

Santa Clara Valley Water District

Draft 2017 Water Supply Master Plan

Planning Objectives

The purpose of the Water Supply Master Plan (Water Master Plan) is to present the District's strategy for ensuring a reliable, clean water supply to meet future demands. One of the first tasks for such a planning activity is to establish objectives that the agency hopes to achieve through implementation of the plan. The objectives guide development of alternatives and include criteria to measure how well identified strategies meet the objectives. Ultimately, they help develop a recommended strategy to pursue.

Planning objectives were developed for the 2012 Water Supply and Infrastructure Master Plan by staff, with input from a technical team, Stakeholder Review Committee, management team, and the District Board. These objectives were based on Board policies, and staff worked with stakeholders to rank the objectives. The objectives have been reviewed and updated for proposed use in the 2017 Water Master Plan update.

The proposed planning objectives and sub-objectives for the 2017 Water Master Plan are described below. They are listed in order of priority from the 2012 WSIMP. The objectives are broad ideas that the District may attain with the plan. With each objective are more detailed sub-objectives, which include evaluation criteria designed to be quantitatively or qualitatively measurable, non-redundant, and clear.

Most of the proposed objectives overlap with objectives in the One Water Master Plan and many may be related to stream stewardship objectives and Safe Clean Water objectives and outcome measures. Development of the 2017 Water Master Plan is being coordinated with development of plans addressing other District mission components. Projects that primarily address the District's water supply responsibilities will be included in the 2017 Water Master Plan. Projects that are designed to address other components of the District mission will be address in the One Water Master Plan and/or related watershed plans.

The objectives of the 2017 Water Master Plan are to:

Objective / Sub-objective	In support of:
1. Provide a Reliable Water Supply for Municipalities, Industries, Agriculture, and the Environment (by):	Board Ends Policy 2.1
Meeting service area demands	CEO Interpretation S 2.4
Maintaining groundwater storage	State Law and Regulations; Board Ends Policy 2.1.1
Securing existing water supplies	Board Ends Policies 2.1.2, 2.1.3, 2.1.4
Reducing reliance on the Delta	State Law and Regulations
Maximizing water conservation and water use efficiency	Board Ends Policy 2.1.5
2. Ensure Drinking Water Quality (by):	
Protecting groundwater quality	State Law and Policy; Board Ends Policy 2.1.1
Meeting drinking water quality regulations	State and Federal Law and Regulations; Board Ends Policy 2.3
3. Minimize Costs (by):	
Minimizing life-cycle costs	Executive Limitation 4.2
4. Maximize Flexibility in the Water Supply System (by):	
Maximizing District influence over supplies and operations	State Law and Policy
Minimizing implementation complexities and barriers	Board Ends Policy 1.3
Allowing for phased implementation of new projects and programs	Executive Limitation 4.2
Adapting to climate change	CEO Interpretation S.2.7
5. Protect the Natural Environment (by):	
Protecting and restoring creek, bay, and other aquatic ecosystems	State and Federal Law; Ends Policy 4.1; FAHCE Initialed Settlement Agreement
Reducing greenhouse gas emissions	Ends Policy 4.3
6. Ensure Community Benefits (by):	
Fulfilling reasonable customer expectations for good service	Executive Limitation EL-2
Improving quality of life in the county through appropriate public access to trails, open space, and District facilities	Ends Policy 4.2
Providing natural flood protection and/or reduce potential for flood damages	Ends Policies 3.1 and 3.2

Objective 1 – Provide a Reliable Water Supply for the County

This objective relates to Board Ends Policy 2.1 “Current and future water supply for municipalities, industries, agriculture and the environment is reliable.” The District strives to meet water demands throughout the county under all water supply conditions by maintaining a diverse mix of water supplies and a reliable infrastructure system. One of strengths of the District’s water supply and infrastructure system is the inter-connected nature of the District’s infrastructure and the variety of water supply sources. The District is actively engaged in maintaining its existing imported and local water supplies and is looking at regional and local projects for new supplies. Maintaining a diverse water supply and system reliability minimizes the District’s risk of being unable to provide a reliable supply if one part of the system is not performing up to expectations.

Meeting Service Area Demands

CEO Interpretation S 2.4 requires the District to “Develop water supplies designed to meet at least 100 percent of average annual water demand identified in the District’s Urban Water Management Plan during non-drought years and at least 90 percent of average annual water demand in drought years.” The District manages water supplies to maximize storage in wet periods for use during dry periods. Currently, supplies exceed demands in most years. However, during droughts, storage can be depleted and result in shortages between water supplies and water demands. The District’s Water Shortage Contingency Plan (WSCP) provides a strategy for detecting and responding to water shortages where calls for short-term reductions in water use begin when the projected end of year groundwater storage falls below 300,000 acre-feet. Shortages are primarily managed by requesting short-term behavioral changes that result in reduced water use/water demands. Projected end-of-year storage is one of the outputs of the District’s water supply system model.

Water supply strategies should avoid the need to call for short-term reductions in water use of more than 10 percent. Strategies will be evaluated to determine the modeled level of short-term demand reductions required.

Maintaining Groundwater Storage

Board Ends Policy 2.1.1 calls for the District to “aggressively protect groundwater from the threat of contamination and maintain and develop groundwater to optimize reliability and to minimize land subsidence and salt water intrusion.” In years where supplies exceed demand excess water is stored for future years. The largest ‘reservoir’ available to the District is the groundwater basin. Maintaining groundwater storage provides reserves for use during droughts/emergencies and is also important in avoiding permanent land subsidence.

Water supply strategies ideally maintain groundwater storage above the “severe” stage in the District’s water shortage contingency plan in at least 95% of years modeled to avoid the need to call for short-term reductions in water use of more than 10 percent.

Securing Existing Water Supplies

Board Ends Policies 2.1.2, 2.1.3, and 2.1.4 call for the District to “protect, maintain, and develop” local surface water, imported water, and recycled water, respectively. The District’s existing water supply system supports most of the county’s water needs and will continue to do so into the

future. Optimizing the use of existing supplies and infrastructure leverages the investments the District has already made in water supply reliability and increases the system's flexibility. The existing system includes the use of surface water, groundwater, recycled and purified water, imported water, and a strong commitment to water conservation. Optimizing the use of existing supplies and infrastructure leverages the investments the District has already made in water supply reliability and increases the system's flexibility.

Water supply strategies should maintain existing local and imported water supplies, protect existing water supply infrastructure, and provide redundancy for outages of supplies and/or infrastructure.

Reducing Reliance on the Delta

Section 85021 of the 2009 Delta Reform Act states that "The policy of the State of California is to reduce reliance on the Delta in meeting California's future water supply needs through a statewide strategy of investing in improved regional supplies, conservation, and water use efficiency. Each region that depends on water from the Delta watershed shall improve its regional self-reliance for water through investment in water use efficiency, water recycling, advanced water technologies, local and regional water supply projects, and improved regional coordination of local and regional water supply efforts."

This sub-objective will be evaluated based on the degree to which local and regional supplies are maximized as a means of minimizing risks associated with the reliability of imported water supplies. When first developing, Santa Clara County relied on groundwater and local streams for its water supply, but excessive pumping resulted in ground subsidence. Over the last half-century, the District has brought in imported water supplies to meet increasing demands, to the point where over half the water used in the county is imported from outside the county boundaries. Imported water from the Delta is the District's largest source of supply (about 40 percent on average) and a single event, such as a levee failure, could adversely impact these deliveries.

Water supply diversity helps reduce the county's exposure to risk of any one supply investment not performing up to expectations. This sub-objective is an insurance measure that says, in effect, "Don't put all your eggs in one basket." Individual local supplies are a significantly lower percentage of the county's overall supply and less susceptible to widespread outages from single events. Although imported supplies will continue to be an important part of the county's water supply, maintaining existing local water rights and meeting new demands by developing local and regional projects will help maintain water supply diversity.

Water supply strategies should focus on developing local sources and decrease the overall percentage of the District's water supply that is imported.

Maximizing Water Conservation and Water Use Efficiency

Board Ends Policy 2.1.5, is to "Maximize water use efficiency, water conservation and demand management opportunities." The District has a history of promoting water conservation and other water use efficiency efforts. By 2030, the District anticipates that current and planned conservation activities will result in 98,800 acre-feet per year in savings. These conservation savings will offset demands by about 20 percent and reduce the need for new supplies.

Conservation also provides other benefits. These benefits include energy conservation, reduced greenhouse gas emissions, reduced costs, and reduced demand for wastewater treatment. Water conservation benefits may also be attributable to land use practices such as low-impact development. In addition to efficient use of existing water resources, the water savings and/or yields associated with water use efficiency are minimally affected by changes in hydrology.

Water supply strategies that can exceed conservation savings of 98,800 acre-feet per year by 2030, as anticipated in the 2012 Water Master Plan, are preferred.

Objective 2 - Ensure Drinking Water Quality

This objective is based on Board Ends Policies 2.1.1 “Aggressively protect groundwater basins from the threat of contamination and maintain and develop groundwater to optimize reliability and to minimize land subsidence and saltwater intrusion” and 2.3 “Reliable high quality drinking water is delivered.” The District’s water quality efforts focus on protecting groundwater quality and meeting State and Federal drinking water quality regulations. The purpose of these efforts is to protect public health and drinking water supplies for current and future beneficial use.

Protecting Groundwater Quality

The District is concerned with a number of threats to groundwater quality, including nitrate, salts, gasoline, and solvents. Nitrate, primarily from anthropogenic sources, has historically been the contaminant most frequently detected above drinking water standards in groundwater. Residual nitrate from past practices may contribute to nitrate concentrations in groundwater for decades to come, as water slowly infiltrates from the surface. Further, ongoing land use practices including fertilizer and septic system use can contribute to nitrate in groundwater. Salts, primarily sodium and chloride, are also a concern as the use of recycled water continues to increase. Recycled water, without advanced treatment, is relatively high in salts and recycled water use has the potential to increase salt concentrations in groundwater. Both salts and nitrate are conservative constituents in groundwater, meaning their concentrations do not decrease significantly due to natural subsurface processes. Recharge with surface water, which typically has low concentrations of both constituents, can help reduce salt and nitrate concentrations in groundwater. Treatment processes that remove salt and nitrate from groundwater or waters that will infiltrate to groundwater can also positively affect groundwater quality.

Water supply strategies should help improve groundwater quality by reducing the concentrations of salt, nitrates, and other contaminants.

Meeting Drinking Water Quality Regulations

The District’s treatment plants must comply with a long list of state and federal water quality regulations related to chemical, biological, radiological, and physical parameters prior to treatment, during treatment, and within the treated water distribution system. A key treatment challenge is to maximize the disinfection of biological contaminants such as bacteria, viruses, and protozoa, while minimizing the formation of harmful disinfection by-products such as bromate, trihalomethanes, and n-nitrosodimethylamine. The District is also concerned with a number of potential threats to surface water quality, such as protozoan pathogens, perchlorate, endocrine disruptors, pharmaceuticals, and personal care products, each of which could require the addition of new treatment processes. Research level efforts to determine which emerging contaminants

are most important to test for are on-going. However, many of the contaminants have no concrete guidelines monitoring or testing as of yet.

Source water quality can impact the effectiveness of the water treatment processes at the District's water treatment plants. Large or sudden fluctuations in source water quality constituents of algae, turbidity, salinity, organic carbon, pH and temperature can create operational problems that can potentially result in plant shutdowns, with algae being of greatest concern. The District collaborates and cooperates with other agencies to protect and monitor surface water sources but needs to have a variety of water sources to draw from should an individual source have water quality issues.

Water supply strategies need to meet current and anticipated treated water quality standards with existing or currently planned treatment facilities and should provide various options of supply water to the treatment plants that can be selected if other sources are impacted by adverse water quality constituents.

Objective 3 - Minimize Cost

This objective relates to Executive Limitation 4.2 that the Board Appointed Officers shall "Spend in ways that are cost-efficient." Costs include capital and operations costs associated with a project or program, including maintenance and mitigation. The District looks at total cost to the county's residents and businesses, not just District costs.

Water supply strategies will be measured by total present value cost.

Objective 4 - Maximize Flexibility in the Water Supply System

In addition to its variety of water supply sources, one of the District's strengths is the inter-connectedness and reliability of its water supply infrastructure. The Water Master Plan will lay out the District's long-term water supply strategy and identify the associated new infrastructure and infrastructure upgrade needs. Infrastructure reliability and asset management are addressed through separate programs. However, system reliability is an important consideration in long-term planning, as water supply reliability can only be assured if the system that provides the supplies is flexible to address various conditions. Multiple water supply sources, multiple storage and recharge facilities, and a well-maintained and connected infrastructure system all provide the District with a flexible system that can respond to change. Some expected changes are short-term, such as switching sources due to water quality issues, calling on reserves in dry years, or asking retailers to use more groundwater during treated water pipeline shutdowns. Other changes are long-term, such as reservoir and recharge re-operations to meet aquatic habitat needs and climate change. So far, the District's system has proven capable of responding to change. However, some parts of the infrastructure system may not be prepared for future changes. Some new supplies or projects may provide more flexibility for responding to future changes than others.

Maximizing District Influence over Supplies and Operations

The District's influence over a source of water or water supply operation affects the District's ability to manage that supply's performance. For example, the District has greater ability to affect deliveries from its own reservoirs than deliveries from the State and Federal water projects.

Likewise, the District has greater ability to affect expansion of the recycled water and purified system in the South Bay Water Recycling and South County Regional Wastewater Authority service areas than other areas since it is a partner in those two recycled water programs. Local and regional partnerships are another means to increase the District's ability to secure supplies and influence operations, and are consistent with State policy direction to implement integrated regional water management.

Water supply strategies should allow the District to adapt to changes in water supplies by providing a high degree of District control including District-controlled supplies and supplies developed in partnership with other local and regional agencies.

Minimizing Implementation Complexities and Barriers

Different types of projects and programs have different levels of implementation complexity and barriers. Very complex projects and projects with significant barriers are more difficult to implement. The types of complexities and barriers that may affect the District's ability to implement a project or program include legal and regulatory requirements, conflicts with existing policy, public perception, institutional and contractual relationships, and technical complexity. For instance, a local water exchange (i.e., an exchange with San Jose Water Company or the San Francisco Public Utilities Commission) might be easier to implement than an exchange that involves moving water through the Delta. Ends Policy E-1.3 states that "collaboration with government, academic, private, non-governmental, and non-profit organizations is integral to accomplishing the District mission."

Water supply strategies should be supported by the public and minimize legal, regulatory, and technical complexity.

Allowing for Phased Implementation of New Projects and Programs

This Water Master Plan is based on assumptions about future conditions, including assumptions regarding future water demands, precipitation patterns, availability of new technologies, and imposition of future regulations. Depending of the accuracy of these assumptions new supplies may be needed sooner or later or at a different scale. Alternatives that can be implemented in phases, as needed, are more desirable.

Water supply strategies that can be phased over time and allow the District to adjust to changes in water demands from those forecasted are preferred to those that must occur at once.

Adapting to Climate Change

CEO Interpretation S.2.7 of Ends Policy E-2 "there is a reliable, clean water supply for current and future generations" calls for the District to "incorporate climate change mitigation and adaptation into District planning efforts." Climate change is expected to increase sea level and change precipitation patterns, both of which can impact the District's water supplies. Sea level is projected to increase by 55 inches by 2100, resulting in increased salinity in the Delta and reduced exports if no action is taken to offset impacts. Modeling results indicate that changing weather patterns may also result in more intense storms over a shorter period of time which could impact both local

surface supplies and imported water. In addition, the frequency and severity of droughts may increase.

Water supply strategies that are not affected by changing weather patterns, or are adaptable to these changes are preferable to those that are not.

Objective 5 - Protect the Natural Environment

This objective relates to Board Ends Policies 4.1 “Protect and restore creek, bay, and other aquatic ecosystems” and 4.3 “Strive for zero net greenhouse gas emission or carbon neutrality.” The District and its customers value the natural environment. While the purpose of the Water Master Plan is to provide for water supply reliability, it is important that the projects and programs be considered in the context of their impacts on the environment. This includes avoiding impacts to watersheds, streams, and natural resources such as water quality and habitat degradation. It also includes maximizing energy efficiency as a means to reduce greenhouse gas emissions.

Protecting and Restoring Creek, Bay, and Other Aquatic Ecosystems

Santa Clara County is rich in natural resources and the District participates in and supports watershed stewardship to protect and enhance resources and ensure consistency with State and Federal laws and regulations. These activities include protecting and restoring fisheries and aquatic species, preserving and restoring natural stream functions and processes, protecting and restoring riparian and in-stream habitat conditions, and protecting and improving water quality in streams, the Bay, and the Delta. District programs such as the Fisheries and Aquatic Habitat Collaborate Effort are expected to restore and maintain fisheries, wildlife, water quality, and other beneficial uses of creeks in good condition.

Water supply strategies should provide benefits to environmental resources and in-stream and reservoir water quality, or at a minimum avoid impacts to these resources.

Reducing Greenhouse Gas Emissions

Board Ends Policy 4.3 calls for the District to “strive for zero net greenhouse gas emissions or carbon neutrality.” Planning for future water supplies and infrastructure should consider both total emissions generated or sequestered and adaptation to climate change (which is addressed under the Maximize Flexibility criterion). The California Water Plan 2009 suggests that local agencies should implement cost effective, energy efficiency measures in their water projects as a means of reducing GHG emissions.

Water supply strategies should reduce greenhouse gas emissions.

Objective 6 - Ensure Community Benefits

This objective relates to Board Executive Limitation EL-2 “The BAOs shall promote conditions, procedures, and decisions that fulfill reasonable customer expectations for good service, are safe, dignified, and nonintrusive.” This objective also relates to Board Ends Policies 3.2 “Reduced potential for flood damages,” and 4.2.1 “Support healthy communities by providing additional trails, parks, and open space along creeks and in the watersheds.” The District provides multiple services to the

community. In addition to environmental stewardship and water supply, the District provides flood protection services and supports recreational opportunities when possible. In developing its water supply strategy, the District will consider these benefits for the community and work to ensure benefits are distributed equitably.

Fulfilling Reasonable Customer Expectations for Good Service

It is important for the District to provide even levels of service within zones of benefit and minimizing adverse socio-cultural impacts. Minimizing socio-cultural impacts includes minimizing disproportionate impacts to minority and low-income populations (environmental justice), minimizing adverse impacts to cultural resources, and minimizing adverse social effects such as impacts to community character.

Water supply strategies will be evaluated by the degree to which water supply benefits are provided throughout the District's service area and the likelihood of disruption is the same throughout the service area.

Improving Quality of Life in the County through Appropriate Public Access to Trails, Open Space, and District Facilities

The District supports recreational opportunities on and around its reservoirs, along creeks, and in the watersheds by providing access to District facilities and, in some cases, providing funding for recreation projects. The recreation programs are maintained and operated by other entities.

Water supply strategies should provide additional water-based recreational opportunities benefits.

Providing Natural Flood Protection and/or Reducing Potential for Flood Damages

One of the primary missions of the District is to minimize flooding impacts to residents and property in Santa Clara County. Flood protection benefits could be associated with water supply projects that increase reservoir storage or reduce stormwater runoff to creeks.

Water supply strategies should provide additional flood protection benefits.