STATE OF CALIFORNIA
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

STAFF SUMMARY REPORT: Alec Naugle
MEETING DATE: May 12, 2021

ITEM: 8

Groundwater Management in the San Francisco Bay Region – Status Report

DISCUSSION:

This status report (Appendix A) provides an overview of our efforts to protect groundwater basins in the San Francisco Bay Region. Our Sustainable Groundwater Management Team (a multi-division team) is prioritizing our Region's groundwater basins considering current and future use and community reliance. Using local and regional groundwater quality information and management plans the team is informing our permitting and cleanup decisions to protect beneficial uses for drinking, irrigation, and stream/wetland replenishment. We previously reported our efforts to the Board in a 2018 status report. This update includes new information about supply wells affected by per- and polyfluoroalkyl substances (PFAS) and our progress toward source water protection, salt and nitrate evaluations, and basin prioritization.

Groundwater is a vital environmental and economic resource in the San Francisco Bay Region and provides a critical water supply to buffer the impacts of drought and climate change. In normal water years, the Region's groundwater basins supply about 20% of the Region's total water, most of which is from municipal/community supply wells, with a lesser contribution from private domestic and irrigation wells. During sustained drought periods that percentage can nearly double.

APPENDIX:

A. Status Report

Appendix A

Status Report

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

Status Report

Groundwater Management in the San Francisco Bay Region

Introduction

Our agency's interest in groundwater use and management is the nexus between quantity and quality. State-wide regulations intended to protect groundwater basins from overuse and over loading of salt and nutrients require local agencies to produce plans. We play an important role in the review of these plans and they can in turn inform our efforts to protect beneficial uses for drinking and irrigation water supplies, and stream/wetland replenishment. This status report describes our approach and progress toward developing a deeper understanding of local plans and baseline groundwater conditions to better inform our regulatory activities.

Background

The San Francisco Bay Region is home to about 7 million residents who use 1.5 million acre-feet of water per year. In normal water years the Region's groundwater basins supply about 20% of this total, most of which is from municipal/community supply wells, with a lesser contribution from private domestic and irrigation wells. During sustained drought periods that percentage can nearly double. The Basin Plan identifies 35 groundwater basins and subbasins in our Region (Figure 1). Table 1 indicates if the basin has municipal or community uses and information about local agency management.

In 2015, we formed a multi-division team to evaluate groundwater conditions in our Region and recommend alternatives to address adverse impacts. The work includes: 1) engaging local groundwater agencies and reviewing their groundwater management plans, 2) comparing current conditions to baseline, including assessing beneficial uses, supply well impacts, localized salt and nutrient areas of concern, and other water quality/habitat threats,and 3) documenting and sharing findings amongst our programs and with external stakeholders.

Water Board Groundwater Management and Prioritization

The 1992 Local Groundwater Management Act (AB3030) encouraged local agencies to develop voluntary groundwater management plans to support municipal water supply and prevent undesirable results due to over-pumping. This includes subsidence, seawater intrusion, and depletion of interconnected surface water. In 2014, the State went further and enacted the Sustainable Groundwater Management Act (SGMA) to mandate a regulatory framework for local groundwater use management. SGMA requires local agencies that manage SGMA priority basins to develop thresholds and

criteria for the basin that will avoid *significant and unreasonable degradation of water quality* and *surface water depletions that have significant and unreasonable adverse impacts on beneficial uses*.

SGMA authorizes the Department of Water Resources (DWR) to approve plans and develop regulations, and the State Water Board to enforce over-pumping restrictions. While Regional Water Boards are not delegated a specific role under SGMA, our team is engaging local agencies as they develop their plans and coordinating with the State Water Board to provide feedback on draft plans to encourage improvements. Our team also engages regularly about groundwater management plan implementation with other Regional Water Boards and the State Board through regular participation on the SGMA Roundtable.

In our Region, there are seven SGMA priority basins: Santa Clara Valley, Niles Cone, Livermore Valley, the East Bay Plain, and the Napa, Sonoma, and Petaluma valleys (Table 1). For these basins, SGMA requires the formation of local Groundwater Sustainability Agencies and the development of Groundwater Sustainability Plans (GSPs) by 2022 to balance long-term pumping and recharge in a way that supports beneficial uses and maintains good water quality. In 2019, the Santa Clara Valley, Niles Cone, and Livermore Valley received GSP approval from Department of Water Resources (DWR), which is thestate agency charged with SGMA implementation. Draft GSPs for the four other SGMA priority basins are being developed or under review.

For basins not subject to state requirements (i.e., SGMA), some have voluntarily developed plans, while others have not, despite having important municipal, domestic, and agricultural groundwater reliance. These basins remain a priority for us. Examples of basins without management plans that support important beneficial uses for drinking and irrigation include the Kenwood, Clayton, and Ygnacio Valleys, and the coastal basins of Pescadero and Half Moon Bay (Table 1, Figure 1).

Local agency funding for groundwater projects is available under two general obligation bonds:

1. Proposition 1 (Water Quality, Supply, and Infrastructure Improvement Act of 2014), and
2. Proposition 68 (Drought, Water, Parks, Climate, Coastal Protection, and Outdoor Access For All Act of 2018)

Over $5.75 million have been distributed to five SGMA priority basins in our Region for GSP development and hydrogeological work to evaluate recharge enhancements.

In addition to the SGMA prioritization criteria (i.e., current use), we believe there are additional considerations that will help inform our regulation and permitting for groundwater beneficial use protections. These include local and region-specific concerns about expanding groundwater use due to potentially worsening droughts associated with climate change, provision of safe drinking water for environmental

justice and disadvantaged communities and future threats to water supply infrastructure. To that end, our team is developing a list of additional prioritization factors. These include not only current municipal and domestic groundwater use as SGMA does, but also community reliance on groundwater; the potential to resume historic use under drought or emergency conditions; and aquifer susceptibility to water quality degradation.

Overlaying these additional priority considerations can, for example, inform our decisions about acceptable cleanup timeframes and case closure and better support our regulatory decisions regarding waste discharge permits, compliance with the State Water Board's Winery General Order, and salt and nutrient management plan requirements under the State Water Board's Recycled Water Policy, which is discussed below. It is also consistent with State Water Board Resolution No. 2016-0010 for the human right to water, which extends to all Californians, including disadvantaged individuals and groups and communities in rural and urban areas.

Source Water Protection

To better understand impacts to drinking water supply wells in our Region, we have gathered information from the State Water Board's Groundwater Ambient Monitoring and Assessment (GAMA) program and generated by per- and polyfluoroalkyl substances (PFAS) sampling orders. Starting in 2019, the State Water Board Division of Water Quality issued PFAS sampling orders to facilities that are potential sources of PFAS including landfills, airports, chrome platers, refineries, and bulk fuel terminals. At the same time, the Division of Drinking Water has issued sampling orders to numerous public supply wells.

Of the 1228 public supply wells in our Region, we have identified about 50 with contaminants that are exceeding regulatory screening levels. These contaminants include perchlorate, tetrachloroethene, trichloroethene,1,2,3-trichloropropane, methyl tert-butyl ether, and PFAS. Ten affected wells are located in the Santa Clara Valley Basin, five in the San Mateo Plain Subbasin, eight in the Livermore Valley Basin, two in the Half Moon Bay Terrace Basin, two in Lobos Basin, one in the Napa-Sonoma Valley Basin, one in Clayton Valley Basin, and one in Marin County outside basin boundaries. The local water agencies that own and/or operate these wells have taken steps to protect their water supply by treating the water or removing affected wells from service.

Our work is to identify the most likely pollutant source(s) affecting a supply well and require property use information, sampling, and site cleanup as necessary under our Water Code authority to reduce future supply well impacts. To date, this has included:

- Collaboration with stakeholders at Zone 7 in Livermore and at San Jose Water Company and Valley Water in Santa Clara County, focusing on 14 municipal wells affected by PFAS;
- Identification of more than 20 potential PFAS sources near the affected wells from

numerous databases and the issuance of site history report requirement letters to facilities in Livermore and San Jose;
- Continued development/refinement of conceptual site models of contaminant fate and transport to affected supply wells;
- Continued focus on additional meetings and communications with responsible parties and/or stakeholders, requiring investigation workplans, completion reports, and eventual cleanup and abatement actions.

PFAS investigations are complicated by the vast extent of potential PFAS sources; however, data collected to date allow us to focus on potential sources with the greatest known environmental impacts, such as facilities that have used aqueous film-forming foams at fire training sites.

Salt and Nutrient Assessments

The State Water Board's 2009 Recycled Water Policy (as amended in 2019) requires regional water boards to evaluate and identify basins where salts and/or nutrients are a threat to water quality and therefore need salt and nutrient management plans to achieve or maintain water quality objectives. This is because expanded use of recycled water, which the Policy encourages, could degrade groundwater quality due to the salts and nutrients contained within recycled water derived from reclaimed municipal wastewater.

The Policy encourages local water agencies to work collaboratively with the regional water board to develop salt and nutrient management plans, as needed. The Policy specifies that plans must identify and quantify existing and potential future salt and nutrient sources, which in addition to irrigation with recycled water, typically include agricultural and landscape fertilizer applications, livestock operations, wastewater disposal, aquifer recharge projects, and seawater intrusion. Plans must also include an evaluation of a basin's long-term capacity to assimilate the additional salts and nutrients and actions needed to restore, protect, and monitor water quality.

Since December 2014, this Board has adopted resolutions of support for three plans. These include the Sonoma Valley plan (December 2014), the Livermore Valley plan (March 2016), and the Santa Clara Valley plan (November 2016). These plans were voluntarily developed by local water districts/agencies that have groundwater management authority so that they could best protect groundwater quality considering city/municipal plans to expand recycled water use.

Evaluating these local agency plans has proved to be extremely valuable as it has informed our priority-setting and decision-making regarding the permitting of winery wastewater disposal and recycled water projects, and our review of county regulations for septic system expansion pursuant to the State Water Board's On-site Wastewater Treatment Systems Policy. For example, in the Livermore Valley and Coyote Valley near Morgan Hill, salt and nutrient management plans helped us identify elevated nutrient (i.e., nitrate) areas of concern from current and past agricultural land uses and

septic systems that threaten some public and private wells. For these areas, our groundwater management team is coordinating with the local water districts as they implement their plans.

In other priority basins, plan development is challenging due to the lack of a groundwater management agency (or lack of funding) or lack of significant evidence of a problem, or both. To fulfill our Policy mandate, our groundwater team is systematically conducting salt and nutrient assessments of groundwater quality in these basins. Our immediate attention is focused on the remaining SGMA priority basins including Napa and Petaluma Valleys, Suisun-Fairfield Valley, East Bay Plain,and coastal basins of Half Moon Bay and Pescadero where there is significant groundwater reliance. We use data from the GAMA database, DWR reports, local agency records, and other sources. Our goal is to complete these assessments by the end of the year.

Managed Aquifer Recharge

Aquifer recharge is an important component of sustainable groundwater management. Typically, local agencies use percolation ponds, spreading basins, in-stream recharge, and occasionally injection wells to recharge aquifers. Our regulatory approach to permitting recharge projects largely depends on the quality of the source water and its potential impact on the quality of the receiving groundwater. For example, treated potable water may contain small amounts of disinfection by-products that could affect water quality when injected into aquifers. For recharge with recycled water or urban stormwater, the source water may contain industrial chemicals, contaminants of emerging concern, and salts and nutrients. Furthermore, the type of source water and the recharge method could liberate naturally occurring arsenic or chromium already within an aquifer.

Waste discharge requirements or waivers are our tools to regulate recharge projects. In 2012, the State Water Board adopted general waste discharge requirements specifically for ASR projects using treated potable water. In 2014, the State Department of Public Health's drinking water program (now part of State Water Board's Division of Drinking Water) adopted regulations for indirect potable reuse (IPR) that involves recharging highly treated, recycled water into drinking water aquifers.

Five basins in our Region have relied on managed aquifer recharge for decades to replenishgroundwater supply. Santa Clara Valley, Livermore Valley, and Niles Cone use former quarries, percolation ponds, and in-stream recharge. The Alameda County Water District also manages groundwater in the Niles Cone by pumping and treating saline groundwater to control saline water intrusion from the Bay. Sonoma Valley and the Westside Basins rely on "in-lieu" recharge, delivering excess surface water to golf courses and other groundwater users in exchange for decreased pumping, which in-turn allows aquifers to recharge naturally over time.

More recent management efforts include the Sonoma County Water Agency's (SCWA)

aquifer storage and recovery project in the Sonoma Valley using treated potable water from the Russian River. This project, which is still in a planning stages, could eventually recharge up to ten percent of the total groundwater used in Sonoma Valley. The groundwater management team worked closely with the SCWA to permit a 1-year pilot test of the Sonoma Valley project in 2018, which successfully demonstrated adequate aquifer capacity while maintaining water quality goals. Additional evaluation and pilot studies to potentially expand the project in other areas are being planned in coordination with the Sonoma Valley GSP development.

Another example is the East Bay Municipal Utility District's Bayside Groundwater Project in San Lorenzo, which the Board approved in 2007. This aquifer storage and recovery project has the capacity to inject up to one million gallons per day of treated potable water into the East Bay Plain basin and extract it for emergency or drought use.

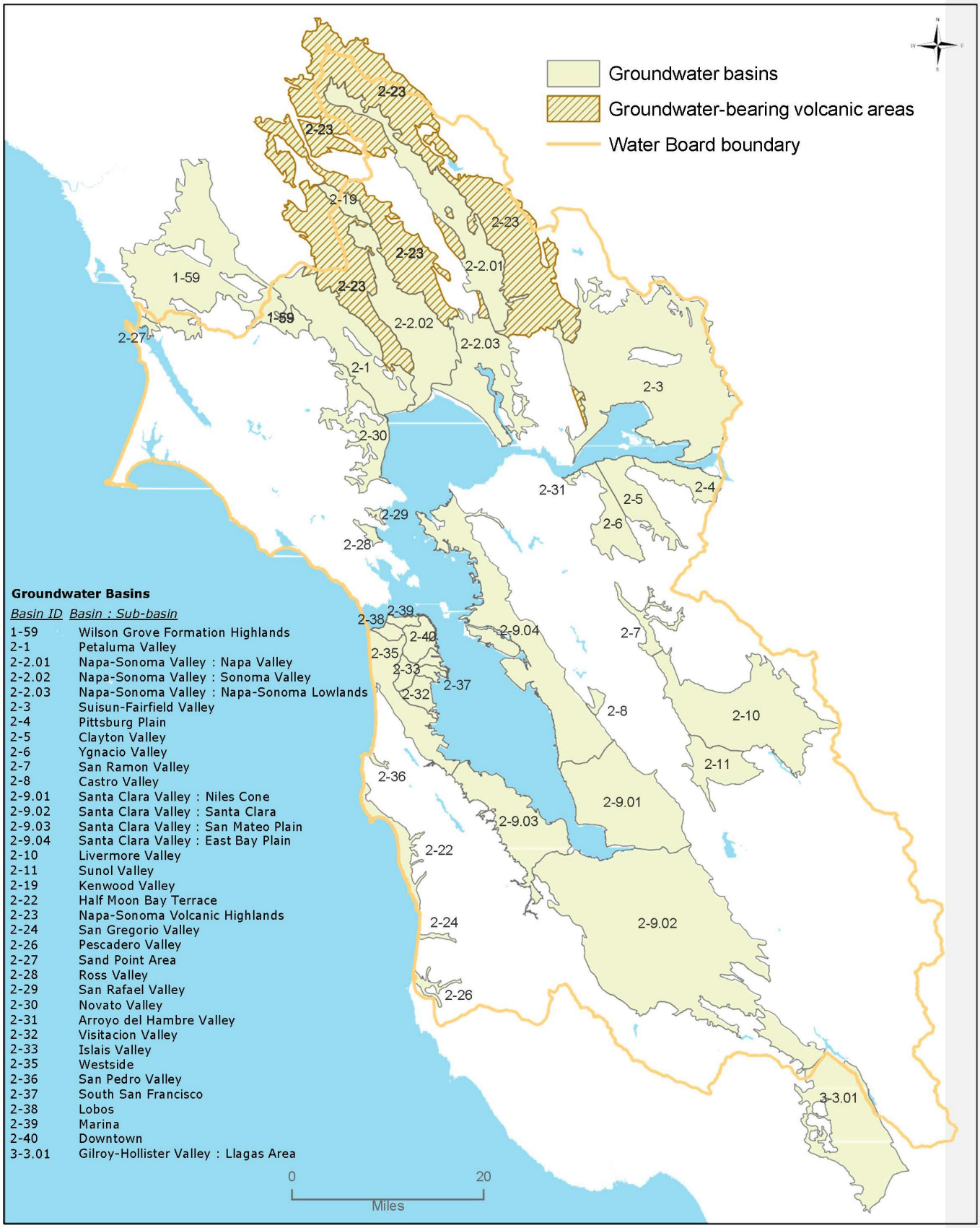
While we do not have any pending applications for IPR projects, agencies such as Valley Water are evaluating them. Additionally, researchers continue to develop tools to help State and local agencies evaluate the use of captured stormwater to augment local groundwater supplies.

Conclusion

We rely on our Sustainable Groundwater Management Team to evaluate, prioritize, and recommend best regulatory strategies to inform our permitting and cleanup decisions to protect groundwater basins. The team’s work is helping optimize our limited resources to identify and address the most important threats to groundwater beneficial uses. We will report back to the Board with future progress updates.

Attachments:

Figure 1 – Groundwater Basins in the San Francisco Bay Region
Table 1 – Groundwater Management Planning in the San Francisco Bay Region



Groundwater Basins

Basin ID	*Basin : Sub-basin*
1-59	Wilson Grove Formation Highlands
2-1	Petaluma Valley
2-2.01	Napa-Sonoma Valley : Napa Valley
2-2.02	Napa-Sonoma Valley : Sonoma Valley
2-2.03	Napa-Sonoma Valley : Napa-Sonoma Lowlands
2-3	Suisun-Fairfield Valley
2-4	Pittsburg Plain
2-5	Clayton Valley
2-6	Ygnacio Valley
2-7	San Ramon Valley
2-8	Castro Valley
2-9.01	Santa Clara Valley : Niles Cone
2-9.02	Santa Clara Valley : Santa Clara
2-9.03	Santa Clara Valley : San Mateo Plain
2-9.04	Santa Clara Valley : East Bay Plain
2-10	Livermore Valley
2-11	Sunol Valley
2-19	Kenwood Valley
2-22	Half Moon Bay Terrace
2-23	Napa-Sonoma Volcanic Highlands
2-24	San Gregorio Valley
2-26	Pescadero Valley
2-27	Sand Point Area
2-28	Ross Valley
2-29	San Rafael Valley
2-30	Novato Valley
2-31	Arroyo del Hambre Valley
2-32	Visitacion Valley
2-33	Islais Valley
2-35	Westside
2-36	San Pedro Valley
2-37	South San Francisco
2-38	Lobos
2-39	Marina
2-40	Downtown
3-3.01	Gilroy-Hollister Valley : Llagas Area

Table 1 – Groundwater Basin Management in the San Francisco Bay Region

Groundwater Basin/ Subbasin	SGMA Priority Basin	Municipal/ Community Use	Groundwater ManagementPlans	Salt/Nutrient Management Plan	Managed Aquifer Recharge*
East Bay Plain 2-09.04	✓	✓	A GMP for the South East BayPlain Basin (2013) prepared by EBMUD will provide the basis for a SGMA GSP required by 2022.	No.	Since 2007 EBMUD has operated the Bayside Aquifer Storage Recovery groundwater banking project.
Livermore Valley 2-10	✓	✓	In 2016, Zone 7 submitted a SGMA GSP alternative plan based on its 2005 GMP and analysis of basin conditions for 10 years. The GSP alternative plan was approvedby DWR in 2019.	Yes (2005 & 2015). The Water Board approved the SMP in 2005 and the NMP in March 2016.	Yes. Zone 7 operates passive recharge using streambed infiltration and quarries to recharge natural streamflow and imported surface water.
Napa Valley 2-02.01	✓	✓	The Napa Valley Groundwater Sustainability Plan SGMA GSP alternative was not approved by DWR in 2019. The SGMA GSP alternative will provide the basis for a SGMA GSP required by 2022.	Under development.	No.
Niles Cone 2-09.01	✓	✓	In 2019, DWR the Alameda County Water District (ACWD)submitted a SGMA GSP alternative plan based on analysis of basin conditions for 10 years. The GSP alternative plan was approvedby DWR in 2019.	A draft plan (2016) has been submitted which will provide the basis for a future S/NMP.	Yes. ACWD operates passive recharge using streambed infiltration and quarries to recharge with natural streamflow and imported surface water.

Table 1 – Groundwater Basin Management in the San Francisco Bay Region

Petaluma Valley 2-01	✓	✓	There is no existing GMP. A SGMA GSP is required by 2022.	No.	No.
Santa Clara 2-09.02	✓	✓	A GMP (2016) prepared by the Santa Clara Valley WaterDistrict (SCVWD) will providethe basis for a SGMA GSP required by 2022.	Yes (2014). The Water Board approved the plan in November 2016.	Yes. SCVWD operates passive recharge using streambed infiltration and percolation basins to recharge with natural streamflow and imported surface water.
Sonoma Valley 2-02.02	✓	✓	A GMP (2012) prepared by the Sonoma County Water Agency (SCWA) will providethe basis for a SGMA GSP required by 2022.	Yes (2014). The Water Board approved the plan in December 2014.	Yes. Sonoma Valley relies on “in-lieu” recharge to optimize natural infiltration of precipitation as the primarysource of aquifer recharge. The SCWA completed a pilot test for aquifer storageand recovery in 2020 and plans to assess full-scale feasibility in the 2022 GSP.
Clayton Valley 2-05		✓	None identified	No.	No.

Table 1 – Groundwater Basin Management in the San Francisco Bay Region

San Mateo Plain 2-09-.03		✓	San Mateo County completedan assessment of the basin in2018 as a basis for potential future groundwater management projects.	No.	No.
Westside 2-35		✓	The North Westside Basin developed a GMP in 2005 andthe South Westside Basin developed a GMP in 2012.	No.	Yes. The Westside basin relies on “in-lieu” recharge to optimize natural infiltration of precipitation as the primary source of aquifer recharge.
Kenwood Valley 2-19		✓	None identified. The southernhalf of the basin will be incorporated into the adjacent Sonoma Valley GSP.	No.	No.
Half Moon Bay Terrace 2-22		✓	None identified however the Montara Water and Sanitary District proposes to develop the Mid-Coastside Multi-Basin GMP.	No.	No.
Pescadero Valley 2-26		✓	None identified	No.	No.
Pittsburg Plain 2-4		✓	In 2012, the City of Pittsburg prepared a GMP for the basin.	In 2012, the City of Pittsburg prepared a Salt	No.

Table 1 – Groundwater Basin Management in the San Francisco Bay Region

				and Nutrient Program Summary if an S/NMP is deemed necessary in the future.	
Ygnacio Valley 2-06		✓	None identified.	No.	No.
Arroyo Del Hambre Valley 2-31			None identified.	No.	No.
Castro Valley 2-08			None identified.	No.	No.
Downtown San Francisco 2-37			None identified.	No.	No.
Islais Valley 2-33			None identified.	No.	No.
Lobos 2-38			None identified.	No.	No.
Marina 2-39			None identified.	No.	No.
Napa-Sonoma Lowlands 2-03.03			None identified.	No.	No.
Novato Valley 2-30			None identified.	No.	No.
Ross Valley 2-28			None identified.	No.	No.

Table 1 – Groundwater Basin Management in the San Francisco Bay Region

San Gregorio Valley 2-24			None identified.	No.	No.
San Pedro Valley 2-24			None identified.	No.	No.
San Rafael Valley 2-29			None identified.	No.	No.
San Ramon Valley 2-07			None identified.	No.	No.
Sand Point Area 2-27			None identified.	No.	No.
South San Francisco 2-37			None identified.	No.	No.
Suisun-Fairfield Valley 2-03			None identified.	No.	No.
Sunol Valley 2-11			None identified.	No.	No.
Visitacion Valley 2-32			None identified.	No.	No.

DWR – Department of Water Resources
GSA – Groundwater Sustainable Agency (SGMA)
GSP – Groundwater Sustainability Plan (SGMA)
GMP – Groundwater Management Plan (AB 3030)
MAR – Managed Aquifer Recharge
S/NMP – Salt/Nutrient Management Plan
SGMA – Sustainable Groundwater Management Act
* Unless otherwise noted, natural infiltration of precipitation is the primary source of aquifer recharge.