

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

STAFF SUMMARY REPORT (Nathan King)
November 9, 2016

ITEM: 9

SUBJECT: **Santa Clara Valley Water District, Concurrence with Findings of the Salt and Nutrient Management Plan for the Santa Clara Subbasin Groundwater Basin – Hearing to Consider Adoption of Tentative Resolution**

CHRONOLOGY: December 2014 - Concurrence with the Sonoma Valley Salt and Nutrient Management Plan
March 2016 – Concurrence with Nutrient Management Plan for the Livermore Valley Groundwater Basin

DISCUSSION: The Tentative Resolution (Appendix A) recognizes the merits of the Santa Clara Valley Water District's (SCVWD) Salt and Nutrient Management Plan for the Santa Clara Subbasin (SNMP) and supports SCVWD's efforts to increase the use of recycled water while protecting and enhancing groundwater resources in the Santa Clara Valley. The State Board's Recycled Water Policy, as amended in 2013, calls for local water and wastewater entities, together with local salt and nutrient contributing stakeholders, to develop salt and nutrient management plans for each groundwater basin/subbasin in California in order to assess water quality and evaluate strategies for complying with salt and nutrient water quality objectives. The SNMP was prepared by SCVWD in collaboration with stakeholders and adopted by its Board of Directors after a public hearing on July 12, 2016. The SNMP's Executive Summary is included as Appendix B.

The SNMP includes an analysis demonstrating that, if recycled water use increases as projected (from the 2010 level of 7,000 acre-feet to 46,500 acre-feet per year by 2035), the high quality groundwater in the Santa Clara Subbasin will be maintained and protected. SCVWD expects that, by 2030, advanced purified recycled water from its Silicon Valley Advanced Water Purification Center in San Jose will be used for groundwater recharge (indirect potable reuse). For modeling and analysis purposes, the Santa Clara Subbasin was further subdivided in our Region into the Santa Clara Plain (underlying most of the San Jose/Silicon Valley metropolitan area) and the Coyote Valley (underlying the area from south San Jose to Morgan Hill)(see Appendix A, Figure 1). The Santa Clara Plain is urban/suburban and served by municipal water supplies and wastewater collection. The Coyote Valley is mainly agricultural with private water wells and individual/community wastewater systems.

Santa Clara Plain - Salt concentrations (measured as total dissolved solids or TDS) in the Santa Clara Plain are expected to rise slightly but still remain below water quality objectives through 2035. While a small part of the rise is due to

increased recycled water use for landscape irrigation, most is due to the managed recharge of water SCVWD imports from the State Water Project and the Central Valley Project. While the salt content of imported water is typically lower than the salt content of basin groundwater, large volumes are recharged each year, which contributes to a net accumulation of salts in the Santa Clara Subbasin. Therefore, maintaining salt levels in the Santa Clara Plain is highly dependent on the future quality of imported water. Nonetheless, SCVWD is considering additional actions, including recharge augmentation with advanced purified recycled water, to preserve its high quality groundwater. At the same time, nutrient levels in the Santa Clara Plain (measured as nitrate) are expected to remain low due to ongoing source control efforts and the use of low-nitrate surface water for aquifer recharge.

Coyote Valley - Current salt concentrations in the Coyote Valley are low and future levels are not expected to increase significantly. This is mainly due to the lack of significant salt sources in the valley (recycled water use is currently limited to the Santa Clara Plain) and the managed recharge of water from low-TDS Coyote Creek. The SNMP predicts that nitrate levels in the Coyote Valley will continue to decline due to the combination of groundwater pumping (which removes nutrients from the basin); the recharge of high-quality, low-nitrate surface water via Coyote Creek; and optimized irrigation efficiency and fertilizer use. However, elevated nitrate levels are a concern in the southwestern part of the Coyote Valley (see Appendix A, Figure 3). These are believed to be related to agricultural activities (historic and ongoing) and, to a lesser extent, wastewater septic systems in that area of the valley. Staff is working collaboratively with SCVWD staff to more thoroughly evaluate nitrate groundwater impacts within the Coyote Valley and determine whether additional source control measures are needed. SCVWD is committed to reporting monitoring results in its annual Groundwater Report and collaborating with Board staff on future assessments in the Coyote Valley and identify additional measures that will reduce nutrient loading.

We recently distributed the Tentative Resolution for public comment and will report back to you at the meeting on comments received. While we plan a brief presentation on this item, as does SCVWD, we expect this item to remain uncontested.

**RECOMMEN-
DATION:**

Adoption of the Tentative Resolution

APPENDICES:

- A. Tentative Resolution
- B. SNMP Executive Summary

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APPENDIX A

TENTATIVE RESOLUTION

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION**

TENTATIVE RESOLUTION No. R2-2016-XXXX

**CONCURRENCE WITH FINDINGS OF THE
SALT AND NUTRIENT MANAGEMENT PLAN
FOR THE
SANTA CLARA GROUNDWATER SUBBASIN**

WHEREAS, the California Regional Water Quality Control Board, San Francisco Bay Region (Regional Water Board), finds that:

1. On May 14, 2009, the State Water Resources Control Board (State Water Board) adopted the “Policy for Water Quality Control for Recycled Water” (Recycled Water Policy; Resolution No. 2009-0011 as amended by Resolution No. 2013-0003¹). The Recycled Water Policy requires the State and Regional Water Boards to exercise the authority granted to them by the Legislature to the fullest extent possible to encourage the use of recycled water, consistent with State and federal water quality laws.
2. The Recycled Water Policy requires, among other things, that Salt and Nutrient Management Plans (SNMPs) be completed for all groundwater basins in California. It is the intent of the Recycled Water Policy that salts and nutrients from all sources be managed in a manner that ensures attainment of water quality objectives and protection of beneficial uses. The State Water Board found that the appropriate way to address salt and nutrient issues is through the development of regional or sub-regional salt and nutrient management plans rather than through imposing requirements solely on individual recycled water projects. The intent of the Recycled Water Policy is for local water and wastewater entities, together with contributing stakeholders, to develop a SNMP for each groundwater basin/subbasin to assess water quality and evaluate strategies for complying with salt and nutrient water quality objectives.
3. The Santa Clara Valley Water District (SCVWD) actively manages groundwater in the Santa Clara Valley Groundwater Basin, which forms an elongated valley bounded by the Santa Cruz Mountains to the west and the Diablo Range to the east, and extends north into San Mateo and Alameda counties. The study area for this SNMP is the Santa Clara Subbasin (California Department of Water Resources [DWR] Basin No. 2-9.02²), which extends from San Francisco Bay’s southern edge southward to Morgan Hill (Figure 1). For study purposes, the Santa Clara Subbasin is further divided into the Santa Clara Plain and the Coyote Valley. The SNMP also includes the Llagas subarea; however, this subarea resides entirely within the Central Coast Regional Water Board boundary and is therefore not considered a part of this resolution. The Santa Clara Plain is urban/suburban and is mainly served by municipal surface water and groundwater supplies and

¹ State Water Resources Control Board. *Recycled Water Policy, Resolution No. 2009-0011*. Amended by Resolution No.2013-0003. January 2013.

² DWR (California Department of Water Resources). 2003. California’s Groundwater Bulletin 118 Update 2003. October 2003.

wastewater collection. The Coyote Valley is largely agricultural and unsewered with private water wells and individual/community wastewater systems.

4. Table 2-2 in the Basin Plan designates the existing and potential beneficial uses of groundwater in the Santa Clara Valley Groundwater Basin as municipal and domestic water supply (MUN), industrial water supply (IND), industrial process supply (PROC), and agricultural water supply (AGR). The Basin Plan Water Quality Objectives (WQOs) for MUN are 500 mg/L total dissolved solids (TDS), which is a surrogate for salts, and 45 mg/L total nitrate (NO₃) or 10 mg/L total nitrogen (N), which are surrogates for nutrients. The WQOs for AGR are 10,000 mg/L TDS and 135 mg/L or 30 mg/L nitrate as NO₃ or N, respectively. The Basin Plan includes no numeric TDS or nitrate WQOs for IND and PROC.
5. SCVWD developed a SNMP for the Santa Clara Subbasin³ with support and input from the Regional Water Board, the California Water Services Company, the City of Milpitas, the City of Mountain View, the City of Palo Alto, the City of San Jose, the City of Santa Clara, the City of Sunnyvale, the San Jose Water Company, the Santa Clara Basin Watershed Management Initiative, the Santa Clara County Farm Bureau, South Bay Water Recycling, and Stanford University. SCVWD has determined that the SNMP describes existing activities only and does not propose nor implement any new projects that could result in direct or reasonably foreseeable indirect physical change in the environment pursuant to the California Environmental Quality Act (CEQA).
6. The SNMP contains the following components in compliance with the Recycled Water Policy:
 - a) The SNMP considers and proposes to manage salts and nutrients from all sources, including recycled water projects, on a subbasin-wide basis in a manner that ensures attainment of WQOs and protects beneficial uses. The SNMP finds that:
 1. The volume weighted average TDS and nitrate concentrations within the Santa Clara Plain (based on 2008–2012 data) were 425 mg/L and 10.7 mg/L, respectively (compared to the TDS and nitrate WQOs of 500 mg/L and 45 mg/L, respectively). This provides a baseline assimilative capacity of 75 mg/L and 34.3 mg/L for TDS and nitrate in the Santa Clara Plain, respectively. Assimilative capacity is defined as the difference between the WQO and the existing concentration.
 2. The volume weighted average TDS and nitrate concentrations within the Coyote Valley (based on 2008–2012 data) were 377 mg/L and 20 mg/L, respectively. This provides a baseline assimilative capacity of 123 mg/L and 25 mg/L for TDS and nitrate in the Coyote Valley, respectively.
 - b) The SNMP finds that recycled water projects in the Santa Clara Subbasin (all are within the Santa Clara Plain) are projected to increase from the current 7,000 acre-feet per year (AFY) in 2010 to 46,500 AFY in 2035. Most recycled water projects will use tertiary-treated recycled water for landscape irrigation. By 2035, the SNMP predicts that 20,000 AFY of the total will be advanced treated recycled water from the Silicon Valley Advanced Water Purification Center in San Jose. This microfiltration, reverse osmosis, and ultraviolet light-purified water will be blended with tertiary-treated recycled water to lower the concentration of TDS. SCVWD anticipates that the blended water will be used for aquifer recharge (known as indirect potable reuse) to help manage future salt loading to the subbasin.

³ Salt and Nutrient Management Plan, Santa Clara Subbasin, Santa Clara Valley Water District, November 2014.

- c) Recycled water projects will offset an equivalent amount of potable water use. This offset is about 3% of the total potable water demand for the Santa Clara Subbasin today and is projected to be 18% by 2035.
- d) The SNMP finds that the largest source of TDS loading and assimilative capacity consumption in the Santa Clara Plain is due to imported surface water from the State Water Project, which is used for managed aquifer recharge. This is because State Water Project water contains TDS concentrations near the WQO of 500 mg/L, and the volumes imported are large (currently about 64,000 AFY). Therefore, maintaining salt levels in the Santa Clara Plain is highly dependent on the quality of the imported surface water. While tertiary-treated recycled water contains higher TDS concentrations (~750 mg/L), the volumes utilized for landscape irrigation are smaller by comparison (~7,000 AFY in 2010 up to 26,500 AFY in 2035).
- e) The SNMP assesses changes in assimilative capacity related to recycled water projects and other salt and nutrient sources. To predict future water quality conditions, SCVWD used a mixing model and projected salt and nutrient loading over a 25-year planning period (2010–2035). The model predicts that:
 1. For the Santa Clara Plain, average TDS concentrations will increase by 30 mg/L – from 425 mg/L to 455 mg/L. This increase corresponds to 40% of the remaining 75 mg/L assimilative capacity. Recycled water projects comprise only 6% of this total. The remaining 34% is associated with salt loading from all other sources, including aquifer recharge with imported surface water, lawn irrigation, sewer leakage, and natural recharge (which includes stormwater capture/recharge projects).
 2. For the Santa Clara Plain as a whole, average nitrate concentrations will decrease by 2 mg/L – from 10.7 mg/L to 8.7 mg/L. This decrease is largely due to the combination of municipal groundwater pumping (which removes nitrate from the basin) and recharge of high-quality, low-nitrate surface water from the State Water Project.
 3. For the Coyote Valley, average TDS concentrations will decrease by 120 mg/L – from 377 mg/L to 257 mg/L and average nitrate concentrations will decrease by 14 mg/L – from 20 mg/L to 6 mg/L. These decreases are largely due to the combination of municipal groundwater pumping (which removes TDS and nitrate from the basin) and recharge of high-quality, low-nitrate surface water from Coyote Creek.
- f) The SNMP predicts that use of tertiary-treated recycled water for landscape irrigation, which is planned entirely within the Santa Clara Plain, will, 1) contribute only a minimal increase (<2 mg/L) in groundwater TDS concentrations at urban build-out, 2) not use more than 20% of the available assimilative capacity for TDS, collectively, as specified in the Recycled Water Policy (6% is projected by 2035), and 3) not cause groundwater quality in the Santa Clara Plain on average to exceed Basin Plan WQOs for TDS (500 mg/L). At the same time, the SNMP predicts that nitrate loading from recycled water landscape irrigation in the Santa Clara Plain is not expected to lead to increased groundwater concentrations or consume assimilative capacity because it is small compared to removal by municipal groundwater pumping and dilution from low-nitrate recharge water. Overall, average nitrate concentrations in the Santa Clara Plain are predicted to decline by 2 mg/L by 2035.

- g) No significant recycled water projects are planned in the Coyote Valley, and, accordingly, recycled water use is not expected to consume TDS or nitrate assimilative capacity in that area.
 - h) The SNMP includes a significant stormwater recharge component. SCVWD artificially recharges the Santa Clara Plain through direct and in-lieu recharge programs to sustain groundwater supplies and minimize salt water intrusion and land subsidence using natural stormwater runoff and imported water from the State Water Project, which is stored and released from recharge ponds and controlled in-stream recharge. The SNMP also encourages continued use of existing low-impact development practices to increase the capture and infiltration of stormwater on a local scale. Stormwater capture comprises about 30% of the total basin recharge.
 - i) The SNMP includes a long-term monitoring plan that is adequate to provide a reasonable, cost-effective means of determining if nutrient concentrations are consistent with applicable WQOs. The proposed monitoring program includes subbasin monitoring using municipal wells, monitoring wells, and private wells. The monitoring program will evaluate trends of TDS, nitrate, and other water quality parameters, including emerging contaminants. Monitoring well locations coincide with recharge locations, recycled water operations, and groundwater production. Monitoring results are compared to WQOs. The SNMP monitoring program is a subset of SCVWD's regional monitoring program, which includes additional water quality parameters not required by the Recycled Water Policy.
 - j) The SNMP includes implementation measures to sustainably manage salt and nutrient loading. These include: surface water programs that improve the quality of surface water that infiltrates to groundwater, stormwater infiltration devices to reduce runoff and increase groundwater recharge, water conservation programs to reduce salt loading from landscape irrigation, compost and mulch programs that lower the demand for fertilizers, fertilizer management education programs to educate the public and to reduce nitrate loading, septic tank management through the County of Santa Clara to help reduce nitrate loading; and livestock manure management to reduce nitrate loading.
 - k) The SNMP is consistent with the goals and requirements of State Water Board Resolution No. 68-16 "Statement of Policy with Respect to Maintaining High Quality of Waters in California" (State Antidegradation Policy). The use of recycled water will produce minor effects that will not result in a significant reduction of water quality, and, therefore, a complete antidegradation analysis is not required. The State Water Board finds in the Recycled Water Policy that "The use of recycled water in accordance with this Policy [Recycled Water Policy], that is, which supports the sustainable use of groundwater and/or surface water, which is sufficiently treated so as not to adversely impact public health or the environment and which ideally substitutes for use of potable water, is presumed to have a beneficial impact." Under this presumption, any change in groundwater quality from increasing the use of recycled water in the Santa Clara Subbasin is consistent with providing maximum benefit to the people of the State. Nonetheless, each water recycling project will be evaluated individually for consistency with the State Antidegradation Policy, and the project proponent shall provide sufficient information for the Regional Water Board to make this evaluation.
7. The SNMP identifies a zone of salt water intrusion along the southern edge of San Francisco Bay (Figure 2) that is most likely due to the historic incursion of salt water due to periods of higher groundwater pumping during the 1940s. The declines in the depth to groundwater, which started in

the late 1940s, are attributed to rapid population growth in the area. In the late 1960s and 1970s, this trend was reversed as a result of the import of surface water from the State Water Project and successful implementation of SCVWD's managed aquifer recharge program.

8. The SNMP identifies two localized areas of high TDS concentrations in shallow groundwater in the Santa Clara Plain: the Evergreen High Salinity Area in San Jose and the Menlo Park/Palo Alto High Salinity Area (Figure 2). These are attributed to sediments of marine origin that contain salts of the original seawater when the sediments were deposited. The SNMP finds that these localized areas of elevated TDS do not threaten existing beneficial uses in those local areas or overall water quality in the Santa Clara Plain.
9. The SNMP identifies an area in southwestern Coyote Valley where concentrations of nitrate in domestic wells exceed the WQO of 45 mg/L (Figure 3). These elevated nitrate concentrations are believed to be related to agricultural activities and to a lesser extent wastewater septic systems.
10. The SNMP finds that nitrate concentrations in groundwater within the Coyote Valley are currently below the WQO on average, are declining, and will continue to decline through 2035 due to the combination of groundwater pumping (which removes nitrates from the basin); recharge of high-quality, low-nitrate surface water via Coyote Creek; and optimized irrigation efficiency and fertilizer use that limits future nitrate loading.
11. While SCVWD is not a land use agency, it has implemented actions to address the Coyote Valley nitrate problem. In 1998, SCVWD conducted initial pilot testing of approximately 600 South County domestic wells for nitrate and, on an ongoing basis, offers basic water quality testing to eligible domestic well owners. Beginning in 2013, SCVWD began offering rebates for reverse osmosis treatment systems to well owners as part of the Safe, Clean, Water and Natural Flood Protection Program approved by county voters. The SNMP supports SCVWD's participation with other stakeholders in the following additional actions:
 - a) Conduct ongoing monitoring and analysis of nitrate trends and hot spots;
 - b) Recharge low-nitrate surface water through SCVWD recharge facilities to help dilute nitrate in groundwater;
 - c) Provide in-field nutrient assistance for growers, including use of best management practices to apply fertilizers at optimal agronomic rates;
 - d) Conduct outreach through workshops and targeted materials, including nitrate fact sheets and nutrient management guidelines for growers;
 - e) Work with the Resource Conservation Districts to provide irrigation efficiency and nutrient management resources to Santa Clara County growers;
 - f) Work to influence State and/or local legislation and policies related to nitrate, including participation in efforts such as the Wastewater Advisory Group related to the Santa Clara County Onsite Wastewater Treatment System ordinance update; and
 - g) Maintain a Nitrate in Groundwater Web Page and comprehensive Private Well Owner's Guide.
12. A Substitute Environmental Document (SED) was prepared by the State Water Board for the Recycled Water Policy in accordance with the State Water Board's certified regulatory program (Cal. Code Regs., Title 23, §§ 3775-3781). The State Water Board approved the Recycled Water Policy and the SED on May 14, 2009. Because the resolution falls within the scope of the Recycled

Water Policy as analyzed by the State Water Board in the SED for the Recycled Water Policy, this resolution does not require further environmental review pursuant to CEQA (Pub. Res. Code § 21166). This resolution consists of only general descriptions of existing regulations and water quality information from the Santa Clara Subbasin SNMP and does not include any regulatory changes. It therefore is not a “project” as defined in CEQA. There is no possibility that the activity in question may have a significant effect on the environment (Cal. Code Regs., Title 14, §§ 15378 and 15061, subd. (b)(3) and Cal. Code Regs., Title 23, § 3720).

13. Regional Water Board staff prepared and distributed for public comment this resolution on October 26, 2016. The resolution was distributed to SCVWD and stakeholders for comment.
14. On November 9, 2016, the Regional Water Board, in a public meeting, heard and considered comments that pertain to the resolution.

NOW, THEREFORE, BE IT RESOLVED THAT, the San Francisco Bay Regional Water Board:

1. Recognizes the imperative for increased recycled water development and use in the San Francisco Bay Region and supports the proposed increase in non-potable recycled water used for landscape irrigation from 7,000 acre feet (AFY) in 2010 to 26,500 AFY in 2035 and a proposed additional 20,000 AFY of advanced treated recycled water from the Silicon Valley Advanced Water Purification Center in San Jose for aquifer recharge to help offset future salt loading to the subbasin;
2. Recognizes the benefits of developing and implementing salt and nutrient management plans for the preservation and/or enhancement of the quality of the Region’s water resource;
3. Recognizes that SCVWD has developed the Salt and Nutrient Management Plan for the Santa Clara Subbasin in a manner consistent with the Recycled Water Policy;
4. Recognizes that on a basin/sub-basin scale, water quality objectives are not exceeded, assimilative capacity for nutrients exists, and the recycled water projects will not use more than 20% of the assimilative capacity, collectively;
5. Recognizes that the SNMP, including the identified steps to improve the understanding of water quality in the areas of high nitrate, provides an adequate, reasonable, and cost-effective means of monitoring and evaluating water quality to determine if nutrient concentrations are consistent with applicable water quality objectives;
6. Recognizes that while there are localized areas of elevated TDS concentrations in groundwater in the Santa Clara Plain, which are attributed to naturally-occurring mineral salts from marine sediments, these areas do not threaten existing beneficial uses or the overall water quality of the subbasin;
7. Recognizes that there is a localized area of concern in the southwestern Coyote Valley where shallow groundwater and domestic wells have been affected by high nitrate concentrations; these impacts are believed to be related to agricultural activities and to a lesser extent wastewater septic systems;

8. Recognizes that Regional Water Board staff will work collaboratively with SCVWD to evaluate the status and trends of nitrate groundwater impacts within the Coyote Valley area and prioritize the contributions from various sources, including irrigated agriculture, commercial/industrial waste discharges, livestock operations, and OWTS discharges;
9. Recognizes that the Regional Water Board will use its authority to regulate nitrate sources in order to restore beneficial uses of groundwater in the Coyote Valley;
10. Determines that at this time, existing implementation measures are adequate to ensure attainment of WQOs and protection of beneficial uses and that an implementation plan, pursuant to the Basin Plan, is not necessary because 1) water quality objectives are not exceeded or threatened to be exceeded on a basin/sub-basin scale, 2) assimilative capacity for nutrients (nitrate and TDS) exists, and 3) nutrient loading from all sources, including recycled water projects, is projected to have minimal effects on salt and nutrient concentrations and assimilative capacity basin-wide;
11. Supports triennial review of the SNMP, monitoring data, and new information by Regional Water Board staff to determine if an update to the SNMP or any additional implementation actions are needed, based on changes in recycled water use, stormwater recharge quantities, or groundwater quality trends, on a basin/sub-basin scale or within localized areas of concern;
12. Supports the continued efforts of SCVWD to manage the Santa Clara Subbasin and to implement its stated goal to “evaluate all sources of salts and nutrients loading to groundwater in the Santa Clara Groundwater Subbasin, develop recycled water and stormwater goals and objectives, provide a plan for long term groundwater monitoring for salts and nutrients, and identify measures to manage salt and nutrients loading to groundwater on a sustainable basis;” and
13. Recognizes that Regional Water Board staff will continue to work collaboratively with SCVWD and other stakeholders to protect the beneficial uses of groundwater in the Santa Clara Subbasin.

I, Bruce H. Wolfe, Executive Officer of the California Regional Water Quality Control Board, San Francisco Bay Region, do hereby certify that the foregoing is a full, true and correct copy of a resolution adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on November 9, 2016.

Bruce H. Wolfe
Executive Officer

Figure 1

Santa Clara Groundwater Subbasin with
Santa Clara Plain, Coyote Valley, and Llagas Subareas



Legend

- | | | | |
|---|----------------------------------|------------------------------------|--------------------|
| Santa Clara Plain Confined Area | Coyote Valley Recharge Area | Llagas Confined Area | Santa Clara County |
| Santa Clara Plain Recharge Area | | Llagas Recharge Area | |
| Santa Clara Subbasin (DWR Basin 2-9.02) | Approximate Extent Confined Area | Llagas Subbasin (DWR Basin 3-3.01) | |

Figure 2

Areas of Elevated TDS Concentrations related to
Historic Salt Water Intrusion and Natural Conditions
in the Santa Clara Plain

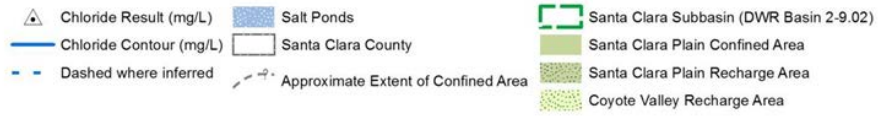
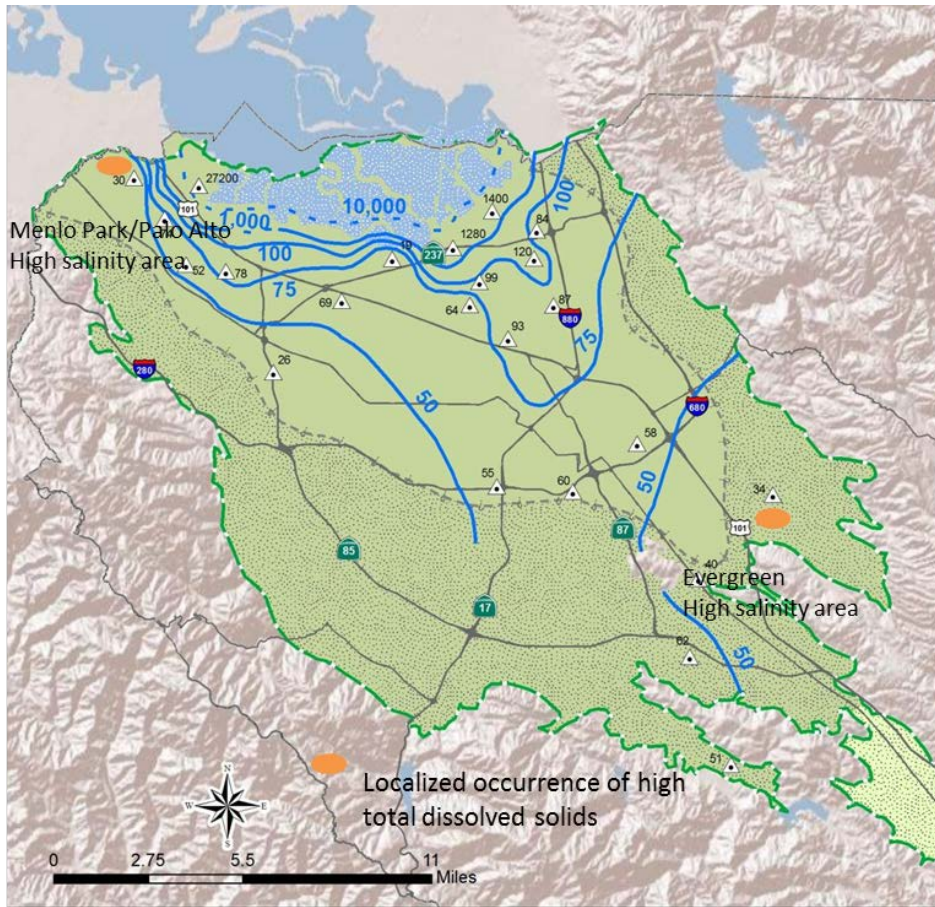
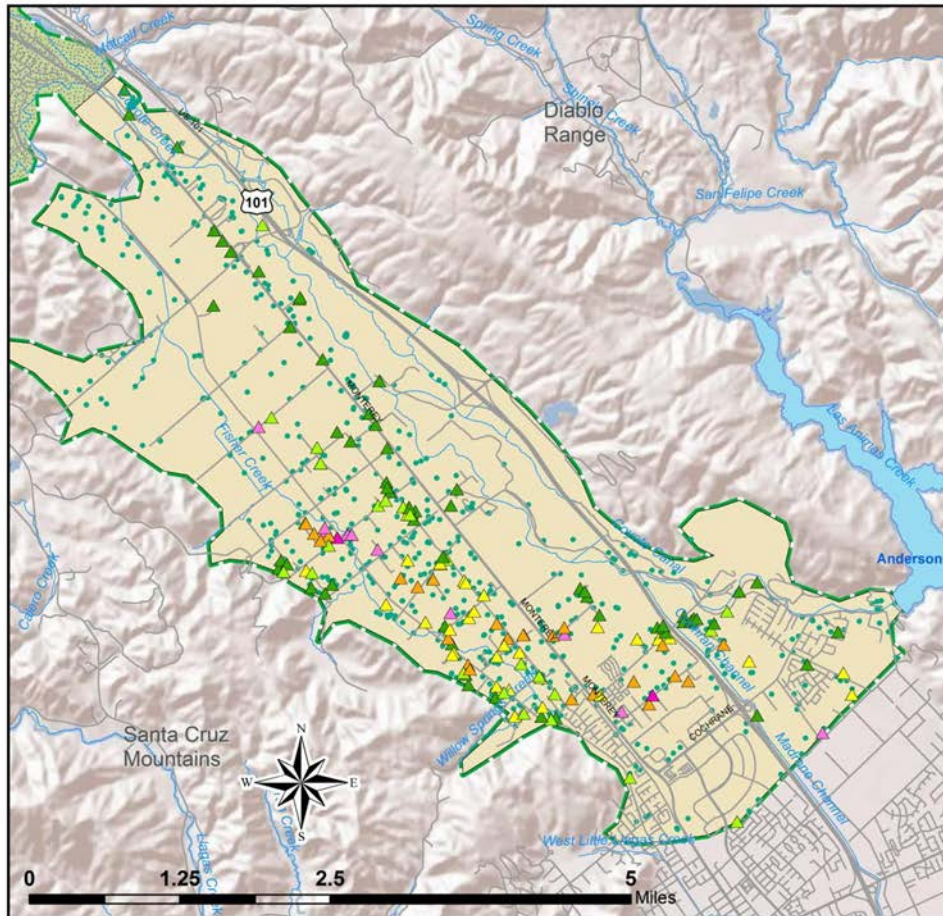


Figure 3

Area of Elevated Nitrate Concentrations
in the Southwestern Coyote Valley



Median Nitrate as NO₃, mg/L, All Years (1949 - 2015)

- ▲ 0 - 15
 - ▲ 15 - 30
 - ▲ 30 - 45
 - ▲ 45 - 60
 - ▲ 60 - 75
 - ▲ >75
- Coyote Valley Wells - not tested
- Santa Clara Subbasin (DWR Basin 2-9.02)
- NOTE: Date range is from 1949 to 2015. Some wells have been tested only once and results may be decades old. This map should not be used to interpret current conditions in the Coyote Valley subarea of the Santa Clara Subbasin; it is intended to display spatial extent of past and recent nitrate results.

APPENDIX B

**SANTA CLARA VALLEY WATER DISTRICT SALT AND NUTRIENT
MANAGEMENT PLAN
EXECUTIVE SUMMARY**

EXECUTIVE SUMMARY

In February 2009, the State Water Resources Control Board (SWRCB) adopted the statewide Recycled Water Policy that encourages increased use of recycled water and local stormwater, together with enhanced water conservation. The Recycled Water Policy calls for basin-wide management of salts and nutrients from all sources with the goal of attaining water quality objectives (WQOs) and protecting beneficial uses of groundwater.

Because recycled water can contribute salts and nutrients to groundwater, the Recycled Water Policy requires local entities to develop a Salt and Nutrient Management Plan (SNMP) to support streamlined permitting of new recycled water projects while managing salts and nutrients basin-wide.

This SNMP for the Santa Clara Groundwater Subbasin was prepared by the Santa Clara Valley Water District (District) with input from stakeholders, including the San Francisco Bay Regional Water Quality Control Board, Santa Clara County, water retailers and recycled water producers, the farm bureau, and interested stakeholders such as environmental groups.

The purpose of this SNMP is to comply with the SRWCB Recycled Water Policy by:

- Evaluating all sources of salt and nutrient loading to the Santa Clara Subbasin,
- Determining whether current and projected salt and nutrient concentrations are consistent with applicable WQOs
- Developing recycled water and stormwater goals and objectives,
- Providing a plan for long-term groundwater monitoring, and
- Identifying sustainable measures to manage salt and nutrient loading to groundwater.

An overview of the SNMP, including key findings, is provided below.

Study Area

The Study Area for this SNMP is the Santa Clara Groundwater Subbasin¹ in northern Santa Clara County, including the Santa Clara Plain and Coyote Valley. Groundwater typically provides about 45 percent of the water used in the Santa Clara Plain. Treated water provides the majority of the water used, with minor portions served by local surface water and recycled water. Tertiary-treated recycled water is used for irrigation and industrial purposes in Palo Alto, Mountain View, Sunnyvale, Santa Clara, San Jose, and Milpitas. Advanced-treated recycled water from the Silicon Valley Advanced Water Purification Center is now blended into recycled water serving San Jose and Santa Clara. The Coyote Valley relies almost entirely on groundwater, with small amounts of surface water used.

Water supply management of the Santa Clara Subbasin includes active groundwater replenishment operations conducted by the District. Significant volumes of imported water and surface water released from local reservoirs, along with local runoff are recharged in ponds and in-stream facilities. On average, the District's Managed aquifer recharge (MAR) represents two-

¹ The Santa Clara Subbasin is part of the Department of Water Resources-defined Santa Clara Valley Groundwater Basin.

thirds of the annual groundwater pumping in the Santa Clara Plain and 120% of pumping in the Coyote Valley.

Existing Groundwater Quality

Groundwater quality within the Santa Clara Subbasin is very good and is acceptable for all beneficial uses designated in the Basin Plan. Total dissolved solids (TDS) and nitrate (as NO₃) are used as representative salt and nutrient indicators for this SNMP. The volume-weighted average for the Santa Clara Subbasin is 425 mg/L.

Average TDS and nitrate concentrations were compared with the recommended secondary drinking water standard of 500 milligrams per liter (mg/L) and the primary drinking water standard of 45 mg/L, respectively. Average TDS and nitrate concentrations in all areas are well below their respective WQOs. Accordingly, there is available assimilative capacity. Trend analyses indicate nearly all wells analyzed show stable or decreasing trends for TDS and nitrate.

Salt and Nutrient Sources

Major current sources of TDS loading to the Santa Clara Plain include landscape irrigation and managed aquifer recharge, and in Coyote Valley, managed aquifer recharge and agricultural irrigation. Minor sources of TDS loading include recycled water, drainage and conveyance losses (leaks in storm drain, sewer, and water transmission pipes). The primary sources of nitrate in the Santa Clara Plain are landscape irrigation with potable and recycled water, and groundwater flowing into the Santa Clara Plain from Coyote Valley. In the Coyote Valley, agricultural fertilizer and irrigation, and septic systems are the primary sources of nitrate.

All sources of groundwater recharge add salt and nutrient load to the subbasin. Recharge sources with lower TDS and nitrate than ambient groundwater will result in improved groundwater quality. Average concentrations of TDS and nitrate in all sources of groundwater recharge combined are much lower than average groundwater concentrations.

Salts and nutrients are removed from the subbasin through groundwater pumping, basin outflow, gaining reaches of streams, and groundwater infiltration into storm drains and sewer mains. The difference between total salt and nutrient loading and removal determines whether there is currently net loading or net removal, as summarized in Table 1.

Table 1 – Net Loading of Salts and Nutrients in the Santa Clara Subbasin

	Santa Clara Plain		Coyote Valley		Santa Clara Subbasin	
	TDS	Nitrate	TDS	Nitrate	TDS	Nitrate
Total Loading, tons per year	89,600	1,130	7,850	226	97,450	1,356
Total Removal, tons per year	58,080	890	10,860	670	68,940	1,560
Net Loading, tons per year	31,520	240	- 3,010	- 444	28,510	- 204

Future Salt and Nutrient Loading and Assimilative Capacity

Loading and removal categories were quantified to support a salt and nutrient mass balance. Fate and transport of salt and nutrients was estimated, and nitrate attenuation factors were developed. A ten-year baseline mass balance was developed for 2001-2010 to establish median loading rates by category. Forecasts were developed for future loading and removal, accounting for improvements to recycled water quality through advanced treatment, planned indirect potable reuse projects, water supply demand projections, and other factors. These forecasts were used to project future TDS and nitrate concentrations, compare those concentrations to applicable WQOs, and evaluate available assimilative capacity. For the SNMP planning horizon ending in 2035, TDS concentrations are projected to decrease in Coyote Valley and increase the Santa Clara Plain. Nitrate is projected to decrease in both the Coyote Valley and Santa Clara Plain. Under the future salt and loading forecast in this SNMP, it is projected that there will be available assimilative capacity for both TDS and nitrate as shown in Table 2, below.

Table 2 – Projected Salt and Nutrient Concentrations and Assimilative Capacity

Sub-Area/Aquifer	Volume Weighted Average TDS, mg/L	TDS Assimilative Capacity	Volume Weighted Average Nitrate as NO ₃	NO ₃ Assimilative Capacity
<i>Basin Plan Objective</i>	500		45	
Santa Clara Plain – Shallow	528	-28	9.1	35.9
Santa Clara Plain – Principal	410	90	11.0	34.0
Santa Clara Subbasin	425	75	10.7	34.3
Coyote Valley	377	123	20.0	25.0

Assimilative capacity is the difference between the Basin Plan Objective and the average groundwater concentration.

Anti-Degradation Analysis

The SNMP analysis finds that current and planned recycled water use by 2035 causes only minor water quality changes to the subbasin with respect to salts and nutrients. Accordingly, recycled water project(s) are consistent with the maximum benefit of the people of the State and can be increased while still protecting groundwater quality for beneficial uses.

Salt and Nutrient Groundwater Quality Management Programs

Projects and programs to manage salt and nutrient loading on a sustainable basis have been implemented by the District and subbasin stakeholders for many years. The SWRCB Recycled Water Policy states that within one year of the receipt of a proposed SNMP, the RWQCBs shall consider for adoption revised Basin Plans for groundwater basins where WQOs for salts and nutrients are being, or are threatening to be exceeded. Accordingly, the need for implementation measures to limit and reduce salt and nitrate concentrations is determined by comparing current average and simulated future groundwater quality with WQOs.

Current and projected TDS and nitrate concentrations in the Santa Clara Subbasin do not exceed WQOs, so implementation measures are not required. Nonetheless, many groundwater quality management initiatives have been conducted in the Santa Clara Subbasin by the District and SNMP stakeholders, and may continue as deemed appropriate by their proponents. A summary of groundwater quality management initiatives is provided in Appendix 4.

SNMP Monitoring Program

For many years the District has conducted regular and comprehensive monitoring that includes TDS and nitrate, as well as other water quality parameters. The District also analyzes data from public water supply wells. The proposed SNMP Monitoring Program is the District's voluntary subbasin monitoring and reporting for TDS and nitrate. The District prepares an annual groundwater report that documents monitoring results, provides trend analyses for TDS and nitrate, and compares detections with WQOs. District reports are available on the District website.