WORKING DRAFT

Sustainable Management Criteria Section
Groundwater Sustainability Plan for
Sonoma Valley Groundwater Subbasin

Note to Reader: Portions of this section that are under-development or are being considered at upcoming Advisory Committee or Board meetings are shown in italics

Contents

4.0 Sustainable Management Criteria

This section defines the conditions that constitute sustainable groundwater management, discusses the process by which the GSA will characterize undesirable results, and establishes minimum thresholds and measurable objectives for each sustainability indicator.

This section addresses significant regulatory requirements. The measurable objectives, minimum thresholds, and undesirable results detailed in this section define the Subbasin's future conditions and commits the GSA to actions that will meet these objectives. Defining these Sustainable Management Criteria (SMC) requires a significant level of analysis and scrutiny, and this section includes adequate data to explain how SMC were developed and how they influence all beneficial uses and users.

This section is structured to address all of the SGMA regulations regarding SMC. To retain an organized approach, this section follows the same structure for each sustainability indicator. The SMC are grouped by sustainability indicator. Each section follows a consistent format that contains the information required by Section 354.22 et. seq of the regulations and outlined in the SMC BMP (DWR, 2017). Each SMC section includes a description of:

- How locally defined significant and unreasonable conditions were developed
- How minimum thresholds were developed, including:
  - The information and methodology used to develop minimum thresholds (§354.28 (b)(1))
  - The relationship between minimum thresholds and the relationship of these minimum thresholds to other sustainability indicators (§354.28 (b)(2))
  - The effect of minimum thresholds on neighboring basins (§354.28 (b)(3))
  - The effect of minimum thresholds on beneficial uses and users (§354.28 (b)(4))
  - Relevant federal, state, or local standards (§354.28 (b)(5))
  - The method for quantitatively measuring minimum thresholds (§354.28 (b)(6))
- How measurable objectives were developed, including:
  - The methodology for setting measurable objectives (§354.30)
  - Interim milestones (§354.30 (a), §354.30 (e), §354.34 (g)(3))
- How undesirable results were developed, including:
  - The criteria for defining undesirable results (§354.26 (b)(2))
  - The potential causes of undesirable results (§354.26 (b)(1))
  - The effects of these undesirable results on the beneficial users and uses (§354.26 (b)(3))

4.1 Definitions

The SGMA legislation and GSP Regulations contain a number of terms relevant to the SMC. These terms are defined below using the definitions included in the GSP Regulations. Where appropriate, additional explanatory text is added in italics. This explanatory text is not part of the official definitions of these terms but provides useful clarifications.

- Interconnected surface water refers to 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.

  Interconnected surface waters are sections of streams, lakes, or wetlands where the groundwater table is at or near the ground surface.

- Interim milestone refers to a target value representing measurable groundwater conditions, in increments of five years, set by an Agency as part of a Plan.

  Interim milestones are targets such as groundwater elevations that will be achieved every five years to demonstrate progress towards sustainability.

- Measurable objectives refer to specific, quantifiable goals for the maintenance or improvement of specified groundwater conditions that have been included in an adopted Plan to achieve the sustainability goal for the basin.

  Measurable objectives are goals that the GSP is designed to achieve.

- Minimum threshold refers to a numeric value for each sustainability indicator used to define undesirable results.

  Minimum thresholds are indicators of an unreasonable condition. For example, the level of a pump in a well may be a minimum threshold because groundwater levels dropping below the pump level would be an unreasonable condition.

- Representative monitoring refers to a monitoring site within a broader network of sites that typifies one or more conditions within the basin or an area of the basin.

- Sustainability indicator refers to any of the effects caused by groundwater conditions occurring throughout the basin that, when significant and unreasonable, cause undesirable results, as described in Water Code Section 10721(x).

  The six sustainability indicators relevant to this subbasin include chronic lowering of groundwater levels; reduction of groundwater storage; degraded water quality; land subsidence; seawater intrusion; and depletion of interconnected surface waters.

- Uncertainty refers to a lack of understanding of the basin setting that significantly affects an Agency's ability to develop sustainable management criteria and appropriate projects and management actions in a Plan, or to evaluate the efficacy of Plan implementation, and therefore may limit the ability to assess whether a basin is being sustainably managed.

- Undesirable Result

  Undesirable Result is not defined in the GSP Regulations. However, the description of undesirable result states that it should be a quantitative description of the combination of minimum threshold exceedances that cause significant and unreasonable effects in the subbasin. An example undesirable result is more than 10% of the measured groundwater levels being lower than the minimum thresholds. Undesirable results should not be confused with significant and unreasonable conditions. Significant and

unreasonable conditions are physical conditions to be avoided; an undesirable result is a quantitative assessment based on minimum thresholds.

4.2 Sustainability Goal

Per Section §354.24 of the GSP Regulations, the sustainability goal for the Subbasin has three parts:

- A description of the sustainability goal;
- A discussion of the measures that will be implemented to ensure the Subbasin will be operated within sustainable yield, and;
- An explanation of how the sustainability goal is likely to be achieved.

Note: The following information will be updated when the GSP is completed.

A number of projects and actions measures are included in this GSP. Not all these measures will be implemented. However, some combination of these measures will be implemented to ensure the Subbasin is operated within its sustainable yield and achieves sustainability.

Note: The list of projects and actions will be included here once finalized.

These measures will achieve sustainability within 20 years by the following means:

Note: The effects of the projects and actions will be included here once finalized.

4.3 General Process for Establishing Sustainable Management Criteria

The SMC presented in this section were developed using information from publicly available information, feedback gathered during public meetings, hydrogeologic analysis, and meetings with GSA staff and Advisory Committee members. The general process included:

- Discussions with GSA technical staff to develop initial overarching methodologies to developing SMCs, and specific approaches for each Sustainability Indicator.
- Presentations to the Advisory Committee outlining the approach to developing SMC and discussing initial SMC ideas. The Advisory Committee provided feedback and suggestions for the development of initial SMC.
- Presentations to the Board of Directors on the SMC requirements, proposed methodology for establishing minimum thresholds and measurable objectives, options for establishing undesirable results and SMC implications.
- Modifying minimum thresholds, measurable objectives and undesirable results based on input from GSA staff, Advisory Committee members and Board Members.

This general process resulted in the SMC presented in this section.

4.4 Sustainable Management Criteria Summary

Table 4-4-1 provides a summary of the SMCs for each of the six sustainability indicators. The rational and background for developing these criteria are described in detail in the following sections. Table 4-4-1: Sustainable Management Criteria Summary [*Note to reader: this table will be completed once all SMC are developed]*

Sustainability Indicator	**Minimum Threshold**	**Measurement**	**Measurable Objective**	**Undesirable Result**	**Interim Milestones**
Chronic lowering of groundwater levels					
Reduction in groundwater storage					
Seawater intrusion					
Degraded groundwater quality					
Subsidence					
Depletion of interconnected surface water					

4.8 Degraded Water Quality SMC

Minimum thresholds and measurable objectives are criteria for groundwater management in 20 years. Groundwater quality is regulated by other local, state and federal statutes administered by other agencies and is not regulated by SGMA.

The primary challenge in establishing degraded water quality SMCs is to establish what constitutes an impact from GSP projects and actions. The GSA should not set SMCs in a way that makes the GSA responsible for natural changes in groundwater quality or groundwater degradation caused by others. An additional, but related challenge is being able to assess in the future if any degradation to groundwater quality is due to SGMA activities.

4.8.1 Locally Defined Significant and Unreasonable Conditions

Locally defined significant and unreasonable conditions were determined based on public meetings, and discussions with GSA staff, Advisory Committee members, and GSA Board.

Note: the current DRAFT description is below and will be reviewed at October 13 Advisory Committee meeting:

Significant and unreasonable water quality conditions occur if Sonoma Valley GSP projects or management activities directly cause an increase in the concentration of constituents of concern in groundwater or if the GSA fails to enforce other SMC that lead to adverse impacts on beneficial users or uses of groundwater. Adverse impacts include diminished supply due to water quality impacts, such as non-compliance with drinking water standards or undue costs for mitigating negative impacts such as wellhead treatment or well replacement.

4.8.1.1 Constituents of Concern

As noted in Section 354.28 (c)(4) of the GSP Regulations, minimum thresholds are based on a degradation of groundwater quality, not an improvement of groundwater quality (CCR, 2016). Therefore, this GSP is designed to avoid taking any action that may inadvertently move groundwater constituents that have already been identified in the Subbasin in such a way that the constituents have a significant and unreasonable impact that would not otherwise occur. Constituents of concern were identified based on three criteria:

1. They have an established level of concern such as an MCL or SMCL, or a level that reduces crop production
2. They have been found in the Subbasin at levels above the level of concern
3. The occurrence of the COC is extensive throughout the Subbasin

Based on the review of groundwater quality in Section 3.2.5 three constituents of concern (COCs) were identified that may affect groundwater supply in the Subbasin. The constituents of concern include:

- Arsenic
- Nitrate; and
- Salinity (measured as total dissolved solids [TDS])

There are other point source contaminants found sporadically in the Subbasin, but these are not regional in extent, are monitored through various other regulatory programs, and consequently SMC are not established in the GSP. Additionally, while boron is identified as a naturally occurring constituent of interest in Section 3.2.5, boron is not routinely sampled through existing regulatory monitoring programs. New or additional water quality constituents may be identified as potential COCs applicable to the GSP implementation activities through routine consultation and information sharing with other regulatory agencies. The GSA would then consider assigning SMC during the five-year GSP updates.

Future GSP implementation projects or actions that require their own site-specific monitoring network would take into consideration any localized constituents of concern and regulatory requirements.

4.8.2 Minimum Thresholds

Section §354.28(c)(2) of the GSP Regulations states that "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" (CCR, 2016). The GSP Regulations allow three options for setting degraded water quality minimum thresholds. In this Subbasin, minimum thresholds are based on a number of supply wells that exceed concentrations of constituents determined to be of concern for the Subbasin.

The currently available supply wells for monitoring constituents of concern that have an MCL or SMCL are public supply wells (should domestic wells be incorporated into future monitoring programs established by the GSA or other entities, they can also be included in monitoring COCs during future GSP updates). If agricultural irrigation wells are monitored in the future, they will be used to monitor for constituents of concern that may lead to reduced crop production such as salinity and boron.

4.8.2.1 Existing Water Quality Monitoring Programs and Networks

The SMC is based on a number of supply wells, and the GSA identified sets of supply wells that are currently monitored (or are proposed to be monitored in the future) for various groundwater constituents and supply uses such as drinking water and irrigation water. Because these supply wells are monitored under different programs and may have different required sampling schedules (even under the same program), no one set of constituents will be sampled in all wells.

The goal is to use existing monitoring programs for supply well water quality assessment and not create new water quality monitoring networks that the GSA would be responsible for

sampling. Initially, it is anticipated that representative monitoring points (RMPs) will come from public water supply and irrigation wells that are already monitored. The only additional sampling the GSA would perform is on a project as-needed basis to specifically identify potential impacts on supply wells due to the development of a project related to GSP implementation (such as recharge ponds, aquifer storage and recovery, etc.).

Existing monitoring programs identified in this subbasin include:

- Public supply wells regulated by the SWRCB Department of Drinking Water (DDW). This dataset was obtained from the SWRCB through the GAMA online portal.

- The Sonoma Valley SNMP includes sampling and analysis of water quality constituents in a network of existing wells (RMC, 2014). The SNMP monitoring network includes 26 public supply wells, two multi-level monitoring well clusters that were installed as part of the Sonoma Valley Groundwater Management Plan (SVGMP), and 12 wells of unknown type that are routinely sampled by DWR. The public supply wells proposed for the MRP are already included in the DDW dataset described above. Per the SNMP, each of the SVGMP monitoring wells are sampled annually and each of the wells sampled by DWR are sampled every other year. Samples from public supply wells are analyzed for various constituents including nitrate, electrical conductivity, or TDS. SVGMP monitoring wells and wells sampled by DWR are sampled for analysis of nitrate, electrical conductivity, and TDS. The analytical datasets from the SNMP wells will be available from the SWRCB through the GAMA online portal.

Existing and future water quality monitoring programs may be used to help collect data during GSP implementation and establish consistency with other programs. Additional information on each of the existing monitoring programs is provided in Table 4-8-2. Table 4-8-3 provides information on future monitoring networks to be used specifically for monitoring projects and management actions for GSP implementation.

Table 4-8-2. Sonoma Valley Subbasin Monitoring Networks

Monitoring Network	Responsible Party	Type of Wells	Constituents Sampled	Sampling Frequency	Purpose of Network
Salt and Nutrient Management Plan	Sonoma Valley Sanitation District	Public Supply; Monitoring	EC, TDS, Nitrate	Annually, in October.	Abide by SNMP requirements
DDW Public Supply Wells	Cities and small water systems	Public Supply	Subset of Title 22 constituents	Varies	Protect drinking water beneficials users

Table 4-8-3. Future Monitoring Networks for Project-Specific Monitoring

Future As-needed Monitoring Network	Responsible Party	Type of Wells	Constituents Sampled	Sampling Frequency	Purpose of Network
Future Project Implementation Monitoring Network	GSA	To be determined (public and private wells)	COCs identified as part of the GSP – and to the constituents as required by the project permitting	To be determined	Identify water quality impacts related to site-specific project and action implementation

Each of these well networks are monitored for different purposes and overseen by different entities; therefore, sampling frequency and analytical suites vary. Water quality minimum thresholds for each well are selected based on which constituents are analyzed in water samples per existing programs, summarized in Table 4-8-4.

Table 4-8-4. Summary of Constituents Monitored at Each Well Network

Constituent	Public Supply	SNMP
Arsenic	✓	
Nitrate	✓	✓
TDS	✓	✓

4.8.2.2 Limits and Concentrations for each Constituent of Concern

Each COC has an associated level of concern for each category of beneficial user. For the drinking water supply well category, the limit of concern is represented by the Maximum Contaminant Levels (MCL) (or Secondary Maximum Contaminant Level (SMCL), as applicable).

The San Francisco Bay RWQCB Basin Plan (Basin Plan) designates municipal and agricultural water quality management objectives for the Sonoma Valley. The municipal designation aims to maintain water quality for public supplies below the California MCL and SMCL drinking water standards (RWQRCB, 2019). The agricultural designation aims to maintain water quality for irrigation below specific thresholds that may be harmful to certain crops (RWQCB, 2019).

The basis for establishing minimum thresholds for each constituent of concern in the Subbasin are summarized in Table 4-8-5. This table does not identify the number of supply wells that will exceed the level of concern, but rather identifies how many additional wells will be allowed to exceed the level of concern. Wells that already exceed this limit are not counted against the minimum thresholds.

Table 4-8-5. Groundwater Quality Minimum Thresholds Basis

Constituent of Concern	Minimum Threshold Based on Number of Wells
Arsenic	Zero additional supply wells that are in the GSP monitoring area shall exceed the arsenic MCL of 0.010 mg/L.
Nitrate	Zero additional supply wells that are in the GSP monitoring program shall exceed the nitrate measured as nitrogen MCL of 10 mg/L.
TDS	Zero additional supply wells that are in the GSP monitoring program shall exceed the TDS recommended SMCL of 500 mg/L.

Note: While the initial proposal is for zero additional supply wells to exceed the MCLs as a direct result of GSP projects and actions, additional options can be considered.

4.8.2.3 Development of Minimum Thresholds at Supply Wells

The minimum thresholds for degraded water quality for the supply wells are based on the goal of zero additional exceedances in existing wells shown in Table 4-8-5. However, some exceedances already exist in those wells, and these exceedances will likely continue into the future. The minimum threshold for the number of allowed exceedances is therefore equal to this baseline number of exceedances (calculated as the number of public water supply wells

with any MCL or SMCL exceedance between 2015 and 2020). Based on the number of public supply wells in the existing water quality monitoring network, the number of existing exceedances since 2015 for each constituent is tabulated in Table 4-8-6 and the distribution of exceedances are shown on Figures 4-8-1 through 4-8-3, along with all of the other public water supply wells included in the initial RMP network.

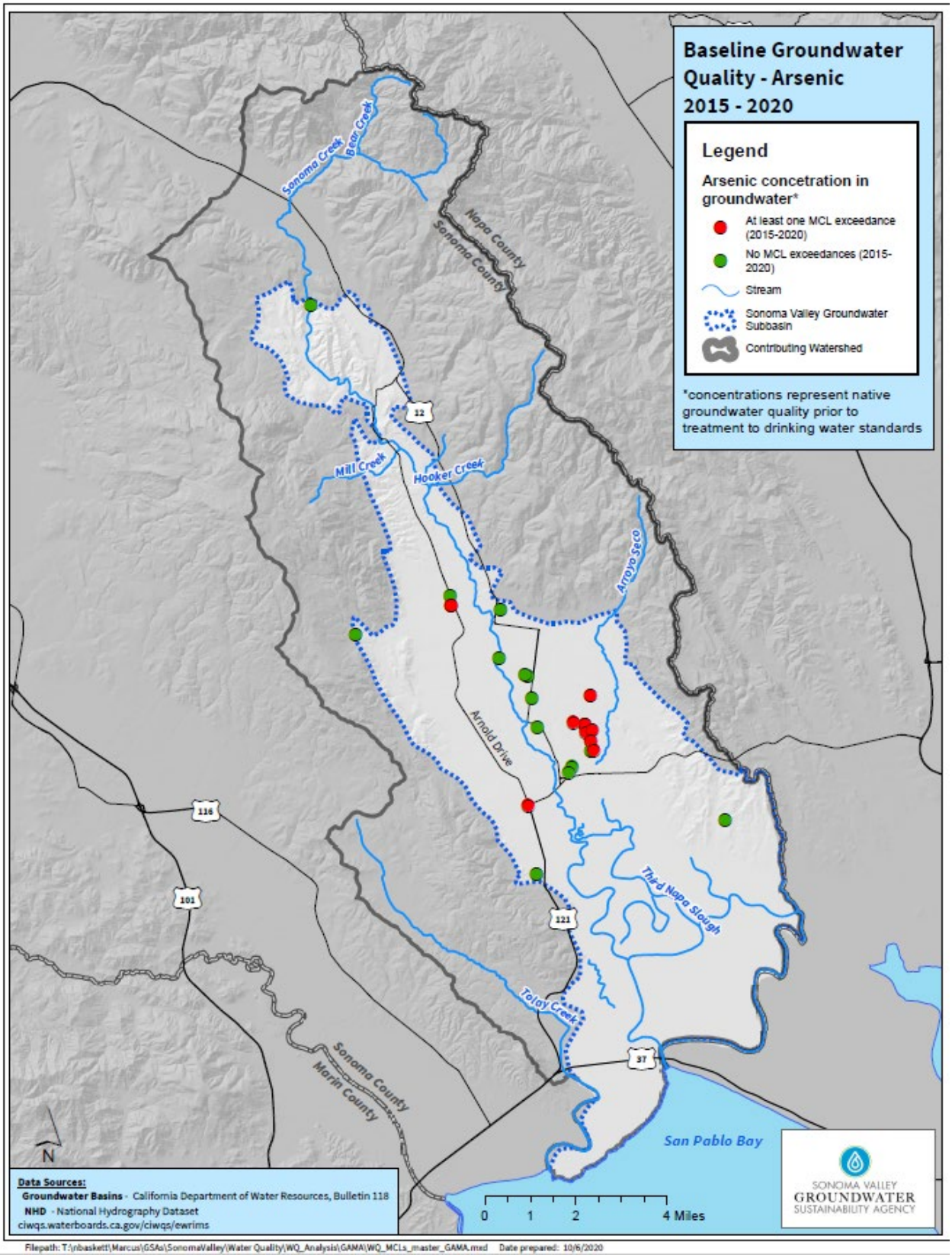
In addition, exceedances are based on existing wells only. The well networks will be re-assessed every 5 years to identify any new wells that should be added to the monitoring networks. According to the GSP Regulations, the Minimum Thresholds are based on the same number of wells to have exceedances, not necessarily the same wells. An average of water quality samples is used for wells that are measured more than once a year.

If new wells are added to the monitoring network the initial measured concentration will form the basis for the minimum threshold, and not the MCL or SMCL. This ensures that the initial conditions in these wells are considered, before potential projects and actions are implemented.

If new exceedances of minimum thresholds are observed that are not due to GSP implementation, those new levels may be used to modify the minimum threshold accordingly to better reflect basin conditions regardless of the GSP implementation actions.

Table 4-8-6. Minimum Thresholds for Degradation of Groundwater Quality for the Municipal Supply Wells Under the Current Monitoring Network

Constituent of Concern	Regulatory Exceedance Standard	Standard Units	Number of Sampled Wells in Monitoring Network (2015-2020)	Total Number of Exceedances (2015-2020)	Minimum Threshold - Number of Wells Exceeding Regulatory Standard
Arsenic	10	ug/L	25	160	11
Nitrate	10	mg/L	40	1	1
Total Dissolved Solids	500	mg/L	13	3	2


Baseline Groundwater Quality - Arsenic 2015 - 2020
Legend
Arsenic concetration in groundwater*
At least one MCL exceedance (2015-2020)
No MCL exceedances (2015-2020)
Stream
Sonoma Valley Groundwater Subbasin
Contributing Watershed
*concentrations represent native groundwater quality prior to treatment to drinking water standards
Sonoma Creek
Bear Creek
Napa County
Sonoma County
12
Mill Creek
Hooker Creek
Arroyo Seco
Arnold Drive
116
101
121
Third Napa Slough
Tolay Creek
37
Sonoma County
Marin County
San Pablo Bay
N
0 1 2 4 Miles
Data Sources:
Groundwater Basins - California Department of Water Resources, Bulletin 118
NHD - National Hydrography Dataset
ciwqs.waterboards.ca.gov/ciwqs/ewrims
SONOMA VALLEY GROUNDWATER SUSTAINABILITY AGENCY
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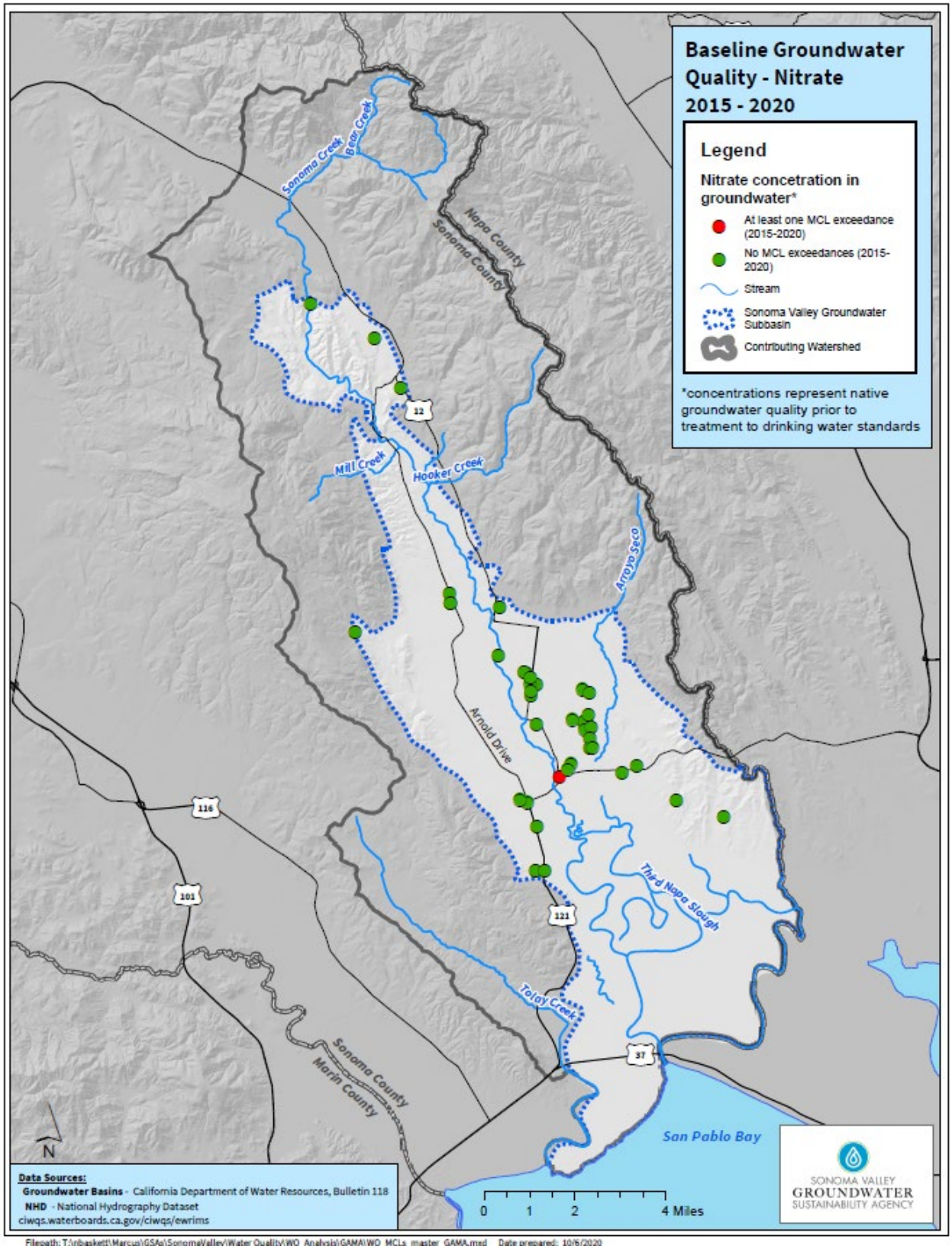
Baseline Groundwater Quality - Nitrate 2015 - 2020
Legend
Nitrate concetration in groundwater*
At least one MCL exceedance (2015-2020)
No MCL exceedances (2015-2020)
Stream
Sonoma Valley Groundwater Subbasin
Contributing Watershed
*concentrations represent native groundwater quality prior to treatment to drinking water standards
Sonoma Creek
Bear Creek
Napa County
Sonoma County
12
Mill Creek
Hooker Creek
Arroyo Seco
Arnold Drive
116
101
121
Third Napa Slough
Tolay Creek
37
Sonoma County
Marin County
San Pablo Bay
N
Data Sources:
Groundwater Basins - California Department of Water Resources, Bulletin 118
NHD - National Hydrography Dataset
ciwqs.waterboards.ca.gov/ciwqs/ewrims
0
1
2
4 Miles
SONOMA VALLEY
GROUNDWATER
SUSTAINABILITY AGENCY
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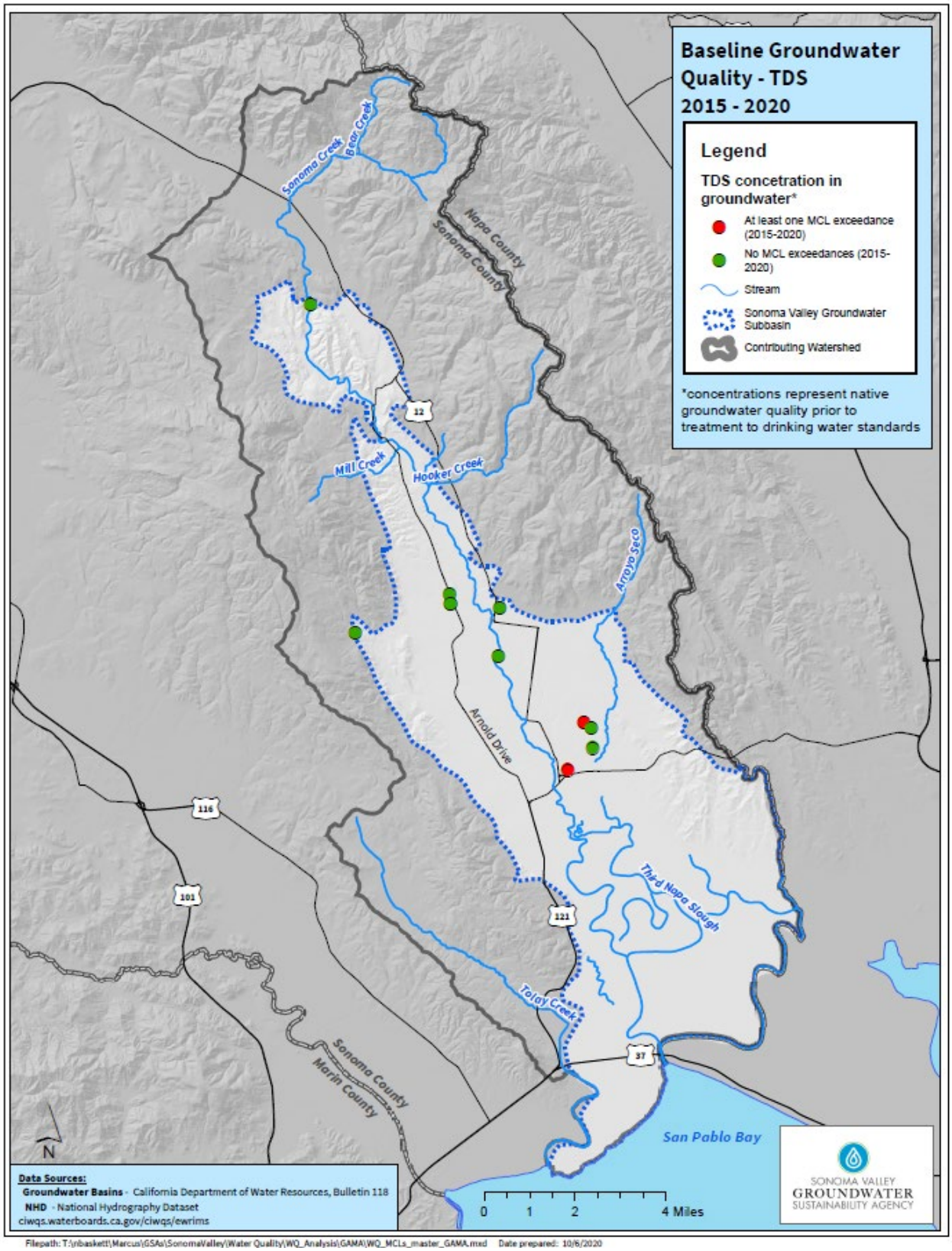
Baseline Groundwater Quality - TDS 2015 - 2020
Legend
TDS concetration in groundwater*
At least one MCL exceedance (2015-2020)
No MCL exceedances (2015-2020)
Stream
Sonoma Valley Groundwater Subbasin
Contributing Watershed
*concentrations represent native groundwater quality prior to treatment to drinking water standards
Sonoma Creek
Bear Creek
Napa County
Sonoma County
12
Mill Creek
Hooker Creek
Arroyo Seco
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101
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37
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San Pablo Bay
N
0 1 2 4 Miles
Data Sources:
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SONOMA VALLEY GROUNDWATER SUSTAINABILITY AGENCY
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4.8.2.4 Information and Methodology Used to Establish Water Quality Minimum Thresholds and Measurable Objectives

The exceedances shown in Table 4-8-6 were based on a review of recent datasets. The information used for establishing the degradation of groundwater quality minimum thresholds includes:

- Historical groundwater quality data from public supply in the Subbasin;
- Federal and State drinking water quality standards;
- Feedback from GSA staff members and Advisory Committee members.

The historical groundwater quality data used to establish groundwater quality minimum thresholds are presented in Section 3.2.5. Based on the reviews of historical and current groundwater quality data, federal and state drinking water standards, these standards are appropriate to define groundwater quality minimum thresholds.

4.8.2.5 Relationship between Individual Minimum Thresholds and Relationship to Other Sustainability Indicators

Because SGMA does not require projects or actions to improve groundwater quality, there will be no direct actions under the GSP associated with the groundwater quality minimum thresholds. Therefore, there are no actions that directly influence other sustainability indicators. However, preventing migration of poor groundwater quality may limit activities needed to achieve minimum thresholds for other sustainability indicators.

- Chronic lowering of groundwater levels. Groundwater quality minimum thresholds could influence groundwater elevation minimum thresholds by limiting the types of water that can be used for recharge to raise groundwater elevations. Water used for recharge cannot result in exceedances of any of the groundwater quality minimum thresholds. In addition, a change in groundwater elevations may cause a change in groundwater flow direction which in turn could cause poor water quality to migrate into areas of good water quality.
- Change in groundwater storage. Nothing in the groundwater quality minimum thresholds promotes pumping in excess of the sustainable yield. Therefore, the groundwater quality minimum thresholds will not result in an exceedance of the groundwater storage minimum threshold.
- Subsidence. Nothing in the groundwater quality minimum thresholds promotes additional pumping that could cause subsidence. Therefore, the groundwater quality minimum thresholds will not result in an exceedance of the subsidence minimum threshold.
- Depletion of interconnected surface waters. Nothing in the groundwater quality minimum thresholds promotes additional pumping or lower groundwater elevations adjacent to interconnected surface waters. Therefore, the groundwater quality minimum thresholds will not result in a significant or unreasonable depletion of interconnected surface waters.

4.8.2.6 Effect of Minimum Thresholds on Neighboring Basins and Subbasins

The anticipated effect of the degraded groundwater quality minimum thresholds on each of the neighboring subbasins is addressed below.

The Sonoma Valley Subbasin has two neighboring subbasins that are categorized as medium priority and are also subject to SGMA: the Petaluma Valley Subbasin, to the west and the Napa Lowlands Subbasin to the east. The Sonoma Valley Subbasin is also adjacent to the very low priority Kenwood Valley Basin to the North which is not subject to SGMA.

Because the minimum thresholds in the Sonoma Valley Subbasin are to prevent migration of poor-quality water, it is likely that the minimum thresholds will not prevent the Petaluma Valley and Napa Lowlands Subbasins from achieving and maintaining sustainability. The Sonoma Valley GSA will coordinate closely with the neighboring Subbasins as they both set minimum thresholds to ensure that the subbasins do not prevent each other from achieving sustainability.

4.8.2.7 Effect on Beneficial Uses and Users

Agricultural land uses and users. The degradation of groundwater quality minimum thresholds generally provides positive benefits to the Subbasin's agricultural water users. Preventing additional agricultural supply wells from exceeding levels that could reduce crop production ensures that a supply of usable groundwater will exist for beneficial agricultural use.

Urban land uses and users. The degradation of groundwater quality minimum thresholds generally provides positive benefits to the Subbasin's urban water users. Preventing constituents of concern in additional drinking water supply wells from exceeding MCLs or SMCLs ensures an adequate supply of groundwater for municipal supplies.

Domestic land uses and users. The degradation of groundwater quality minimum thresholds generally provides positive benefits to the Subbasin's domestic water users. Preventing constituents of concern in additional drinking water supply wells from exceeding MCLs or SMCLs ensures an adequate supply of groundwater for domestic supplies. In addition, monitoring will be conducted on an as-needed basis as projects are implemented, to avoid impacting domestic users of groundwater.

Ecological land uses and users. Although the groundwater quality minimum thresholds do not directly benefit ecological uses, it can be inferred that the degradation of groundwater quality minimum thresholds provide generally positive benefits to the Subbasin's ecological water uses. Preventing constituents of concern from migrating will prevent unwanted contaminants from impacting ecological groundwater uses.

4.8.2.8 Relation to State, Federal, or Local Standards

The degradation of groundwater quality minimum thresholds specifically incorporate state and federal standards for drinking water.

4.8.2.9 Method for Quantitative Measurement of Minimum Thresholds

Degradation of groundwater quality minimum thresholds will be measured directly using analysis of samples collected from public drinking water supply and SNMP domestic and irrigation supply wells. If any other routine monitoring of supply wells is initiated in the Subbasin at a later date, these wells will also be considered for inclusion in the water quality monitoring network. The data review will focus on exceedances of minimum thresholds, or MCLs and SMCLs for the COCs identified for this GSP. However, if during review of the water quality data additional constituents appear to exceed MCLs and SMCLs, minimum thresholds and measurable objectives will be considered for these additional constituents.

4.8.3 Measurable Objectives

The measurable objectives for degradation of groundwater quality represent target groundwater quality distributions in the Subbasin. SGMA does not mandate the improvement of groundwater quality. Therefore, the GSA has set the measurable objectives identical to the minimum thresholds, as defined in Table 4-8-4, Table 4-8-5, and Table 4-8-6.

4.8.2.3.1 Method for Setting Measurable Objectives

As described above, measurable objectives are set to be identical to the minimum thresholds and therefore follow the same method as detailed in Section 4.8.2.9.

4.8.2.3.2 Interim Milestones

Interim milestones show how the GSA anticipates the Subbasin will gradually move from current conditions to meeting the measurable objectives over the next 20 years of implementation. Interim milestones are set for each 5-year interval following GSP adoption.

The measurable objectives for degradation of groundwater quality are set at current conditions; there is no anticipated degradation of groundwater quality during GSP implementation that results from the implementation of projects and actions as described in Section XX. Therefore, the expected interim milestones are identical to current conditions.

If, during GSP implementation, specific projects are implemented to help with improving other sustainability indicators, a water quality monitoring network will be installed and/or identified to ensure water quality is not degraded through these project implementations.

4.8.4 Undesirable Results

4.8.4.1 Criteria for Defining Undesirable Results

By regulation, the degradation of groundwater quality undesirable result is a quantitative combination of groundwater quality minimum threshold exceedances. For the Subbasin, any groundwater quality degradation is unacceptable as a direct result of GSP implementation.

Some groundwater quality changes are expected to occur independent of SGMA activities; because these changes are not related to SGMA activities they do not constitute an undesirable result. Therefore, the degradation of groundwater quality undesirable result is:

Note: Please refer to companion for the Water Quality SMC in the October 13 Advisory Committee meeting packet to review and consider options for establishing undesirable results.

4.8.4.2 Potential Causes of Undesirable Results

Conditions that may lead to an undesirable result include the following:

- Required Changes to Subbasin Pumping. If the location and rates of groundwater pumping change as a result of projects implemented under the GSP, these changes could alter hydraulic gradients and associated flow directions, and cause movement of one of the COCs towards a supply well at concentrations that exceed relevant standards.
- Groundwater Recharge. Active recharge of imported water or captured runoff could modify groundwater gradients and move one of the COCs towards a supply well in concentrations that exceed relevant limits.
- Recharge of Poor-Quality Water. Recharging the Subbasin with water that exceeds an MCL, SMCL, or level that reduces crop production will lead to an undesirable result.

4.8.4.3 Effects on Beneficial Users and Land Use

The undesirable result for degradation of groundwater quality is avoiding groundwater degradation due to actions directly resulting from GSP implementation. Therefore, the undesirable result will not impact the use of groundwater and will not have a negative effect on the beneficial users and uses of groundwater. This undesirable result, however, only applies to groundwater quality changes directly caused by projects or management actions implemented as part of this GSP. This undesirable result does not apply to groundwater quality changes that occur due to other causes.

4.8.5 References

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