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

Groundwater Basin Name:	Napa-Sonoma Valley – Napa Valley (Basin No. 2-002.01)
Submitting Agency:	Napa County
Recommendation:	Do Not Approve
Date Issued:	July 17, 2019

I. Summary

The County of Napa (Napa County or County) submitted an alternative (Napa Valley Alternative *or* Alternative) to the Department of Water Resources (Department) for evaluation and assessment as provided by the Sustainable Groundwater Management Act (SGMA).[1] Following review of the material submitted by the County and consideration of public comments, the Department staff recommend the Napa Valley Alternative not be approved because the County was not able to demonstrate the Napa Valley Subbasin (*or* Subbasin) had been operated within its sustainable yield over a period of at least 10 years as required for the alternative submitted.[2]

Napa County, as a county government, has the authority to manage water resources, including groundwater, within its jurisdictional boundary. Prior to SGMA, Napa County set conservation goals for water resources as part of its 2008 General Plan and subsequently funded a monitoring program, public outreach, and hydrogeologic studies. As part of these efforts, however, the County did not develop any management or operational criteria for the Napa Valley Subbasin. After SGMA passed, the County developed the Basin Analysis Report in 2016 specifically to submit as an alternative allowed by SGMA. The Basin Analysis Report and related documents describe a reasonable understanding of the geology and hydrology of the Napa Valley Subbasin and provide an analysis of groundwater conditions over a base period from 1988 to 2015. In addition, Napa County established a sustainability goal in the Basin Analysis Report for the Napa Valley Subbasin that aspires to protect and enhance groundwater quality, and defines sustainability as the use of groundwater "in a manner that can be maintained indefinitely without causing unacceptable economic, environmental, or social consequences, while

[1] Water Code § 10720 *et seq*.
[2] Water Code § 10733.6(b)(3)

protecting economic, environmental, and social benefits".[3] However, the County did not identify quantitative thresholds where the use of groundwater would produce significant and unreasonable effects, and did not manage the Napa Valley Subbasin to any threshold.

The County has not defined undesirable results in a manner consistent with SGMA. As a result, it is not possible for Department staff to assess whether the County has operated within the sustainable yield of the Subbasin over a period of at least 10 years, as required by statute. Department staff cannot evaluate whether undesirable results have occurred unless the conditions that cause an undesirable result in the Subbasin have been reasonably defined and bounded by quantifiable, reasonable minimum thresholds. Because the County has not established such thresholds or defined the conditions giving rise to undesirable results, the County can only speculate whether undesirable results have occurred. The Department cannot evaluate an alternative that claims to have operated a basin without incurring undesirable results over a period of at least 10 years based on speculation.

Contrary to the claim of sustainability, the Basin Analysis Report acknowledges that diminished baseflow observed at some locations in the Subbasin "could be considered an undesirable result." Department staff understand the reference to "diminished baseflow" to describe sustainability indicator related to the depletion of interconnected surface water. Since groundwater use will always cause diminution of baseflow in a hydraulically-connected system, the presence of diminished baseflow is not *per se* an undesirable result. However, the County proposes that historically-diminished baseflow, although it could be considered an undesirable result, should not be disqualifying because SGMA does not require an agency to address undesirable results that occurred before, and have not been corrected by, January 1, 2015.[4]

While it is true that SGMA does not require undesirable results prior to 2015 to be remediated, the presence of undesirable results before 2015 undermines the County's claim that it has operated the Napa Valley Subbasin without undesirable results. The 2015 exemption does not apply to an alternative based on 10 years of sustainable basin-wide management, as this would render meaningless the requirement that an agency demonstrate 10 years of sustainability.

The County also relies on the authority SGMA grants a local agency or GSA to set measurable objectives as supporting the County defining undesirable results and minimum thresholds retroactively, based on past worst-case conditions in the Subbasin. In the judgement of Department staff, the County's approach is inconsistent with both the

[3] Basin Analysis Report, Section ES 7.1, p. ES-17
[4] Basin Analysis Report, Section 7.2, p. 136, citing Water Code § 10727.2(b)(4)

legislative intent of SGMA as well as the plain meaning of the statute. To successfully demonstrate 10 years of sustainable groundwater management, it is imperative that a managing agency is shown to have identified and quantified undesirable results, and then deliberately managed to those standards.

Based on the information presented in the Basin Analysis Report, the Department has no data upon which it can conclude that the Alternative meets the requirement to demonstrate operation within the sustainable yield for at least the last 10 years and, therefore, Department staff recommend that it not be approved.

The findings of this assessment are not an indication the Napa Valley Subbasin is being managed *unsustainably*. Rather, it is a finding that the analysis presented in the Alternative did not confirm the absence of undesirable conditions during the prior 10 years. It should also be noted that this assessment in no way diminishes efforts of the County and other entities within the Napa Valley Subbasin to improve their understanding of groundwater and surface water conditions. Documentation submitted with the Alternative makes it clear that water managers in the County have undertaken considerable efforts to improve understanding of groundwater in recent years, including the formation of the Groundwater Resources Advisory Committee and the Watershed Information & Conservation Council, development of several studies of groundwater conditions, and installation of monitoring wells in 2014 to better understand interactions between groundwater and surface water. Those efforts will likely serve as foundational material to rely upon when developing a Groundwater Sustainability Plan (GSP) for the basin.

The remainder of this assessment is organized as follows:

- **Section II. Review Principles** describes legal and other considerations regarding the Department's assessment and evaluation of alternatives.
- **Section III. Alternative Material** describes materials (i.e., plans, reports, data, and other information) submitted by the County that collectively, the Department staff considered as the Alternative.
- **Section IV. Required Conditions** describes whether the Alternative satisfies each of the four conditions required for the Department to review an alternative.
- **Section V. Alternative Contents** briefly describes the information contained in the Alternative submittal.
- **Section VI. Assessment** describes Department staff's evaluation of the Alternative, whether it satisfies the objectives of SGMA, and, if applicable, describes recommended actions required for the first five-year update.

II. Review Principles

Napa County submitted an alternative based on an analysis of basin conditions to the Department for evaluation and assessment to determine whether it satisfies the objectives of SGMA for the Napa Valley Subbasin. To satisfy the objectives of SGMA, an alternative based on an analysis of basin conditions must demonstrate that the basin has been operated within its sustainable yield for a period of at least 10 years.[5] The SGMA definition of sustainable yield requires the avoidance of undesirable results.[6] As a result, an alternative based on an analysis of basin conditions must demonstrate that the submitting agency has an understanding of groundwater conditions that would cause undesirable results, as well as analysis in the alternative demonstrating the absence of undesirable results over a 10-year period.

An alternative, to be evaluated by the Department, must be submitted by the statutory deadline and be within a basin that complies with Part 2.11 of Division 6 of the Water Code.[7] The submitted alternative must also be complete and must cover the entire basin.[8] The GSP Regulations[9] require the Department to evaluate an Alternative "in accordance with Sections 355.2, 355.4(b), and Section 355.6, *as applicable*, to determine whether the Alternative complies with the objectives of the Act".[10] The elements of the cited sections are not all applicable to alternatives. Some provisions apply to GSPs and alternatives alike, to alternatives only prospectively, or do not apply to alternatives at all.[11] Ultimately, the purpose of the evaluation is to determine whether an alternative satisfies the objectives of SGMA.[12] The agency must explain how the elements of an alternative are "functionally equivalent" to the elements of a GSP required by Articles 5 and 7 of the GSP Regulations and are sufficient to demonstrate the ability of an alternative to achieve the

[5] Water Code § 10733.6(b)(3)
[6] Water Code § 10721(w)
[7] Water Code § 10733.6(c)-(d)
[8] 23 CCR § 358.4(a)
[9] 23 CCR § 350 *et seq.*
[10] 23 CCR § 358.4(b) (emphasis added)
[11] Procedural requirements, including submissions by the agency, posting by the Department, and the public comment period, apply equally to plans and alternatives (23 CCR § 355.2(a)-(c)). The periodic review of Plans (23 CCR § 355.6(a)) applies to alternatives prospectively but does not apply to initial submissions. Other regulatory provisions are inapplicable to alternatives, including the two-year review period (23 CCR § 355.2(e)), which is based on the statutory time-frame that applies to Plans but not alternatives (Water Code § 10733.4(d)); the "incomplete" status that allows the agency to address "one or more deficiencies that preclude approval, but which may be capable of being corrected by the Agency in a timely manner" (23 CCR § 355.2(e)(2)), which applies to plans undergoing development, but not alternatives that purportedly satisfy the objectives of SGMA at the time of their submission (Water Code § 10733.6(a)); and, for the same reason, corrective actions to address deficiencies in plans (23 CCR § 355.4(a)(4)), which applies to plans developed after the adoption of SGMA, but is inapplicable to alternatives that predate SGMA.
[12] Water Code § 10733.6(a)). The Department considers the regulatory language in 23 CCR § 358.2(d) ("complies with the objectives of [SGMA]") to be equivalent to the statutory threshold upon which it is based.

objectives of SGMA.[13] The explanation by the agency that elements of an alternative are functionally equivalent to elements of a GSP furthers the objective of demonstrating that an alternative satisfies the objectives of SGMA. Alternatives based on groundwater management plans or historical basin management practices that predate the passage of SGMA or adoption of GSP Regulations, although required to satisfy the objectives of SGMA, are not necessarily expected to conform to the precise format and content of a GSP. The Department's assessment is thus focused on the ability of an alternative to satisfy the objectives of SGMA as demonstrated by information provided by the agency; it is not a determination of the degree to which an alternative matched the specific requirements of the GSP Regulations.

When evaluating whether an alternative satisfies the objectives of SGMA and thus is likely to achieve the sustainability goal for the basin, staff reviews the information provided by and relied upon by the agency for sufficiency, credibility, and consistency with scientific and engineering professional standards of practice.[14] The Department's review considers whether there is a reasonable relationship between the information provided and the assumptions and conclusions made by the agency, whether sustainable management criteria and projects and management actions described in an alternative are commensurate with the level of understanding of the basin setting, and whether those projects and management actions are feasible and likely to prevent undesirable results.[15] Staff will recommend that an alternative be approved if staff believe, in light of these factors, that alternative has achieved or is likely to achieve the sustainability goal for the basin.[16]

An alternative based on a demonstration that the basin has operated within its sustainable yield over a period of at least 10 years may be approved based on information that demonstrates that objective criteria defining operating standards that governed groundwater management for the basin were established and consistently achieved. Even when staff review indicates that an alternative will satisfy the objective of SGMA, the Department may recommend actions to facilitate future evaluation of that alternative and to allow the Department to better evaluate whether an alternative adversely affects adjacent basins. Department staff propose that recommended actions be addressed by the submission date for the first periodic evaluation.

Staff assessment of an alternative involves the review of information presented by the agency, including models and assumptions, and an evaluation of that information based on scientific reasonableness. The assessment does not require Department staff to recalculate or reevaluate technical information provided in an alternative or to perform its

[13] 23 CCR § 358.2(d)
[14] 23 CCR § 351(h)
[15] 23 CCR § 355.4(b)(1), (3), and (5).
[16] 23 CCR § 355.4(b)

own geologic or engineering analysis of that information. The staff recommendation to approve an alternative does not signify that Department staff, were they to exercise the professional judgment required to develop a plan for the basin, would make the same assumptions and interpretations as those contained in an alternative, but simply that Department staff has determined that the assumptions and interpretations relied upon by the submitting agency are supported by adequate, credible evidence, and are scientifically reasonable.

III. Alternative Materials

Napa County submitted an alternative based on an analysis of basin conditions demonstrating the Napa Valley Subbasin has operated within its sustainable yield over a period of at least 10 years, pursuant to Water Code Section 10733.6(b)(3). The Napa Valley Alternative includes the following documents:

- Napa Valley Groundwater Sustainability: A Basin Analysis Report for the Napa Valley Subbasin, 2016 (Basin Analysis Report)
- Napa County Groundwater Conditions and Groundwater Monitoring Recommendations, 2011 (Groundwater Conditions Report)

Appendices to the Basin Analysis Report contain numerous additional documents including:

- Updated Hydrogeologic Conceptualization and Characterization of Conditions, 2013 (Hydrogeologic Conceptualization Report)
- Napa County Groundwater Monitoring Plan, 2013 (Groundwater Monitoring Plan)
- Napa County Comprehensive Groundwater Monitoring Program 2015 Annual Report and CASGEM Update, 2015 (2015 Annual Report)
- Napa County Groundwater/Surface Water Monitoring Facilities Report, California Department of Water Resources Local Groundwater Assistance Grant Program, 2016 (Surface Water Groundwater Facilities Report)

Napa County also submitted an Alternative Elements Guide, Annual Reports[17], and a notice of exemption from the requirements of the California Environmental Quality Act (CEQA). Other information provided to or relied upon by the Department have been posted on the Department's website and includes material submitted by the County, public comments, and correspondence. Napa County also submitted an amendment to its Alternative Submittal as part of the 2018 Annual Report, but Department staff did not

[17] The Annual Report is not part of the Alternative and was not reviewed by the Department for the purpose of approving the Alternative.

review this as part of the Alternative evaluation because it was received after the statutory deadline for alternative submissions.

IV. Required Conditions

An alternative, to be evaluated by the Department, must be submitted by the statutory deadline and be within a basin that complies with Part 2.11 of Division 6 of the Water Code.[18] The submitted alternative must also be complete and must cover the entire basin.[19]

A. Submission Deadline

SGMA requires that an alternative for a basin categorized as high- or medium-priority as of January 31, 2015, be submitted no later than January 1, 2017.[20]

Napa County submitted its Alternative on December 16, 2016, before the statutory deadline.

B. Part 2.11 (CASGEM) Compliance

SGMA requires that the Department assess whether an alternative is within a basin that is in compliance with Part 2.11 of Division 6 of the Water Code,[21] which requires that groundwater elevations in all groundwater basins be regularly and systematically monitored and that groundwater elevation reports be submitted to the Department.[22] To manage its obligations under this law, the Department established the California Statewide Groundwater Elevation Monitoring (CASGEM) Program. The acronym CASGEM is used in this document to denote both the program and the groundwater monitoring law.[23] SGMA specifies that an alternative does not satisfy the objectives of SGMA if the basin is not in compliance with the requirements of CASGEM.[24] The Department confirmed that the Napa Valley Subbasin was in compliance with the requirements of CASGEM and confirmed that the Subbasin remained in compliance with CASGEM through the last reporting deadline, prior to issuing this assessment.

[18] Water Code § 10733.6(c)-(d)
[19] 23 CCR § 358.4(a)
[20] Water Code § 10733.6(c). Pursuant to Water Code § 10722.4(d), a different deadline applies to a basin that has been elevated from low- or very low-priority to high- or medium-priority after January 31, 2015.
[21] Water Code § 10733.6(d)
[22] Water Code § 10920 *et seq*.
[23] Stats.2009-2010, 7th Ex.Sess., c. 1 (S.B.6), § 1
[24] Water Code § 10733.6(d)

C. Completeness

GSP Regulations specify that the Department shall evaluate an alternative if that alternative is complete and includes the information required by SGMA and the GSP Regulations.[25] An alternative submitted pursuant to Water Code Section 10733.6(b)(3) must include an analysis demonstrating the basin has operated within its sustainable yield over a period of at least 10 years. That analysis must include a report prepared by a registered professional engineer or geologist who is licensed by the state, and that report must be submitted under that engineer's or geologist's seal. The alternative must include an explanation of how the elements of the alternative are functionally equivalent to the elements of a GSP required by Articles 5 and 7 of the GSP Regulations and are sufficient to demonstrate the ability of the alternative to achieve the objectives of SGMA.[26]

Napa County submitted an analysis of basin conditions under the seal of a licensed Professional Geologist and several complementary reports, as indicated above, along with an Alternative Elements Guide, which includes the County's explanation of how the elements of the Alternative are functionally equivalent to the elements of a GSP. Department staff found the Alternative to be complete and containing the required information, sufficient to warrant an evaluation by the Department.

D. Basin Coverage

An alternative must cover the entire basin.[27] An alternative is presumed to cover the entire basin if the basin is contained within the jurisdictional boundaries of the submitting agency.

The Napa Valley Subbasin is entirely within Napa County and, therefore, the requirement for basin coverage was met.

V. Alternative Contents

GSP Regulations require the submitting agency to explain how the elements of an alternative are functionally equivalent to the elements of a GSP as required by Article 5 of the GSP regulations[28] and are sufficient to demonstrate the ability of an alternative to achieve the objectives of SGMA.[29]

[25] 23 CCR § 358.4(a)(3)
[26] 23 CCR § 358.2(c)-(d)
[27] 23 CCR § 358.4(a)(4)
[28] 23 CCR § 354-354.44
[29] 23 CCR § 358.2(d). The requirements pertaining to Article 7 of the GSP Regulations (23 CCR § 356-356.4) relate to annual reports and periodic evaluation and are not applicable to review of the initial alternative.

As stated previously, alternatives based on historical basin management practices that predate the passage of SGMA or adoption of GSP Regulations, although required to satisfy the objectives of SGMA, are not necessarily expected to conform to the precise format and content of a GSP, and the criteria for adequacy of an alternative is whether the Department is able to determine that an alternative satisfies the objectives of SGMA. Department staff rely on the submitting agency's determination of functional equivalence of alternative elements to facilitate its evaluation and assessment of an alternative (*see* Assessment, below). Although the exact components of a GSP are not required for an alternative, for organizational purposes the discussion of information contained in the Napa Subbasin Alternative and related documents provided by the County follows the elements of a GSP provided in Article 5 of the GSP Regulations. The reference to requirements of the GSP Regulations at the beginning of each section is to provide context regarding the nature of the element discussed but is not meant to define a strict standard applicable to alternatives.

A. Administrative Information

GSP Regulations require information identifying the submitting agency, describing the plan area, and demonstrating the legal authority and ability of the submitting agency to develop and implement a plan for that area.[30]

The Basin Analysis Report contains information describing the County and its role in managing groundwater. Napa County shares the responsibility for groundwater resource planning and management between the County Department of Public Works and the County Department of Planning, Building and Environmental Services.[31] The Basin Analysis Report describes the 2008 County General Plan as a foundational effort related to groundwater management in the county. Through the conservation element of the 2008 Napa County General Plan, Napa County developed six goals related to water resources, which include goals related to groundwater quality and quantity. The General Plan served as the starting point for subsequent County efforts that included a groundwater public outreach project in 2010, the Groundwater Resources Advisory Committee between 2011 and 2014, and development of the Napa County Comprehensive Groundwater Monitoring Program in 2009. The County explains its legal authority to submit an alternative is derived from SGMA. In addition, the Basin Analysis Report provides a budget related to groundwater management and monitoring for Fiscal Year 2016-2017 to indicate the County has the financial resources necessary to manage groundwater in the Napa Valley Subbasin. The Basin Analysis Report also includes a list of public meetings where the

[30] 23 CCR § 354.2 et seq.
[31] Basin Analysis Report, Section 1.3, p. 15

Alternative was discussed to demonstrate that the County provided opportunities for stakeholder participation.

Napa County has divided itself into groundwater subareas for the purpose of local resource planning (see Figure 1, below). Five of these groundwater subareas make up the Napa Valley Floor and at least partially coincide with the Napa Valley Subbasin. The County discusses certain aspects of the basin setting in relation to these subareas. The subareas that are entirely included in the Napa Valley Subbasin are the Calistoga, St. Helena, Yountville, and Napa subareas. The subarea that is partially included in the Napa Valley Subbasin is the Milliken-Sarco-Tulucay (MST) subarea.[32]

B. Basin Setting

GSP Regulations require information about the physical setting and characteristics of the basin and current conditions of the basin, including a hydrogeologic conceptual model, a description of historical and current groundwater conditions, and an assessment of the water budget.[33]

[32] Basin Analysis Report, Section 2.1, p. 19
[33] 23 CCR § 354.12 et seq.

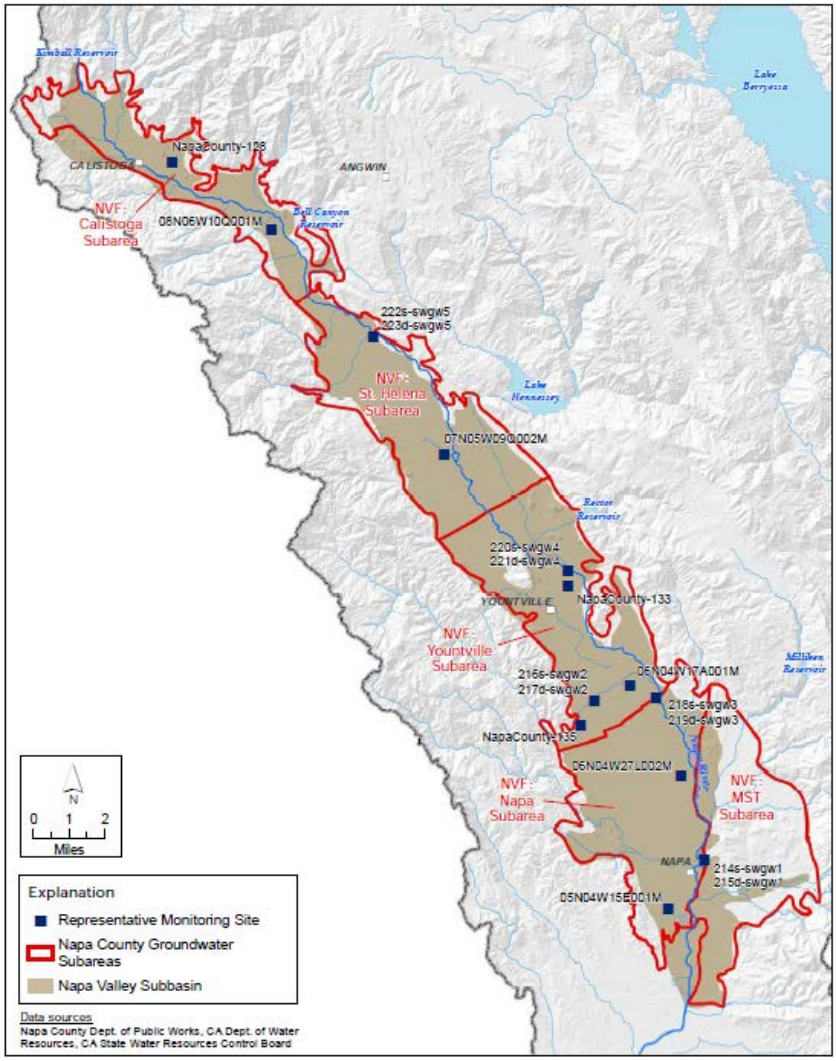

Figure 1. Napa County Groundwater Subareas in the Napa Valley Subbasin (From Basin Analysis Report, Figure 7-1)

1. Hydrogeologic Conceptual Model

The GSP Regulations require a descriptive hydrogeologic conceptual model of the basin that includes a written description supported by cross sections and maps.[34]

Napa County provided a hydrogeologic conceptual model that covers the entire Subbasin in the Basin Analysis Report. [35] The hydrogeologic conceptual model was provided to show the physical understanding of the Napa Valley Subbasin and explain key factors controlling groundwater flow. The Basin Analysis Report builds upon previous work from the Hydrogeologic Conceptualization Report. Some of the same information is also presented in the Groundwater Conditions Report. The Hydrogeologic Conceptualization

[34] 23 CCR § 354.14(a)
[35] Basin Analysis Report, Sections 2.2, pp. 20-25 and 2.3, pp. 26-32

Report was prepared by the County to provide an updated geologic characterization of the Napa Valley, information on groundwater occurrence and movement, and estimates of groundwater recharge. The geologic characterization is based on previous studies conducted by the U.S. Geological Survey.[36] Groundwater occurrence and movement, including surface water groundwater interaction, is described using well driller's reports, groundwater elevation monitoring, and stream bed elevation mapping. Groundwater wells are primarily found in the Quaternary alluvium and the underlying Sonoma Volcanics and Tertiary sediments. Groundwater recharge is estimated using a mass balance of water entering and leaving the soil-root zone (root zone water balance). The Groundwater Conditions Report, which was developed prior to the Hydrogeologic Conceptualization Report, described the geology and groundwater occurrence across Napa County. The sections discussing the Napa Valley Floor and MST subareas reference the same studies as the Hydrogeologic Conceptualization Report. The Basin Analysis Report adds information about surface water imports, wastewater outflows, and groundwater pumping in the Subbasin.

2. Groundwater Conditions

The GSP Regulations require a description of historical and current groundwater conditions in the basin that includes information related to groundwater elevations, groundwater storage, seawater intrusion, groundwater quality, subsidence, and interconnected surface water, as applicable. The GSP Regulations also require an identification of groundwater dependent ecosystems.[37]

Groundwater elevation trends are discussed in the Basin Analysis Report, the Groundwater Conditions Report, and the 2015 Annual Report. In each report, the groundwater elevation trends are discussed by the County's groundwater subareas within the Napa Valley Floor. These subareas are generally consistent with the Napa Valley Subbasin (*see* Administrative Information, above). In addition, groundwater elevation contours are provided for the Subbasin. The Basin Analysis Report indicates the alluvium is treated as a single aquifer for contouring and wells outside the alluvium are not included. The Basin Analysis Report and 2015 Annual Report indicate groundwater elevation trends in the Napa Valley Subbasin are primarily related to precipitation and geologic setting, but irrigation demands may also be a factor in certain locations. In each report, seasonal fluctuations in groundwater levels are also discussed. The long-term groundwater elevation trends and seasonal fluctuations discussions are based on hydrographs from selected wells dispersed throughout the Subbasin.[38,39,40] Generally,

[36] Kunkel and Upson (1960) and Faye (1973)
[37] 23 CCR § 354.16
[38] Basin Analysis Report, Figures 4-6 and 4-7
[39] Groundwater Conditions Report, Figures 4.2 to 4.5
[40] 2015 Annual Report, Figures 5-6, 5-7, 5-10, and 5-11

groundwater elevations in the Calistoga area fluctuate about 10 feet between spring and fall. Groundwater elevations in the St. Helena area fluctuate about 20 feet between spring and fall. Groundwater elevations in the Yountville area fluctuate about 10 to 25 feet in the center of the Valley and 25 to 35 feet near the edges. Groundwater elevations in the Napa Valley area fluctuate 10 to 40 feet. Groundwater elevations in the MST area show declining trends due to several pumping depressions. It is noted that much of the MST area is not within the Napa Valley Subbasin; however, none of the reports distinguish the part of the MST area in the Napa Valley Subbasin from the portion outside of the Subbasin when discussing groundwater elevations. Except for the MST area, the focus in each subarea is on groundwater elevations rebounding in the spring, even in dry years. However, several wells throughout the Subbasin show declining trends and are explained as being screened below the alluvium in the Sonoma Volcanics. In addition, the Groundwater Conditions Report notes that the northeastern area of the Napa subarea has seen a 10- to 30-foot decline in groundwater levels over the 2000 to 2010 period.[41]

Groundwater storage changes are discussed in the Basin Analysis Report. The Report assesses annual and average changes in groundwater storage estimated in the water budget, and in an analysis of the change in groundwater levels.[42] Change in storage is presented in tabular and graphical form and the tabular form indicates the type of water year experienced.

The Basin Analysis Report states seawater intrusion is not an issue in the Napa Valley Subbasin because common indicators of salinity, such as Total Dissolved Solids (TDS), electrical conductivity (EC), and sodium, are not found in high enough concentrations to indicate sea water has intruded into the Subbasin. The Basin Analysis Report notes that higher concentrations have been observed in areas south of the Napa Valley Subbasin in the Napa River Marshes, Jameson/American Canyon, and Carneros subareas.

Groundwater quality is described in the Groundwater Conditions Report,[43] the 2015 Annual Report,[44] and the Basin Analysis Report.[45] The reports indicate water quality is generally good with local areas experiencing poor water quality due to naturally-occurring constituents and contaminants primarily from agricultural areas. The Basin Analysis Report states that the primary water quality concerns for irrigation water are TDS, EC, sodium, bicarbonate, and boron. Water quality concerns for drinking water include chloride, nitrate, sulfate, fluoride, iron, and sodium. However, Napa County did not specifically mention water quality regulatory programs in its Alternative. Water Quality trends are provided in the Basin Analysis Report for 2009 through 2015 and arsenic is

[41] Groundwater Conditions Report, Section 4.1.1.2, p. 47
[42] Basin Analysis Report, Section 6.8.1
[43] Groundwater Conditions Report, Section 4, p. 46
[44] 2015 Annual Report, Section 5, p. 26 Section 6, p. 34
[45] Basin Analysis Report, Section 4, p. 47

the only constituent exceeding maximum contaminant levels (MCLs). The Basin Analysis Report also indicates that historical water quality data is limited but does not explain what limited means.[46] The Groundwater Conditions Report mentions exceedances prior to 2009 related to fluoride, metals, arsenic, EC, and TDS.[47]

The Basin Analysis Report includes survey data[48] from three land-surface benchmarks in the Subbasin which include measurements spanning from the early 1990s to 2012. The data indicate between approximately 0.3 to 0.6 feet of change during that time and also indicate that, at two of the locations, there has been some rebound in land surface elevation. The Report describes that stability in the more recent measurements from 2007 and 2012 indicate subsidence has not occurred.[49]

The Basin Analysis Report identifies the Napa River as undergoing complex interactions with shallow groundwater in the surficial alluvial deposits. The Basin Analysis Report also mapped known and probable perennial streams in the Napa Valley Subbasin[50] and provided a scatter plot of flow rate by month to illustrate the timing of low- to no-flow periods on the Napa River.[51] However, Napa County does not address depletions of interconnected surface water directly, discussing baseflow instead. A baseflow analysis was also provided to show correlations between baseflow and pumping, and baseflow and precipitation. The County uses groundwater elevation as a proxy for depletions of interconnected surface water and for setting sustainable management criteria (*see* Depletions of Interconnected Surface Water, below).

The Basin Analysis Report also provides maps and tables that identify groundwater dependent ecosystems and recommends future study of the relationships of those communities with the depth to groundwater.[52]

3. Water Budget

GSP Regulations require a water budget for the basin that provides an accounting and assessment of the total annual volume of groundwater and surface water entering and leaving the basin, including historical, current, and projected water budget conditions, and the change in the volume of water stored, as applicable.[53]

Napa County presented a water budget in the Basin Analysis Report that was developed as part of its Alternative submittal. The Hydrogeologic Conceptualization Report

[46] Basin Analysis Report, Section 4.1.3.1, p. 50
[47] Groundwater Conditions Report, Section 4.3, p. 55
[48] Basin Analysis Report, Table 4-7, p. 65
[49] Basin Analysis report, Section 4.4, p. 65
[50] Basin Analysis Report, Figure 4-19
[51] Basin Analysis Report, Figure 4-26
[52] Basin Analysis Report, Figures 4-71 to 4-74
[53] 23 CCR § 354.18

presented a root zone water balance (*see* Hydrogeologic Conceptual Model, above) developed in 2013 to estimate groundwater recharge on the Napa Valley Floor subareas. However, because a root zone water balance considers only precipitation, surface water runoff, plant evapotranspiration, and soil moisture storage, it does not consider the available storage capacity of the aquifer or account for groundwater pumping or subsurface groundwater outflow, which are generally part of a water budget. As a result, the root zone water balance was updated and incorporated into the water budget along with estimates of both groundwater pumping and subsurface outflow in the Alternative submittal. The Basin Analysis Report states that the estimated sustainable yield for the Napa Valley Subbasin is between 17,000 and 20,000 acre-feet per year (AFY). The Report notes that the upper end of the range (i.e., 20,000 acre-feet per year) accounts for higher pumping during the 2012 to 2015 drought and surplus (i.e., positive change in storage) calculated in the water budget.[54] In addition, the positive average annual change in storage was used as support for stable groundwater conditions in the Subbasin. A projected water budget was also provided by Napa County in the Basin Analysis Report through 2025.

4. Management Areas

GSP Regulations authorize, but do not require, an agency to define one or more management areas within a basin if the agency has determined that creation of management areas will facilitate implementation of the GSP.[55]

The County has not defined management areas for the Napa Valley Subbasin. Napa County indicated a study has been initiated to determine if creating a management area in the MST subarea of the Subbasin is warranted.[56] As discussed in the Administrative Information section above, the County divided itself into groundwater management subareas for local planning purposes.[57] However, these are planning management areas are not considered by the County as management areas for the purpose of SGMA implementation (*see* Administrative Information, above).

C. Sustainable Management Criteria

GSP Regulations require a sustainability goal that defines conditions that constitute sustainable groundwater management for the basin, the characterization of undesirable results, and establishment of minimum thresholds and measurable objectives for each applicable sustainability indicator, as appropriate.[58]

[54] Basin Analysis Report, Section 6.10, p. 131
[55] 23 CCR § 354.20
[56] Basin Analysis Report, Section 7.6 p. 149
[57] Basin Analysis Report Figure 7-1, p. 372
[58] 23 CCR § 354.22

1. Sustainability Goal

GSP Regulations require that sustainable management criteria include a sustainability goal that culminates in the absence of undesirable results within the appropriate timeframe, and includes a description of the sustainability goal, describes information used to establish the goal for the basin, describes measures that will be implemented to ensure the basin operates within its sustainable yield, and contains an explanation of how the sustainability goal will be met. [59] The sustainability goal for an alternative based on an analysis of basin conditions represents the criteria that allowed the basin to be operated within its sustainable yield for a period of at least 10 years, which includes the avoidance of undesirable results.[60]

Napa County provides in its Basin Analysis Report a sustainability goal for the Napa Valley Subbasin, which it states is in conformance with SGMA and the intent of the Groundwater Resources Advisory Committee and the County Board of Supervisors: "To protect and enhance groundwater quantity and quality for all the people who live and work in Napa County, regardless of the source of their water supply. The County and everyone living and working in the county will integrate stewardship principles and measures in groundwater development, use, and management to protect economic, environmental, and social benefits and maintain groundwater sustainability indefinitely without causing undesirable results, including unacceptable economic, environmental, or social consequences."[61] The sustainability goal is based on previous work by the Groundwater Resources Advisory Committee, which sought to establish a sustainability goal as part of the Napa County General Plan Update in 2008. The sustainability goal in the General Plan was modified by the County for SGMA.

2. Sustainability Indicators

The GSP Regulations specify that an agency define conditions that constitute sustainable groundwater management for a basin, including the characterization of undesirable results and the establishment of minimum thresholds and measurable objectives for each applicable sustainability indicator.[62]

Sustainability indicators are defined as any of the effects caused by groundwater conditions occurring throughout the basin that, *when significant and unreasonable*, cause undesirable results.[63] Sustainability indicators thus correspond with the six undesirable

[59] 23 CCR § 354.24. For an alternative based on a demonstration of 10 years of sustainable management, the sustainability goal, or its functional equivalent, would have been developed at some previous time during basin management, and its goals met by the time the Alternative was submitted to the Department.
[60] Water Code § 10721(w)
[61] Basin Analysis Report, Section 7.1, p. 134
[62] 23 CCR § 354.22
[63] 23 CCR § 351(ah)

results – chronic lowering of groundwater levels indicating a depletion of supply if continued over the planning and implementation horizon, reduction of groundwater storage, seawater intrusion, degraded water quality, including the migration of contaminant plumes that impair water supplies, land subsidence that substantially interferes with surface land uses, and depletions of interconnected surface water that have adverse impacts on beneficial uses of the surface water[64] – but refer to groundwater conditions that are not, in and of themselves, significant and unreasonable. Rather, sustainability indicators refer to the effects caused by changing groundwater conditions that are monitored, and for which criteria in the form of minimum thresholds are established by the agency to define when the effect becomes significant and unreasonable, producing an undesirable result.

The sustainability indicators section thus conflates three requirements of the sustainable management criteria set out in the GSP Regulations: undesirable results, minimum thresholds, and measurable objectives. Information pertaining to the processes and criteria relied upon to define undesirable results applicable to the basin as quantified through the establishment of minimum thresholds are discussed for each sustainability indicator. However, a submitting agency is not required to establish criteria for an undesirable result when the agency can demonstrate that an undesirable result for that sustainability indicator is not present and is not likely to occur in the basin.[65]

The following discussion of sustainability indicators as developed and applied by the County for the Napa Valley Subbasin can, perhaps, best be understood by reviewing the explanation provided in the Basin Analysis Report. The Report describes the Napa Valley Subbasin as having a high recharge potential in most years, relatively low water requirements, and a hydrogeologic setting conducive to recharge, and claims that, apart from dry years, groundwater levels in the Subbasin are generally stable. According to the Report, stable groundwater levels over the base period means that no significant and unreasonable effects occurred throughout the Napa Valley Subbasin related to five of the six undesirable results defined by SGMA: chronic lowering of groundwater levels, reduction of groundwater storage, seawater intrusion, degraded water quality, and land subsidence.[66] With regard to the sixth undesirable result, depletions of interconnected surface water that have significant and unreasonable adverse impacts, the Report notes that the historical occurrence of diminished baseflow could be considered an undesirable result, but claims that this possibility is basically immaterial inasmuch as SGMA does not require an alternative to address undesirable results that occurred before, and have not been corrected by, January 1, 2015.[67]

[64] Water Code § 10721(x)
[65] 23 CCR § 354.26(d)
[66] Basin Analysis Report, Section 7.2, p 135; *see* Water Code § 10721(x)
[67] Basin Analysis Report, Section 7.2, p 136

a. Chronic Lowering of Groundwater Levels

GSP Regulations specify that the minimum threshold for chronic lowering of groundwater levels shall be based on groundwater elevations indicating a depletion of supply that may lead to undesirable results.[68]

Sustainable management criteria for chronic lowering of groundwater levels are discussed in the Basin Analysis Report. In the Report, Napa County concludes that stable groundwater levels from the "base period" from 1988 to 2015 amount to evidence that no significant and unreasonable effects related to chronic lowering of groundwater levels have occurred.[69] The Report does not describe any qualitative or quantitative standard for groundwater levels to which the Subbasin had been managed for the "base period" or for any other period and does not describe what groundwater level conditions would cause an undesirable result.

The Report describes quantitative minimum thresholds and measurable objectives for groundwater levels that were established in 2016, after the passage of SGMA, specifically for the Alternative submittal, but those criteria were established to be protective of the river system (*see* Depletions of Interconnected Surface Water, below). The Report did set quantitative groundwater elevation standards for a single monitoring site, setting the minimum threshold at the historic low fall groundwater level,[70] and defining the measurable objective as the fall groundwater level observed prior to the 2012 to 2015 drought.[71] Minimum thresholds and measurable objectives were set at representative monitoring sites (*see* Monitoring Network, below).

b. Reduction of Groundwater Storage

GSP Regulations specify that 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, supported by the sustainable yield of the basin, calculated based on historical trends, water year type, and projected water use in the basin.[72]

Similar to the approach noted above (*see* Chronic Lowering of Groundwater Levels*)*, the Basin Analysis Report concludes that stable groundwater levels demonstrate that no significant and unreasonable effects related to reduction of groundwater storage have occurred in the Napa Valley Subbasin. The Report does not describe any quantitative standard for groundwater storage to which the Subbasin had been managed for the

[68] 23 CCR § 354.28(c)(1)
[69] Basin Analysis Report, Section 7.2, pp. 135-136
[70] Basin Analysis Report, Section 7.4.4, p. 142-143
[71] Basin Analysis Report, Section 7.5.4, p. 145
[72] 23 CCR § 354.28(c)(2)

period of analysis and does not define what would constitute a significant and unreasonable effect for reduction of groundwater storage, or when it would result in an undesirable result for the Subbasin. Groundwater levels are used as a proxy for reduction of groundwater storage and the minimum thresholds and measurable objectives are the same as those established for chronic lowering of groundwater levels, although the Report does not provide information about the relationship between these sustainability indicators in support of this proxy relationship (*see* Chronic Lowering of Groundwater Levels, above, and Monitoring Network, below).

c. Seawater Intrusion

GSP Regulations specify that 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.[73]

The sustainable management criterion for seawater intrusion is discussed in the Basin Analysis Report. Again, Napa County relies upon the conclusion that groundwater levels have been stable, on average, and therefore no significant and unreasonable effects related to seawater intrusion have occurred in the Subbasin (see *Chronic Lowering of Groundwater Levels*). As before, the Report does not describe any quantitative standard for seawater intrusion to which the Napa Valley Subbasin had been managed for the period of analysis, and no definition was provided for what would be a significant and unreasonable effect, or when it would become an undesirable result for the Subbasin. The Report describes that, in 2016, a minimum threshold and measurable objective was developed to maintain TDS concentrations below 450 mg/L and 300 mg/L, respectively, at one representative monitoring well (*see* Monitoring Network, below).

d. Degraded Water Quality

GSP Regulations specify that 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.[74]

The sustainable management criteria for water quality are discussed in the Basin Analysis Report. Stable groundwater levels are used to justify that significant and unreasonable effects related to water quality have not occurred in the Napa Valley Subbasin (*see* Chronic Lowering of Groundwater Levels, above). The Report does not describe quantitative standards for degradation of groundwater quality to which the Subbasin had been managed for the period of analysis. The Report states that minimum thresholds

[73] 23 CCR § 354.28(c)(3)
[74] 23 CCR § 354.28(c)(4)

developed in 2016 are based on groundwater quality concentrations remaining above water quality objectives described in the Basin Analysis Report, but the County does not describe what the water quality objectives are.[75] The Report notes that minimum thresholds for degraded water quality focus on water quality constituents that are contributed due to activities at the land surface, and not for naturally occurring constituents. The Basin Analysis Report provides minimum thresholds and measurable objectives at seven representative monitoring sites (*see* Monitoring Network, below) for nitrate as an "example".[76] The minimum threshold is set at 10 mg/L of nitrate as nitrogen (equivalent to the California MCL for public drinking water) and the measurable objective is 8 mg/L. Except for nitrate, the Report does not specify which other water quality constituents will have minimum thresholds and measurable objectives defined, or make reference to other regulatory programs that are specific to water quality.

e. Land Subsidence

GSP Regulations specify that 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.[77]

The sustainable management criteria for land subsidence is discussed in the Basin Analysis Report. Napa County uses the same approach as used for groundwater levels (*see* Chronic Lowering of Groundwater Levels) to conclude that no significant and unreasonable effects for land subsidence have occurred in the Napa Valley Subbasin. However, the Report does not describe quantitative standards for land subsidence to which the Subbasin had been managed for the period of analysis. The Basin Analysis Report does not define what would be a significant and unreasonable effect related to land subsidence or what would be an undesirable result for the Subbasin. The Report describes that, in 2016, Napa County used the same groundwater elevations used for chronic lowering of groundwater levels as proxies for land subsidence minimum thresholds and measurable objectives at representative monitoring sites (*see* Monitoring Network, below).

f. Depletion of Interconnected Surface Water

GSP Regulations specify that 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.[78]

[75] Basin Analysis Report, Section 7.4.2, p. 141
[76] Basin Analysis Report, Section 7.4.2, p. 141-142
[77] 23 CCR § 354.28(c)(5)
[78] 23 CCR § 354.28(c)(6)

The sustainable management criteria for depletions of interconnected surface water is discussed in the Basin Analysis Report. Unlike the other five sustainability indicators, Napa County indicates that diminished baseflow observed historically at certain locations during the summer and fall could be considered an undesirable result for the Napa Valley Subbasin.[79] The County had not historically established quantitative standards defining when diminished baseflow would cause undesirable results, and claims it is not required to address this potential undesirable result because it occurred prior to January 1, 2015.[80] Based on SGMA's 2015 baseline for undesirable results, together with groundwater elevation data the County regards as demonstrating stable conditions, the County concludes that the Subbasin has been operated sustainably.[81] However, the Report describes that, in 2016, minimum thresholds were set at the lowest static groundwater elevations observed in the fall at a network of representative monitoring sites located adjacent to surface water bodies (*see* Monitoring Networks, below). The Report states that those levels would be protective of the Napa River and would prevent additional depletions of surface water that would cause longer durations of low- or no-flow conditions.[82] The report also states that operating to those levels on a continuous basis would not be acceptable as doing so would contribute to a worsening of existing conditions.[83] Measurable objectives for depletion of interconnected surface water were set to the mean fall groundwater levels that occurred historically.[84]

D. Monitoring Networks

GSP Regulations require that each basin be monitored, and that a monitoring network include monitoring objectives, monitoring protocols, and data reporting requirements be developed that 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.[85]

The monitoring network is described in the Basin Analysis Report, the 2015 Annual Report, and the Groundwater Conditions Report. The groundwater monitoring network is discussed in the Groundwater Monitoring Plan.[86] Surface water groundwater monitoring sites are discussed in the Surface Water Groundwater Facilities Report.[87]

[79] Basin Analysis Report, Section 7.2, p. 136
[80] Basin Analysis Report, Section 7.2, p. 136
[81] Basin Analysis Report, Section 7.2, p. 136
[82] Basin Analysis Report, Section 7.4.1, p. 139
[83] Basin Analysis Report, Section 7.4.1, p. 139
[84] Basin Analysis Report, Section 7.5.1, p. 143
[85] 23 CCR § 354.32
[86] Groundwater Monitoring Plan, Section 4, p. 29
[87] Surface Water Groundwater Facilities Report, Section 2, p. 3

The monitoring network described in the Basin Analysis Report and 2015 Annual Report indicates 113 wells were measured for groundwater elevations in 2015. However, only about half of these wells were located within the Napa Valley Subbasin. In 2011, 87 wells were measured for groundwater elevations county-wide as part of the Groundwater Conditions Report. Again, only about half were located within the Subbasin. Napa County installed an additional 10 multi-completion wells near the Napa River in 2014 for monitoring surface water-groundwater interactions. The monitoring network described for water quality included 81 sites county-wide over the period of 2009 and 2015. The subset of those monitoring sites within the Napa Valley Subbasin were not explicitly provided (e.g., in a tabular format), but the monitoring locations were identified on a map.[88] Several stream gages along the Napa River and select tributaries were also discussed as part of the monitoring network, including the USGS Napa River near Napa and Napa River near St. Helena gages.

The Basin Analysis Report states that 18 wells were identified as representative monitoring sites for tracking minimum thresholds and measurable objectives for all six sustainability indicators.[89] A map depicting the location of representative monitoring sites is reproduced in the Management Areas section, above. Minimum thresholds and measurable objectives for chronic lowering of groundwater levels and reduction in groundwater storage were assigned at 17 of the 18 representative monitoring sites, at one of the sites for seawater intrusion, at eight of the sites for water quality, at seven of the sites for land subsidence, and at 16 of the 18 representative monitoring sites for depletions of interconnected surface water.[90] Of the representative monitoring wells used for groundwater levels, storage, and depletions of interconnected surface water, 10 of the wells did not have 10 or more years of data. These 10 wells are the multi-completion wells installed in 2014, specifically for monitoring surface water-groundwater interactions.[91] No information was found in the Basin Analysis Report to demonstrate a significant correlation between groundwater levels and the other sustainability indicators where groundwater levels were used as a proxy.

E. Projects and Management Actions

GSP Regulations require a description of the projects and management actions the submitting agency has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin.[92]

[88] Basin Analysis Report, Figure 3-2
[89] Groundwater Monitoring Plan, Section 7.3, p. 136
[90] Basin Analysis Report, Section 7.3, Tables 7-1 and 7-2
[91] Surface Water Groundwater Facilities Report, Section 1.1, p. 1
[92] 23 CCR § 354.44

Napa County summarizes numerous near- and long-term activities to implement groundwater management in the Basin Analysis Report. Table 10-1 lists implementation activities identified through several county efforts including the Groundwater Conditions Report, Groundwater Resources Advisory Committee, and the Basin Analysis Report. The table also outlines a summary description of each activity, as well as the implementation timeframe and relative priority and status. These activities are primarily to improve understanding of the Subbasin and groundwater resources throughout Napa County. Napa County identifies several types of actions including data collection and management, public outreach, and technical studies. However, none of the activities described indicate actions specific to managing for minimum thresholds.

VI. Assessment

The following describes the evaluation and assessment of the Alternative for the Napa Valley Subbasin as determined by Department staff. In undertaking this assessment, Department staff did not conduct geologic or engineering studies, although Department staff may have relied on publicly available geologic or engineering or other technical information to verify claims or assumptions presented in the Alternative.[93] As discussed above, Department staff have determined that the Napa Subbasin Alternative satisfied the conditions for submission of an alternative.[94] The Alternative was submitted within the statutory period, the Subbasin was found to be in compliance with the reporting requirements of CASGEM, and staff finds the Alternative to be complete and to cover the entire Subbasin (*see* Required Conditions, above). Based on its evaluation and assessment of the Napa Valley Alternative, as discussed below, Department staff find that the County was not able to demonstrate that the Subbasin has operated within its sustainable yield over a period of at least 10 years as required for an alternative. Staff recommend that the Napa Valley Alternative not be approved.

A. Evaluation of Alternative Contents

Napa County documents its authority as a county to manage groundwater within its statutory boundary which includes the Napa Valley Subbasin. The Basin Analysis Report also documents Napa County's assertion that SGMA provides it legal authority to submit an Alternative. The County shares the responsibility for groundwater resource planning and management between the Department of Public Works and the Department of Planning, Building, and Environmental Services. As described in the Basin Analysis Report, much of the groundwater resource planning for the Napa Valley Subbasin is based on the 2008 County General Plan where six conservation goals were developed

[93] Instances where the Department review relied upon publicly available data that was not part of the Alternative are specifically noted in the assessment.
[94] 23 CCR § 358.4(a)

for water resources, including groundwater. The County indicates the General Plan served as a starting point for efforts including public outreach, development of a comprehensive monitoring program, and technical investigations related to the hydrogeology of Napa County, including the Napa Valley Subbasin (*see* Administrative Information, above). In addition, the County provided budgetary information for the 2016-2017 fiscal year. Department staff found the provided administrative information sufficient for demonstrating legal authority and financial resources necessary to manage groundwater under SGMA.

The Basin Analysis Report and associated technical studies demonstrate a satisfactory understanding of the hydrogeologic and groundwater conditions of the Napa Valley Subbasin. Staff consider the technical studies, including the Hydrogeologic Conceptualization Report and Groundwater Conditions Report, to be based on the best available information and best available science, and that the conclusions in the reports are scientifically reasonable. The hydrogeologic conceptual model described in the Basin Analysis Report and Hydrogeologic Conceptualization Report incorporate the relevant hydrologic processes in the entire Subbasin and the understanding of hydrogeologic conditions based on previous studies.

Napa County claims that stable groundwater levels over the 28-year base period indicate that no undesirable results have occurred throughout the Napa Valley Subbasin related to five of the six undesirable results. Department staff do not agree with the County's assumption that if groundwater levels are stable over the base period, significant and unreasonable effects cannot have occurred throughout the Subbasin, and thus the Subbasin cannot have experienced undesirable results. Stable groundwater elevations would provide logical support for an argument that chronic lowering of groundwater levels and significant and unreasonable reduction of groundwater storage had not occurred, and the Department might accept such an inference even if the County failed to explain its reasoning in detail. However, the same cannot be said of all undesirable results. Stable groundwater elevations might be invoked as one element of a claim that seawater intrusion had been blocked, or that groundwater extraction was not causing land subsidence, but the County should explain its reasoning and demonstrate that other variables do not invalidate its theory.[95] However, the County did not consider any variables at all, and provides no evidence and makes no argument based on hydrologic principles as to why the Department should accept its claim.

With regard to depletions of interconnected surface water that have significant and unreasonable adverse impacts, the Report notes that the historical occurrence of

[95] Such factors might include groundwater elevation variation as a function of season and water year type.

diminished baseflow[96] could be considered an undesirable result. As an initial matter, the fact that the County recognizes that conditions of diminished baseflow could be considered an undesirable result indicates that the County has not defined what constitutes an undesirable result in the Subbasin. Having not defined what an undesirable result related to depletions of interconnected surface water would be, it is unreasonable to expect the Department to accept the County's conclusion that they have not occurred.

The County pivots on this point, taking language from SGMA and employing it to make two arguments. The County notes that a GSP is not required to address undesirable results that occurred before, and have not been corrected by, January 1, 2015, and that a groundwater sustainability agency has discretion to set measurable objectives and the timeframes for achieving any objectives for those undesirable results.[97] The County applies both provisions to its situation.

Although SGMA is silent on the issue, the County extrapolates the 2015 baseline for undesirable results to alternatives. The Department agrees with the general principle that the 2015 baseline applies to alternatives but does not believe that it can be applied to the category of alternative selected by the County.

The County submitted an alternative based on an analysis of basin conditions that demonstrates that the Napa Valley Subbasin has operated within its sustainable yield over a period of at least 10 years,[98] and SGMA defines "sustainable yield" with regard to undesirable results.[99] In fact, SGMA defines sustainable yield, in part, as the absence of undesirable results. If the Legislature had intended for an alternative based on 10 years of sustainable yield to avail itself of the 2015 baseline for undesirable results, it would have shortened the period an agency was required to demonstrate sustainable yield from 10 years to two, consistent with the 2017 deadline for submitting alternatives to the Department. At any rate, the 2015 baseline for undesirable results is simply a limitation on what conditions must be addressed; it does not operate as an exoneration of the undesirable result itself. SGMA may not require a basin to reverse the effect of undesirable results to pre-SGMA conditions, but if undesirable results occurred during the 10-year period of the Alternative, that basin cannot demonstrate that it operated within its sustainable yield.

Regarding the sustainable yield, the Basin Analysis Report does include a range of annual pumping volumes that it terms the sustainable yield for the Subbasin. That quantity is based entirely on the County's estimate of the actual pumping during the period of

[96] Department staff understand the Report's reference to "diminished baseflow" as a surrogate for the depletion of interconnected surface water sustainability indicator.
[97] Basin Analysis Report, Section 7.2, p. 136, *see* Water Code § 10727.2(b)(4)
[98] Water Code § 10733.6(b)(3)
[99] Water Code § 10721(w)

analysis. However, as noted above, that pumping occurred during a time when "...diminished baseflow could be considered an undesirable result." The quantity of pumping during a period when undesirable results may have been occurring cannot be confirmed to be within the sustainable yield and, if undesirable results were occurring, then that quantity is certainly not within the sustainable yield.

Regarding the discussion of minimum thresholds in the Basin Analysis Report, those criteria, as defined in the Report, do not support the demonstration that the Napa Valley Subbasin has operated within its sustainable yield for at least the past 10 years. Many of the monitoring sites used for setting thresholds have fewer than 10 years of data with which to demonstrate a lack of undesirable results (e.g., 10 of the 16 sites used for depletion of interconnected surface water have data for only approximately 2 years). Additionally, the minimum thresholds appear to be set based on not making future conditions worse than historic low conditions (see, e.g., the reference to setting those thresholds with the purpose of "not exacerbating streamflow depletion"[100]), but do not represent criteria for which the Subbasin has been managed for at least 10 years. Groundwater levels selected for minimum thresholds are all based on the lowest recorded fall groundwater levels in the base period. The County appears to rely on the January 1, 2015, provision of SGMA as justification for setting those thresholds but, as noted above, use of that provision is not consistent with the intent of SGMA for alternatives submitted pursuant to Water Code Section 10733.6(b)(3).

The Basin Analysis Report did not describe why the groundwater levels selected were a suitable proxy for undesirable results associated with depletions of interconnected surface water. The Report does not discuss depletions of interconnected surface water but, instead, relies on an analysis that only looked at the correlations between groundwater pumping and baseflow and precipitation and baseflow. The analysis concludes that precipitation is more correlated to baseflow than groundwater pumping. Even if this were adequate to demonstrate how groundwater levels could serve as a proxy for interconnected surface waters, baseflow is not the same as depletion. Depletion represents a change in baseflow due to groundwater pumping which can take two primary forms, including 1) water that flows to a well directly from the stream and 2) water that would have flowed to the stream that was intercepted by a well prior to becoming baseflow. So, while precipitation may be more correlated with baseflow, groundwater pumping, by definition, is more correlated with depletion. The question, therefore, becomes one of timing and estimated quantity of depletion and whether that quantity at a particular time is significant and unreasonable.

[100] Basin Analysis Report, Section 7.4.1, p. 139

The lack of supporting information related to the establishment of minimum thresholds for degraded water quality has prevented Department staff from being able to determine if the provided threshold is reasonable and supported by best available information.

The basis of the minimum threshold for water quality is unclear and does not appear indicative of potential water quality issues identified in the Napa Valley Subbasin. This lack of clarity becomes apparent in the discussion of minimum thresholds related to water quality in the Basin Analysis Report. First, Napa County mentions maintaining concentrations above water quality objectives. These water quality objectives are never defined despite being mentioned several times in the text and associated appendices. The Groundwater Conditions Report and the Groundwater Monitoring Plan both describe groundwater quality monitoring objectives.[101] However, the monitoring objectives do not relate to objectives or criteria that may be used to set minimum thresholds. As a result, the water quality objectives mentioned for minimum thresholds are unknown and cannot be verified. Second, the only minimum threshold for water quality is discussed as an "example" minimum threshold for nitrate as nitrogen based on the MCL for drinking water. Based on the information provided, it is unclear if the use of an example minimum threshold is intended to apply to other constituents, or how the example minimum threshold relates to undesirable results for the Subbasin. In addition to the lack of clarity, several of the identified constituents of concern do not appear to be captured in the sustainable management criteria.

Justification for the selection of representative monitoring sites could not be found. While a GSP may allow a monitoring network to be improved over time to account for significant data gaps (i.e. not representative), an analysis of basin conditions needs to have sufficient monitoring based on the understanding of the basin to demonstrate basin-wide management within the sustainable yield. Thus, representative monitoring also needs to be sufficient to demonstrate that the basin is being operated to the established metrics for tracking sustainability. If a monitoring network is not representative of differing conditions across the basin, then it is not able to demonstrate the basin is being operated sustainably. The Basin Analysis Report provides hydrographs for 18 representative wells. Of those wells, seven appear to be same as the representative monitoring sites for minimum thresholds using groundwater levels. Based on the trends in the provided hydrographs, the subset used for minimum thresholds exhibit different trends than some of the other nearby wells. Some of these trends are discussed in the Basin Analysis Report such as a NapaCounty-132, which had a nearby vineyard replanting in 2007. However, this discussion does not explain why that well is not used for monitoring sustainable management criteria. Due to the large vineyard acreage in the Napa Valley Subbasin, this seems to be representative of conditions that may occur elsewhere in the

[101] Groundwater Monitoring Plan, Section 3.1, p. 24

Subbasin. The discussion of representative monitoring wells used for setting minimum thresholds provided indicates that seven of the wells have long measurement records and have been used in prior studies; another 10 were selected because of their construction for monitoring surface water-groundwater interactions. The surface water-groundwater monitoring wells used to establish minimum thresholds for groundwater levels were installed using a Local Groundwater Assistance grant awarded by the Department in 2014. These wells do not have 10 years of record to show that minimum thresholds have not been exceeded.

Minimum thresholds for sustainability indicators do not appear to include the MST area and no representative monitoring includes the MST area. The monitoring network section provides a description of groundwater monitoring for the entire county in 2015. Napa County categorizes monitoring areas by local groundwater subareas. The subareas corresponding to the Napa Valley Floor approximately align with the Napa Valley Subbasin as defined by Bulletin 118 except for the Napa Valley Floor – MST Subarea (MST area). The MST area does not align well with the boundaries of the Subbasin. Because of this lack of alignment, it is unclear which wells in the MST area are within the Napa Valley Subbasin and which wells are not. Two monitoring wells in the MST area are used as representative monitoring wells for plotting hydrographs and occur within the Napa Valley Subbasin. However, neither of the wells are used to set minimum thresholds despite showing declining water levels and different trends from the other areas of the Subbasin. The Basin Analysis Report does indicate there are efforts to further investigate the MST area; however, these efforts were not completed by the statutory deadline for submitting an alternative to the Department.

Based on the analysis presented in the Basin Analysis Report, Department staff cannot reasonably conclude that the Napa Valley Alternative meets the requirement of SGMA to demonstrate operation within the sustainable yield for at least the last 10 years and, therefore, Department staff recommend that it not be approved.