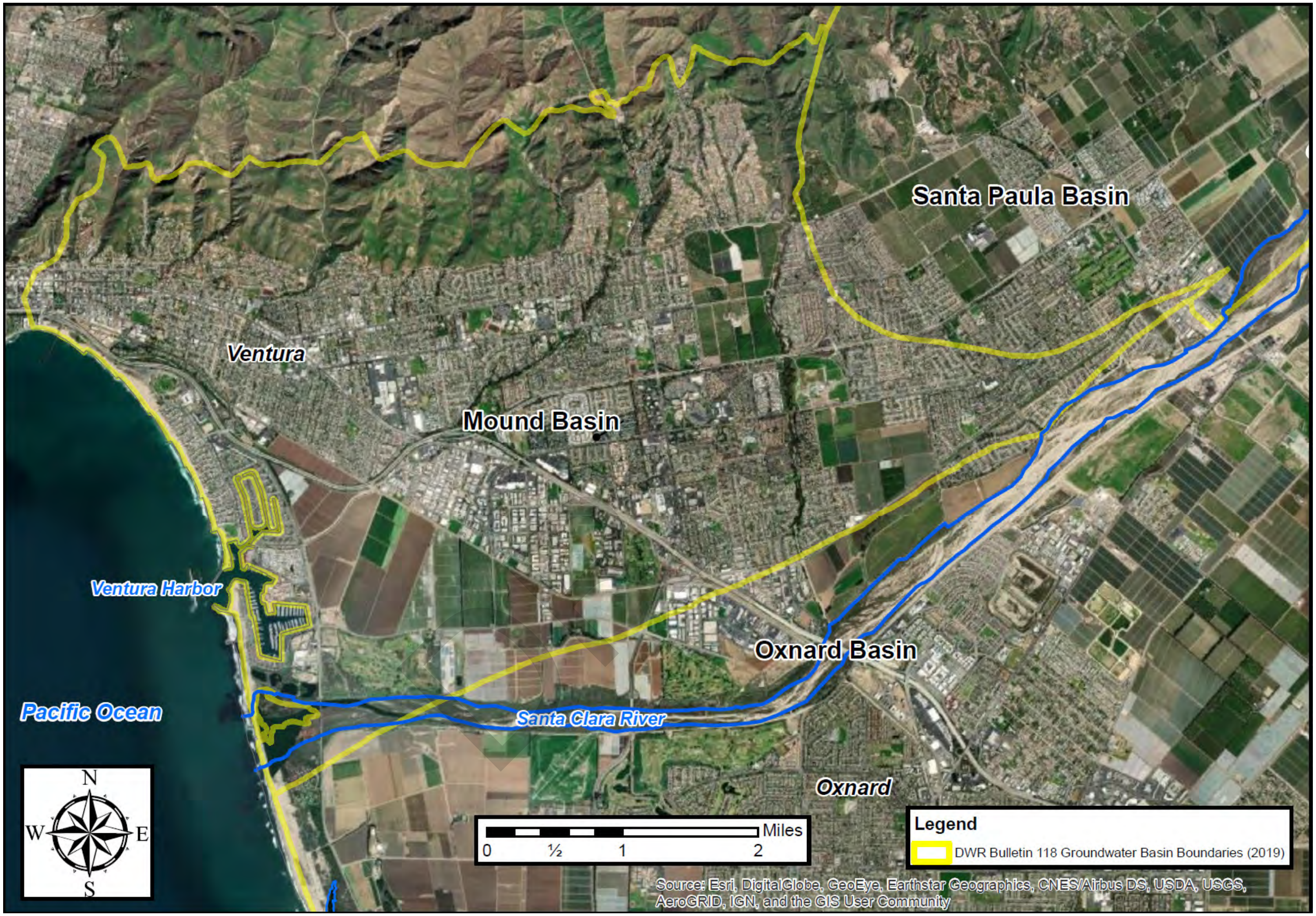

Figure G-1. Location Map for Mound Basin.

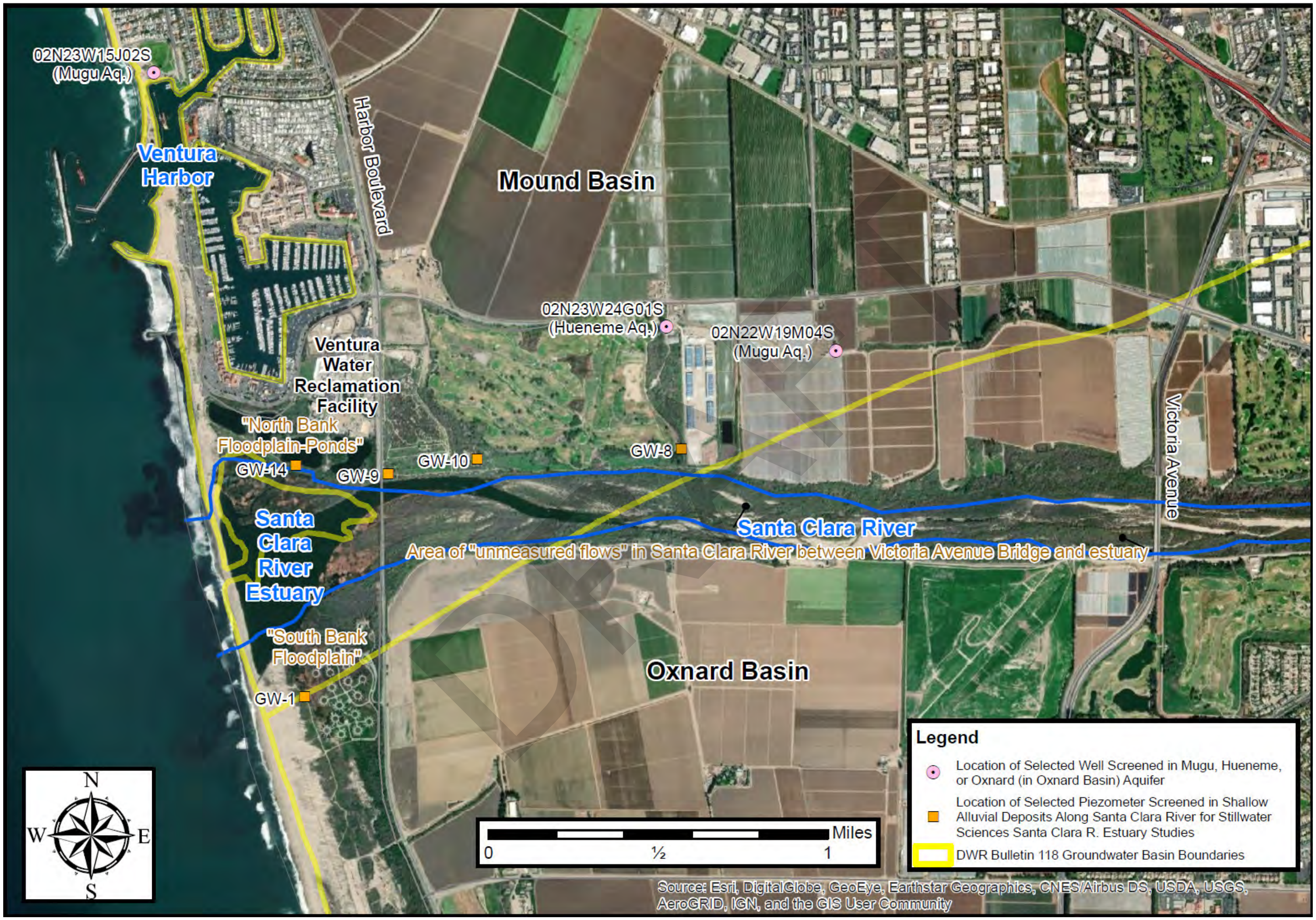

Figure G-2. Location of Selected Wells and Shallow Piezometers near Santa Clara River with Multiple Groundwater Level Measurements Reported from 2009 through 2017.

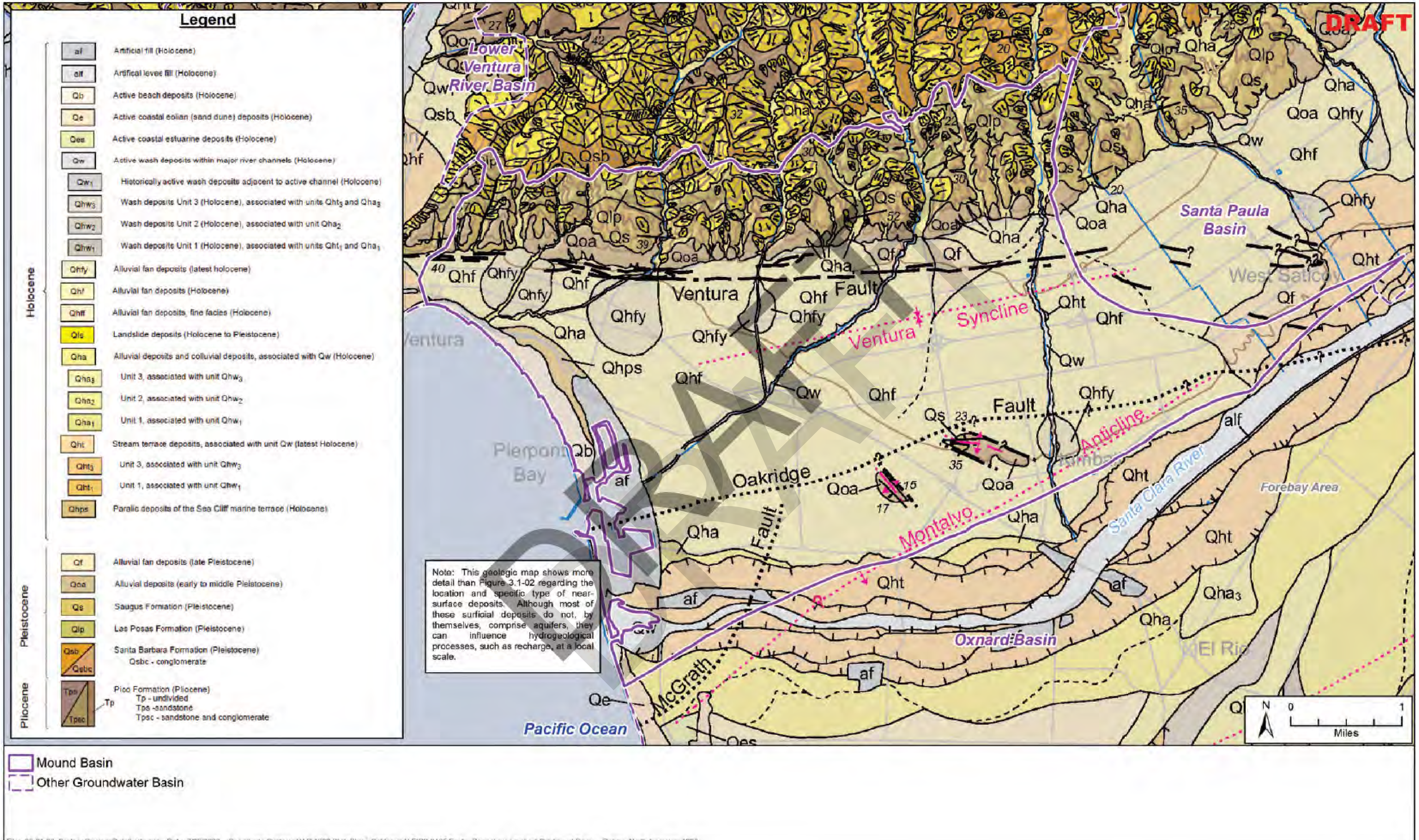

Figure G-3. Detailed Surface Geologic Map of Mound Basin, from Gutierrez et al. (2008) (Figure 3.1-03 of the Draft Mound Basin GSP).

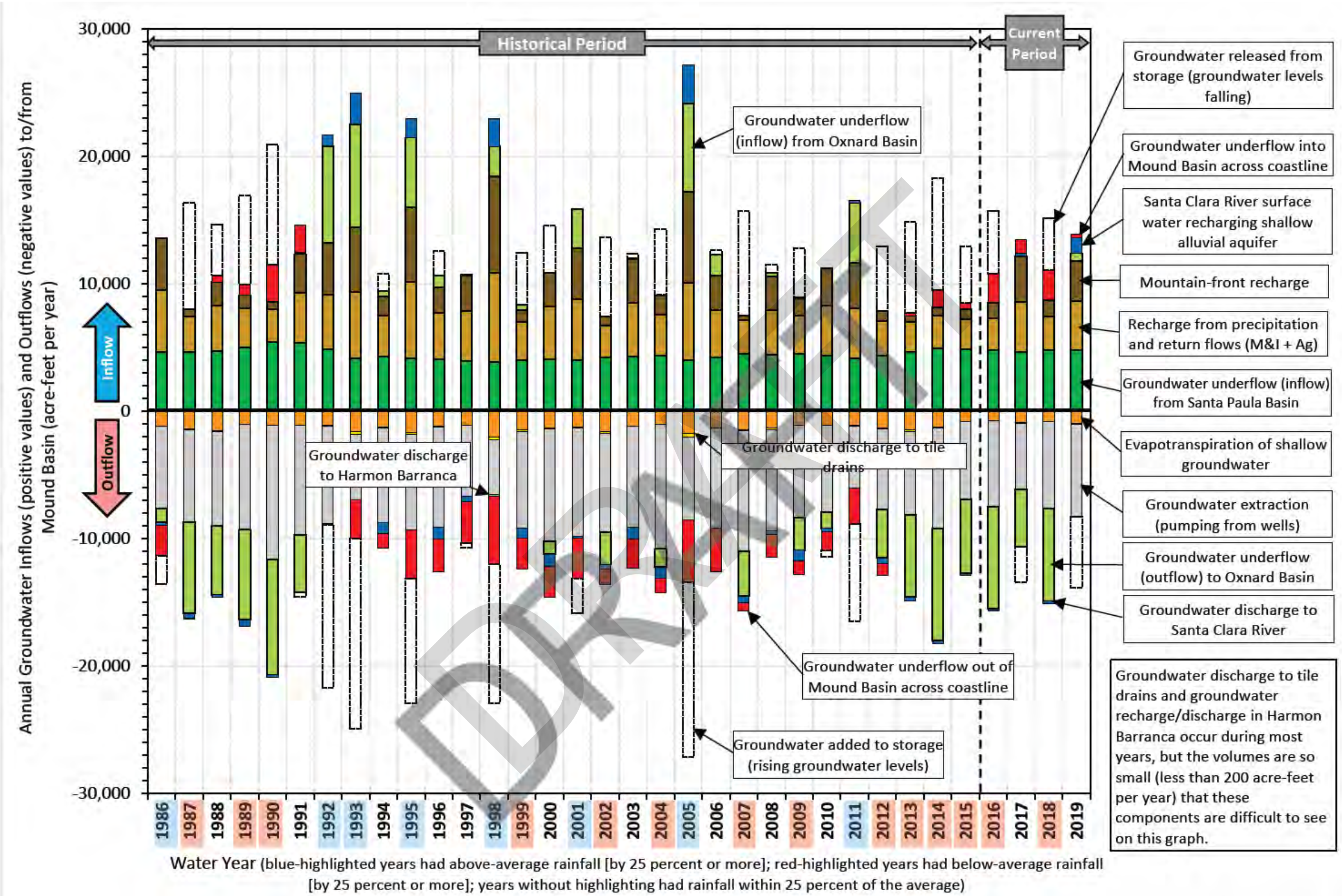

Figure G-4. Annual Groundwater Inflows (positive values) and Outflows (negative values) to/from Mound Basin, in acre-feet per year (Figure 3.3-02 from Draft GSP).

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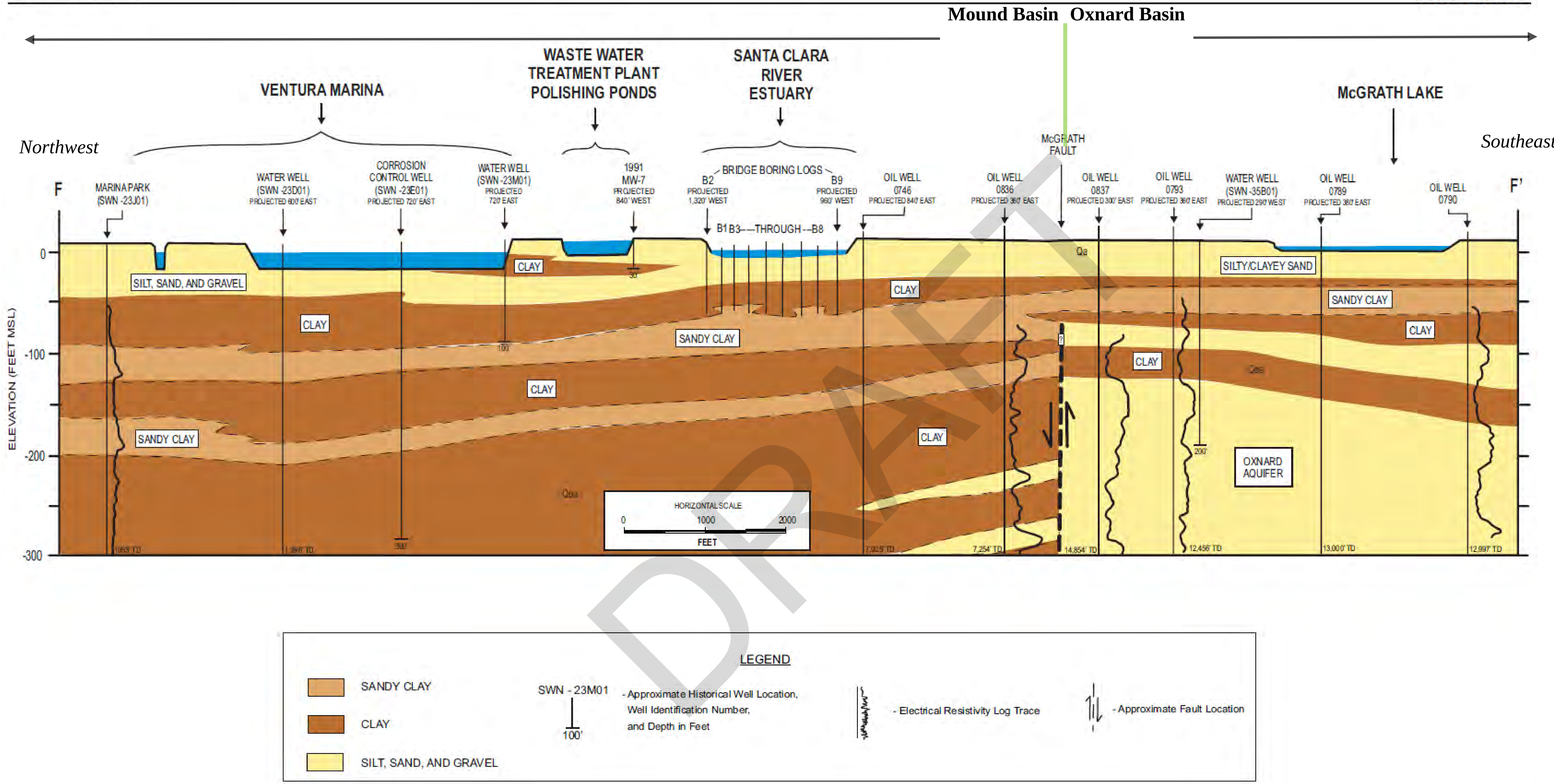


HYDROGEOLOGICAL CROSS-SECTION F-F'
Phase 3 Santa Clara River Estuary Groundwater Special Study
City of San Buenaventura
Ventura, California

PLATE 10

Figure G-5. Hydrogeological Cross Section F-F' from Hopkins, 2018, Showing Detailed Stratigraphy Below the Santa Clara River in Mound Basin (Plate 10 in Hopkins, 2018, report).

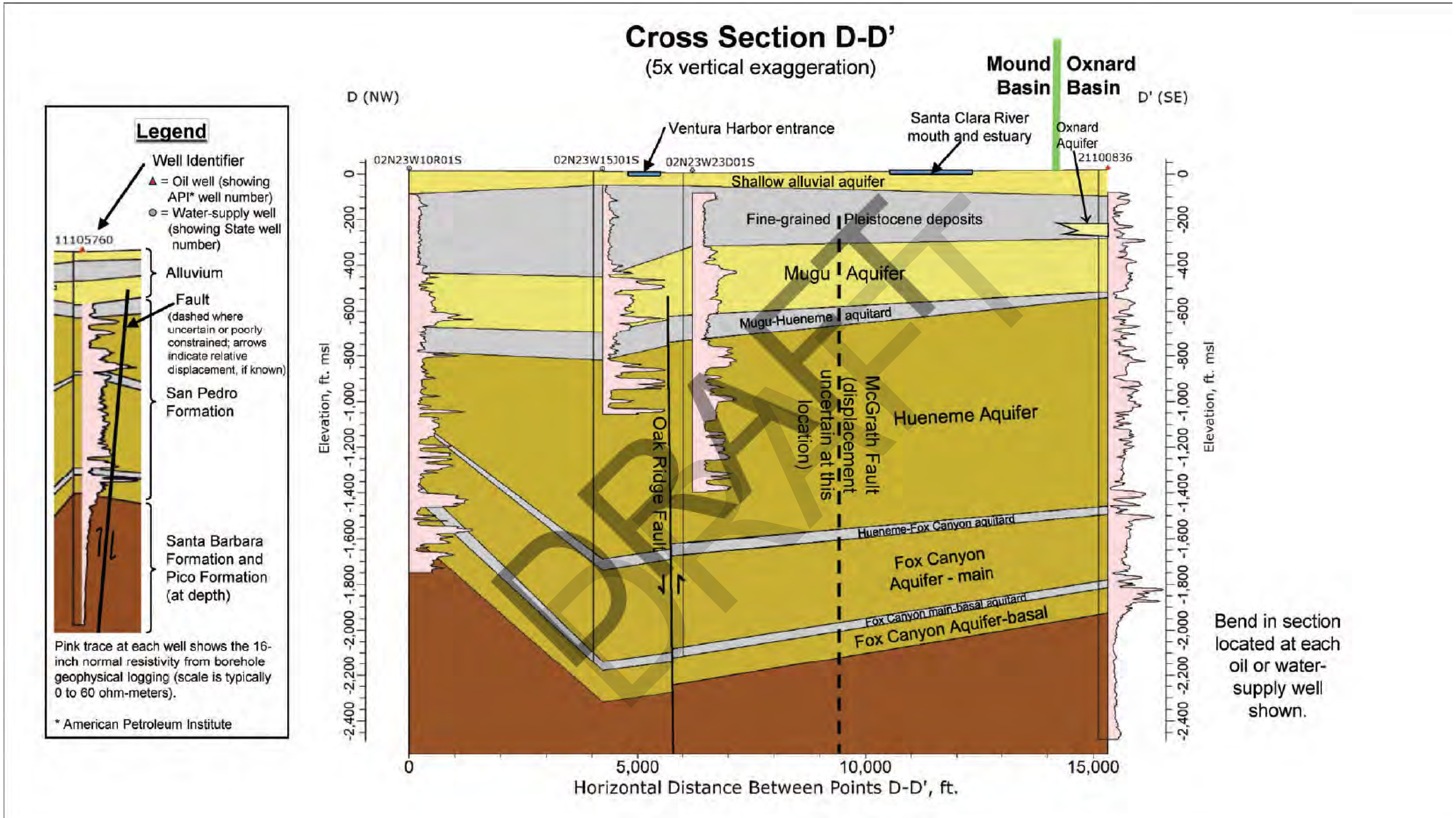


Figure G-6. Cross Section D-D' Showing Hydrostratigraphic Units below the Santa Clara River in Mound Basin (Figure 3.1-03 of the Draft Mound Basin GSP)

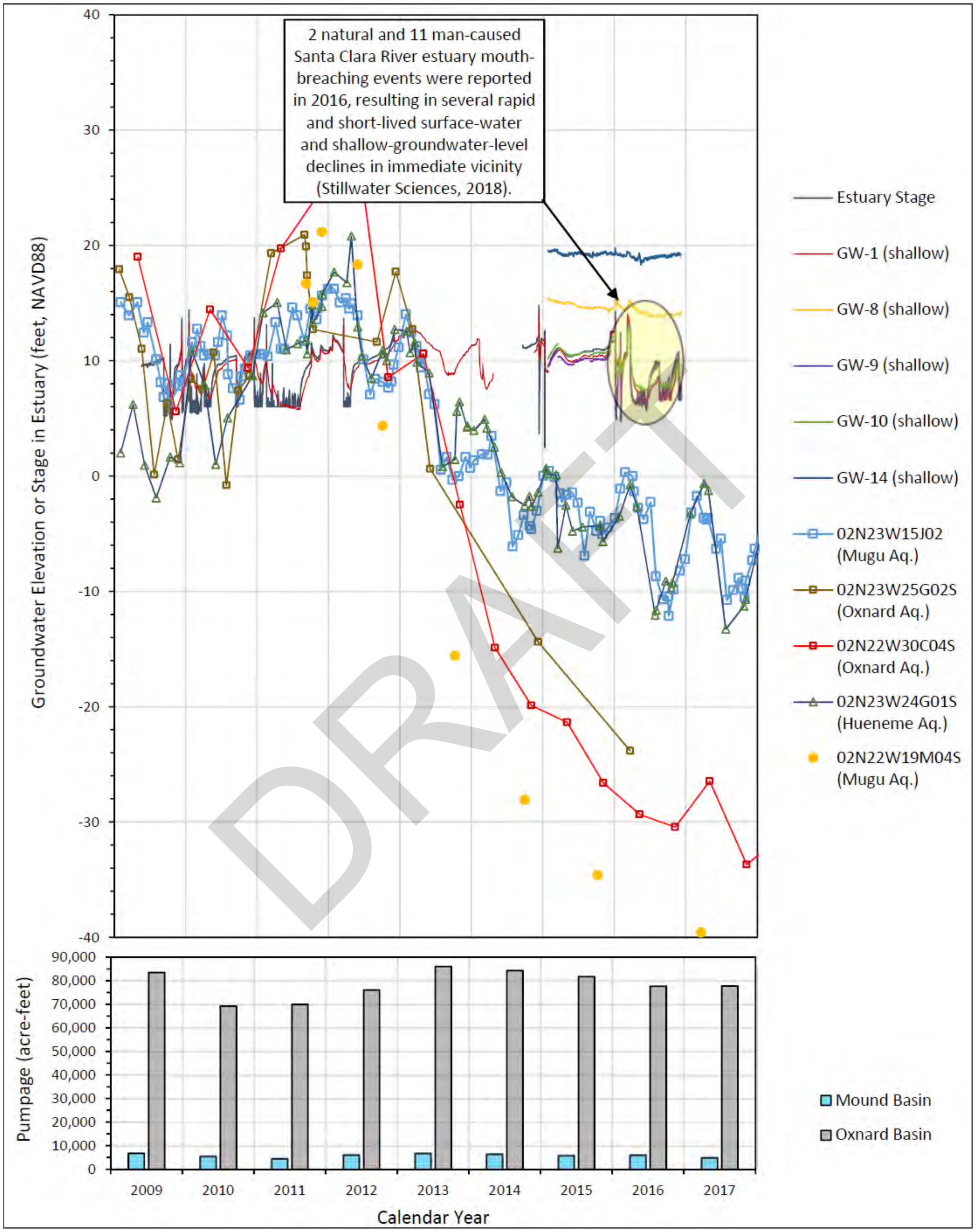


Figure G-7. Groundwater Elevations Reported for Selected Wells and Shallow Piezometers near Santa Clara River in Mound Basin, 2009-17, and Total Groundwater Extracted from Mound and Oxnard Basins

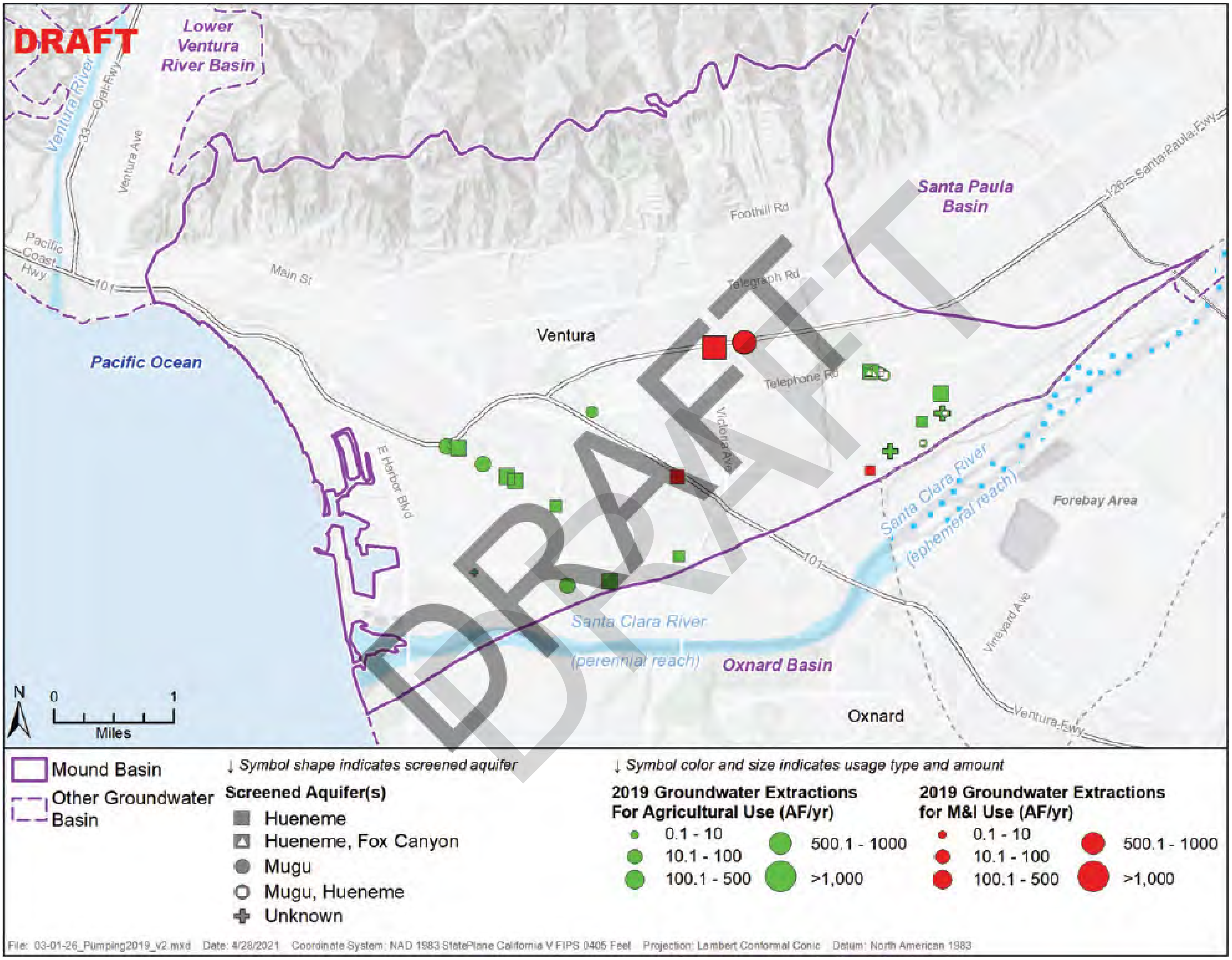


Figure G-8. Map of Active Water Supply Wells in Mound Basin, Showing Extractions in 2019 (Figure 3.1-26 of the Draft Mound Basin GSP).

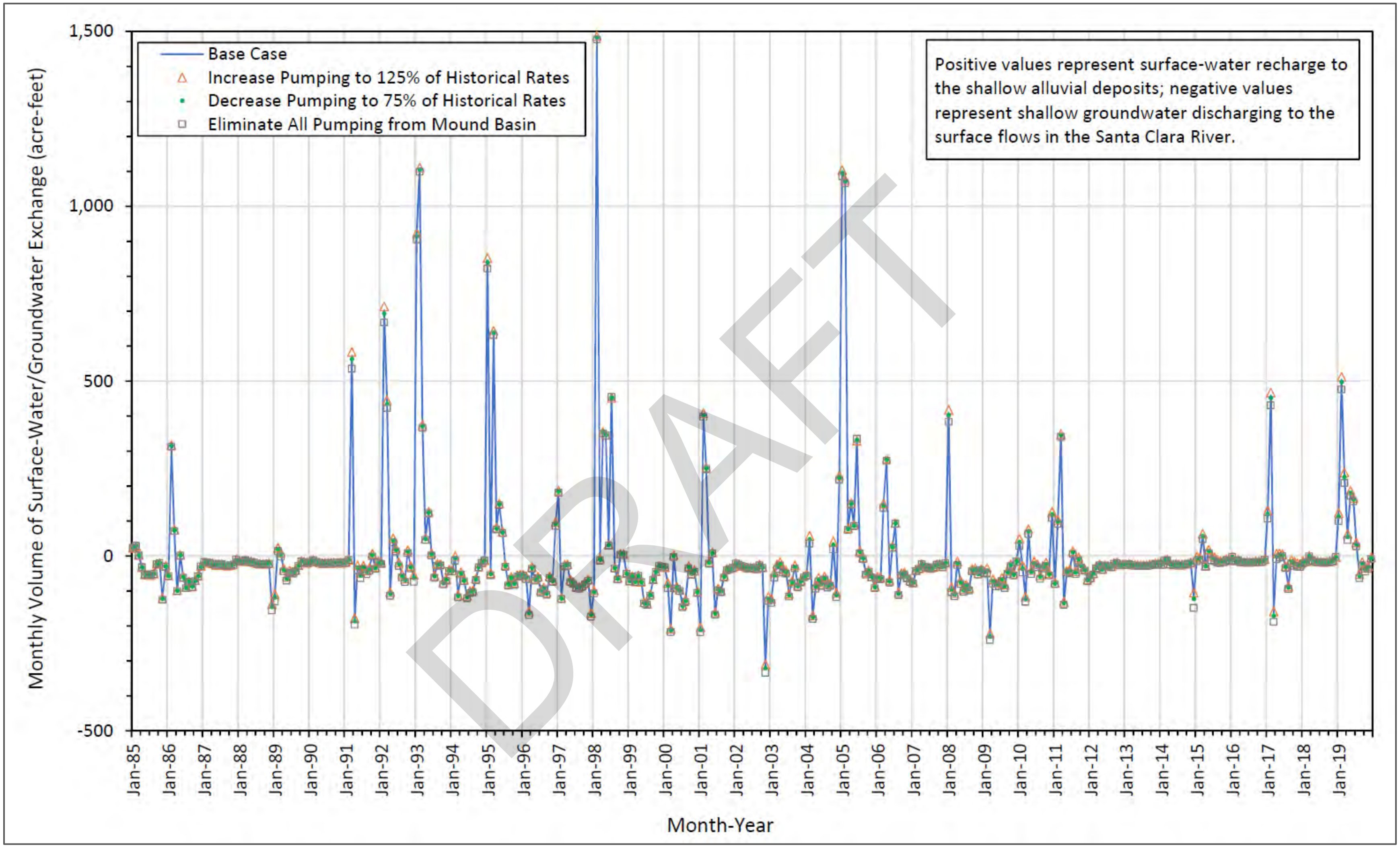
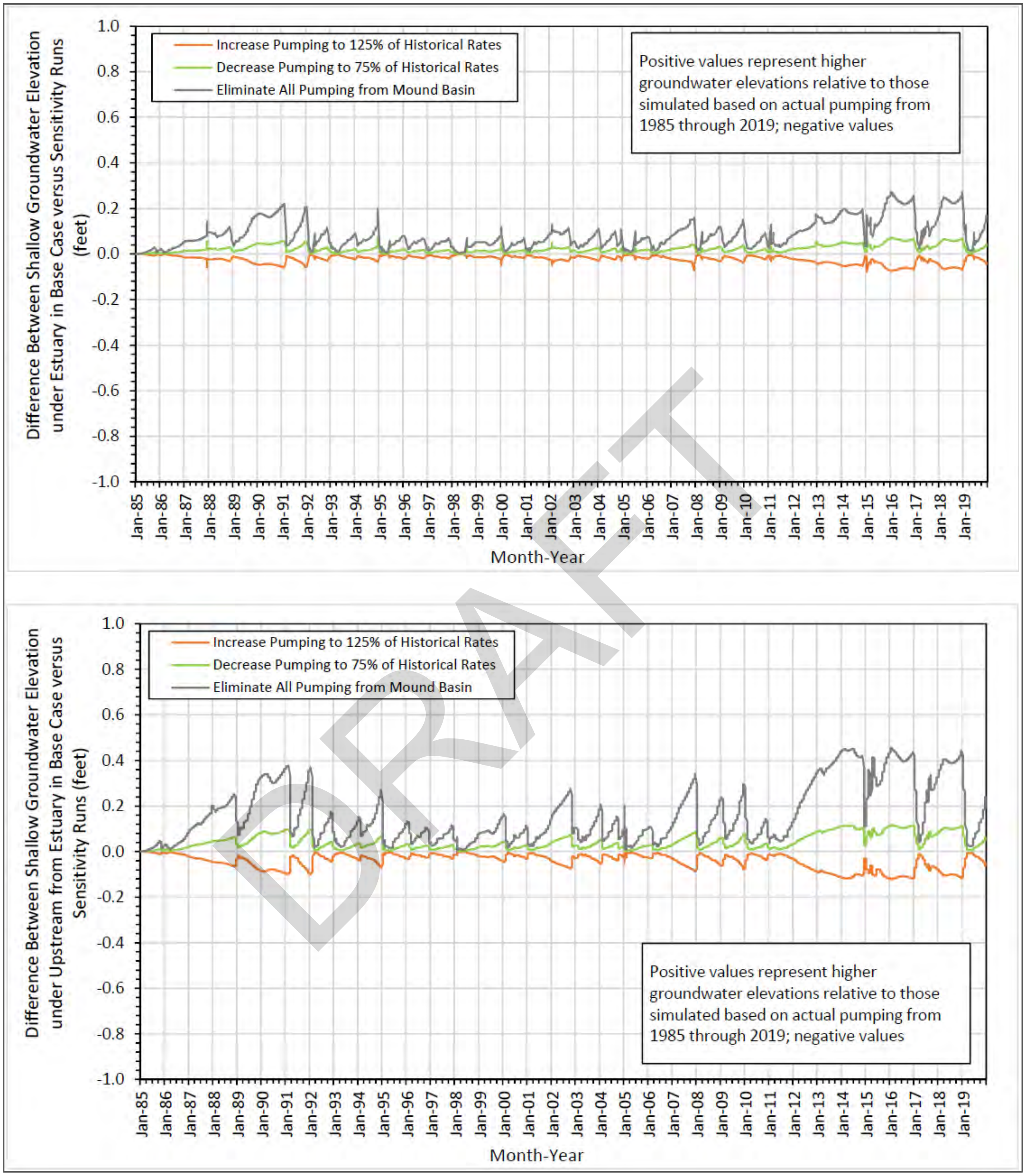


Figure G-9. Volume of Simulated Groundwater Exchange with Surface Water along Santa Clara River in Mound Basin in Base Case and Sensitivity Runs



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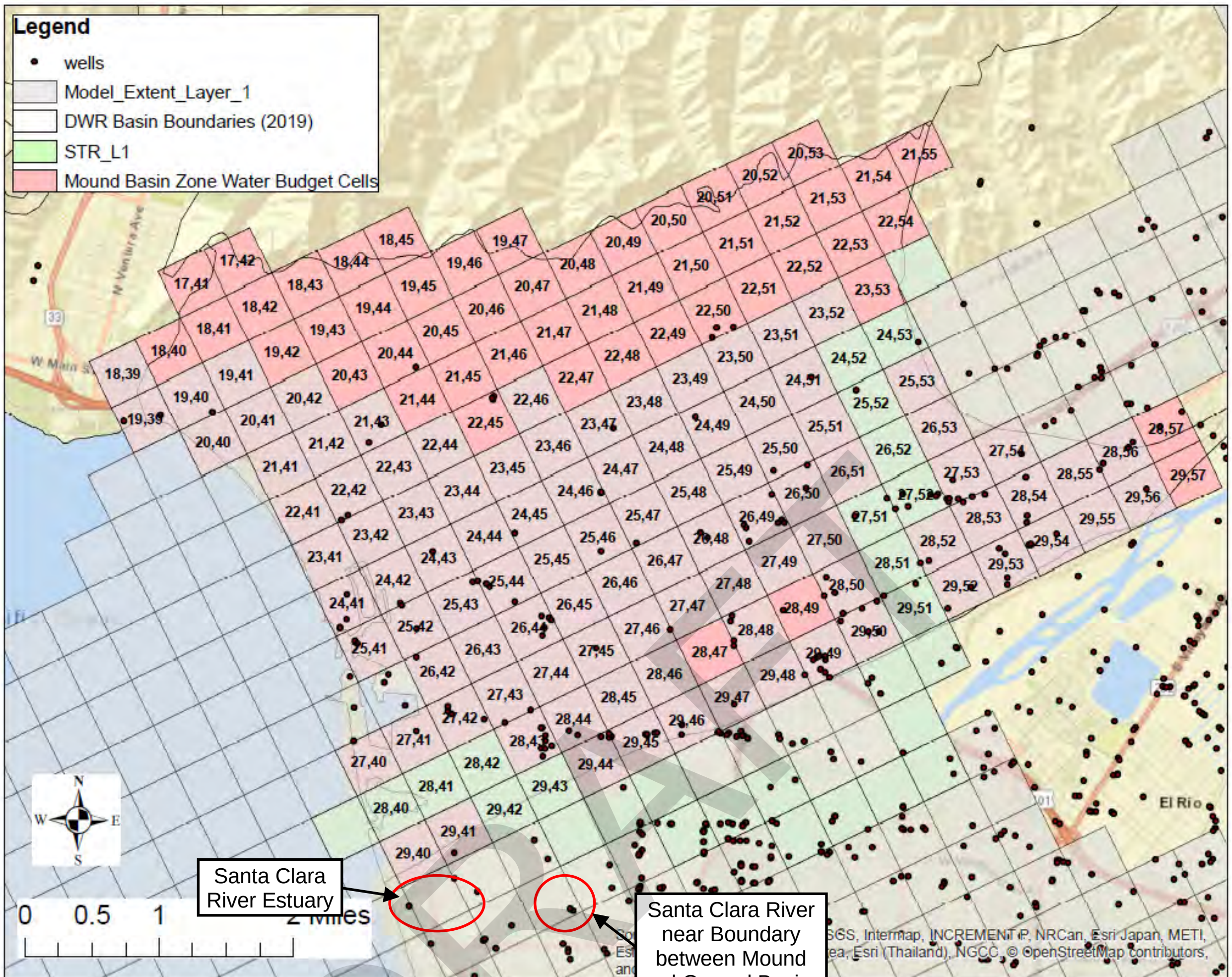

Figure G-11. Location of Model Grid Cells where Simulated Differences Between Base-Case and Sensitivity-Run Groundwater Elevations in Shallow Alluvial Deposits were Extracted for Graphing in Figure X-9

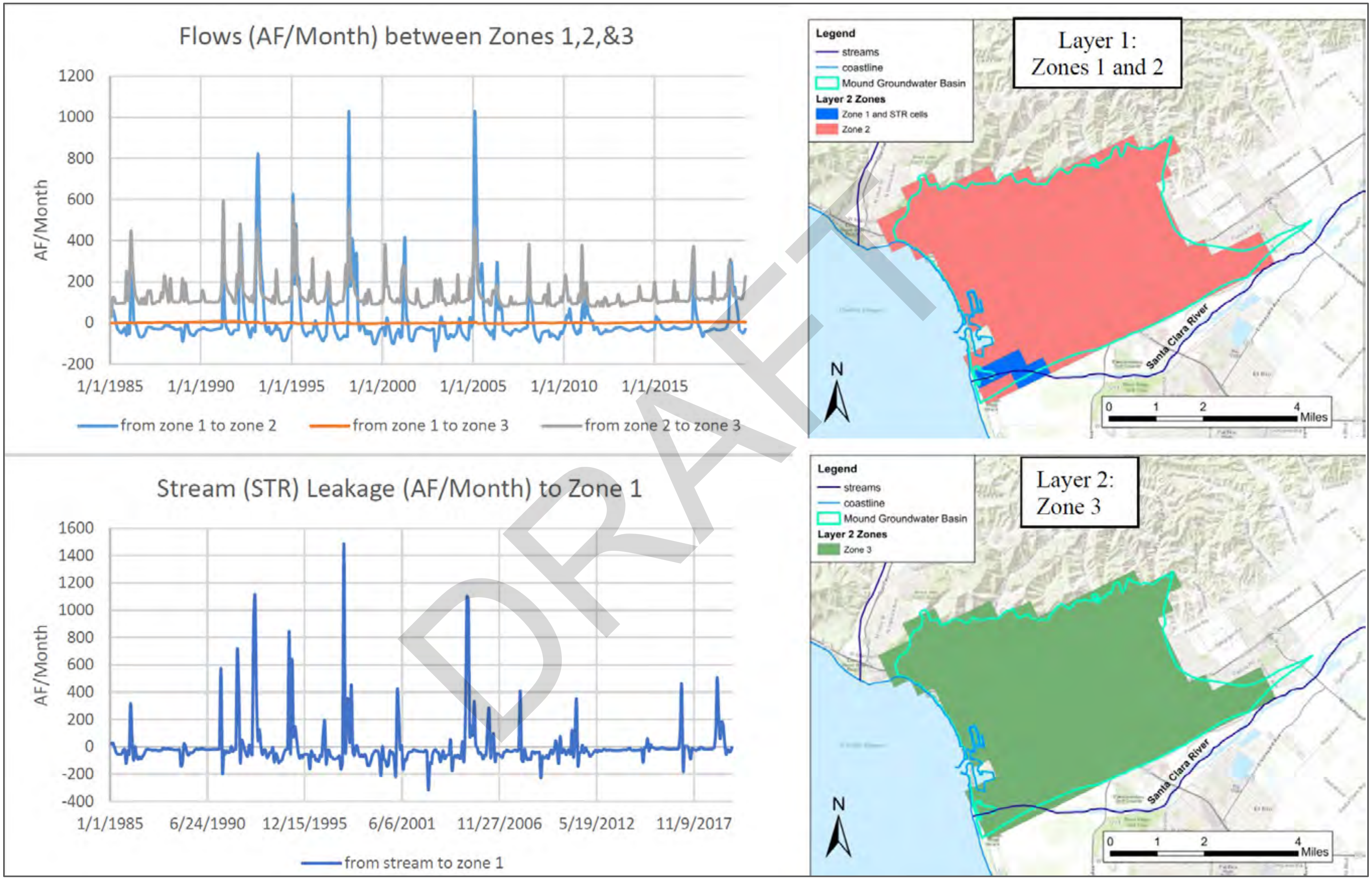

Figure G-12. Zone Budget Results for Selected Zones and the Stream Package.

Appendix H

Review of Areas Mapped as Containing Indicators of Potential Groundwater Dependent Ecosystems

Appendix H

Review of Areas Mapped as Containing Indicators of Potential Groundwater Dependent Ecosystems

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Introduction

This appendix presents the screening results for the 11 areas of mapped "indicators of groundwater dependent ecosystems" (iGDEs) within Mound Basin (Areas 1 through 11) (Figure H-1). Figures H-2 through H-12 include aerial imagery and mapping of specific "vegetation types commonly associated with the sub-surface presence of groundwater" and "wetland features commonly associated with the surface expression of groundwater under natural, unmodified conditions" (CNRA, 2020) within each of Areas 1 through 11. As noted in Mound Basin Groundwater Sustainability Plan (GSP, Section 3.2.7), mapping of iGDEs is recommended as a starting point for the identification and analysis of potential groundwater dependent ecosystems (pGDEs) under the Sustainable Groundwater Management Act (SGMA) (Klausmeyer et al., 2018). Determining whether an iGDE is actually a groundwater dependent ecosystem (GDE) requires local-scale information regarding land use, groundwater levels, surface water hydrology, and geology. That local-scale information is provided in this appendix, together with an evaluation of whether each iGDE is dependent on groundwater from a principal aquifer in Mound Basin. The following presents a summary of the iGDE screening results in addition to a detailed assessment of each of the 11 iGDE areas identified in the GSP.

Summary of iGDE Screening Results

In Areas 1-10, it was observed that plant communities are generally established in topographic areas that concentrate surface water flow, and which can retain soil moisture and/or in areas where there is irrigation. These areas include incised drainages, north-facing slopes, depressions and barrancas conveying runoff from upstream and adjacent irrigated parks and residential developments. In some cases, very shallow, perched water sustained by nearby irrigation may supply some water for transpiration; however, localized shallow perched water is not an aquifer and is therefore not managed under this GSP. MBGSA concludes that Areas 1-10 are not GDEs for the purposes of this GSP because the plant communities observed in these areas appear to be reliant on sources of water other than groundwater in an aquifer, particularly that of a principal aquifer.

To aid discussion for each iGDE area, a historic photo plate is provided for Areas 1-10 to display general historic and present conditions for each iGDE area (Attachment H-1).

Area 11 is considered a GDE because the surface water of the Santa Clara River and its estuary is interconnected with groundwater in the Shallow Alluvial Deposits and the vegetation in Area 11 is likely utilizing Shallow Alluvial Deposits groundwater for some of its transpiration needs. However, it is important to note that there is no groundwater extraction from the shallow groundwater of the Shallow Alluvial Deposits. In addition, Appendix G to the GSP explains that the Santa Clara River and its estuary and groundwater in the Shallow Alluvial Deposits are not material affected by pumping in the principal aquifers. Given the lack of potential for significant impacts to the GDEs by principal aquifer pumping, there are no potential impacts to the Area 11 GDE that need to be considered in the development of sustainable management criteria for the principal aquifers. However, MBGSA will monitor well permit applications for proposed uses of shallow groundwater in the vicinity of Area 11. If any shallow wells are proposed, MBGSA will evaluate impacts to the Area 11 GDEs. Proposed uses that would have a significant impact to Area 11 GDEs may be required to mitigate those impacts as a condition of MBGSA permit approval.

Area 1—Harmon Canyon

Area 1 is located in Harmon Canyon near the northern boundary of Mound Basin (Figure H-1), in an area underlain by “alluvial deposits and colluvial deposits” associated with “active wash deposits” of Holocene age, and landslide deposits of Holocene to Pleistocene age (Gutierrez et al., 2008). A surficial geologic map of Mound Basin is provided on Figure 3.1-02 of the GSP. These alluvial, colluvial, and landslide deposits occupy the narrow bottom and portions of the flanks of Harmon Canyon and overlie partially consolidated sedimentary deposits of the San Pedro Formation (Gutierrez et al. [2008] refer to these deposits by the nomenclature used by Dibblee [1988, 1992]; specifically, the Saugus and Las Posas Formations). The narrow, shallow “shoestring” deposits of alluvium in the foothills of northern Mound Basin are not known to store or transmit significant quantities of groundwater, nor are they currently used for groundwater supply. However, they may become partially saturated following major storms, particularly in winter and spring, potentially creating temporary perched groundwater conditions. It is unlikely that groundwater in these alluvial deposits is hydraulically connected with groundwater in the Hueneme and Fox Canyon aquifers (which are present in the underlying San Pedro Formation), as groundwater elevations in the underlying aquifers are generally hundreds of feet below ground surface in the northern Mound Basin (see Section 3.2 of the Mound Basin GSP). No seeps, springs, or perennial streams are shown on the U.S. Geological Survey (USGS) topographic maps of the Santa Paula 15-minute quadrangle or on the Saticoy 7.5-minute quadrangle in the vicinity of Area 1 (the USGS Santa Paula quadrangle map, originally published in 1903, included the area of the USGS Saticoy 7.5-minute quadrangle published in 1951 and photo-revised in 1967).

The iGDE mapped in Area 1 consists of coast live oak trees (CNRA, 2020), as shown on Figure H-2. Stands of coast live oak are also present outside of Area 1, most commonly in canyon bottoms and on north-facing slopes (Figure H-2) in areas where the substrate consists of San Pedro Formation, rather than alluvial and colluvial deposits. Photographs 1 through 4 in Attachment H-1 provide historic images from 1927 through 2021, showing continued presence of this vegetation in areas that concentrate surface water flow and which retain soil moisture. Considering the substantial depth to groundwater in the underlying principal aquifers (Hueneme and Fox Canyon aquifers), and the presence of coast live oak trees on hillsides outside of Area 1, it is unlikely that the coast live oak trees within Area 1 (or on the surrounding hillsides and canyons) are dependent on groundwater from a principal aquifer in Mound Basin. Therefore, Area 1 is not considered to be a GDE for the purpose of this GSP.

Area 2—Sexton Canyon

Area 2 is located in Sexton Canyon near the northern boundary of Mound Basin (Figure H-1), in an area underlain by “alluvial deposits and colluvial deposits” associated with “active wash deposits” of Holocene age (Gutierrez et al., 2008). No seeps, springs, or perennial streams are shown on the USGS topographic maps of the Santa Paula quadrangle (1903 edition) or the Saticoy quadrangle (1967 edition) in the vicinity of Area 2. The iGDEs mapped in Area 2 include “wetland features commonly associated with the sub-surface presence of groundwater under natural, unmodified conditions” (and more specifically as “riverine, unknown perennial, unconsolidated bottom, semipermanently flooded” wetland) along an approximately 400-foot length of the canyon bottom, and coast live oak trees within 400 feet of area mapped as wetland (CNRA, 2020), as shown on Figure H-3. Inspection of the aerial imagery shown on Figure H-3 indicates the presence of single-family residences and irrigated landscaping within and adjacent to Area 2, and citrus or avocado orchards to the north (up-canyon), south, and east from Area 2.

Approximately 100 acres of avocado orchards and a flood-control dam are located 300 to 800 feet farther north from Area 2, outside of the area shown on Figure H-3. Similar to Area 1, stands of coast live oak are also present outside of Area 2 in Sexton Canyon, most commonly occurring in canyon bottoms and on north-facing slopes (Figure H-3) in areas where the underlying geology consists of landslide deposits or San Pedro Formation, rather than alluvial and colluvial deposits.

There is no visual evidence from the aerial photo to support the presence of the “wetland feature” mapped in Area 2. Any saturated zones present in these shallow “shoestring” alluvial deposits are unlikely to be hydraulically connected with groundwater in the Hueneme and Fox Canyon aquifers present in the underlying San Pedro Formation, as groundwater elevations in these aquifers are generally hundreds of feet below ground surface in the northern Mound Basin. Any perched saturated zones within the alluvial and colluvial deposits are almost certainly not in hydraulic connection with the underlying principal aquifers (Hueneme and Fox Canyon aquifers), and coast live oak trees are present on hillsides outside of Area 2 where they do not have access to perched groundwater. Photographs 5 and 6 in Attachment H-1 provide historic images from 1958 and 2021, showing continued presence of this vegetation in areas that concentrate surface water flow and which retain soil moisture.

Based on this analysis, the iGDEs in Area 2 are not believed to be dependent on groundwater from a principal aquifer in Mound Basin, and Area 2 is not considered to be a GDE for the purpose of this GSP.

Area 3—Barlow Canyon (Arroyo Verde Park)

Area 3 is located in Barlow Canyon along the western margin of the irrigated fields in the south part of Arroyo Verde Park, in the foothills of northern Mound Basin (Figure H-1). Similar to Areas 1 and 2, Area 3 is underlain by shallow “alluvial deposits and colluvial deposits” associated with “active wash deposits” of Holocene age (Gutierrez et al., 2008). No seeps, springs, or perennial streams are shown on the USGS topographic maps of the Santa Paula quadrangle (1903 edition) or the Saticoy quadrangle (1967 edition) in the vicinity of Area 3. The iGDE mapped in Area 3 consists of “riparian mixed hardwood” (CNRA, 2020), as shown on Figure H-4. Inspection of the aerial imagery shown on Figure H-4 indicates the presence of approximately 25 acres of irrigated turf, baseball fields, and picnic areas in Arroyo Verde Park immediately adjacent to and up-canyon from Area 3. Field visits confirm this area is irrigated by the City of Ventura.

The iGDE mapped at Area 3 is located approximately 30 feet above Barlow Canyon and is likely dependent on irrigation, rather than groundwater. Groundwater in the Hueneme and Fox Canyon aquifers present in the underlying San Pedro Formation is generally hundreds of feet below ground surface in the northern Mound Basin. Photographs 7 through 10 in Attachment H-1 provide historic images from 1927 through 2021, showing changing land uses from open space to agriculture up to the current parks/recreation. Between photos 9 and 10 we see the establishment of the vegetation community, understood to demonstrate the effect that irrigation has in this area. Because the iGDE present in Area 3 is likely to be dependent on irrigation, as well as the separation from principal aquifers, this iGDE is not believed to be dependent on groundwater from a principal aquifer in Mound Basin. Therefore, it is not considered to be a GDE for the purpose of this GSP.

Area 4—Sanjon Barranca

Area 4 is located in the canyon bottom and east-facing slope of Sanjon Barranca in the foothills north of downtown Ventura near the northern boundary of Mound Basin (Figure H-1). Area 4 is underlain by the "Saugus Formation" (referred to as San Pedro Formation in the GSP) and "alluvial deposits and colluvial deposits" associated with "active wash deposits" of Holocene age in the canyon bottom (Gutierrez et al., 2008). No seeps, springs, or perennial streams are shown on the USGS topographic maps of the Ventura quadrangle (1904 or 1951 editions) in the vicinity of Area 4. The iGDE mapped in Area 4 is coast live oak (CNRA, 2020), as shown on Figure H-5. The aerial imagery shown on Figure H-5 was obtained after the Thomas Fire burned the foothills north of Ventura in December 2017, which is why only grass and some small shrubs are apparent on Figure H-5. Review of older aerial imagery available in Google Earth in the vicinity of Area 4 indicates that trees and shrubs were more abundant prior to the Thomas Fire. Similar stands of trees and shrubs were also present outside of the mapped iGDE area in Sanjon Barranca and nearby drainages, most commonly in canyon bottoms and on north-facing slopes (some can be seen on Figure H-5) in areas where the underlying geology consists of landslide deposits or San Pedro Formation. Photographs 11 through 14 in Attachment H-1 provide historic images from 1927 through 2021, showing the vegetation community in areas that concentrate surface water flow and which retain soil moisture (as well as the Thomas Fire impacts in photo 14).

Considering the absence of mapped springs or seeps, the substantial depth to groundwater in the underlying principal aquifers (Hueneme and Fox Canyon aquifers), and the nature of the coast live oak community to occur in upland areas without access to groundwater, it is unlikely that the coast live oaks within Area 4 (or on the surrounding hillsides and canyons) are dependent on groundwater from a principal aquifer in Mound Basin. Therefore, the iGDE in Area 4 is not considered to be a GDE for the purpose of this GSP.

Area 5—Kennebec Linear Park and North Bank of Santa Clara River near Saticoy

Area 5 includes two iGDEs: one iGDE is in an unnamed barranca within Kennebec Linear Park, and the other is mapped along the north bank of the Santa Clara River near Kennebec Linear Park. Area 5 is underlain by stream terrace deposits "of latest Holocene age" and "active wash deposits within major river channels" of Holocene age (Gutierrez et al., 2008). No seeps, springs, or perennial streams are shown on the USGS topographic maps of the Santa Paula quadrangle (1903 edition) or the Saticoy quadrangle (1967 edition) in the vicinity of Area 5 within Mound Basin.

The iGDEs in Area 5 include mixed willow forest along the north bank of the Santa Clara River, and mixed riparian forest in the unnamed barranca within Kennebec Linear Park (CNRA, 2020), as shown on Figure H-6. Inspection of the aerial imagery shown on Figure H-6 indicates the presence of irrigated turf landscaping on the northeast and southwest flanks of Kennebec Linear Park where the "mixed riparian forest" is mapped, and in residential subdivisions of single-family residences present adjacent to both iGDEs in Area 5. In addition, a storm drain outlet is located at the northern boundary of the iGDE in the barranca, discharging storm water, irrigation runoff, and other non-storm water flows from the upper watershed drainage area.

Small quantities of perched groundwater likely are present at shallow depths in the stream terrace deposits underlying Area 5 as a result of park and residential irrigation in the area. However, the primary source water supporting the iGDEs appears to be landscape irrigation at Kennebec Linear Park and surface water in the unnamed barranca (surface water from urban runoff via storm water drains and precipitation events). Photographs 15 through 18 in Attachment H-1 provide historic images from 1945 through 2021, showing the vegetation communities in these iGDEs. These photos illustrate the land use changes over time, presence of the unnamed barranca, and establishment of the vegetation communities in the barranca and on the slopes below the southern edge of the linear park.

Because the iGDEs present in Area 5 appear to be primarily dependent on upstream surface water sources, irrigation, and return flows occurring in shallow perched zones for their water supply, Area 5 is not considered to be a GDE for the purpose of this GSP.

Area 6—Harmon Barranca and Park

Area 6 occupies an approximately 1,200-foot-long reach of Harmon Barranca near the southern boundary of Harmon Park (Figure H-1). Area 6 is underlain by a narrow band of "active wash deposits within major river channels" of Holocene age and alluvial fan deposits of "latest Holocene" age (Gutierrez et al., 2008). No seeps, springs, or perennial streams are shown on the USGS topographic maps of the Santa Paula quadrangle (1903 edition) or the Saticoy quadrangle (1967 edition) in the vicinity of Area 6.

The iGDE in Area 6 is riparian mixed hardwood (CNRA, 2020), as shown on Figure H-7. Inspection of the aerial imagery shown on Figure H-7 indicates the presence of subdivisions of single-family residences both east and west adjacent to Area 6; not visible on Figure H-7 is Barranca Vista Park, which includes 3 acres of irrigated turf, approximately 1,000 feet north of Area 6 adjacent to Harmon Barranca. Irrigation return flows from Barranca Vista Park and from the residential neighborhoods adjacent to Harmon Barranca would be expected to percolate to thin, shallow perched zones in near-surface soils and then migrate horizontally to Harmon Barranca (the nearest topographic "low"), where the perched water can seep out to land surface in the bed and banks of the barranca.

In addition, surface water in the barranca is another source of water for the iGDE (surface water from urban runoff via storm water drains and precipitation events). The return flows and surface water are believed to be primary sources of water for the iGDE mapped at Area 6. Photographs 19 through 22 in Attachment H-1 provide historic images from 1945 through 2021, showing the changes in agricultural irrigation and land use over time. While the vegetation in the barranca is present in 1927, the density generally increases over time in response to the changing land use. Based on the understanding that shallow perched groundwater conditions likely occur and the separation from the principal aquifers, as well as the presence of stormwater, irrigation runoff, and other non-storm water flows, Area 6 is not considered to be a GDE for the purpose of this GSP.

Area 7—Arundell Barranca (northern)

Area 7 occupies an approximately 1,500-foot-long reach of Arundell Barranca near the mouth of Sexton Canyon in the northeast portion of Mound Basin (Figure H-1). The iGDE in Area 7 consists of "wetland features commonly associated with the sub-surface presence of groundwater under natural, unmodified conditions" (and more specifically as "riverine, unknown perennial, unconsolidated bottom, semipermanently flooded"), according to the CNRA (2020), as shown on Figure H-8. Area 7 is underlain by "active wash deposits within major river channels" of Holocene age (Gutierrez et al., 2008). No seeps or springs are shown on the USGS topographic map of the Santa Paula quadrangle (1903 edition) or the Saticoy quadrangle (1967 edition) in the vicinity of Area 7.

Arundell Barranca conveys surface water from a relatively large drainage area and is supplied by upstream surface water sources. Surface-water flow is shown on the 1967 edition of the USGS Saticoy quadrangle map as perennial within and downstream from Area 7; however, surface flow in Arundell Barranca is not shown as perennial on the 1903 edition of the Santa Paula quadrangle map. The channel is lined just upstream of the mapped iGDE and water is visible in the lined portion of the channel, but the unlined portion appears dry (Figure H-8). The source of water is likely urban runoff and storm water routed to the barranca via storm drains.

Inspection of the aerial imagery shown on Figure H-8 indicates the presence of subdivisions of single-family residences both east and west adjacent to Area 7. Farther upstream (in Sexton Canyon north of Foothill Road, beyond the field of view of Figure H-8) are approximately 150 acres of avocado orchards and additional residential development. Irrigation return flows from the adjacent and upstream residential neighborhoods, as well as the upstream orchards, would be expected to percolate to thin, shallow perched zones in near-surface soils and the active wash deposits, then migrate horizontally to Arundell Barranca (the nearest topographic "low" where surface water and shallow groundwater drainage can collect), and then seep out to the bed and banks of the barranca. These return flows likely are a source of water for the iGDE mapped at Area 7. Photographs 23 through 26 in Attachment H-1 provide historic images from 1938 through 2021. In addition to documenting the changes in land use over time, these photos show the presence of vegetation in the barranca over time.

Based on the understanding that shallow perched groundwater conditions likely occur and the separation from the principal aquifers, as well as the presence of surface water flows and irrigation return flows, Area 7 is not considered to be a GDE for the purpose of this GSP.

Area 8—Arundell Barranca (central)

Area 8 occupies an approximately 1,300-foot-long reach of Arundell Barranca near the center of Mound Basin at the U.S. Highway 101 and State Highway 126 interchange (Figure H-1). As shown on Figure H-9, most of this reach of Arundell Barranca presently is in a closed culvert (a concrete-lined tunnel) beneath Highways 101 and 126 and their on- and off-ramps. Surface-water flow in Arundell Barranca is shown on the 1967 edition of the USGS Saticoy quadrangle map as perennial upstream and downstream of Area 8; however, surface flow in Arundell Barranca is not shown as perennial on the 1903 edition of the Santa Paula quadrangle map. The iGDE in Area 8 consists of "wetland features commonly associated with the sub-surface presence of groundwater under natural, unmodified conditions" (and more specifically as "riverine, unknown perennial, unconsolidated bottom, semipermanently flooded"), according to the CNRA (2020), as shown on Figure H-9. The source of water is likely urban runoff and storm water routed to the barranca via storm drains.

Inspection of the aerial imagery shown on Figure H-9 indicates the presence of a subdivision of single-family residences northwest adjacent to Area 8, and Camino Real Park to the northeast. Upstream of Area 8, most of Arundell Barranca within Mound Basin is flanked by residential subdivisions or orchards (in the foothills in the northern part of Mound Basin). Irrigation return flows from the adjacent and upstream residential neighborhoods, as well as the upstream orchards, would be expected to percolate to thin, shallow perched zones in near-surface soils and the active wash deposits, then migrate horizontally to Arundell Barranca (the nearest topographic “low”), where they can seep out to land surface in the bed and banks of the barranca. These return flows likely are the primary sources of water for the iGDE mapped upstream from State Highway 126 at Area 8. The remainder of Area 8 is located in a closed culvert under State Highway 126 and U.S. Highway 101—the iGDE depicted in the CNRA (2020) database in this reach of Arundell Barranca seems to be in error.

Similar to Area 7, any saturated zones present in the thin active wash deposits present in Area 8 north of State Highway 126 are unlikely to be hydraulically connected with groundwater in the underlying principal aquifers of Mound Basin. Photographs 27 and 28 in Attachment H-1 provide historic images from 1958 and 2021. As is the case with Area 7, these photos document the changes in land use over time (specifically the development of State Highway 126) and show the presence of vegetation in the barranca over time. Because the iGDE present in Area 8 north of State Highway 126 is believed to be primarily dependent on surface water and irrigation return flows for its water supply, and because the area south of State Highway 126 is a culvert, Area 8 is not considered to be a GDE for the purpose of this GSP.

Area 9—Prince Barranca

Area 9 occupies an approximately 5,000-foot-long reach of Prince Barranca from near the mouth of Hall Canyon to Main Street, Ventura, in the northwest portion of Mound Basin (Figure H-1). Area 9 is underlain by “alluvial deposits and colluvial deposits” associated with “active wash deposits” of Holocene age (Gutierrez et al., 2008). No seeps or springs are shown on the USGS topographic maps of the Ventura 15- and 7.5-minute quadrangles (1904 and 1951 editions, respectively) in the vicinity of Area 9. Surface-water flow in Prince Barranca is shown on the 1951 edition of the USGS Ventura quadrangle map as perennial within and upstream of Area 9; however, surface flow in Prince Barranca is not shown as perennial on the 1904 edition.

The iGDE in Area 9 consists of “wetland features commonly associated with the sub-surface presence of groundwater under natural, unmodified conditions” (and more specifically as “palustrine [marsh], scrub-shrub, seasonally flooded”), according to the CNRA (2020), as shown on Figure H-10. Inspection of the aerial imagery shown on Figure H-10 indicates the presence of subdivisions of single-family residences both east and west adjacent to most of Area 9, except in the lower reaches of Hall Canyon where it lies adjacent to irrigated baseball fields. Within Hall Canyon, an approximately 14-acre avocado orchard is present adjacent to the east margin of the iGDE mapped in Area 9. Irrigation return flows from the adjacent residential neighborhoods and orchard would be expected to percolate to thin, shallow perched zones in near-surface soils deposits, then migrate horizontally to Prince Barranca (the nearest topographic “low”), and then seep out of the bed and banks of the barranca. These return flows likely are the primary sources of water for the iGDE mapped at Area 9 outside of precipitation-induced runoff events. Any saturated zones present in the thin active wash deposits present in Area 9 are unlikely to be hydraulically connected with groundwater in the underlying principal aquifers of Mound Basin.

Because the iGDEs present in Area 9 are believed to be primarily dependent on precipitation runoff and irrigation return flows for their water supply, and any perched saturated zones within the shallow alluvial deposits in Area 9 are not likely to be hydraulically connected with the underlying principal aquifers, Area 9 is not considered to be a GDE for the purpose of this GSP.

Area 10—Alessandro Lagoon

Area 10 consists of the Alessandro Lagoon, which occupies approximately 6 acres between U.S. Highway 101 and Alessandro Drive in the west part of Mound Basin (Figure H-1). Area 10 is underlain by "paralic deposits (interfingered marine and non-marine sediments) of the Sea Cliff marine terrace" of Holocene age (Gutierrez et al., 2008). The iGDE in Area 10 consists of "willow shrub" (CNRA, 2020), as shown on Figure H-11. No seeps, springs, or perennial streams are shown on the USGS topographic maps of the Ventura 15- and 7.5-minute quadrangles (1904 and 1951 editions, respectively) in the immediate vicinity of Area 10, although the USGS topographic map edition of 1951 shows marshland present approximately ¼-mile southeast of Area 10. This marshland has subsequently been filled and is now the site of residential and commercial development.

A map of historical estuarine and related habitats for the Ventura area prepared by Grossinger et al. (2011) indicates that both Area 10 and the marshland to the south were occupied by sand dunes in the late 19th century, with no wetland vegetation depicted. In December 1982, the City of Ventura designated Alessandro Lagoon a point of interest due to its history and its value as a freshwater refuge on the Pacific Coast flyway within Ventura County (City of Ventura, 2020). During the late 19th and early 20th centuries, the area was known as "Chautaqua Flats" and was the site of camping and amusement enterprises (City of Ventura, 2020). Neither the map presented by Grossinger et al. (2011) nor the 1951 USGS topographic maps of the Ventura quadrangle indicate the presence of features suggesting water at land surface within Area 10 from the late 19th century through 1951. Thus, it appears that the lagoon formed sometime after 1951. This is consistent with the fact that the lagoon occupies a fully enclosed depression between U.S. Highway 101 on the south and bluffs to the north. It appears that construction of U.S. Highway 101 served to create the southern enclosure of the depression that is now occupied by the lagoon. U.S. Highway 101 was constructed along the southern margin of the lagoon in 1959 and 1960.

Photographs 33 through 36 in Attachment H-1 provide historic images from 1959 through 2021, and document the changes described above. Because this iGDE appears to be dependent on surface water that becomes trapped within a closed artificial depression, Area 10 is not considered to be a GDE for the purpose of this GSP.

Area 11—Lower Santa Clara River and Estuary

Area 11 occupies much of the channel of the lower Santa Clara River within Mound Basin, the river's estuary, and adjacent lowlands (Figure H-1). A map of historical estuarine and related habitats for the Ventura area prepared by Grossinger et al. (2011) shows that "open water," "vegetated wetland," and "vegetated woody" areas existed in Mound Basin within and adjacent to the lower Santa Clara River in the late 19th century. As described by Stillwater Sciences (2011), "The lower Santa Clara River and Santa Clara River estuary (SCRE) have undergone considerable geomorphic change over the past 150 years since European-American settlement due to a combination of land-use practices and climatic conditions. Historically, the SCRE was an expansive ecosystem that included an open-water lagoon and a series of channels that supported intertidal vegetation. Land development since the mid-19th century has resulted in a 75% to 90% decrease in overall SCRE area and available habitat, and the confinement of flood flows by levees." Area 11 is underlain by "active wash deposits within major river channels" of Holocene age, stream terrace deposits, alluvial and colluvial deposits, and artificial fill (Gutierrez et al., 2008).

The iGDEs within Area 11 consist of seven "vegetation types commonly associated with the sub-surface presence of groundwater," and "wetland features commonly associated with the sub-surface presence of groundwater under natural, unmodified conditions," according to the CNRA (2020), as shown on Figure H-12. No seeps, springs, or perennial streams are shown on the USGS 1904 topographic map of the Hueneme 15-minute quadrangle or the USGS 1949 topographic map of the Oxnard 7.5-minute quadrangle (photo revised in 1967). Both the 1904 and the 1949 topographic maps show estuary lakes of 50 to 70 acres in area at the mouth of the Santa Clara River, separated from the Pacific Ocean by a narrow beach area. The 1949 Oxnard quadrangle map also shows a small pond in the Santa Clara River floodplain approximately 1.25 miles upstream from the coastline.

Sources of Water to Area 11

At present, the Olivas Links golf course and Ventura's wastewater treatment plant (WWTP), which includes artificial treatment ponds shaped to fit in the natural landscape, are present adjacent to (and partly within) Area 11 to the north (Figure H-12). Farm fields and the campground at McGrath State Beach are adjacent to Area 11 to the south (Figure H-12). Sources of water and their relative contributions to surface flows within the lower Santa Clara River and its estuary were estimated by Stillwater Sciences (2011) for the period from October 25, 2009, through September 15, 2010, as follows:

- Surface flows in the Santa Clara River originating upstream from Mound Basin—80% of the total inflow.
- Effluent discharge from Ventura's WWTP—8% of total inflow.
- Surface inflows from the Pacific Ocean during high tides—7% of total inflow.
- Groundwater inflow from the Shallow Alluvial Deposits in Mound Basin and from the semi-perched Aquifer in Oxnard Basin—4% (combined) of total inflow.
- Direct precipitation—less than 1% of total inflow.
- Subsurface tidal inflow—less than 1% of total inflow.

Although not included in Stillwater Sciences (2011) accounting of inflows, tile drains underlying farm fields and overland surface runoff produced during storm events likely also contribute water to the lower Santa Clara River (United, 2018). It should be noted that much of the groundwater present in the Shallow Alluvial Deposits in Mound Basin and the semi-perched aquifer of the Oxnard Basin near Area 11 consists of return flows from irrigation water applied to the golf courses and farm fields north and south of the Santa Clara River (United, 2018).

Although surface flows originating upstream from Mound Basin dominate the inflow of water to the lower Santa Clara River (and Area 11), those flows are ephemeral, only reaching the lower Santa Clara River in Mound Basin following major storms, which occur primarily in winter and spring (Stillwater Sciences, 2011). Therefore, the primary sources of water supporting Area 11 iGDEs during dry months and drought periods include tile-drain discharges, effluent from Ventura's WWTP, and groundwater discharge from the semi-perched aquifer in Oxnard Basin.

Following TNC guidance, each of the iGDEs within Area 11 were analyzed and slightly revised to more accurately reflect the vegetation communities present. These potential GDEs were then grouped into the Area 11 GDE Unit. The Area 11 GDE Unit was characterized and evaluated based on the vegetation communities present and the potential to provide habitat for special status plant and wildlife species.

Characterization of the Area 11 GDE Unit

Vegetation Communities

The following iGDEs are mapped within the Natural Communities Commonly Associated with Groundwater (NCCAG) dataset within Area 11 (Figure H-12):

- *Leymus triticoides*
- Mixed willow forest
- *Populus balsamifera – Salix lasiolepis*
- *Salix lasiolepis*
- *Salix lucida*
- *Scirpus* spp.
- Wetlands

These vegetation communities were reviewed by biologists at Rincon Consultants Inc. (Rincon) and compared with previous vegetation mapping that was completed within the SCRE by Stillwater Sciences (2011) and WRA (2014). Based on this analysis, the following vegetation communities with potential to be groundwater dependent were mapped within Area 11 (Figure H-13):

- Arroyo Willow Thicket
- Black Cottonwood Forest
- Freshwater Marsh
- *Arundo* stands
- Wetlands

Stands of *Arundo donax* (giant reed) are widespread throughout Area 11 (Stillwater Sciences, 2011). Arundo is a highly invasive species that utilizes up to six times more water than native riparian plant species (Giessow et al., 2011). Other invasive plant species that are prevalent within Area 11 include salt cedar (*Tamarisk* spp.) and iceplant (*Carpobrotus* spp.). These invasive plant species can provide habitat for wildlife but have an overall detrimental impact on the ecosystems within which they occur due to their rapid growth rates and ability to out-compete native species for resources (i.e., water and nutrients).

Critical Habitat

Rincon queried the U.S. Fish and Wildlife Service (USFWS) Critical Habitat Portal (USFWS 2021) and the NOAA Critical Habitat maps (NOAA, 2021) for information on federally designated critical habitat within Area 11 (Figure H-14). The area includes critical habitat for four federally listed species: Southern California distinct population segment (DPS) steelhead (*Oncorhynchus mykiss irideus*), tidewater goby (*Eucyclogobius newberryi*), southwestern willow flycatcher (*Empidonax traillii extimus*), and western snowy plover (*Charadrius nivosus nivosus*). Critical habitat for Ventura Marsh milk vetch (*Astragalus pycnostachyus var. lanosissimus*) lies approximately 0.7 miles south of the Mound Basin boundary.

Special Status Species

For the purposes of this document, special status species are defined as those:

- Listed, proposed, or candidates for listing as endangered or threatened under the federal Endangered Species Act (ESA) or the California Endangered Species Act (CESA).
- Designated by the CDFW as a Species of Special Concern (SSC) or Watchlist Species (WL).
- Designated by the CDFW as Fully Protected (FP) under the California Fish and Game Code (Sections 3511, 4700, 5050, and 5515).
- Included on CDFW's most recent Special Vascular Plants, Bryophytes, and Lichens List (CDFW 2021c) with a California Rare Plant Rank (CRPR) of 1 or 2.
- Protected by the Migratory Bird Treaty Act (MBTA) or California Fish and Game Code Section 3503.

Special Status Plant Species

Rincon queried the California Natural Diversity Database (CNDDB; CDFW, 2021a), the California Native Plant Society (CNPS, 2021) Inventory of Rare Plants, and Calflora (Calflora, 2021) for occurrences of special status plant species within the Ventura, Oxnard, and Saticoy 7.5-minute USGS quadrangles. Based on these queries, 14 plant species were evaluated for their potential to occur within Mound Basin and Area 11 (Attachment H-2). Of these, eight special status plant species have some potential to occur within Area 11. Table H-1 provides a summary of these species, their regulatory status, their potential to occur, and their potential GDE Association.

Table H-1 Special Status Plant Species with Potential to Occur within Area 11

Scientific Name **Common Name**	**Status** **Fed/State ESA** **CDFW**	**Potential to Occur[1]**	**GDE Association[1]**
Aphanisma blitoides aphanisma	None/None G3G4/S2 1B.2	Likely to Occur	Unlikely
Astragalus pycnostachyus var. *lanosissimus* Ventura Marsh milk-vetch	FE/SE 1B.1	Present	Likely
Atriplex coulteri Coulter's saltbush	None/None G3/S1S2 1B.2	May Occur	Unlikely
Atriplex pacifica south coast saltscale	None/None G4/S2 1B.2	May Occur	Unlikely
Chaenactis glabriuscula var. *orcuttiana* Orcutt's pincushion	None/None G5T1T2/S1 1B.1	Likely to Occur	Unlikely

Scientific Name Common Name	Status Fed/State ESA CDFW	Potential to Occur[1]	GDE Association[1]
Chloropyron maritimum ssp. *maritimum* salt marsh bird's-beak	FE/SE G4?T1/S1 1B.2	May Occur	Likely
Lasthenia glabrata ssp. *coulteri* Coulter's goldfields	None/None G4T2/S2 1B.1	May Occur	Likely
Pseudognaphalium leucocephalum white rabbit-tobacco	None/None G4/S2 2B.2	May Occur	Unlikely

[1] Attachment H-2 presents criteria for assessing species' potential to occur and GDE association.

CRPR (California Rare Plant Rank)

1A=Presumed Extinct in California.

1B=Rare, Threatened, or Endangered in California and elsewhere.

2A=Plants presumed extirpated in California, but more common elsewhere.

2B=Plants Rare, Threatened, or Endangered in California, but more common elsewhere.

CRPR Threat Code Extension

.1=Seriously endangered in California (over 80% of occurrences threatened/high degree and immediacy of threat).

.2=Fairly endangered in California (20-80% occurrences threatened).

.3=Not very endangered in California (<20% of occurrences threatened).

CDFW Rare

G1 or S1 = Critically Imperiled Globally or Subnationally (state).

G2 or S2 = Imperiled Globally or Subnationally (state).

G3 or S3 = Vulnerable to extirpation or extinction Globally or Subnationally (state).

G4/5 or S4/5 = Apparently secure, common and abundant.

GNR/SNR= Globally or Subnationally (state) not ranked.

Special Status Wildlife Species

Rincon queried the CNDDB, eBird (Cornell Lab of Ornithology, 2021a), and other literature sources (e.g., Stillwater Sciences 2011; WRA, 2014; Labinger et al., 2011) for occurrences of special status wildlife species within the Ventura, Oxnard, and Saticoy 7.5-minute USGS quadrangles. Based on these queries, thirty-six species were evaluated for their potential to occur within Mound Basin and Area 11 (Attachment H-2). Of these, eight special status plant species have some potential to occur within Area 11. Table H-1 provides a summary of these species, their regulatory status, their potential to occur, and their potential GDE Association.

Table H-2 Special Status Wildlife Species with Potential to Occur within Area 11

Scientific Name Common Name	Status Fed/State ESA CDFW	Potential to Occur[1]	GDE Association[1]
Invertebrates			
Danaus plexippus pop. 1 monarch - California overwintering population	FC/None G4T2T3/S2S3	May Occur (non-roosting)	Indirect
Fish			
Catostomus santaanae Santa Ana sucker	FT/None G1/S1	May Occur	Direct

Scientific Name Common Name	Status Fed/State ESA CDFW	Potential to Occur[1]	GDE Association[1]
Eucyclogobius newberryi tidewater goby	FE/None G3/S3	Present	Direct
Entosphenus tridentatus Pacific lamprey	None/None SSC	Present	Direct
Gila orcuttii arroyo chub	None/None SSC (Non-Native to Santa Clara River)	May Occur	Direct
Oncorhynchus mykiss irideus pop. 10 Southern California DPS steelhead	FE/None	Present	Direct
Amphibians			
Rana draytonii California red-legged frog	FT/None SSC	May Occur	Direct
Reptiles			
Anniella ssp. California legless lizard	None/None G3G4/S3S4 SSC	Likely to Occur	Indirect
Anniella stebbinsi Southern California legless lizard	None/None G3/S3 SSC	Likely to Occur	Indirect
Aspidoscelis tigris stejnegeri coastal whiptail	None/None G5T5/S3 SSC	May Occur	No known dependence on groundwater
Actinemys pallida (Emys marmorata) Southwestern pond turtle	None/None SSC	May Occur	Direct
Phrynosoma blainvillii coast horned lizard	None/None G3G4/S3S4 SSC	May Occur	No known dependence on groundwater
Thamnophis hammondii Two-striped gartersnake	None/None SSC	Likely to Occur	Direct
Birds			
Agelaius tricolor tricolored blackbird	None/ST G1G2/S1S2 SSC	Present	Indirect
Athene cunicularia burrowing owl	None/None G4/S3 SSC	Present	No known dependence on groundwater
Charadrius nivosus western snowy plover	FT/None G3T3/S2 SSC	Present	Indirect
Circus hudsonius northern harrier	None/None G5/S3 SSC	Present	Indirect
Coccyzus americanus occidentalis western yellow-billed cuckoo	FT/SE G5T2T3/S1	May Occur	Indirect

Scientific Name **Common Name**	**Status** **Fed/State ESA** **CDFW**	**Potential to Occur**[1]	**GDE Association**[1]
Elanus leucurus white-tailed kite	None/None G5/S3S4 FP	Present	Indirect
Empidonax traillii extimus Southwestern willow flycatcher	FE/SE	May Occur	Indirect
Falco peregrinus anatum American peregrine falcon	None/ST G3G4T1/S1 FP	Present (foraging)	Indirect
Passerculus sandwichensis beldingi Belding's savannah sparrow	None/SE G5T3/S3	Present	Indirect
Polioptila californica coastal California gnatcatcher	FT/None G4G5T3Q/S2 SSC	Unlikely to Occur	Indirect
Riparia bank swallow	None/ST G5/S2	Present	Indirect
Setophaga petechia Yellow warbler	None/None SSC	Present	Indirect
Sternula antillarum browni California least tern	FE/SE G4T2T3Q/S2 FP	Present	Indirect
Vireo bellii pusillus Least Bell's vireo	FE/SE G5T2/S2	Present	Indirect
Mammals			
Antrozous pallidus pallid bat	None/None G4/S3 SSC	Unlikely to Occur	No known dependence on groundwater

[1] Attachment H-2 presents criteria for assessing species' potential to occur and GDE association.

Fed = Federal
ESA = Endangered Species Act
CDFW = California Department of Fish and Wildlife
FE = Federally Endangered
FT = Federally Threatened
SSC= CDFW Species of Special Concern
SE = State Endangered
ST = State Threatened
SCE = State Candidate Endangered
FP = State Fully Protected

Ecological Value

The Area 11 GDE Unit includes the lower Santa Clara River and the SCRE and has a high ecological value. This area includes federally designated critical habitat for southern California DPS steelhead, southwestern willow flycatcher, tidewater goby, and western snowy plover. The estuary also provides known or potential habitat for eight special status plant species and 28 special status wildlife species (Tables H-1 and H-2), in addition to providing habitat for numerous other species. The SCRE is a highly productive ecosystem that provides important foraging, breeding, rearing, and migration habitat for shore birds, fishes, and other wildlife species.

Consideration of Area 11 GDE in the GSP

It is important to note that there is no groundwater extraction from the shallow groundwater of the Shallow Alluvial Deposits. In addition, Appendix G to the GSP explains that the Santa Clara River and its estuary and groundwater in the Shallow Alluvial Deposits are not material affected by pumping in the principal aquifers. Given the lack of potential for significant impacts to the GDEs by principal aquifer pumping, there are no potential impacts to the Area 11 GDE that need to be considered in the development of sustainable management criteria for the principal aquifers. However, MBGSA will monitor well permit applications for proposed uses of shallow groundwater in the vicinity of Area 11. If any shallow wells are proposed, MBGSA will evaluate impacts to the Area 11 GDEs. Proposed uses that would have a significant impact to Area 11 GDEs may be required to mitigate those impacts as a condition of MBGSA permit approval.

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_____. 1904. Topographic Map of the Hueneme 15' Quadrangle.

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Figures

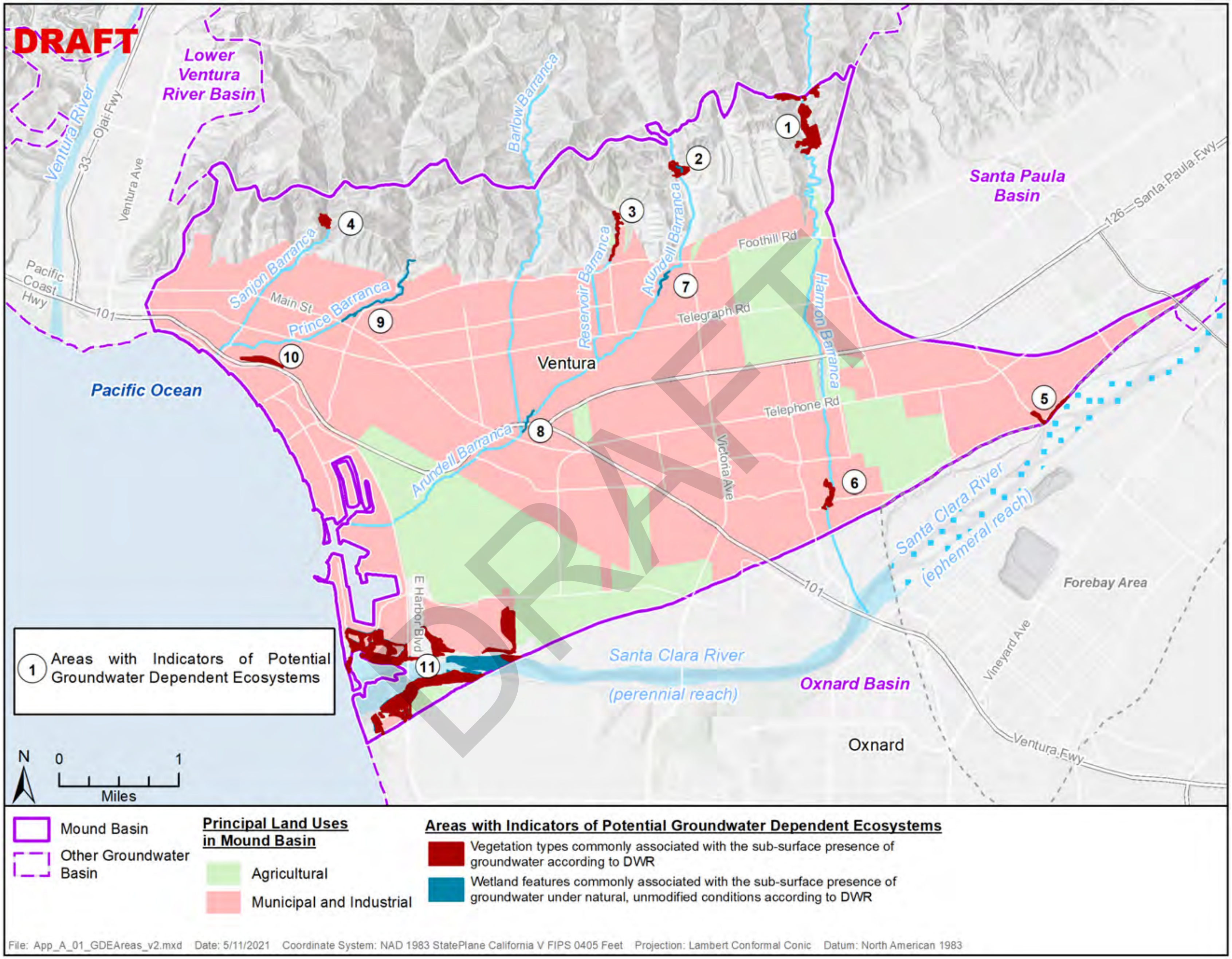


Figure H-1 Map of Areas with Indicators of Potential Groundwater Dependent Ecosystems.

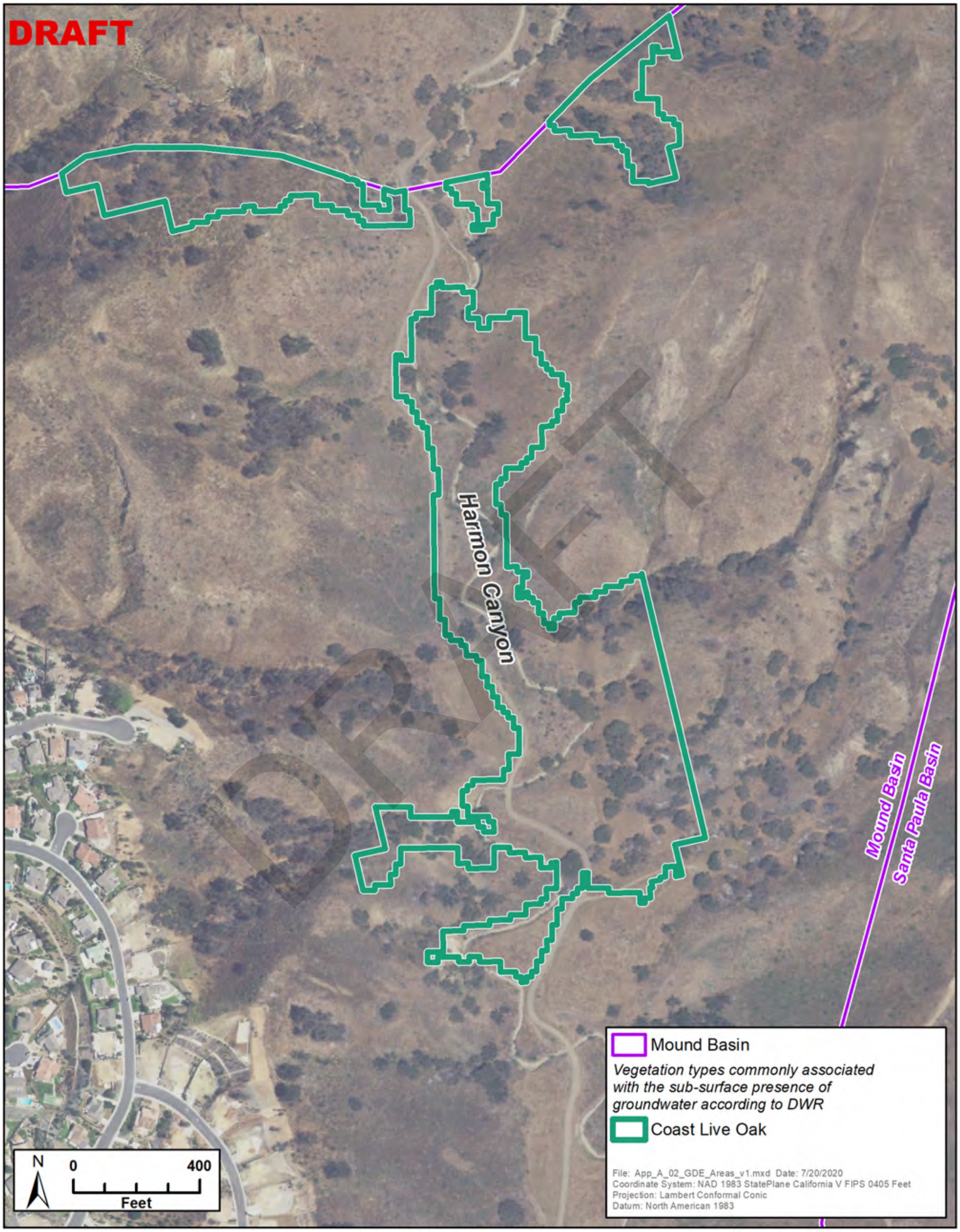


Figure H-2 Potential GDE Area 1.

Figure H-3 Potential GDE Area 2.

Figure H-4 Potential GDE Area 3.

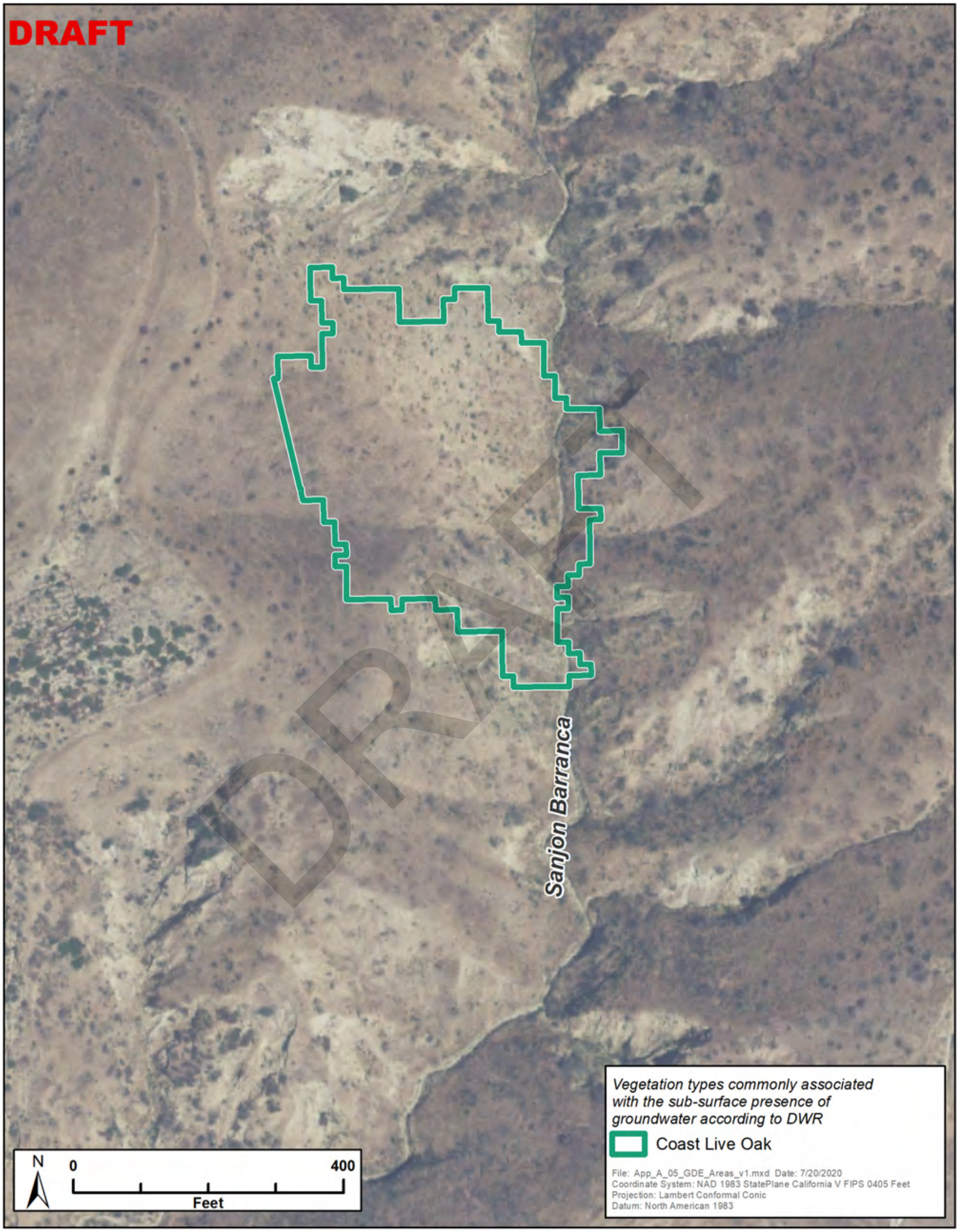


Figure H-5 Potential GDE Area 4.

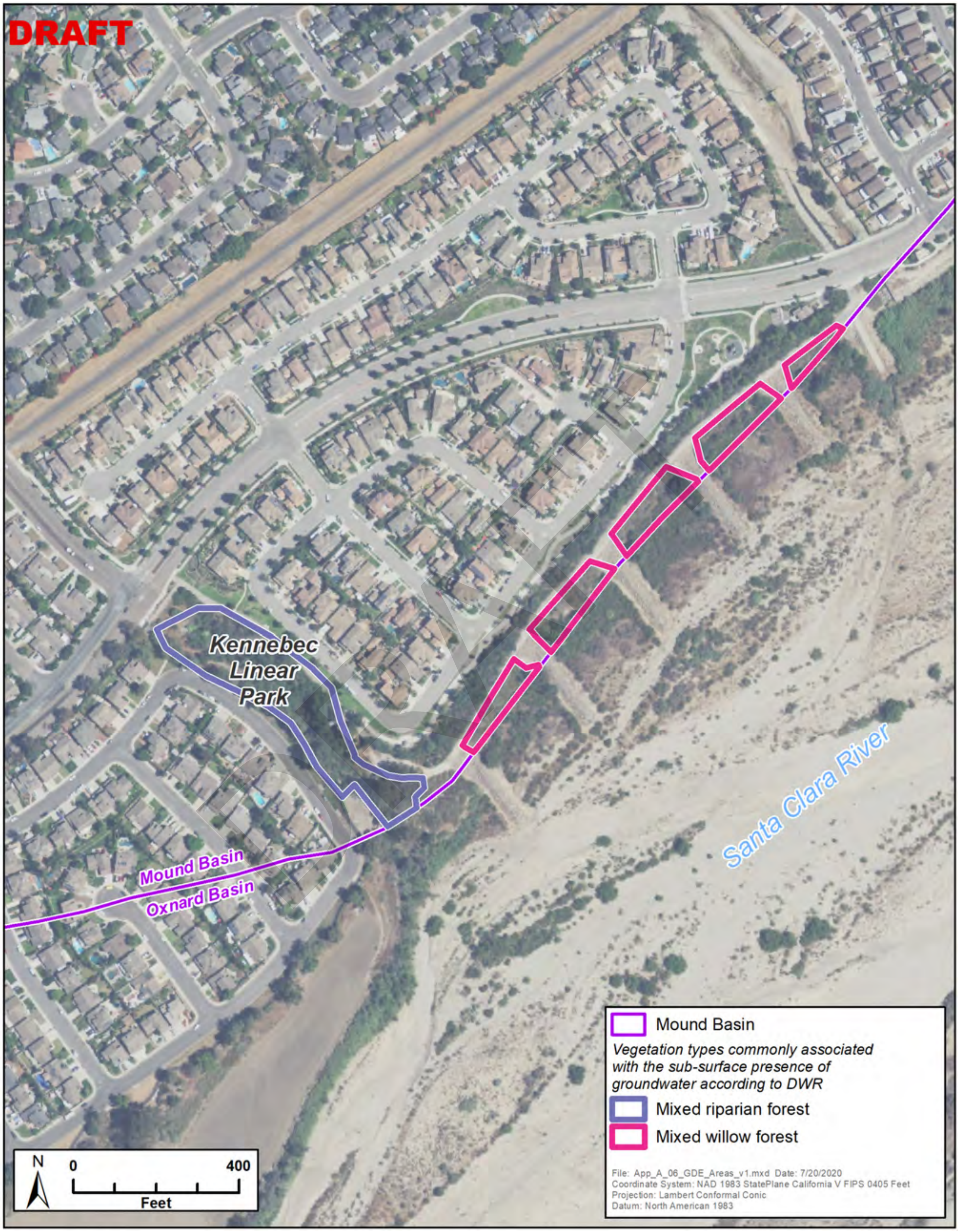


Figure H-6 Potential GDE Area 5.

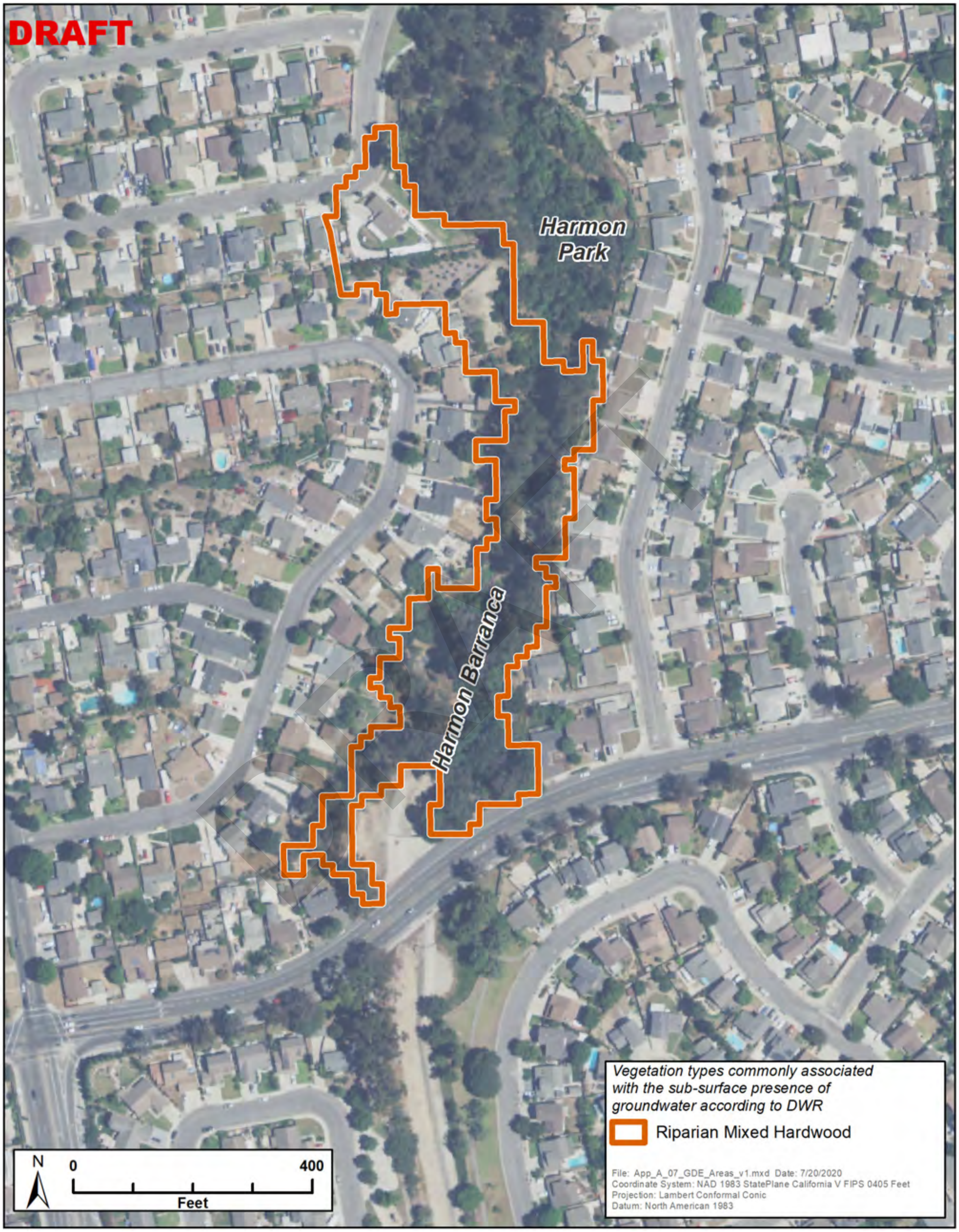


Figure H-7 Potential GDE Area 6.

Figure H-8 Potential GDE Area 7.

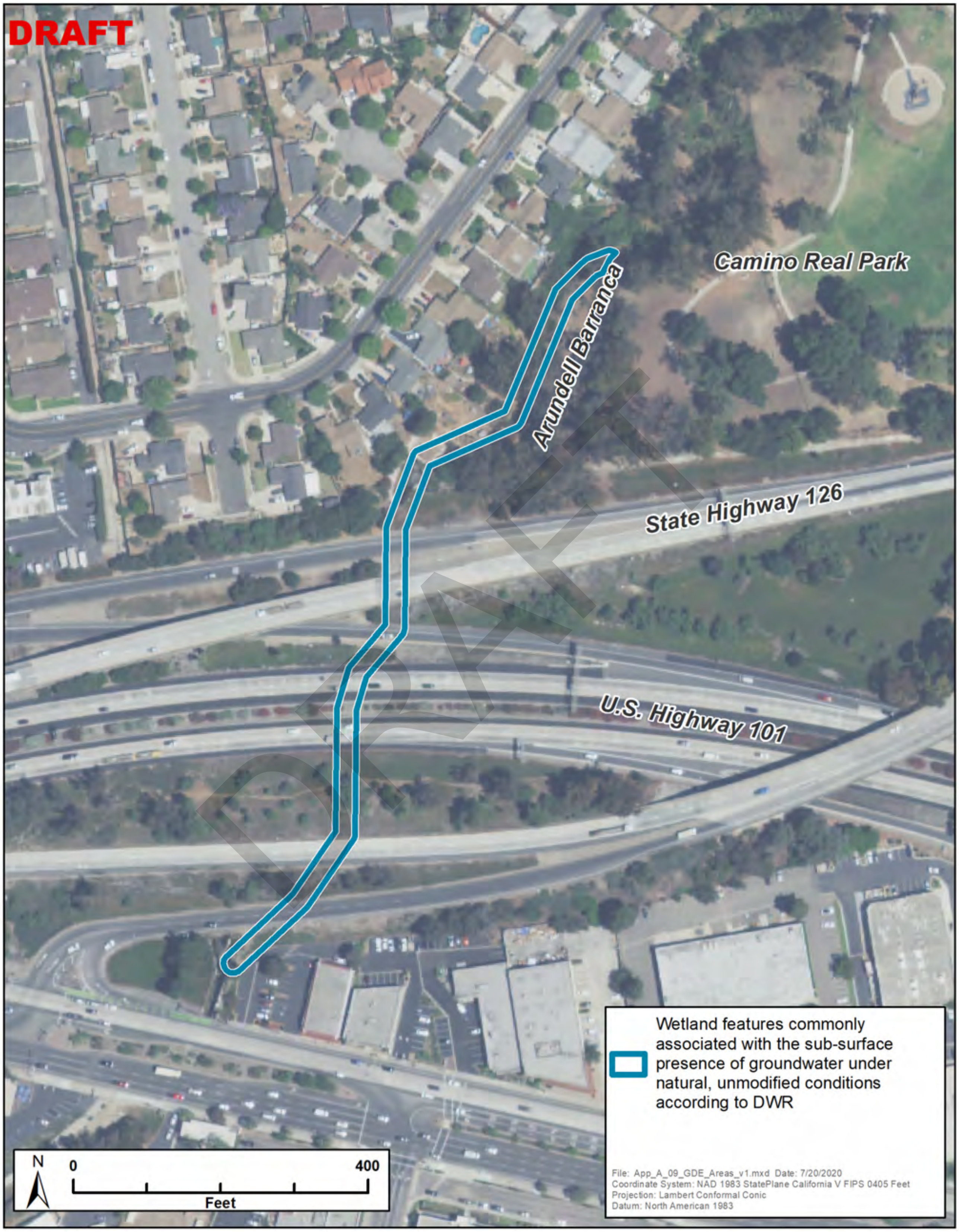


Figure H-9 Potential GDE Area 8.

Figure H-10 Potential GDE Area 9.

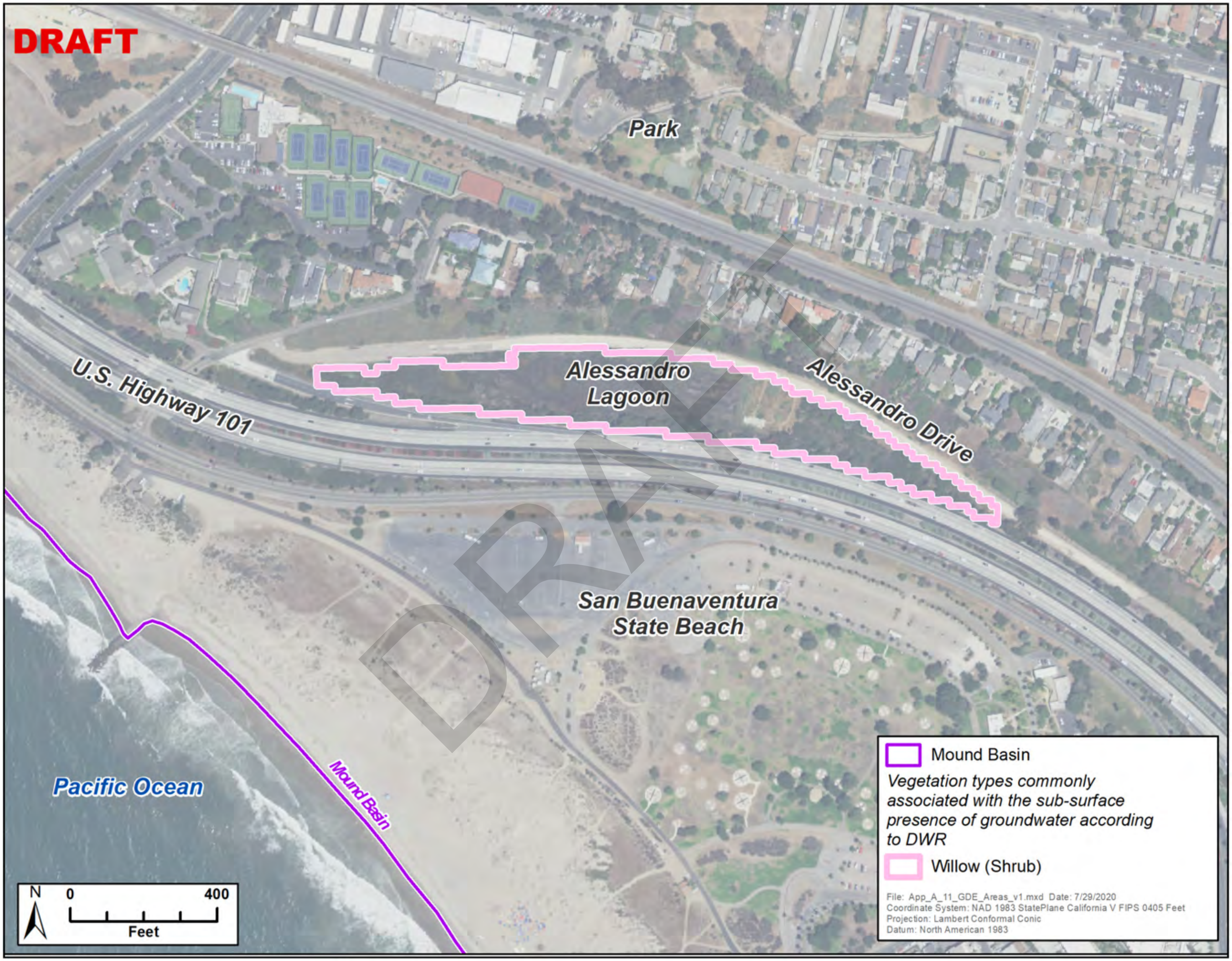


Figure H-11 Potential GDE Area 10.

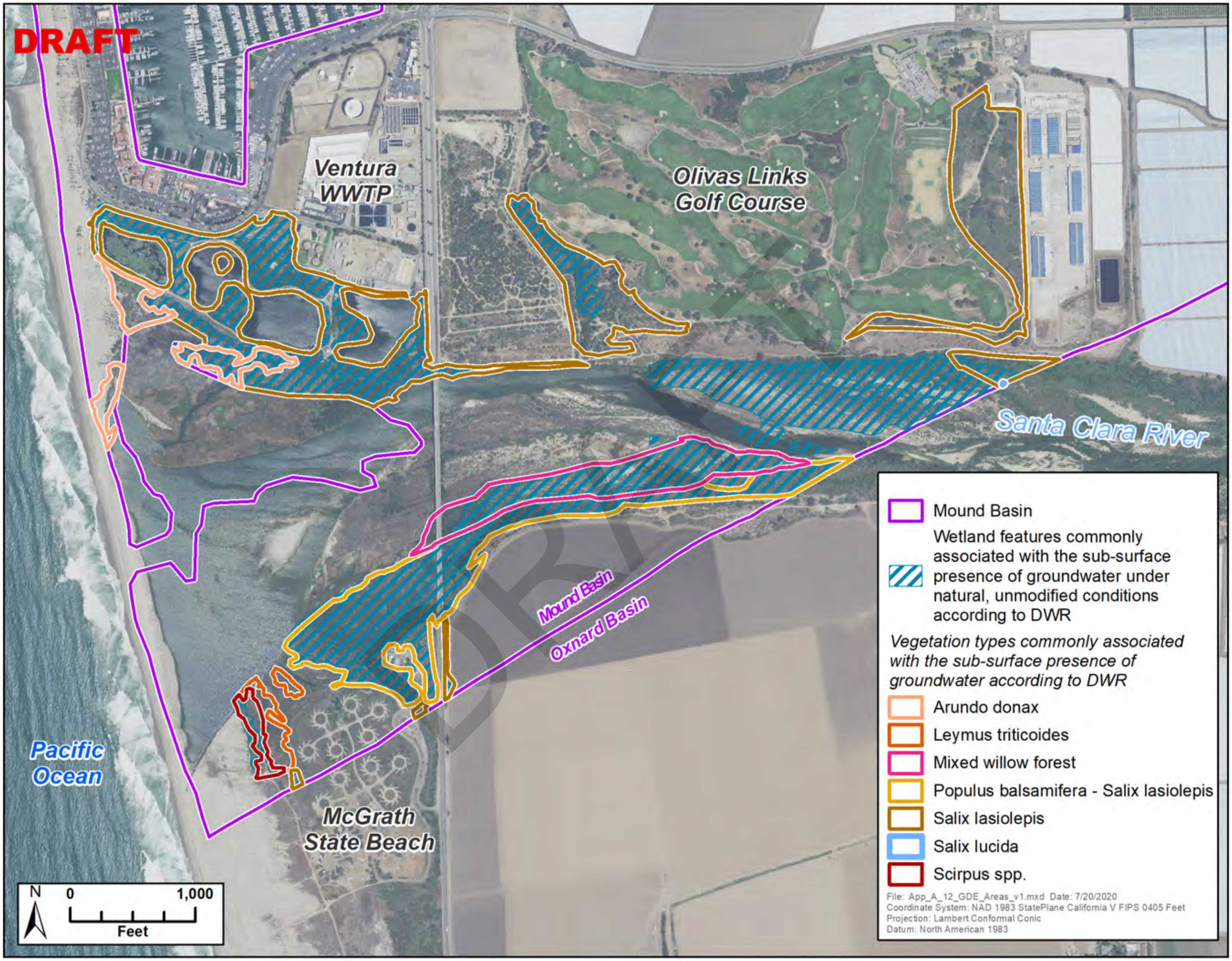
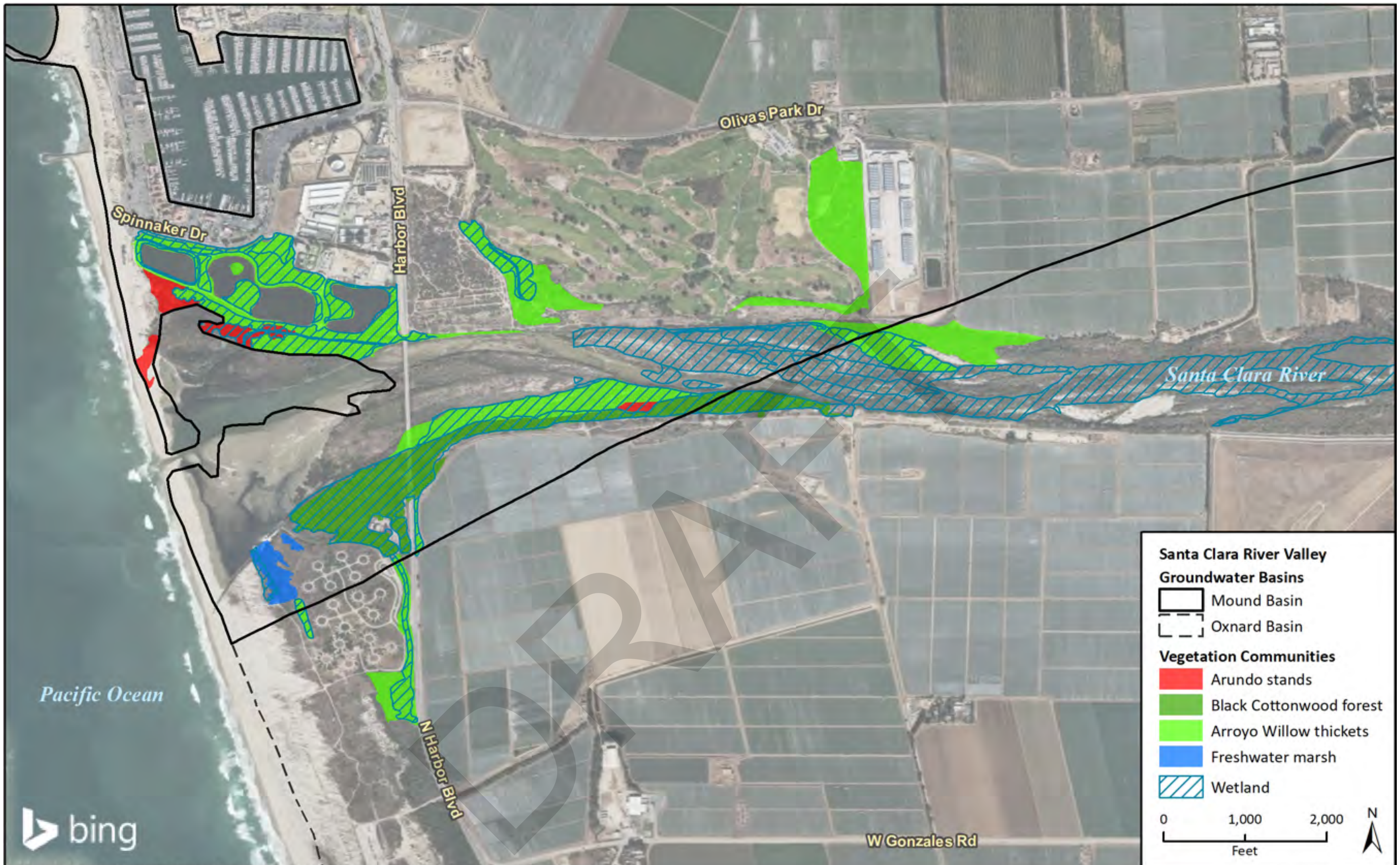


Figure H-12 Potential GDE Area 11.



Imagery provided by Microsoft Bing and its licensors © 2021.
Additional data provided by California Natural Resources Agency (CNRA), 2020

Figure H-13 Area 11 Vegetation Communities with Potential to be Groundwater Dependent.

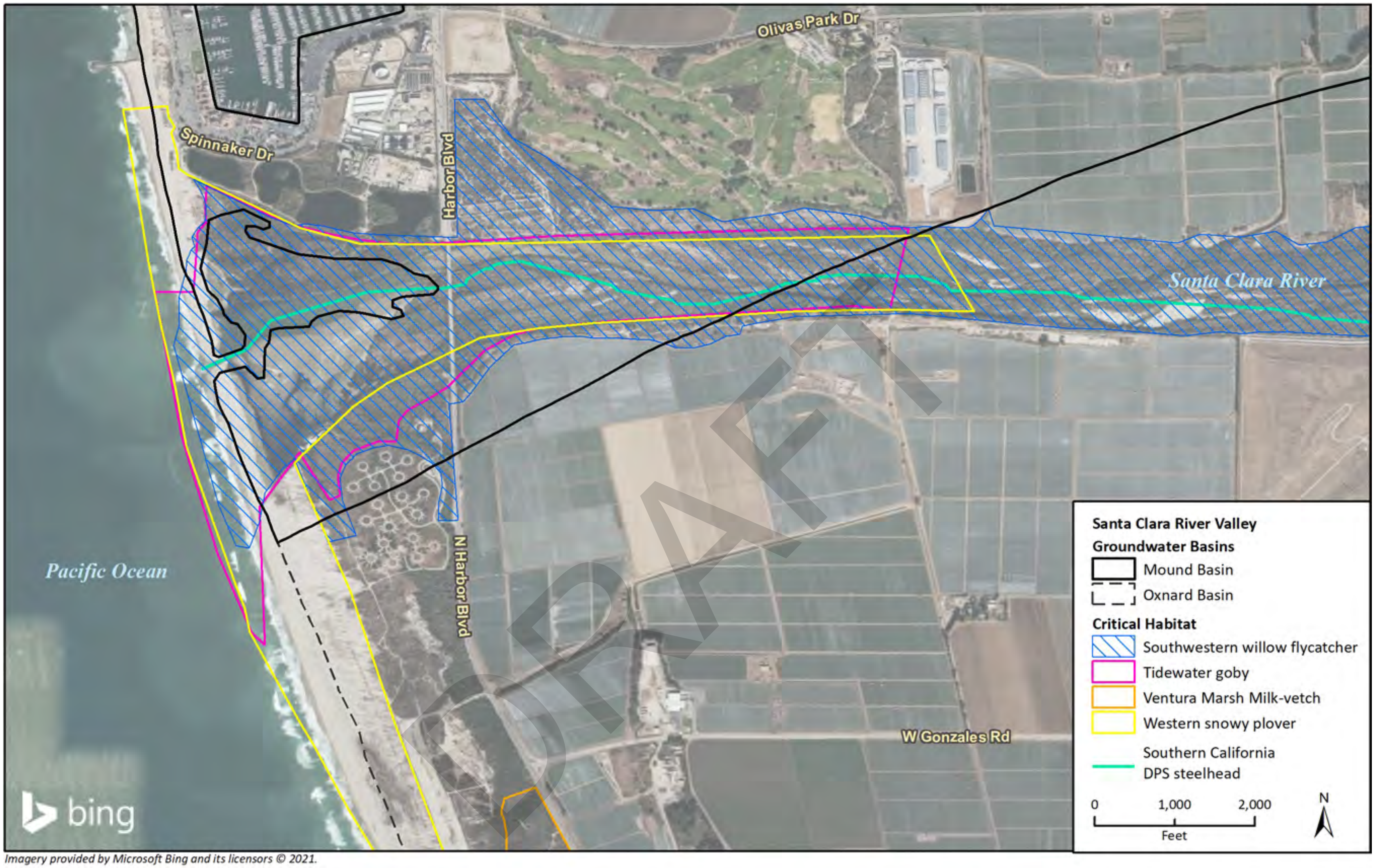
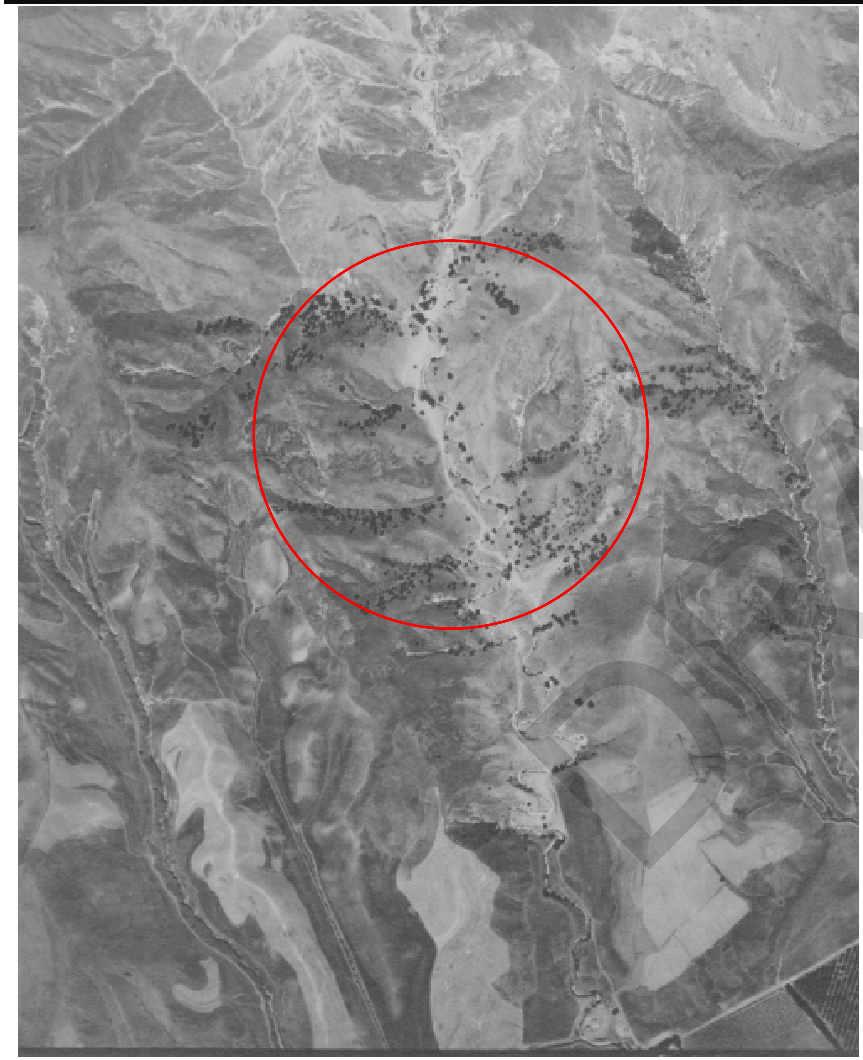


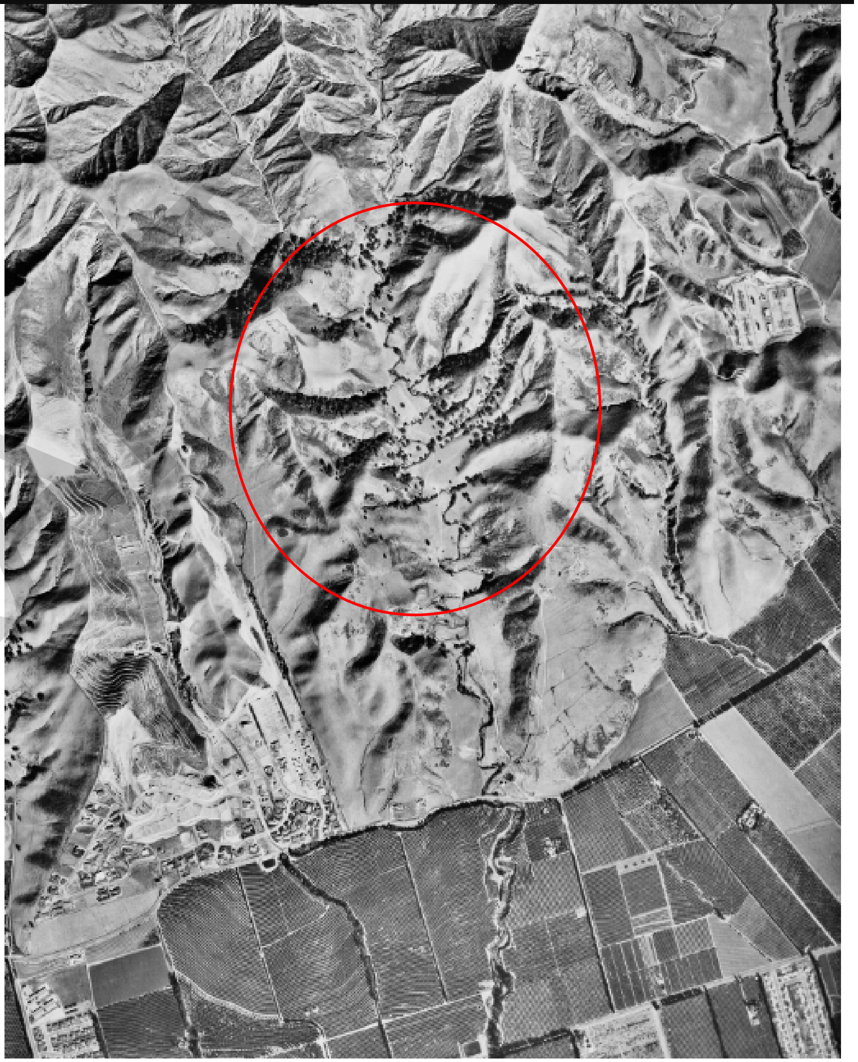
Figure H-14 Area 11 Critical Habitat.

Attachment H-1. Historic Photo Plate for Areas 1 – 10

Area 1 (1927, 1959, 1964, 2021)



Photograph 1. Area 1, 1927



Photograph 2. Area 1, 1959

Photograph 3. Area 1, 1964

Photograph 4. Area 1, 2021

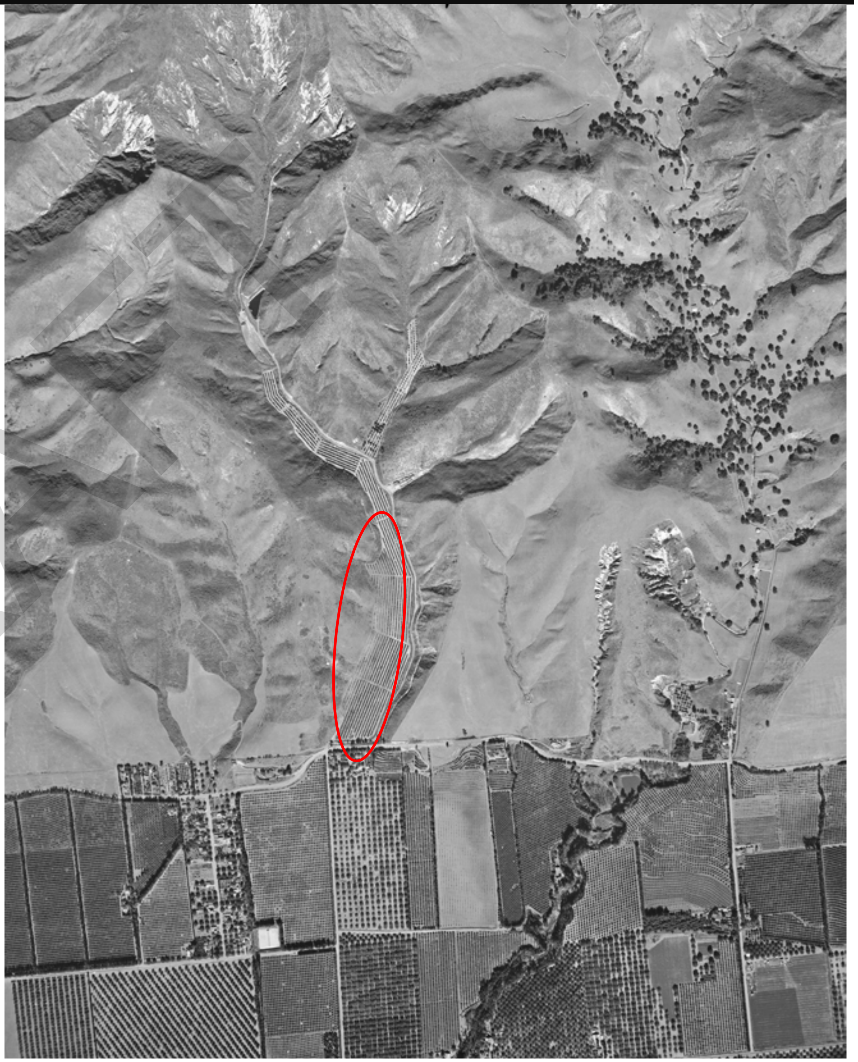
Area 2 (1958,2021)

Photograph 5. Area 2, 1958

Photograph 6. Area 2, 2021

Area 3 (1927, 1945, 1963, 2021)

Photograph 7. Area 3, 1927

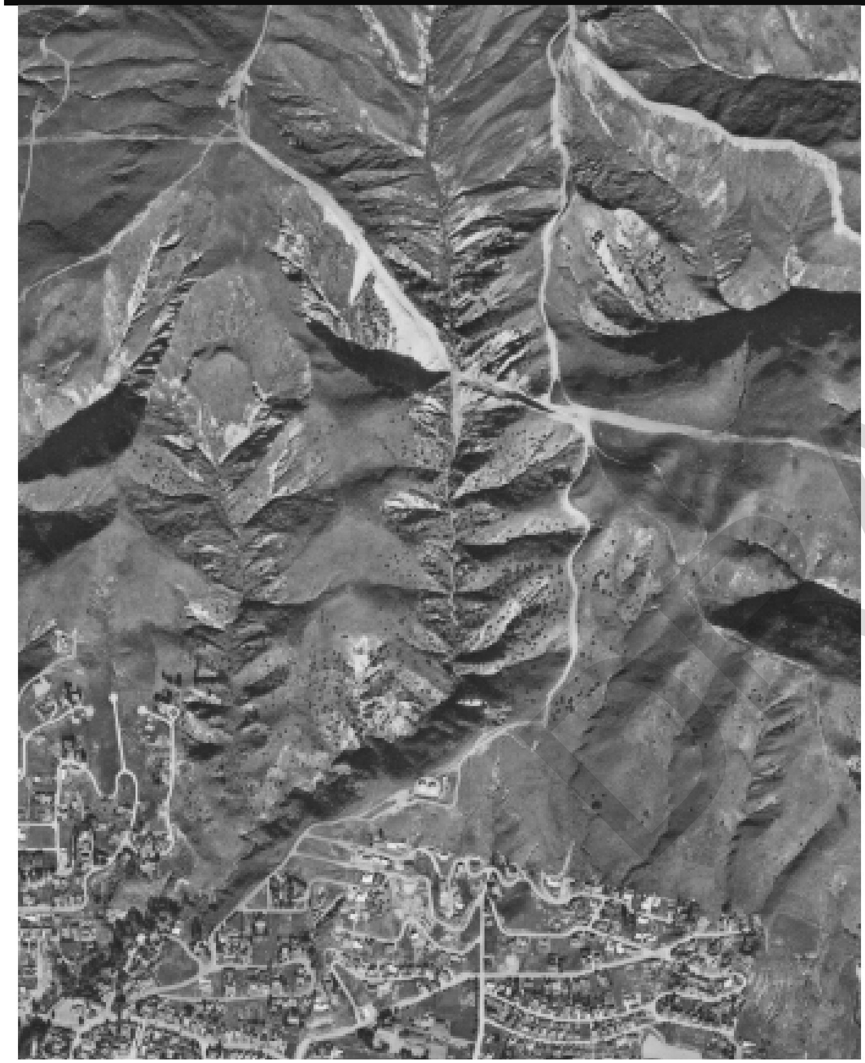


Photograph 8. Area 3, 1945

Photograph 9. Area 3, 1963

Photograph 10. Area 3, 2021

Area 4 (1927, 2021)



Photograph 11. Area 4, 1927

Photograph 12. Area 4, 1996

Photograph 13. Area 4, 2009

Photograph 14. Area 4, 2021

Area 5 (1945, 1958, 1970, 2021)

Photograph 15. Area 5, 1945

Photograph 16. Area 5, 1958

Photograph 17. Area 5, 1970

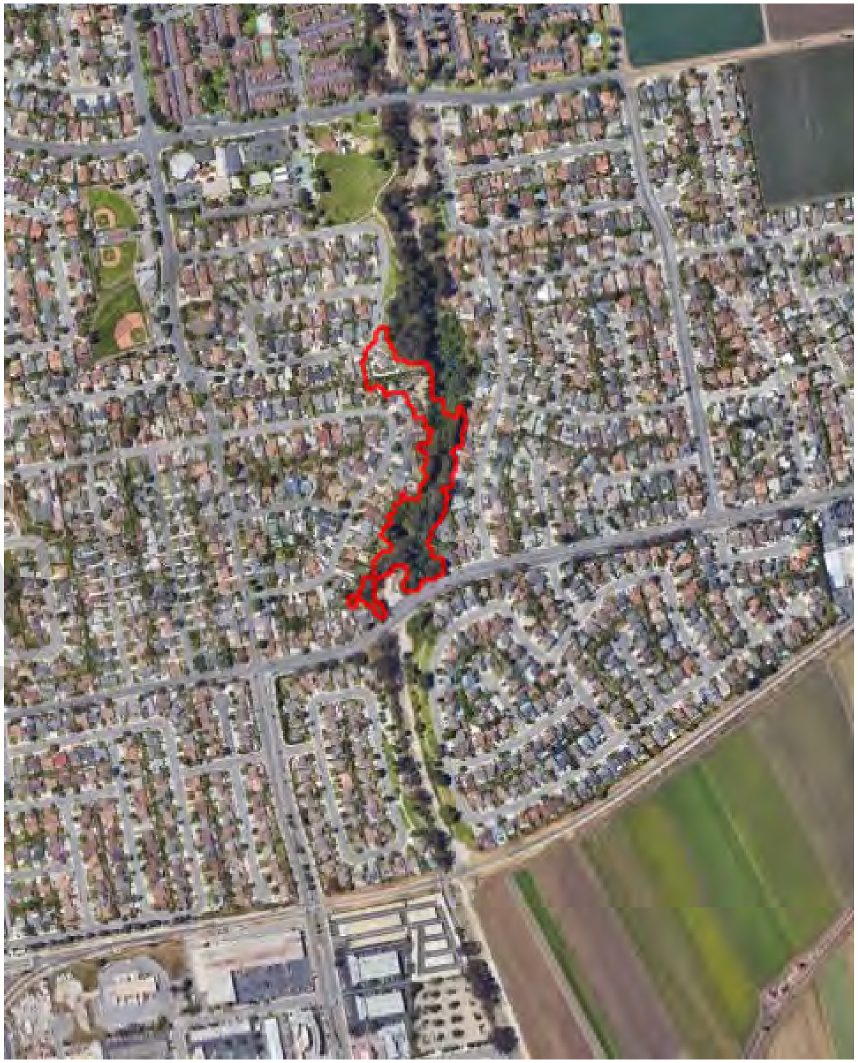
Photograph 18. Area 5, 2021

Area 6 (1927, 1947, 1963, 2021)

Photograph 19. Area 6, 1927

Photograph 20. Area 6, 1947

Photograph 21. Area 6, 1963



Photograph 22. Area 6, 2021

Area 7 (1938, 1961, 1994, 2021)

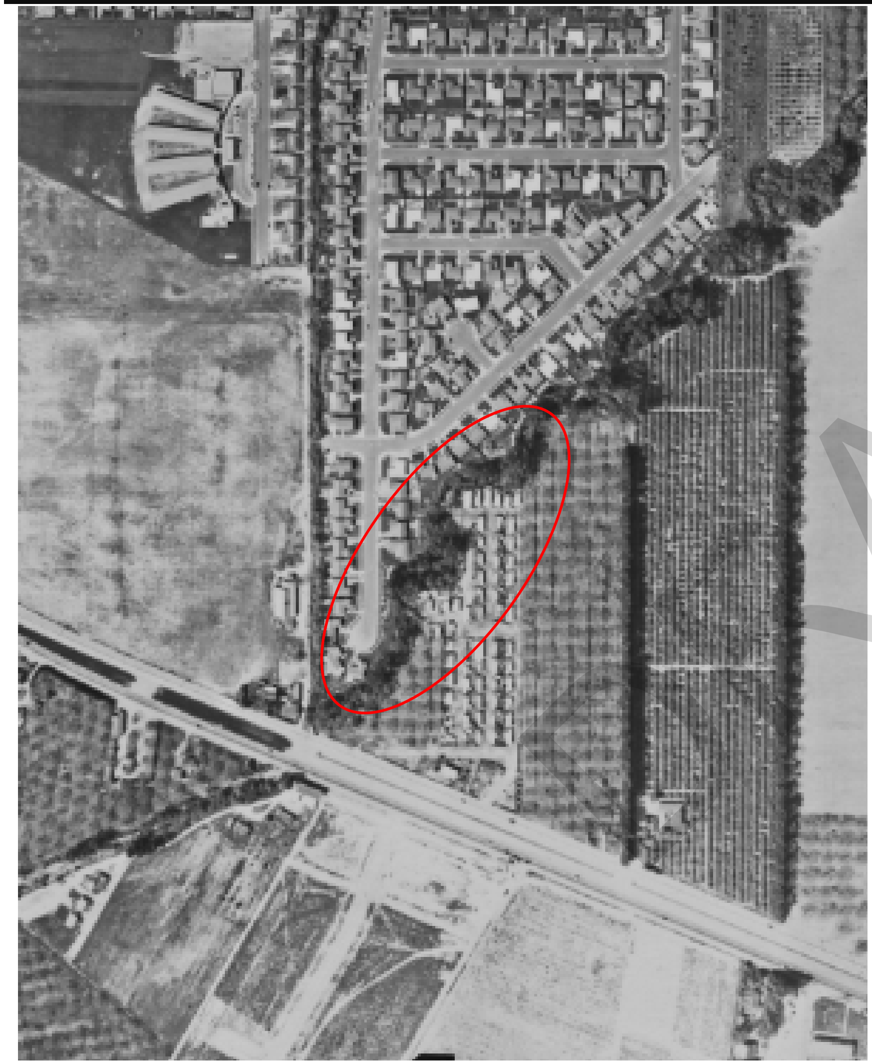
Photograph 23. Area 7, 1938

Photograph 24. Area 7, 1961

Photograph 25. Area 7, 1994

Photograph 26. Area 7, 2021

Area 8 (1958, 2021)



Photograph 27. Area 8, 1958

Photograph 28. Area 8, 2021

Area 9 (1938, 1958, 1968, 2021)

Photograph 29. Area 9, 1938

Photograph 30. Area 9, 1958

Photograph 31. Area 9, 1968

Photograph 32. Area 9, 2021

Area 10 (1959, 1964, 1994, 2021)

Photograph 33. Area 10, 1959

Photograph 34. Area 10, 1964

Photograph 35. Area 10, 1994

Photograph 36. Area 10, 2021

Attachment H-2. Evaluation of Special Status Species with Potential to Occur in Mound Basin and Area 11

Evaluation of Special Status Species with Potential to Occur in Mound Basin and Area 11

Data Sources

Rincon queried the following databases for information on special status species and sensitive natural communities with documented occurrences within Mound Basin:

- California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB, CDFW 2021a)
- California Native Plant Society Online Inventory of Rare and Endangered Plants of California (CNPS, 2021)
- Calflora Database (Calflora, 2021)
- eBird Online Database of Bird Distribution and Abundance (Cornell Lab of Ornithology, 2021a)
- California Freshwater Species Database (TNC, 2020)
- VegCAMP (CDFW, 2021d)

Rincon reviewed additional literature for information on special status species and sensitive natural communities with potential to occur within Mound Basin and Area 11, including the following sources:

- CDFW Special Animals List (CDFW, 2021b)
- CDFW Special Vascular Plants, Bryophytes, and Lichens List (CDFW, 2021e)
- CDFW Sensitive Natural Communities List (CDFW, 2021c)
- All About Birds Online Bird Guide (Cornell Lab of Ornithology, 2021b)
- A Manual of California Vegetation, Second Edition, California Native Plant Society (CNPS, 2009)
- Estuary Subwatershed Study Assessment of the Physical and Biological Condition of the Santa Clara River Estuary (Stillwater Sciences, 2011)
- Biological Resources Technical Report, Santa Clara River Estuary Habitat Restoration Project (WRA, 2014)

Evaluation Criteria

The following criteria were used to evaluate the potential for special status species to occur, as well as their potential dependency on groundwater. Due to the presence of important habitat for special status species within and around the SCRE, as well as the uncertainty of material connection of the surface water and shallow groundwater to the managed aquifer, Area 11 was specifically assessed for special status species potential to occur.

- **Present.** The species has been observed by a qualified local biologist within the basin/Area 11 within the past five years and/or has a documented occurrence within the basin within the past five years.

- **Likely to Occur.** Suitable habitat is present within the basin/Area 11 and there are documented occurrences within the basin/Area 11 (or nearby locations with similar habitat) within the past ten years.
- **May Occur.** Some suitable habitat currently exists within the basin/Area 11 and/or there are documented occurrences in the vicinity within the past 20 years.
- **Unlikely to Occur.** Only marginally suitable habitat for the species exists within the basin/Area 11 and/or there are no documented occurrences of the species within basin in the past 30 years.
- **Not Expected.** No suitable habitat for the species exists within the basin/Area 11, the species is considered extirpated in the region, and/or there are no documented occurrences of the species within the basin in the past 30 years.

Special status plant species were classified as either **likely** or **unlikely** to depend on groundwater, and therefore be associated with a Groundwater Dependent Ecosystem (GDE), based on rooting depths, habitat and water requirements, current distribution within the basin and/or the location of documented occurrences within the basin, and depth to water data within areas of documented occurrences.

Wildlife and fish species were evaluated for potential groundwater dependence based on determinations from the Critical Species Lookbook (Rohde et al., 2019) and by evaluating known habitat preferences, life histories, and diets. Species GDE associations were assigned one of three categories:

- **Direct.** Species directly dependent on groundwater for some or all water needs (e.g., juvenile steelhead in dry season).
- **Indirect.** Species dependent upon other species that rely on groundwater for some or all water needs (e.g., riparian birds).
- **No known reliance on groundwater.**

-

Special Status Species Within the Regional Vicinity of Mound Basin

Scientific Name Common Name	Status	Potential to Occur within Mound Basin	Habitat Requirements and Documented Occurrences within Mound Basin	GDE Association	Potential to Occur within Area 11 of Mound Basin
Plants					
Aphanisma blitoides aphanisma	None/None G3G4/S2 1B.2	Likely to Occur	Coastal bluff scrub, Coastal dunes, Coastal scrub. On bluffs and slopes near the ocean in sandy or clay soils. 1-305m. Blooms Feb-Jun. There is one documented occurrence of the species approximately 2.5 miles northwest of Mound Basin, near Conoco Oil Road (Calflora 2021). Some suitable habitat for the species occurs within Mound Basin and Area 11.	Unlikely	Likely to Occur
Astragalus didymocarpus var. milesianus Miles' milk-vetch	None/None 1B.2	Not Expected	Annual herb. 50-385 m elevation. Occurs in coastal scrub with clay soils. Blooms Mar-Jun. There is one historic occurrence (from 1945) of the species documented approximately 5.5 miles northwest of Mound Basin along Casitas Road, near Casitas Lake (Calflora 2021). Some coastal scrub habitat occurs within the northwestern portion of Mound Basin, but no suitable habitat for the species occurs within Area 11.	Unlikely	Not Expected
Astragalus pycnostachyus var. *lanosissimus* Ventura Marsh milk-vetch	FE/SE 1B.1	Present	Perennial herb. 1-35 m elevation. Occurs in marshes and swamps, coastal dunes, coastal scrub. Within reach of high tide or protected by barrier beaches, more rarely near seeps on sandy bluffs. Blooms Jul-Oct. There are two documented occurrences in Mound Basin, within the SCRE (Calflora 2021). Critical habitat for the species occurs approximately 0.7 mile south of the basin.	Likely	Present

Scientific Name Common Name	Status	Potential to Occur within Mound Basin	Habitat Requirements and Documented Occurrences within Mound Basin	GDE Association	Potential to Occur within Area 11 of Mound Basin
Atriplex coulteri Coulter's saltbush	None/None G3/S1S2 1B.2	Likely to Occur	Coastal bluff scrub, Coastal dunes, Coastal scrub, valley and foothill grassland. Ocean bluffs, ridgetops, as well as alkaline low places. Alkaline or clay soils. 3-460m. Blooms Mar-Oct. There is one documented occurrence of the species approximately 1.5 miles southwest of the basin (Calflora 2021). Suitable habitat for the species occurs throughout undisturbed portions of the basin and within dune habitat near Area 11.	Unlikely	May Occur
Atriplex pacifica south coast saltscale	None/None G4/S2 1B.2	May Occur	Coastal bluff scrub, Coastal dunes, Coastal scrub, Playas. Alkali soils. 0-140m. Blooms Mar-Oct. Some suitable habitat for the species occurs within the basin, but there is only one historical occurrence (from 1963) documented within ten miles (Calflora 2021). Potentially suitable habitat exists within Area 11 in the foredunes and on the fringes of the estuary.	Unlikely	May Occur
Atriplex serenana var. *davidsonii* Davidson's saltscale	None/None G5T1/S1 1B.2	Unlikely to Occur	Annual herb. Blooms April to October. Coastal bluff scrub, coastal scrub. Alkaline soil. 3-250m (10-820ft). One occurrence of the species was documented in 2001 within the Oxnard USGS quad, southeast of the basin (Calflora 2021). Suitable habitat for the species occurs within the basin, but not within Area 11.	Unlikely	Not Expected
Calochortus fimbriatus Late-flowered mariposa lily	None/None 1B.3	May Occur	Perennial bulbiferous herb. 270-1435 m. Occurs chaparral, cismontane woodland, and riparian woodland in dry, open areas on serpentine soils. Blooms Jun-Aug. Some potentially suitable habitat for the species occurs in the northern portion of the basin, but does not exist within Area 11. The species is documented within the Ventura USGS quad. (Calflora 2021).	Unlikely	Not Expected

Scientific Name Common Name	Status	Potential to Occur within Mound Basin	Habitat Requirements and Documented Occurrences within Mound Basin	GDE Association	Potential to Occur within Area 11 of Mound Basin
Chaenactis glabriuscula var. *orcuttiana* Orcutt's pincushion	None/None G5T1T2/S1 1B.1	Likely to Occur	Coastal bluff scrub, Coastal dunes. Sandy sites. 0-100m. Blooms Jan-Aug. The species is documented within the Ventura USGS quadrangle and within McGrath State Beach (Calflora 2021). Suitable habitat for the species occurs within Mound Basin and Area 11.	Unlikely	Likely to Occur
Chloropyron maritimum ssp. *maritimum* salt marsh bird's-beak	FE/SE G4?T1/S1 1B.2	May Occur	Occurs in coastal dunes and coastal salt marshes and swamps. This species blooms between May and October, and typically occurs at elevations ranging from 0-30 meters. Suitable habitat for the species occurs within Mound Basin and Area 11. One occurrence of the species was documented within McGrath State Beach in 2005 (Calflora 2021).	Likely	May Occur
Lasthenia glabrata ssp. *coulteri* Coulter's goldfields	None/None G4T2/S2 1B.1	May Occur	Annual herb. Blooms February to June. Coastal salt marshes, playas, valley and foothill grassland, vernal pools. Usually found on alkaline soils in playas, sinks, and grasslands. 1-1400m (3-4595ft).The species is documented within the Ventura USGS quadrangle (Calflora 2021).	Likely	May Occur
Malacothrix similis Mexican malacothrix	None/None G2G3/SH 2A	Not Expected	Coastal dunes. 0-40m. Blooms Apr-May. One historic occurrence of the species was documented near Port Hueneme in 1925 (Calflora 2021). Some suitable habitat for the species occurs within Mound Basin and Area 11, though the species is considered possibly extirpated in the region (CDFW 2021a).	Unlikely	Not Expected
Monardella hypoleuca ssp. *hypoleuca* White-veined monardella	None/None 1B.3	Unlikely to Occur	Perennial herb. 50-1280 m. Occurs in chaparral and cismontane woodland on dry slopes. 50-1280 m. Blooms Apr-Nov. Potentially suitable habitat occurs within the northern portion of the basin, but no chaparral or cismontane woodland occurs within Area 11.	Unlikely	Not Expected

Scientific Name Common Name	Status	Potential to Occur within Mound Basin	Habitat Requirements and Documented Occurrences within Mound Basin	GDE Association	Potential to Occur within Area 11 of Mound Basin
Navarretia ojaiensis Ojai navarretia	None/None 1B.1	Unlikely to Occur	Annual herb. 275-620 m. elevation. Occurs in openings in chaparral and coastal scrub, and in valley and foothill grasslands. Blooms May-Jul. Suitable habitat for the species is present in the northern portion of the basin, but Area 11 is lower than the elevation range of the species.	Unlikely	Not Expected
Pseudognaphalium leucocephalum white rabbit-tobacco	None/None G4/S2 2B.2	Likely to Occur	Chaparral, Cismontane woodland, Coastal scrub, Riparian woodland. Sandy, gravelly sites. 0-2100m. Blooms (Jul) AuH-Nov (Dec). Multiple occurrences of the species are documented within one mile of Mound Basin, within both coastal and upland habitat (Calflora 2021).	Unlikely	May Occur
Invertebrates					
Bombus crotchii Crotch bumble bee	None/SCE	Not Expected	Occurs in coastal California east to the Sierra-Cascade crest and south into Mexico. Food plant genera include: *Antirrhinum, Phacelia, Clarkia, Dendromecon, Eschscholzia,* and *Eriogonum.* Suitable plant food genera are not abundant within Mound Basin.	No known dependence on groundwater	Not Expected
Danaus plexippus pop. 1 monarch - California overwintering population	FC/None G4T2T3/S2S3	Present	Winter roost sites extend along the coast from northern Mendocino to Baja California, Mexico. Roosts located in wind-protected tree groves (eucalyptus, Monterey pine, cypress), with nectar and water sources nearby. Multiple roosting sites are documented within the boundaries of Mound Basin (Xerces Society 2021), though none occur within Area 11. While individual monarchs may pass through Area 11, suitable roosting habitat for the species does not occur within the estuary area.	Indirect	May Occur (non-roosting)

Scientific Name Common Name	Status	Potential to Occur within Mound Basin	Habitat Requirements and Documented Occurrences within Mound Basin	GDE Association	Potential to Occur within Area 11 of Mound Basin
Fish					
Catostomus santaanae Santa Ana sucker	FT/None G1/S1	May Occur	The Santa Ana sucker is found in the Los Angeles, San Gabriel, and Santa Ana watersheds of Southern California, where it is considered native. The species is also found in the Santa Clara River Watershed, though during the recovery planning process there was uncertainty as to whether the species was native to the Santa Clara River. The Santa Clara River population is therefore not currently protected by the USFWS (USFWS 2014). Genetic research conducted by Richmond et al. (2017) later verified the species is most likely native to the Santa Clara River. However, the species remains unprotected by the USFWS in the Santa Clara River. These fish are habitat generalists, but prefer sand-rubble-boulder bottoms, cool, clear water, and algae. Santa Ana suckers are known to occur within the Santa Clara River (CDFW 2021a, Richmond et al. 2017). The species is unlikely to inhabit brackish water within the estuary but may occur within the eastern portions of Area 11, upstream of the saltwater interface.	Direct	May Occur
Eucyclogobius newberryi tidewater goby	FE/None G3/S3	Present	Tidewater gobies occur within brackish water habitats along the California coast from Agua Hedionda Lagoon, San Diego County to the mouth of the Smith River in Del Norte County. Found in shallow lagoons and lower stream reaches, they need fairly still but not stagnant water and high oxygen levels and salinities typically between 12 and 28 ppt. Tidewater goby are present within the SCRE (USFWS 2005). Critical habitat for tidewater goby exists within the SCRE and falls within the basin and Area 11.	Direct	Present

Scientific Name Common Name	Status	Potential to Occur within Mound Basin	Habitat Requirements and Documented Occurrences within Mound Basin	GDE Association	Potential to Occur within Area 11 of Mound Basin
Entosphenus tridentatus Pacific lamprey	None/None SSC	Present	Occurs in freshwater systems and requires adequate flows for migration, suitable substrate (i.e., gravels) for spawning, and adequate cover for pre-spawning holding. Juveniles (called ammocoetes) spend an extended period of time (between four and ten years) rearing while burrowed in sediments filter feeding on organic material and require suitable cover, flow, foraging conditions, and cool temperatures. Juvenile migrant (called macropthalmia) emigration (i.e., outmigration to the ocean) requires water conditions suitable for migration (i.e., water velocity and water depth, dissolved oxygen levels within the surface water, and water temperature suitable for passage). The lower Santa Clara River serves primarily as a migration corridor for Pacific lamprey (Puckett and Villa 1985). Adults, as well as macropthalmia and ammocoetes, have been captured at the Vern Freeman Diversion, which is located approximately 10 miles upstream of the SCRE. However, only a few ammocoetes have been observed within the river basin in recent years (Swift and Howard 2009). Pacific lamprey could be present within Mound Basin and Area 11, especially when the estuary is open to the ocean and immigration and emigration can occur.	Direct	Present
Gasterosteus aculeatus williamsoni unarmored threespine stickleback	FE/SE G5T1/S1 FP	Not Expected	Weedy pools, backwaters, and among emergent vegetation at the stream edge in small Southern California streams. Cool (<24 C), clear water with abundant vegetation. The species range is now restricted to a 14 km stretch of the Soledad Canyon portion of the Upper Santa Clara River and upper San Francisquito Canyon (USFWS 1985, Buth et al. 1984). The species is therefore present upstream of Mound Basin but is not expected to occur within the basin.	Direct	Not Expected

Scientific Name Common Name	Status	Potential to Occur within Mound Basin	Habitat Requirements and Documented Occurrences within Mound Basin	GDE Association	Potential to Occur within Area 11 of Mound Basin
Gila orcuttii arroyo chub	None/None SSC (Non-Native to Santa Clara River)	May Occur	Native to streams from Malibu Creek to San Luis Rey River basin. Introduced into streams in Santa Clara, Ventura, Santa Ynez, Mojave & San Diego river basins. Inhabits slow water stream sections with mud or sand bottoms. Feeds heavily on aquatic vegetation and associated invertebrates. Known to be common and widely distributed in some of the streams in which it was introduced, including the Santa Clara River (CDFW 2015, Nautilus 2005). While this fish is a SSC, the Santa Clara River is not currently considered part of its native range. The species is unlikely to inhabit brackish water within the estuary but may occur within the eastern portions of Area 11, upstream of the saltwater interface.	Direct	May Occur
Oncorhynchus mykiss irideus pop. 10 Southern California DPS steelhead	FE/None	Present	Occurs in freshwater systems and requires adequate water conditions suitable for migration (i.e., flow, dissolved oxygen levels within the surface water, and water temperature suitable for passage) and suitable substrate (i.e., gravels) for spawning. Juvenile *O. mykiss* require suitable cover, flow, foraging conditions, and cool temperatures for rearing. Juvenile emigration (i.e., outmigration to the ocean) requires water conditions suitable for migration. Steelhead are known to occur within the Santa Clara River (NMFS 2012, Dagit et al. 2019). The lower Santa Clara River serves primarily as a migration corridor for steelhead (Puckett and Villa 1985). The entire Santa Clara River, from the ocean upstream to impassible barriers, is designated critical habitat for steelhead.	Direct	Present

Scientific Name Common Name	Status	Potential to Occur within Mound Basin	Habitat Requirements and Documented Occurrences within Mound Basin	GDE Association	Potential to Occur within Area 11 of Mound Basin
Amphibians					
Rana boylii foothill yellow-legged frog	None/SE G3/S3 SSC	Not Expected	Prefers partly shaded, shallow streams and riffles with a rocky substrate in a variety of habitats. Needs at least some cobble-sized substrate for egH-laying and sunny streamside banks. Needs at least 15 weeks to attain metamorphosis. There is one historic occurrence of the species (from 1940) documented in the CNDDB within the Ventura USGS quadrangle, but the species is now considered extirpated in the Santa Clara River (CDFW 2021a).	Direct	Not Expected
Rana draytonii California red-legged frog	FT/None SSC	May Occur	Occurs in lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11-20 weeks of permanent water for larval development. Must have access to estivation habitat. There are no documented occurrences of CRLF within the SCRE area in the CNDDB (CDFW 2021a). The species was not documented during amphibian surveys conducted on the Santa Clara River and is thought to only occur within the watershed within several upland tributaries (Santa Clara River Trustee Council 2008). However, suitable riparian habitat for the species occurs within Mound Basin and Area 11.	Direct	May Occur
Reptiles					
Anniella ssp. California legless lizard	None/None G3G4/S3S4 SSC	Likely to Occur	Contra Costa County south to San Diego, within a variety of open habitats. This element represents California records of *Anniella* not yet assigned to new species within the *Anniella pulchra* complex. *Anniella pulchra* are considered present within the vicinity of the SCRE (Stillwater 2011, WRA 2014) and may occur within foredune habitat within Mound Basin and Area 11.	Indirect	Likely to Occur

Scientific Name Common Name	Status	Potential to Occur within Mound Basin	Habitat Requirements and Documented Occurrences within Mound Basin	GDE Association	Potential to Occur within Area 11 of Mound Basin
Anniella stebbinsi Southern California legless lizard	None/None G3/S3 SSC	Likely to Occur	Generally south of the Transverse Range, extending to northwestern Baja California. Occurs in sandy or loose loamy soils under sparse vegetation. Disjunct populations in the Tehachapi and Piute Mountains in Kern County. Variety of habitats; generally in moist, loose soil. They prefer soils with a high moisture content. Six occurrences of the species are documented in the CNDDB along the shore just south of Mound Basin and Area 11 (CDFW 2021a).	Indirect	Likely to Occur
Aspidoscelis tigris stejnegeri coastal whiptail	None/None G5T5/S3 SSC	May Occur	Found in deserts and semi-arid areas with sparse vegetation and open areas. Also found in woodland & riparian areas. Ground may be firm soil, sandy, or rocky. One occurrence of the species is documented within the CNDDB approximately 1.2 miles north of Mound Basin (CDFW 2021a). Potentially suitable habitat for the species occurs within Mound Basin and Area 11.	Indirect	May Occur
Actinemys pallida (Emys marmorata) Southwestern pond turtle	None/None SSC	May Occur	Occurs in ponds, lakes, rivers, streams, creeks, marshes, and irrigation ditches with basking sites. Feeds on aquatic plants, invertebrates, worms, frog and salamander eggs and larvae, crayfish, and occasionally frogs and fish. Relies on surface water that may be supported by groundwater (Rhode et al. 2019). There are no readily available data on occurrences within Mound Basin. However, suitable habitat does occur upstream of the estuary and the species could be present upstream of the salt wedge.	Direct	May Occur

Scientific Name Common Name	Status	Potential to Occur within Mound Basin	Habitat Requirements and Documented Occurrences within Mound Basin	GDE Association	Potential to Occur within Area 11 of Mound Basin
Phrynosoma blainvillii coast horned lizard	None/None G3G4/S3S4 SSC	May Occur	Frequents a wide variety of habitats, most common in lowlands along sandy washes with scattered low bushes. Open areas for sunning, bushes for cover, patches of loose soil for burial, and abundant supply of ants and other insects. There are multiple occurrences of the species documented in the CNDDB within the vicinity of Mound Basin, several within the Santa Clara River bed, upstream of Area 11 (CDFW 2021a). Some suitable habitat for the species occurs throughout undisturbed portions of Mound Basin. Potentially suitable habitat for the species occurs within foredunes in Area 11.	No known dependance on groundwater	May Occur
Thamnophis hammondii Two-striped gartersnake	None/None SSC	Likely to Occur	Highly aquatic snake species. Found in or near permanent fresh water, often along streams with rocky beds and riparian vegetation. Prey includes fish, fish eggs, tadpoles, newt larvae, small frogs and toads, leeches, and earthworms. There are five occurrences of the species documented in the CNDDB northwest of Mound Basin, within the Ventura River watershed (CDFW 2021a). Suitable riparian habitat for the species occurs within Mound Basin and Area 11.	Direct	Likely to Occur
Birds					
Agelaius tricolor tricolored blackbird	None/ST G1G2/S1S2 SSC	Present	Highly colonial species, most numerous in Central Valley & vicinity. Largely endemic to California. Requires open water, protected nesting substrate, and foraging area with insect prey within a few kilometers of the colony. Cattail (*Typha* spp.) stands are present within the Santa Clara Estuary (Stillwater 2011), which could provide suitable foraging and nesting habitat for the species. Multiple occurrences of the species are documented within the basin and within Area 11 (Cornell Lab of Ornithology 2021a).	Indirect	Likely to Occur

Scientific Name Common Name	Status	Potential to Occur within Mound Basin	Habitat Requirements and Documented Occurrences within Mound Basin	GDE Association	Potential to Occur within Area 11 of Mound Basin
Athene cunicularia burrowing owl	None/None G4/S3 SSC	Present	Open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel. Suitable habitat for the species exists within the basin and there are multiple occurrences documented within the basin and near Area 11 (Cornell Lab of Ornithology 2021a).	No known dependence on groundwater	Likely to Occur
Charadrius nivosus western snowy plover	FT/None G3T3/S2 SSC	Present	Sandy beaches, salt pond levees & shores of large alkali lakes. Needs sandy, gravelly or friable soils for nesting. Numerous occurrences of the species are documented along the coastline within Mound Basin and known nesting habitat for the species exists in and around the SCRE (Cornell Lab of Ornithology 2021a). Critical habitat for the species is designated within Area 11.	No known dependence on groundwater	Present
Circus hudsonius northern harrier	None/None G5/S3 SSC	Present	Occurs in coastal salt & freshwater marsh. Nest and forage in grasslands, from salt grass in desert sink to mountain cienagas. Nests on ground in shrubby vegetation, usually at marsh edge; nest built of a large mound of sticks in wet areas. The species was observed within the SCRE during biological surveys conducted in 2014 (WRA 2014). Numerous occurrences of the species are also documented within Mound Basin and Area 11 in eBird (Cornell Lab of Ornithology 2021a). Suitable nesting and foraging habitat for the species occurs within Area 11.	Indirect	Present

Scientific Name Common Name	Status	Potential to Occur within Mound Basin	Habitat Requirements and Documented Occurrences within Mound Basin	GDE Association	Potential to Occur within Area 11 of Mound Basin
Coccyzus americanus occidentalis western yellow-billed cuckoo	FT/SE G5T2T3/S1	May Occur	Riparian forest nester, along the broad, lower flood-bottoms of larger river systems. Nests in riparian jungles of willow, often mixed with cottonwoods, with lower story of blackberry, nettles, or wild grape. There is one documented occurrence of the species (from 2020) within the Ventura Settling Ponds in the western portion of the basin, just north of Area 11 (Cornell Lab of Ornithology 2021a). Some potential breeding habitat for the species occurs within Area 11, though no individuals were detected within the basin during surveys conducted in 2018 and 2019 (Hall et al. 2020).	Indirect	May Occur
Elanus leucurus white-tailed kite	None/None G5/S3S4 FP	Present	Often found in rolling foothills and valley margins with scattered oaks & river bottomlands or marshes next to deciduous woodland. Also occurs in open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching. The species was observed within SCRE during biological surveys conducted in 2014 (WRA 2014). Numerous occurrences of the species are also documented within Mound Basin and Area 11 in eBird (Cornell Lab of Ornithology 2021a). Suitable foraging habitat and potentially suitable nesting habitat for the species occurs within Area 11.	Indirect	Present

Scientific Name Common Name	Status	Potential to Occur within Mound Basin	Habitat Requirements and Documented Occurrences within Mound Basin	GDE Association	Potential to Occur within Area 11 of Mound Basin
Empidonax traillii extimus Southwestern willow flycatcher	FE/SE	May Occur	Occurs in dense brushy thickets within riparian woodland often dominated by willows and/or alder, near permanent standing water. Reliant on groundwater-dependent riparian vegetation, including for nest sites that are typically located near slow-moving streams, or side channels and marshes with standing water and/or wet soils (Rohde et al. 2019). Feeds on insects, fruits, and berries. There are no occurrences of the species documented within the CNDDB or eBird within the basin (CDFW 2021a, Cornell Lab of Ornithology 2021a). The species was documented within the Santa Clara River channel, upstream of the basin, during avian population surveys in 2005 and 2006 (Labinger et al. 2011). Some potential nesting habitat for the species exists within Area 11, though no individuals were detected within the basin during surveys conducted in 2018 and 2019 (Hall et al. 2020). The Santa Clara River channel and estuary are designated critical habitat for the southwestern willow flycatcher.	Indirect	May Occur
Falco peregrinus anatum American peregrine falcon	FD/SD G4T4/S3S4 FP	Present	Near wetlands, lakes, rivers, or other water; on cliffs, banks, dunes, mounds; also, human-made structures. Nests consist of a scrape or a depression or ledge in an open site. One known nest site exists within the Oxnard USGS quadrangle (CDFW 2021a). Numerous occurrences of the species are documented within the basin and Area 11 (Cornell Lab of Ornithology 2021a, WRA 2014). The Santa Clara estuary and surrounding beach provide high quality foraging habitat for the species, though suitable nesting habitat is not present within Area 11.	Indirect	Present (foraging)

Scientific Name Common Name	Status	Potential to Occur within Mound Basin	Habitat Requirements and Documented Occurrences within Mound Basin	GDE Association	Potential to Occur within Area 11 of Mound Basin
Laterallus jamaicensis coturniculus California black rail	None/ST G3G4T1/S1 FP	Not Expected	Inhabits freshwater marshes, wet meadows and shallow margins of saltwater marshes bordering larger bays. Needs water depths of about 1 inch that do not fluctuate during the year and dense vegetation for nesting habitat. Suitable habitat for the species occurs within the basin and Area 11, but there are no documented occurrences within Ventura County since 1936 (CDFW 2021a, Cornell Lab of Ornithology 2021a).	Direct	Not Expected
Passerculus sandwichensis beldingi Belding's savannah sparrow	None/SE G5T3/S3	Present	Inhabits coastal salt marshes, from Santa Barbara south through San Diego County. Nests in Salicornia on and about margins of tidal flats. Multiple occurrences of the species are documented within Mound Basin and Area 11 (Cornell Lab of Ornithology 2021a).	Indirect	Present
Polioptila californica coastal California gnatcatcher	FT/None G4G5T3Q/S2 SSC	Unlikely to Occur	Obligate, permanent resident of coastal sage scrub below 2500 ft in Southern California. Low, coastal sage scrub in arid washes, on mesas and slopes. Not all areas classified as coastal sage scrub are occupied. There is one occurrence of the species documented in eBird within Area 11 in 2018 (Cornell Lab of Ornithology 2021a). Two historical occurrences (in 1872 and 1906) of the species are documented within the basin in the CNDDB (CDFW 2021a).	Indirect	Unlikely to Occur
Riparia bank swallow	None/ST G5/S2	Present	Colonial nester; nests primarily in riparian and other lowland habitats west of the desert. Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting hole. Multiple occurrences of the species are documented within the basin and near Area 11 (WRA 2014, Cornell Lab of Ornithology 2021a). One historic occurrence (1976) is documented in McGrath State Beach in the CNDDB (CDFW 2021a).	Indirect	Present

Scientific Name Common Name	Status	Potential to Occur within Mound Basin	Habitat Requirements and Documented Occurrences within Mound Basin	GDE Association	Potential to Occur within Area 11 of Mound Basin
Setophaga petechia Yellow warbler	None/None SSC	Present	Inhabits riparian plant associations in close proximity to water. Also nests in montane shrubbery in open conifer forests in Cascades and Sierra Nevada. Frequently found nesting and foraging in willow shrubs and thickets, and in other riparian plants including cottonwoods, sycamores, ash, and alders. There are multiple observations of the species documented within the basin and Area 11 in eBird (Cornell Lab of Ornithology 2021a). There are two recent occurrences (2016 and 2017) of the species documented within the vicinity of the basin in the CNDDB (CDFW 2021a). The species was also detected within the lower reaches of the Santa Clara River during avian population surveys conducted in 2005 and 2006 (Labinger et al. 2011).	Indirect	Present
Sternula antillarum browni California least tern	FE/SE G4T2T3Q/S2 FP	Present	Nests along the coast from San Francisco Bay south to northern Baja California. Colonial breeder on bare or sparsely vegetated, flat substrates: sand beaches, alkali flats, landfills, or paved areas. There are multiple observations of the species documented within the basin and Area 11 in eBird (Cornell Lab of Ornithology 2021a). Suitable nesting habitat for the species occurs within Area 11.	Indirect	Present

Scientific Name Common Name	Status	Potential to Occur within Mound Basin	Habitat Requirements and Documented Occurrences within Mound Basin	GDE Association	Potential to Occur within Area 11 of Mound Basin
Vireo bellii pusillus Least Bell's vireo	FE/SE G5T2/S2	Present	Nests in dense vegetative cover of riparian areas; often nests in willow or mulefat; forages in dense, stratified canopy. This species relies on groundwater-dependent vegetation in riparian areas, particularly during breeding periods (Rohde et al. 2019). Eats insects, fruits, and berries. Multiple occurrences of the species are documented within the basin and near Area 11 (Cornell Lab of Ornithology 2021a). Multiple occurrences of the species were also documented upstream of the estuary during avian population surveys conducted in 2005 and 2006 (Labinger et al 2011). Suitable nesting habitat for the species occurs within Area 11.	Indirect	Present
Mammals					
Antrozous pallidus pallid bat	None/None G4/S3 SSC	Unlikely to Occur	Found in a variety of habitats including deserts, grasslands, shrublands, woodlands, and forests. Most common in open, dry habitats with rocky areas for roosting. Roosts in crevices of rock outcrops, caves, mine tunnels, buildings, bridges, and hollows of live and dead trees which must protect bats from high temperatures. Very sensitive to disturbance of roosting sites. Only one historic occurrence of the species (from 1906) is documented in the CNDDB within the vicinity of mound Basin (CDFW 2021a).	No known dependence on groundwater	Unlikely to Occur

Scientific Name Common Name	Status	Potential to Occur within Mound Basin	Habitat Requirements and Documented Occurrences within Mound Basin	GDE Association	Potential to Occur within Area 11 of Mound Basin
Chaetodipus californicus femoralis Dulzura pocket mouse	None/None SSC	Not Expected	Inhabit a variety of habitats including coastal scrub, chaparral & grassland (primarily in San Diego County). Attracted to grass-chaparral edges. Specimens were collected northeast of Mound Basin at unknown dates, but presumably not within recent decades. One male and one female were collected within near Meiner's Oaks at an unknown date. Another female was collected near Weldon Canyon at an unknown date (CDFW 2021a). There are no other documented occurrences of the species within Mound Basin.	No known dependence on groundwater	Not Expected
Choeronycteris mexicana Mexican lonH-tongued bat	None/None G3G4/S1 SSC	Not Expected	Common throughout Mexico, this species is occasionally found in San Diego and Imperial Counties. Feeds on nectar and pollen of night-blooming succulents. Roosts in desert canyons, caves, and rock crevices. Also uses abandoned buildings. canyons, deep caves, mines, or rock crevices. There is one historic occurrence of the species (in 1994) documented just north of Mound Basin in the CNDDB (CDFW 2021a). Suitable habitat for the species is not present within Area 11.	No known dependence on groundwater	Not Expected
Eumops perotis californicus Western mastiff bat	None/None SSC	Not Expected	Occurs in open, semi-arid to arid habitats, including coniferous and deciduous woodlands, coastal scrub, grasslands, and chaparral. Roosts in crevices in cliff faces and caves, and buildings. Roosts typically occur high above ground. One occurrence of the species was documented in 1907 near Weldon (CDFW 2021a).	No known dependence on groundwater	Not Expected

Scientific Name Common Name	Status	Potential to Occur within Mound Basin	Habitat Requirements and Documented Occurrences within Mound Basin	GDE Association	Potential to Occur within Area 11 of Mound Basin
Taxidea taxus American badger	None/None G5/S3 SSC	Unlikely to Occur	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils for digging burrows. Needs sufficient food, friable soils and open, uncultivated ground. Preys on burrowing rodents. There is some potentially suitable habitat for the species within hills in the northwestern portion of Mound Basin, though the species is more likely to occur in open habitat inland of the basin. No suitable habitat for the species occurs within Area 11.	No known dependence on groundwater	Not Expected

Regional Vicinity refers to the three USGS quadrangles surrounding Mound Basin (Ventura, Oxnard, and Saticoy)

FE = Federally Endangered

FT = Federally Threatened

SSC= CDFW Species of Special Concern

SE = State Endangered

ST = State Threatened

SCE = State Candidate Endangered

FP = State Fully Protected

CRPR (California Rare Plant Rank)

1A=Presumed Extinct in California

1B=Rare, Threatened, or Endangered in California and elsewhere

2A=Plants presumed extirpated in California, but more common elsewhere

2B=Plants Rare, Threatened, or Endangered in California, but more common elsewhere

CRPR Threat Code Extension

.1=Seriously endangered in California (over 80% of occurrences threatened/high degree and immediacy of threat)

.2=Fairly endangered in California (20-80% occurrences threatened)

.3=Not very endangered in California (<20% of occurrences threatened)

CDFW Rare

G1 or S1 = Critically Imperiled Globally or Subnationally (state)

G2 or S2 = Imperiled Globally or Subnationally (state)

G3 or S3 = Vulnerable to extirpation or extinction Globally or Subnationally (state)

G4/5 or S4/5 = Apparently secure, common and abundant

GNR/SNR= Globally or Subnationally (state) not ranked

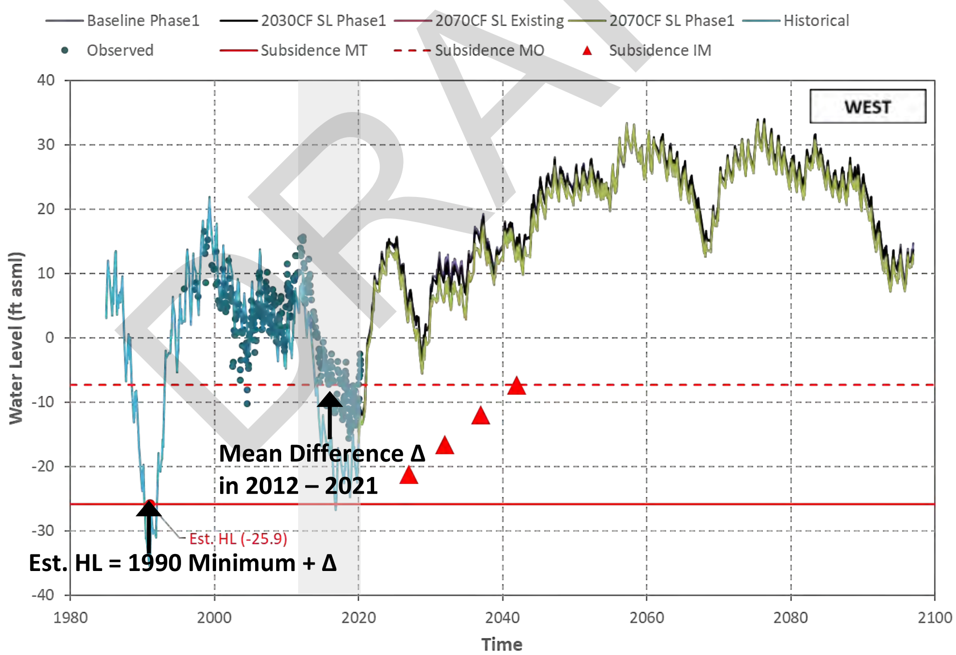
Appendix I

Time Series Plots of Measured Groundwater Level Data with Model Calibration and Predictive Simulations with Minimum Thresholds and Measurable Objectives

APPENDIX I

Method for Establishing Groundwater Level Historical Lows (HL)

Measured and modeled groundwater level data was analyzed for the Mound Basin monitoring network (Figures I-1 and I-2). The observed groundwater level (GWL) data contained two notable periods of historical lows (HL), one near the year 1990 and one near the year 2020. When a well had low GWL measurements near 1990, the lowest of those measurements was selected as HL for that well (e.g., Hueneme Well 02N22W09K04S; Figure I-3). When a well did not have an observed GWL measurement near 1990, the HL was estimated using the modeled GWL because the modeled HL was typically lower at 1990 than near 2020 (with the exception of two wells in the Mugu aquifer). This estimation method first calculated the mean difference between the observed and simulated data in the 2012 – 2021 period (this period was used because the last peak GWL before 2021 occurred near 2012), and then the mean difference was added to the lowest simulated GWL near 1990 (e.g., see annotated figure for Hueneme Well 02N23W15J01S below).



There were two exceptions to this HL estimation method, the Mugu wells 02N22W08G01S and 02N22W19M04S (Figures I-16 and I-20, respectively). For these wells, the estimated HL using modeled GWL ended up being higher than the observed HL measurement near 2020, so the HL near 2020 was used instead.

Minimum Thresholds (MT)

Chronic Lowering of Groundwater Levels MT:
Initially, the Groundwater Supply Depletion Water Level Threshold was estimated (Table I-1): for each Mugu well, a fixed height of 40 ft was added and the estimated drawdown (estimated pumping rate divided by specific capacity; 2000/60 ≈ 33 ft) to the top elevation of the aquifer at that well location. Similarly, for each Hueneme well, a fixed height of 40 ft was added and the estimated drawdown (2000/83 ≈ 24 ft) to the top elevation of the aquifer at that well location. The drawdown estimates are based on the historical data and the 2000 gpm pumping assumption.

Table I-1. Groundwater Supply Depletion Water Level Thresholds

Well ID	Aquifer	Aquifer Top Elevation (ft amsl) [Z]	Specific Capacity (gpm/ft) [Q/s]	Pumping Rate (gpm) [Q]	Drawdown (ft) [s]	GW Supply Depletion Water Level Threshold (ft amsl) [Z + s + 40 ft]
02N22W09K04S	Hueneme	-103.53	83	2000	24.10	-39.43
02N22W09L03S	Hueneme	-206.94	83	2000	24.10	-142.85
02N22W09L04S	Hueneme	-206.94	83	2000	24.10	-142.85
02N22W10N03S	Hueneme	-45.02	83	2000	24.10	19.08
02N22W16K01S	Hueneme	-162.35	83	2000	24.10	-98.25
02N22W17Q05S	Hueneme	-269.52	83	2000	24.10	-205.42
02N22W07M01S	Hueneme	-1041.36	83	2000	24.10	-977.27
02N22W17M02S	Hueneme	-345.08	83	2000	24.10	-280.99
02N22W20E01S	Hueneme	-273.97	83	2000	24.10	-209.87
02N23W13K03S	Hueneme	-711.48	83	2000	24.10	-647.39
02N23W13K04S	Hueneme	-703.22	83	2000	24.10	-639.12
02N23W15J01S	Hueneme	-824.31	83	2000	24.10	-760.21
02N23W24G01S	Hueneme	-552.57	83	2000	24.10	-488.48
02N22W08G01S	Mugu	-107.88	60	2000	33.33	-34.55
02N22W08P01S	Mugu	-57.21	60	2000	33.33	16.12
02N22W07M02S	Mugu	-414.68	60	2000	33.33	-341.34
02N22W07P01S	Mugu	-262.96	60	2000	33.33	-189.62
02N22W19M04S	Mugu	-212.99	60	2000	33.33	-139.66
02N23W15J02S	Mugu	-454.22	60	2000	33.33	-380.88

Although this water level threshold calculation was considered for the minimum threshold for the chronic lowering of groundwater levels sustainability indicator, it was noted that some calculated levels are several hundred feet lower in elevation than the measured historical low groundwater elevation (especially for the Hueneme aquifer), while others are similar into the historical low elevations; this is due to the significant folding of the principal aquifers that create a variable depth to the top of aquifer throughout the Basin. Other considerations include the prevention of land subsidence, avoiding potentially unrecoverable reduction of groundwater storage, and impacting underflows to/from the adjacent Oxnard Basin. After considering these factors, therefore, the minimum thresholds for the chronic lowering of groundwater levels are conservatively set at the historical low groundwater elevations in the monitoring wells. This approach will protect the wells near anticlines (upward folds), prevent land subsidence, prevent the Basin groundwater levels from falling beyond a point from which groundwater storage may not fully recover, and ensure that underflow to/from the Oxnard Basin is not unduly impacted to ensure the protection of the overall groundwater supply for the Basin (i.e., groundwater levels going significantly below historical lows could lead to long-term storage depletions). However, as discussed in Section 4.4.2.1.1 of the GSP, some of the minimum thresholds that fall below the historical low groundwater levels are superseded by the proxy groundwater level minimum thresholds for the land subsidence sustainability indicator. The resulting minimum thresholds are depicted on the time-series plots (hydrographs) below.

Land Subsidence MT:

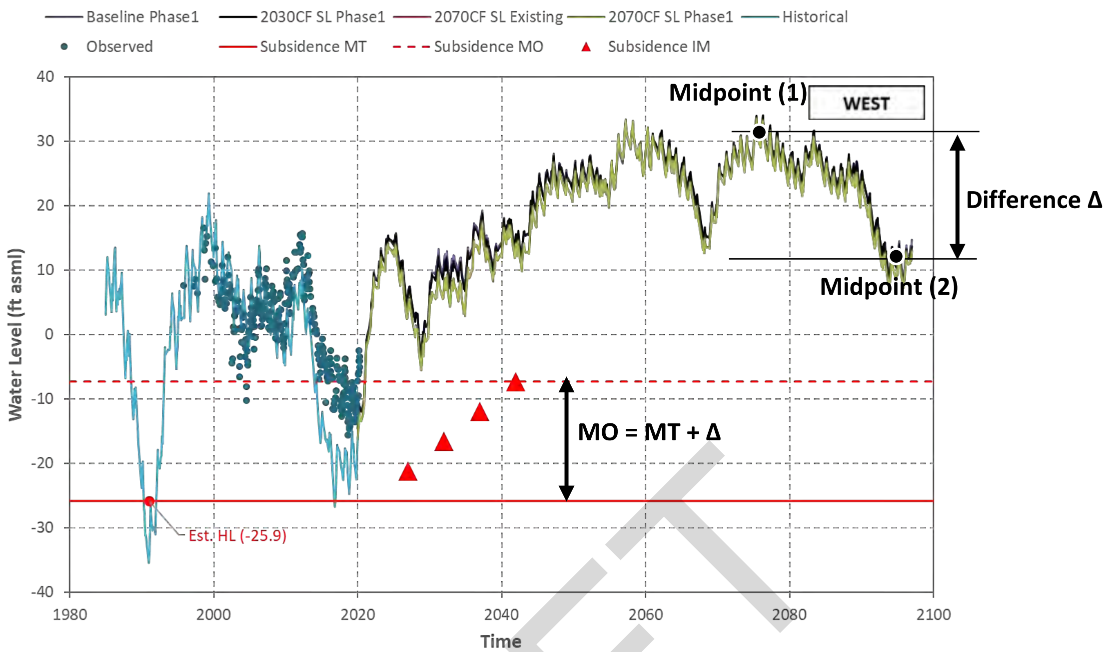
For the wells in the eastern half of the Basin, a subsidence rate of ≥ 0.1 ft/year (based on corrected measurements calculated from InSAR data) was used as the MT for when the GWL is at or below the HL. For the wells in the western half of the Basin, the HL was used as the MT.

Measurable Objectives (MO) and Interim Milestones (IM)

The MO was estimated as follows:

(1) The upper limit of the GWL range in the baseline projected model results was extracted by locating the midpoint between the highest and lowest simulated in the 2074 – 2076 period (the highest modeled GWLs).
(2) The lower limit of the GWL range in the baseline projected model results was extracted by locating the midpoint between the highest and lowest simulated GWL in the 2093 – 2095 period (the lowest modeled GWLs following the highest modeled GWLs).
(3) The difference between the two midpoints from (1) and (2) was added to the MT. This difference represents the maximum modeled decline in GWL at the well location.

The IM was estimated by calculating the difference between MT and MO and dividing that range into four sections. Starting from year 2022, IM was set for 2027, 2032, 2037, and 2042 (20 years).


Baseline Phase1
2030CF SL Phase1
2070CF SL Existing
2070CF SL Phase1
Historical
Observed
Subsidence MT
Subsidence MO
Subsidence IM
Water Level (ft asml)
Time
Midpoint (1)
WEST
Difference Δ
Midpoint (2)
MO = MT + Δ
Est. HL (-25.9)

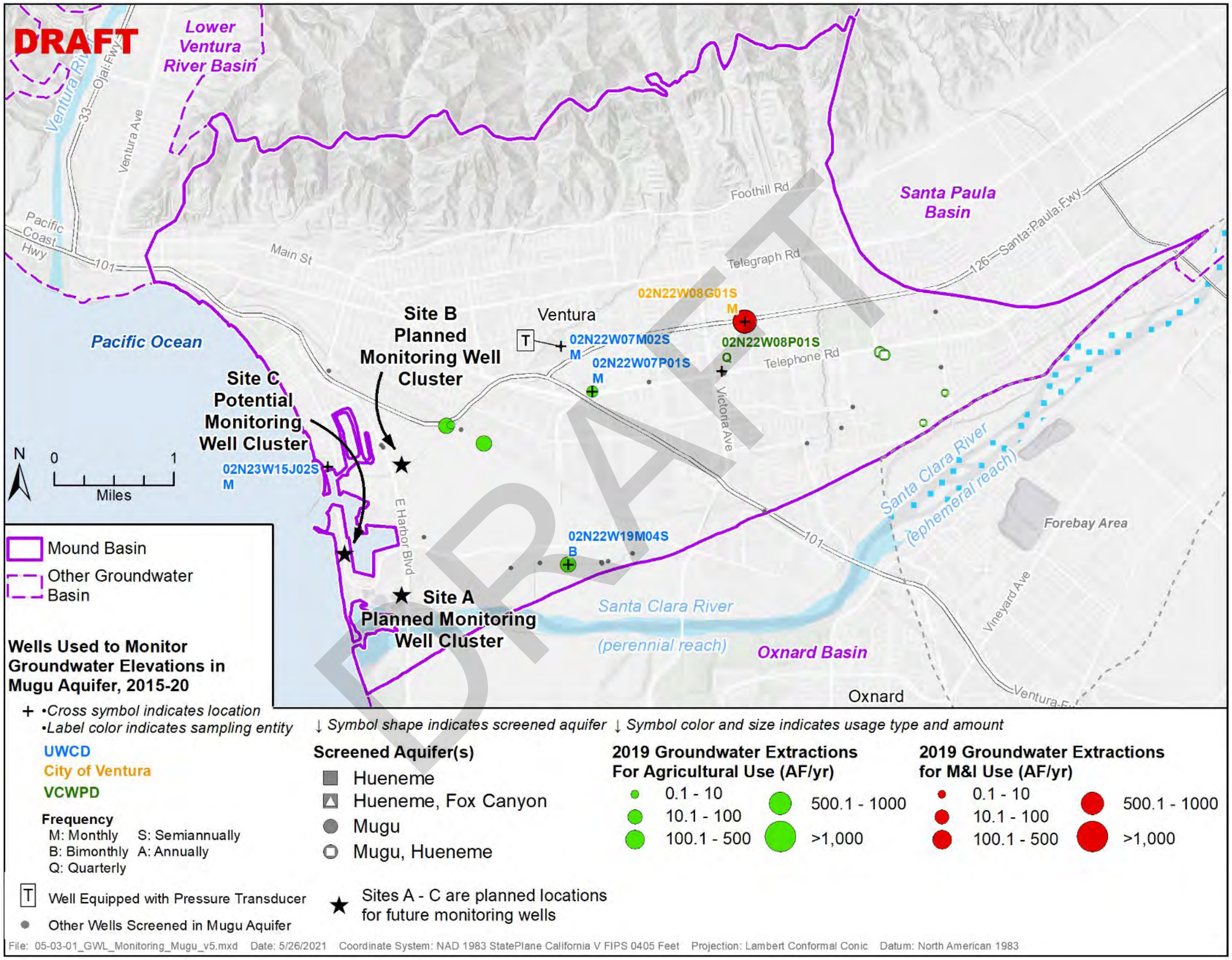


Figure I-1 Map Showing the Groundwater Elevation Monitoring Network in the Mugu Aquifer of Mound Basin.

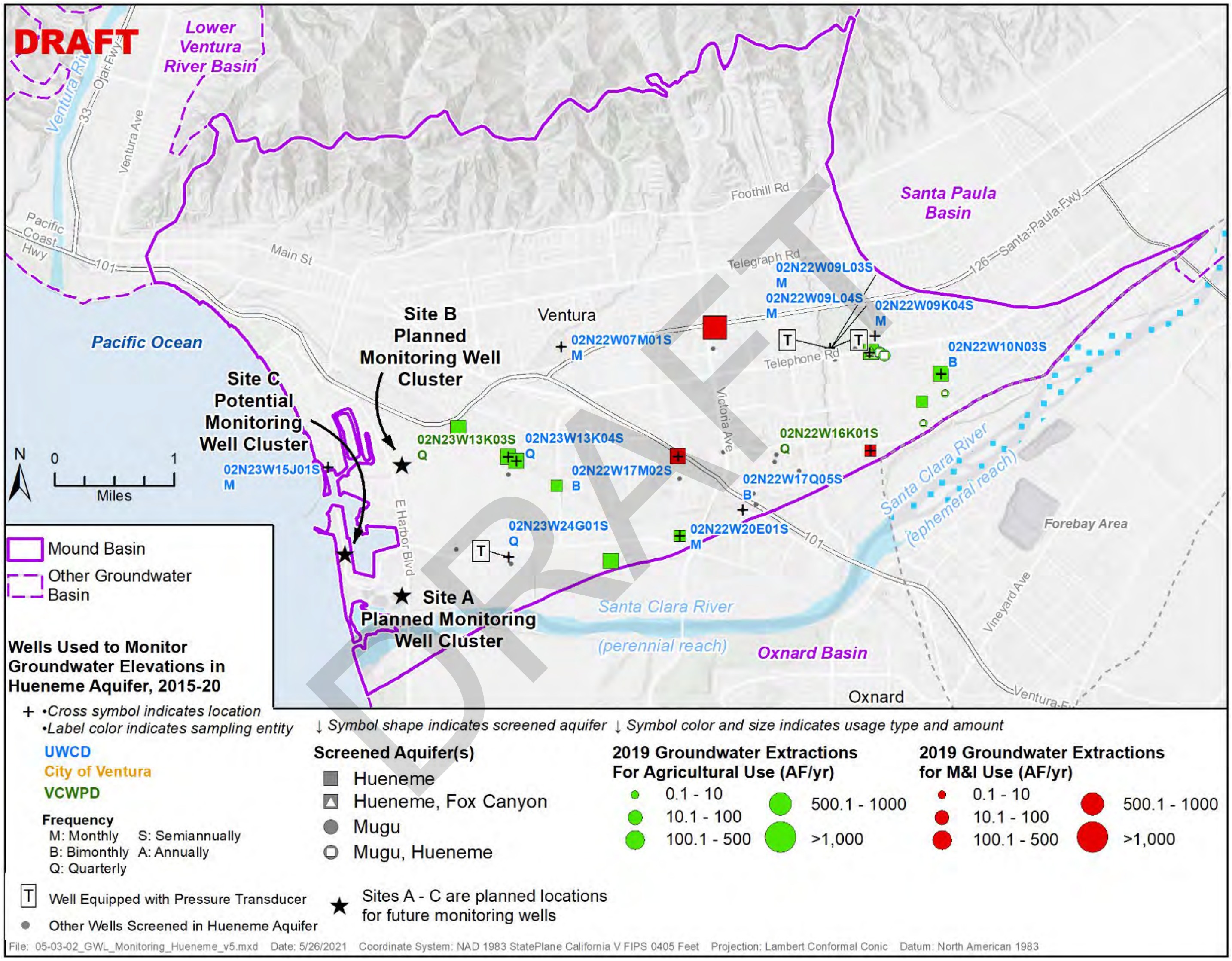


Figure I-2 Map Showing the Groundwater Elevation Monitoring Network in the Hueneme Aquifer of Mound Basin Aquifer of Mound Basin.

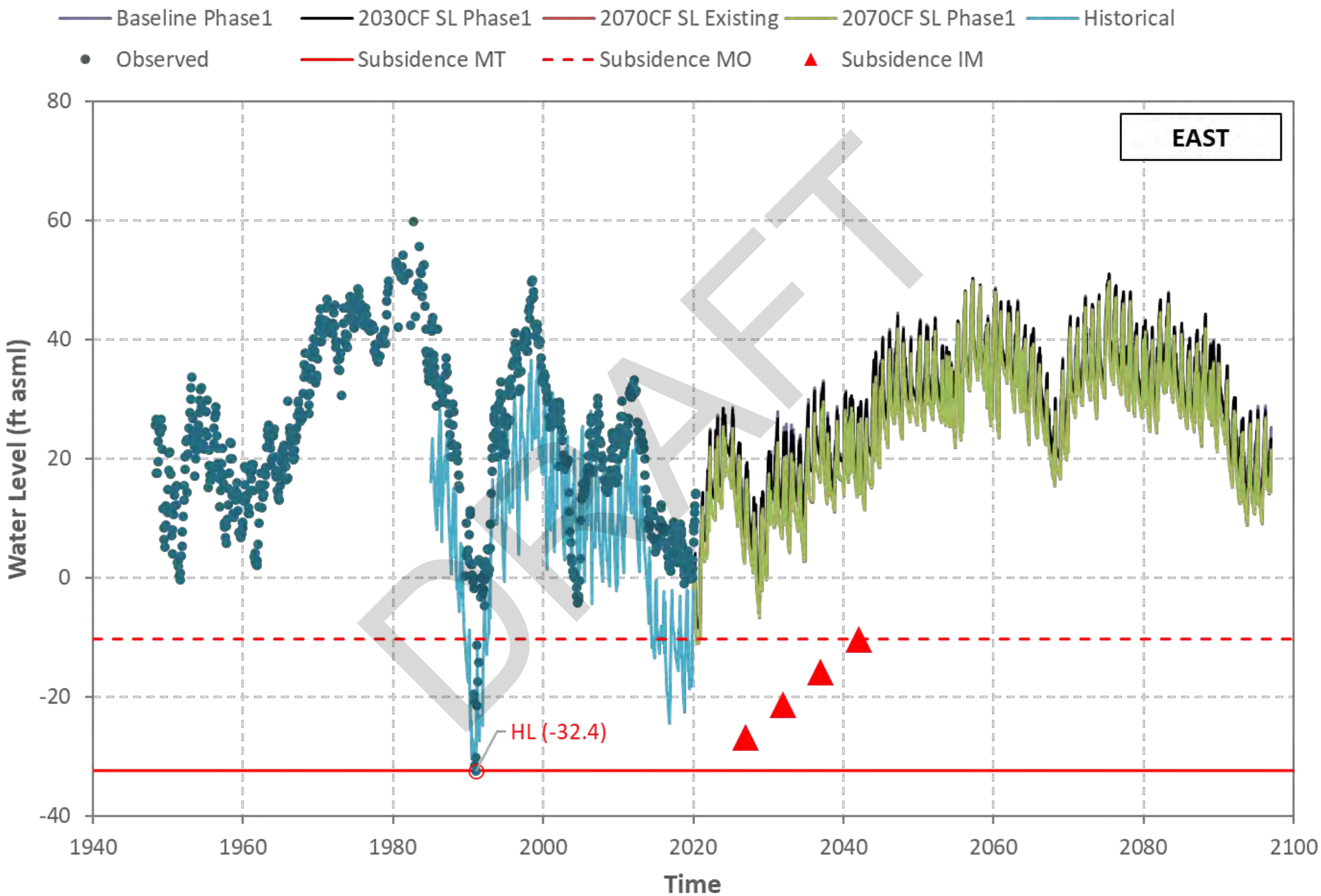


Figure I-3 Hueneme Aquifer - Simulated/Observed Water Level (Well 02N22W09K04S).

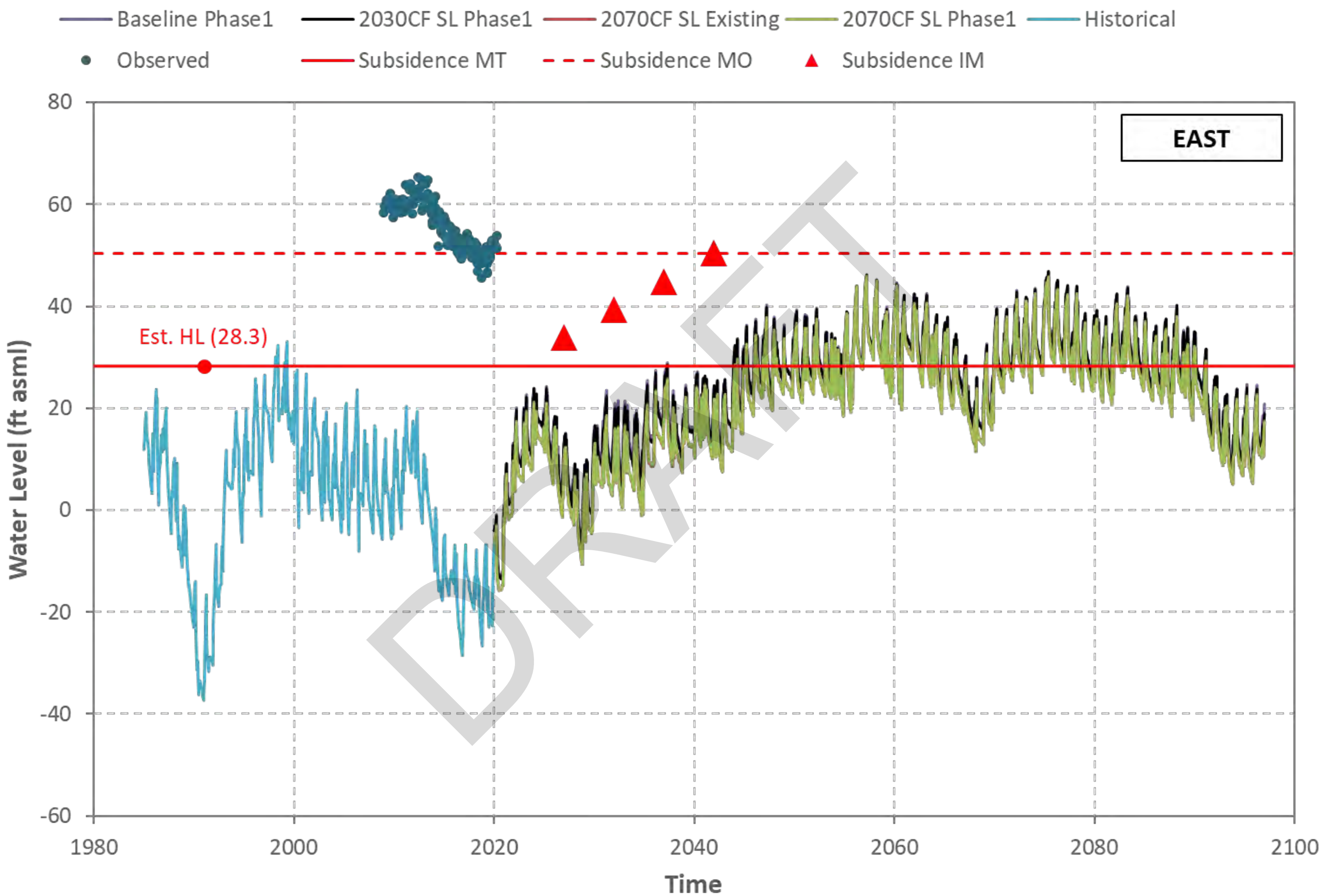


Figure I-4 Hueneme Aquifer - Simulated/Observed Water Level (Well 02N22W09L03S).

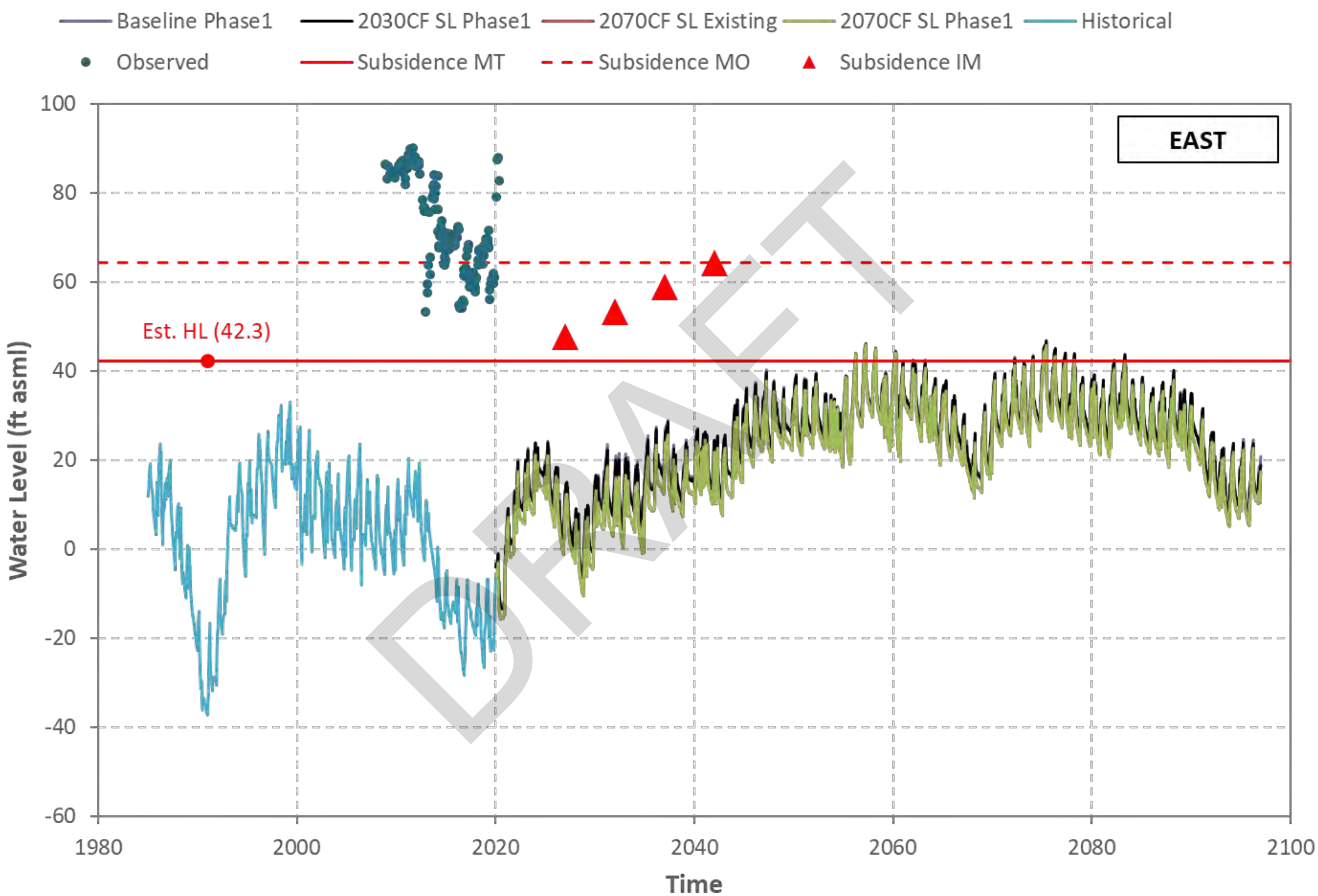


Figure I-5 Hueneme Aquifer - Simulated/Observed Water Level (Well 02N22W09L04S).

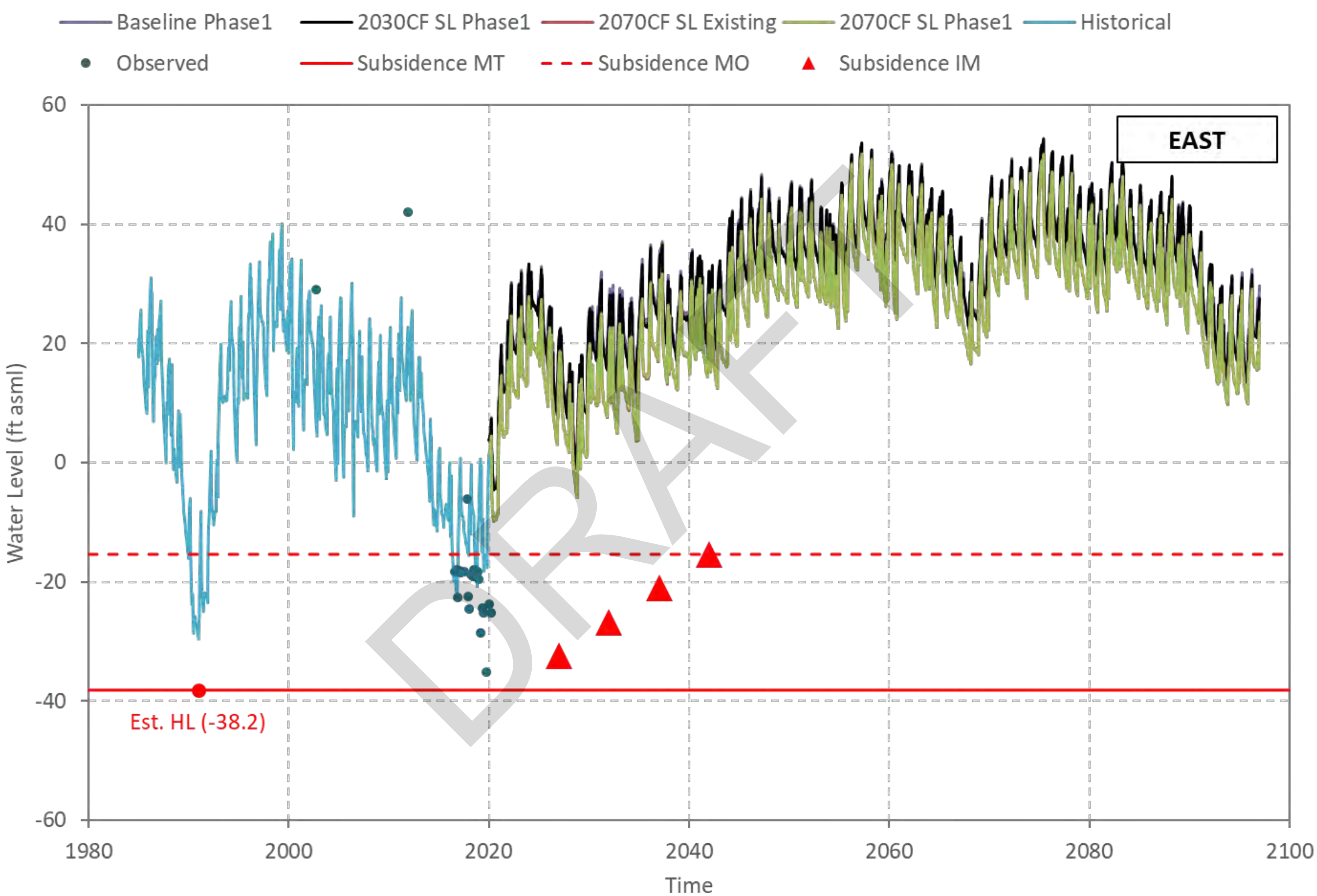


Figure I-6 Hueneme Aquifer - Simulated/Observed Water Level (Well 02N22W10N03S).

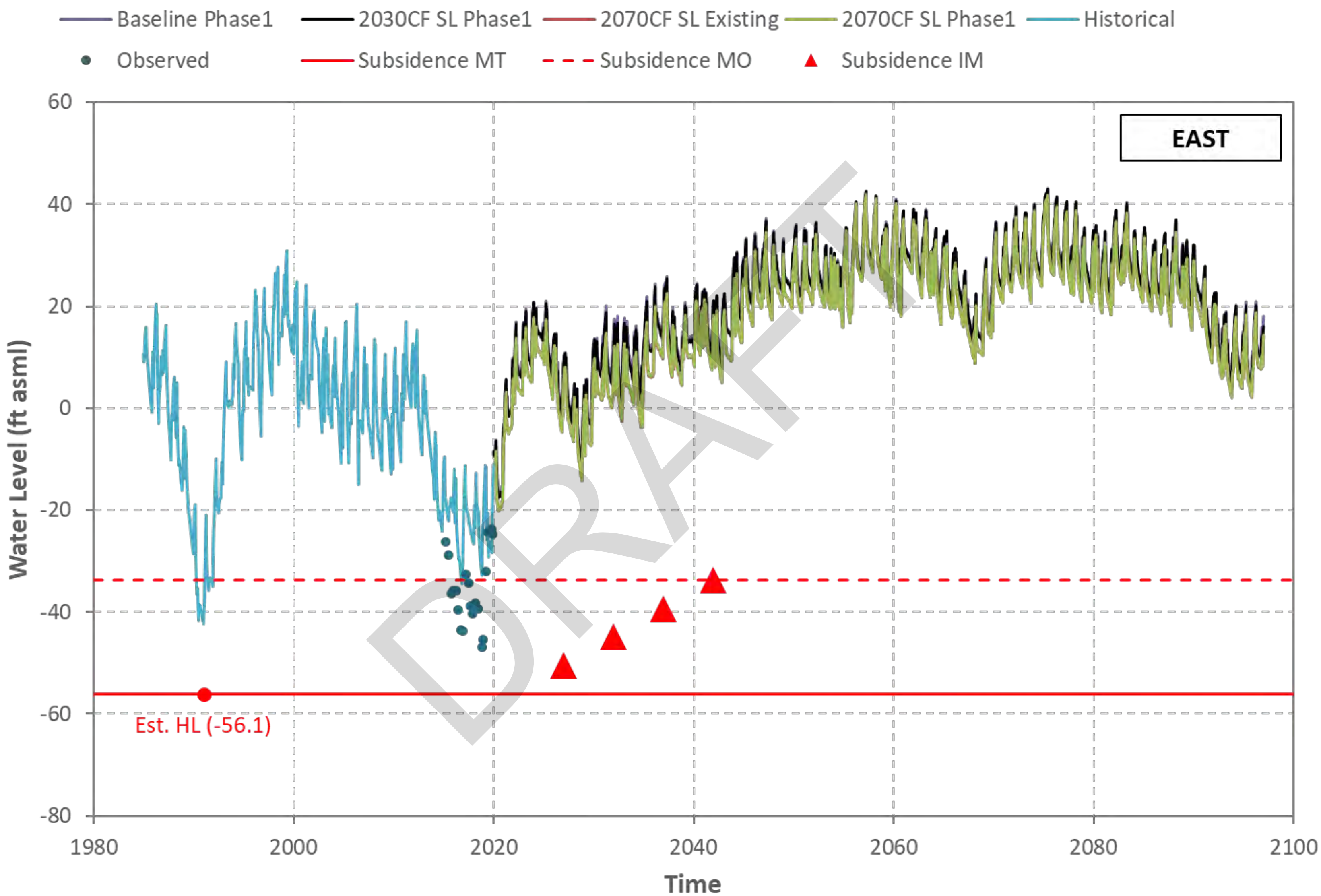


Figure I-7 Hueneme Aquifer - Simulated/Observed Water Level (Well 02N22W16K01S).

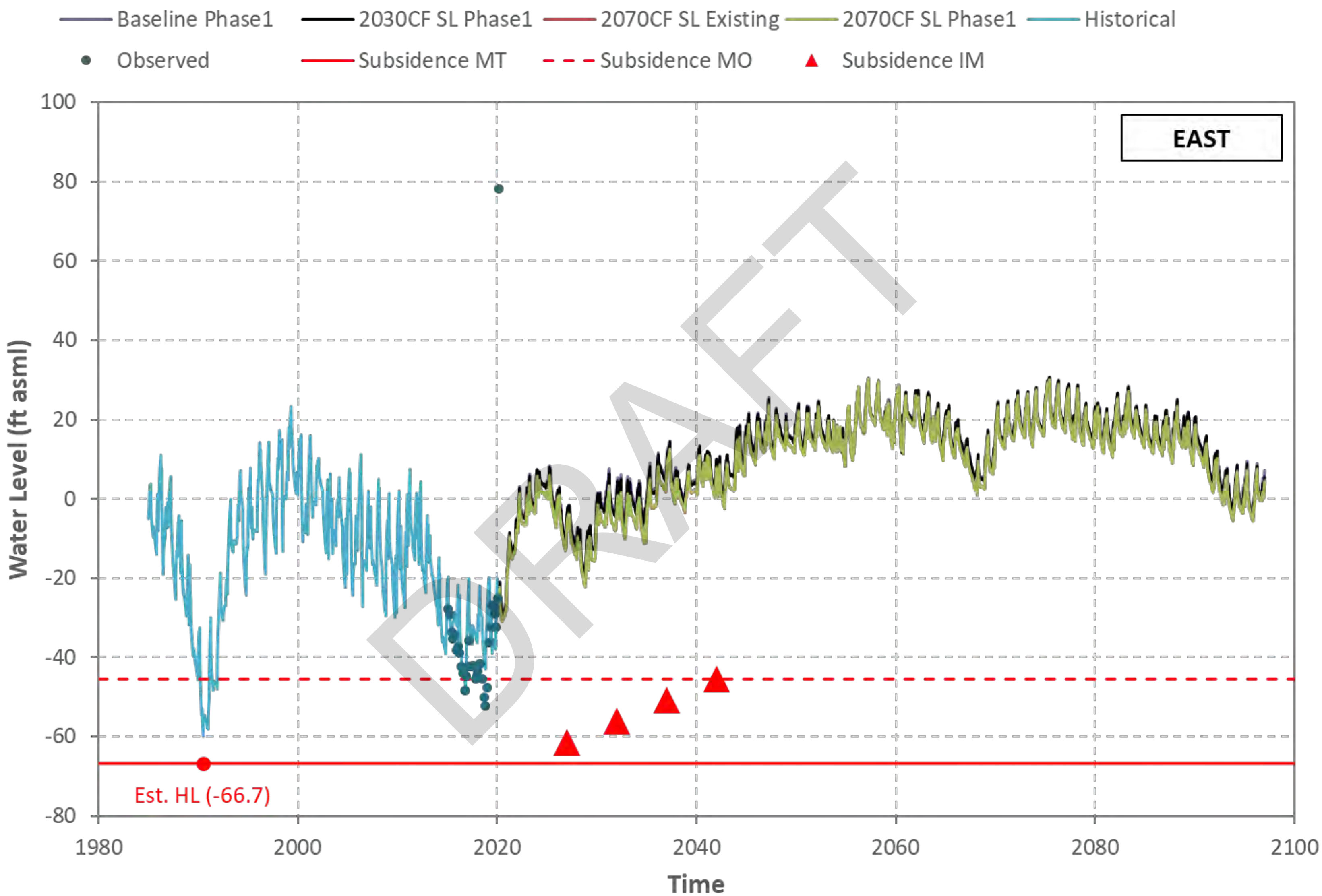


Figure I-8 Hueneme Aquifer - Simulated/Observed Water Level (Well 02N22W17Q05S).

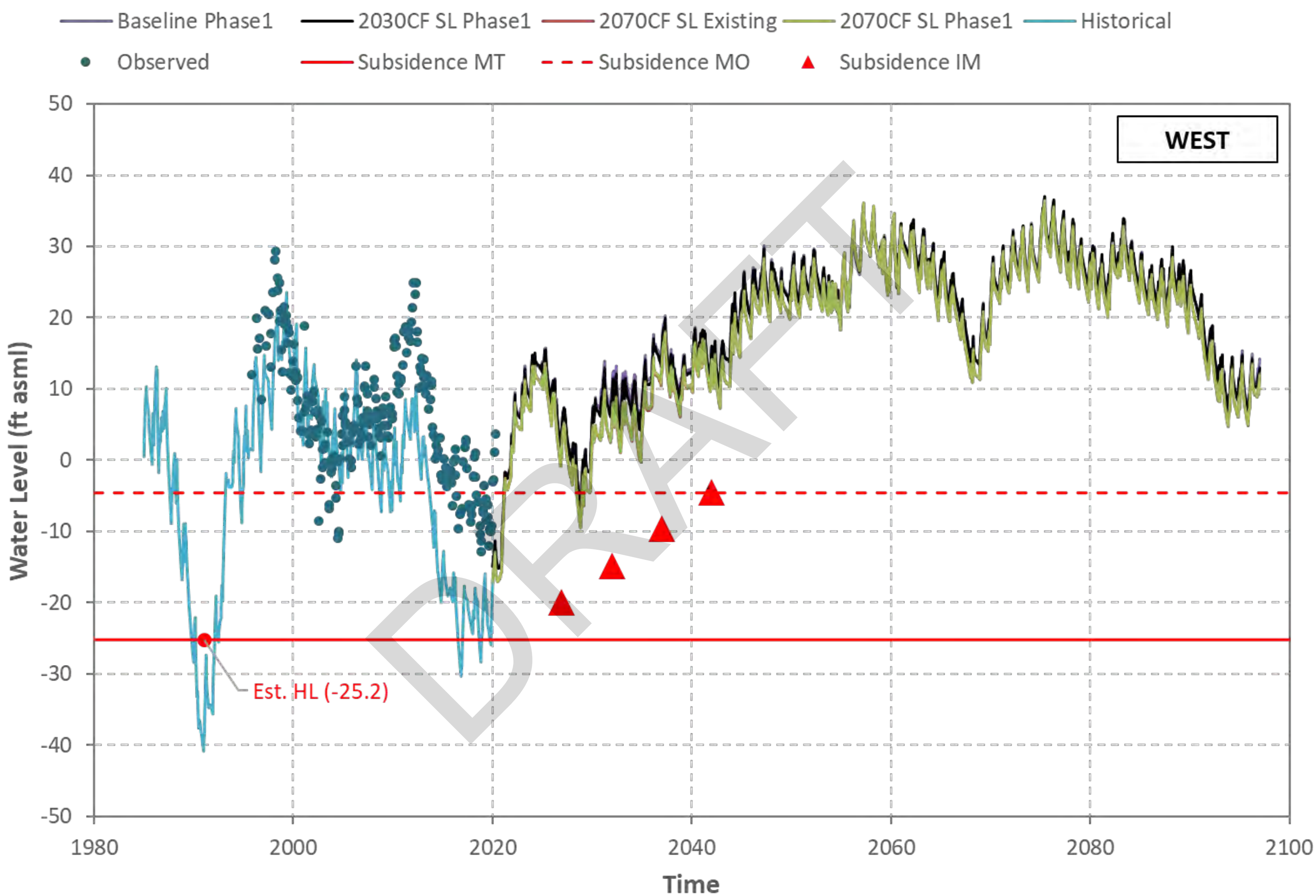


Figure I-9 Hueneme Aquifer - Simulated/Observed Water Level (Well 02N22W07M01S).

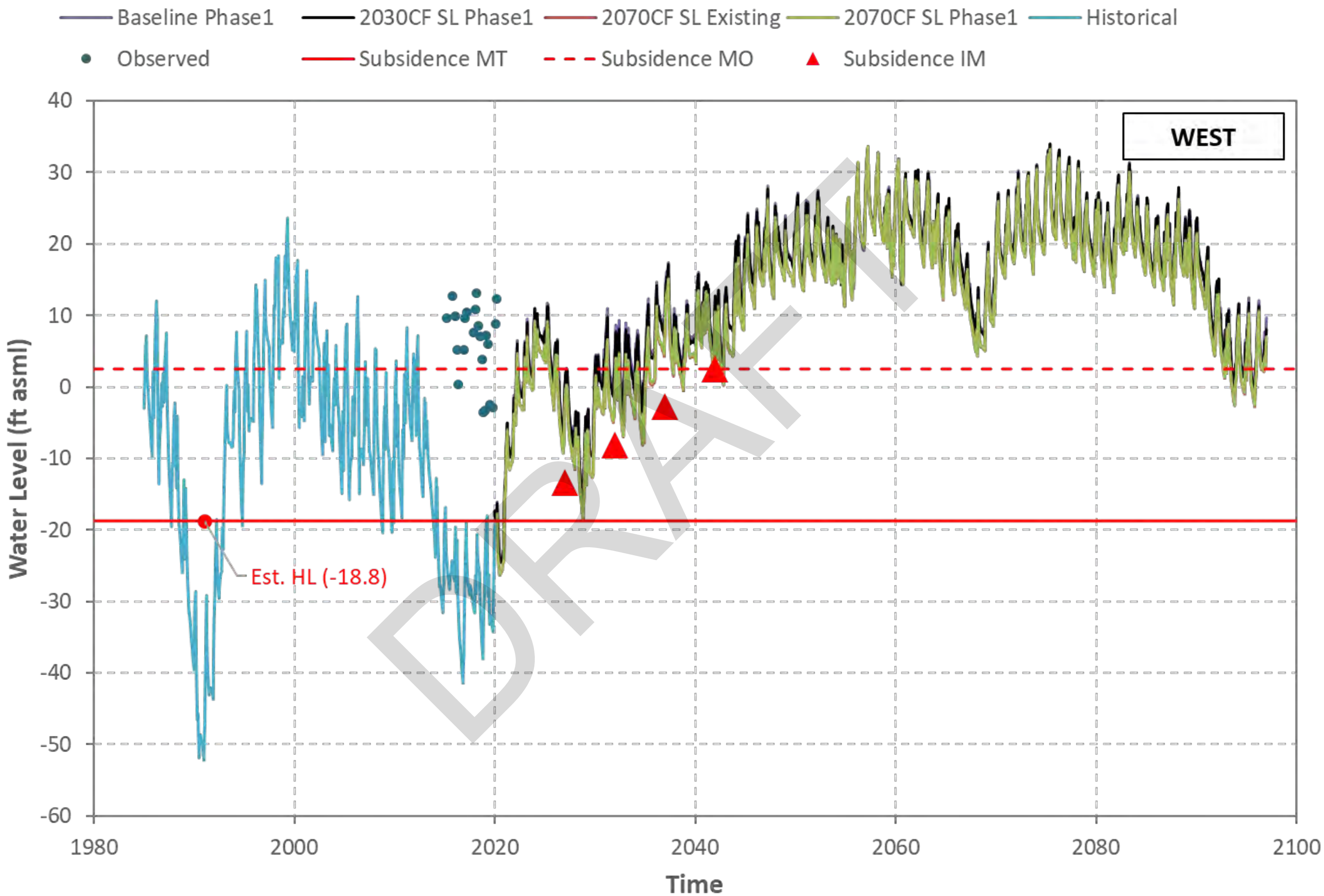


Figure I-10 Hueneme Aquifer - Simulated/Observed Water Level (Well 02N22W17M02S).

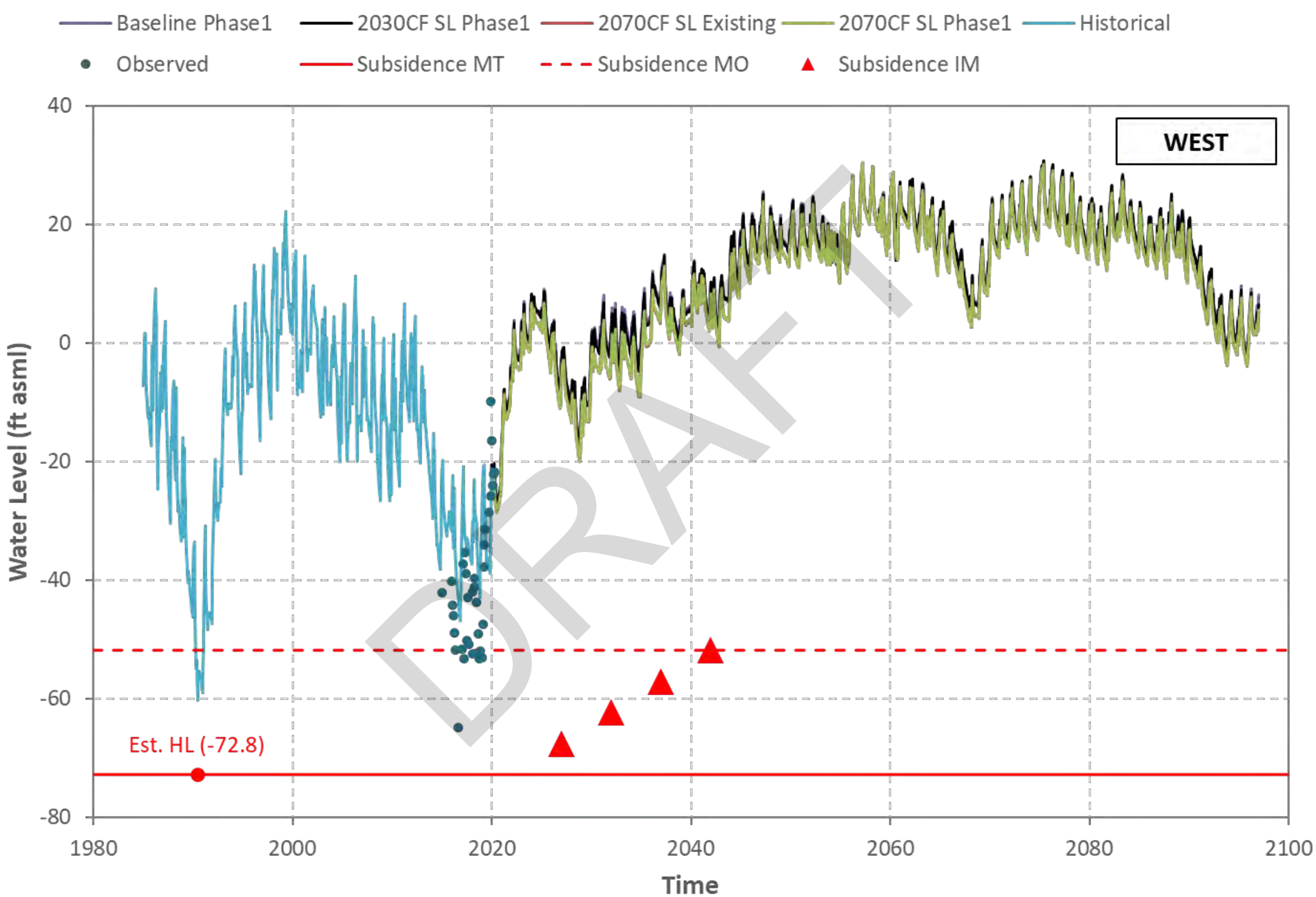


Figure I-11 Hueneme Aquifer - Simulated/Observed Water Level (Well 02N22W20E01S).

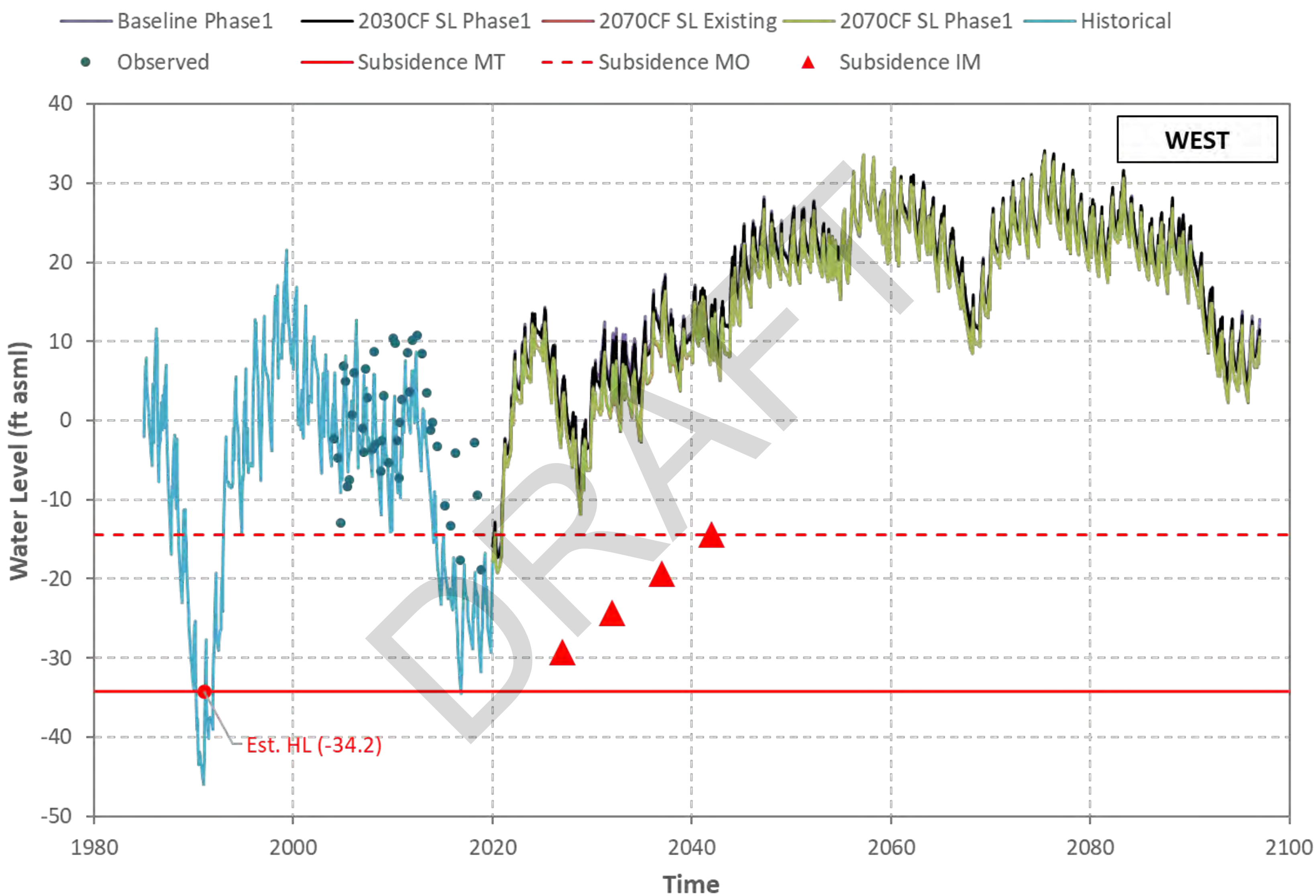


Figure I-12 Hueneme Aquifer - Simulated/Observed Water Level (Well 02N23W13K03S).

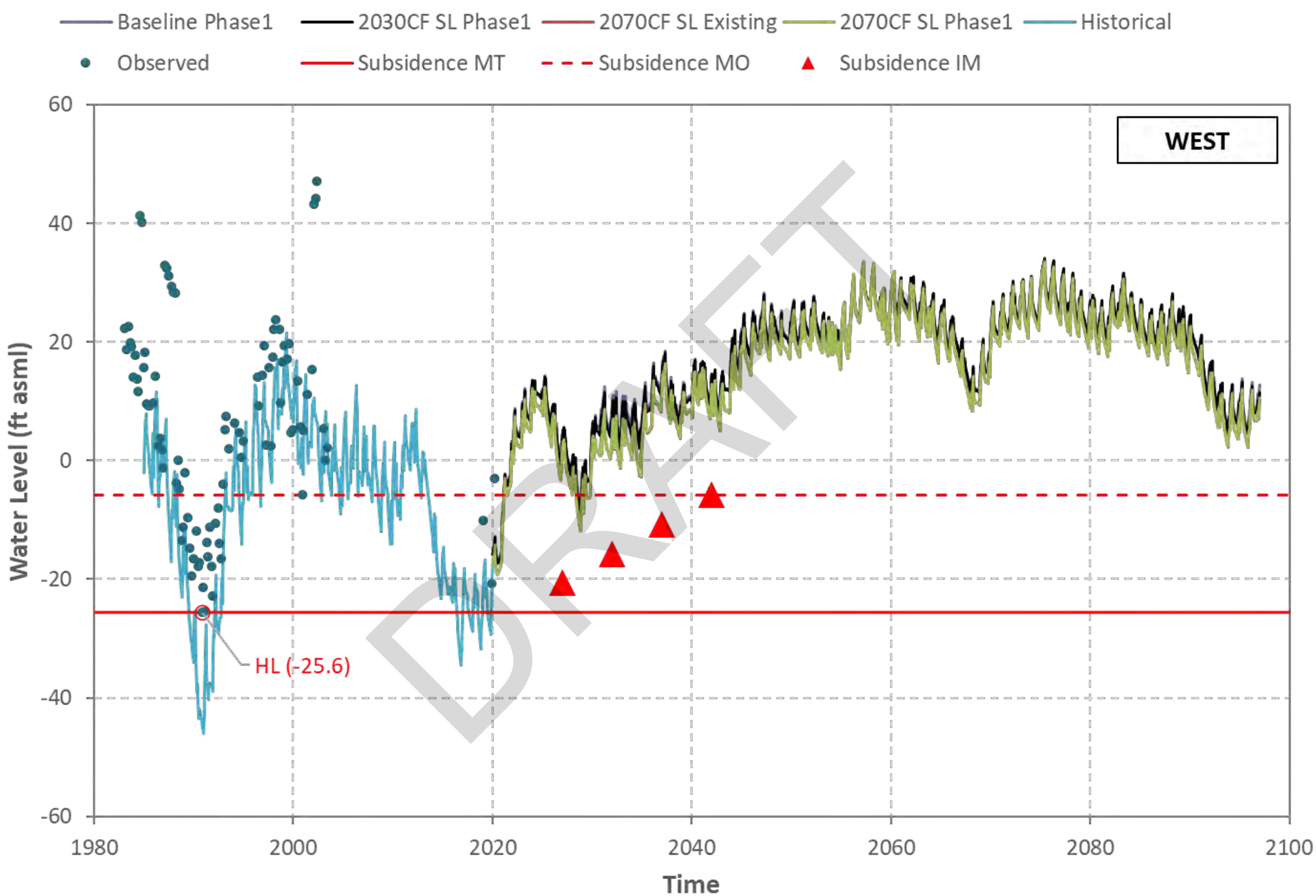


Figure I-13 Hueneme Aquifer - Simulated/Observed Water Level (Well 02N23W13K04S).

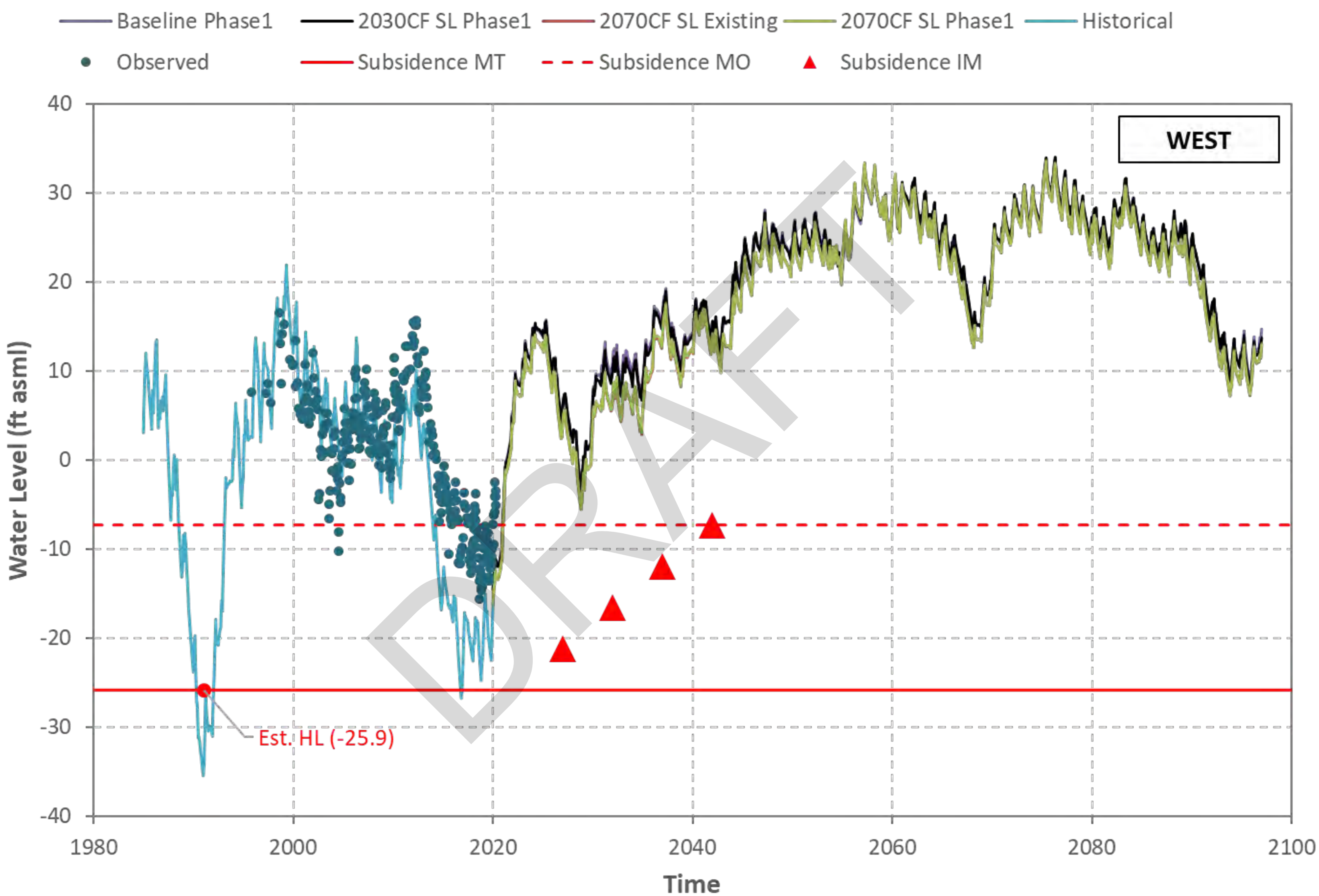


Figure I-14 Hueneme Aquifer - Simulated/Observed Water Level (Well 02N23W15J01S).

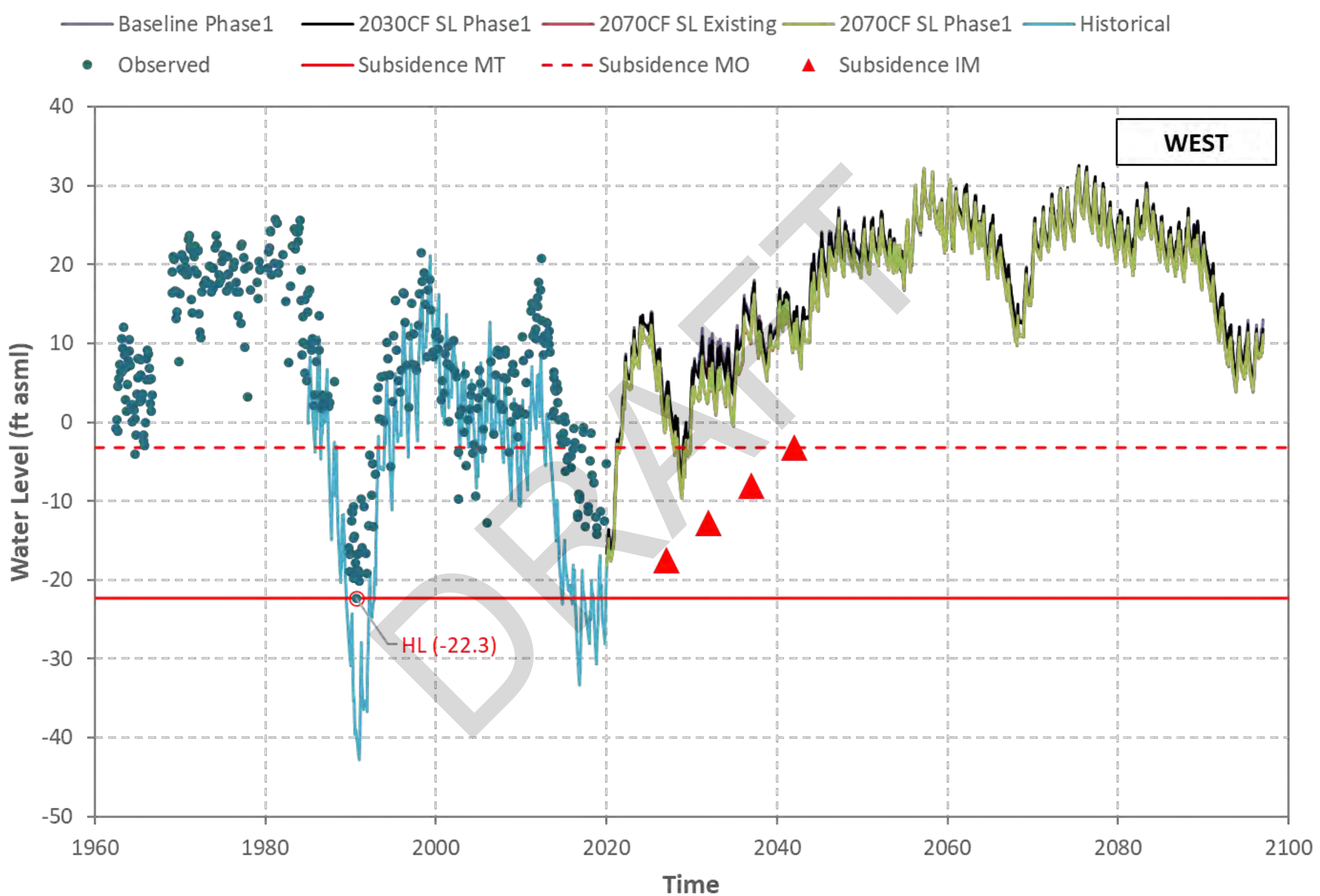


Figure I-15 Hueneme Aquifer - Simulated/Observed Water Level (Well 02N23W24G01S).

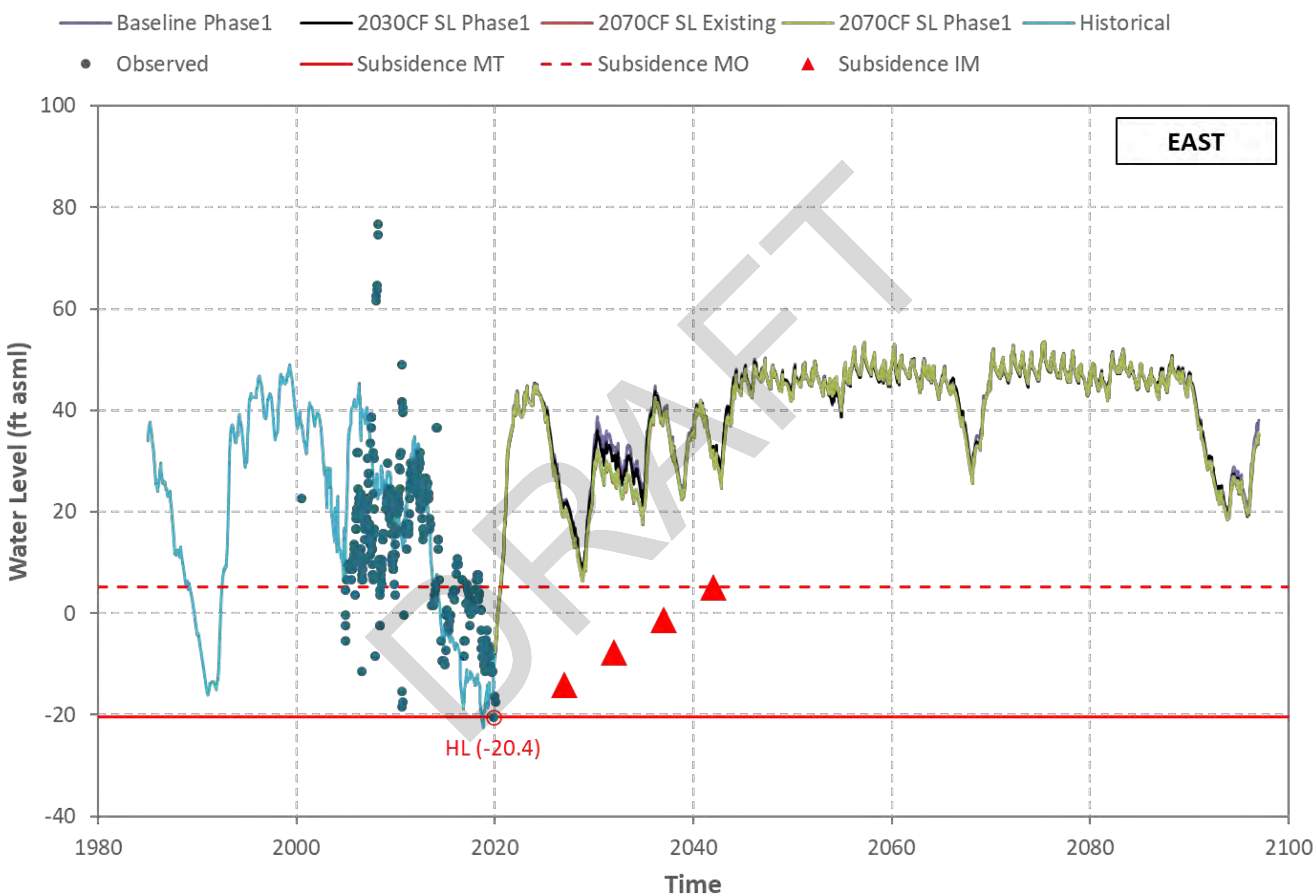


Figure I-16 Mugu Aquifer - Simulated/Observed Water Level (Well 02N22W08G01S).

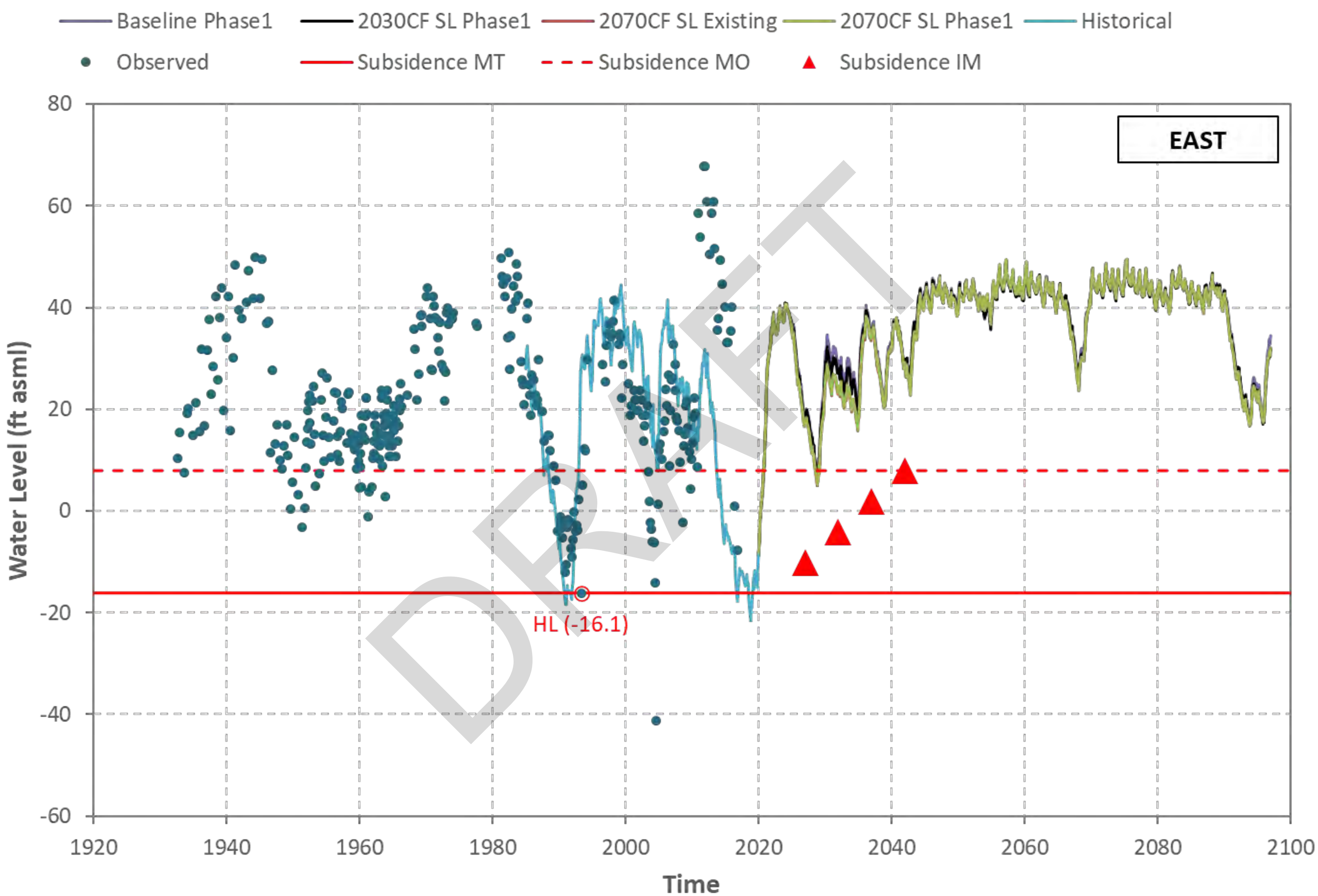


Figure I-17 Mugu Aquifer - Simulated/Observed Water Level (Well 02N22W08P01S).

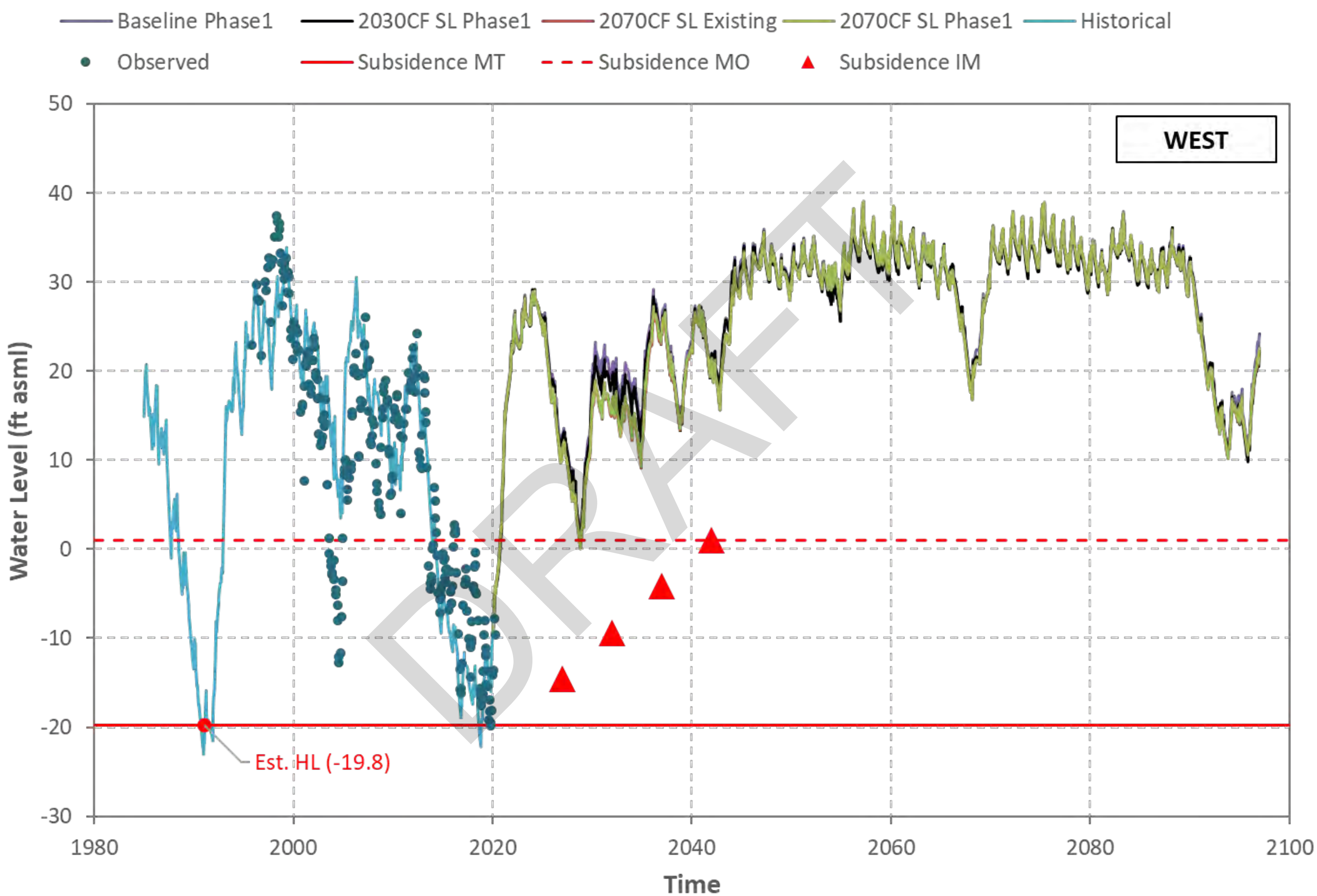


Figure I-18 Mugu Aquifer - Simulated/Observed Water Level (Well 02N22W07M02S).

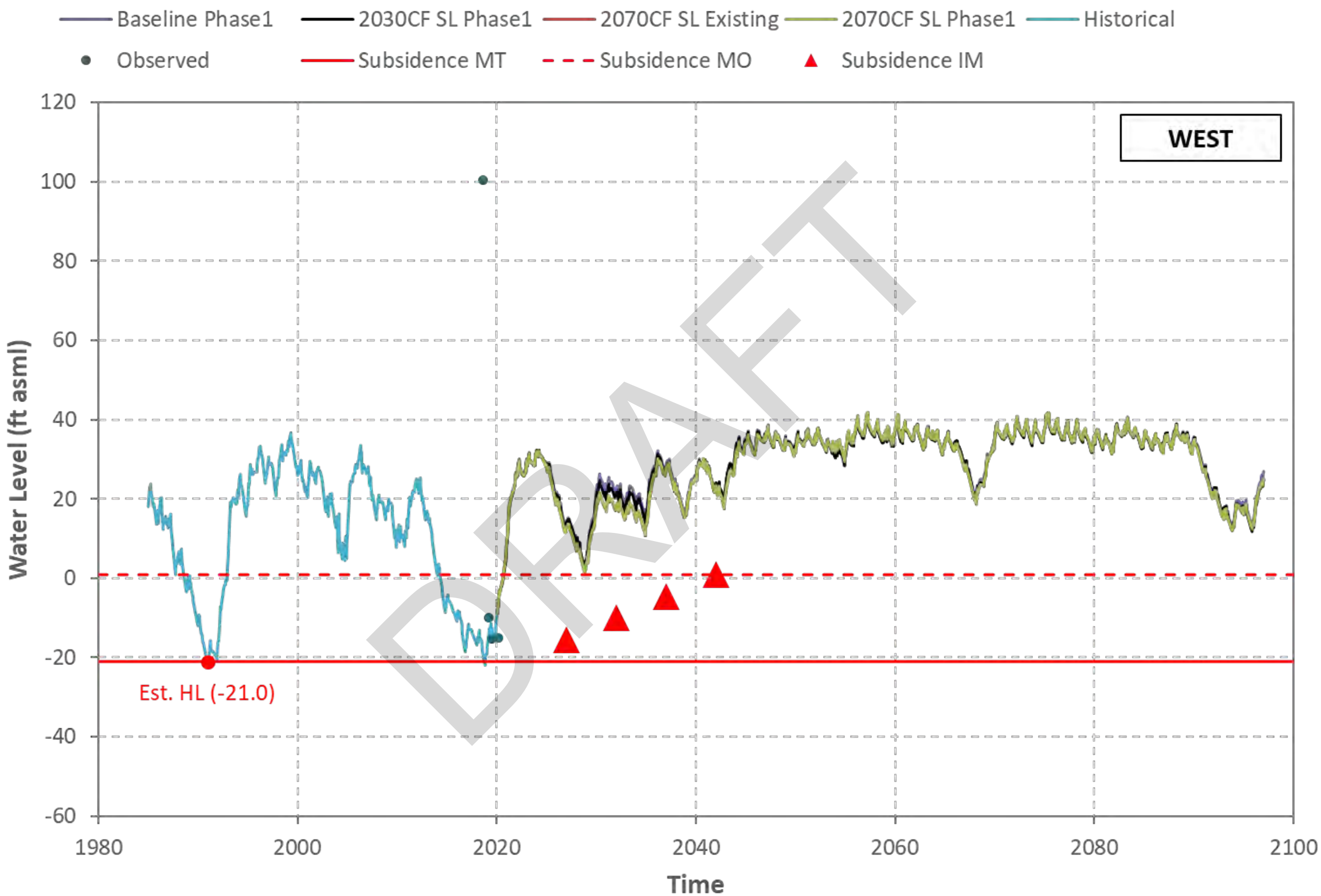


Figure I-19 Mugu Aquifer - Simulated/Observed Water Level (Well 02N22W07P01S).

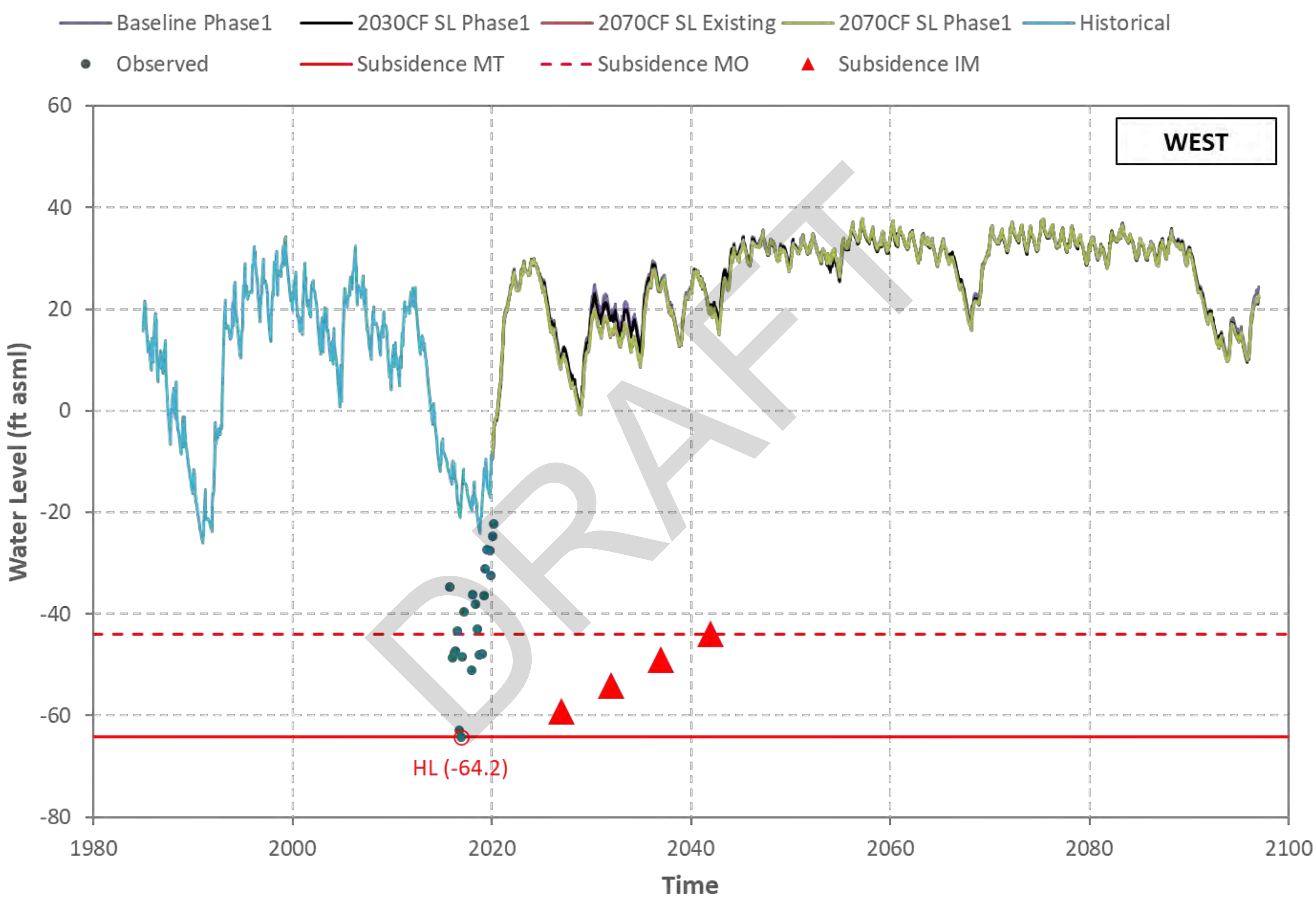


Figure I-20 Mugu Aquifer - Simulated/Observed Water Level (Well 02N22W19M04S).

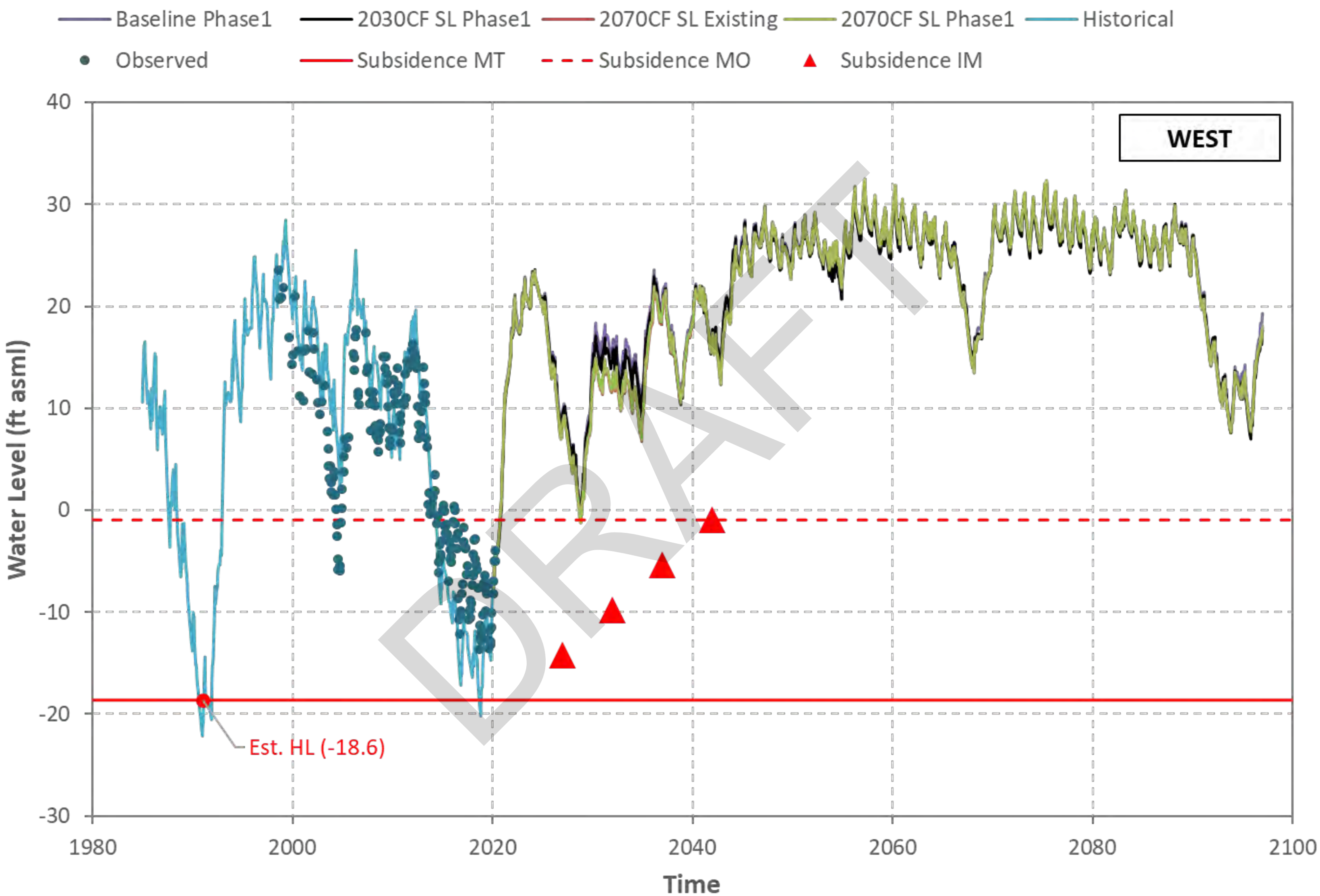


Figure I-21 Mugu Aquifer - Simulated/Observed Water Level (Well 02N23W15J02S).

Appendix J

Time Series Plots of Groundwater Quality with Minimum Thresholds and Measurable Objectives

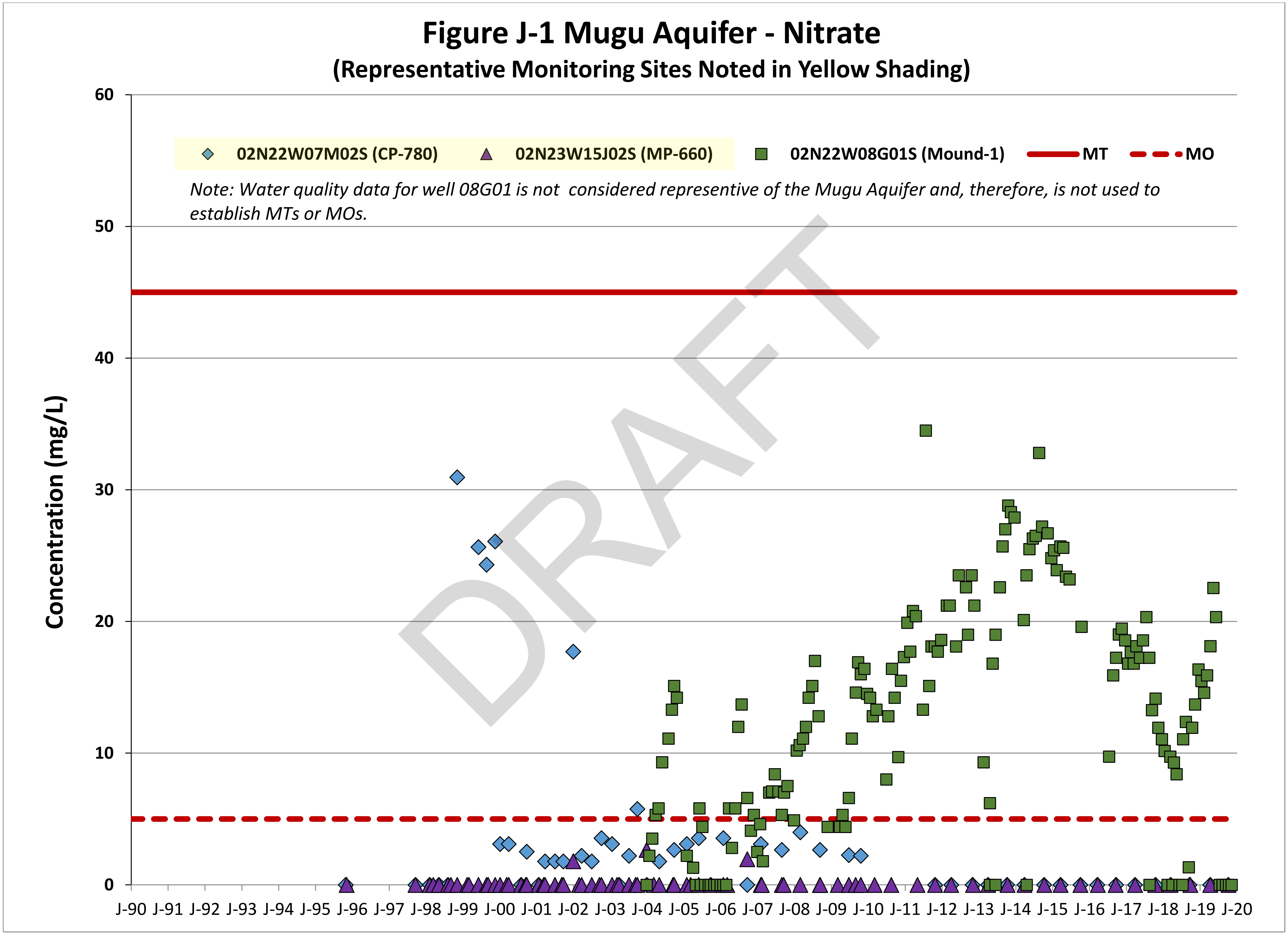


Figure J-1 Mugu Aquifer - Nitrate
(Representative Monitoring Sites Noted in Yellow Shading)
02N22W07M02S (CP-780)
02N23W15J02S (MP-660)
02N22W08G01S (Mound-1)
MT
MO
Note: Water quality data for well 08G01 is not considered representative of the Mugu Aquifer and, therefore, is not used to establish MTs or MOs.
Concentration (mg/L)
0
10
20
30
40
50
60
J-90
J-91
J-92
J-93
J-94
J-95
J-96
J-97
J-98
J-99
J-00
J-01
J-02
J-03
J-04
J-05
J-06
J-07
J-08
J-09
J-10
J-11
J-12
J-13
J-14
J-15
J-16
J-17
J-18
J-19
J-20
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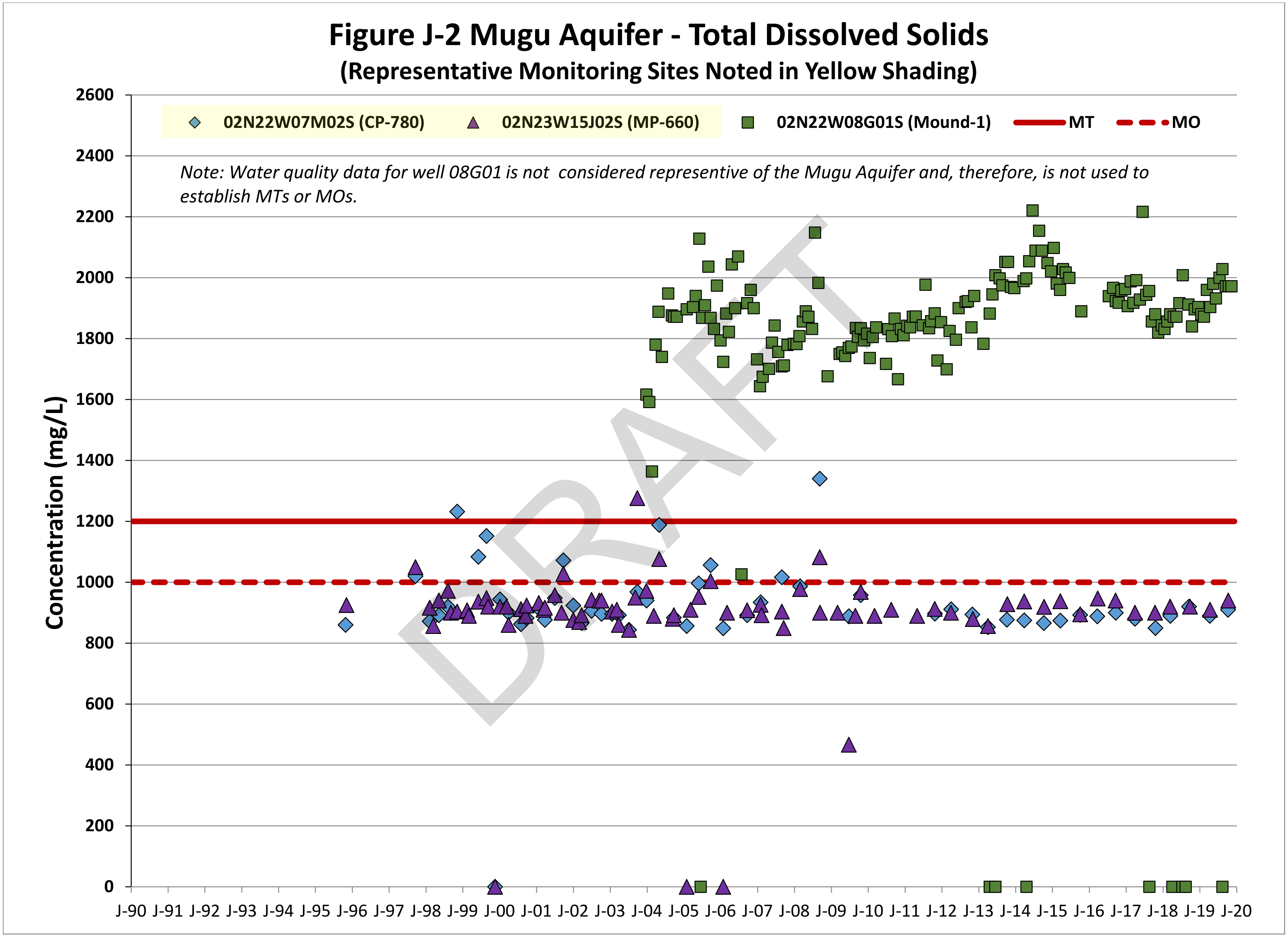
Figure J-2 Mugu Aquifer - Total Dissolved Solids
(Representative Monitoring Sites Noted in Yellow Shading)
02N22W07M02S (CP-780)
02N23W15J02S (MP-660)
02N22W08G01S (Mound-1)
MT
MO
Note: Water quality data for well 08G01 is not considered representive of the Mugu Aquifer and, therefore, is not used to establish MTs or MOs.
Concentration (mg/L)
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
J-90
J-91
J-92
J-93
J-94
J-95
J-96
J-97
J-98
J-99
J-00
J-01
J-02
J-03
J-04
J-05
J-06
J-07
J-08
J-09
J-10
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J-19
J-20
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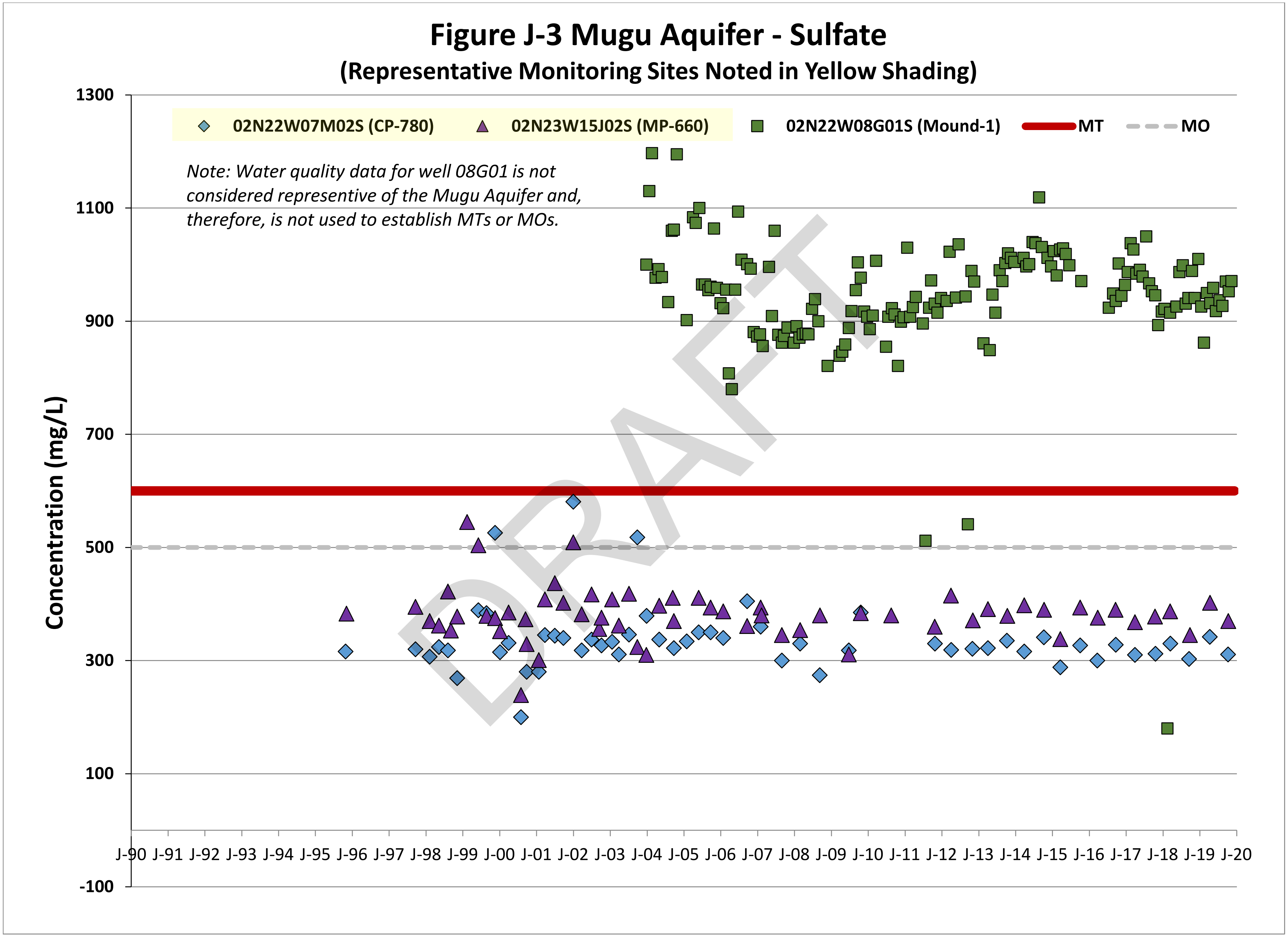

Figure J-3 Mugu Aquifer - Sulfate
(Representative Monitoring Sites Noted in Yellow Shading)
02N22W07M02S (CP-780)
02N23W15J02S (MP-660)
02N22W08G01S (Mound-1)
MT
MO
Note: Water quality data for well 08G01 is not considered representive of the Mugu Aquifer and, therefore, is not used to establish MTs or MOs.
Concentration (mg/L)
1300
1100
900
700
500
300
100
-100
J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06 J-07 J-08 J-09 J-10 J-11 J-12 J-13 J-14 J-15 J-16 J-17 J-18 J-19 J-20
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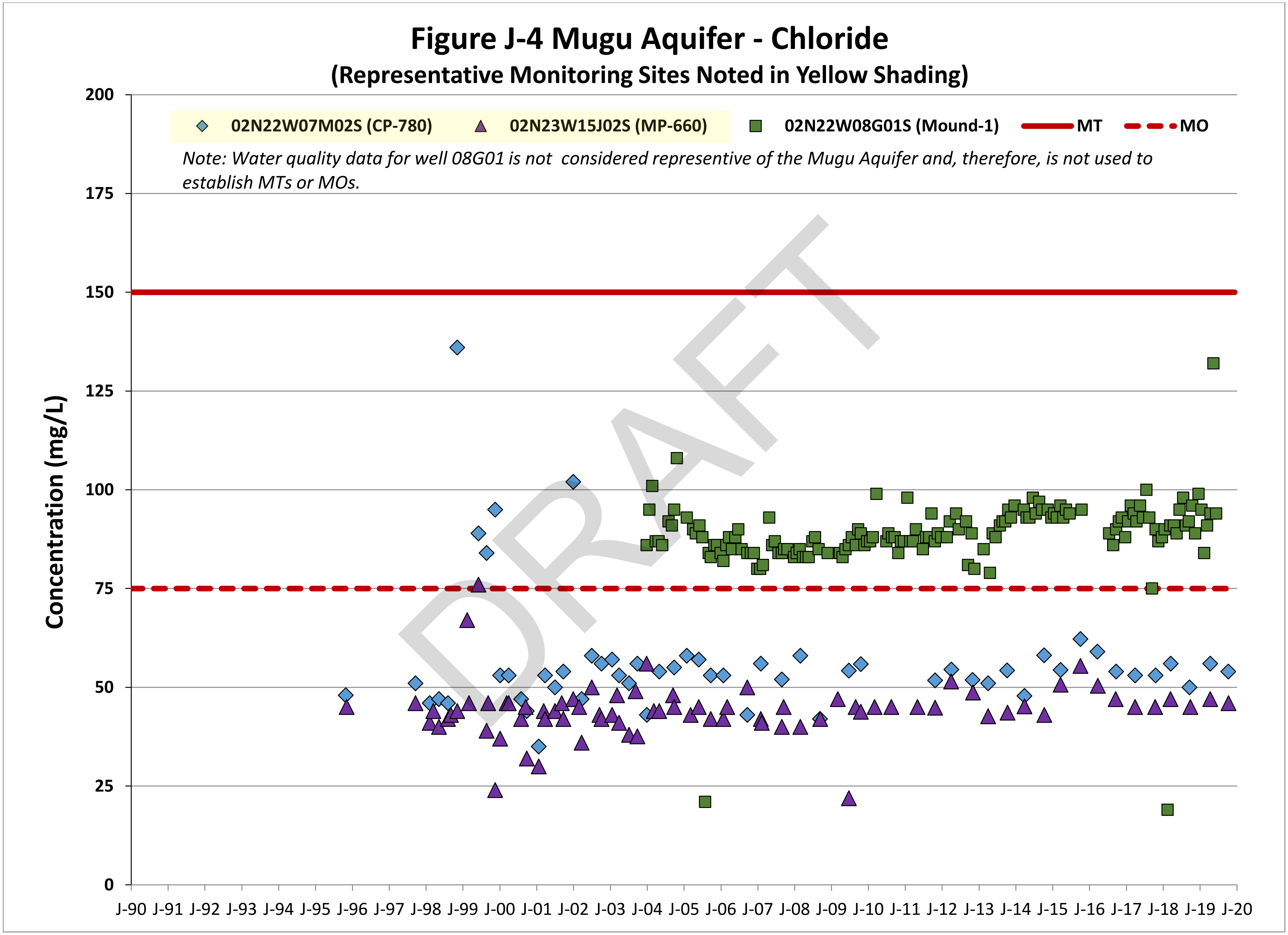

Figure J-4 Mugu Aquifer - Chloride
(Representative Monitoring Sites Noted in Yellow Shading)
02N22W07M02S (CP-780)
02N23W15J02S (MP-660)
02N22W08G01S (Mound-1)
MT
MO
Note: Water quality data for well 08G01 is not considered representative of the Mugu Aquifer and, therefore, is not used to establish MTs or MOs.
Concentration (mg/L)
200
175
150
125
100
75
50
25
0
J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06 J-07 J-08 J-09 J-10 J-11 J-12 J-13 J-14 J-15 J-16 J-17 J-18 J-19 J-20
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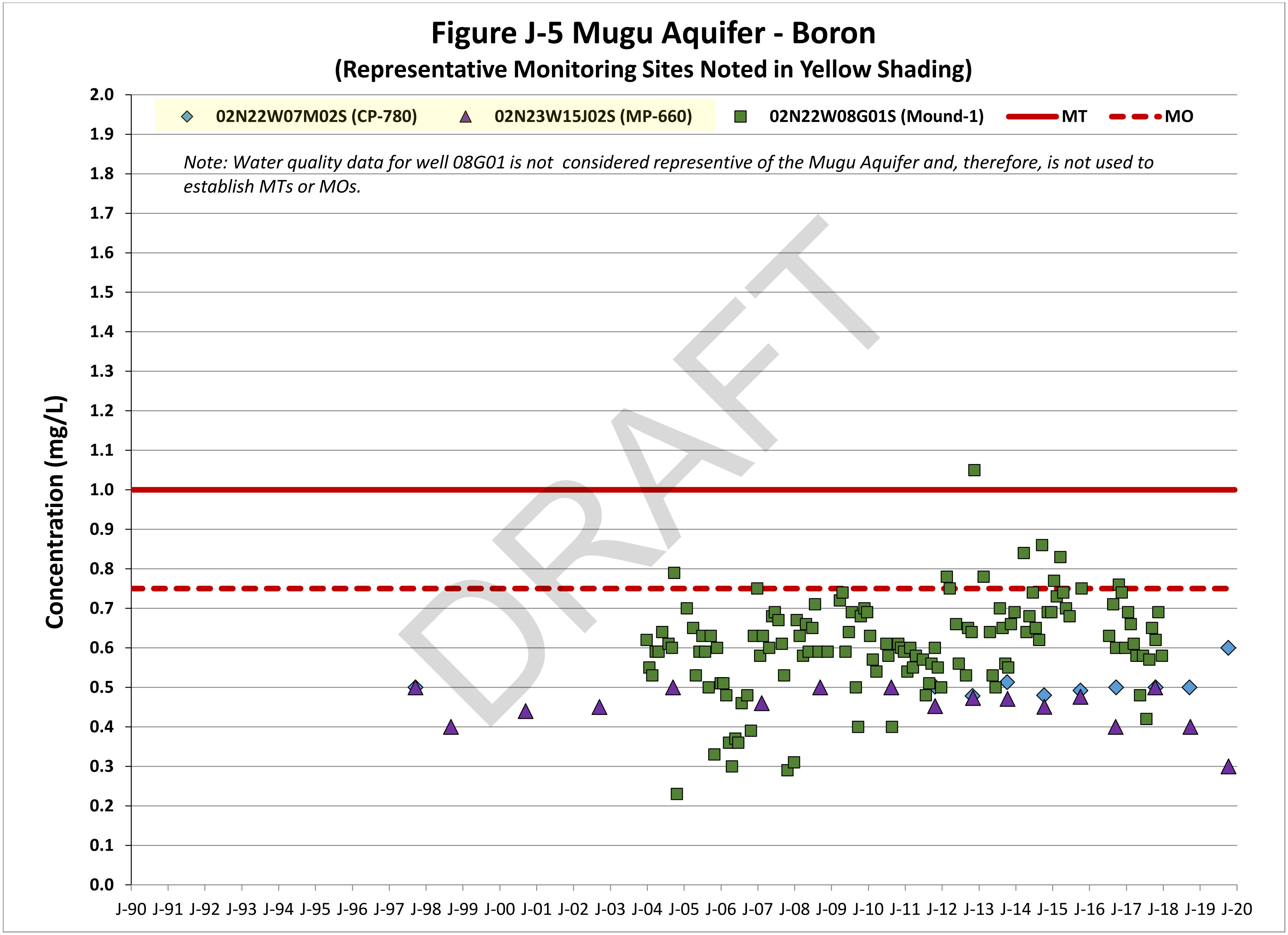

Figure J-5 Mugu Aquifer - Boron
(Representative Monitoring Sites Noted in Yellow Shading)
02N22W07M02S (CP-780)
02N23W15J02S (MP-660)
02N22W08G01S (Mound-1)
MT
MO
Note: Water quality data for well 08G01 is not considered representative of the Mugu Aquifer and, therefore, is not used to establish MTs or MOs.
Concentration (mg/L)
2.0
1.9
1.8
1.7
1.6
1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06 J-07 J-08 J-09 J-10 J-11 J-12 J-13 J-14 J-15 J-16 J-17 J-18 J-19 J-20
DRAFT

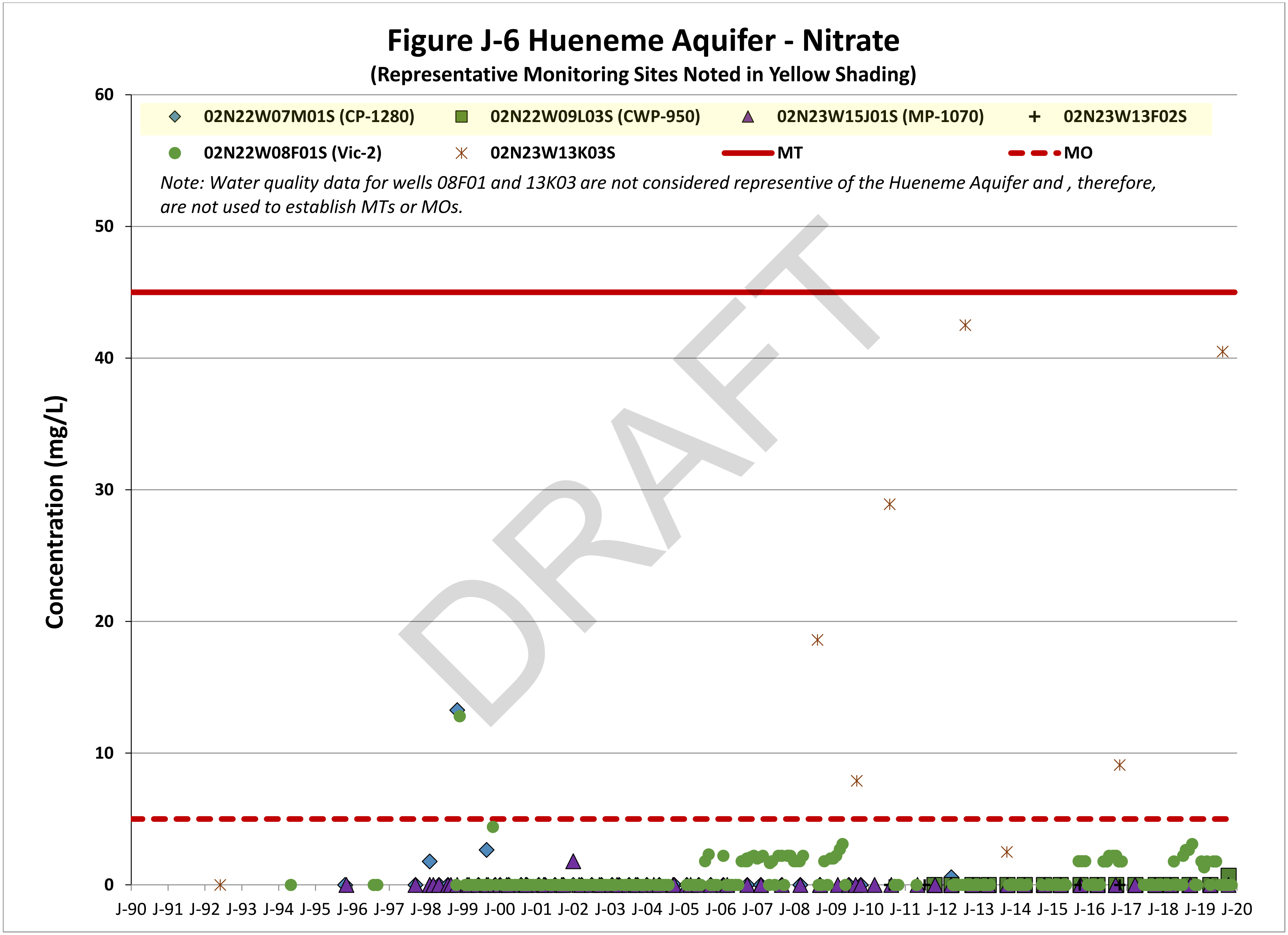

Figure J-6 Hueneme Aquifer - Nitrate
(Representative Monitoring Sites Noted in Yellow Shading)
02N22W07M01S (CP-1280)
02N22W09L03S (CWP-950)
02N23W15J01S (MP-1070)
02N23W13F02S
02N22W08F01S (Vic-2)
02N23W13K03S
MT
MO
Note: Water quality data for wells 08F01 and 13K03 are not considered representive of the Hueneme Aquifer and , therefore, are not used to establish MTs or MOs.
Concentration (mg/L)
0
10
20
30
40
50
60
J-90
J-91
J-92
J-93
J-94
J-95
J-96
J-97
J-98
J-99
J-00
J-01
J-02
J-03
J-04
J-05
J-06
J-07
J-08
J-09
J-10
J-11
J-12
J-13
J-14
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J-18
J-19
J-20
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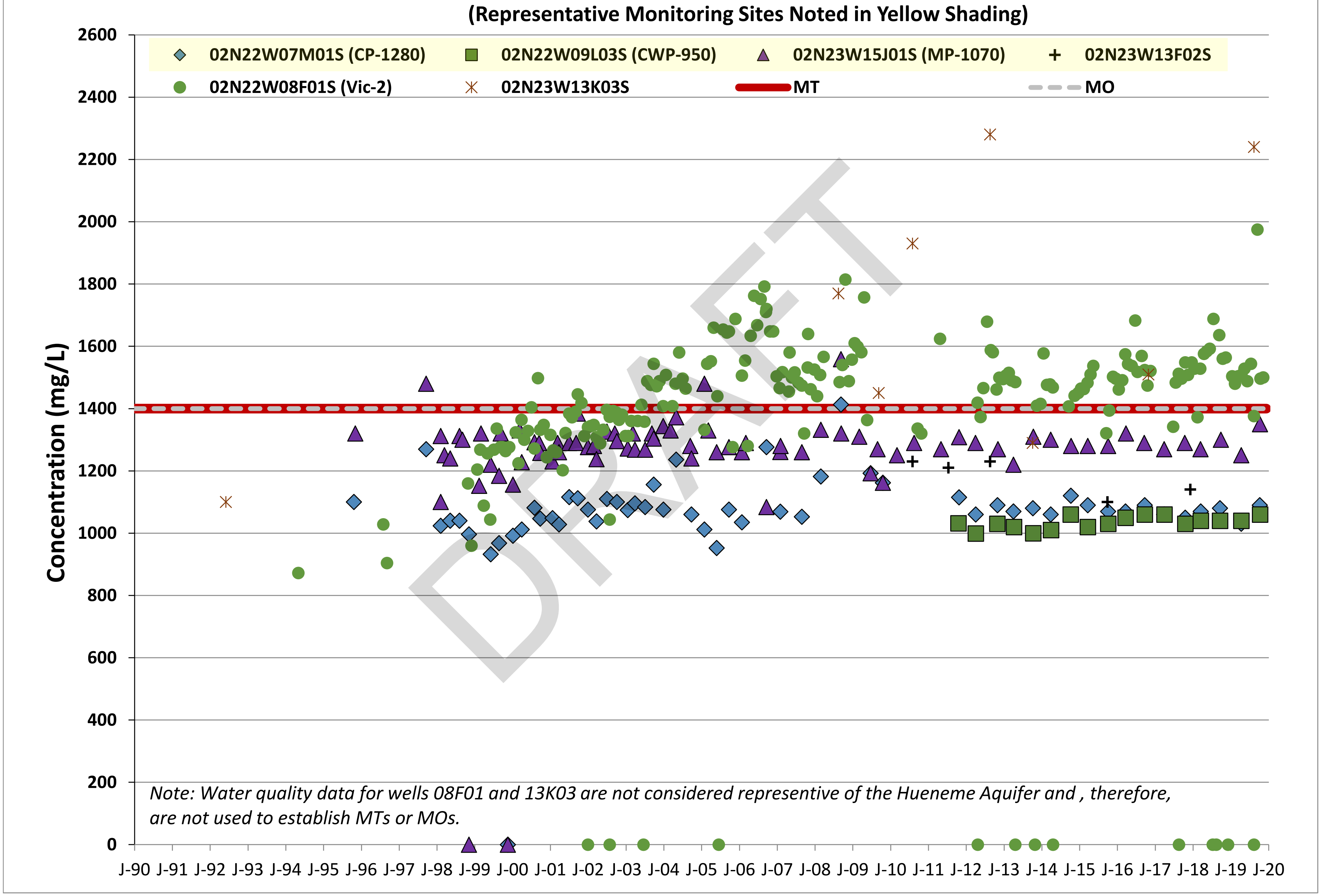
Figure J-7 Hueneme Aquifer - Total Dissolved Solids



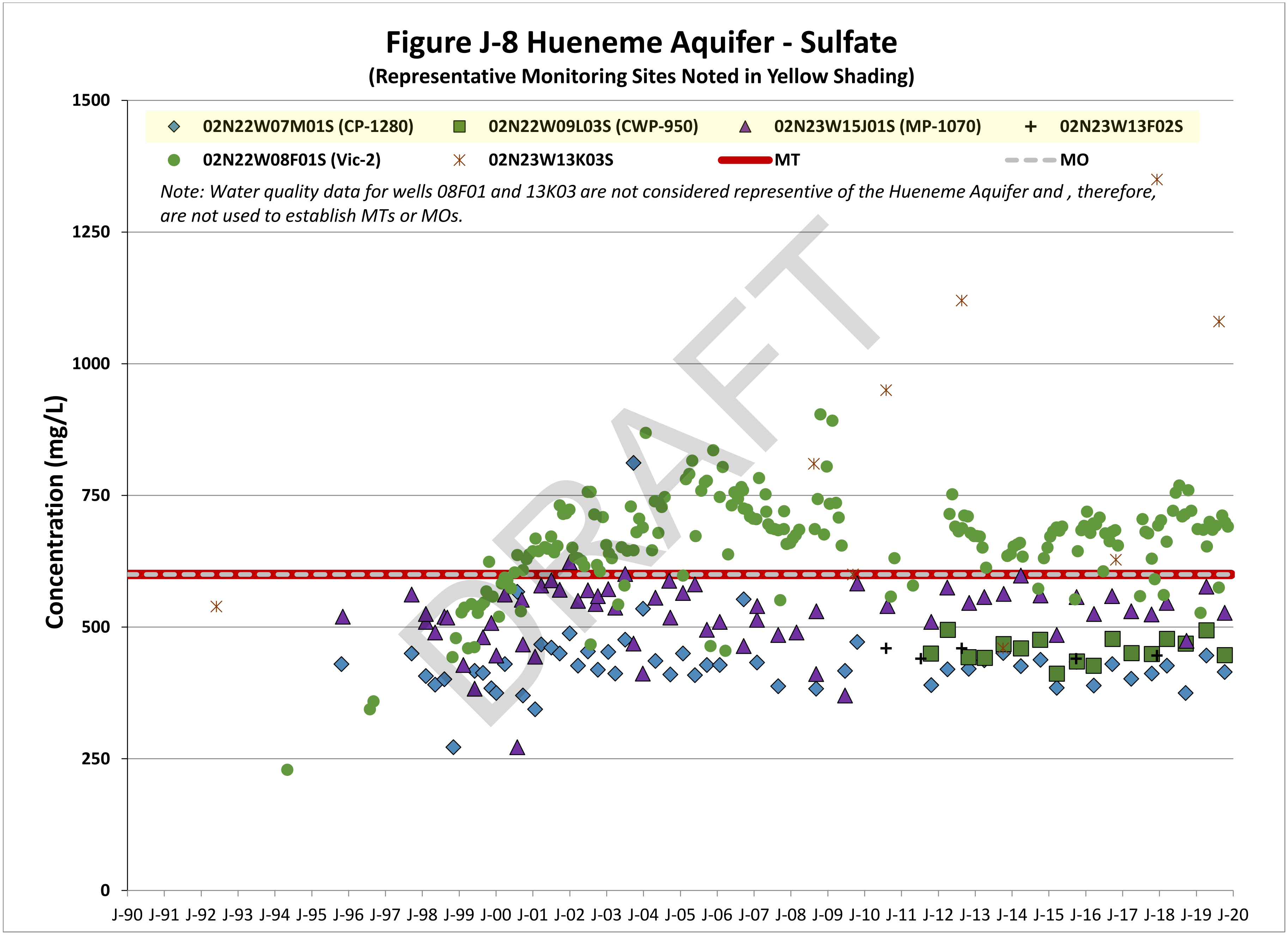


Figure J-8 Hueneme Aquifer - Sulfate
(Representative Monitoring Sites Noted in Yellow Shading)
02N22W07M01S (CP-1280)
02N22W09L03S (CWP-950)
02N23W15J01S (MP-1070)
02N23W13F02S
02N22W08F01S (Vic-2)
02N23W13K03S
MT
MO
Note: Water quality data for wells 08F01 and 13K03 are not considered representative of the Hueneme Aquifer and , therefore, are not used to establish MTs or MOs.
Concentration (mg/L)
1500
1250
1000
750
500
250
0
J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06 J-07 J-08 J-09 J-10 J-11 J-12 J-13 J-14 J-15 J-16 J-17 J-18 J-19 J-20
DRAFT

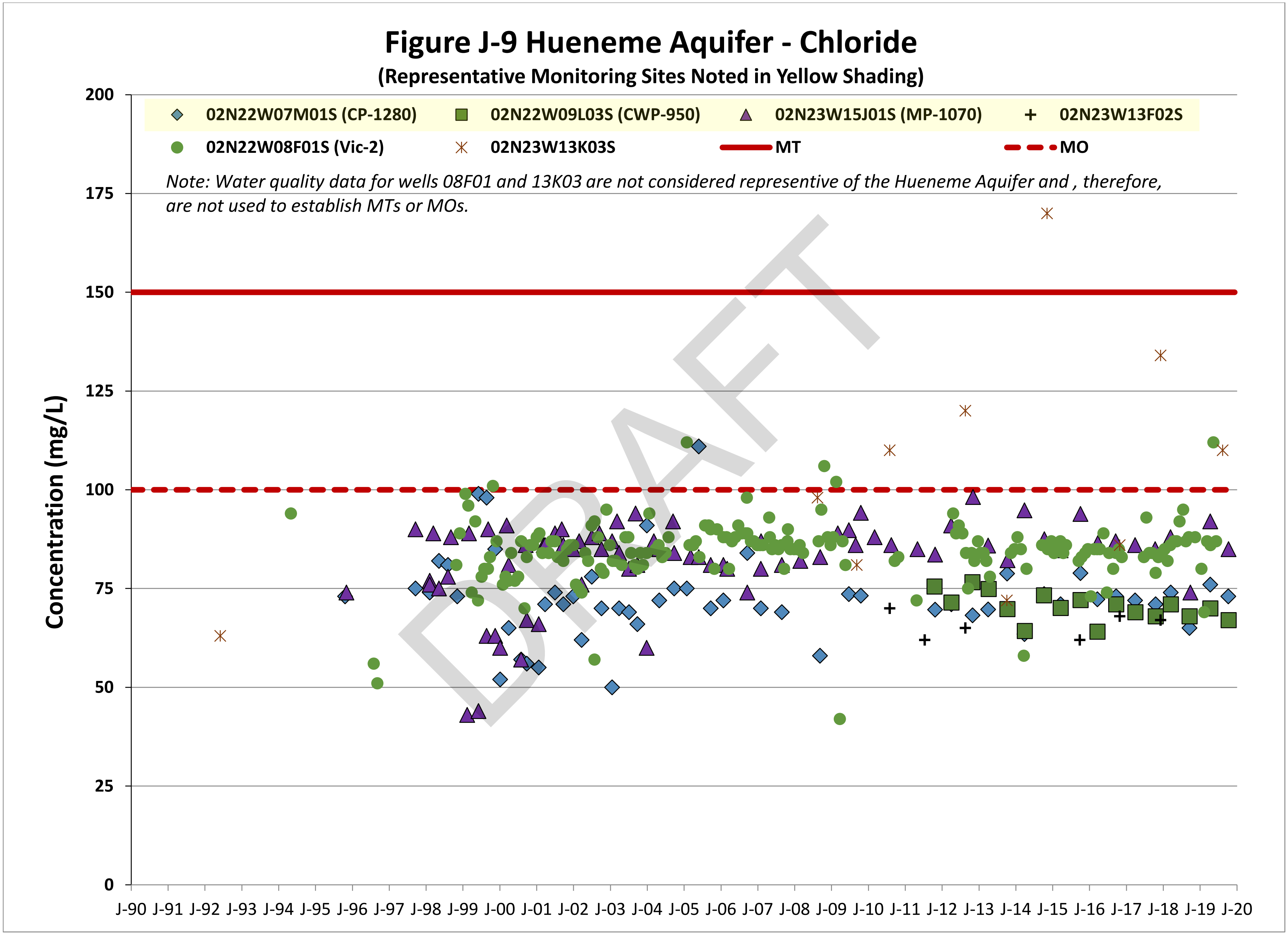


Figure J-9 Hueneme Aquifer - Chloride
(Representative Monitoring Sites Noted in Yellow Shading)
02N22W07M01S (CP-1280)
02N22W09L03S (CWP-950)
02N23W15J01S (MP-1070)
02N23W13F02S
02N22W08F01S (Vic-2)
02N23W13K03S
MT
MO
Note: Water quality data for wells 08F01 and 13K03 are not considered representative of the Hueneme Aquifer and , therefore, are not used to establish MTs or MOs.
Concentration (mg/L)
200
175
150
125
100
75
50
25
0
J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06 J-07 J-08 J-09 J-10 J-11 J-12 J-13 J-14 J-15 J-16 J-17 J-18 J-19 J-20
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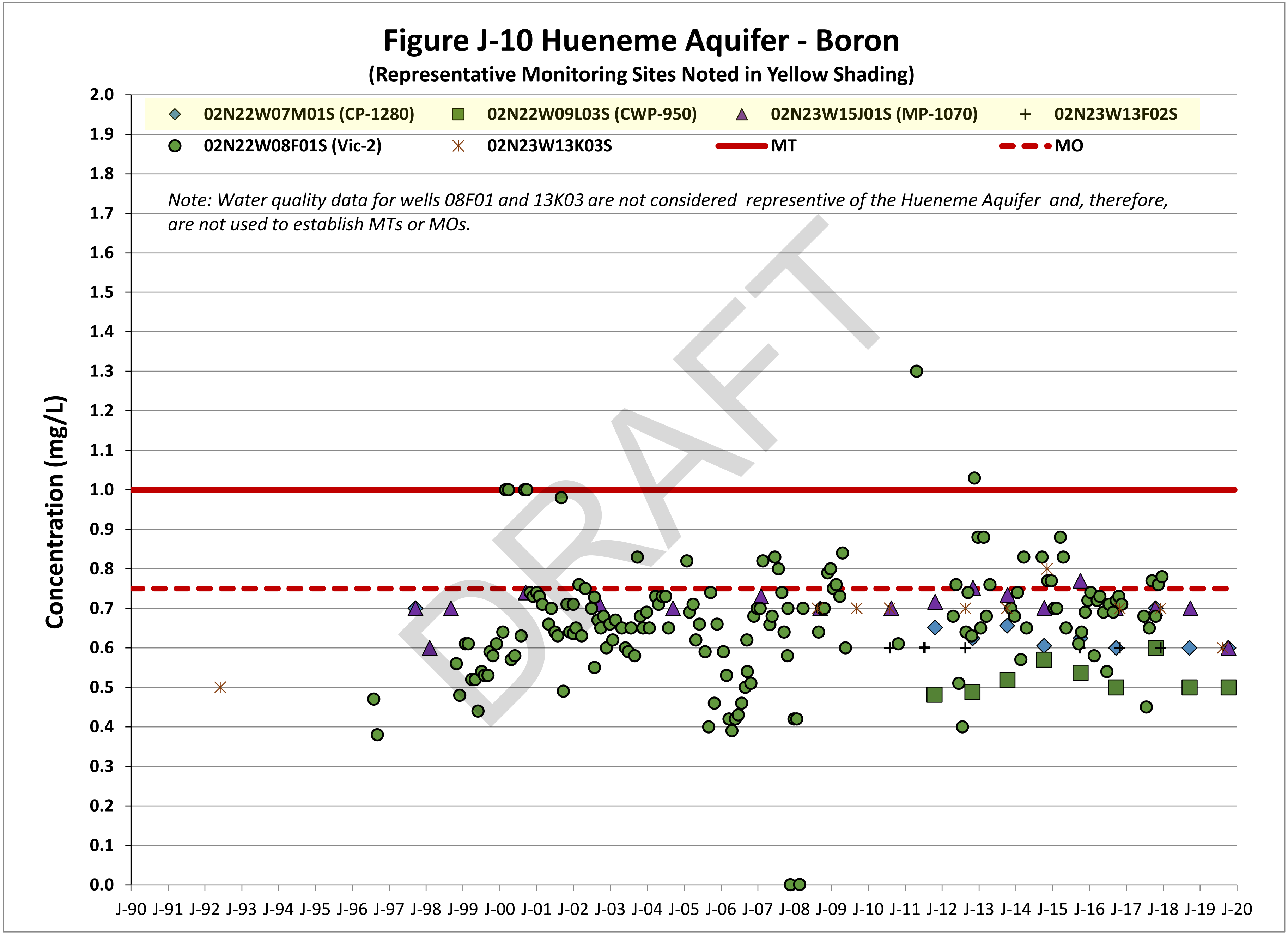
Figure J-10 Hueneme Aquifer - Boron
(Representative Monitoring Sites Noted in Yellow Shading)
02N22W07M01S (CP-1280)
02N22W09L03S (CWP-950)
02N23W15J01S (MP-1070)
02N23W13F02S
02N22W08F01S (Vic-2)
02N23W13K03S
MT
MO
Note: Water quality data for wells 08F01 and 13K03 are not considered representative of the Hueneme Aquifer and, therefore, are not used to establish MTs or MOs.
Concentration (mg/L)
2.0
1.9
1.8
1.7
1.6
1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
J-90 J-91 J-92 J-93 J-94 J-95 J-96 J-97 J-98 J-99 J-00 J-01 J-02 J-03 J-04 J-05 J-06 J-07 J-08 J-09 J-10 J-11 J-12 J-13 J-14 J-15 J-16 J-17 J-18 J-19 J-20
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Appendix K

Storage Curve Approach to Estimating Annual Change in Storage

Appendix K

Development of a "Storage Curve" to Estimate Annual Change in Groundwater in Storage In Mound Basin Using Groundwater Level Data

Introduction/Background

This appendix provides data and methodology used to develop a relationship between the historical changes in groundwater levels measured in the principal aquifers of Mound Basin and corresponding modeled changes in groundwater storage. This relationship will be used to calculate the annual storage changes in Mound Basin for the purpose of annual reporting required under the Sustainable Groundwater Management Act (SGMA) during years between future model updates by United (currently anticipated to occur approximately every 5 years).

SGMA Section 354.18(b)(4) states that "the water budget shall quantify the following, either through direct measurements or estimates based on data… the change in annual volume of groundwater in storage between seasonal high conditions." In Mound Basin, data presented in the Mound Basin Groundwater Sustainability Plan (GSP) indicate that spring is typically the season when aquifers in the region are in a positive water-balance condition (inflows exceed outflows) and groundwater levels (including potentiometric surfaces in confined aquifers) are at their highest. Changes in volume of groundwater in storage from one spring-high to the next can provide an indication of whether the aquifers have received sufficient recharge to recover from discharges during the preceding dry season (summer and fall), or whether a declining trend in storage is developing. Fall-low groundwater levels in Mound and adjacent basins can be strongly influenced by short-term, local factors such as timing of the first winter rainfall event and the presence or absence of Santa Ana winds in fall (which can result in a significant increase in demand for irrigation). Therefore, fall groundwater elevations provide a less reliable indicator of year-over-year changes in groundwater in storage compared to spring groundwater elevations.

Data Sources and Review

Groundwater elevation data available in the Mound Basin data management system were reviewed and selected for this analysis based on the following characteristics:

- Wells with a lengthy period of record (at least 20 years) of spring-high groundwater elevation measurements.
- The preferred timeframe for selection of spring-high groundwater elevations was the week of March 31 of each year. However, if no data were available that week, or if higher groundwater elevations occurred earlier or later in spring of that year, groundwater elevation data from other dates (up to several weeks earlier or later than the week of March 31) were selected to represent spring-high water levels.
- Only groundwater elevations from wells screened in principal aquifers in Mound Basin (Mugu and Hueneme Aquifers) were selected.
- Well locations had to be representative of areas of the basin where annual groundwater-level (and storage) changes were most significant, specifically along the central axis and southern portions of Mound Basin.

The clustered monitoring wells in Marina Park (02N23W15J01S and -J02S, screened in the Hueneme and Mugu aquifers, respectively) and Camino Real Park (02N22W07M01S and –M02S, also screened in the Hueneme and Mugu aquifers, respectively), together with agricultural supply well 02N22W20E01S (screened in the Hueneme Aquifer) met these criteria best. Locations of these wells are shown on Figure K-1. Spring-high groundwater elevations measured at these wells are summarized on Table K-1. The arithmetic mean (average) of the spring groundwater elevations at the five selected wells was calculated, and the change in average groundwater elevations from year to year was calculated (Table K-1). Note that years when data were not available for one or more of the selected wells, an average was not calculated. Furthermore, changes in groundwater elevation from the previous year could not be (and were not) calculated when no average was available for the prior year.

Past annual changes in groundwater in storage in Mound Basin were estimated by United's groundwater flow model, as described in Section 3.3 (water-budget analysis) of the Mound Basin GSP. However, rather than using model output to calculate water-year (October through September) changes in groundwater in storage in Mound Basin, as was conducted for the water-budget analysis presented in the GSP, model output for the end of March of each year was used to calculate changes in spring-high groundwater in storage.

Correlation Results and Development of Storage Curve

A scatterplot of annual spring-high changes in groundwater elevation versus annual changes in groundwater in storage in Mound Basin (from spring of the previous year to spring of the selected year) is shown on Figure K-2. The best-fit linear regression calculated for this relationship is:

Annual change in storage (acre-feet) = 706 (acre-feet/foot) x Annual change in average groundwater elevation (feet)

The coefficient of determination (R^2) for this relationship is 0.51.

The y-intercept in this regression was forced through the origin (the point on the graph representing zero change in groundwater elevation and zero change in storage). If this y-intercept had not been forced, the best-fit would have changed slightly to:

Annual change in storage (acre-feet) = 777 (acre-feet/foot) x Annual change in average groundwater elevation (feet) + 818 (acre-feet)

The coefficient of determination for this relationship is 0.53.

Although the equations and coefficients of determination are similar, conceptually it is logical to assume that in a year with no change in groundwater elevations in Mound Basin, the volume of groundwater in storage in the basin would not change. Therefore, the first linear regression above (with the y-intercept forced through the origin) is selected as representative of the relationship between changes in groundwater elevation and storage in the basin. In the near future, annual changes in spring-high storage in Mound Basin can be approximated using this relationship and groundwater elevation data collected from wells 02N23W15J01S, 02N23W15J02S, 02N22W07M01S, 02N22W07M02S, and 02N22W20E01S. As noted previously, changes in storage in the basin for the previous 5 years are expected to be computed via groundwater flow modeling at approximately 5-year intervals. When these model estimates are completed, the storage-curve can be modified if needed, and the modeled estimates of change in storage can be used to improve the storage-curve-based estimates of the previous 5 years.

MoundBasin

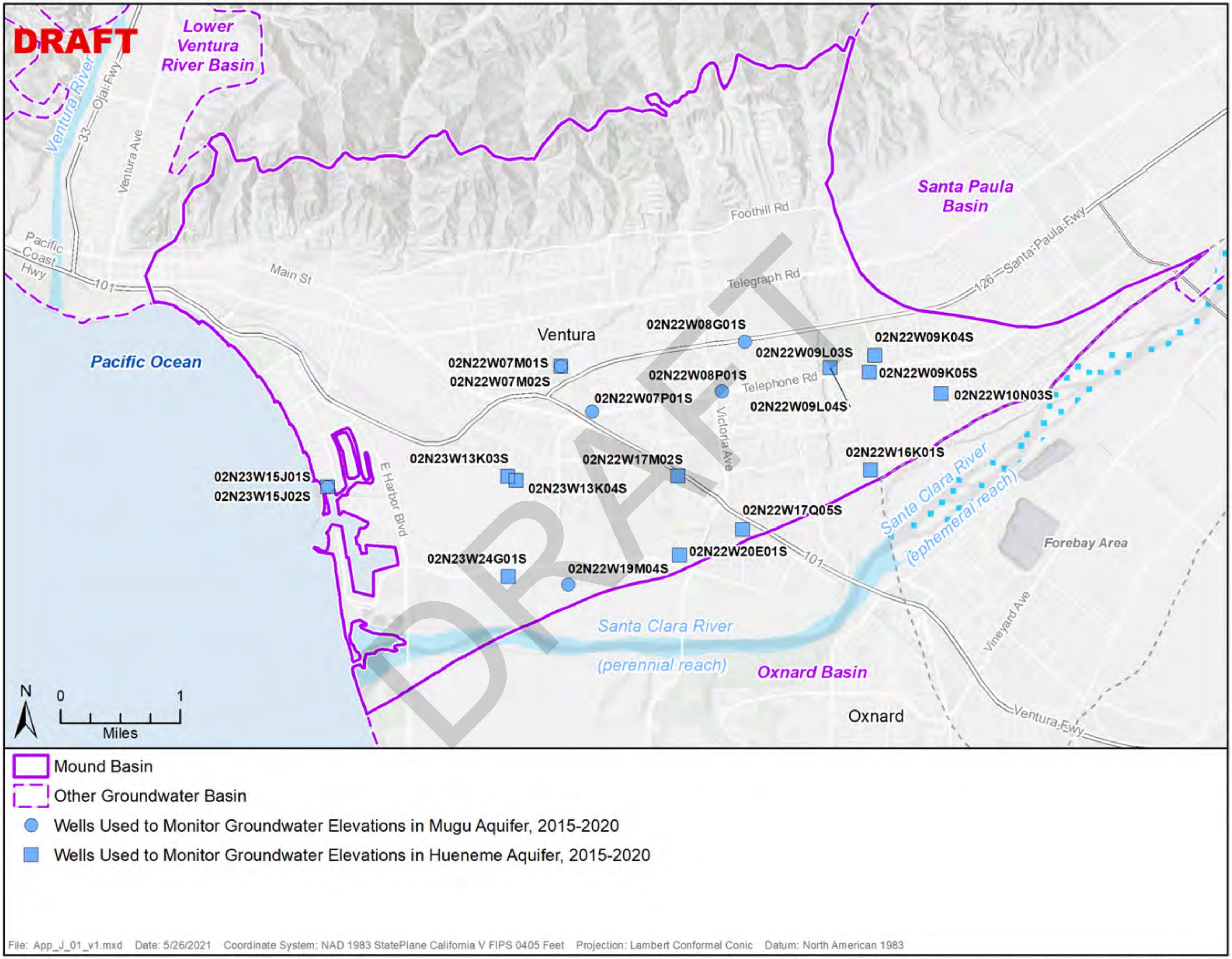


Figure K-01 Locations of Wells.

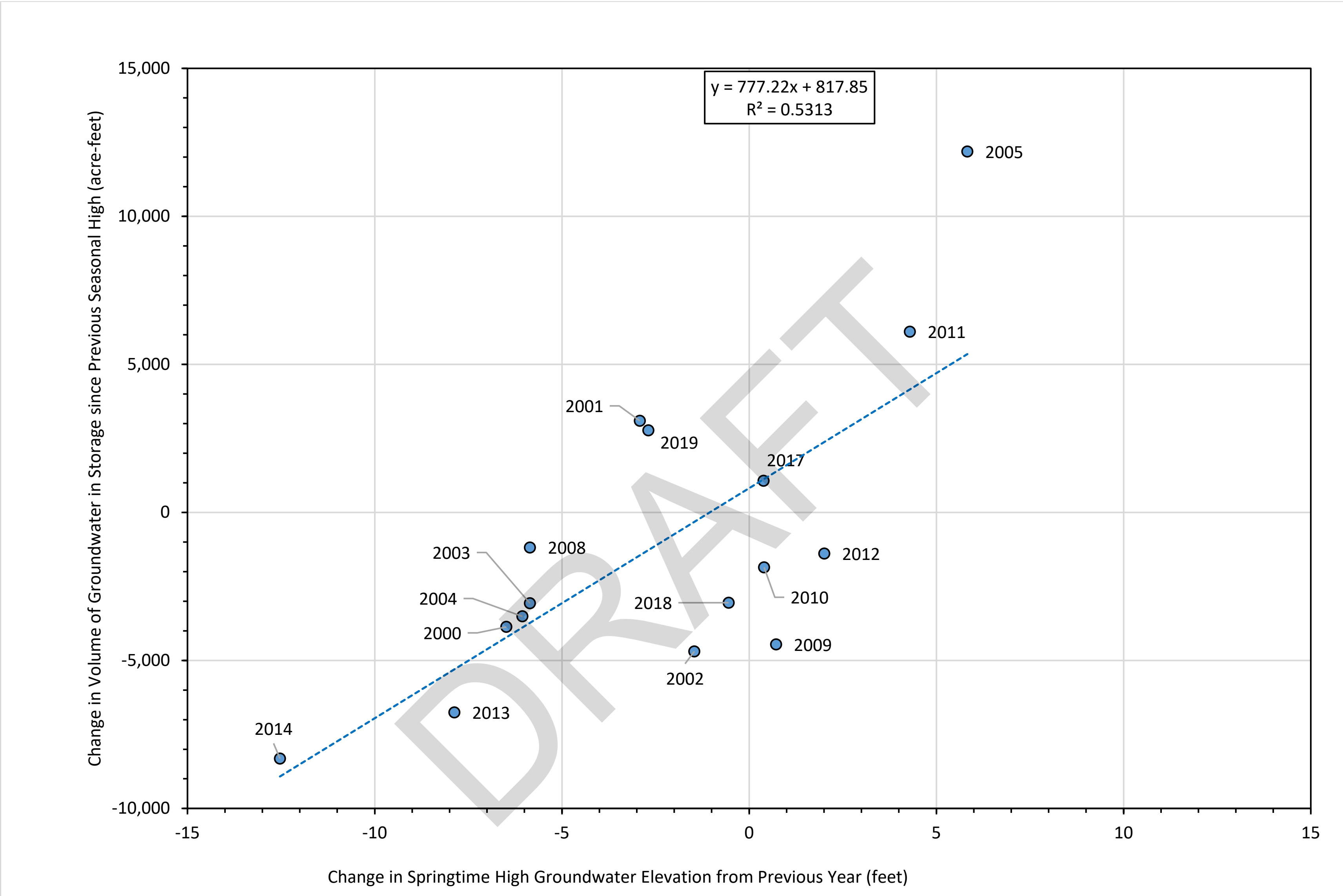


Figure K-02 Annual Spring-High Changes in Groundwater Elevation Versus Annual Changes In Groundwater In Storage In Mound Basin.

MoundBasin
GROUNDWATER SUSTAINABILITY AGENCY

Table K-01 Groundwater Level Elevations Measured at Selected Wells and Modeled Changes in Groundwater in Storage in Mound Basin

Water Year	Average of Spring-High Groundwater Elevations Measured in Mugu and Hueneme Aquifers at Marina Park and Camino Real Park Clustered Monitoring Wells, and Supply Well 02N22W20E01S (feet, msl)	Change in Average of Spring-High Groundwater Elevations Measured in Mugu and Hueneme Aquifers at Marina Park and Camino Real Park Clustered Monitoring Wells, and Supply Well 02N22W20E01S (feet)	Change in Volume of Groundwater in Storage since Previous Seasonal High (acre-feet)	Well Identifier	Date Ground-water Level Measured	Ground-water Level (feet, msl)	Well Identifier	Date Ground-water Level Measured	Ground-water Level (feet, msl)	Well Identifier	Date Ground-water Level Measured	Ground-water Level (feet, msl)	Well Identifier	Date Ground-water Level Measured	Ground-water Level (feet, msl)	Well Identifier	Date Ground-water Level Measured	Ground-water Level (feet, msl)
1996			641	02N22W07M01S	4/15/1996	19.96	02N22W07M02S	4/15/1996	29.66	02N23W15J01S	4/15/1996	11.73	02N23W15J02S	4/15/1996	15.93			
1997			-96	02N22W07M01S	2/14/1997	21.06	02N22W07M02S	2/14/1997	30.06	02N23W15J01S	4/10/1997	7.53						
1998			8,253	02N22W07M01S	4/9/1998	29.36	02N22W07M02S	4/9/1998	37.46	02N23W15J01S	3/19/1998	13.95	02N23W15J02S	3/19/1998	23.19			
1999	27.05		-1,834	02N22W07M01S	3/31/1999	20.36	02N22W07M02S	3/31/1999	32.76	02N23W15J01S	3/30/1999	18.07	02N23W15J02S	3/30/1999	22.54	02N22W20E01S	3/18/1999	41.55
2000	20.57	-6.48	-3,869	02N22W07M01S	4/7/2000	12.46	02N22W07M02S	4/7/2000	24.86	02N23W15J01S	3/16/2000	13.41	02N23W15J02S	3/16/2000	21.03	02N22W20E01S	3/2/2000	31.09
2001	17.65	-2.92	3,094	02N22W07M01S	3/28/2001	7.06	02N22W07M02S	3/28/2001	20.76	02N23W15J01S	3/19/2001	10.76	02N23W15J02S	3/19/2001	15.60	02N22W20E01S	3/28/2001	34.07
2002	16.19	-1.46	-4,697	02N22W07M01S	3/29/2002	3.21	02N22W07M02S	3/29/2002	19.38	02N23W15J01S	3/7/2002	6.38	02N23W15J02S	3/7/2002	15.82	02N22W20E01S	2/25/2002	36.15
2003	10.33	-5.85	-3,071	02N22W07M01S	4/4/2003	2.26	02N22W07M02S	4/4/2003	16.86	02N23W15J01S	3/17/2003	5.26	02N23W15J02S	3/17/2003	12.24	02N22W20E01S	2/27/2003	15.05
2004	4.28	-6.05	-3,514	02N22W07M01S	2/4/2004	0.54	02N22W07M02S	2/6/2004	-1.24	02N23W15J01S	3/18/2004	3.17	02N23W15J02S	3/18/2004	3.78	02N22W20E01S	4/20/2004	15.15
2005	10.11	5.83	12,191	02N22W07M01S	2/7/2005	8.96	02N22W07M02S	4/7/2005	10.06	02N23W15J01S	3/1/2005	5.85	02N23W15J02S	3/18/2005	6.92	02N22W20E01S	3/9/2005	18.75
2006			-1,345	02N22W07M01S	4/13/2006	13.26	02N22W07M02S	4/13/2006	21.96	02N23W15J01S	3/15/2006	9.73	02N23W15J02S	3/15/2006	14.93			
2007	17.12		-4,908	02N22W07M01S	4/4/2007	13.16	02N22W07M02S	4/4/2007	26.06	02N23W15J01S	3/6/2007	8.65	02N23W15J02S	4/4/2007	12.63	02N22W20E01S	4/4/2007	25.11
2008	11.27	-5.85	-1,184	02N22W07M01S	2/6/2008	11.30	02N22W07M02S	4/2/2008	9.56	02N23W15J01S	3/31/2008	6.65	02N23W15J02S	3/31/2008	10.29	02N22W20E01S	4/8/2008	18.55
2009	11.99	0.72	-4,463	02N22W07M01S	3/31/2009	8.86	02N22W07M02S	3/31/2009	18.96	02N23W15J01S	3/17/2009	6.39	02N23W15J02S	3/17/2009	13.93	02N22W20E01S	2/26/2009	11.80
2010	12.39	0.40	-1,858	02N22W07M01S	4/6/2010	17.06	02N22W07M02S	2/8/2010	15.86	02N23W15J01S	3/1/2010	11.50	02N23W15J02S	3/1/2010	12.77	02N22W20E01S	4/12/2010	4.75
2011	16.68	4.29	6,103	02N22W07M01S	4/8/2011	18.68	02N22W07M02S	4/8/2011	15.77	02N23W15J01S	4/5/2011	12.77	02N23W15J02S	4/5/2011	13.35	02N22W20E01S	4/14/2011	22.84
2012	18.69	2.01	-1,389	02N22W07M01S	4/18/2012	24.88	02N22W07M02S	4/4/2012	17.68	02N23W15J01S	3/30/2012	15.20	02N23W15J02S	3/30/2012	15.43	02N22W20E01S	4/4/2012	20.25
2013	10.82	-7.87	-6,760	02N22W07M01S	3/28/2013	10.34	02N22W07M02S	3/16/2013	19.14	02N23W15J01S	3/28/2013	9.89	02N23W15J02S	3/28/2013	11.27	02N22W20E01S	3/27/2013	3.45
2014	-1.71	-12.53	-8,316	02N22W07M01S	3/24/2014	3.14	02N22W07M02S	3/10/2014	6.88	02N23W15J01S	3/26/2014	0.67	02N23W15J02S	3/26/2014	1.85	02N22W20E01S	3/21/2014	-21.11
2015			-6,837	02N22W07M01S	3/18/2015	-2.63	02N22W07M02S	3/1/2015	-0.99	02N23W15J01S	3/2/2015	-2.07	02N23W15J02S	3/2/2015	-0.09			
2016	-9.37		-3,459	02N22W07M01S	3/24/2016	1.55	02N22W07M02S	3/14/2016	2.70	02N23W15J01S	4/4/2016	-2.46	02N23W15J02S	2/26/2016	0.33	02N22W20E01S	3/23/2016	-48.97
2017	-8.99	0.38	1,064	02N22W07M01S	3/21/2017	1.73	02N22W07M02S	3/21/2017	-3.98	02N23W15J01S	2/27/2017	-3.70	02N23W15J02S	2/27/2017	-1.73	02N22W20E01S	2/28/2017	-37.26
2018	-9.54	-0.55	-3,051	02N22W07M01S	3/15/2018	0.50	02N22W07M02S	3/27/2018	-0.34	02N23W15J01S	3/29/2018	-3.75	02N23W15J02S	3/15/2018	-2.92	02N22W20E01S	3/27/2018	-41.17
2019	-12.23	-2.69	2,775	02N22W07M01S	3/6/2019	-3.57	02N22W07M02S	3/25/2019	-8.05	02N23W15J01S	3/28/2019	-8.27	02N23W15J02S	3/6/2019	-7.18	02N22W20E01S	4/8/2019	-34.08
2020	-7.26	4.97		02N22W07M01S	3/12/2020	1.10	02N22W07M02SX	3/12/2020	-7.85	02N23W15J01S	3/26/2020	-2.49	02N23W15J02S	3/12/2020	-4.99	02N22W20E01S	3/11/2020	-22.07
2021	-6.19	1.07		02N22W07M01S	1/21/2021	3.96	02N22W07M02S	3/17/2021	-7.46	02N23W15J01S	3/17/2021	-2.83	02N23W15J02S	3/17/2021	-3.58	02N22W20E01S	3/16/2021	-21.06

Notes: Blank entries represent years when no data are available or average groundwater elevations could not be calculated
feet, msl = feet above (or below, if negative) mean sea level

Appendix L

Data Management System Information

Overview

This data management system (DMS) was developed for the purpose of "storing and reporting information relevant to the development or implementation of the Plan and monitoring of the basin", per section 352.6 of the GSP regulations. The DMS was developed for use by the Mound Basin Groundwater Sustainability Agency (MBGSA).

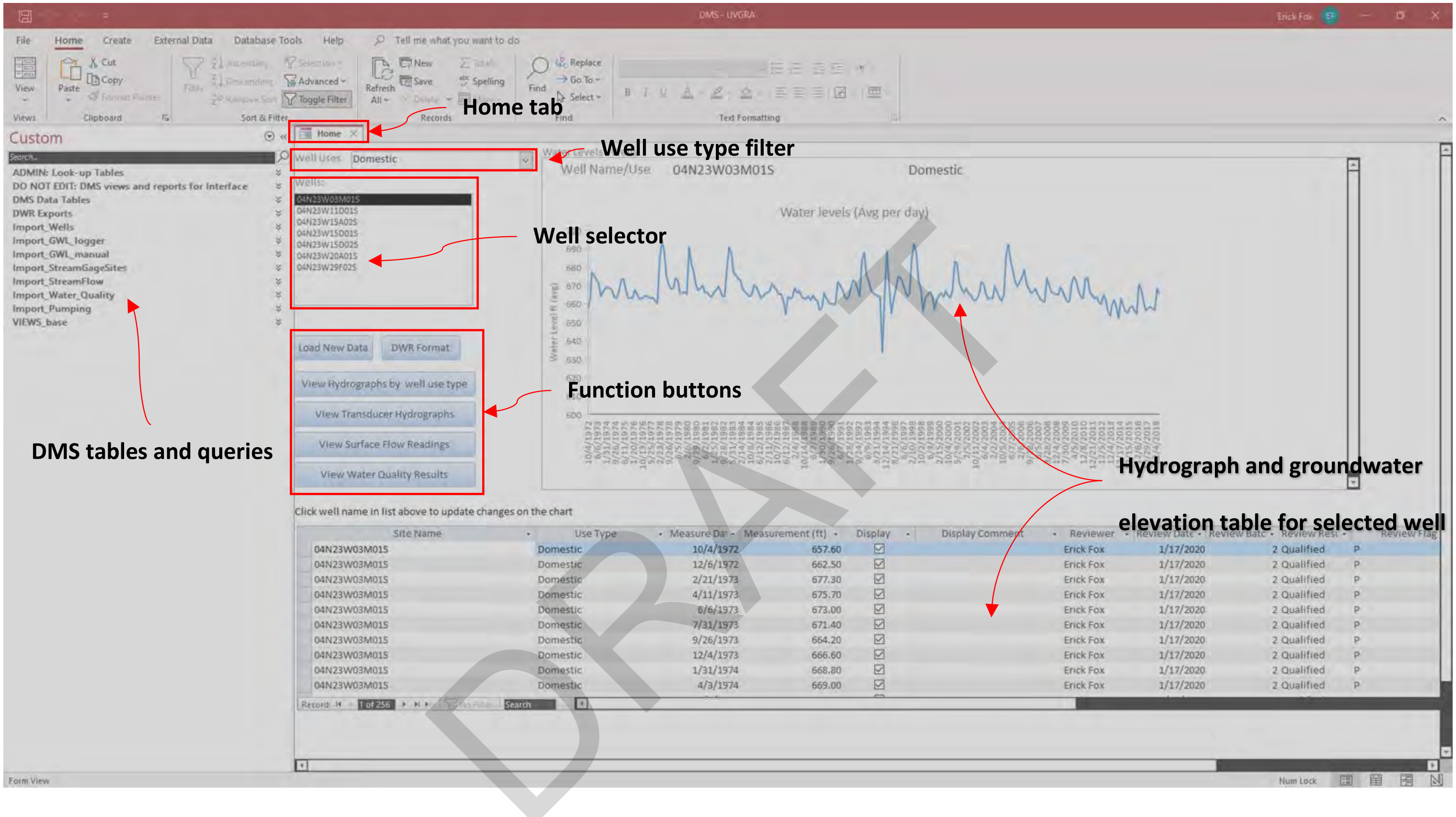
The DMS is housed in an Access database, which has the ability to import data from Excel, perform filtering and charting for some data, and export to Excel tables that are formatted according to DWR templates for upload with the GSP. The data in the DMS have undergone quality control checks prior to import in line with the UVRGA Data Quality Control Review Procedures document, adopted by the UVRGA board on September 13, 2018.

The DMS is designed to contain the following data:

- Well construction details
- Groundwater level elevations (manual measurements and logger data)
- Water quality
- Pumping
- Stream gages
- Streamflow data

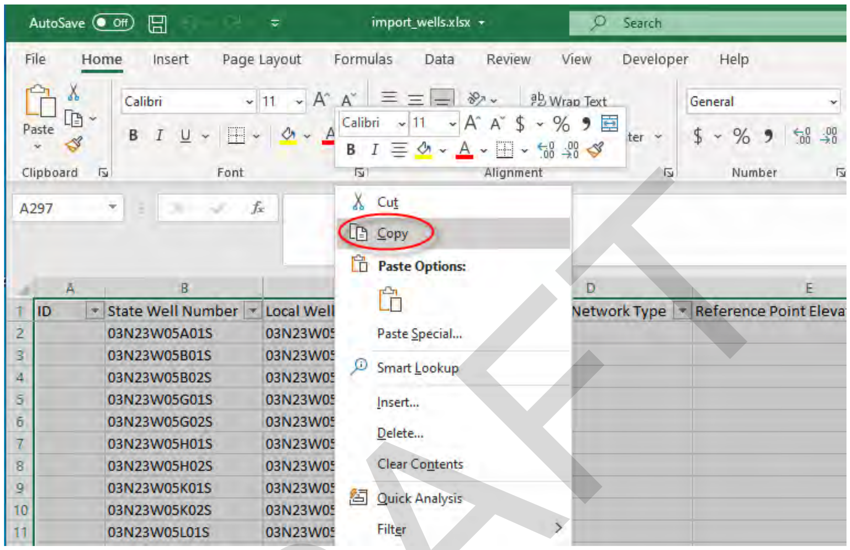
In addition to the data tables that hold the above information, the DMS also contains a number of tables and queries that are used for importing, data format verification, and other backend functions. See DMS Object Description (attached) for a description of these tables and queries. DMS Object Map (attached) shows how these tables and queries are used for the import and export functions.

The default starting view shows the Home tab that contains a dropdown list of wells filtered by use type, a hydrograph and groundwater elevation data table for the selected well, and several buttons that can be used to access certain functions of the DMS—see screenshot next page. (If the Home tab is not visible, expand the DMS views and reports for Interface group in the table of contents on the left hand side of the screen, and open chart_WaterLevels_wells.)

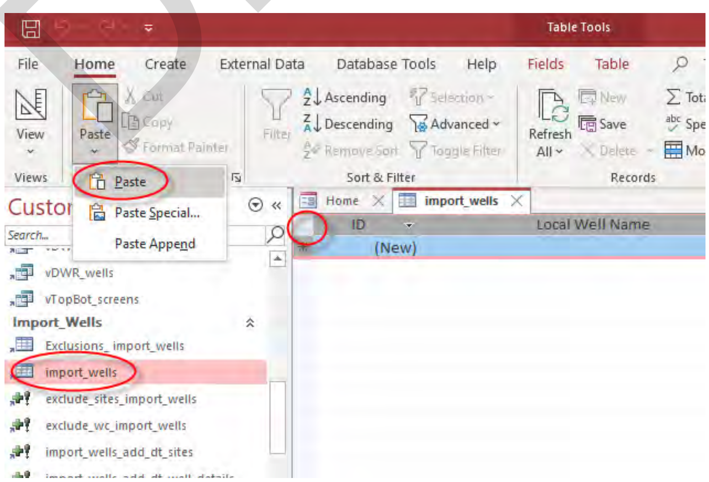

Home tab
Well use type filter
Well selector
Function buttons
DMS tables and queries
Hydrograph and groundwater
elevation table for selected well
DRAFT

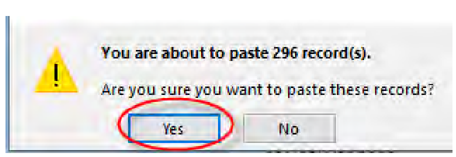
Importing Well Site Details

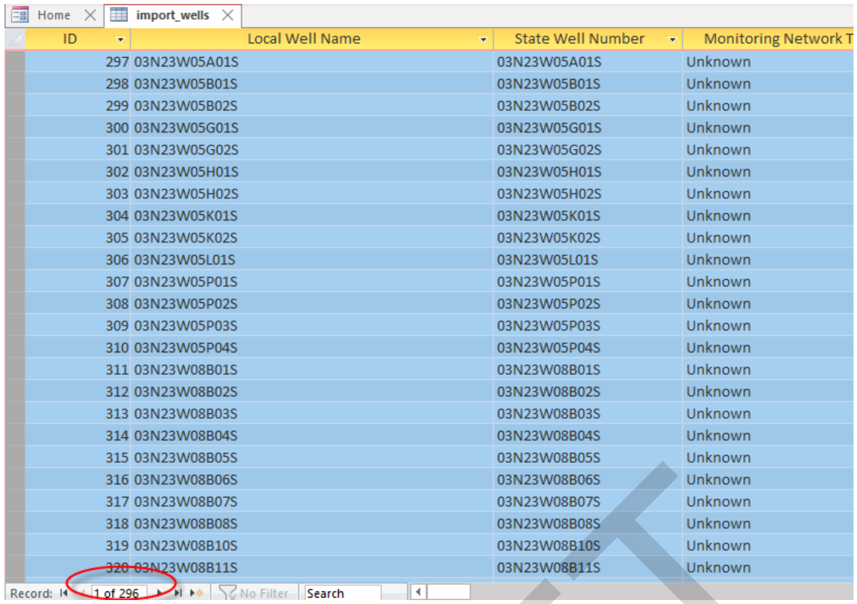
1. Format the data in Excel according to the "import_wells.xlsx" file. Select and copy the data to be imported to DMS (including column headers).



2. Import to DMS by opening the "import_wells" table in Access, clicking the top left corner of the table, and pasting the copied data from Step 1. Click "Yes" to confirm. After pasting the data, verify that the number of records in the "import_wells" table is equal to the number of rows copied from Excel.

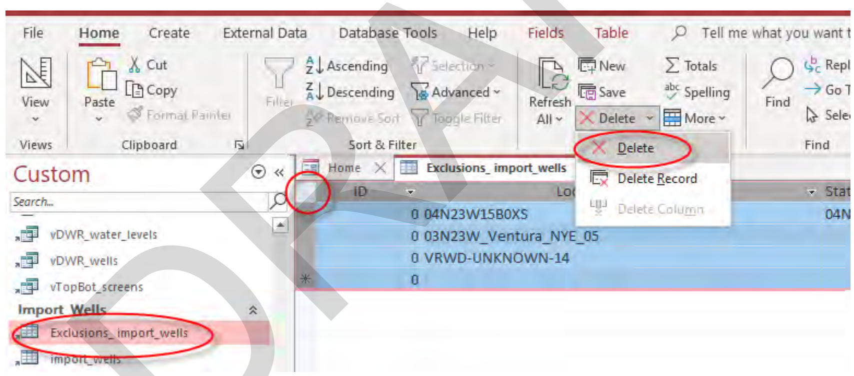




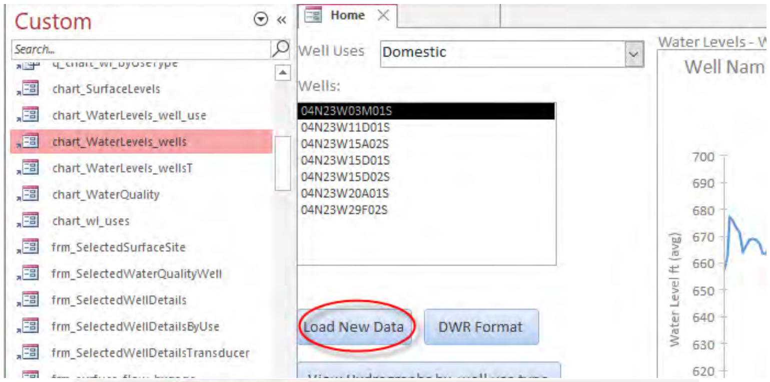


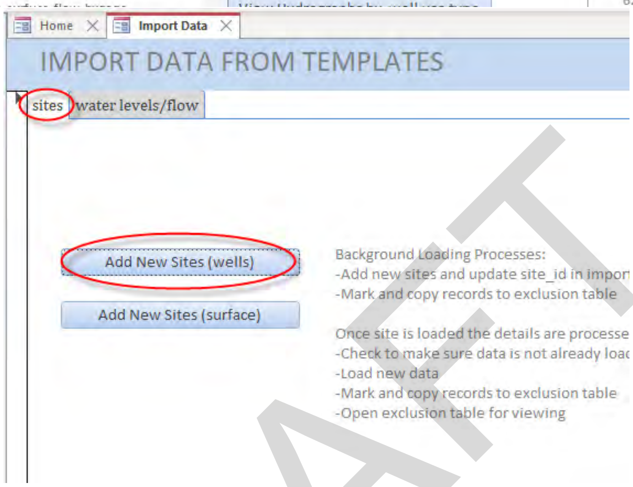
ID	Local Well Name	State Well Number	Monitoring Network T
297	03N23W05A01S	03N23W05A01S	Unknown
298	03N23W05B01S	03N23W05B01S	Unknown
299	03N23W05B02S	03N23W05B02S	Unknown
300	03N23W05G01S	03N23W05G01S	Unknown
301	03N23W05G02S	03N23W05G02S	Unknown
302	03N23W05H01S	03N23W05H01S	Unknown
303	03N23W05H02S	03N23W05H02S	Unknown
304	03N23W05K01S	03N23W05K01S	Unknown
305	03N23W05K02S	03N23W05K02S	Unknown
306	03N23W05L01S	03N23W05L01S	Unknown
307	03N23W05P01S	03N23W05P01S	Unknown
308	03N23W05P02S	03N23W05P02S	Unknown
309	03N23W05P03S	03N23W05P03S	Unknown
310	03N23W05P04S	03N23W05P04S	Unknown
311	03N23W08B01S	03N23W08B01S	Unknown
312	03N23W08B02S	03N23W08B02S	Unknown
313	03N23W08B03S	03N23W08B03S	Unknown
314	03N23W08B04S	03N23W08B04S	Unknown
315	03N23W08B05S	03N23W08B05S	Unknown
316	03N23W08B06S	03N23W08B06S	Unknown
317	03N23W08B07S	03N23W08B07S	Unknown
318	03N23W08B08S	03N23W08B08S	Unknown
319	03N23W08B10S	03N23W08B10S	Unknown
320	03N23W08B11S	03N23W08B11S	Unknown

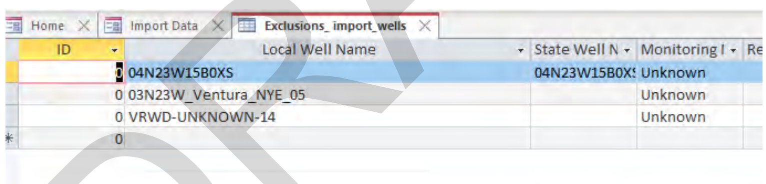
3. Open the “Exclusions_import_wells” table. If the table is not empty, then delete all records in it. After making sure that it is empty, close the table.



4. Open the “chart_WaterLevels_wells” form, i.e. the Home tab (if not already open). Click the “Load New Data” button and then the “Add New Sites (wells)” button under the “Sites” tab. This adds the new acceptable data from the “import_wells” table to the master “dt_sites” and “dt_well_details” tables and opens the “Exclusions_import_wells” table to show which new data were not added to the master tables due to missing information.





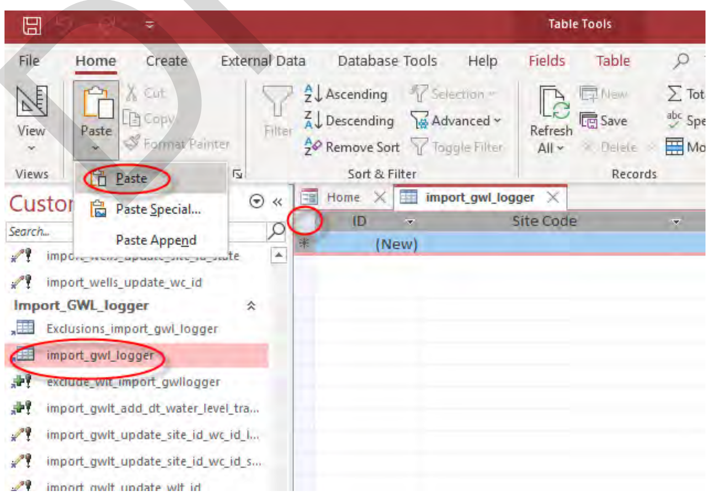


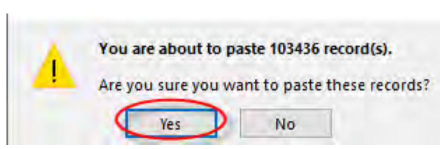
5. For the new data that were not added to the master "dt_sites" and "dt_well_details" tables (i.e., records showing up in the "Exclusions_import_wells" table), go back to the Excel template in Step 1, add the missing details (e.g., latitude, longitude, coordinates method, coordinates accuracy, and county), and repeat Steps 1 – 4.

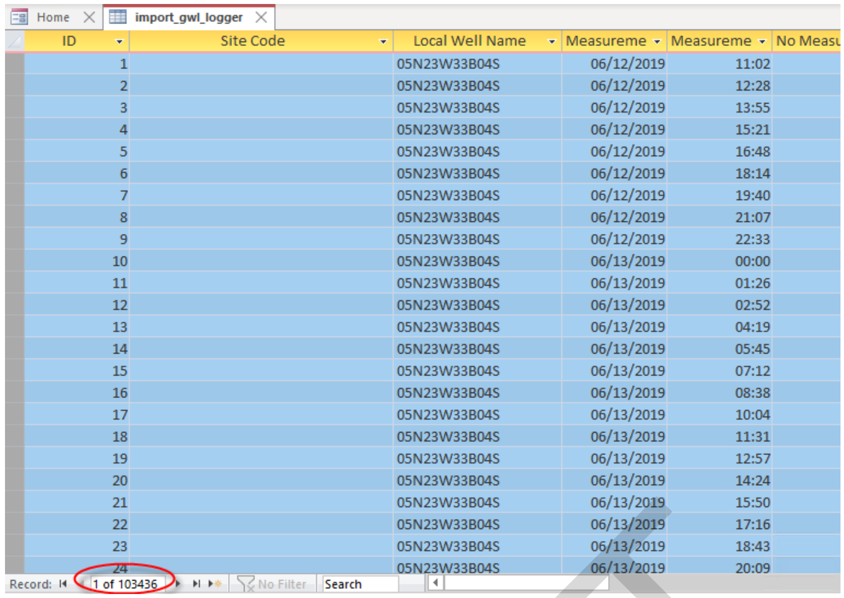
Importing Electronic Logger GWL Data

1. Format the data in Excel according to the "import_gwl_logger.xlsx" file. Make sure that the Measurement Date is in the correct format. Select and copy the data to be imported to DMS (including column headers).

2. Import to DMS by opening the "import_gwl_logger" table in Access, clicking the top left corner of the table, and pasting the copied data from Step 1. This may take a few minutes if the number of records is large. Click "Yes" to confirm. After pasting the data, verify that the number of records in the "import_gwl_logger" table is equal to the number of rows copied from Excel.

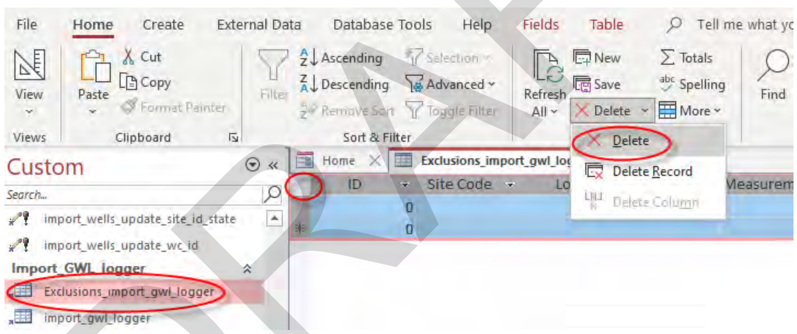




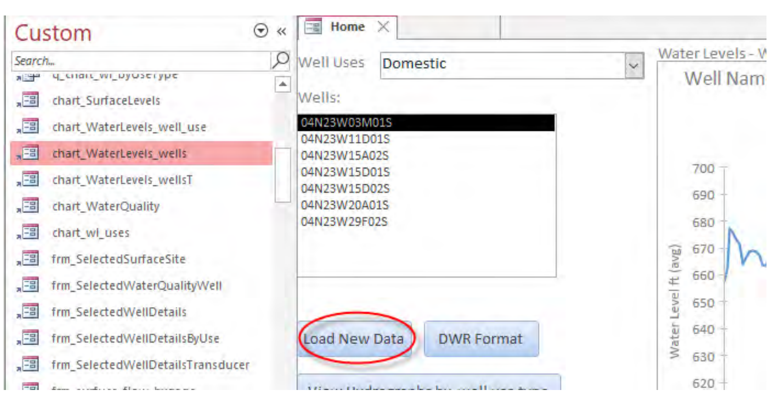


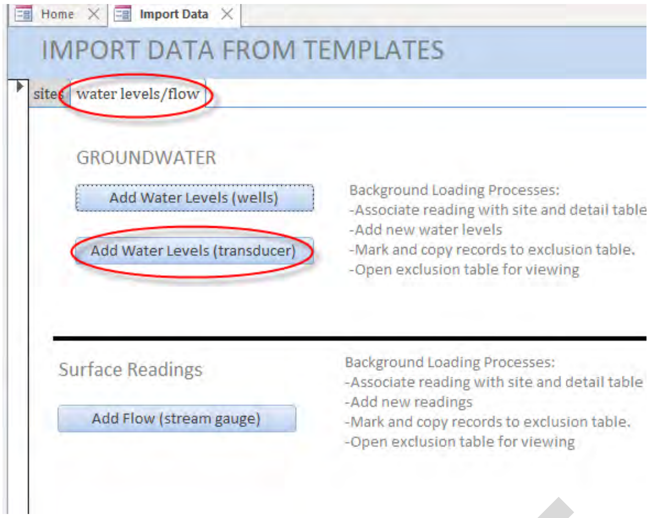
ID	Site Code	Local Well Name	Measureme	Measureme	No Measu
1		05N23W33B04S	06/12/2019	11:02	
2		05N23W33B04S	06/12/2019	12:28	
3		05N23W33B04S	06/12/2019	13:55	
4		05N23W33B04S	06/12/2019	15:21	
5		05N23W33B04S	06/12/2019	16:48	
6		05N23W33B04S	06/12/2019	18:14	
7		05N23W33B04S	06/12/2019	19:40	
8		05N23W33B04S	06/12/2019	21:07	
9		05N23W33B04S	06/12/2019	22:33	
10		05N23W33B04S	06/13/2019	00:00	
11		05N23W33B04S	06/13/2019	01:26	
12		05N23W33B04S	06/13/2019	02:52	
13		05N23W33B04S	06/13/2019	04:19	
14		05N23W33B04S	06/13/2019	05:45	
15		05N23W33B04S	06/13/2019	07:12	
16		05N23W33B04S	06/13/2019	08:38	
17		05N23W33B04S	06/13/2019	10:04	
18		05N23W33B04S	06/13/2019	11:31	
19		05N23W33B04S	06/13/2019	12:57	
20		05N23W33B04S	06/13/2019	14:24	
21		05N23W33B04S	06/13/2019	15:50	
22		05N23W33B04S	06/13/2019	17:16	
23		05N23W33B04S	06/13/2019	18:43	
24		05N23W33B04S	06/13/2019	20:09	

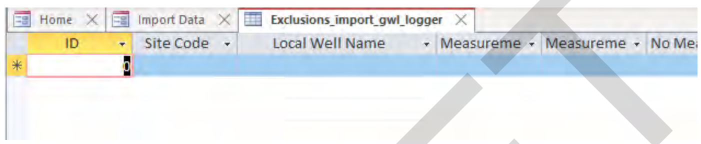
3. Open the "Exclusions_import_gwl_logger" table. If the table is not empty, then delete all records in it. After making sure that it is empty, close the table.



4. Open the "chart_WaterLevels_wells" form, i.e. the Home tab (if not already open). Click the "Load New Data" button and then the "Add Water Levels (transducer)" button under the "water levels/flow" tab. This adds the new acceptable data from the "import_gwl_logger" table to the master "dt_water_levels_transducer" table and opens the "Exclusions_import_gwl_logger" table to show which new data were not added to the master table due to missing information.







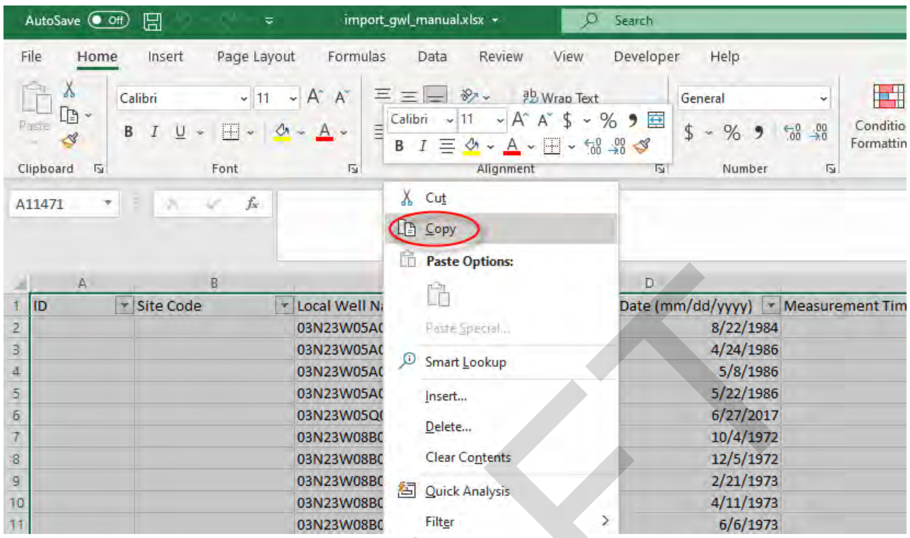
5. For the new data that were not added to the master “dt_water_levels_transducer” table (i.e., records showing up in the “Exclusions_import_gwl_logger” table), check the Site Code and Local Well Name and make sure that they exist in the “dt_sites” and “dt_well_details” tables.

   If the Site Code, Local Well Name, or any field in the GWL logger data needs to be corrected, then go back to the Excel template in Step 1, edit the information, and repeat Steps 1 – 4.

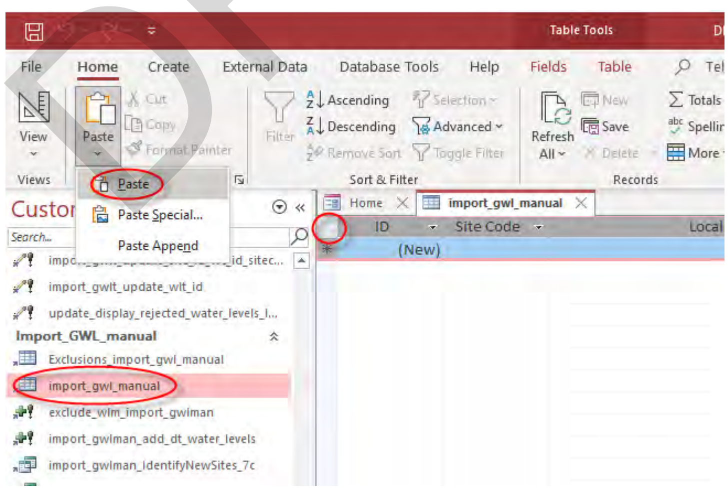
   If the well information does not exist in the “dt_sites” or “dt_well_details” table, then follow the steps for “Importing Well Data.”

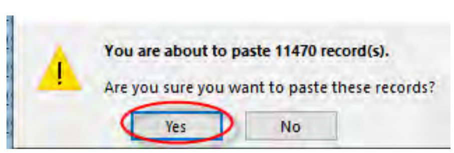
Importing Manual GWL Data

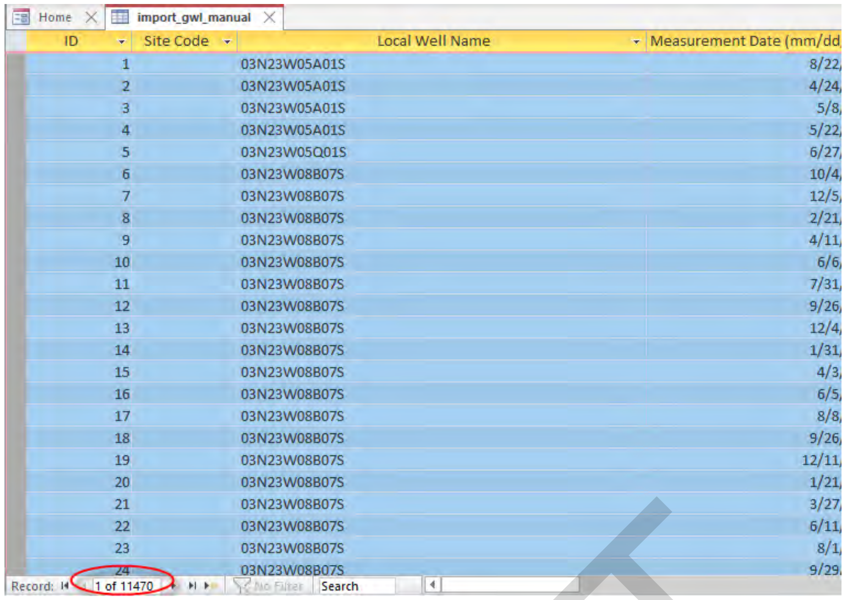
1. Format the data in Excel according to the "import_gwl_manual.xlsx" file. Make sure that the Measurement Date is in the correct format. Select and copy the data to be imported to DMS (including column headers).



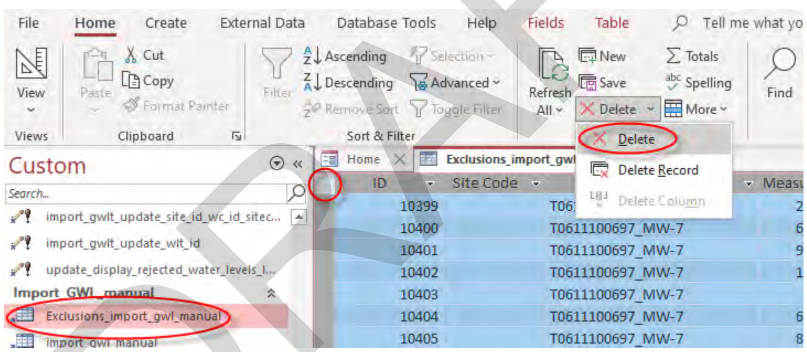
2. Import to DMS by opening the "import_gwl_manual" table in Access, clicking the top left corner of the table, and pasting the copied data from Step 1. This may take a few minutes if the number of records is large. Click "Yes" to confirm. After pasting the data, verify that the number of records in the "import_gwl_manual" table is equal to the number of rows copied from Excel.



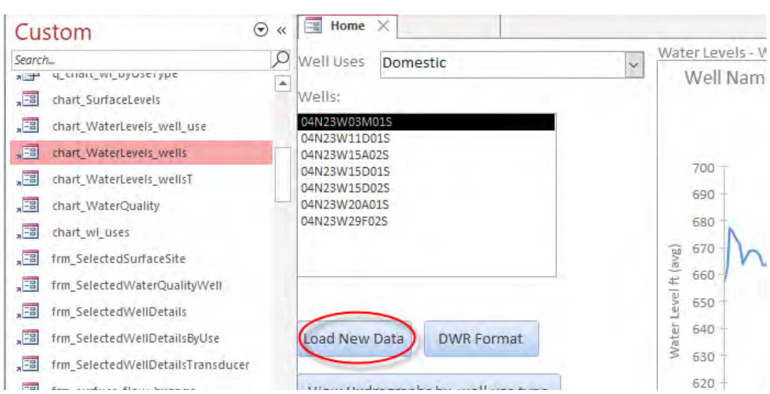


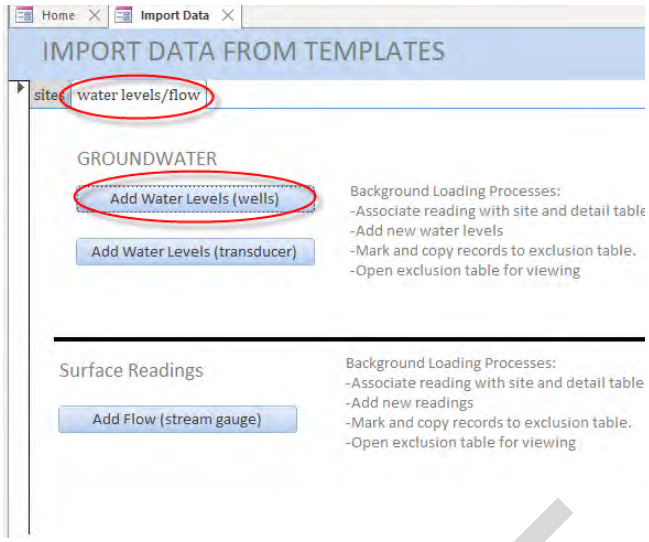


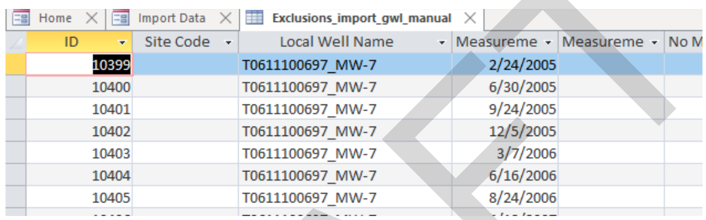
3. Open the “Exclusions_import_gwl_manual” table. If the table is not empty, then delete all records in it. After making sure that it is empty, close the table.



4. Open the “chart_WaterLevels_wells” form, i.e. the Home tab (if not already open). Click the “Load New Data” button and then the “Add Water Levels (wells)” button under the “water levels/flow” tab. This adds the new acceptable data from the “import_gwl_manual” table to the master “dt_water_levels” table and opens the “Exclusions_import_gwl_manual” table to show which new data were not added to the master table due to missing information.







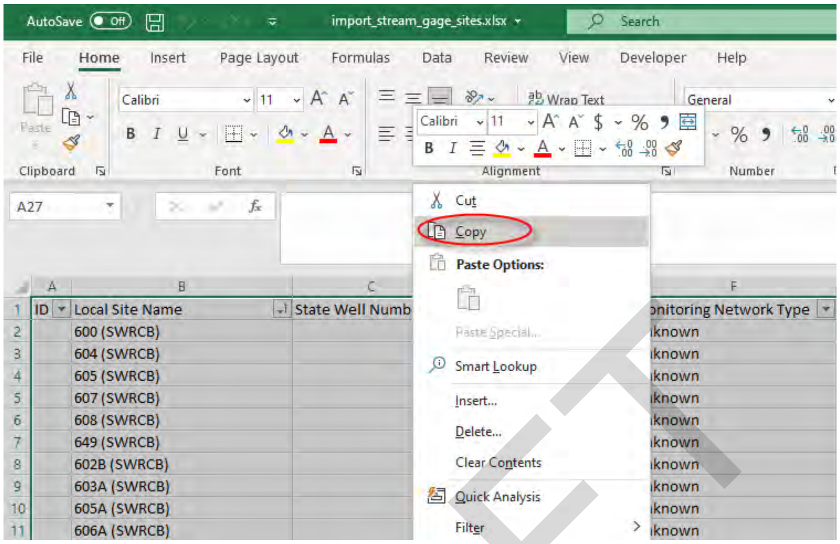
5. For the new data that were not added to the master “dt_water_levels” table (i.e., records showing up in the “Exclusions_import_gwl_manual” table), check the Local Well Name and make sure that it exists in the “dt_sites” and “dt_well_details” tables.

   If the Local Well Name or any field in the GWL manual data needs to be corrected, then go back to the Excel template in Step 1, edit the information, and repeat Steps 1 – 4.

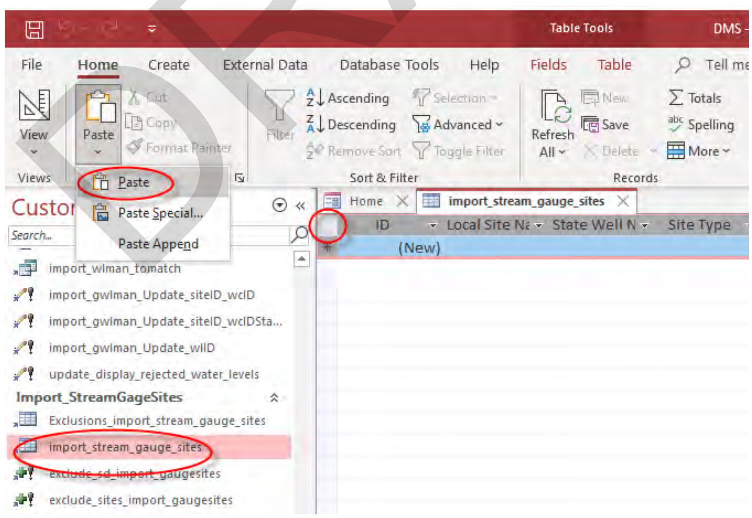
   If the well information does not exist in the “dt_sites” or “dt_well_details” table, then follow the steps for “Importing Well Data.”

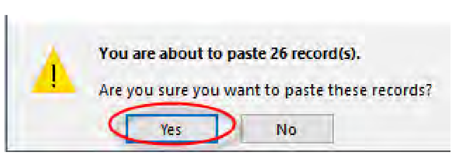
Importing Stream Gage Site Details

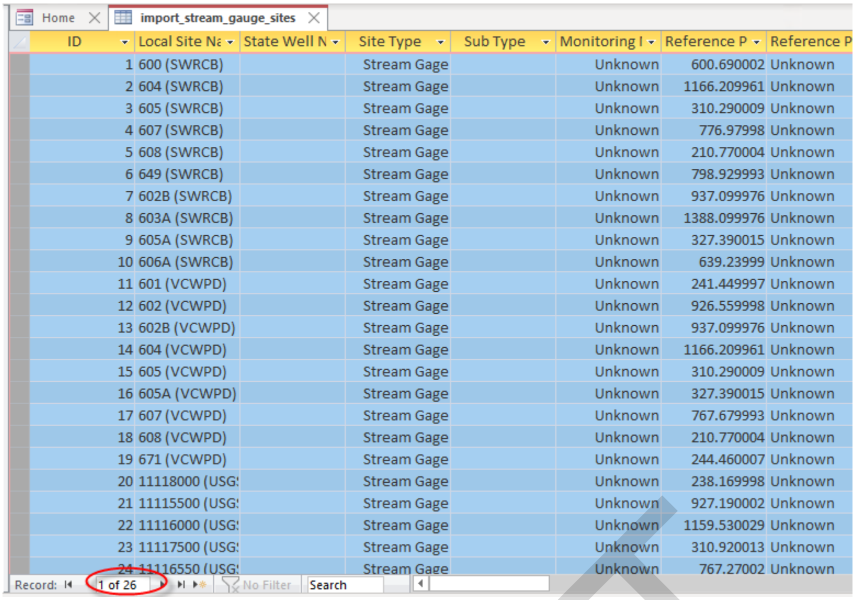
1. Format the data in Excel according to the "import_stream_gage_sites.xlsx" file. Select and copy the data to be imported to DMS (including column headers).



2. Import to DMS by opening the "import_stream_gauge_sites" table in Access, clicking the top left corner of the table, and pasting the copied data from Step 1. Click "Yes" to confirm. After pasting the data, verify that the number of records in the "import_stream_gauge_sites" table is equal to the number of rows copied from Excel.

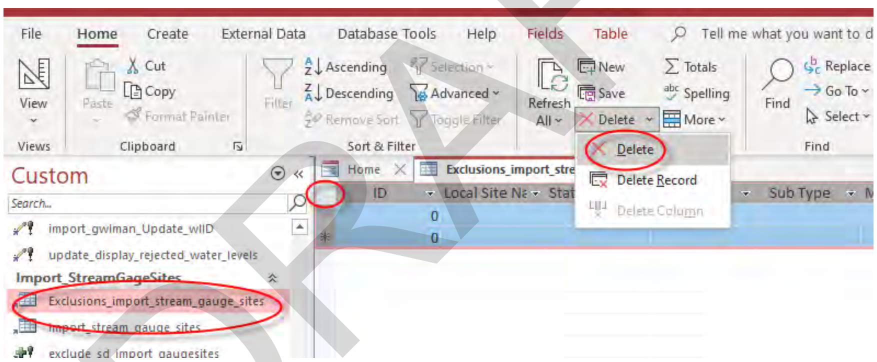




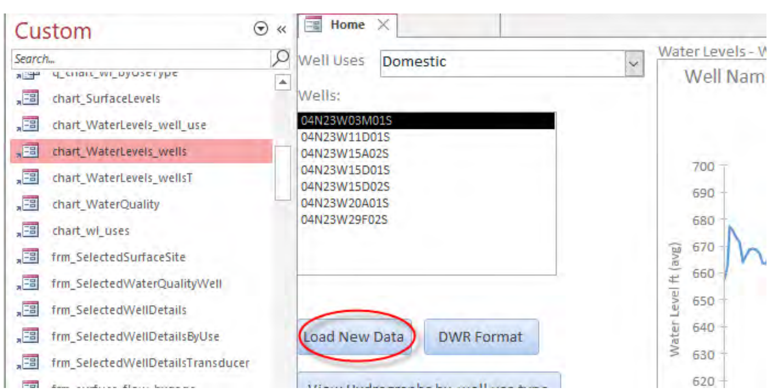


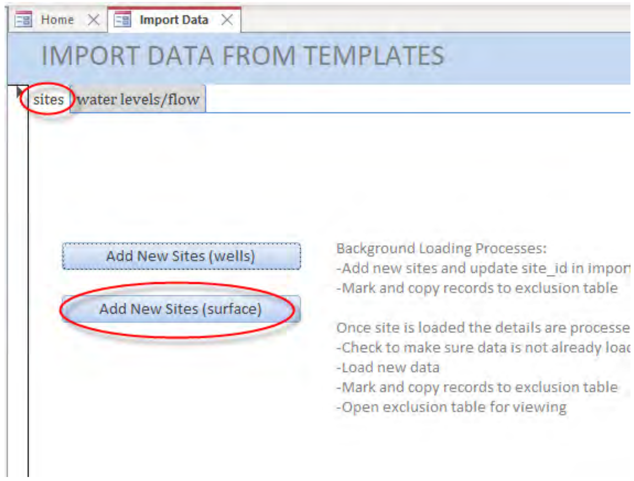
ID	Local Site Na	State Well N	Site Type	Sub Type	Monitoring I	Reference P	Reference P
1	600 (SWRCB)		Stream Gage		Unknown	600.690002	Unknown
2	604 (SWRCB)		Stream Gage		Unknown	1166.209961	Unknown
3	605 (SWRCB)		Stream Gage		Unknown	310.290009	Unknown
4	607 (SWRCB)		Stream Gage		Unknown	776.97998	Unknown
5	608 (SWRCB)		Stream Gage		Unknown	210.770004	Unknown
6	649 (SWRCB)		Stream Gage		Unknown	798.929993	Unknown
7	602B (SWRCB)		Stream Gage		Unknown	937.099976	Unknown
8	603A (SWRCB)		Stream Gage		Unknown	1388.099976	Unknown
9	605A (SWRCB)		Stream Gage		Unknown	327.390015	Unknown
10	606A (SWRCB)		Stream Gage		Unknown	639.23999	Unknown
11	601 (VCWPD)		Stream Gage		Unknown	241.449997	Unknown
12	602 (VCWPD)		Stream Gage		Unknown	926.559998	Unknown
13	602B (VCWPD)		Stream Gage		Unknown	937.099976	Unknown
14	604 (VCWPD)		Stream Gage		Unknown	1166.209961	Unknown
15	605 (VCWPD)		Stream Gage		Unknown	310.290009	Unknown
16	605A (VCWPD)		Stream Gage		Unknown	327.390015	Unknown
17	607 (VCWPD)		Stream Gage		Unknown	767.679993	Unknown
18	608 (VCWPD)		Stream Gage		Unknown	210.770004	Unknown
19	671 (VCWPD)		Stream Gage		Unknown	244.460007	Unknown
20	11118000 (USG:		Stream Gage		Unknown	238.169998	Unknown
21	11115500 (USG:		Stream Gage		Unknown	927.190002	Unknown
22	11116000 (USG:		Stream Gage		Unknown	1159.530029	Unknown
23	11117500 (USG:		Stream Gage		Unknown	310.920013	Unknown
24	11116550 (USG:		Stream Gage		Unknown	767.27002	Unknown

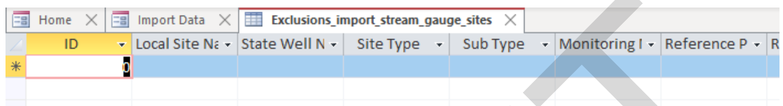
3. Open the "Exclusions_import_stream_gauge_sites" table. If the table is not empty, then delete all records in it. After making sure that it is empty, close the table.



4. Open the "chart_WaterLevels_wells" form, i.e. the Home tab (if not already open). Click the "Load New Data" button and then the "Add New Sites (surface)" button under the "Sites" tab. This adds the new acceptable data from the "import_stream_gauge_sites" table to the master "dt_sites" and "dt_site_details" tables and opens the "Exclusions_import_stream_gauge_sites" table to show which new data were not added to the master tables due to missing information.



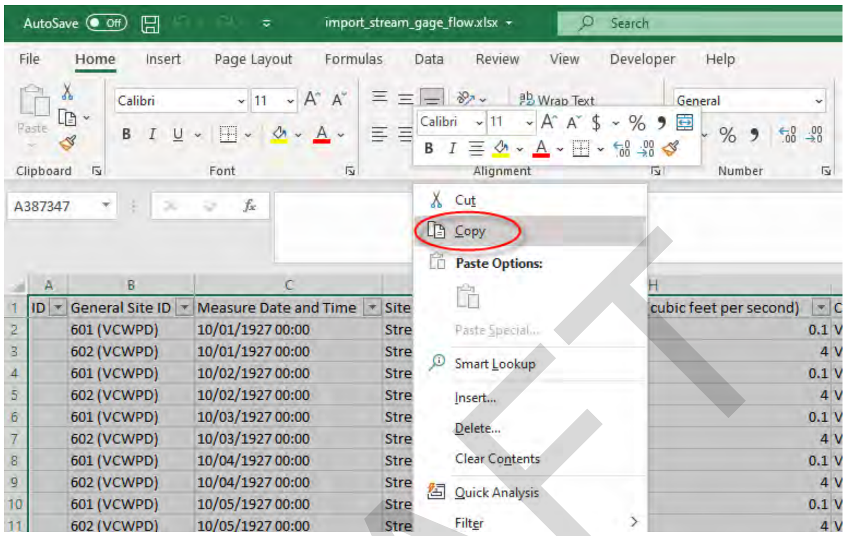




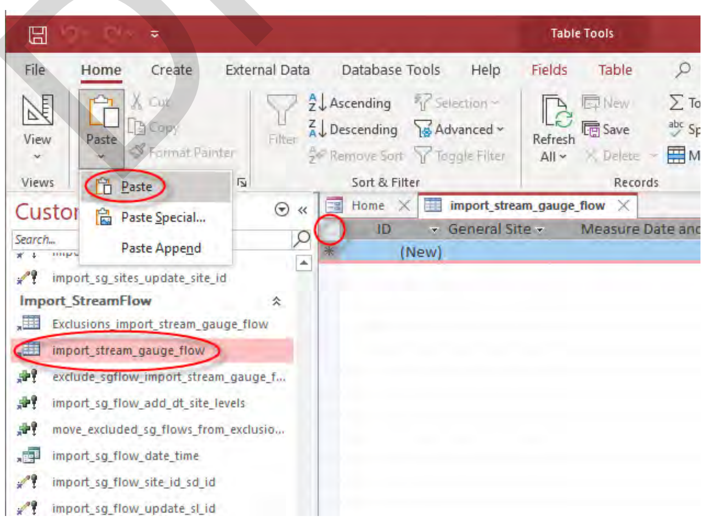
5. For the new data that were not added to the master "dt_sites" and "dt_site_details" tables (i.e., records showing up in the "Exclusions_import_stream_gauge_sites" table), go back to the Excel template in Step 1, add the missing details (e.g., latitude, longitude, coordinates method, coordinates accuracy, and county), and repeat Steps 1 – 4.

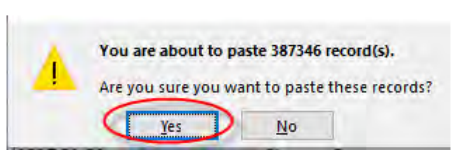
Importing Streamflow Data

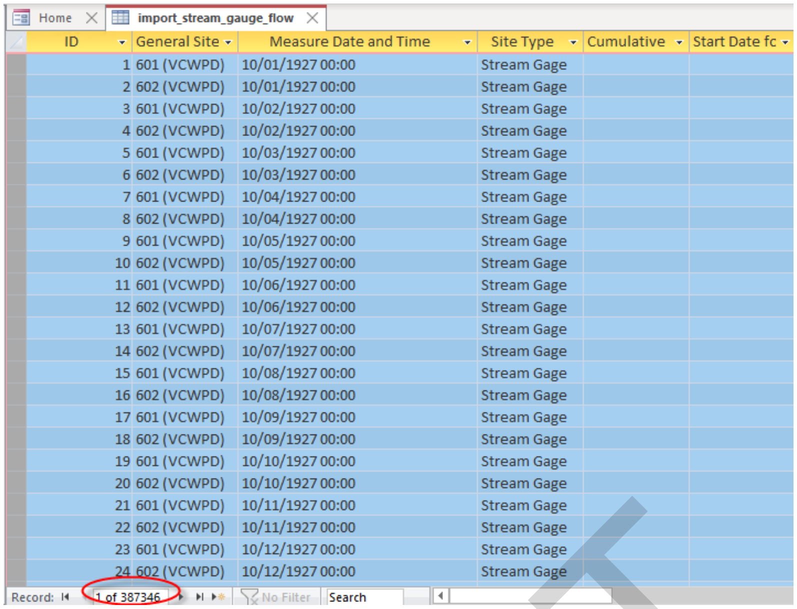
1. Format the data in Excel according to the "import_stream_gage_flow.xlsx" file. <u>Make sure that the Measure Date and Time is in the correct format and that the Surface Water Discharge (cubic feet per second) is not missing.</u> Select and copy the data to be imported to DMS (including column headers).



2. Import to DMS by opening the "import_stream_gauge_flow" table in Access, clicking the top left corner of the table, and pasting the copied data from Step 1. This may take a few minutes if the number of records is large. Click "Yes" to confirm. After pasting the data, verify that the number of records in the "import_stream_gauge_flow" table is equal to the number of rows copied from Excel.

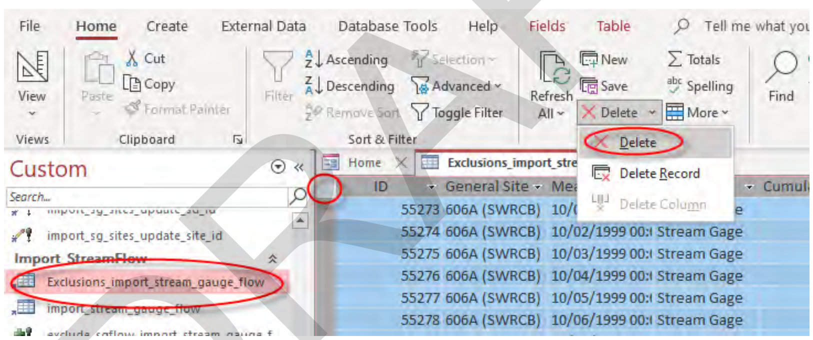




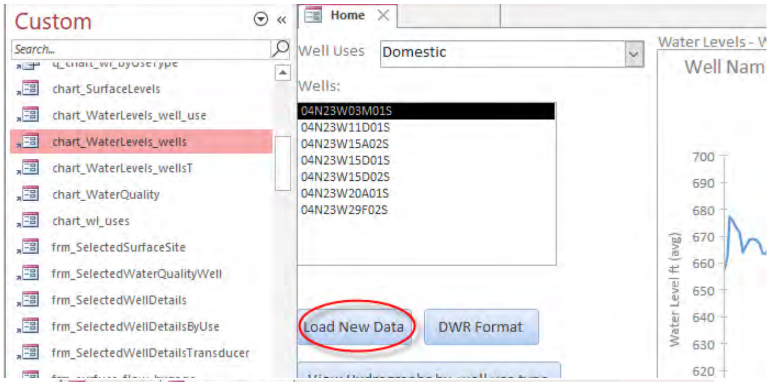


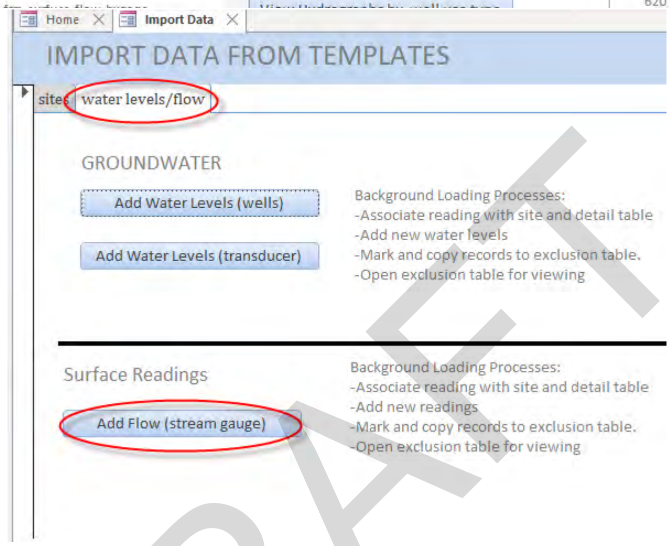
ID	General Site	Measure Date and Time	Site Type	Cumulative	Start Date fc
1	601 (VCWPD)	10/01/1927 00:00	Stream Gage		
2	602 (VCWPD)	10/01/1927 00:00	Stream Gage		
3	601 (VCWPD)	10/02/1927 00:00	Stream Gage		
4	602 (VCWPD)	10/02/1927 00:00	Stream Gage		
5	601 (VCWPD)	10/03/1927 00:00	Stream Gage		
6	602 (VCWPD)	10/03/1927 00:00	Stream Gage		
7	601 (VCWPD)	10/04/1927 00:00	Stream Gage		
8	602 (VCWPD)	10/04/1927 00:00	Stream Gage		
9	601 (VCWPD)	10/05/1927 00:00	Stream Gage		
10	602 (VCWPD)	10/05/1927 00:00	Stream Gage		
11	601 (VCWPD)	10/06/1927 00:00	Stream Gage		
12	602 (VCWPD)	10/06/1927 00:00	Stream Gage		
13	601 (VCWPD)	10/07/1927 00:00	Stream Gage		
14	602 (VCWPD)	10/07/1927 00:00	Stream Gage		
15	601 (VCWPD)	10/08/1927 00:00	Stream Gage		
16	602 (VCWPD)	10/08/1927 00:00	Stream Gage		
17	601 (VCWPD)	10/09/1927 00:00	Stream Gage		
18	602 (VCWPD)	10/09/1927 00:00	Stream Gage		
19	601 (VCWPD)	10/10/1927 00:00	Stream Gage		
20	602 (VCWPD)	10/10/1927 00:00	Stream Gage		
21	601 (VCWPD)	10/11/1927 00:00	Stream Gage		
22	602 (VCWPD)	10/11/1927 00:00	Stream Gage		
23	601 (VCWPD)	10/12/1927 00:00	Stream Gage		
24	602 (VCWPD)	10/12/1927 00:00	Stream Gage		

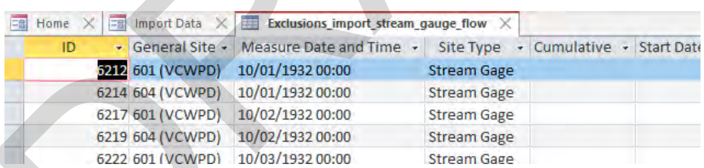
3. Open the "Exclusions_import_stream_gauge_flow" table. If the table is not empty, then delete all records in it. After making sure that it is empty, close the table.



4. Open the "chart_WaterLevels_wells" form, i.e. the Home tab (if not already open). Click the "Load New Data" button and then the "Add Flow (stream gauge)" button under the "water levels/flow" tab. This adds the new acceptable data from the "import_stream_gauge_flow" table to the master "dt_site_levels" table and opens the "Exclusions_import_stream_gauge_flow" table to show which new data were not added to the master table due to missing information.







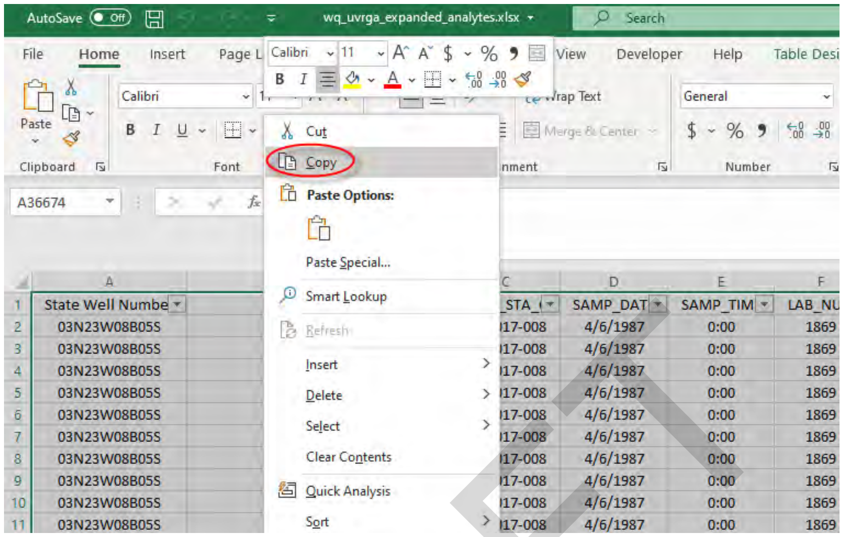
5. For the new data that were not added to the master "dt_site_levels" table (i.e., records showing up in the "Exclusions_import_stream_gauge_flow" table), check the General Site ID and make sure that it exists in the "dt_sites" and "dt_site_details" tables.

   If the General Site ID or any field in the streamflow data needs to be corrected, then go back to the Excel template in Step 1, edit the information, and repeat Steps 1 – 4.

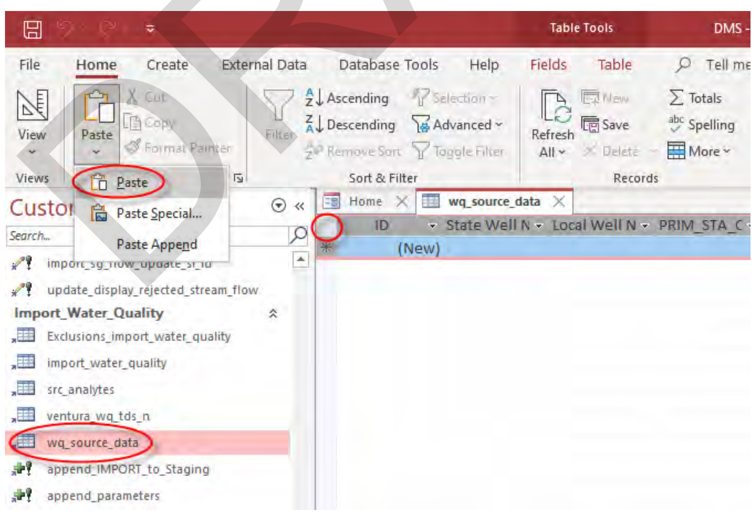
   If the site information does not exist in the "dt_sites" or "dt_site_details" table, then follow the steps for "Importing Stream Gage Site Data."

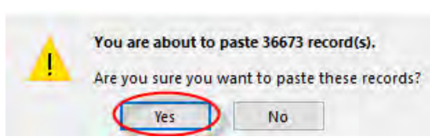
Importing Water Quality Data

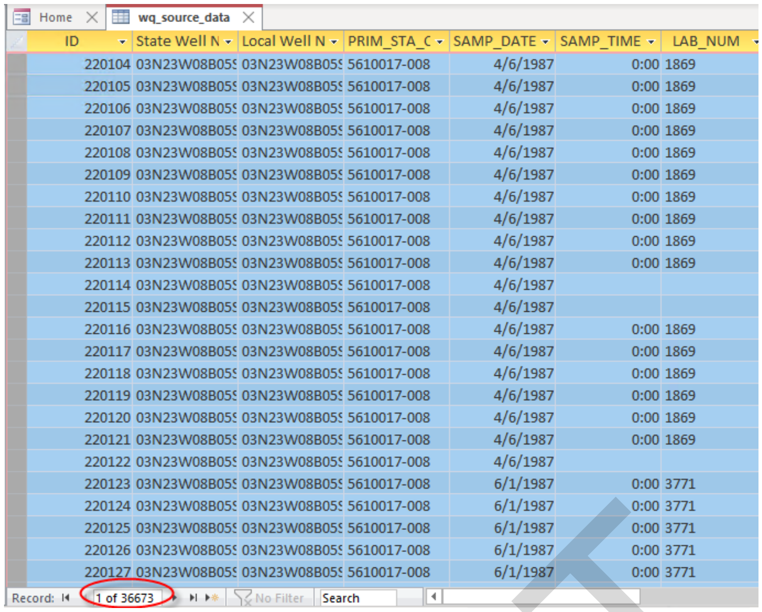
1. Format the data in Excel according to the "import_wq.xlsx" file. Select and copy the data to be imported to DMS (including column headers).



2. Import to DMS by opening the "wq_source_data" table in Access, clicking the top left corner of the table, and pasting the copied data from Step 1. This may take a few minutes if the number of records is large. Click "Yes" to confirm. After pasting the data, verify that the number of records in the "wq_source_data" table is equal to the number of rows copied from Excel.



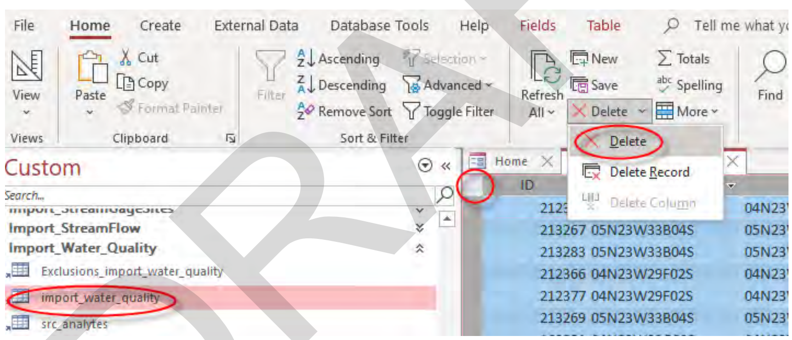




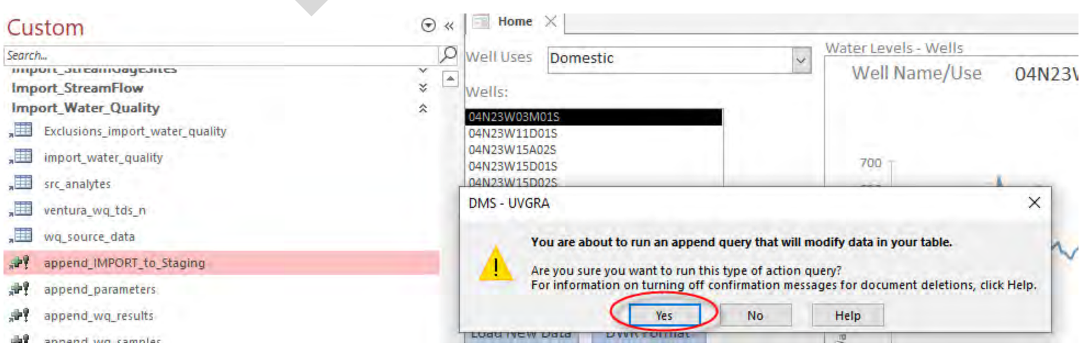
ID	State Well N	Local Well N	PRIM_STA_C	SAMP_DATE	SAMP_TIME	LAB_NUM
220104	03N23W08B05	03N23W08B05	5610017-008	4/6/1987	0:00	1869
220105	03N23W08B05	03N23W08B05	5610017-008	4/6/1987	0:00	1869
220106	03N23W08B05	03N23W08B05	5610017-008	4/6/1987	0:00	1869
220107	03N23W08B05	03N23W08B05	5610017-008	4/6/1987	0:00	1869
220108	03N23W08B05	03N23W08B05	5610017-008	4/6/1987	0:00	1869
220109	03N23W08B05	03N23W08B05	5610017-008	4/6/1987	0:00	1869
220110	03N23W08B05	03N23W08B05	5610017-008	4/6/1987	0:00	1869
220111	03N23W08B05	03N23W08B05	5610017-008	4/6/1987	0:00	1869
220112	03N23W08B05	03N23W08B05	5610017-008	4/6/1987	0:00	1869
220113	03N23W08B05	03N23W08B05	5610017-008	4/6/1987	0:00	1869
220114	03N23W08B05	03N23W08B05	5610017-008	4/6/1987		
220115	03N23W08B05	03N23W08B05	5610017-008	4/6/1987		
220116	03N23W08B05	03N23W08B05	5610017-008	4/6/1987	0:00	1869
220117	03N23W08B05	03N23W08B05	5610017-008	4/6/1987	0:00	1869
220118	03N23W08B05	03N23W08B05	5610017-008	4/6/1987	0:00	1869
220119	03N23W08B05	03N23W08B05	5610017-008	4/6/1987	0:00	1869
220120	03N23W08B05	03N23W08B05	5610017-008	4/6/1987	0:00	1869
220121	03N23W08B05	03N23W08B05	5610017-008	4/6/1987	0:00	1869
220122	03N23W08B05	03N23W08B05	5610017-008	4/6/1987		
220123	03N23W08B05	03N23W08B05	5610017-008	6/1/1987	0:00	3771
220124	03N23W08B05	03N23W08B05	5610017-008	6/1/1987	0:00	3771
220125	03N23W08B05	03N23W08B05	5610017-008	6/1/1987	0:00	3771
220126	03N23W08B05	03N23W08B05	5610017-008	6/1/1987	0:00	3771
220127	03N23W08B05	03N23W08B05	5610017-008	6/1/1987	0:00	3771

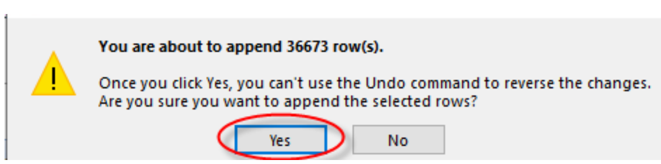
Record: 1 of 36673

3. Open the "import_water_quality" table. If the table is not empty, then delete all records in it. After making sure that it is empty, close the table.

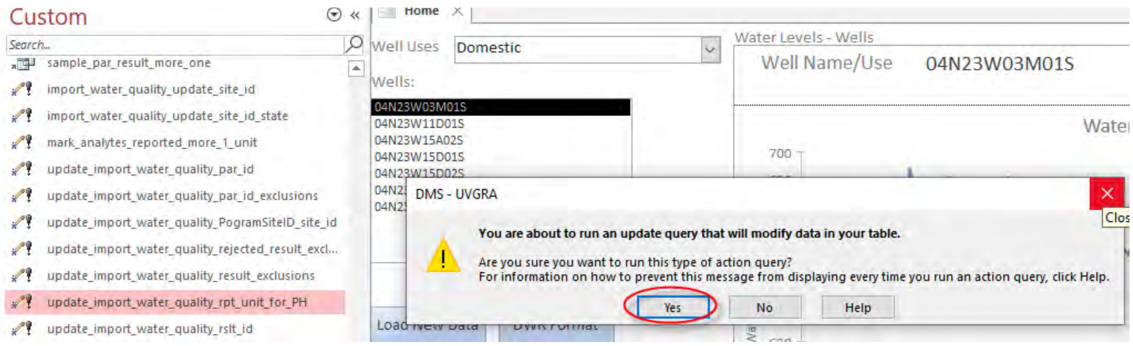


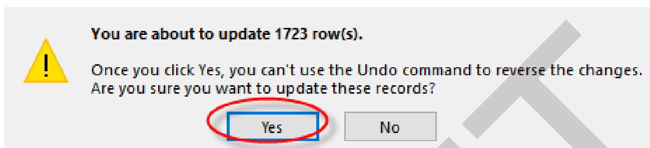
4. Run the "append_IMPORT_to_Staging" query. Click "Yes" to confirm. This adds the source data from the "wq_source_data" table to the "import_water_quality" table.





5. Run the “update_import_water_quality_rpt_unit_for_PH” query. Click “Yes” to confirm. This assigns the unit S.U. to the PH laboratory analytes.

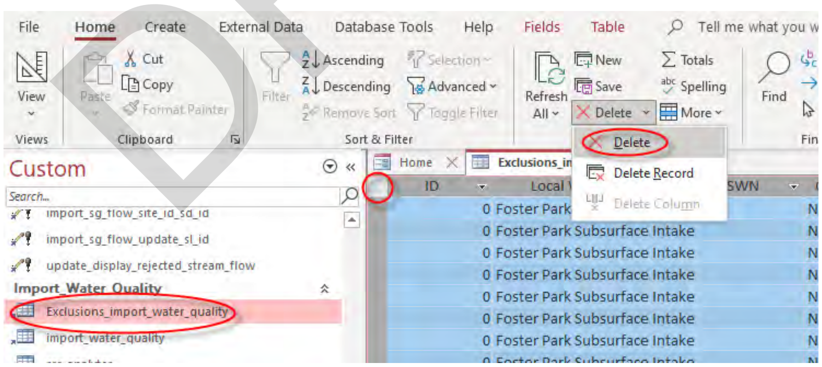




6. Run the following queries:
check_each_chem_reported_in_one_unit – to check the unit of each analyte.
chemicals_results_multiple_units – to identify the analytes reported in more than one unit.

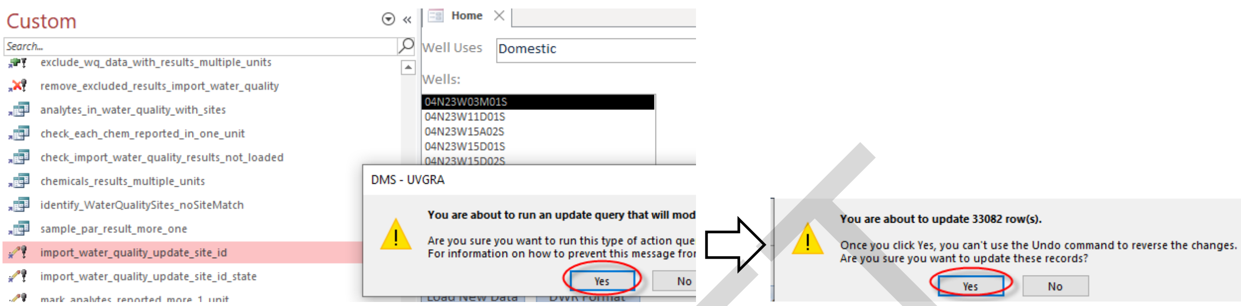
If the units need to be corrected, then go back to the Excel template in Step 1, edit the information, and repeat Steps 1 – 5.

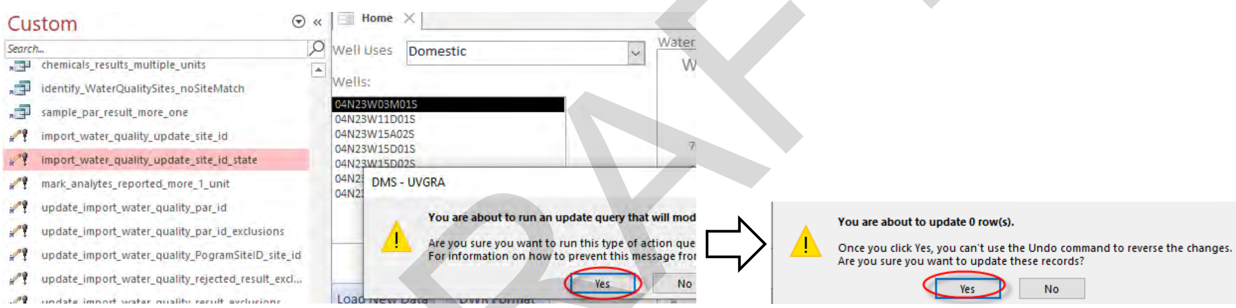
7. Open the “Exclusions_import_water_quality” table. If the table is not empty, then delete all records in it. After making sure that it is empty, close the table.

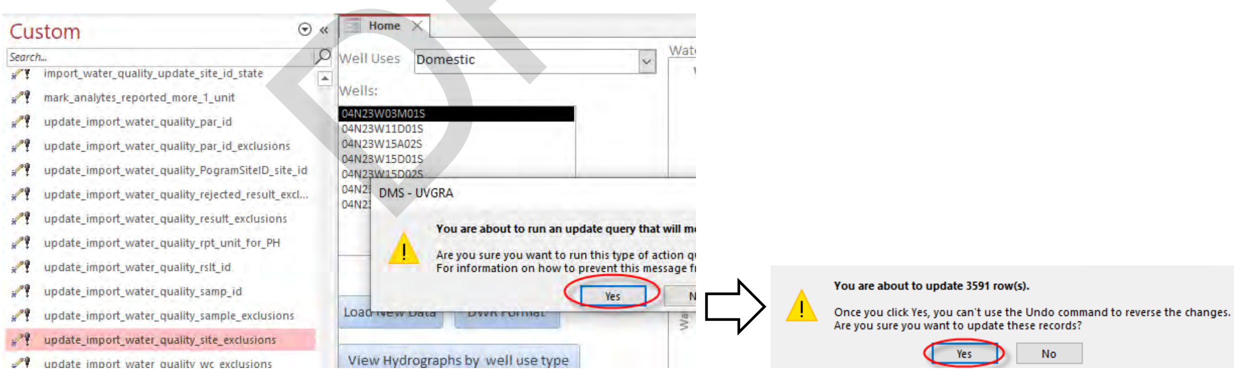


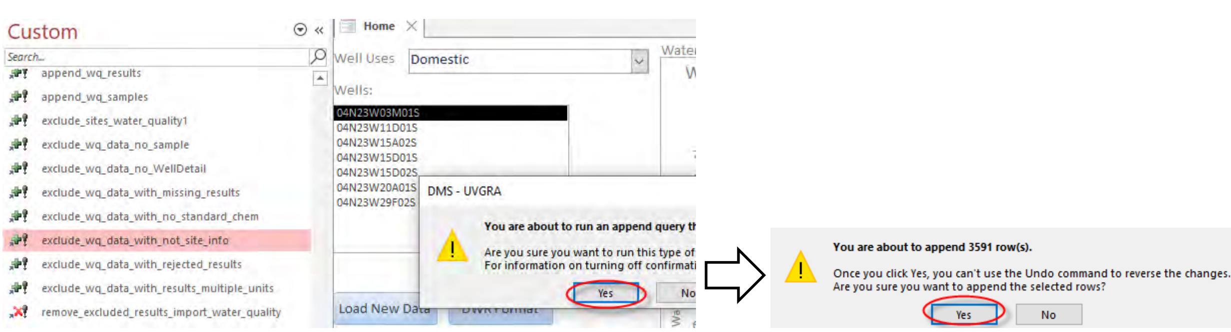
8. Run the following queries in the order shown:
import_water_quality_update_site_id
→ import_water_quality_update_site_id_state
→ update_import_water_quality_site_exclusions
→ exclude_wq_data_with_not_site_info

This marks the records in the "import_water_quality" table for which neither Local Well Name nor SWN exists in the "dt_sites" table and adds those records to the "Exclusions_import_water_quality" table.









9. Similar to Step 8, run the following queries in the order shown:
   update_site_wc_ids_inimport
   → update_import_water_quality_wc_exclusions
   → exclude_wq_data_no_WellDetail

   This marks the records in the "import_water_quality" table for which neither Local Well Name nor SWN exists in the "dt_well_details" table and adds those records to the "Exclusions_import_water_quality" table.

10. Similar to Step 8, run the following queries in the order shown:
    update_import_water_quality_par_id
    → update_import_water_quality_par_id_exclusions
    → exclude_wq_data_with_no_standard_chem

    This marks the records in the "import_water_quality" table for which the CHEMICAL does not exist in the "lu_parameters" table and adds those records to the "Exclusions_import_water_quality" table.

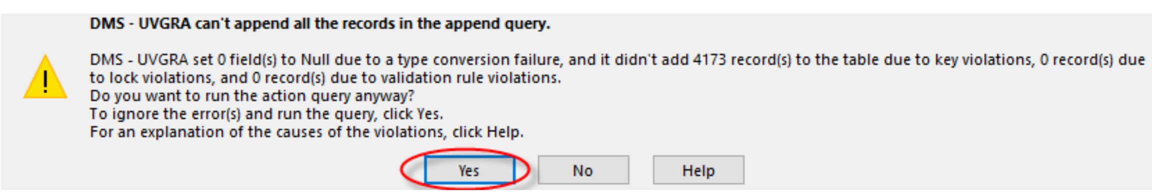
11. Similar to Step 8, run the following queries in the order shown:
    update_import_water_quality_rejected_result_exclusions
    → exclude_wq_data_with_rejected_results

    This marks the records in the "import_water_quality" table for which the Review_Result is Rejected and adds those records to the "Exclusions_import_water_quality" table.

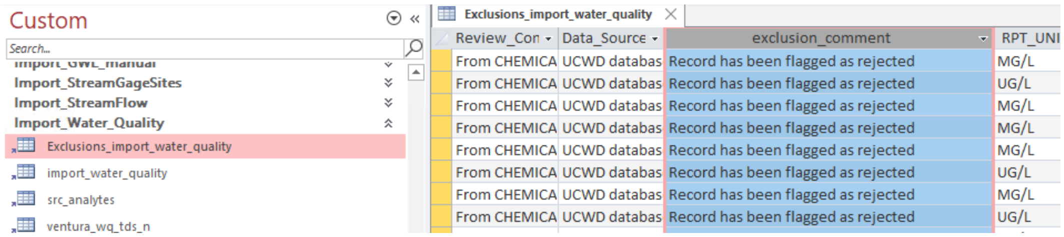
12. Similar to Step 8, run the following queries in the order shown:
    update_import_water_quality_samp_id
    → append_wq_samples
    → update_import_water_quality_samp_id
    → update_import_water_quality_sample_exclusions
    → exclude_wq_data_no_sample

    This adds the new acceptable data from the "import_water_quality" table to the master "dt_samples" table.

    Note: Click "Yes" if the message below appears while running the queries.



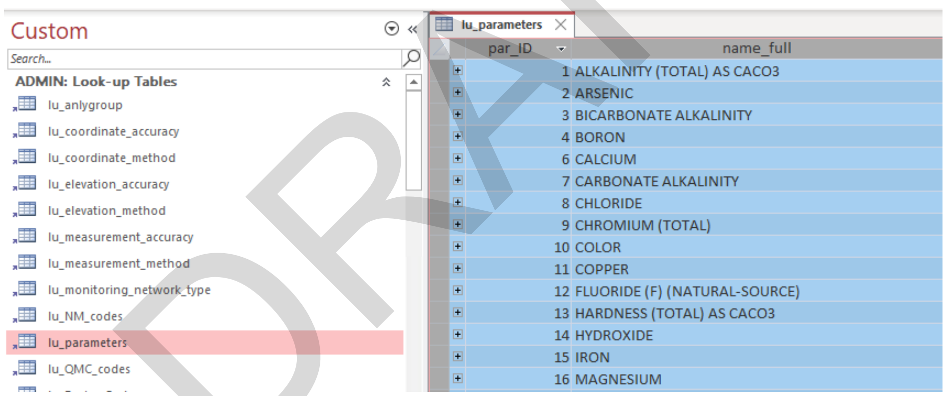
13. Open the “Exclusions_import_water_quality” table to see which new data were not added to the master “dt_samples” table and check the exclusion_comment.



If any field in the water quality data needs to be corrected, then go back to the Excel template in Step 1, edit the information, and repeat Steps 1 – 12.

If the well information does not exist in the “dt_sites” or “dt_well_details” table, then follow the steps for “Importing Well Data.”

If the chemical information does not exist in the “lu_parameters” table, then update the “lu_parameters” table accordingly. If the chemical information exists in the “lu_anlygroup” table, then run the “update_lu_parameter_anlygroup_from_lu_anlygroup” query to copy that information to the “lu_parameters” table.



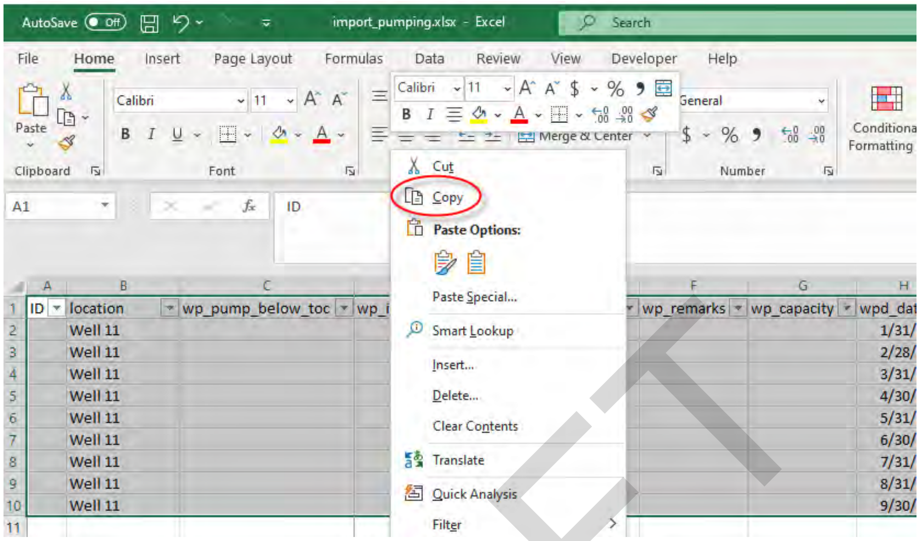
14. Similar to Step 12, run the following queries in the order shown:
update_import_water_quality_result_exclusions
→ update_import_water_quality_rslt_id
→ append_wq_results
→ update_import_water_quality_rslt_id

This adds the new acceptable data from the “import_water_quality” table to the master “dt_results” table.

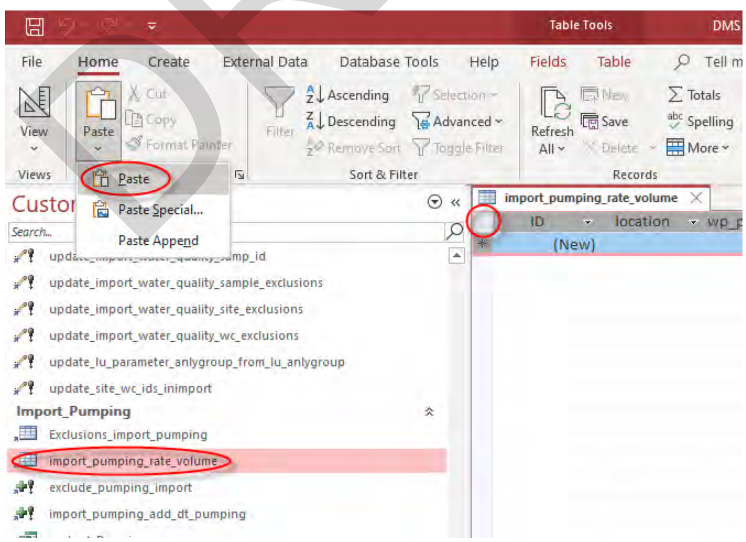
15. Run the “check_import_water_quality_results_not_loaded” query to see which new data were not added to the master “dt_results” table.

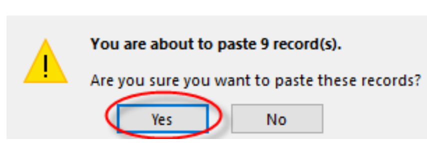
Importing Pumping Data

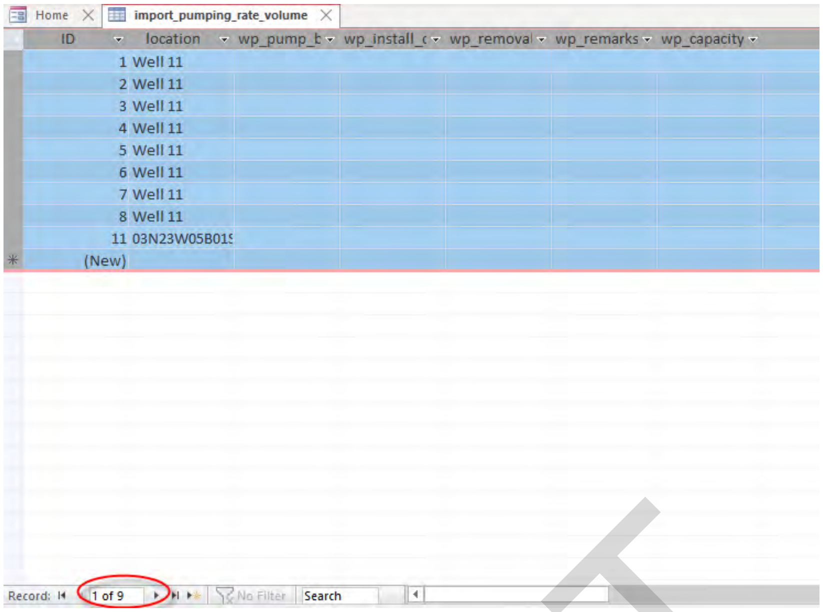
1. Format the data in Excel according to the "import_pumping.xlsx" file. Select and copy the data to be imported to DMS (including column headers).



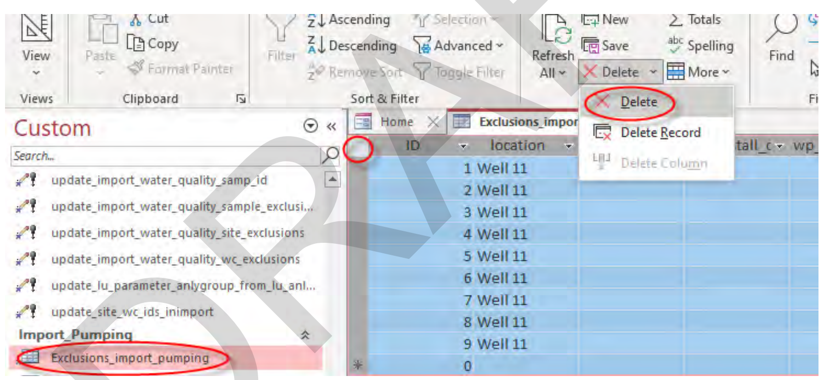
2. Import to DMS by opening the "import_pumping_rate_volume" table in Access, clicking the top left corner of the table, and pasting the copied data from Step 1. This may take a few minutes if the number of records is large. Click "Yes" to confirm. After pasting the data, verify that the number of records in the "import_pumping_rate_volume" table is equal to the number of rows copied from Excel.



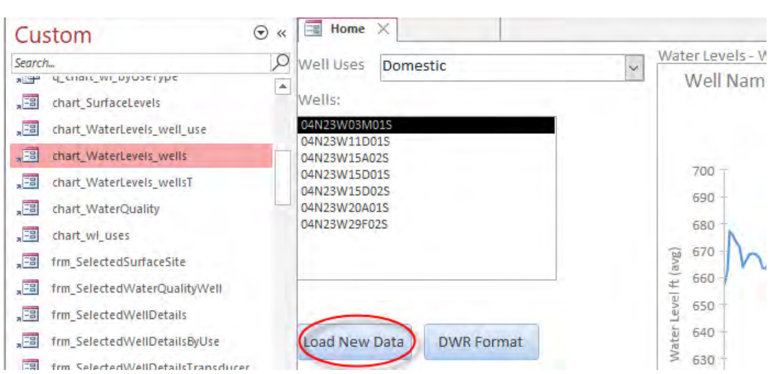


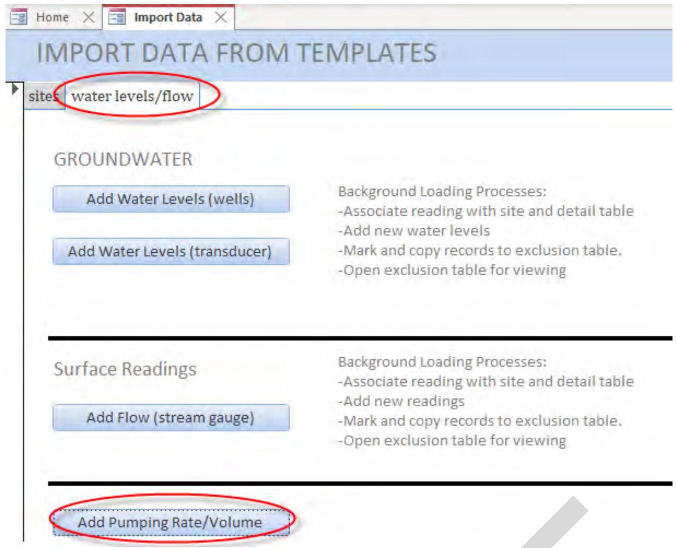


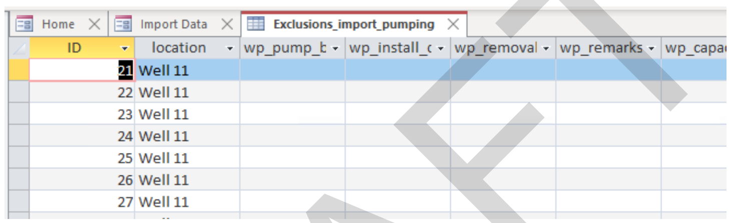
3. Open the "Exclusions_import_pumping" table. If the table is not empty, then delete all records in it. After making sure that it is empty, close the table.



4. Open the "chart_WaterLevels_wells" form, i.e. the Home tab (if not already open). Click the "Load New Data" button and then the "Add Pumping Rate/Volume" button under the "water levels/flow" tab. This adds the new acceptable data from the "import_pumping_rate_volume" table to the master "dt_pumping" table and opens the "Exclusions_import_pumping" table to show which new data were not added to the master table due to missing information.







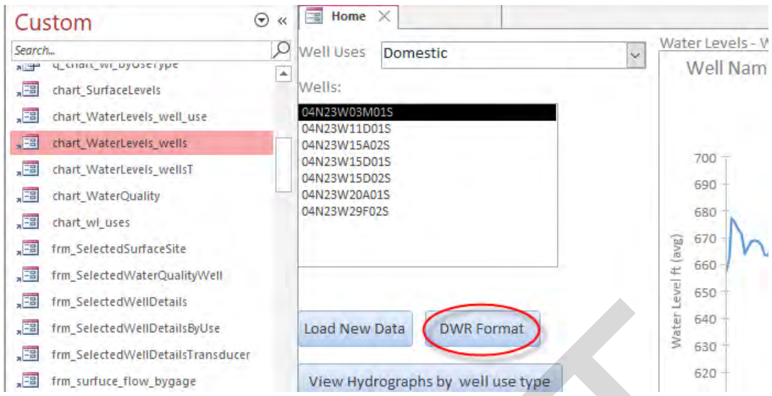
5. For the new data that were not added to the master "dt_pumping" table (i.e., records showing up in the "Exclusions_import_pumping" table), check the location and make sure that it exists in the "dt_sites" and "dt_well_details" tables.

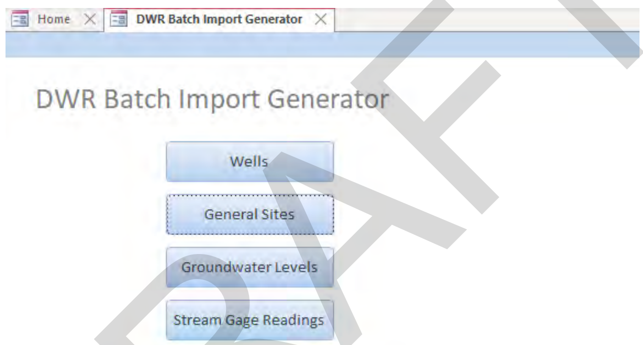
   If the location or any field in the pumping data needs to be corrected, then go back to the Excel template in Step 1, edit the information, and repeat Steps 1 – 4.

   If the well information does not exist in the "dt_sites" or "dt_well_details" table, then follow the steps for "Importing Well Data."

Exporting to DWR Templates

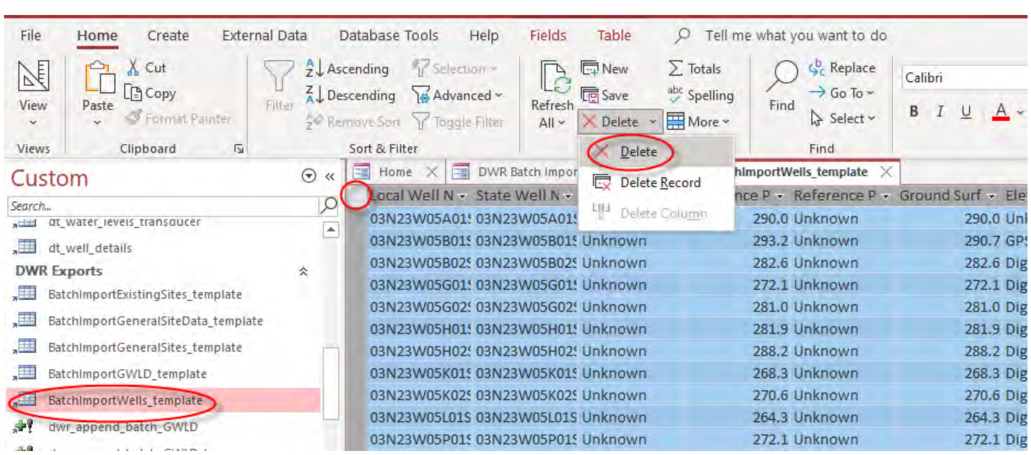
1. Open the "chart_WaterLevels_wells" form, i.e. the Home tab (if not already open). Click the "DWR Format" button. This opens the "DWR Batch Import Generator" form.





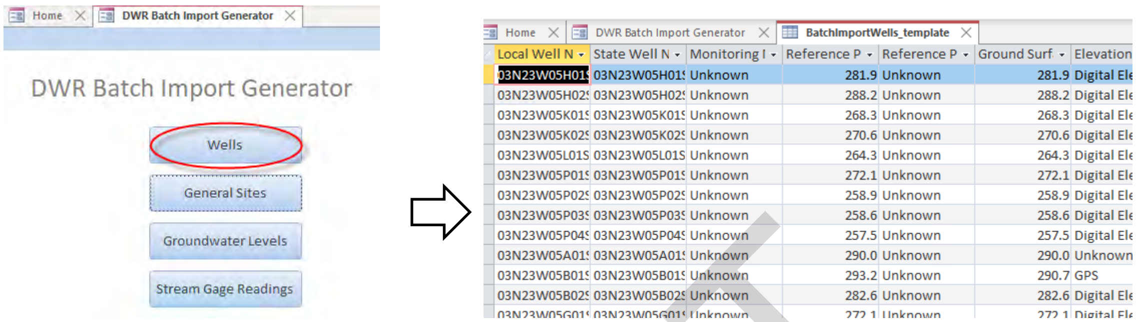
2. For the well template, open the "BatchImportWells_template" table.
   For the general site template, open the "BatchImportGeneralSites_template" table.
   For the groundwater level template, open the "BatchImportGWLD_template" table.
   For the stream gage reading template, open the "BatchImportGeneralSiteData_template" table.

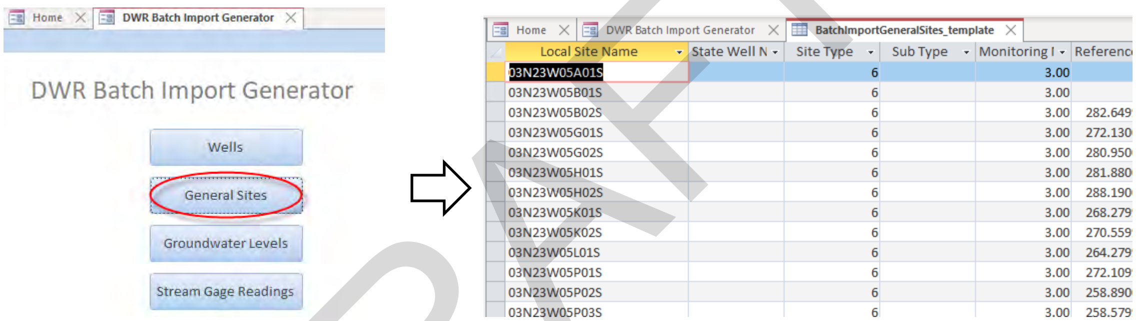
   If the table is not empty, then delete all records in it. After making sure that it is empty, close the table and go back to the "DWR Batch Import Generator" form.

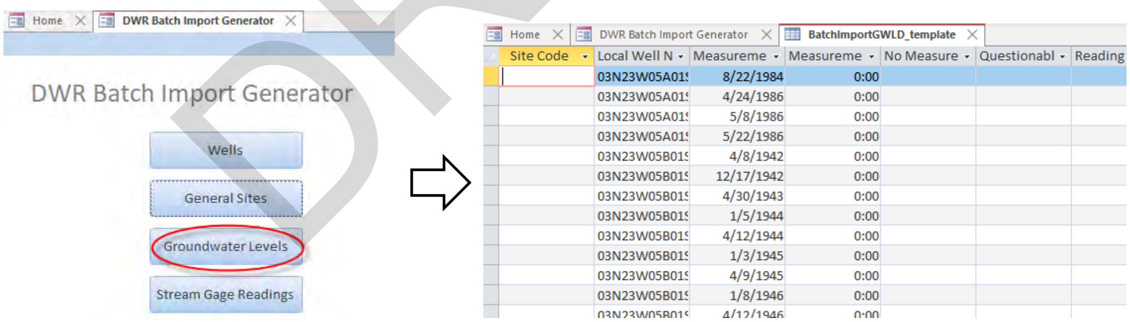


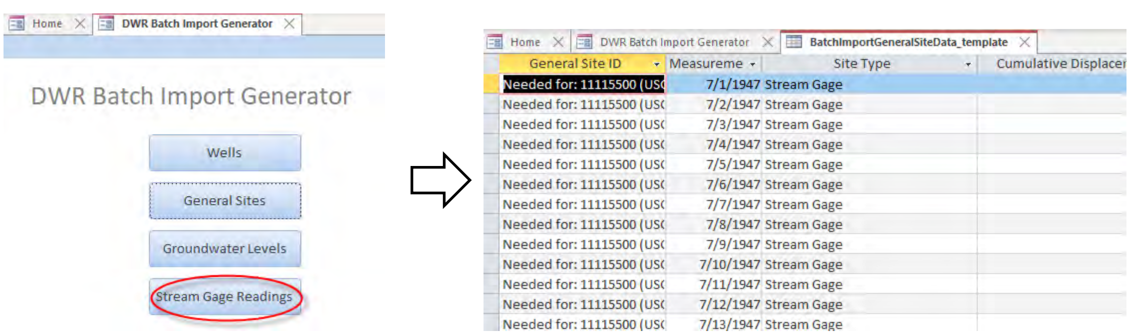
3. For the well template, click the “Wells” button.
For the general site template, click the “General Sites” button.
For the groundwater level template, click the “Groundwater Levels” button.
For the stream gage reading template, click the “Stream Gage Readings” button.

Click “Yes” to confirm. This fills the corresponding template table emptied in Step 2. The data from the template table may be copied and pasted to Excel.



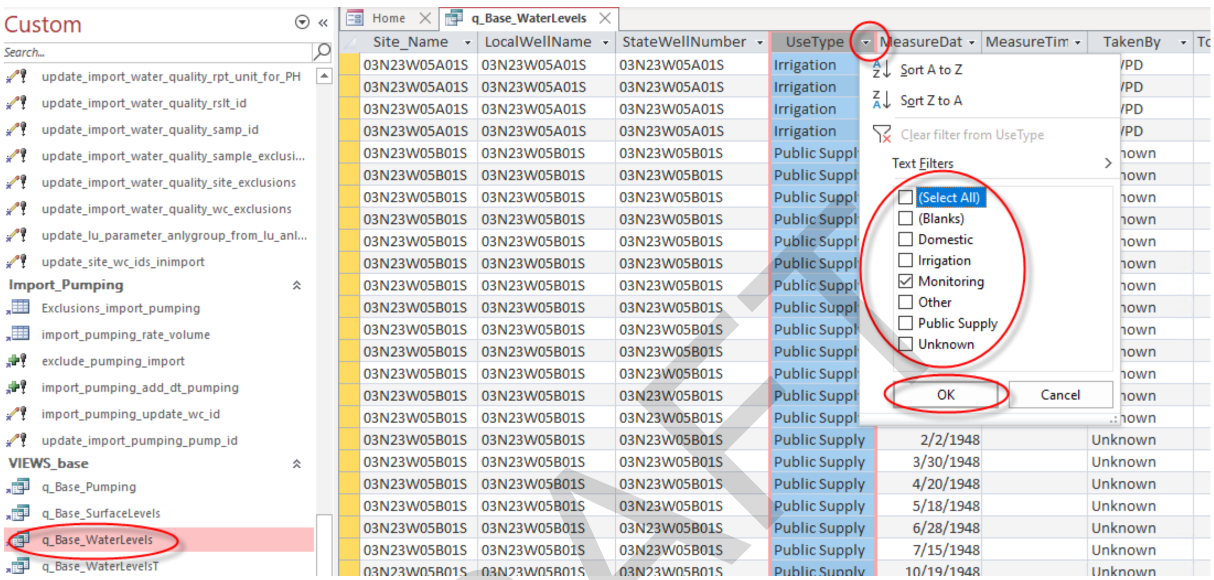


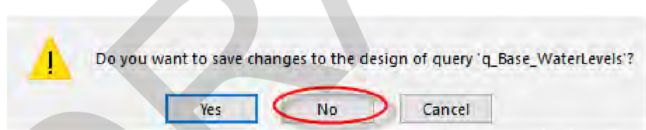




Viewing the Data Tables

1. The queries under the "VIEWS_base" group can be used to view the data saved in the production data tables. Open the query of interest and click the arrow next to the field name to see the drop-down list. The data can be filtered by checking/unchecking boxes in the drop-down list and clicking "OK." When closing the query, click "No" so that the filter criteria are not saved.





DMS OBJECT DESCRIPTION

Group	Object Name	Object Type	Description
ADMIN: Look-up Tables	lu_anlygroup	Table	Reference table.
	lu_coordinate_accuracy	Table	Reference table.
	lu_coordinate_method	Table	Reference table.
	lu_elevation_accuracy	Table	Reference table.
	lu_elevation_method	Table	Reference table.
	lu_measurement_accuracy	Table	Reference table.
	lu_measurement_method	Table	Reference table.
	lu_monitoring_network_type	Table	Reference table.
	lu_NM_codes	Table	Reference table.
	lu_parameters	Table	Reference table.
	lu_QMC_codes	Table	Reference table.
	lu_ReviewCodes	Table	Reference table.
	lu_SG_codes	Table	Reference table.
	lu_site_type	Table	Reference table.
	lu_well_completion_type	Table	Reference table.
	lu_well_status	Table	Reference table.
	lu_well_type	Table	Reference table.
	lu_well_use_type	Table	Reference table.
	map_well_status	Table	Reference table.
	map_well_use	Table	Reference table.
DMS Data Tables	dt_pumping	Table	Table for storing the pumping data.
	dt_results	Table	Table for storing the water quality results.
	dt_samples	Table	Table for storing the water quality sample data.
	dt_site_details	Table	Table for storing the gage site details.
	dt_site_levels	Table	Table for storing the streamflow data from gages.
	dt_sites	Table	Table for storing the well/gage site info.
	dt_sources	Table	Table for storing the source info.
	dt_water_levels	Table	Table for storing the water level data from wells.
	dt_water_levels_transducer	Table	Table for storing the water level data from transducers.
	dt_well_details	Table	Table for storing the well site details.
DWR Exports	BatchImportGeneralSiteData_template	Table	Table for exporting the streamflow data in DWR format.
	BatchImportGeneralSites_template	Table	Table for exporting the general well/gage site info in DWR format.
	BatchImportGWLD_template	Table	Table for exporting the water level data in DWR format.
	BatchImportWells_template	Table	Table for exporting the well site info in DWR format.
	dwr_append_batch_GWLD	Append Query	Formats the water level data from the "dt_water_levels" table and adds them to the "BatchImportGWLD_template" table.
	dwr_append_batch_GWLD_loggers	Append Query	Formats the water level data from the "dt_water_levels_transducer" table and adds them to the "BatchImportGWLD_template" table.
	dwr_append_batchGeneralSitesGages	Append Query	Formats the gage site info from the "dt_sites" and "dt_site_details" tables and adds it to the "BatchImportGeneralSites_template" table.
	dwr_append_batchGeneralSitesWells	Append Query	Formats the well site info from the "dt_sites" and "dt_well_details" tables and adds it to the "BatchImportGeneralSites_template" table.
	dwr_append_batchGenSitesData_gage	Append Query	Formats the streamflow data from the "dt_site_levels" table and adds them to the "BatchImportGeneralSiteData_template" table.
	dwr_append_batchWells	Append Query	Formats the well site info from the "vDWR_wells" query and adds it to the "BatchImportWells_template" table.
	vDWR_wells	Select Query	Extracts the well site info from the "dt_sites" and "dt_well_details" tables if SiteType = 6. Used as an intermediate step for the "dwr_append_batchWells" query.
	vTopBot_screens	Select Query	Extracts the screening info from the "dt_well_details" table. Used as an intermediate step for the "dwr_append_batchGeneralSitesWells" query.
Import_Wells	Exclusions_ import_wells	Table	Table for viewing the records from the "import_wells" table that have not been loaded to the "dt_sites" or "dt_well_details" table.
	import_wells	Table	Table for importing the well site info.

Group	Object Name	Object Type	Description
	exclude_sites_import_wells	Append Query	Adds the records from the "import_wells" table to the "Exclusions_ import_wells" table if the required well site info (e.g., latitude/longitude, coordinates method/accuracy, county) is missing.
	exclude_wc_import_wells	Append Query	Adds the records from the "import_wells" table to the "Exclusions_ import_wells" table if the required well site details are missing.
	import_wells_add_dt_sites	Append Query	Formats the well site info from the "import_wells" table and adds it to the "dt_sites" table. Does not add if a record with the same Local Well Name/State Well Number already exists in the "dt_sites" table.
	import_wells_add_dt_well_details	Append Query	Formats the well site details from the "import_wells" table and adds them to the "dt_well_details" table. Does not add if a record with the same Local Well Name/State Well Number already exists in the "dt_well_details" table.
	import_wells_update_site_id	Update Query	Adds site_id to the records in the "import_wells" table if the matching Local Well Name is found in the "dt_sites" table.
	import_wells_update_site_id_state	Update Query	Adds site_id to the records in the "import_wells" table if the matching State Well Number is found in the "dt_sites" table.
	import_wells_update_wc_id	Update Query	Adds wc_id to the records in the "import_wells" table if the matching site_id is found in the "dt_well_details" table.
Import_GWL_logger	Exclusions_import_gwl_logger	Table	Table for viewing the records from the "import_gwl_logger" table that have not been loaded to the "dt_water_levels_transducer" table.
	import_gwl_logger	Table	Table for importing the water level data from transducers.
	exclude_wlt_import_gwllogger	Append Query	Adds the records from the "import_gwl_logger" table to the "Exclusions_import_gwl_logger" table if the required well site info is missing.
	import_gwlt_add_dt_water_level_trans	Append Query	Formats the water level data from the "import_gwl_logger" table and adds them to the "dt_water_levels_transducer" table. Does not add if a record with the same Local Well Name/Site Code and Measurement Date/Time already exists in the "dt_water_levels_transducer" table.
	import_gwlt_update_site_id_wc_id_localname	Update Query	Adds site_id and wc_id to the records in the "import_gwl_logger" table if the matching Local Well Name is found in the "dt_sites" table.
	import_gwlt_update_site_id_wc_id_sitecode	Update Query	Adds site_id and wc_id to the records in the "import_gwl_logger" table if the matching Site Code is found in the "dt_sites" table.
	import_gwlt_update_wlt_id	Update Query	Adds wlt_id to the records in the "import_gwl_logger" table if the matching wc_id and Measurement Date/Time are found in the "dt_water_levels_transducer" table.
	update_display_rejected_water_levels_logger	Update Query	Sets use_flag = 0 in the "dt_water_levels_transducer" table if Review_Result = "Rejected."
Import_GWL_manual	Exclusions_import_gwl_manual	Table	Table for viewing the records from the "import_gwl_manual" table that have not been loaded to the "dt_water_levels" table.
	import_gwl_manual	Table	Table for importing the water level data from wells.
	exclude_wlm_import_gwlman	Append Query	Adds the records from the "import_gwl_manual" table to the "Exclusions_import_gwl_manual" table if the required well site info is missing.
	import_gwlman_add_dt_water_levels	Append Query	Formats the water level data from the "import_gwl_manual" table and adds them to the "dt_water_levels" table. Does not add if a record with the same Local Well Name and Measurement Date already exists in the "dt_water_levels" table.
	import_wlman_tomatch	Select Query	Formats Measurement Date in the "import_gwl_manual" table. Used as an intermediate step for the "import_gwlman_Update_wlID" query.

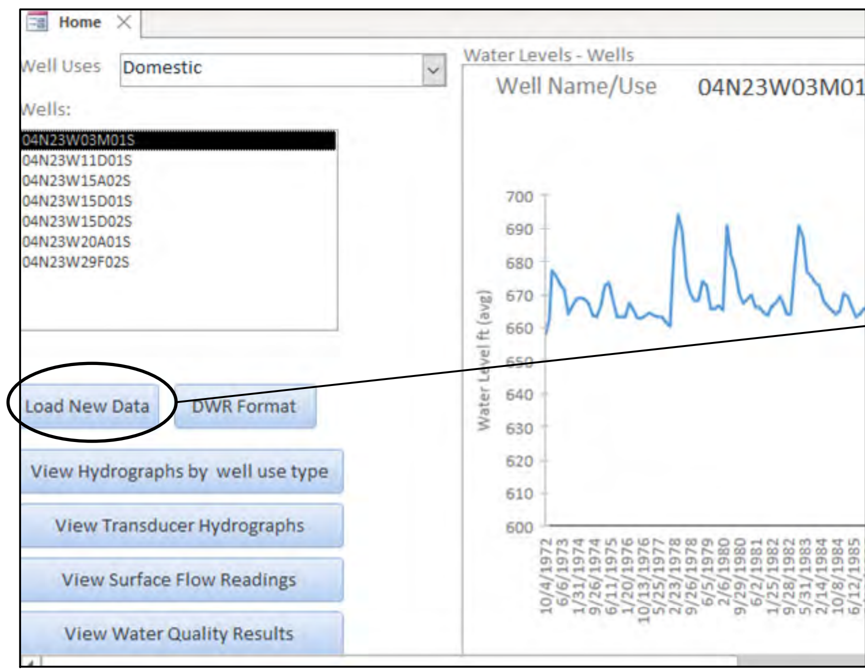
Group	Object Name	Object Type	Description
	import_gwlman_Update_siteID_wcID	Update Query	Adds site_id and wc_id to the records in the "import_gwl_manual" table if the matching Local Well Name is found in the "dt_sites" table.
	import_gwlman_Update_siteID_wcIDStateWell	Update Query	Adds site_id and wc_id to the records in the "import_gwl_manual" table if the matching Local Well Name is found in the "dt_well_details" table.
	import_gwlman_Update_wlID	Update Query	Adds wl_id to the records in the "import_gwl_manual" table if the matching wc_id and Measurement Date are found in the "dt_water_levels" table.
	update_display_rejected_water_levels	Update Query	Sets use_flag = 0 in the "dt_water_levels" table if Review_Result = "Rejected."
Import_StreamGageSites	Exclusions_import_stream_gauge_sites	Table	Table for viewing the records from the "import_stream_gage_sites" table that have not been loaded to the "dt_sites" or "dt_site_details" table.
	import_stream_gauge_sites	Table	Table for importing the gage site info.
	exclude_sd_import_gaugesites	Append Query	Adds the records from the "import_stream_gauge_sites" table to the "Exclusions_import_stream_gauge_sites" table if the required gage site details are missing.
	exclude_sites_import_gaugesites	Append Query	Adds the records from the "import_stream_gauge_sites" table to the "Exclusions_import_stream_gauge_sites" table if the required gage site info (e.g., latitude/longitude, coordinates method/accuracy, county) is missing.
	import_sg_sites_add_dt_site_details	Append Query	Formats the gage site details from the "import_stream_gauge_sites" table and adds them to the "dt_site_details" table. Does not add if a record with the same Local Site Name already exists in the "dt_site_details" table.
	import_sg_sites_add_dt_sites	Append Query	Formats the gage site info from the "import_stream_gauge_sites" table and adds it to the "dt_sites" table. Does not add if a record with the same Local Site Name already exists in the "dt_sites" table.
	import_sg_sites_update_sd_id	Update Query	Adds sd_id to the records in the "import_stream_gauge_sites" table if the matching site_id is found in the "dt_site_details" table.
	import_sg_sites_update_site_id	Update Query	Adds site_id to the records in the "import_stream_gauge_sites" table if the matching Local Site Name is found in the "dt_sites" table.
Import_StreamFlow	Exclusions_import_stream_gauge_flow	Table	Table for viewing the records from the "import_stream_gauge_flow" table that have not been loaded to the "dt_site_levels" table.
	import_stream_gauge_flow	Table	Table for importing the streamflow data from gages.
	exclude_sgflow_import_stream_gauge_flow	Append Query	Adds the records from the "import_stream_gauge_flow" table to the "Exclusions_import_stream_gauge_flow" table if the required gage site info or Surface Water Discharge (cubic feet per second) is missing.
	import_sg_flow_add_dt_site_levels	Append Query	Formats the streamflow data from the "import_stream_gauge_flow" table and adds them to the "dt_site_levels" table. Does not add if a record with the same General Site ID and Measure Date and Time already exists in the "dt_site_levels" table.
	import_sg_flow_date_time	Select Query	Formats Measure Date and Time in the "import_stream_gauge_flow" table. Used as an intermediate step for the "import_sg_flow_update_sl_id" query.
	import_sg_flow_site_id_sd_id	Update Query	Adds site_id and sd_id to the records in the "import_stream_gauge_flow" table if the matching General Site ID is found in the "dt_sites" table.
	import_sg_flow_update_sl_id	Update Query	Adds sl_id to the records in the "import_stream_gauge_flow" table if the matching sd_id and Measure Date and Time are found in the "dt_site_levels" table.
	update_display_rejected_stream_flow	Update Query	Sets use_flag = 0 in the "dt_site_levels" table if Review_Result = "Rejected."
Import_Water_Quality	Exclusions_import_water_quality	Table	Table for viewing the records from the "import_water_quality" table that have not been loaded to the "dt_samples" table.

Group	Object Name	Object Type	Description
	import_water_quality	Table	Contents from the "wq_source_data" table plus Data_Source.
	wq_source_data	Table	Table for importing the water quality data.
	append_IMPORT_to_Staging	Append Query	Adds all records from the "wq_source_data" table to the “import_water_quality” table.
	append_wq_results	Append Query	Formats the water quality data from the "import_water_quality" table and adds them to the "dt_results" table. Does not add if a record with the same Local Well Name/SWN, SAMP DATE, and CHEMISTRY already exists in the "dt_results" table.
	append_wq_samples	Append Query	Formats the water quality data from the "import_water_quality" table and adds them to the "dt_samples" table. Does not add if a record with the same Local Well Name/SWN and SAMP DATE already exists in the "dt_samples" table.
	exclude_wq_data_no_sample	Append Query	Adds the records from the "import_water_quality" table to the "Exclusions_import_water_quality" table if the matching wc_id and SAMP DATE are not found in the "dt_samples" table.
	exclude_wq_data_no_WellDetail	Append Query	Adds the records from the "import_water_quality" table to the "Exclusions_import_water_quality" table if neither Local Well Name nor SWN is found in the "dt_well_details" table.
	exclude_wq_data_with_no_standard_chem	Append Query	Adds the records from the "import_water_quality" table to the "Exclusions_import_water_quality" table if the matching CHEMISTRY is not found in the "lu_parameters" table.
	exclude_wq_data_with_not_site_info	Append Query	Adds the records from the "import_water_quality" table to the "Exclusions_import_water_quality" table if neither Local Well Name nor SWN is found in the "dt_sites" table.
	exclude_wq_data_with_rejected_results	Append Query	Adds the records from the "import_water_quality" table to the "Exclusions_import_water_quality" table if Review_Result = "Rejected."
	check_each_chem_reported_in_one_unit	Select Query	Shows the unit of each analyte.
	check_import_water_quality_results_not_loaded	Select Query	Shows the records from the "import_water_quality" table that have not been loaded to the "dt_results" table.
	chemicals_results_multiple_units	Select Query	Shows the analytes reported in more than one unit.
	import_water_quality_update_site_id	Update Query	Adds site_id to the records in the "import_water_quality" table if the matching Local Well Name is found in the "dt_sites" table.
	import_water_quality_update_site_id_state	Update Query	Adds site_id to the records in the "import_water_quality" table if the matching SWN is found in the "dt_sites" table.
	update_import_water_quality_par_id	Update Query	Adds par_id to the records in the "import_water_quality" table if the matching CHEMISTRY is found in the "lu_parameters" table.
	update_import_water_quality_par_id_exclusions	Update Query	Adds exclusion_comment to the records in the "import_water_quality" table if the matching CHEMISTRY is not found in the "lu_parameters" table.
	update_import_water_quality_rejected_result_exclusions	Update Query	Adds exclusion_comment to the records in the "import_water_quality" table if Review_Result = "Rejected."
	update_import_water_quality_result_exclusions	Update Query	Adds exclusion_comment to the records in the "import_water_quality" table if the matching samp_id and par_id are not found in the "dt_results" table.
	update_import_water_quality_rpt_unit_for_PH	Update Query	Sets rpt_unit = "S.U." in the "import_water_quality" table if CHEMICAL = "PH, LABORATORY."
	update_import_water_quality_rslt_id	Update Query	Adds rslt_id to the records in the "import_water_quality" table if the matching samp_id and par_id are found in the "dt_results" table.
	update_import_water_quality_samp_id	Update Query	Adds samp_id to the records in the "import_water_quality" table if the matching wc_id and SAMP DATE are found in the "dt_samples" table.
	update_import_water_quality_sample_exclusions	Update Query	Adds exclusion_comment to the records in the "import_water_quality" table if the matching wc_id and SAMP DATE are not found in the "dt_samples" table.

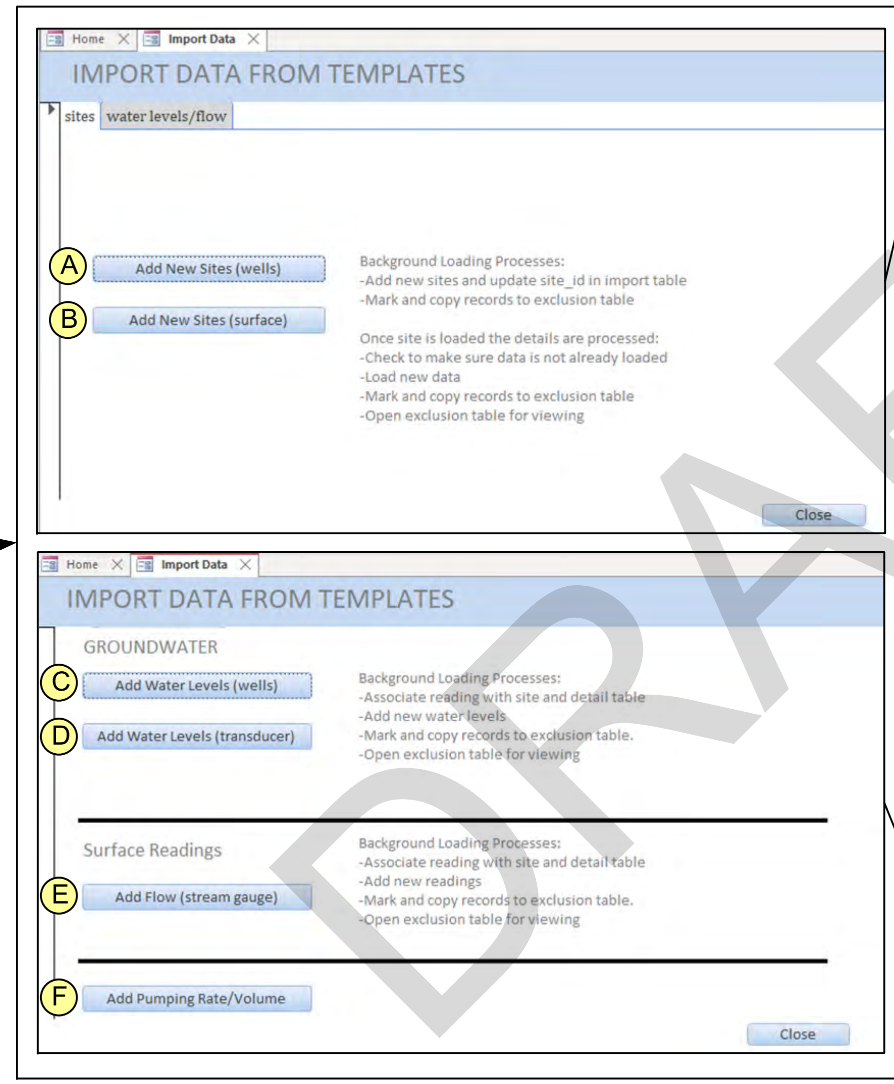
Group	Object Name	Object Type	Description
	update_import_water_quality_site_exclusions	Update Query	Adds exclusion_comment to the records in the "import_water_quality" table if neither Local Well Name nor SWN is found in the "dt_sites" table.
	update_import_water_quality_wc_exclusions	Update Query	Adds exclusion_comment to the records in the "import_water_quality" table if neither Local Well Name nor SWN is found in the "dt_well_details" table.
	update_lu_parameter_anlygroup_from_lu_anlygroup	Update Query	Copies the chemical info from the "lu_anlygroup" table to the "lu_parameters" table.
	update_site_wc_ids_inimport	Update Query	Adds wc_id to the records in the "import_water_quality" table if the matching Local Well Name/SWN is found in the "dt_well_details" table.
Import_GWL_logger	Exclusions_import_pumping	Table	Table for viewing the records from the "import_pumping_rate_volume" table that have not been loaded to the "dt_pumping" table.
	import_pumping_rate_volume	Table	Table for importing the pumping data.
	exclude_pumping_import	Append Query	Adds the records from the "import_pumping_rate_volume" table to the "Exclusions_import_pumping" table if the required well site info is missing.
	import_pumping_add_dt_pumping	Update Query	Formats the pumping data from the "import_pumping_rate_volume" table and adds them to the "dt_pumping" table. Does not add if a record with the same location, wpd_date, wpd_vol, wpd_vol_unit, and wpd_vol_period already exists in the "dt_pumping" table.
	import_pumping_update_wc_id	Update Query	Adds site_id and sd_id to the records in the "import_stream_gauge_flow" table if the matching location is found in the "dt_sites" table.
	update_import_pumping_pump_id	Update Query	Adds pump_id to the records in the "import_pumping_rate_volume" table if the matching wc_id, wpd_date, wpd_vol, wpd_vol_unit, and wpd_vol_period are found in the "dt_pumping" table.
VIEWS_base	q_Base_Pumping	Select Query	Shows the contents of select fields in the "dt_pumping" table.
	q_Base_SurfaceLevels	Select Query	Shows the contents of select fields in the "dt_site_levels" table.
	q_Base_WaterLevels	Select Query	Shows the contents of select fields in the "dt_water_levels" table.
	q_Base_WaterLevelsT	Select Query	Shows the contents of select fields in the "dt_water_levels_transducer" table.
	q_Base_WaterQuality	Select Query	Shows the contents of select fields in the "dt_samples" and "dt_results" tables.

DMS Object Map: Importing Data

"chart_WaterLevels_wells" Form



"frmImportData" Form



A

Input Tables:	Queries (run in order shown):	Output Tables:
• import_wells • lu_monitoring_network_type • lu_site_type	import_wells_update_site_id import_wells_update_site_id_state import_wells_add_dt_sites import_wells_update_site_id import_wells_update_site_id_state exclude_sites_import_wells import_wells_update_wc_id import_wells_add_dt_well_details import_wells_update_wc_id exclude_wc_import_wells	• dt_sites • dt_well_details • Exclusions_ import_wells

B

Input Tables:	Queries (run in order shown):	Output Tables:
• import_stream_gauge_sites • lu_monitoring_network_type • lu_site_type	import_sg_sites_update_site_id import_sg_sites_add_dt_sites import_sg_sites_update_site_id exclude_sites_import_gaugesites import_sg_sites_update_sd_id import_sg_sites_add_dt_site_details import_sg_sites_update_sd_id exclude_sd_import_gaugesites	• dt_sites • dt_site_details • Exclusions_import_stream _gauge_sites

C

Input Tables:	Queries (run in order shown):	Output Tables:
• import_gwl_manual • dt_sites • dt_well_details	import_gwlman_Update_siteID_wcID import_gwlman_Update_siteID_wcIDState Well import_gwlman_Update_wlID import_gwlman_add_dt_water_levels import_gwlman_Update_wlID exclude_wlm_import_gwlman update_display_rejected_water_levels	• dt_water_levels • Exclusions_import_gwl _manual

D

Input Tables:	Queries (run in order shown):	Output Tables:
• import_gwl_logger • dt_sites • dt_well_details	import_gwlt_update_site_id_wc_id_localname import_gwlt_update_site_id_wc_id_sitecode import_gwlt_update_wlt_id import_gwlt_add_dt_water_level_trans import_gwlt_update_wlt_id exclude_wlt_import_gwllogger update_display_rejected_water_levels_logger	• dt_water_levels_transducer • Exclusions_import_gwl _logger

E

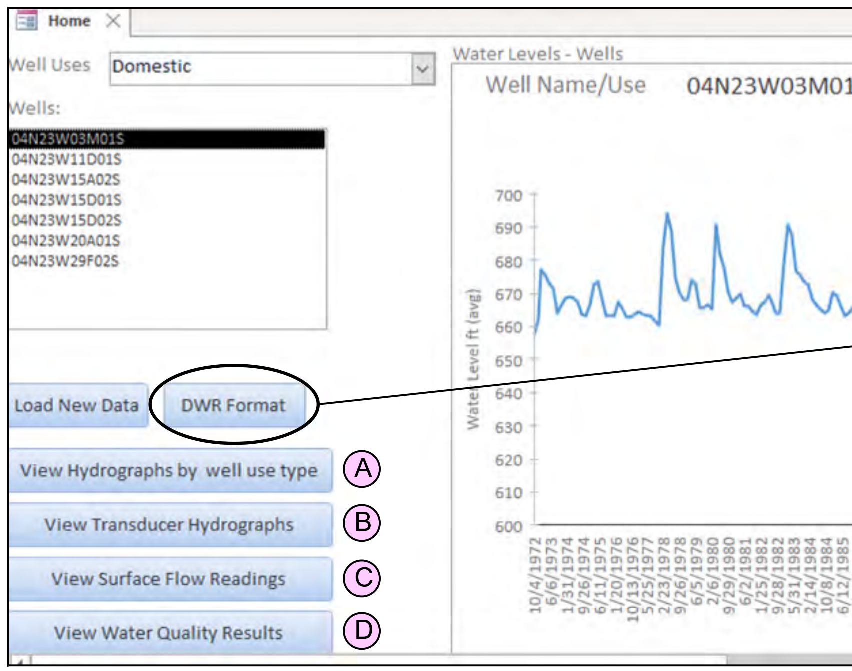
Input Tables:	Queries (run in order shown):	Output Tables:
• import_stream_gauge_flow • dt_sites • dt_site_details	import_sg_flow_site_id_sd_id import_sg_flow_add_dt_site_levels import_sg_flow_update_sl_id exclude_sgflow_import_stream_gauge_flow update_display_rejected_stream_flow	• dt_site_levels • Exclusions_import_stream _gauge_flow

F

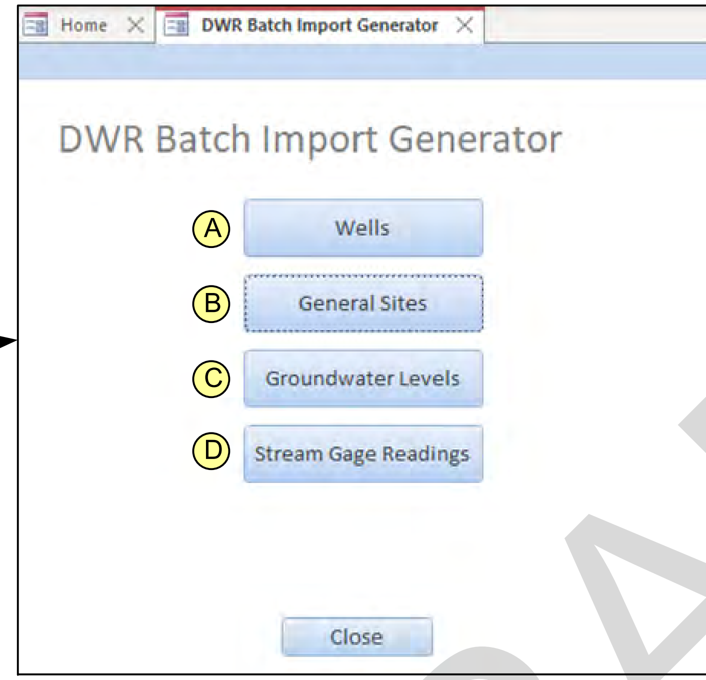
Input Tables:	Queries (run in order shown):	Output Tables:
• import_pumping_rate _volume • dt_sites • dt_well_details • dt_sources	import_pumping_update_wc_id update_import_pumping_pump_id import_pumping_add_dt_pumping update_import_pumping_pump_id exclude_pumping_import	• dt_pumping • Exclusions_import_pumping

DMS Object Map: Formatting Data & Graphing

"chart_WaterLevels_wells" Form



"frmDWR_Exports" Form



A

Input Tables:	Queries (run in order shown):	Output Tables:
• dt_sites • dt_well_details • lu_monitoring_network_type	dwr_append_batchWells	• BatchImportWells_template

B

Input Tables:	Queries (run in order shown):	Output Tables:
• dt_sites • dt_site_details • dt_well_details	dwr_append_batchGeneralSitesGages dwr_append_batchGeneralSitesWells	• BatchImportGeneralSites _template

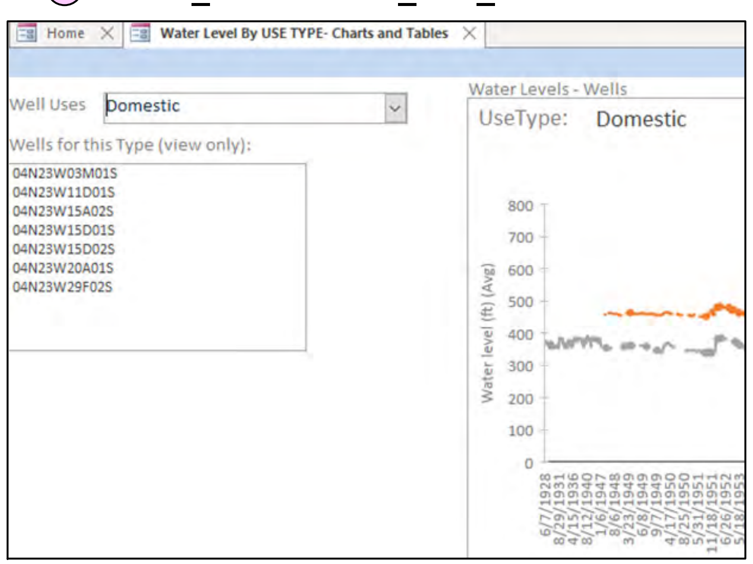
C

Input Tables:	Queries (run in order shown):	Output Tables:
• dt_sites • dt_well_details • dt_water_levels • dt_water_levels_transducer	dwr_append_batch_GWLD dwr_append_batch_GWLD_loggers	• BatchImportGWLD_template

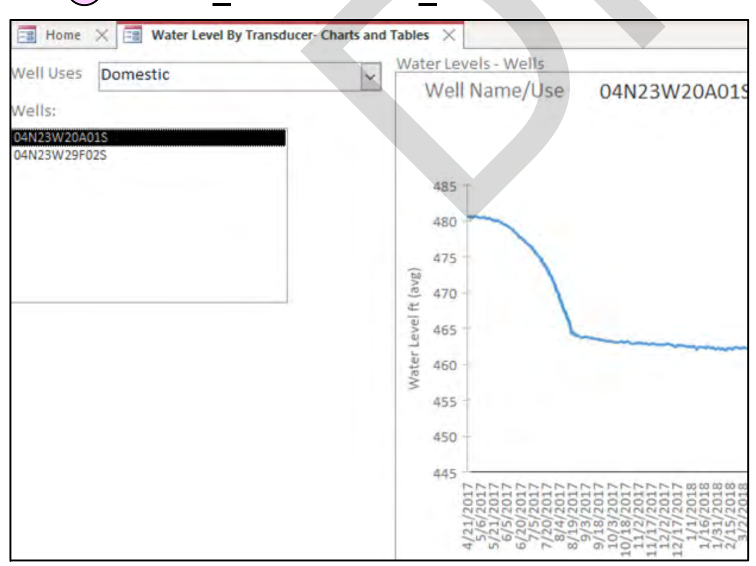
D

Input Tables:	Queries (run in order shown):	Output Tables:
• dt_sites • dt_site_details • dt_site_levels • lu_site_type	dwr_append_batchGenSitesData_gage	• BatchImportGeneralSiteData _template

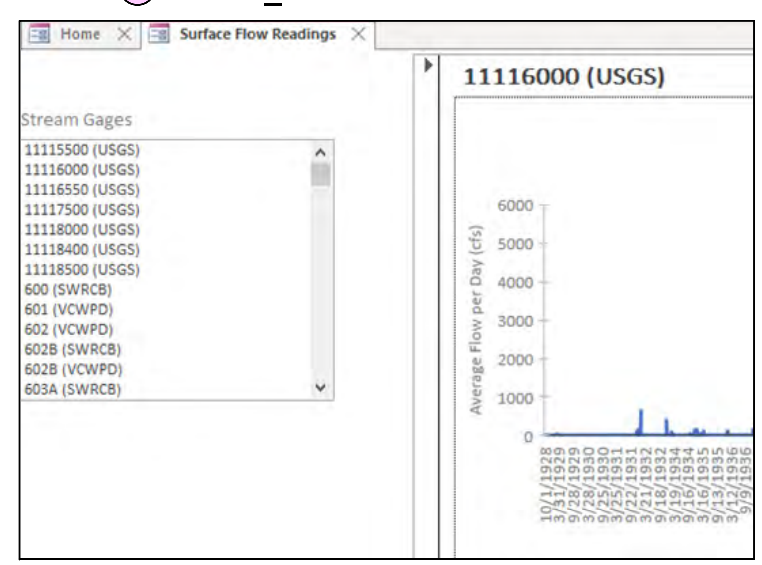
A "chart_WaterLevels_well_use" Form



B "chart_WaterLevels_wellsT" Form



C "chart_SurfaceLevels" Form



D "chart_WaterQuality" Form