FINAL

San Benito Urban Areas Water Supply and Treatment Master Plan Update

City of Hollister, City of San Juan Bautista, San Benito County, San Benito County Water District, and Sunnyslope County Water District

Approved: October 25, 2023

REGISTERED PROFESSIONAL ENGINEER
Holly Kennedy
NO. 74682
EXP. 12/31/23
STATE OF CALIFORNIA

Prepared under the responsible charge of

Holly Kennedy

C74682

2365 Iron Point Road, Suite 300
Folsom, CA 95630-8709

1 Table of Contents

Appendices

2 List of Tables

3 List of Figures

Executive Summary

The San Benito Urban Areas Water Supply and Treatment Master Plan Update (Master Plan Update) provides a comprehensive plan and implementation program to meet the existing and future water resources needs of the San Benito Urban Areas (SBUA). The master plan was first prepared in 2008, then updated in 2017. Since the last update, there have been changes in water use patterns, water supply (drought), development in the Hollister Urban Area (HUA) and the City of San Juan Bautista (SJB), as well as State of California water quality and groundwater sustainability regulations. This Master Plan Update has been prepared to reflect changes since 2017 and update the recommendations.

This executive summary provides an overview of the background, improvements completed since the 2017 Master Plan Update, and the recommended program described in this Master Plan Update.

ES-1 Background

The SBUA is located in San Benito County, California, approximately 50 miles southwest of the City of San Jose and 40 miles east of Monterey Bay. The 2008 Master Plan and 2017 Master Plan Update focused on the HUA, which includes the city of Hollister and its adjacent unincorporated areas of San Benito County designated for urban development. This Master Plan Update incorporates the City of San Juan Bautista into the study area.

The 2008 Master Plan established project opportunities for regional cooperation and coordination of water, wastewater, and recycled water facilities to serve the HUA. The 2017 Master Plan Update re-evaluated and updated these project opportunities with a decade of changed conditions. This Master Plan Update continues to plan to secure water supply and treatment capacity for SBUA's growing drinking water demand and to fulfill water quality objectives established in the Memorandum of Understanding (MOU; see below).

ES-1.1 Memorandum of Understanding

The 2008 Master Plan was initiated through the 2004 Memorandum of Understanding (2004 MOU) developed among the City of Hollister (City), San Benito County (County), and the San Benito County Water District (SBCWD). The 2004 MOU was subsequently amended in 2008 to include the Sunnyslope County Water District (SSCWD).

The 2004 MOU described the principles, objectives, and assumptions that formed the basis of the 2008 Master Plan, focusing on the following goals:

- Improve municipal, industrial, and recycled water quality.
- Increase the reliability of the water supply.
- Coordinate infrastructure improvements for water and wastewater systems.
- Implement the goals of the Groundwater Management Plan.
- Integrate recommendations of the Long-term Wastewater Management Plans with the Master Plan.

- Support economic growth and development consistent with the City of Hollister and San Benito County General Plans and Policies.
- Consider regional issues and solutions.

In 2009, the Coordinated Water Supply and Treatment Plan (Coordinated Plan) was completed. The purpose of the Coordinated Plan was to refine the water supply and treatment recommendations from the 2008 Master Plan.

The 2014 Memorandum of Understanding (2014 MOU) was developed among the City, County, SBCWD, and SSCWD to facilitate and guide the preparation of the 2017 Master Plan Update.

The 2014 MOU incorporated the principles, objectives, and assumptions from the 2004 MOU. In addition, the following issues were identified for evaluation in the 2017 Master Plan Update:

- Update water demand and wastewater flow projections.
- Review and evaluate previously identified long-term water supply options.
- Review drinking water goals for Total Dissolved Solids (TDS) and hardness.
- Review goals for recycled water TDS.
- Evaluate the need, timing, and estimated cost of the following facilities and activities:
    - Expansion of the West Hills Water Treatment Plant (WTP),
    - Crosstown Pipeline,
    - Groundwater Demineralization or Softening,
    - Modifications to and/or expansion of the City's Water Reclamation Facility and the SSCWD Ridgemark Wastewater Treatment Plant,
    - Expansion of the recycled water system, and
    - Major infrastructure improvements to the water distribution system and the wastewater collection system.

The 2014 MOU also reaffirmed the institutional framework and responsibilities of the Governance and Management Committees (see Section 1.1.3).

In 2021, SJB negotiated with SBCWD for better-quality surface water to blend with its local groundwater supplies to improve drinking water quality, as part of the plan to settle and resolve violations to environmental regulations. SJB had recently been fined by the U.S. Environmental Protection Agency (EPA) for exceeding wastewater discharge limits, which was partly a result of poor drinking water quality. SBCWD and SJB developed an MOU to prepare a feasibility study and preliminary design to provide SJB with treated surface water from the West Hills WTP. SJB subsequently signed on to the MOU to participate in this Master Plan Update.

ES-1.2 Related Planning Activities

Several recently completed or ongoing planning activities are related to this Master Plan Update. All work completed for this Master Plan Update was closely coordinated with these related planning activities, including the 2020 Hollister Urban Area Urban Water Management

Plan (UWMP), the recently completed Groundwater Sustainability Plan (GSP), and SJB's Water Master Plan. In addition, SBCWD actively engages with non-SBUA agencies for additional water supply or storage opportunities. There are two such ongoing projects: Valley Water's Pacheco Reservoir Expansion Project (PREP) and the U.S. Bureau of Reclamation's (USBR) B.F. Sisk Dam Seismic Retrofit and Raise Project. In addition, a Climate Change Strategic Plan was developed as part of this Master Plan Update to outline impacts of climate change to SBCWD's water supply and infrastructure. The plan also summarizes mitigation strategies and recommendations presented in the GSP and other climate change related planning activities. This plan is enclosed in Appendix B.

ES-1.3 Master Plan Update Objectives

This Master Plan Update considers both future water supply needs and water quality. The overall objectives of this Master Plan Update are the following:

- Provide continuous improvement toward achieving drinking water quality goals.
- Increase dry-year water supply reliability.
- Provide a reliable and sustainable water supply to respond to long-term growth needs.
- Coordinate with ongoing programs including SGMA related activities, and the supply of treated surface water to SJB.
- Continue to address water needs through coordinated regional solutions.

The emphasis for this Master Plan Update is on water supply and treatment. The wastewater and recycled water infrastructure will be addressed in a future update once the City of Hollister General Plan Update is complete, and the Local Agency Formation Commission issues related to the wastewater service area are resolved.

ES-1.4 Planning Period

The planning period for this Master Plan Update extends from 2021 to 2045. The initial year of the planning period was selected to provide a common baseline for data-related water supply and demand. The final year of the planning period coincides with the planning horizon of the 2020 UWMP.

ES-2 Improvements since 2017 Master Plan Update

After the 2017 Master Plan Update was completed, the agencies collaborated to successfully implement major water projects for the benefit of the HUA. Water conservation and other water-related programs have also continued.

ES-2.1 Water Supply Improvements

Through the 2012–2016 drought, SBCWD's primary surface water supply, imported water from USBR's Central Valley Project (CVP), was typically allocated at less than half the contracted baseline amount. In 2014, SBCWD renegotiated the baseline amount for its municipal and industrial (M&I) use, and that historical use value is now 8,250 AFY. Renegotiating the baseline was a key strategy that SBCWD used to improve the reliability of dry-year supply of imported surface water for M&I use, as it is the key metric that USBR uses as a basis for supply allocations during a shortage condition.

SBCWD maintains groundwater basin health with both surface water percolation and treated wastewater percolation. Historically, surface water percolation has been challenging due to invasive Dreissenid (zebra) mussels, low CVP allocations, and/or limited local reservoir availabilities. Surface water percolation activities have resumed with recent attenuated hydrological constraints. In addition, an intertie was constructed to enable SBCWD to divert excess CVP water to the abandoned percolation ponds at the City's Water Reclamation Facility (WRF) for percolation.

ES-2.2 Water Treatment and Distribution

SBCWD now has a total of 6.5 million gallons per day (MGD) of treatment capacity between its two WTPs. The Lessalt WTP was upgraded in 2014 and has a capacity of 2.0 MGD and the West Hills WTP was completed in 2017 and has a capacity of 4.5 MGD.

Since the West Hills WTP was completed, two key projects were completed to expand the distribution of high-quality surface water and to support compliance with the State's anticipated hexavalent chromium maximum contaminant level (MCL). The Crosstown Pipeline extends West Hills WTP finished water to the middle zone of the HUA distribution system. The treated surface water blends with SSCWD groundwater supply that is high in hexavalent chromium. The second project includes bifurcations of the 20-inch transmission pipeline from the West Hills WTP to convey surface water for blending at City Well No. 2, City Well No. 4 and City Well No. 5, all of which are high in hexavalent chromium.

ES-3 Recommended Program

A comprehensive planning process was used in this Master Plan Update to develop and evaluate a wide range of alternatives for both water supply and water treatment facilities and programs. The results of the evaluation are summarized in the following subsections along with the recommended implementation program through 2045.

NOTE TO READER: Following the completion of the water supply analysis presented in this Master Plan Update, the scope of ASR Phases 1 and 2 was updated to facilitate the pursuit of federal and state grant funding opportunities and ultimately deliver the project on an accelerated timeline. Although the facilities and phasing of the ASR project were updated, the total projected supply generated by the overall ASR program remains unchanged. Referred to as ADRoP (Accelerated Drought Response Project), the first phase of the ASR program now relies on the expansion of the West Hills WTP for treatment of imported water prior to injection, whereas the original project included a new dedicated water treatment plant. The first phase is also anticipated to include three to five ASR wells, capable of injecting 1,600 acre-feet-per-year (AFY) to 2,700 AFY in wet years and generating an average annual yield of 650 AF to 1,035 AF. A more detailed description of ADRoP, including a full description of facilities, estimated cost and implementation schedule, is included in Appendix C.

ES-3.1 Water Supply Recommendations

The annual water demand is projected to increase from 5,560 AFY to approximately 9,190 AFY by 2035 and to approximately 12,500 AFY by 2045, an increase of approximately 6,940 AFY. The recommended priorities and actions for long-term water supply are summarized in Table ES-1. These recommendations include continuing ongoing programs and new projects requiring further investigation. All of the long-term water supply options should be retained as a menu of alternatives to contribute to a diverse and drought resilient water supply portfolio. Due to the inherent uncertainties in California water supply (drought, environmental constraints, regulations, etc.), it is prudent to maintain maximum flexibility in planning for long-term water supplies.

Table ES-1. Recommended Priorities and Actions for Long-term Water Supply Program

Description	Priority Level[1]	Estimated Average Annual Supply (AFY)	Recommended Action
Surface Water			
B.F. Sisk Dam Raise	3	1,500	Collaborate with USBR; Secure Storage Volume of 5,000 AF
PREP	4	TBD[2]	Evaluate Appropriate Level of Engagement due to High Costs
Local Surface Water Storage	Future	TBD[3]	Further Investigation Required
Groundwater			
ASR	1	1,000–2,190[4]	Conduct Pilot Study
North Area Groundwater	2	1,000–2,000[5]	Complete Feasibility and Environmental Studies
Ongoing Programs			
Water Conservation	1	—[6]	Continue Existing Program
Imported Surface Water	1	As Needed[7]	Continue Existing Program
Semitropic Water Bank	1	Drought Supply[8]	Continue Existing Program
Local Wells for Large Landscape Areas	1	—[9]	Continue Existing Program

AF – acre-feet, AFY – acre-feet per year, ASR – aquifer storage and recovery, CVP – Central Valley Project, PREP – Pacheco Reservoir Expansion Project, TBD – to be determined, USBR – U.S. Bureau of Reclamation

1. Priority level from Table 4-8.
2. Negotiations are required to determine the appropriate level of engagement.
3. Further investigation of an expansion of Paicines, or other options, is needed to confirm feasibility and yield.
4. Requires a pilot study to confirm feasibility. Could be implemented in phases.
5. Preliminary investigations indicated up to 5,000 AFY during normal years and up to 2,000 AFY during dry years.
6. Significant reductions have already been achieved through regional efforts in water conservation. Further reductions to be determined based on the results of ongoing efforts.
7. Conversion of Agricultural CVP water to M&I, long-term transfers, and/or spot market purchases are needed to augment M&I CVP supplies to meet water quality goals.
8. Semitropic Water Bank enhances dry-year reliability, but water might not be available during critically dry years if water is not available to divert from San Luis Reservoir.
9. The demand for high quality water could be offset with this strategy. However, the volume of water has not been estimated.
10. The water supply options in Table ES-1 provide “building blocks” to meet the need for high-quality water. For example, the proposed aquifer storage and recovery (ASR) Phase 1 project could provide enough supply to meet the 2030 high-quality water need. If the ASR Phase 1 project reveals that ASR is not viable, then the North Area Groundwater project could be accelerated to provide that same increment of new supply.

The quantity and timing of additional high-quality water needs will depend on actual demand growth, hydrologic conditions (wet, normal, and dry years), and allocations of existing CVP supplies by USBR. Both the ASR and B.F. Sisk Dam Raise projects will improve the reliability of the existing CVP water by providing opportunities for long-term storage of excess CVP water during wet years. That water would then be available during dry years, when CVP allocations are curtailed.

During extended dry-year conditions, it might be necessary to relax the TDS and hardness goals. However, even during extended dry-year conditions, enough high-quality water supplies must be provided to meet the anticipated hexavalent chromium regulations.

ES-3.2 Recommended Water Supply and Treatment Facilities

Table ES-2 summarizes the recommended water supply and treatment facilities and improvements, which are limited to the facilities and improvements that are recommended for implementation through 2031. Improvements needed beyond 2031 should be revisited in a subsequent Master Plan Update, which should be completed no later than 2027. At that time, the actual growth in water demand and future projections, water quality requirements, feasibility of the ASR project, updated timelines for regional projects (e.g., B.F. Sisk Dam Raise), new regulations, and other factors can be reconsidered to develop recommendations and for appropriate scope and timing for facilities beyond 2031.

The first phases of the ASR project were subsequently revised in late 2022 to facilitate the pursuit of state and federal grant funding opportunities and ultimately deliver the ASR project on an accelerated timeline. Now, referred to as ADRoP, this first phase of ASR has a modified scope and accelerated schedule as compared to the original plan listed in Table ES-2. Appendix C presents a description of ADRoP, including a cost estimate and implementation schedule.

ES-3.3 Coordination with Related Planning Activities

Implementation of this Master Plan Update should be coordinated with other ongoing programs to provide opportunities for optimizing facility sizing, reducing costs, and obtaining outside financing. Some of the major ongoing programs for coordination include the following:

- Local Water Distribution System Master Plans and Infrastructure Investments
- Groundwater Sustainability Plan
- Valley Water’s Pacheco Reservoir Expansion Project (PREP)
- Pajaro River Watershed Integrated Regional Water Management Program
- USBR’s San Luis Reservoir Low Point Improvement Project
- USBR’s B.F. Sisk Dam Seismic Upgrade and Dam Raise Project

Table ES-2. Estimated Costs, Schedule, and Actions for Recommended Facilities

Description[1]	Estimated Cost ($M) and Timeframe				Total	Recommended Action
	2023	2024	2025	2026–2031		
Water Supply and Treatment WRF						
ASR Phase 1	5.3	0.9	0.9		7.1	Complete design and environmental studies
ASR Phase 2[2]			2.9	38.4	41.3	Complete Pilot Project and initiate design and environmental studies
B.F. Sisk Dam Raise[3]	1.8	1.8	1.7	44.8	50.0	Collaborate with USBR and Secure 5,000 AF Storage
Imported Water[4]	0.2	0.4	0.5	4.1	5.2	Purchase as needed to maximize production at West Hills WTP to meet water quality goals
Subtotal	**7.3**	**3.1**	**6.0**	**87.3**	**103.6**	
Water Transmission						
San Juan Bautista Pipeline	8.7	4.0			12.7	Confirm financing plans, design, and construct
Subtotal	**8.7**	**4.0**			**12.7**	
Total[5,6]	**16.0**	**7.1**	**6.0**	**87.3**	**$116.3**	

$M – millions of dollars, AF – acre-feet, ASR – aquifer storage and recovery, CCI – Construction Cost Index, CIP – capital improvement program, City – City of Hollister, ENR – Engineering News-Record, mgd – million gallons per day, PREP – Pacheco Reservoir Expansion Project, SBCWD – San Benito County Water District, SJB – City of San Juan Bautista, SSCWD – Sunnyslope County Water District, USBR – U.S. Bureau of Reclamation, WTP – water treatment plant

Notes:

1. Costs are referenced to the ENR, San Francisco Bay Area CCI Index for February 2021, at 13,110.
2. ASR Phase 2 includes a 2.5 mgd WTP.
3. Costs provided by SBCWD. Project is reliant on state and federal partners.
4. Needed in the near term to maximize production of the West Hills WTP to meet system hardness goals. Costs estimated at $1,200 per AF based on spot market purchases but could be lower if alternate imported sources are used (e.g., conversion of Ag CVP to M&I CVP).
5. Table does not include CIP costs for PREP, which should be added, if appropriate once the form of continued engagement is determined.
6. Table does not include CIP costs for water distribution system improvements for the City, SJB, or SSCWD.

ES-3.4 Water System Operations

The water distribution system for the HUA consists of the combined systems serving the City and SSCWD. SJB has a separate distribution system and independently operates several local groundwater production wells. Historically, the City and SSCWD have closely coordinated the operation of the HUA combined system. The HUA has been increasingly utilizing treated surface water from the West Hills WTP. To achieve the water quality goals, the SBUA will increasingly utilize treated surface water. Therefore, it is critical for the City, SJB, SSCWD, and SBCWD to cooperate in the efficient operation of the water supply and treatment and distribution facilities.

Cooperation regarding and coordination of system operations will be required to provide efficiencies and maximize the following benefits to consumers in the SBUA:

- Efficient use of limited high-quality water supplies
- Compliance with state and federal drinking water standards, especially the anticipated California hexavalent chromium limits
- Continued progress toward meeting TDS and hardness goals established for drinking water in the SBUA
- Continued compliance with waste discharge requirements for local wastewater treatment plants
- Production of Title 22 recycled water from the City's WRF for reuse by SBCWD for agricultural irrigation

To achieve these benefits, the 2013 System Operations Technical Memorandum should be updated to ensure efficient operation of new facilities and to incorporate facilities developed since 2013. Specifically, some of the issues to be addressed in the update should include the following:

1. Production scheduling for the Lessalt and West Hills WTPs for seasonal and daily flow variations.
2. Scheduling of well operations to complement treated surface water deliveries and provide comparable average run times for all wells.
3. Production scheduling for the new ASR WTP for various year types and seasonal variations. For example, it is expected that, during wet years, the ASR WTP would treat excess CVP for injection; during normal years, the ASR WTP would treat CVP water for distribution, in balance with the West Hills and Lessalt WTPs; and during dry years, the ASR WTP would treat recovered groundwater for distribution, if needed.

ES-3.5 Engineering

The technical work completed for this Master Plan Update provides a framework for water supply and water treatment facilities required through 2045. The locations presented in Figure ES-1 are conceptual, and final locations will be determined during future facilities planning and preliminary design work.

The next step in implementation will be to conduct engineering and related technical investigations for the recommended facilities. Engineering work would include facilities planning, preliminary design, design, construction management, and startup. Many of the proposed improvements will be phased, and the engineering work would be scheduled accordingly. Construction contract packaging should also be evaluated to provide the greatest opportunities for competitive bidding by contractors.

The San Juan Bautista Pipeline preliminary design is underway, and an initial feasibility study for the ASR project was completed as part of the Groundwater Sustainability Plan, which was submitted to the State in early 2022. An initial phase of the ASR project, referred to as ADRoP,

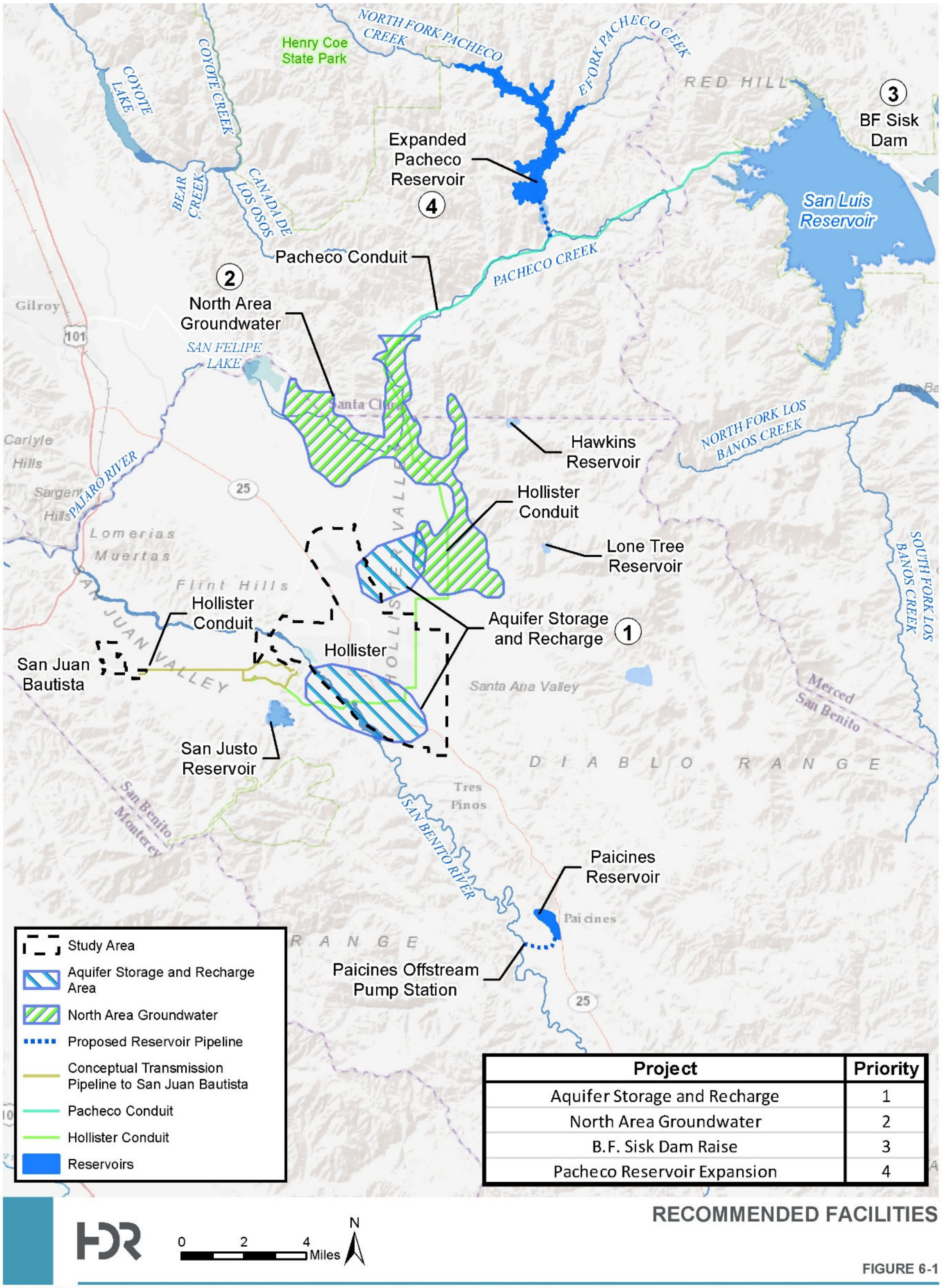


Figure ES-1. Recommended Facilities

is anticipated to rely on the expansion of the West Hills WTP for treatment of imported surface water prior to injection at an ASR wellfield. The location of the wellfield is conceptual. Actual well locations will need to be evaluated based on hydrogeological studies, infrastructure costs to convey water to the wellfield, available land, and environmental impacts, among other factors.

ES-3.6 Environmental Compliance

The recommended facilities will require environmental compliance with the California Environmental Quality Act (CEQA) to evaluate the environmental impacts of the projects. Project-specific compliance would be determined on a case-by-case basis for individual projects.

The region is known to be home to several federally listed species, including the California tiger salamander, California red-legged frog, and San Joaquin kit fox. As projects are developed, consideration should be given regarding how to minimize impacts to their habitat.

If federal grants or loans are used to pay for specific facilities, additional environmental review might be required to comply with the National Environmental Policy Act (NEPA). In addition, if federal facilities such as the Hollister Conduit are impacted, NEPA compliance might also be triggered.

ES-3.7 Permitting

Numerous federal, state, and local permits will also be required for implementation. The required permits will be identified during the preparation of the engineering predesign studies and environmental compliance documents. A permitting strategy should be developed to minimize project delays and potential mitigation costs.

ES-3.8 Institutional Agreements

Institutional agreements between and among agencies will be required to implement projects that provide joint benefits. Multiple institutional agreements are anticipated to be required to implement the recommended projects. The following agreements might be required:

- Update to the Water Supply and Treatment Agreement to add SJB and incorporate the new suite of projects.
- Update to operating agreements for the treatment plants to reflect a new cost allocation to include SJB.
- Agreement between SBCWD and SJB to construct and operate the San Juan Bautista Pipeline.
- Agreement between USBR and SBCWD to use the Hollister Conduit to receive concentrate from the ASR WTP, which would be blended with CVP water in the conduit to minimize overall water losses.
- Agreement with USBR and partner agencies to document storage volume and cost share in the B.F. Sisk Dam Raise.

- Update to the MOU between SBCWD and Valley Water for the PREP to record SBCWD's status of participation going forward.
- Agreement between USBR and SBCWD to use the Hollister Conduit to transmit North Area groundwater (Warren Act).

ES-3.9 Financing

Recommended projects might be financed through local funding and/or state and federal grants and loans. Past projects, such as the Hollister Urban Area Water Project, have been implemented through a combination of local financing and state grants. Opportunities for outside financing (grants or loans) should be fully explored from state water programs and federal infrastructure funding.

For local financing, the agencies will need to update their financial plans and rate studies. Rate study updates should include a review of both rates and connection fees. For the recommended new water facilities, benefits and costs should be allocated to water quality improvements and growth. Staff from each water agency should meet periodically to discuss strategies to accommodate these new facilities and the status of their individual financing plans.

It is recommended that the projected water demands, facilities timing, and financing plan be reviewed in by 2027. This interim milestone would give the agencies the opportunity to verify actual trends in water demand growth and adjust the schedules for implementing and financing facilities as appropriate.

SBCWD has initiated efforts to pursue over $30 million in grant funding from federal and state programs, including:

- Small Storage Grant Program by USBR
- Round 2 Integrated Regional Water Management (IRWM) Implementation Grant Program by California Department of Water Resources (DWR)
- Round 2 Sustainable Groundwater Management (SGM) Grant Program by DWR

If funds are awarded, the funding programs impose certain limits on the performance completion date which is when the funded project needs to be completed. With the performance due dates set as early as December 2026 and as late as March 2027, the original scope of the first phases of the ASR project was updated to facilitate the pursuit of grant funding. The updated ASR project, ADRoP, is described in further detail in Appendix C.

ES-3.10 Stakeholder Outreach

Stakeholder outreach has been an integral part of implementing past master plans. Continued successful implementation of the recommendations of this Master Plan Update will require a proactive approach to the various interest groups and stakeholders in the SBUA, including:

- General public,
- Local interest groups (business, environmental, and others),
- Regulatory agencies,

- City, County, SBCWD, SJB, and SSCWD elected officials and staff, and
- Regional interests outside San Benito County.

A first step in developing a responsive stakeholder outreach program would be to revisit the communications strategy that was previously implemented to support the upgrade of the Lessalt WTP and new West Hills WTP.

ES-3.11 Recommended Implementation Schedule and Next Steps

Implementing this Master Plan Update will require overall program and individual facilities activities. Some of the recommended projects are already in design or have advanced through the feasibility phase.

The next major infrastructure improvements would be completed through 2031. Table ES-3 summarizes the recommended projects and programs along with a timeline and responsibilities for implementation. It is also recommended that this Master Plan Update be updated no later than 2027. An update in this timeframe is necessary to adjust the recommendations for facilities beyond 2027 based on actual growth rates, progress made in program implementation, new regulations, and potential new issues and opportunities.

With the introduction of ADRoP, the first phase of the ASR project has been updated to include the West Hills WTP expansion to 6.75 mgd for treatment of imported surface water prior to injection. Full details of ADRoP are enclosed in Appendix B.

Table ES-3. Summary of Timing and Responsibility for Recommended Improvements

Description	Date	Responsible Agency
Water Supply		
Continue and/or Expand Existing Programs		
Continue Importing Surface Water	Ongoing	SBCWD
Renew Semitropic Water Agreement	Ongoing	SBCWD
Continue Water Conservation Program	Ongoing	WRA
New Programs		
Complete ASR Project Phase 1	2022–2024	City, SBCWD
Secure 5,000 AF of Storage in the B.F. Sisk Dam Raise Project	2022	SBCWD
Determine Appropriate Level of Continued Engagement in PREP	2022	SBCWD
Further Investigate Local Surface Water Supplies and Storage	2024+	SBCWD
Complete Feasibility and Environmental Studies for North Area Groundwater Supply	2024+	SBCWD
Water Treatment		
Confirm Treatment Requirements for the ASR Project	2022–2024	SBCWD
Expand West Hills WTP to 9 mgd	Future	SBCWD
Water Distribution		
Construct the San Juan Bautista Transmission Pipeline	2022–2024	SJB, SBCWD
Complete Additional Operations Studies and Modeling to Provide Uniform Distribution of High-quality Water	Ongoing	City, SJB, SSCWD
Implement CIPs for Water Distribution System Improvements	Ongoing	City, SJB, SSCWD
Updates to Planning Documents		
Update Water System Operations TM	2022	All Agencies
Complete Master Plan Update	By 2027	All Agencies

AF – acre-feet, ASR – aquifer storage and recovery, CIP – capital improvement program, City – City of Hollister, CVP – Central Valley Project, mgd – million gallons per day, PREP – Pacheco Reservoir Expansion Project, SBCWD – San Benito County Water District, SJB – City of San Juan Bautista, TM – Technical Memorandum, USBR – U.S. Bureau of Reclamation, WRA – Water Resources Association of San Benito County, WTP – water treatment plant

Notes:

Refer to Table ES-2 for estimated costs.

1 Introduction and Background

In 2008, the original Hollister Urban Area Water and Wastewater Master Plan (2008 Master Plan) was prepared to provide a long-term vision of water, wastewater, and recycled water management activities and infrastructure improvements for the Hollister Urban Area (HUA). The effort was a regional collaboration undertaken by local agencies including the City of Hollister, San Benito County, the San Benito County Water District, and the Sunnyslope County Water District under a Memorandum of Understanding (MOU).

In 2017, the 2008 Master Plan was updated with a decade of changes in water use patterns, economic activity, water supply (drought), development in the HUA, and State of California–mandated water quality regulations. This update, the Hollister Urban Area Water and Wastewater Master Plan Update, which was completed in 2017 (2017 Master Plan Update), refreshed water demand and wastewater flow projections, balanced supply portfolios to meet water quality objectives, and identified new capital improvement projects. The planning period was through 2035, and an update was recommended after 5 years.

Since 2017, the City of San Juan Bautista (SJB) has joined the MOU, drought conditions have continued, California adopted the Sustainable Groundwater Management Act, and the landscape of future water supply options has evolved. Given these changes, it is appropriate to update the 2017 Master Plan Update. This report, the 2022 San Benito Urban Areas (SBUA) Water Supply and Treatment Master Plan (Master Plan Update), provides water demand projections through 2045 and provides an updated strategy for near- and long-term water supply and treatment. Unlike the past master plans, this Master Plan Update focuses on drinking water supply and treatment planning. Wastewater and recycled water infrastructure will be updated in a future update.

Figure 1-1 illustrates the timeline of the development of previous master plans. The following subsections summarize the historical planning documents, describe ongoing planning efforts and programs, and present the objectives and scope for this Master Plan Update.

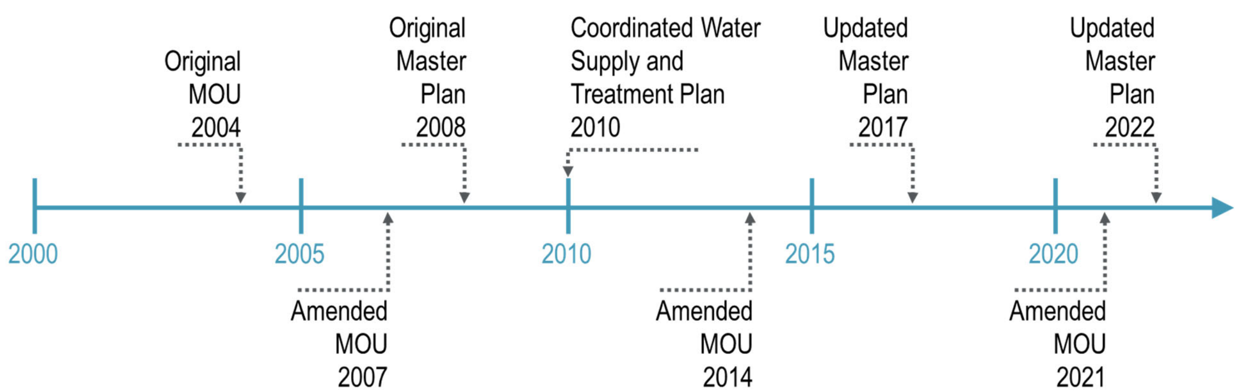


Figure 1-1. Major Milestones of Planning Development

1.1 2008 Master Plan

The 2008 Master Plan provided a comprehensive plan and implementation program to meet the existing and future water resources needs of the HUA. The 2008 Master Plan was a major milestone for regional cooperation and coordination of water, wastewater, and recycled water facilities.

1.1.1 2004 Memorandum of Understanding

The 2008 Master Plan was initiated through the 2004 Memorandum of Understanding (2004 MOU) developed among the City of Hollister (City), San Benito County (County), and the San Benito County Water District (SBCWD). The 2004 MOU was subsequently amended in 2008 to include the Sunnyslope County Water District (SSCWD).

1.1.2 Goals and Objectives

The 2004 MOU described the principles, objectives, and assumptions that formed the basis of the 2008 Master Plan and focused on the following goals:

- Improve municipal, industrial, and recycled water quality.
- Increase the reliability of the water supply.
- Coordinate infrastructure improvements for water and wastewater systems.
- Implement the goals of the Groundwater Management Plan.
- Integrate recommendations of the Long-term Wastewater Management Plans with the Master Plan.
- Support economic growth and development consistent with the City of Hollister and San Benito County General Plans and Policies.
- Consider regional issues and solutions.

1.1.3 Regional Approach and Agency Collaboration

The 2004 MOU also established the institutional framework for completing the 2008 Master Plan. A Governance Committee was established for overall direction, policy directives, and decision-making. The Governance Committee consists of two elected officials from each agency. A Management Committee was also established for day-to-day management and resolution of planning and technical issues. The Management Committee consists of one staff member from each agency and a program manager. This institutional framework enabled the agencies to work collaboratively in developing overall, regional solutions.

1.1.4 Planning Process

A comprehensive planning process was used to develop and evaluate a wide range of alternatives for integrated water resources management, as illustrated in Figure 1-2. The planning process involved establishment of the basis of planning, development of and initial screening of concepts, and final evaluation of alternative plans.

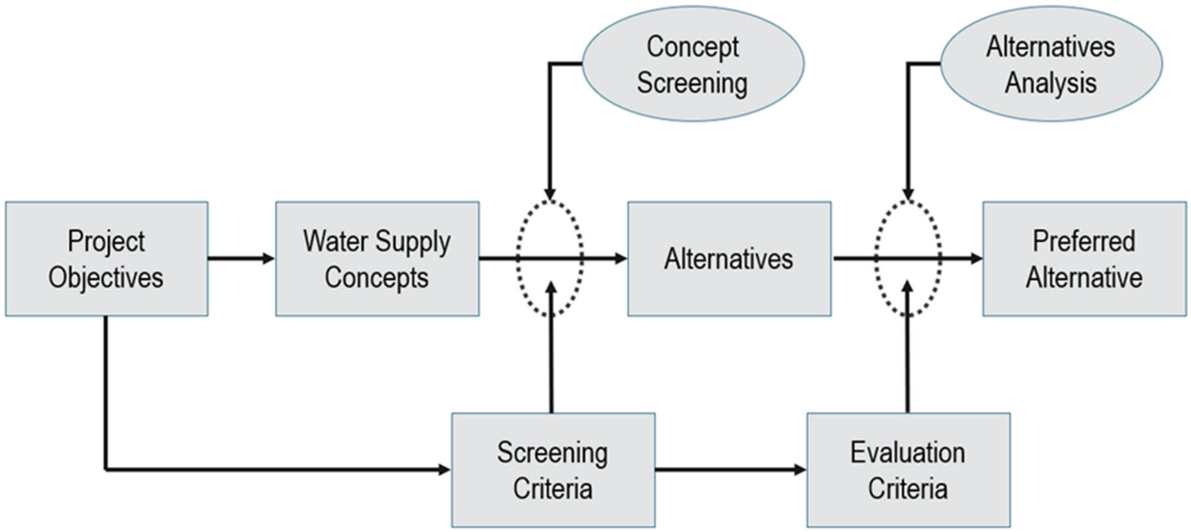


Figure 1-2. Comprehensive Planning Process

1.2 2009 Coordinated Water Supply and Treatment Plan

In 2009, the Coordinated Water Supply and Treatment Plan (Coordinated Plan) was completed. The purpose of the Coordinated Plan was to refine the water supply and treatment recommendations from the 2008 Master Plan. Water supply and treatment were determined to be the critical first step in the implementation program.

The Coordinated Plan recommended the following:

- Upgrade the existing Lessalt Water Treatment Plant (WTP).
- Construction of the new West Hills WTP.
- Firm up the existing imported municipal and industrial (M&I) surface water supply from the Central Valley Project (CVP).
- Further investigate a conjunctive-use project with local surface water supplies and groundwater in the North County area.

1.3 2014 Memorandum of Understanding

Because the goals of the 2008 Master Plan were largely achieved, the agencies recognized that a new MOU was needed to update the 2008 Master Plan and continue planning for the future. The 2014 MOU was developed among the City, SBC, SBCWD, and SSCWD to facilitate and guide this update.

The 2014 MOU incorporated the principles, objectives, and assumptions from the 2004 MOU. In addition, the following issues were identified for evaluation in the next master plan:

- Update water demand and wastewater flow projections.
- Review and evaluate previously identified long-term water supply options.

- Review drinking water goals for total dissolved solids (TDS) and hardness.
- Review goals for recycled-water TDS.
- Evaluate the need, timing, and estimated cost of the following facilities and activities:
  - Expansion of the West Hills WTP,
  - Crosstown Pipeline,
  - Demineralization or Softening at Municipal Groundwater Wells,
  - Modifications to and/or expansion of the City's Water Reclamation Facility and the SSCWD Ridgemark Wastewater Treatment Plant,
  - Expansion of the recycled water system, and
  - Major infrastructure improvements to the water distribution system and the wastewater collection system.

The 2014 MOU also reaffirmed the institutional framework and responsibilities of the Governance and Management Committees.

1.4 2017 Master Plan Update

The 2017 Master Plan Update presented water demand and wastewater flow projections through 2035 considering economic, climate, and water usage changes since the 2008 Master Plan. The 2017 Master Plan Update addressed the issues identified in the 2014 MOU and recommended the following supply augmentation and facility expansion projects:

- Further investigate local surface water supply and storage.
- Complete feasibility and environmental studies for the North Area Groundwater Project.
- Identify a location for a new well with wellhead treatment in the north part of the City's distribution system to provide high-quality drinking water and improve fire suppression flow.
- Expand the West Hills WTP to continue to improve the water quality of the municipal supply and to meet the demands of new connections.
- Connect City Wells Nos. 4 and 5 to the West Hills WTP transmission pipeline and construct the Crosstown Pipeline to extend the reach of high-quality water and address hexavalent chromium concerns.
- Add flow equalization at the City's WRF to improve recycled water production.
- Expand the recycled-water distribution system to new customers, as needed.

Many of these projects have been completed, and the need and timing for those that have not been completed are further evaluated and updated in this Master Plan Update.

1.5 2021 Memorandum of Understanding

In 2020, SJB was fined by the U.S. Environmental Protection Agency (EPA) for violating discharge limits at its wastewater facility. The violations were in part due to the wastewater influent being high in sodium, chlorides, and TDS concentrations. Such influent is a result of poor-quality water for domestic use. As part of the resolution and to reach settlement with the EPA, SJB evaluated options for higher-quality source water for its municipal customers and reached an agreement with SBCWD to divert treated water from the West Hills WTP.

The 2021 MOU continues the institutional collaboration among the City, SBC, SBCWD, and SSCWD, and adds SJB as a partner in future master plan updates and facility planning.

1.6 Related Planning Activities

Several recently completed or ongoing planning activities are related to this Master Plan Update. All work completed for this Master Plan Update was closely coordinated with these related planning activities.

1.6.1 2020 Hollister Urban Area Urban Water Management Plan

The 2020 HUA Urban Water Management Plan (UWMP) was prepared as a collaborative effort among the City, SSCWD, and SBCWD. The plan was prepared in accordance with the Urban Water Management Planning Act and guidelines prepared by the Department of Water Resources (DWR). The 2020 UWMP is intended to help guide the area’s future water management efforts.

The plan builds on and updates the 2015 UWMP by accounting for changes in the California Water Code and local planning and water management efforts. Updates include the Drought Reliability Assessment, quantification of demand reduction of the Water Shortage Contingency Plan, and detailed consideration of supply reliability by source.

1.6.2 San Juan Bautista Water Master Plan

In November 2020, SJB published its Water Master Plan. The SJB Water Master Plan summarizes that the current water supply is largely groundwater and faces several water quality challenges. To meet future demands and to secure more-reliable and higher-quality water, the SJB Water Master Plan recommends constructing a transmission pipeline and associated facilities to connect SJB’s distribution system to SBCWD’s West Hills WTP. The Water Master Plan also provides an updated water demand projection through 2045 based on the latest land use information and consumption data.

1.6.3 City of Hollister Water Distribution System Master Plan

In 2018, the City completed the master planning of its distribution system. The plan addresses existing deficiencies in the water distribution system based on latest standards and requirements, addresses deficiencies in the distribution system to meet future build-out needs, and provides a prioritized capital improvement program and list of recommended projects. The plan revealed that several locations cannot meet 50 percent of the required fire suppression flow. These locations include East Street, Walnut Lane, and the industrial area surrounding the Hollister Municipal Airport.

1.6.4 Groundwater Sustainability Plan (GSP)

The Sustainable Groundwater Management Act (SGMA) of 2014 provides a process and timeline for sustainable management of groundwater basins by local agencies. The SGMA applies to groundwater basins or subbasins designated by DWR as high or medium priority, such as the Hollister, San Juan Bautista, and Bolsa subbasins, which are managed by SBCWD. It requires establishing one or more Groundwater Sustainability Agencies (GSAs) that encompass a basin or subbasin, developing one or more Groundwater Sustainability Plans (GSPs), and achieving groundwater sustainability within 20 years.

The Hollister, San Juan Bautista, and Bolsa subbasins of the Gilroy-Hollister Basin have been ranked as medium priority and thus are subject to the SGMA. In addition, the adjacent Llagas subbasin of the Gilroy-Hollister Basin (Santa Clara County) has been ranked as high priority, and the Pajaro Valley Groundwater Basin (which overlaps Santa Cruz, Monterey, and San Benito counties) has been ranked as high priority. Moreover, the Pajaro Valley Groundwater Basin has been designated as critically over-drafted. This has important ramifications for preparing and implementing GSPs; specifically, GSPs for such over-drafted basins must be adopted with implementation underway by 2020 (2 years early), and sustainability must be achieved by 2040.

After 3 years of preparation, public workshops, and technical reviews, the North San Benito GSP was adopted by the SBCWD Board of Directors in November 2021. In this GSP, the Bolsa, Hollister, San Juan Bautista subbasins of the Gilroy-Hollister Basin and the Tres Pinos Valley Basin form the North San Benito Basin. The GSP provided recommended projects and management actions to improve long-term basin health. The two recommended projects were the Pacheco Reservoir Expansion Project (PREP) and expanding the Managed Aquifer Recharge (MAR) project.

The GSP was funded via the Sustainable Groundwater Management Planning Grant, and SBCWD obtained additional grant funding to site, design, and install dedicated monitoring wells and a feasibility study for the MAR to supplement groundwater recharge. The feasibility study compared two alternatives of MAR methods and recommended the Aquifer Storage and Recovery (ASR) alternative to expand SBCWD's groundwater recharge practices.

1.6.5 Pacheco Reservoir Expansion Project (PREP)

The PREP is a collaborative effort among Valley Water, SBCWD, and the Pacheco Pass Water District (PPWD). The project will establish a new dam and expanded reservoir on the North Fork of Pacheco Creek. The existing dam and reservoir were constructed in 1939 and have been used for supplemental groundwater recharge along Pacheco Creek.

The PREP would increase Pacheco Reservoir's operational capacity from 5,500 acre-feet (AF) up to 140,000 AF. A Draft Environmental Impact Report (EIR) was released for public review in November 2021.

SBCWD entered into an MOU with Valley Water in 2019 to support the implementation of PREP. Under the interagency agreement, SBCWD would participate in the project at levels ranging from 2.5 to 10 percent and would receive an equivalent share of the storage volume. The PREP was originally estimated to cost $1.1 billion, but costs have grown, and it is currently estimated at $2.5 billion. The PREP will receive $500 million of grant funding under the State's

Water Quality, Supply, and Infrastructure Act of 2014 (Proposition 1) and has qualified for a loan under the Water Infrastructure Finance and Innovation Act.

1.6.6 B.F. Sisk Dam Seismic Retrofit and Raise

The B.F. Sisk Dam Safety of Dams Modification Project could also include raising the dam that creates San Luis Reservoir. This project, which is being developed by USBR and DWR, is intended to reduce seismic risk and increase water storage behind the dam. Construction is scheduled for completion in 2031.

SBCWD diverts its CVP allocations from San Luis Reservoir. During elongated drought conditions, the future reliability of annual CVP imports is uncertain. Therefore, SBCWD has considered participating in the B.F. Sisk Dam Raise project to increase storage capacity for carryover storage of surface water allocations in years when excess water is available.

1.7 Objectives and Scope for This Master Plan Update

The objectives, scope, approach, and key planning assumptions for this Master Plan Update are described in the following subsections. The emphasis for this Master Plan Update is on water supply and treatment. The wastewater and recycled water facilities will be addressed in a future update once the City of Hollister General Plan Update is complete and the Local Agency Formation Commission issues related to wastewater service area are resolved.

1.7.1 Objectives

The overall objectives of this Master Plan Update are the following:

- Provide continuous improvement toward achieving drinking water quality goals.
- Increase dry-year water supply reliability.
- Provide a reliable and sustainable water supply to respond to long-term growth needs.
- Coordinate with ongoing programs including SGMA related activities and the supply of treated surface water to SJB.
- Continue to address water needs through coordinated regional solutions.

1.7.2 Scope of Work

The Scope of Work for completing this Master Plan Update includes the following tasks:

- Task 1 – Update Water Demands
- Task 2 – Review Water Quality Goals
- Task 3 – Develop and Evaluate Long-term Water Supply Options
- Task 4 – Facilities Review, Evaluation, and Update
- Task 5 – Institutional and Financial Arrangements Support
- Task 6 – Project Management, Meetings, and Reports

1.7.3 Planning Approach

The planning approach for this Master Plan Update is similar to the approach used for past master plans, as shown in Figure 1-2.

1.7.4 Study Area

The study area developed by the agencies includes lands that are planned for future development that might require municipal and industrial water supply. The study area, shown in Figure 1-3, includes the original Hollister Planning Area boundary, which includes the Sphere of Influence adopted by the Local Agency Formation Commission, some adjacent lands, and the San Juan Bautista city limit.

1.7.5 Planning Period

The planning period for the 2022 Master Plan Update extends through 2045, which coincides with the planning horizon of the 2020 UWMP.

1.8 Abbreviations

To conserve space and improve the text, the following abbreviations have been used in this Master Plan Update:

2008 Master Plan	2008 Hollister Urban Area Water and Wastewater Master Plan
2017 Master Plan Update	2017 Hollister Urban Area Water and Wastewater Master Plan Update
Master Plan Update	San Benito Urban Areas Water Supply and Treatment Master Plan Update
ADD	average daily demand
ADRoP	Accelerated Drought Response Project
AF	acre-feet
AFY	acre-feet per year
Ag water	Agricultural CVP water
agencies	City of Hollister, San Benito County, San Benito County Water District, San Juan Bautista, and Sunnyslope County Water District
ASR	aquifer storage and recovery
CCI	Construction Cost Index
CCL	Contaminant Candidate List
CEQA	California Environmental Quality Act
CIP	Capital Improvement Program
City	City of Hollister
City Council	Hollister City Council
Coordinated Plan	2009 Coordinated Water Supply and Treatment Plan
County	San Benito County
CVP	Central Valley Project

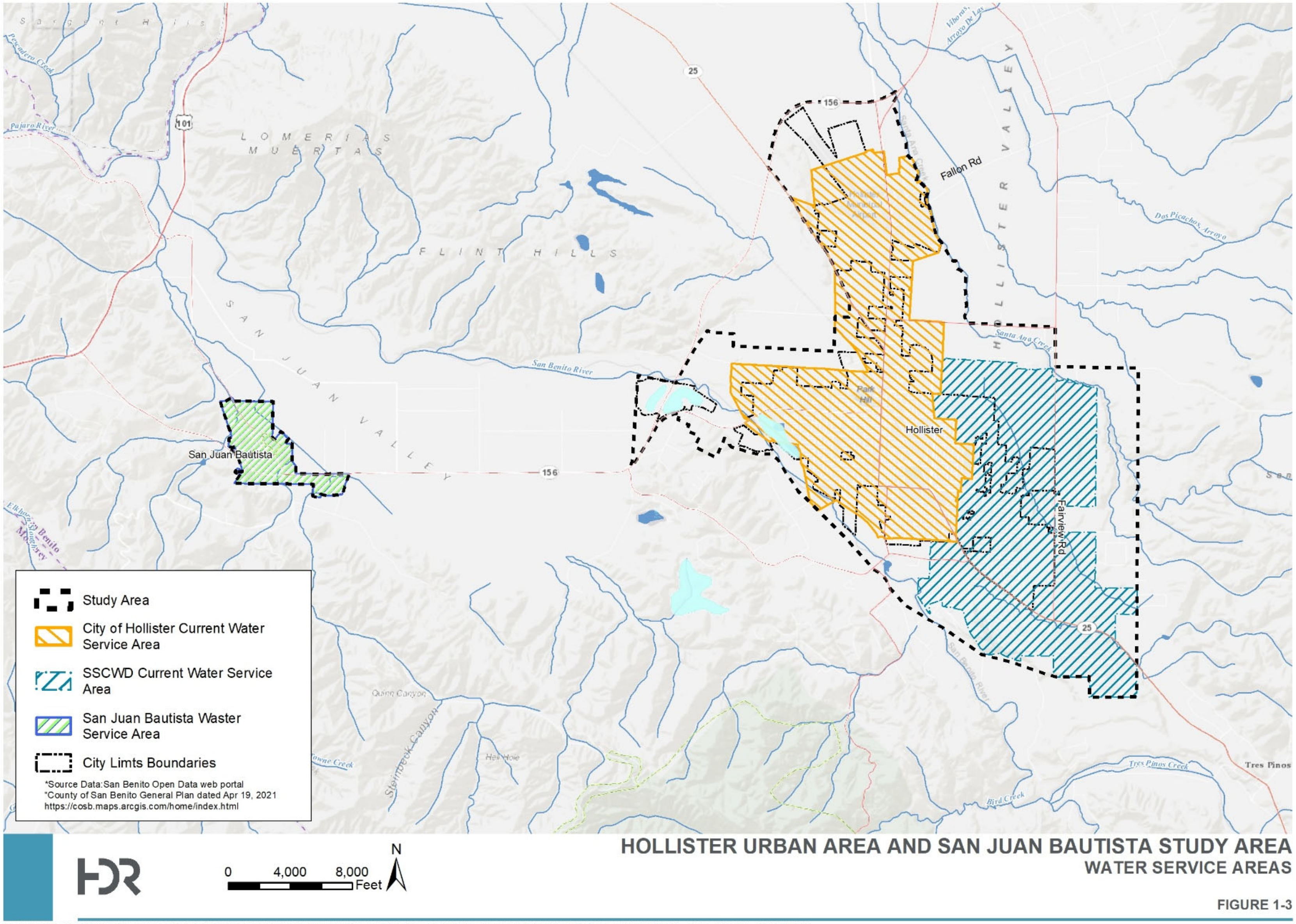


Figure 1-3. Study Area

DDW	California Division of Drinking Water
DWR	California Department of Water Resources
e.g.	for example
EIR	Environmental Impact Report
ENR	Engineering News-Record
EPA	U.S. Environmental Protection Agency
GMP	Groundwater Management Plan
gpd	gallons per day
gpm	gallons per minute
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
H&SC	Health and Safety Code
H:V	horizontal to vertical
HUA	Hollister Urban Area
i.e.	that is
I/I	inflow and infiltration
in	inch
IPR	indirect potable reuse
2008 Master Plan	2008 Hollister Urban Area Water and Wastewater Master Plan
2017 Master Plan Update	2017 Hollister Urban Area Water and Wastewater Master Plan Update
M&I	municipal and industrial
Master Plan Update	San Benito Urban Areas Water Supply and Treatment Master Plan Update
MAR	managed aquifer recharge
MCL	maximum contaminant level
MDD	maximum daily demand
MG or Mgal	million gallons
mg/L	milligrams per liter
mgd	million gallons per day
MMD	maximum month demand
NEPA	National Environmental Policy Act
NL	Notification Level
No.	number
O&M	operation and maintenance
OEHHA	California Office of Environmental Health Hazard Assessment

PFAS	per- and polyfluoroalkyl substances
PFBS	perfluorobutane sulfonic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
ppb	parts per billion
ppt	parts per trillion
PPWD	Pacheco Pass Water District
PREP	Pacheco Reservoir Expansion Project
RWQCB	California Regional Water Quality Control Board, Central Coast Region
SBC	San Benito County
SBCWD	San Benito County Water District
SBUA	San Benito Urban Areas
SCVWD	Santa Clara Valley Water District
SF	single family residential
SGMA	Sustainable Groundwater Management Act
SJB	City of San Juan Bautista
SRWS	self-regenerating water softener
SSCWD	Sunnyslope County Water District
State	State of California
State Board	California State Water Resources Control Board
SWP	State Water Project
SWTR	Surface Water Treatment Rule
TDS	total dissolved solids
Title 22	Title 22 of the California Code of Regulations
TM	Technical Memorandum
TSS	total suspended solids
U.S.	United States
USBR	United States Bureau of Reclamation
UWMP	Urban Water Management Plan
WDR	Waste Discharge Requirements
WRA	Water Resources Association of San Benito County
WRF	City of Hollister Water Reclamation Facility
WSE	water surface elevation
WTP	water treatment plant
yr	year

2 Improvements since the 2008 Master Plan

After the 2017 Master Plan Update was completed, the agencies collaborated to successfully implement major water projects for the benefit of the HUA. Water conservation and other water-related programs have also continued.

2.1 Water Supply Improvements

Significant actions have been taken to improve the reliability and sustainability of both surface water and groundwater supplies in the HUA.

2.1.1 Surface Water Supply

The following subsections describe the major activities related to improving the reliability of surface water supplies in the HUA.

2.1.1.1 CVP ALLOCATIONS

SBCWD gets the majority of its surface water supply through USBR's CVP and its facilities. The CVP allocations are stored at San Luis Reservoir. The San Felipe Project, a diversion system, conveys CVP water from San Luis Reservoir to the County. The CVP contract entitlements are 35,550 AF for agricultural use and 8,250 AF for municipal and industrial (M&I) customers. On an annual basis, CVP allocations are subject to the USBR's Shortage Policy[1], as established in 2017.

As described in the 2017 Shortage Policy, allocation of CVP water supplies for any given water year is based upon forecasted reservoir inflows and Central Valley hydrologic conditions, amounts of storage in CVP reservoirs, regulatory requirements, and management of supply yields in accordance with implementation of the Central Valley Project Improvement Act (CVPIA). During normal and wet years, M&I allocations may be 100 percent of the contract amount; however, during below normal, dry and critically dry years, the allocations may be reduced below the contract amount. More specifically, the 2017 Shortage Policy indicates the following impacts to the reliability of the CVP supply.

- During a shortage, M&I allocations are based on SBCWD's historical use, which is established as the average quantity of CVP water put to beneficial use during the last three years of unconstrained CVP water deliveries. SBCWD's current historical use is set at the M&I entitlement amount of 8,250 AFY.
- Before allocation of M&I water is reduced, the allocation of irrigation water will be reduced below 75 percent of contract total.
- When the allocation of irrigation water has been reduced below 75 percent and still further water supply reductions are necessary, both the M&I and irrigation allocations will be reduced by the same percentage increment. The M&I allocation will be reduced until it reaches 75 percent of historical use, and the irrigation allocation will be reduced until it

[1] Central Valley Project Municipal and Industrial Water Shortage Policy Guidelines and Procedures, USBR 2017

reaches 50 percent of irrigation contract total. The M&I allocation will not be further reduced until the irrigation allocation is reduced to below 25 percent of the contract total.

- Reclamation will strive to deliver M&I water at not less than the amount needed to meet the public health and safety (PHS) need, taking into consideration both CVP allocations and available non-CVP supplies, provided CVP water is available. The Shortage Policy defines how the PHS need is established, based on domestic, commercial/institutional, and industrial needs and includes an allowance for system losses.

Table 2-1 summarizes the CVP allocations for the period 2011 – 2020.

Table 2-1. Past M&I CVP Allocations

Year	Allocation Percent[1] (%)	Allocation Amount (AF)	Actual Amount Used[1] (AF)	Unused Supply (AF)
2011	100%	8,250	2,433	5,817
2012	51%	4,208	2,683	1,525
2013	47%	3,878	2,652	1,226
2014	34%	2,805	1,599	1,206
2015	25%	2,063	1,810	253
2016	55%	4,538	1,914	2,624
2017	100%	8,250	2,909	5,341
2018	75%	6,188	5,679	509
2019	100%	8,250	4,457	3,793
2020	70%	5,775	4,953	822
10 Year Average	**66%**	**5,420**	**3,109**	**2,311**
3 Year Minimum Average (2013–2015)	**35%**	**2,915**	**2,020**	**895**

AF – acre-feet

1. Source: Todd Groundwater, 2020 Annual Groundwater Report, Table E-1

SBCWD's contract with USBR also provides the provision to convert any, or all, of the Ag water entitlement to increase the 8,250 AFY M&I entitlement when the demand for M&I water grows beyond 8,250 AFY. As future M&I demands increase beyond the current entitlement, SBCWD should evaluate if a conversion from Ag to M&I is appropriate.

2.1.1.2 IMPORTED SURFACE WATER TRANSFERS / SPOT MARKET

Over the past decade, SBCWD has had an ongoing practice of purchasing out-of-basin water supplies to supplement its imported CVP supplies. These purchases have totaled 13,550 AF over the period.

Purchases are made, when available and cost-effective, from a variety of sources including irrigation districts north of the Sacramento–San Joaquin River Delta, the San Joaquin River Exchange Contractors, and other sources. These purchases range from single-year (spot market) purchases to multi-year agreements (typically up to 5 years).

2.1.1.3 SEMITROPIC WATER BANK

In February 2011, SBCWD entered into an agreement with Valley Water to participate in the Semitropic Water Bank. Under the terms of the agreement, SBCWD will deliver 5,000 AF of CVP contract water to Valley Water. Valley Water will then store that amount of its CVP contract water supply, less 10 percent losses imposed by the Semitropic Agreement, on behalf of SBCWD for future recovery.

With this arrangement, SBCWD is able to improve its ability to manage current and long-term water supplies, provide a reliable supply for the two surface water treatment plants (Lessalt and West Hills WTPs), and provide an additional source of water supply. However, retrieving that water during dry years is a challenge under some circumstances (e.g., restrictions on pump water out of the Sacramento-San Joaquin Delta) when water cannot be effectively ‘swapped’ with a water agency downstream of Semitropic.

2.1.2 Groundwater

Improvements have also been completed to increase the reliability and sustainability of groundwater supplies.

2.1.2.1 ENHANCED PERCOLATION

A variety of activities are ongoing for percolation to enhance groundwater supplies. Table 2-2 summarizes the percolation quantities during the past 5 years.

Table 2-2. Past Percolation Quantities Summarized by Source (AF)

Year	Reservoir Release for Percolation	Percolation of CVP	Percolation of Treated Wastewater Effluent	Total
2016	—	—	2,402	2,402
2017	25,598	2,549	2,177	30,324
2018	6,438	2,965	1,587	10,990
2019	17,969	5,043	1,986	24,998
2020	11,510	3,161	2,553	17,224

AF – acre-feet, CVP – Central Valley Project
Source: Todd Groundwater, 2020 Annual Groundwater Report, Appendix D

Percolation of CVP Water. In the past, CVP percolation was used to recharge the groundwater basin. CVP percolation peaked in 1997 and was reduced subsequently in response to the successful recovery of the groundwater basin from overdraft. Direct in-stream recharge of CVP water was suspended from 2008 to 2016 due to low CVP allocations and concern about the release of invasive Dreissenid (zebra) mussels, which had been discovered in San Justo Reservoir. SBCWD has resumed recharge at dedicated basins adjacent to streams.

Percolation of Local Surface Water. In most years, local surface water released from Hernandez and Paicines reservoirs is percolated along the San Benito River and Tres Pinos Creek. Releases of local surface water have been limited typically to percolation upstream of the confluence of the San Benito River and Tres Pinos Creek. This release has helped maintain groundwater levels without causing shallow groundwater problems and competing for available storage space with the City’s wastewater percolation ponds. In years when both Paicines and

Hernandez were dry for the entire year due to drought conditions, there were no releases for groundwater percolation.

Percolation at City's WRF. Treated wastewater effluent is percolated at the City's WRF and is also percolated at the SSCWD Ridgemark Wastewater Treatment Plant and by Tres Pinos Water District. SBCWD constructed an intertie to enable the diversion of excess CVP water to the percolation ponds on the west side of State Route 156 for percolation when the recycled water system is not in use.

2.2 Water Treatment and Distribution

Major improvements and additions have been completed to facilities for the treatment and transmission of surface water supplies. Major water facilities are shown in Figure 2-1.

2.2.1 Surface Water Treatment Plants

Treated surface water plants include the existing Lessalt WTP and the new West Hills WTP, which was completed in the fall of 2017.

2.2.1.1 LESSALT WATER TREATMENT PLANT

The Lessalt WTP, owned by SBCWD and operated by SSCWD under contract, was placed into operation in January 2003. The plant, shown in Figure 2-2, was upgraded in 2014 to comply with the requirements of the Disinfectants and Disinfection Byproducts Rule. The treated water is distributed to both City and SSCWD customers.

The plant has a rated capacity of 2.0 million gallons per day (mgd) capable of treating 2,240 AF of imported CVP supply annually. The plant has a short-term production capacity of up to 2.5 mgd.

2.2.1.2 WEST HILLS WATER TREATMENT PLANT

The West Hills WTP and associated transmission facilities are designed for an ultimate capacity of 9 mgd. The Phase 1 treatment and raw water pumping facilities were constructed with an initial capacity of 4.5 mgd in 2017. The plant, shown in Figure 2-3, has the following treatment objectives:

- Reliably meet all applicable drinking water regulations, in particular the Stage 2 Disinfectants and Disinfection Byproducts Rule.
- Remove total organic carbon from the source water such that byproducts formed during disinfection within the 14-day distribution system water age remain within the regulated limits.
- Provide pretreatment to reduce iron and manganese in the San Justo Reservoir source water.

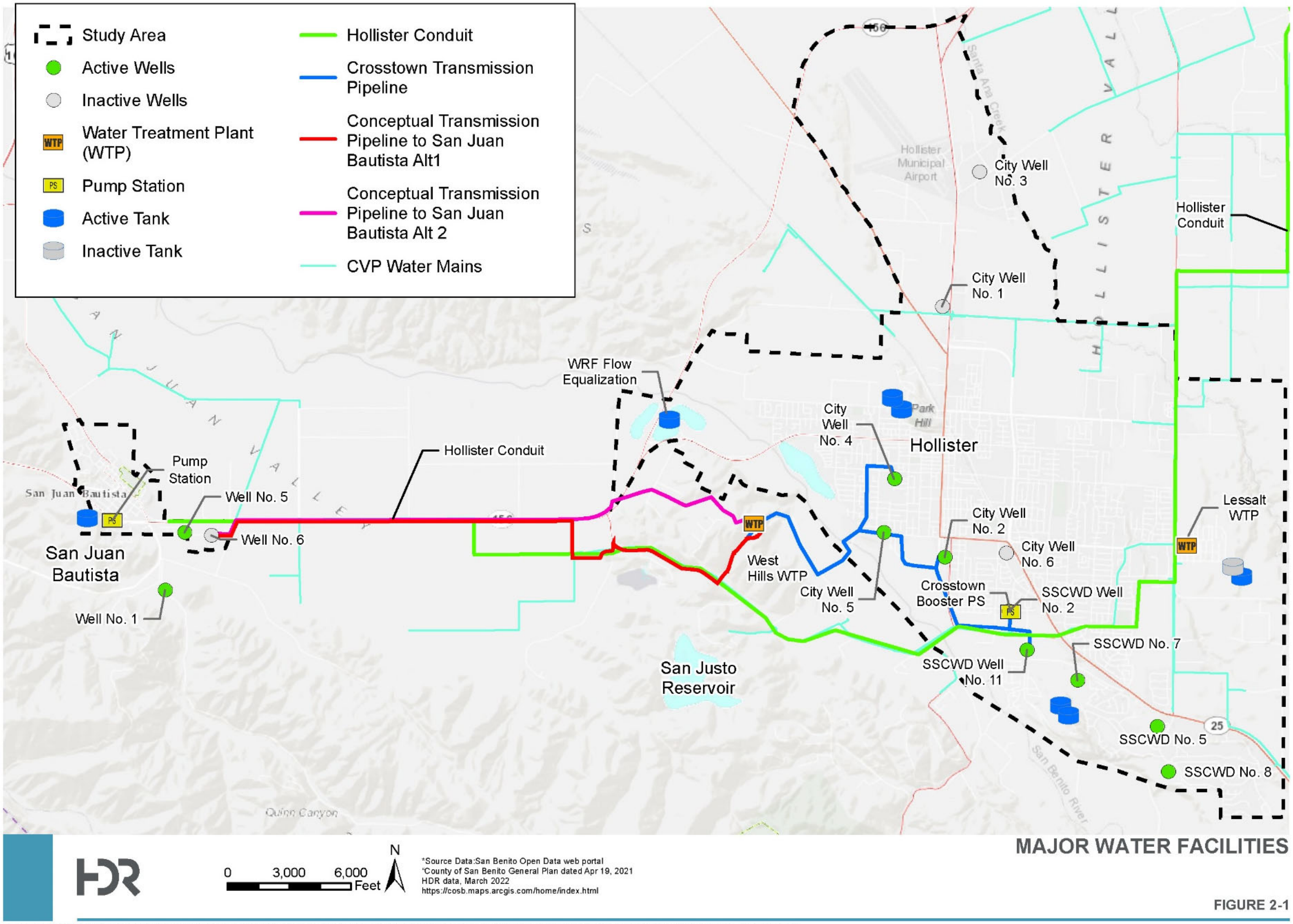


Figure 2-1. Major Water Facilities in the Study Area

The West Hills WTP process and facilities include a raw water pump station, raw water conveyance and treated water transmission pipelines, pre-oxidation for iron and manganese removal, ballasted flocculation clarification pretreatment with enhanced organics removal, conventional gravity filtration, chemical feed and storage, treated water storage tank, and solids handling systems. Water will be delivered from the Hollister Conduit to the plant. Once on-site, the primary treatment processes, storage tank, and the distribution system will operate by gravity. The treated water pipeline will connect to the existing City distribution system at City Well No. 5 and City Well No. 4. The Crosstown Pipeline project will include extending the transmission pipeline to the middle zone and City Well No.2.

Figure 2-2. Lessalt Water Treatment Plant

Figure 2-3. West Hills Water Treatment Plant

2.2.2 Transmission System Improvements

Since the West Hills WTP was completed, two key projects were completed to expand the distribution of high-quality surface water and to support compliance with the anticipated State hexavalent chromium maximum contaminant level (MCL).

2.2.2.1 CROSSTOWN PIPELINE

The Crosstown Pipeline was planned as a transmission pipeline to extend West Hills finished water to the middle zone of the distribution system. The treated surface water blends with

SSCWD and City groundwater wells, some of which are high in hexavalent chromium to address the would-be noncompliance of the hexavalent chromium MCL.

The recently completed Crosstown Pipeline ranges from 16 inches to 20 inches in diameter and spans approximately 2.5 miles in length. Pump stations and blending stations were constructed at existing well sites, City Well No.2, SSCWD Well No.2 and SSCWD Well No.11 to facilitate blending. Specifically, the blending at SSCWD Well No. 11 allows the well to operate at its target pumping rate to provide hexavalent-chromium-compliant water for blending with certain City wells if the WHWTP is down.

2.2.2.2 WEST HILLS WTP CONNECTION TO WELL NO.2, WELL NO. 4 AND WELL NO. 5

The City blends water from three of its well sites, City Well No. 2, City Well No. 4 and City Well No. 5, with the high-quality water from the West Hills WTP to improve water quality and to address the would-be noncompliance of the hexavalent chromium MCL. The 20-inch transmission pipeline from West Hills bifurcates to a 16-inch pipe at San Benito Street and River Parkway to connect with City Well No. 2; to a 12-inch pipe along Westside Boulevard to connect with City Well No. 4, and similarly bifurcates to a 12-inch pipe near the connection to the City's distribution to connect with City Well No. 5.

2.3 Water Conservation

Water conservation is an important tool to manage demands in the HUA. During the multi-year drought, the State mandated water retailers to reduce their demand. Water conservation efforts are led by the Water Resources Association (WRA).

Assembly Bill 1668 and Senate Bill 606 built on California's efforts to make water conservation a way of life and created a new foundation for long-term improvements in water conservation and drought planning. Assembly Bill 1668 and Senate Bill 606established guidelines for efficient water use and a framework for implementing and overseeing the new standards, which must be in place by 2022. The two bills strengthen the state's water resiliency in the face of future droughts with provisions that include the following:

- Establishing water use objectives and long-term standards for efficient water use that apply to urban retail water suppliers
- Providing incentives for water suppliers to recycle water
- Identifying small water suppliers and rural communities that might be at risk of drought and water shortage vulnerability and providing recommendations for drought planning
- Requiring both urban and agricultural water suppliers to set annual water budgets and prepare for drought

During the 2010–2017 drought, several Executive Orders were made to respond to the record dry conditions. Most prominently, on April 1, 2015, an Executive Order mandated water reduction in urban areas to reduce potable urban water usage by 25 percent statewide. The City and SSCWD were required to submit their monthly water demand reduction accomplishments to the State Water Resources Control Board to document their respective achievements in reducing water demand. The City and SSCWD had reduced 26.4 percent and 36.2 percent from their respective 2013 water use, thereby surpassing the mandated conservation requirement.

Other ongoing water conservation programs include the following:

- Landscape Hardware Rebates
- Free Water-Wise Landscape Plans
- Water Softener Assistance and Rebate Program
- Free Home Water Checkups
- Irrigation Assistance
- Toilet Replacement Program
- Education program (workshops; school programs that includes field trips to a water treatment plant and wastewater facility [transportation paid by WRA]; supplying a speaker to service organizations and government entities to explain water issues in San Benito County)
- Outreach programs including ads in local newspapers, bill inserts, newsletters, the San Benito County Fair, Water Awareness Month (May), a Water-Wise demonstration garden, a water conservation library for public use, the WRA website, water efficient landscape plans, and internet and print ads in the *Hollister Free Lance* newspaper and website

These ongoing water conservation programs have successfully reduced water demand in the HUA. However, some of these measures might be reaching saturation. For example, the number of remaining toilets eligible for rebates is limited, since many residents have already installed low-flow toilets. It is important to continue and diversify these plumbing and landscape conversion programs and public outreach to encourage the public to continue to use water wisely.

Together, the state-ordered demand reduction coupled with the expansion of ongoing water conservation efforts has successfully lowered water demand in the HUA.

2.4 Other Programs

In addition to the improvements and water conservation programs described above, the following programs were also implemented to improve water quality and water conservation awareness in the HUA.

2.4.1 Water Softener Rebate Programs

Since 2008, a program has been in place to issue rebates to those water customers who remove a self-regenerating water softener (SRWS) without replacement ($300) or with transition to an off-site exchange service ($250). In July 2014, the City also enacted an ordinance that prohibits installing new SRWSs that use sodium and/or potassium salts. SSCWD also adopted a new code through Ordinance #79 prohibiting new or replacing existing SRWSs. The intent of these programs is to remove salt from the wastewater, thereby improving the resulting recycled water and reducing salt loading to the groundwater basin through percolation.

2.4.2 Irrigation Education

SBCWD, in collaboration with WRA, has offered classes since 2009 on irrigation efficiency and other agriculture practices. These classes provide concepts, tools, and examples for optimizing irrigation and nitrogen management efficiency in row, tree, and greenhouse crop production. The classes also focus on keeping records and acquiring data needed for water quality regulation and reporting.

WRA also offers classes to residential customers. These classes instruct customers on topics such as efficient irrigation practices, converting landscapes to be water-wise, and composting.

3 Projected Water Demands

Demand projections are required for this Master Plan Update to identify future urban water supply needs for the planning horizon of 2045. The demand projections presented in this section follow the framework set by previous studies. The detailed analysis was documented in a technical memorandum that is included in Appendix A.

The existing average annual water demands for the SBUA are approximately 5,560 AFY based on the production data from 2018 to 2019. 2020 was excluded due to the singularity of the pandemic. The annual water demand is projected to increase to approximately 9,190 AFY by 2035 and to approximately 12,500 AFY by 2045, as illustrated in Figure 3-1. By comparison, the 2017 Master Plan Update projected that the annual water demand would be 10,170 AFY by 2035. The decrease in projected future demands is attributed to changes in consumer behavior due to the success of the conservation program, reduced consumption due to increasing water rates, and delayed population growth in the SBUA. The significant difference between the recent demands illustrated in Figure 3-1 and the estimated 2021 demand is due to including SJB's demand, which is 314 AFY for 2021, in the projected demands.

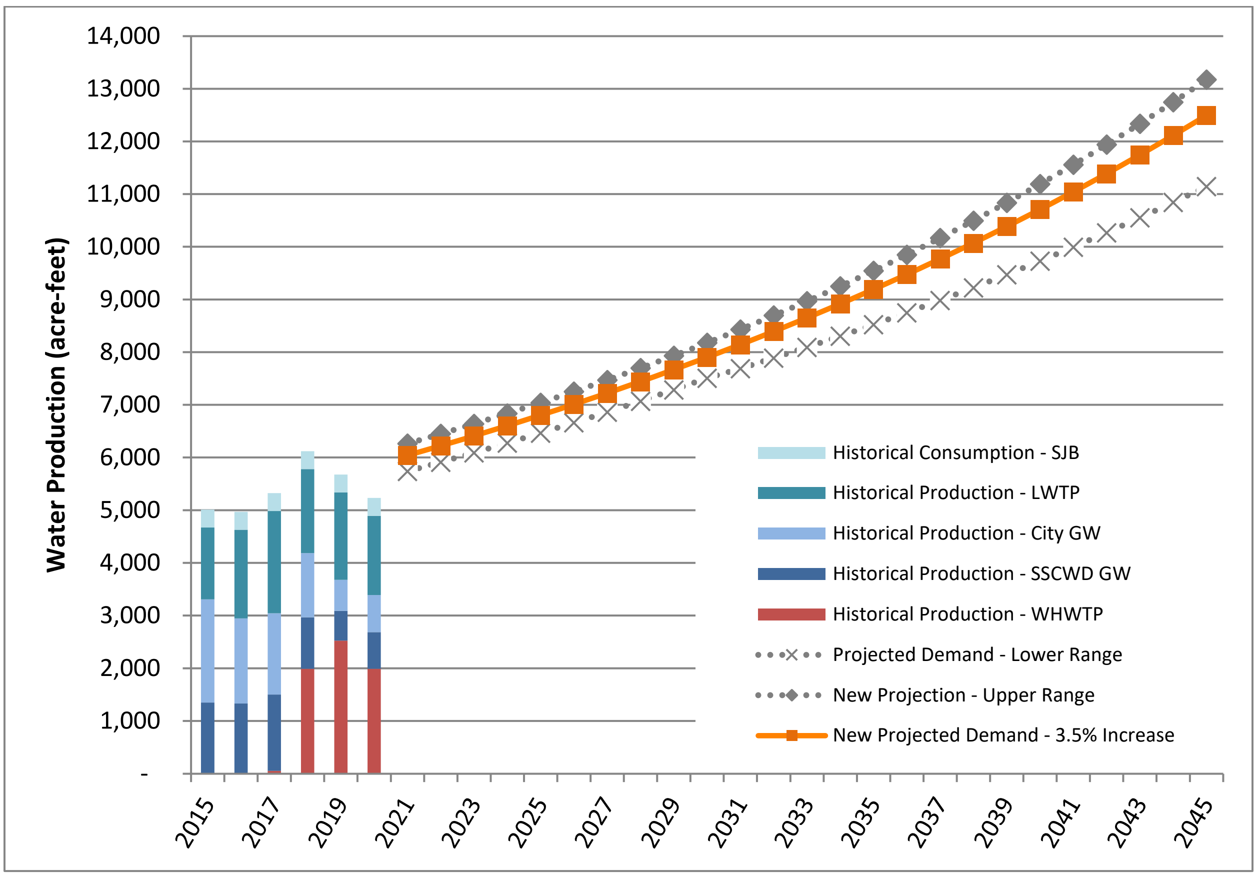


Figure 3-1. Past Production and Projected Water Demands

Due to the inherent uncertainty in projecting future conditions, a range is presented in Figure 3-1. The upper band of the range is the demand projection based on a 4 percent annual population increase in the City and SSCWD service areas plus San Juan Bautista's estimated demands. The lower band uses a lower unit factor of 0.25 AFY per single-family residence based on recent water consumption data. This reflects the consideration of efficient water use and smaller new homes and landscape areas in the future. Due to this uncertainty, it will be important to revisit demand forecasts every five years such that the new water supply infrastructure needed to serve the future demand is implemented in a timely manner.

Compared to the 2017 Master Plan Update, there are two major changes in the water demand projection. The first is that a 3.5 percent annual population growth rate is used compared to the 4 percent rate used in the previous plan. Regional and local planning documents suggest that the region, especially the urban areas, will continue to experience growth but at a slower rate compared to what was previously predicted. The second significant change is the inclusion of SJB since the 2021 MOU. Table 3-1 summarizes the updated water demand projection at 5-year increments through 2045.

Table 3-1. Projected Annual Demand, ADD, MMD, MDD

	Existing (Average of 2018 and 2019)	2025	2030	2035	2040	2045
Annual Water Demand (AFY)						
SSCWD	2,417	2,813	3,274	3,817	4,461	5,217
City	3,142	3,657	4,256	4,963	5,799	6,783
SJB	—	340	372	410	451	496
Total Annual Demand[1]	**5,560**	**6,810**	**7,900**	**9,190**	**10,710**	**12,500**
Demand on Water Production Facilities (mgd)						
Average Day (ADD)	5.0	6.1	7.1	8.2	9.6	11.2
Max month (MMD)[2]	7.4	9.1	10.6	12.3	14.3	16.7
Max day (MDD)[3]	9.9	12.2	14.1	16.4	19.1	22.3

ADD – average daily demand, AF – acre-feet per year, City – City of Hollister, MDD – maximum daily demand, MMD – maximum month demand, SJB – City of San Juan Bautista, SSCWD – Sunnyslope County Water District

Notes:

1. Values are rounded.
2. Maximum month demand (MMD) is estimated at 1.5 times average day demand (ADD).
3. Maximum day demand (MDD) is estimated at 2.0 times ADD.

4 Long-Term Water Supply

Northern San Benito County has a diverse and complex water supply composed of imported surface water from San Luis Reservoir, a substantial groundwater basin, numerous river and creek channels for groundwater recharge, and opportunities for water recycling. However, imported surface water supplies are subject to reduced deliveries due to drought and environmental constraints in the Sacramento–San Joaquin River Delta. Municipal groundwater supplies are high in TDS and hardness and in some areas have hexavalent chromium concentrations that exceed California Division of Drinking Water (DDW) standards. Although DDW has not officially published an MCL for hexavalent chromium, both SSCWD and the City have prepared compliance plans, as documented in the 2017 Master Plan Update.

To meet increased water demands and achieve the reliability and water quality objectives for the SBUA, long-term water supply options have been developed and evaluated.

4.1 Existing Water Supply Sources

Water supplies for the SBUA currently include local groundwater, imported surface water, and recycled water, as described in the following subsections.

4.1.1 Groundwater

The HUA overlies the Gilroy-Hollister groundwater basin, designated as DWR Basin No. 3-3. The San Benito County portion of the basin is bounded by the Pajaro River in the north, the Diablo Range on the east, and the Gabilan Range to the southwest. The basin covers 200 square miles of the Pajaro River watershed and is drained by its tributaries, most notably the San Benito River.

The total groundwater storage in the Gilroy-Hollister groundwater basin is estimated to be approximately 500,000 AF within the upper 200 feet of the basin. Previous estimates of the groundwater safe yield range from 40,000 to 54,000 AFY.

Both the City and SSCWD use groundwater wells for M&I supply. In 2020, the City and SSCWD pumped a combined total of 1,401 AF (707 AF and 694 AF, respectively) from the groundwater basin.[2]

The groundwater has a high mineral content with some wells exceeding 1,000 milligrams per liter (mg/L) TDS compared to the California recommended secondary drinking water standards of 500 mg/L TDS. Hardness in existing M&I groundwater supplies ranges from 300 to 400 mg/L, which is considered very hard and can lead to customers using water softeners. All active City wells and one SSCWD well (Well No. 7) would exceed the 10.0 parts per billion (ppb) for the hexavalent chromium MCL if the regulation is adopted.

Each water year, SBCWD oversees the preparation of an Annual Groundwater Report that describes current groundwater conditions. The report documents water supply sources and use, groundwater levels and storage, and management activities over the water year (October to

[2] Data source: SBCWD, 2020 Urban Water Management Plan

September). Recommendations are provided regarding the future surface water imports, groundwater replenishment, groundwater pumping, and groundwater charges.

As described in Section 1.6.4, the SBCWD Board of Directors adopted the GSP for local subbasins affected by the Sustainable Groundwater Management Act. The plan recommends expanding surface water storage and managed aquifer recharge projects to protect North San Benito Basins' long-term health and sustainability.

SJB owns and operates a domestic water system that consists of two active groundwater wells, Well 1 and Well 5. The local groundwater is high in nitrite and hardness. From 2015 to 2017, the average groundwater production ranged between 0.2 to 0.24 MGD. Well efficiencies fluctuate with water depths through droughts, normal or wet years.

4.1.2 Surface Water

SBCWD purchases imported CVP surface water from USBR. SBCWD's contract with USBR is for a total supply of 43,800 AFY, of which 35,550 AFY is for agricultural use and 8,250 AFY is for M&I use. The current contract was effective in March 2021 and may be terminated upon mutual consent. The contract provides the provision to convert any, or all, of the agricultural entitlement to increase the 8,250 AFY M&I entitlement when the demand for M&I water grows beyond 8,250 AFY. As future M&I demands increase beyond the current entitlement, SBCWD should evaluate if a conversion from Ag to M&I is appropriate.

As described in Section 2.1.1.1, the CVP supply is governed by the USBR's 2017 Shortage Policy in years when a shortage condition is triggered. In such years, the available CVP supply is allocated based on a percentage of historical use. SBCWD's historical use is set at the full M&I entitlement amount of 8,250 AFY. However, under extreme drought conditions, the USBR's Shortage Policy allows allocation to be reduced to the PHS need, or lower depending on the available supply in the overall system.

CVP water is imported through the Sacramento–San Joaquin River Delta to San Luis Reservoir and conveyed through the Hollister Conduit, which is part of the San Felipe Project. The Hollister Conduit is a pressurized pipeline consisting of 60-inch-diameter and 42-inch diameter pipeline. The Hollister Conduit has a design capacity of 83 cubic feet per second and extends approximately 19.5 miles from the bifurcation with the Santa Clara Conduit to the terminus at San Justo Reservoir. San Justo Reservoir is located south of Hollister and has a storage capacity of 10,300 AF, which is used to store imported water deliveries until they are needed. Typically, the agricultural demand is highest during the warmer months, while deliveries occur throughout the year. Half of the storage capacity is allocated for agriculture, while the other half is for M&I supply. Due to the configuration of the outlet structure, approximately 2,000 AF of storage is dead storage. SBCWD estimates that water stored in San Justo Reservoir is subject to a loss rate of approximately 15 percent per year due to evaporation and seepage.

Imported water is delivered to agricultural, municipal, and industrial customers through 120 miles of pressurized laterals and is also released at controlled rates to local percolation basins for percolation and recharge of the groundwater basin.

SBCWD can divert up to 10 percent of the total CVP contract amount as carryover water and keep that stored in San Luis Reservoir for the following year. Carryover water held in San Luis Reservoir can be stored for only 1 year and is subject to evaporation losses. Further, that water has a lower priority for delivery during the following year. For this reason, if USBR is unable to make deliveries of its contract allocations in the following year, the carryover storage will not be available. In addition, if supplies exceed capacity, carryover water is the first to be “spilled.”

4.2 Long-term Water Supply Need

The need for a reliable long-term water supply is driven by water quantity and water quality needs for the SBUA.

4.2.1 Water Quantity

As described in Section 3, water demands for the SBUA are projected to increase from an existing 5,560 AFY to approximately 12,500 AFY by 2045, resulting in an increase of 6,940 AFY over the planning period.

An evaluation of future water supply needs under various hydrologic conditions was completed as part of the 2020 UWMP. The results of that evaluation are summarized in Table 4-1, Table 4-2, and Table 4-3. The demand forecast presented in the following tables is similar in comparison to the updated projections presented in Section 3, with a normal-year 2040 demand of 10,857 AFY below versus an updated demand of 10,710 AFY in Section 3.

Table 4-1. Normal-year Supply and Demand (AFY)

Normal Year	2025	2030	2035	2040
Supply Total	6,968	8,149	9,484	10,857
CVP	5,388	5,388	5,388	5,388
Groundwater	1,480	2,661	3,996	5,369
Recycled Water	100	100	100	100
Demand Total	6,968	8,149	9,484	10,857
Difference	0	0	0	0
Required Conservation	0%	0%	0%	0%

AF – acre-feet per year, CVP – Central Valley Project
Source: 2020 Hollister Urban Area Urban Water Management Plan, Tables 4-3a, b, c; Tables 6-9a, b, c

Table 4-2. Single Dry-year Supply and Demand (AFY)

Single Dry Year	2025	2030	2035	2040
Supply Total	6,272	7,335	8,536	9,772
CVP	3,013	3,013	3,013	3,013
Groundwater	1,919	2,222	3,423	4,659
CVP Supplemental	1,240	2,000	2,000	2,000
Recycled Water	100	100	100	100
Demand Total	6,272	7,335	8,536	9,772
Difference	0	0	0	0
Required Conservation	0%	0%	0%	0%

AF – acre-feet per year, CVP – Central Valley Project
Source: 2020 Hollister Urban Area Urban Water Management Plan, Table 7-3

Table 4-3. Multiple Dry Years Supply and Demand (AFY)

Multiple Dry Year 1	2025	2030	2035	2040
Supply Total	6,271	7,334	8,535	9,771
CVP	4,126	4,126	4,126	4,126
Groundwater	1,919	1,919	2,059	3,295
CVP Supplemental	126	1,189	2,250	2,250
Recycled Water	100	100	100	100
Demand Total	6,271	7,334	8,535	9,771
Difference	0	0	0	0
Required Conservation	0%	0%	0%	0%
Multiple Dry Year 2	**2025**	**2030**	**2035**	**2040**
Supply Total	6,272	7,335	8,536	9,772
CVP	3,904	3,904	3,904	3,904
Groundwater	1,919	1,919	2,282	3,518
CVP Supplemental	349	1,412	2,250	2,250
Recycled Water	100	100	100	100
Demand Total	6,272	7,335	8,536	9,772
Difference	0	0	0	0
Required Conservation	0%	0%	0%	0%
Multiple Dry Year 3	**2025**	**2030**	**2035**	**2040**
Supply Total	6,272	7,335	8,536	9,772
CVP	3,013	3,013	3,013	3,013
Groundwater	1,919	2,222	3,423	4,659
CVP Supplemental	1,240	2,000	2,000	2,000
Recycled Water	100	100	100	100
Demand Total	6,272	7,335	8,536	9,772
Difference	0	0	0	0
Required Conservation	0%	0%	0%	0%
Multiple Dry Year 4	**2025**	**2030**	**2035**	**2040**
Supply Total	6,272	7,335	8,536	9,772
CVP	3,013	3,013	3,013	3,013
Groundwater	1,919	1,972	3,173	4,409
CVP Supplemental	1,240	2,250	2,250	2,250
Recycled Water	100	100	100	100
Demand Total	6,272	7,335	8,536	9,772
Difference	0	0	0	0
Required Conservation	0%	0%	0%	0%

Multiple Dry Year 5	2025	2030	2035	2040
Supply Total	6,272	7,335	8,536	9,772
CVP	3,013	3,013	3,013	3,013
Groundwater	1,919	1,972	3,173	4,409
CVP Supplemental	1,240	2,250	2,250	2,250
Recycled Water	100	100	100	100
Demand Total	6,272	7,335	8,536	9,772
Difference	0	0	0	0
Required Conservation	0%	0%	0%	0%

AF – acre-feet per year, CVP – Central Valley Project
Source: 2020 Hollister Urban Area Urban Water Management Plan, Table 7-4

As shown in the results of the 2020 UWMP, as time progresses, there will be a greater reliance on local groundwater and supplemental CVP water (e.g., carryover water in San Justo Reservoir, Semitropic Water Bank, conversion of agricultural water, spot market purchases, etc.), particularly during dry-year and multi-dry-year conditions. However, the local groundwater has high TDS and high hardness, so relying on this source of supply would require additional treatment (e.g., softening or demineralization) to achieve the water quality goals of the MOU.

The UWMP analysis used CalSim II simulations to forecast the future CVP allocations, considering the effects of climate change. The result is that future *average* allocations are estimated to be 82 percent of the contract amount of 8,250 AFY, or approximately 6,765 AFY. SBCWD has agreements with other M&I users for approximately 700 AFY, and there is a loss factor of 10 percent. As a result, the future average year allocation available for the SBUA is estimated to be approximately 5,400 AFY.

To understand the available CVP supply during a dry year, the 2020 UWMP used 2014 as the baseline year. The CVP allocation in 2014 was 25 percent of the M&I contract value, or 2,062 AFY. The baseline in the 2020 UWMP was revised upward, to 50 percent, based on USBR's Shortage Policy, which recognized that the CVP M&I water is needed to meet PHS needs. However, in March 2022, after another very dry winter in the Sierra Nevadas (the watershed that feeds the CVP system), USBR set the initial M&I allocation at only 35 percent of M&I contract value and later reduced that to zero percent on April 4, 2022. SBCWD was able to provide documentation to USBR to comply with the USBR M&I Shortage Policy in order to receive unmet PHS need and obtained some M&I water; however, the reliability of that supply will always be uncertain in future severe droughts. As a result, the current reliability of the CVP supply is less than that which was presented in the 2020 UWMP for supply during a dry year.

4.2.2 Water Quality

As part of this Master Plan Update, previously established goals for drinking water were reviewed and evaluated relative to affordability, consumer benefits, and current technology.

As specified in Section 2.2.2 of the 2004 MOU, the goal for TDS was set at 500 mg/L and the goal for hardness was set at 120 mg/L. Subsequently, the 2014 MOU revised the hardness goal to 150 mg/L to be consistent with comparable utilities and industry standards.

The facilities completed since the 2008 Master Plan and described in Section 2 provide a significant improvement in drinking water quality.

The 2017 Master Plan Update investigated the need for additional high-quality source water to achieve the 150 mg/L hardness goal. It estimated the additional increment of high-quality water (i.e., low-hardness water, such as CVP supply) to be approximately 1,800 AFY by 2025 and approximately 3,880 AFY by 2035, based on the 2017 Master Plan Update's projected water demand. In this Master Plan Update, the agencies reconsidered the financial implications and recent customer feedback and decided to adjust the hardness goal to reflect a range of 150 to 180 mg/L (180 mg/L is the limit between moderately hard and hard water). This flexibility allows for variations in water quality throughout the distribution system and throughout the year, and it reduces the capacity requirements for surface water treatment.

Considering the growth in water demands and the continued need to further reduce drinking water hardness, the ratio of high-quality water to unsoftened groundwater will continue to increase. Based on current water quality data, approximately 81 percent of the demand must be met by high-quality water to achieve an average, system-wide hardness of 180 mg/L. Further, approximately 90 percent of the demand must be met by high-quality water to achieve an average, system-wide hardness of 150 mg/L. This is illustrated in Figure 4-1. As shown, the demand for high-quality water is projected to increase to approximately 6,400 to 7,120 AFY by 2030 and to approximately 10,120 to 11,250 AFY by 2045 based on achieving a hardness range of 180 to 150 mg/L, respectively.

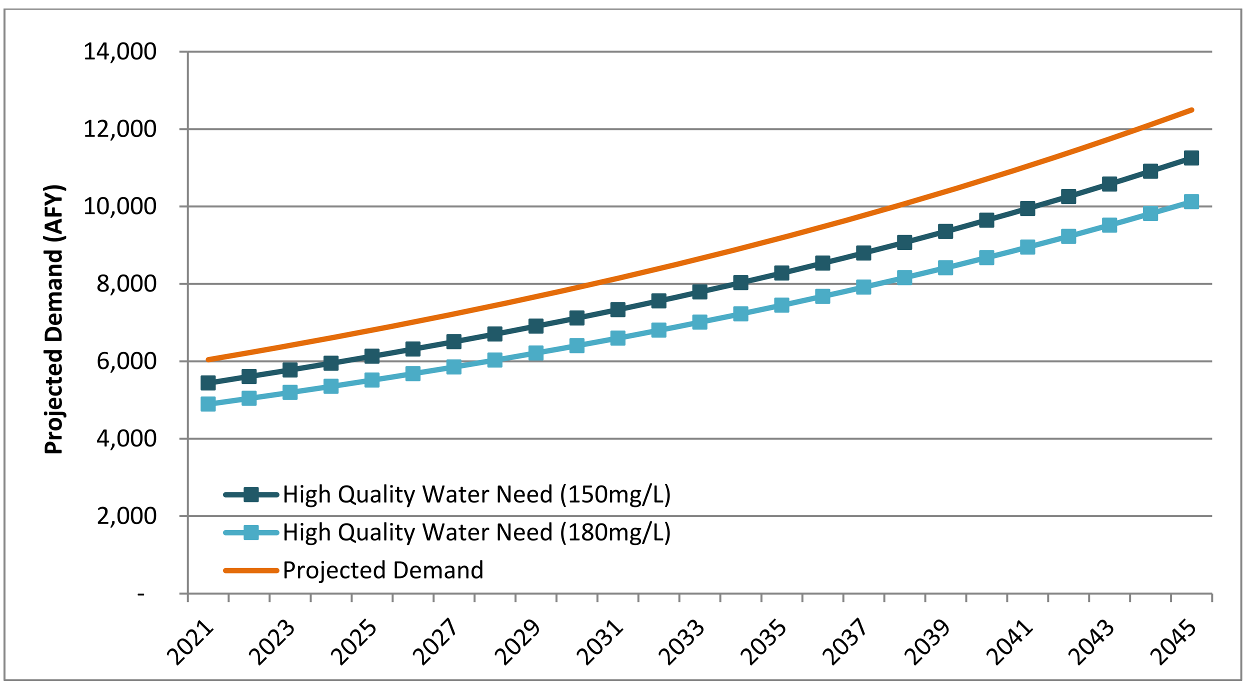


Figure 4-1. Projected Demand and Demand for High-quality Water

Table 2-1 in Section 2 shows that the average CVP allocation over the period between 2011 and 2020 was 5,420 AFY. As described in Section 4.2.1, the average CVP supply available for M&I customers in the SBUA is estimated to be 5,400 AFY. These values are consistent, and, although 5,400 AFY is sufficient to meet the demand for high-quality water for existing customers, it is insufficient to meet demands into the future. Furthermore, the 3-year minimum average allocation between 2011 and 2020 was only 2,915 AFY (as shown in Table 2-1), revealing that the imported CVP supply is not sufficiently reliable to meet the demand for high-quality water for the existing customers during multi-year drought periods. Table 4-4 summarizes the projected demand, projected demand for high-quality water, and supply deficits.

Table 4-4. Summary of Projected High-quality Water Demands and Deficits (AFY)

	Current	2025	2030	2035	2040	2045
Total Demand (AFY)	5,560	6,810	7,900	9,190	10,710	12,500
High-quality Need (180 mg/L Hardness)	4,503	5,514	6,402	7,447	8,677	10,124
Deficit (180 mg/L Hardness)[1]	None	114	1,002	2,047	3,277	4,724
High-quality Need (150 mg/L Hardness)	5,436	6,129	7,116	8,278	9,645	11,254
Deficit (150 mg/L Hardness)[1]	36	729	1,716	2,878	4,245	5,854

AF – acre-feet per year, CVP – Central Valley Project, mg/L – milligrams per liter
Notes:
1. Deficits assume an average 5,400 AFY CVP allocation based on the 2020 UWMP.

The demand for high-quality water could be met by developing new surface water projects, developing new groundwater projects, adding softening or demineralization at municipal groundwater wells, or a combination of these options. These options are further analyzed in Section 4.3 and Section 4.4. In addition to these options, SSCWD plans to expand use of local wells for large landscape demands to encourage use of groundwater for irrigation demands, such as in schools, parks, roadsides etc., and potentially at residential units. If this initiative achieves significant implementation, the demand for high-quality surface water may be offset.

As previously described, both the City and SSCWD have wells that exceed DDW's potential hexavalent chromium MCL of 10 ppb. Both agencies rely on blending groundwater supply with treated high-quality water to meet this potential regulation, as detailed in the 2017 Master Plan Update. An 80 to 90 percent blending ratio is sufficient to meet the blending requirements to meet the potential hexavalent chromium MCL for both agencies.

4.2.3 Water Reliability

Section 2.2.1 of the 2004 MOU established reliability goals for the urban water supply as being capable of meeting 100 percent of the demands during wet, above-normal, normal, and dry years and during the first year of a critically dry period. Further, during the second and subsequent years of a multi-year drought, the water supplies (including surface and groundwater) must be capable of meeting 85 percent of the M&I demand.

As described in Section 4.2.2, to achieve the water quality goals, approximately 81 to 90 percent of the demand should be met with high-quality water (e.g., imported CVP water or similar). During this Master Plan Update, the agencies considered both the water quality goal and the original reliability goal described in the 2004 MOU, and weighed the tradeoffs of reduced water quality versus mandatory conservation during the second and subsequent years of a multi-year drought. The result is an updated reliability goal, stated as follows:

- The urban water supply shall be capable of meeting 100 percent of the demands during all year types, including wet, above-normal, normal, and dry years and critically dry years.
- During wet, above-normal, normal, dry years and the first year of a critically dry period, the urban water supply shall be capable of meeting the water quality goals, meeting the demand with a blend of high-quality water and local groundwater. To achieve the water quality goals, the high-quality water will be approximately 81 to 90 percent of the total demand.
- In the second and subsequent years of a multi-year drought, the water quality goals will be relaxed. Under these conditions, the urban water supply shall be capable of meeting 85 percent of the demand for high-quality water (i.e., 85 percent of 81 percent of the total demand, or 69 percent), and the balance of the demand shall be met with local groundwater.

The result of this updated reliability goal is summarized in Table 4-5.

Table 4-5. Need for High-quality Water in Average and Drought Periods (AFY)

	Current	2025	2030	2035	2040	2045
Total Demand	**5,560**	**6,810**	**7,900**	**9,190**	**10,710**	**12,500**
Wet, Above-normal, Normal, Dry, and First Year of Dry Period						
High-quality Water[1]	4,503	5,514	6,402	7,447	8,677	10,124
Local Groundwater[2]	1,056	1,296	1,498	1,743	2,033	2,376
Total Supply (100% of Demand)	5,560	6,810	7,900	9,190	10,710	12,500
Second and Subsequent Dry Years						
High-quality Water[1,3]	3,828	4,689	5,439	6,327	7,374	8,605
Local Groundwater[2]	1,732	2,121	2,461	2,863	3,336	3,894
Total Supply (100% of Demand)	5,560	6,810	7,900	9,190	10,710	12,500

Notes:
1. High-quality supply is based on the upper hardness range of 180 mg/L, which requires that approximately 81% of the total demand be met with high-quality water (i.e., low-hardness water such as imported CVP water).
2. Untreated local groundwater (i.e., no softening or demineralization).
3. High-quality supplies must be sufficient to meet 85% of the demand for high-quality water (85% of 81% of the total demand, or 69% of the demand).

The gap between the need for high-quality water and available CVP supply is illustrated in Figure 4-2 for both average conditions and a multi-year dry period (i.e., the second and subsequent years of a multi-year drought period). As previously described, the average CVP allocation is estimated to be approximately 5,420 AFY, which is sufficient to meet the need for high-quality water during an average year for existing customers. However, as described in Section 2.1.1.1, the average CVP allocation during a multi-year drought is estimated to be approximately 2,915 AFY, which is less than the existing need for high-quality water during a multi-year drought (4,160 AFY). This results in a deficit of approximately 1,250 AFY for existing customers during a multi-year drought period. The deficit grows to approximately 5,690 AFY in 2045 for a multi-year drought period.

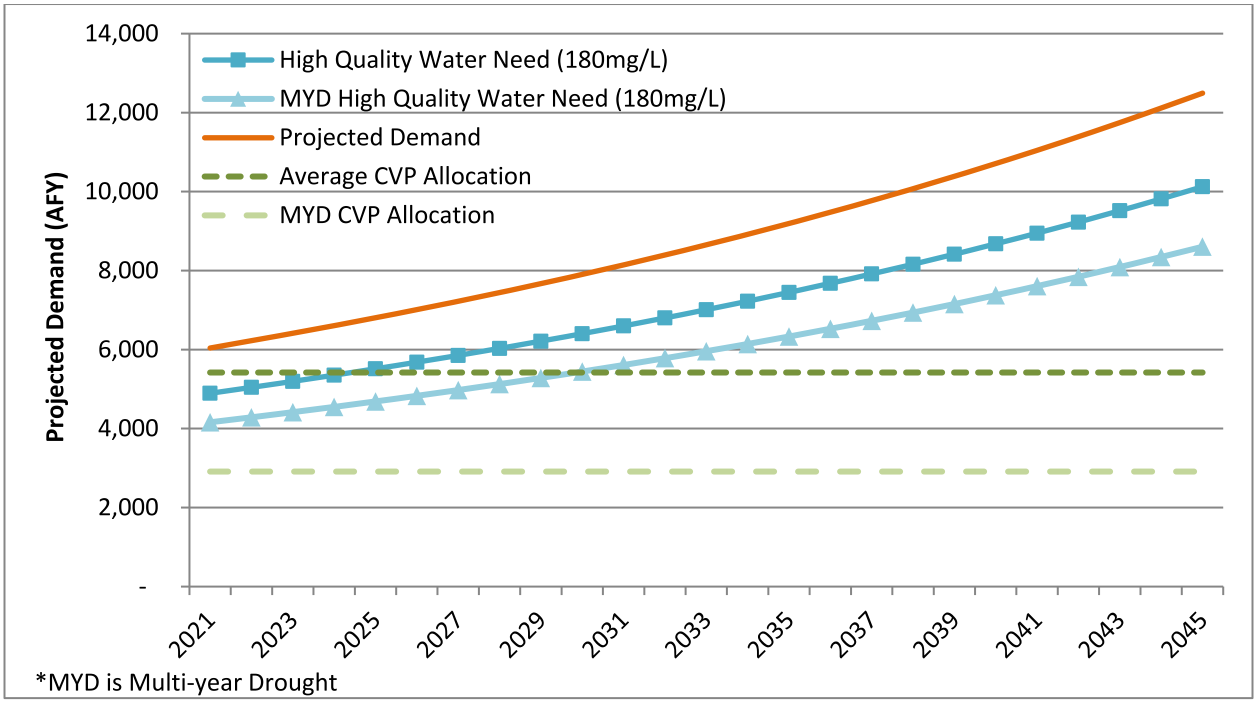


Figure 4-2. Projected Demand, Demand for High-quality Water, and Available CVP Water

4.2.4 Opportunity to Maximize Available CVP Water

As previously described, SBCWD's primary surface water source is through the CVP and its infrastructure. The CVP supply is subject to availability, which therefore imposes risks during drought conditions. The 2020 Annual Groundwater Report predicts a declining availability of CVP supply in the future due to climate and hydrological changes. This reduced availability requires SBCWD to expand its supply portfolio and to store and retain excess supply in times of surplus, so that it is not limited to only groundwater supply or spot market purchases during dry years.

Based on past analyses, there are approximately 6,000 AFY of excess CVP water (including both agricultural and M&I water) in about 25 percent of years. This is illustrated in Figure 4-3. Further, historical use of the agricultural CVP entitlement has not exceeded 24,000 AFY, even in years when the full contract amount of 35,550 AFY is available.

Section 4.3 and 4.4 describe alternatives that provide storage or supply expansion opportunities.

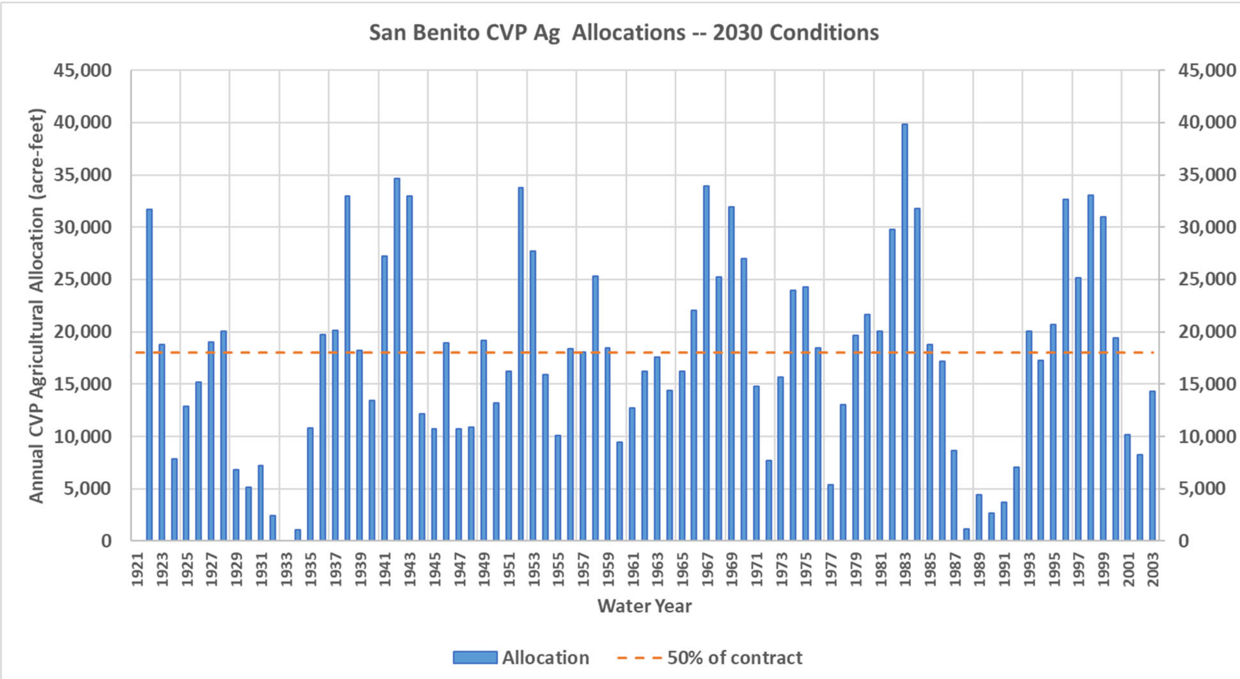


Figure 4-3. Excess CVP Allocations
Source: Todd Groundwater, 2020

4.3 Surface Water

The following surface water storage options, including both imported and local supplies, were considered as part of this Master Plan update:

- Paicines Reservoir Expansion
- San Justo Reservoir Expansion
- New Hawkins Reservoir
- New Reservoir in Lone Tree Valley
- B.F. Sisk Dam Raise
- Pacheco Reservoir Expansion Project
- Semitropic Water Bank

The locations of these options are illustrated in Figure 4-4, and each is described in the following subsections. For planning purposes, a goal of 6,000 AF was established for the capacity of the new local reservoirs. This goal is consistent with the range of growth in projected water demand for high-quality water (5,000 to 6,000 AFY) and the estimated availability of unused CVP water during wet years (6,000 AF).

4.3.1 Paicines Reservoir Expansion

The Paicines Reservoir is an existing off-stream reservoir located between the San Benito River and Tres Pinos Creek approximately 5 miles south of Tres Pinos. It is owned by SBCWD and is filled by water diverted from the San Benito River, with some of the diversions consisting of natural runoff and some consisting of rediversion of water stored and released from Hernandez

Reservoir. The stored water is released for percolation to Tres Pinos Creek and the San Benito River to provide additional groundwater recharge during the dry season.

The existing reservoir has a maximum water surface elevation (WSE) of 695 feet and a berm height of 699 feet. There is approximately 2,870 AF of storage at the reservoir. Raising the dam by 15 feet would provide a new maximum WSE of approximately 710 feet and add an additional 2,600 AF of storage, for a total capacity of approximately 5,500 AF. The following major facilities and improvements would be required for the reservoir expansion:

- Reservoir improvements including increasing the height of the earthen embankment dam with an assumed 4:1 (H:V) upstream slope and 3:1 (H:V) downstream slope. The existing dam would need to be excavated to the foundation and the new dam built in its place.
- Improvements to intakes and outlets, and improvements to dam access.
- Minor repair of existing seepage issues.
- A new pipeline and pump station from the Hollister Conduit. The pipeline would connect the reservoir to Subsystem 9 of the Hollister Conduit. The pump station and pipeline would be sized to transfer available excess CVP water during the winter months.

Since the reservoir's WSE would increase, the existing gravity-fed inlet canal could not supply water, and a new pump station would also be required.

4.3.2 San Justo Reservoir Expansion

San Justo Reservoir is the terminal reservoir for the Hollister Conduit and stores imported CVP water for M&I and agricultural use. The reservoir, which has 10,300 AF of existing storage for municipal and agricultural use, is owned by USBR and is operated and maintained by SBCWD.

The current maximum WSE of 504 feet could be raised by 20 feet, adding an additional 3,400 AF of storage at the reservoir. Since the reservoir is directly supplied by the Hollister Conduit, no additional pipeline and pump station are required to increase storage capacity. However, the reservoir has ongoing seepage issues, previously estimated to be approximately 3,000 AFY. Significant improvements in the form of cutoff walls or a similar method would be required to prevent seepage.

The following improvements would be required to expand the reservoir's capacity:

- Reservoir improvements including increasing the height of the earthen embankment dam with an assumed 4:1 (H:V) upstream slope and 3:1 (H:V) downstream slope.
- Improvements to intakes and outlets, and improvements to dam access.
- Major repair to prevent seepage using cutoff walls or similar methods.

4.3.3 New Hawkins Reservoir

Hawkins Reservoir is owned by the San Benito Cattle Company and is located northeast of Hollister, approximately 4 miles east of the Hollister Conduit. The reservoir has an existing capacity of 575 AF and a maximum WSE of 660 feet. Because the reservoir is located in a steep drainage area, approximately 6,000 AF of additional storage can be obtained by constructing a new dam and raising the reservoir's elevation by 80 feet to an elevation of 740 feet, for a new storage capacity of 6,600 AF. However, due to the increase in storage capacity, the entire dam would need to be demolished and reconstructed. The following facilities and improvements would be required to expand the reservoir's capacity:

- New 80-foot-high, 1,200-foot-long and 25-foot-wide dam with an assumed 4:1 (H:V) upstream slope and 3:1 (H:V) downstream slope.
- New inlet, outlet, and spillway facilities.
- Improvements to the existing access road to the dam.
- Significant care and measures to divert water from the drainage area during construction.
- New pipeline and pump station from the Hollister Conduit. The new pipeline would be connected north of the bifurcation structure to avoid introducing zebra mussels into the reservoir. The pump station and pipeline would be sized to transfer available excess CVP water during the winter months.

4.3.4 New Reservoir in Lone Tree Valley

Previous USBR studies evaluated the potential for a new reservoir on Lone Tree Creek. Several locations were considered based on design considerations to maximize storage available in a minimum footprint near the Hollister Conduit. Due to the presence of several narrow valleys near the Hollister Conduit east of Fairview Road, this area was evaluated for a new reservoir. The location shown in Figure 4-4 was chosen based on its ability to meet the siting design considerations. The following facilities and improvements would be required for a new 6,000 AF–capacity facility:

- New 200-foot-high (new WSE would be 1,235 feet), 1,800-foot-long and 25-foot-wide dam with an assumed 4:1 (H:V) upstream slope and 3:1 (H:V) downstream slope.
- New inlet, outlet, and spillway facilities.
- Improvements to the existing access road to the dam.
- Significant care and measures to divert water from the drainage area during construction.
- New pipeline and pump station from the Hollister Conduit. The pump station and pipeline would be sized to transfer available excess CVP water during the winter months.

4.3.5 B.F. Sisk Dam Raise

B.F. Sisk Dam is a 382-foot-high, zoned, compacted earth fill embankment dam. The dam is over 3.5 miles long and impounds San Luis Reservoir, which has a total capacity of more than 2 million AF. B.F. Sisk Dam is owned by USBR and operated by DWR. The reservoir's storage space is allotted 55 percent for the State and 45 percent federal.

USBR and DWR jointly planned the B.F. Sisk Safety of Dams Modification Project to reduce seismic risks. The Crest Raise alternative was selected as the preferred alternative to provide seismic safety. A secondary project, which will raise the crest an additional 10-feet, will create an additional 130,000 AF of storage in San Luis Reservoir. The project is expected to be completed in 2031.

As an existing CVP contract holder with diversion from San Luis Reservoir, SBCWD will have the option to participate in the B.F. Sisk Dam Raise project. USBR is currently reviewing the participants and their desired shared of storage.

4.3.6 Pacheco Reservoir Expansion Project

Pacheco Reservoir, constructed in 1938, is owned and operated by PPWD. PPWD releases water from the reservoir to Pacheco Creek during the dry season to increase groundwater recharge in the Pacheco subbasin. The existing reservoir has an operational capacity of 5,500 AF.

SBCWD has been collaborating with Valley Water to identify potential opportunities to improve the facilities at Pacheco Reservoir and optimize the use of available storage for groundwater recharge primarily in San Benito County. The proposed expansion project includes constructing a new dam and reservoir, pump station, conveyance facilities, and miscellaneous infrastructure improvements. The proposed reservoir would have a total storage capacity of 140,000 AF. Approximately 40,000 AF would be allocated to enhance fish flow in Pacheco Creek and replace existing PPWD storage. Therefore, the net operational storage would be approximately 100,000 AF. The Draft EIR was released in November 2021 for public review.

SBCWD and PPWD are partners with Valley Water in the development of the PREP. SBCWD has an option to participate in the project at levels ranging from 2.5 percent up to 10 percent. Since the inception of the project, the estimated costs have increased from approximately $1.1 billion to $2.5 billion, raising concerns about economic feasibility. As a result, SBCWD is evaluating whether alternative participation strategies might be more appropriate, including, for example, conditional lease arrangements or short-term water transfers.

4.3.7 Semitropic Water Bank

As previously described in Section 2, SBCWD entered into a contract with Valley Water to store water in the Semitropic Water Bank. This agreement allows SBCWD to store up to 5,000 AFY in the Semitropic Water Bank. However, because the stored water originates from existing CVP contract supplies, this is not a net increase in overall supply. It is also important to note that water must be available in San Luis Reservoir in order to exercise this storage because the actual water for diversion would be from San Luis Reservoir. During severe drought years, such as 2014, diversions were not available. This agreement was subject to renewal in 2021.

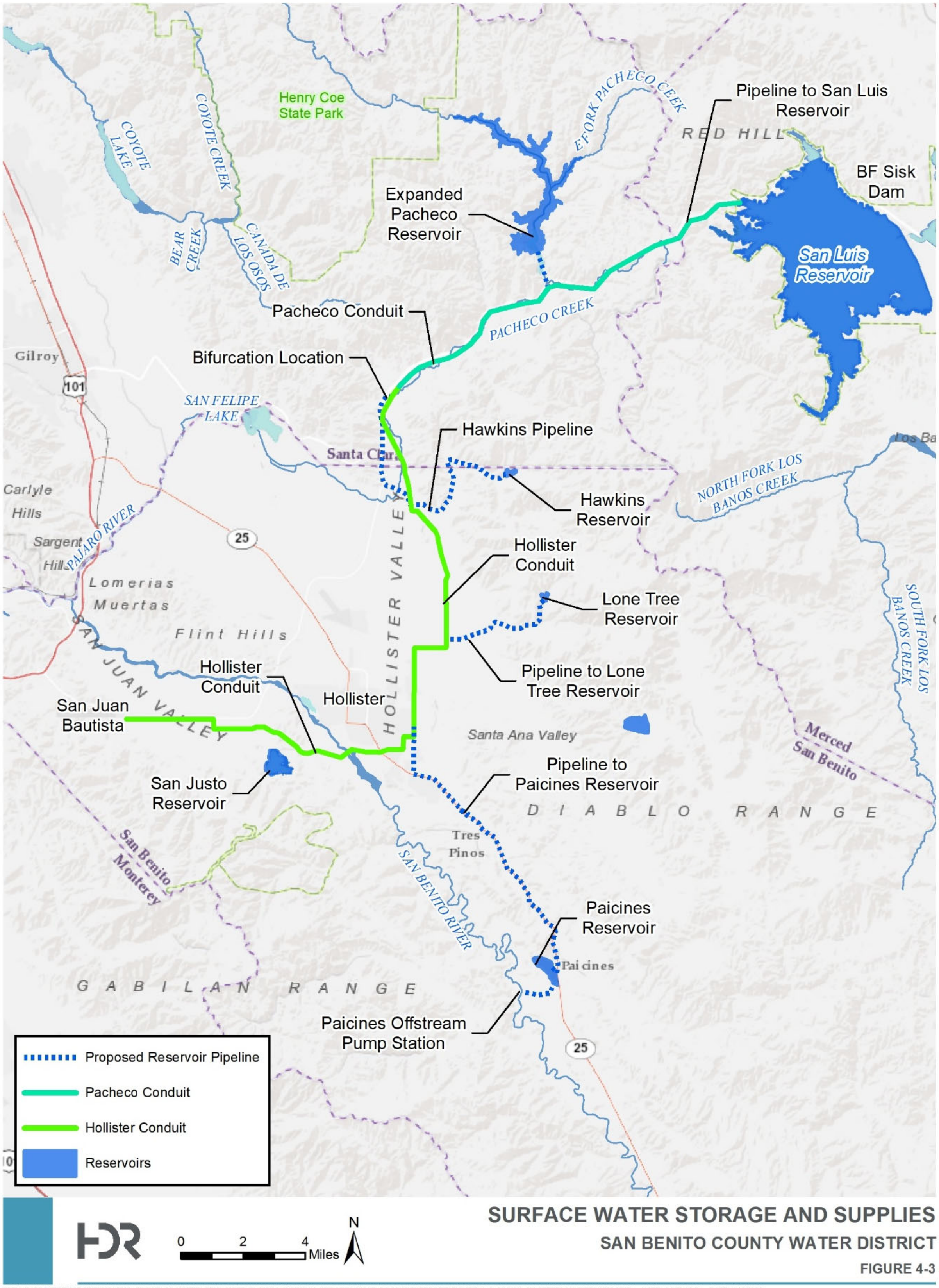


Figure 4-4. Locations of Potential Surface Water Storages and Supplies

4.4 Groundwater

Groundwater is a major source of supply for both M&I and agricultural users in San Benito County. Potential long-term water supply options using groundwater include improving water quality through treatment, developing new well fields, managed aquifer recharge, and potable reuse.

4.4.1 North Area Groundwater

The North Area groundwater consists of the Pacheco, the eastern portion of the Bolsa, and the northern portions of the Hollister East groundwater subbasins as defined by SBCWD. Groundwater in this area originates from several different sources including percolation from local surface water in Pacheco Creek, Arroyo de las Viboras, and Arroyo Dos Picachos.

The source of water influences the quality of the groundwater, specifically the TDS concentration. Water originating from the south has TDS concentrations ranging from approximately 500 to 1,000 mg/L, whereas lower-TDS water (less than 500 mg/L) originates in the northern area of the basin near Pacheco Creek and near Arroyo de las Viboras to the east. There is also an area of historically high groundwater in the Bolsa subbasin. Previous studies have evaluated additional pumping in this area to alleviate the high groundwater conditions and potentially enhance recharge of higher-quality water into the North Area subbasins.

As an extension of the 2009 Coordinated Plan, an update to the groundwater model and evaluation of preliminary project configuration was completed for the North Area groundwater. The preliminary project configuration was based on pumping from seven North Area wells, as shown in Figure 4-5. The purpose of the modeling analysis was to determine the approximate sustainable yield of the low-TDS groundwater zone and identify a set of hypothetical well locations and pumping rates that would efficiently withdraw that yield. Based on these preliminary studies, a yield of up to 5,000 AFY during normal and wet years and 2,000 AFY during droughts appears feasible.

The project would consist of wells located adjacent to the Hollister Conduit to supply up to 2,000 AF of supply that would be pumped into the Hollister Conduit. The groundwater would be blended with CVP water in the Hollister Conduit to achieve water quality goals. The project would require treatment at a surface WTP, pipelines from the wells to the Hollister Conduit, and one or more booster pump stations. A phased approach could be implemented, with the first phase consisting of the four easterly wells closest to the Hollister Conduit.

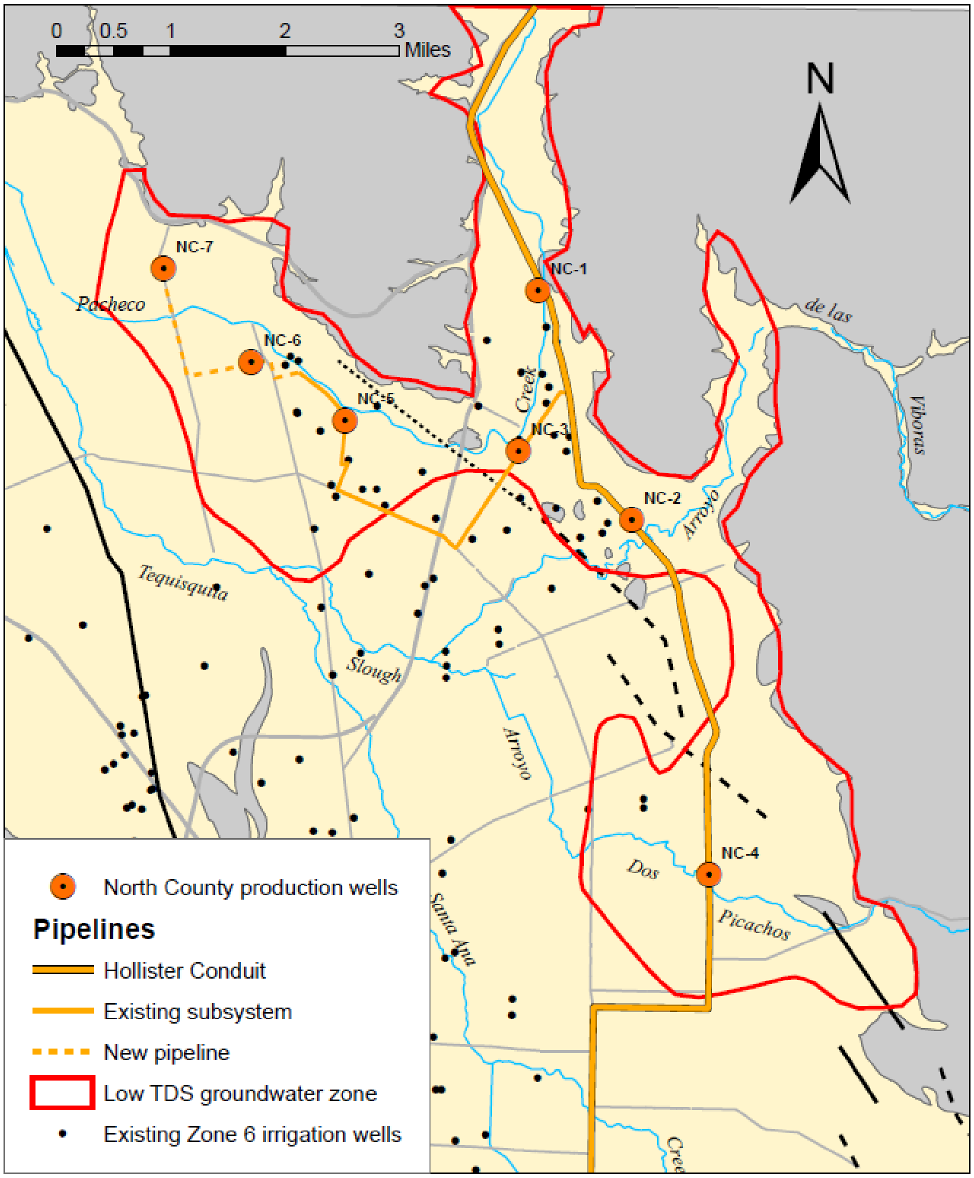


Figure 4-5. Preliminary Concept of North Area Groundwater Well

4.4.2 Local Wells Treated for M&I Use

With this option, groundwater from municipal wells would be demineralized or softened to reduce TDS and hardness and to provide other treatment goals. Individual wellhead treatment is a viable concept for the demineralization option. Softening groundwater could also be used as a treatment process instead of demineralization; however, it does not have the same treatment capability with respect to reducing TDS and hexavalent chromium. The treated groundwater would be blended with the existing CVP and remaining groundwater supplies in the distribution system. The demineralization facilities would have a design capacity of 6,000 AFY and would produce an annual average supply of approximately 3,000 AFY.

Operation and maintenance (O&M) costs are high for this alternative due to intensive energy costs and equipment replacement. Brine disposal is also costly for both capital and O&M costs.

4.4.3 Expanded Percolation

Source water for percolation consists of excess CVP water, treated wastewater effluent, and local surface water, as described in Section 2. None of the sources can be easily expanded to be significantly impactful to improve groundwater basin health. Aside from the limitation due to Dreissenid (zebra) mussels, percolation with CVP water might be limited in both frequency and quantity due to the rising need of CVP water to meet future demands and water quality goals. Increasing water demand will result in increasing wastewater flows; however, the amount of wastewater effluent available for percolation might not be significant and would compete with the demand for recycled water. Lastly, percolation water released from Hernandez and Paicines reservoirs depends hydrological conditions and is limited to the size of the reservoirs.

Groundwater recharge in the North Area is also heavily influenced by the activities of PPWD. PPWD includes areas in both Santa Clara County and northern San Benito County. Water released from Pacheco Reservoir is percolated into the groundwater in the North Area. A smaller, approximately 50 AF reservoir owned by PPWD is located on Arroyo de las Viboras.

Numerous studies and reports have been completed regarding the groundwater in the North County. As an extension of the 2009 Coordinated Plan, additional work was completed on preliminary facilities planning for the North County groundwater. This work included updating the groundwater model and evaluating a preliminary project configuration. The updated groundwater model was then used to simulate the operations of the proposed facilities.

The preliminary project configuration was based on pumping from seven North County wells, as shown on Figure 4-5. The locations and pumping rates for the wells were selected for this analysis on the basis of preliminary simulations. The purpose of the modeling analysis was to determine the approximate sustainable yield of the low-TDS groundwater zone.

4.4.4 Indirect Potable Reuse (IPR)

IPR uses an environmental buffer, such as a lake, river, or a groundwater aquifer, to treat and store treated wastewater effluent for future drinking water. Retrieved water must be treated at a drinking water treatment plant prior to distribution. An IPR project for the SBUA would rely on groundwater storage. Facilities required to implement IPR would consist of:

- New pure water treatment facility
- Pipelines from and to injection wells
- Injection/production wells
- Water treatment for extracted water
- Pipeline to the distribution system

Due to the extreme drought conditions in recent years, many agencies around the State are exploring options for indirect potable reuse. Given that the effluent from the City's WRF is either percolated to the groundwater basin or reused for agricultural irrigation, potable reuse might not be a cost-effective water supply solution for the SBUA and, similar to enhanced percolation, might be in competition with the demand for recycled water. Similarly, the effluent from the Ridgemark Wastewater Treatment Plant is also percolated to the groundwater basin.

4.4.5 Aquifer Storage and Recovery (ASR)

ASR is the direct injection of surface water in an aquifer using injection wells for later recovery and use utilizing the same well. The design of the ASR system would be based on using up to 6,000 AF of excess CVP water during a wet year to be stored in the aquifer and recovering up to 6,000 AF during dry years. A portion of the water available can also be used to directly supply potable water to the northern portion of the HUA distribution system to meet average day demands in the area and improve water quality during a wet year.

As shown in the conceptual layout in Figure 4-6, the facilities required for the ASR alternative include pipelines to divert water from the Hollister Conduit, eleven injection wells located over an area northeast of the Hollister Municipal Airport, a WTP with clearwell to treat water before injection and after recovery from the ground, pipelines to convey water from the WTP to the injection wells, and pipelines to send treated water to the distribution system.

An ASR Feasibility Study was completed in late 2021 which concluded that a pilot project is needed to confirm feasibility and establish operational parameters. During the pilot phase (Phase 1), potable water from the distribution system would be used for groundwater injection and later extracted. If the project is confirmed feasible, it could be constructed in phases, with Phase 2 estimated to produce 1,000 AFY of recovered water, and Phase 3 adding another 1,190 AFY recovery water during dry years.

4.5 Potential Future Regulations

This section discusses emerging drinking water regulations that SBCWD should consider when carrying out facility planning. These potential rules and regulations should be revisited in future Master Plan updates.

Water Quality. EPA publishes a Contaminant Candidate List (CCL) every 5 years. The CCLs list contaminants that are currently not subject to national primary drinking water regulations but are known or anticipated to be present in public water systems. From the CCLs, selected contaminants are monitored to track occurrences in water systems by the Unregulated Contaminants Monitoring Rule. In California, DDW collects and reviews the monitoring data. When deemed necessary, DDW would request a hazard assessment from the California Office of Environmental Health Hazard Assessment (OEHHA). OEHHA sets limits such as the Public Health Goals and recommendations of Notification Levels (NLs). These limits are then reviewed and implemented by the State Board.

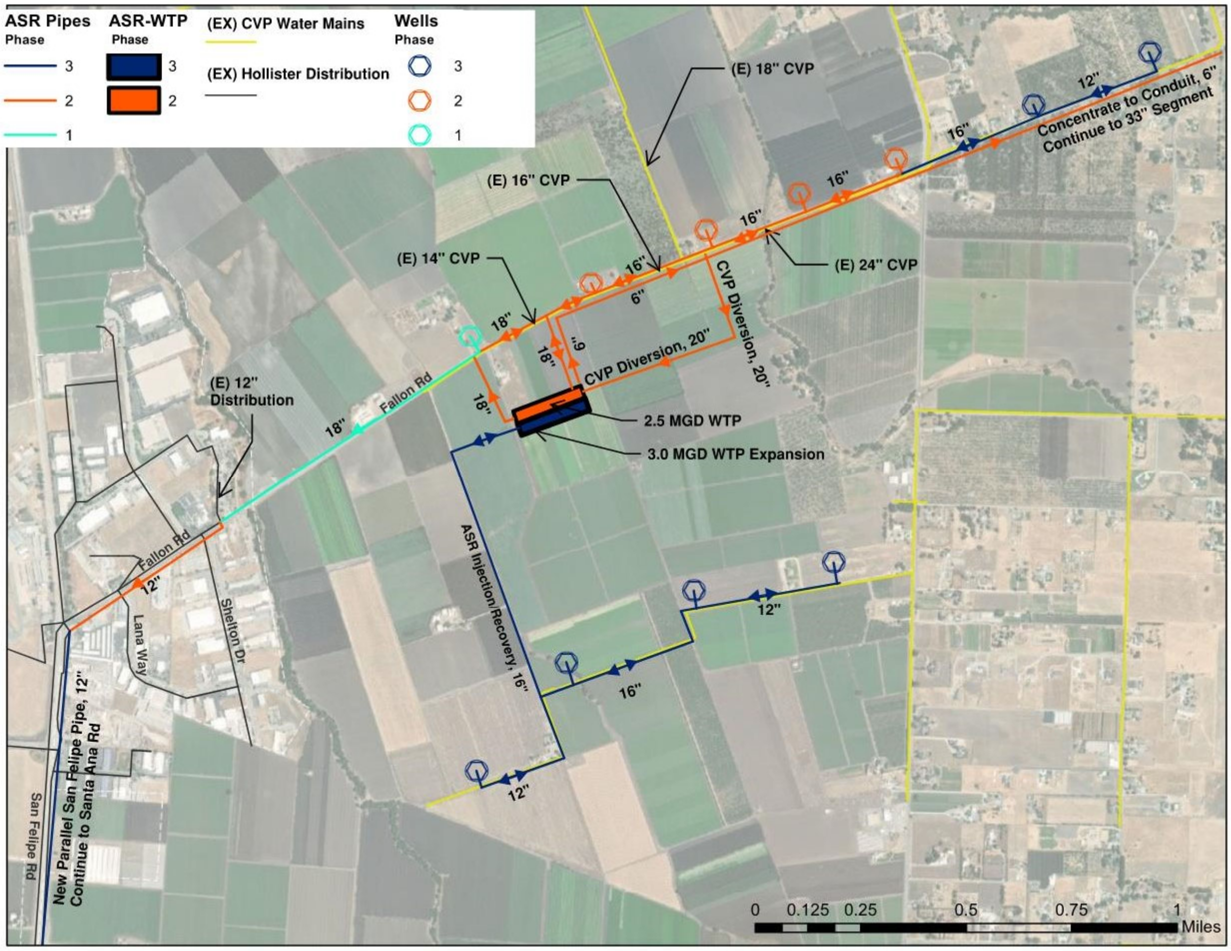


Figure 4-6. Conceptual ASR Phasing and Facility Layout

Potential constituents that may require treatment upgrade or further monitoring:

- **Hexavalent Chromium.** Since the reversion of the hexavalent chromium MCL in 2017, the State Board has progressed in reissuing the MCL of 10 ppb. In March 2022, the State Board issued the notice of public workshop and comment opportunity of the hexavalent chromium MCL Administrative Draft. Two workshops were held in early April 2022. Both the City and SSCWD had developed compliance plans to address the 10 ppb MCL prior to the DDW reversal in 2017, as detailed in the 2017 Master Plan Update.
- **Cyanotoxins.** In response to increasing reports of harmful algal blooms in California's water system, OEHHA issued short-term NLs for four cyanotoxins:
  - Anatoxin-a: 4 ppb
  - Saxitoxins: short-term 0.6 ppb
  - Microcystins: short-term 0.03 ppb
  - Cylindrospermopsin: short-term 0.3 ppb

- **Perfluorooctanoic Acid (PFOA) and Perfluorooctanesulfonic Acid (PFOS).** Through various revisions, in February 2020, the State Board updated the NLs for PFOA and PFOS to be 10 parts per trillion (ppt) and 40 ppt, respectively. OEHHA continues to research and update the Public Health Goals for PFOA and PFOS.
- **Perfluorobutane Sulfonic Acid (PFBS).** In March 2021, DDW issued the drinking water NL of PFBS to be 0.5 ppb.
- **Other PFAS Chemicals.** PFOA and PFOS are the most well-known PFAS chemicals. There are other PFAS chemicals for which DDW has requested OEHHA's NL recommendations:
  - perfluorohexane sulfonic acid (PFHxS) – In March 2022, OEHHA published the NL recommendation for PFHxS to be 2 ppt.
  - perfluorobutane sulfonic acid (PFBS)
  - perfluorohexanoic acid (PFHxA)
  - perfluoroheptanoic acid (PFHpA)
  - perfluorononanoic acid (PFNA)
  - perfluorodecanoic acid (PFDA)
  - 4,8-dioxia-3H-perflourononanoic acid (ADONA)

Infrastructure. The Lead and Copper Rule aims to remove 100 percent of lead service lines, prioritizing communities that are disproportionately affected by lead contamination. The latest revisions require water systems to report the lead service line inventories by October 2024.

Recycled water quality is also directly linked to drinking water quality improvements in TDS.

4.6 Screening Criteria

Screening criteria were developed to prioritize the long-term water supply options. The criteria are described below.

- **Increases Use of Existing CVP Allocations.** Limited surface water storage capability, limited percolation facilities, and operational constraints from the presence of zebra mussels limit the ability to fully utilize CVP allocations available during wet years. Options will be evaluated based on their ability to maximize the beneficial use or storage of an additional 6,000 AF of CVP allocations available during wet years. Alternative supplies will be considered if they provide an equivalent quantity of water in a cost-effective manner.
- **Increases Dry-year Water Supply Reliability.** This criterion is defined as contributing to a diverse portfolio of water supply sources with the ability to provide sustained yield during extended dry periods. Projects that provide new water supply and/or have the potential to provide carryover storage from wet years would meet this criterion.

- **Maximizes Local Control and Resources.** This criterion evaluates options based on whether the MOU partners have local control of water supplies and the ability to implement projects locally.
- **Minimizes Implementation Risk.** This criterion is defined as minimizing implementation risks due to environmental impacts, permitting, and/or community opposition. This criterion includes the potential for phased implementation to increase flexibility and affordability.
- **Minimizes Cost.** Both capital and O&M costs were developed for each of the alternatives. Costs were combined with estimates of capacity and yield to provide a comprehensive evaluation. The primary metric is the annualized cost per AF of yield. The yield metric is the best economic measure since it best reflects the value of water generated by an alternative. A secondary metric is the present-value cost per AF of capacity. The capacity metric represents how much water could be physically supplied but does not account for water supply availability, especially during dry years.

It is assumed that each option will include required treatment facilities, blending, or other measures to meet drinking water quality goals.

4.7 Summary Comparison of Alternatives

The screening criteria described in Section 4.6 were applied to long-term water supply options to establish priorities for future implementation. Several workshops were held from October through December 2021 with the agencies to complete the analysis and evaluate the results. Table 4-6 summarizes the results of the screening process, and Table 4-8 summarizes the prioritization of long-term water supply options.

The total screening scores in Table 4-6 were established by scoring each alternative against each screening criterion. The score ranges from 1 to 3, with 3 being the best fit under a specific criterion. Alternatives with a total score of 10 or more were carried forward for further analysis, specifically for capital cost and yield cost. The capital cost and yield cost comparisons are tabulated in Table 4-7. The results of further evaluation are summarized in Table 4-8.

Priorities were given to projects to establish the relative amount of resources and timing to be applied to the long-term water supply options. Priority levels might be adjusted going forward based on the availability of additional data and analyses, changes in technology, affordability, or other factors determined by the agencies.

Table 4-6. Screening of Long-term Water Supply Options

Options	Screening Criteria				Screening Score	Comments
	Increases Use of Existing CVP Allocations	Increases Dry-year Water Supply Reliability	Maximizes Local Control and Resources	Minimizes Implementation Risks		
Surface Water						
Expand Paicines Reservoir	3	3	3	1	**10**	Significant permitting/environmental issues
Expand San Justo Reservoir	3	3	3	1	**10**	Significant permitting/environmental issues, seepage
New Hawkins Reservoir	3	3	3	1	**10**	Permitting/environmental issues, need of land acquisition
New Reservoir in Lone Tree	3	3	3	1	**10**	Permitting/environmental issues, need of land acquisition
B.F. Sisk Dam Raise	3	3	1	2	**9**	Strong agency support/contract in good shape for access to supply
Pacheco Reservoir Expansion	3	3	1	2	**9**	High cost
Semitropic Water Bank	1	1	1	2	**5**	Dry-year retrieval concerns, 10% loss allowable by contract
Groundwater						
North Area Groundwater	1	2	3	3	**9**	Less water available during dry years
Local Wells Treated for M&I Use	1	2	3	2	**8**	Significant costs, permitting issues, need of reject disposal, no new water during dry years
Expanded Percolation	3	1	3	1	**8**	Permitting/environmental issues, need of land acquisition, evaporative losses
Indirect Potable Reuse	1	1	3	1	**6**	Permitting/environmental issues, challenging to gather public support, no new water during dry years
Aquifer Storage and Recharge	3	2	3	2	**10**	Permitting/environmental issues

CVP – Central Valley Project, M&I – municipal & industrial

Table 4-7. Comparison of Capital Costs and Yield Costs Among Alternatives above Screening Score of 10

Options	Capital Cost[1]				Yield Cost[1]					
	Capital Cost ($M)	Capacity (AF)	Capital Cost ($/AF)	Relative Score[3]	Annual Capital Cost ($1,000s)	Annual O&M Cost ($1,000s)	Total Annual Cost ($1,000s)	Estimated Annual Yield[2] (AFY)	Yield Cost ($/AFY)	Relative Score[3]
Surface Water										
Expand Paicines Reservoir	$92	5,400	$17,100	2	$5,000	**$1,753**	$6,755	1,620	$4,170	2
Expand San Justo Reservoir	$137	3,400	$40,300	1	$7,450	**$1,788**	$9,273	1,020	$9,060	1
New Hawkins Reservoir	$279	6,000	$46,500	1	$15,170	**$2,282**	$17,452	1,800	$9,700	1
New Reservoir in Lone Tree	$324	6,000	$54,000	1	$17,616	**$2,367**	$19,983	1,800	$11,200	1
B.F. Sisk Dam Raise	$50	5,000	$10,000	3	$2,710	**$1,892**	$4,611	1,500	$2,640	3
Pacheco Reservoir Expansion	$137	6,000	$22,900	2	$7,438	**$1,063**	$8,501	720	$11,900	1
Groundwater										
North Area Groundwater	$25	2,000	$12,200	3	$1,326	**$1,999**	$3,325	1,400	$2,380	3
Aquifer Storage and Recharge	$86	6,000	$12,900	3	$4,698	**$2,547**	$7,248	2,190	$3,110	3

$M – millions of dollars, AF – acre-feet, AFY – acre-feet per year, CCI – Construction Cost Index, ENR – Engineering News-Record, O&M – operation and maintenance

1. Costs are referenced to the ENR, San Francisco Bay Area CCI Index for February 2021, at 13,110.
2. To provide a uniform basis for comparative evaluation of alternatives, assumptions were used based on the estimated frequency of hydrologic year types in CalSim modeling. Average annual yield is based on the weighted average during wet, normal, and dry years. Wet years were assumed to have a frequency of 30%, and normal and dry years a 35% frequency.
3. Relative scores were established based on the relative cost in comparison to other options. Those options with the lowest relative costs were assigned a 3, whereas the options with the highest costs were assigned a 1.

Table 4-8. Evaluation of Long-term Water Supply Alternatives

Options	Screening Score	Capital Cost Score	Yield Cost Score	Total Score	Priority	Comments
Surface Water						
Expand Paicines Reservoir	10	2	2	**14**	**Future**	Significant permitting/environmental issues and uncertainty about feasibility.
Expand San Justo Reservoir	10	1	1	**12**	**Future**	Significant permitting/environmental issues, seepage
New Hawkins Reservoir	10	1	1	**12**	**Future**	Permitting/environmental issues, need of land acquisition
New Reservoir in Lone Tree	10	1	1	**12**	**Future**	Permitting/environmental issues, need of land acquisition
B.F. Sisk Dam Raise	9	3	3	**15**	**3**	Strong agency support/contract in good shape for access to supply
Pacheco Reservoir Expansion Project	9	2	1	**12**	**4**	High cost
Groundwater						
North Area Groundwater	9	3	3	**15**	**2**	Less water available during dry years
Aquifer Storage and Recharge	10	3	3	**16**	**1**	Permitting/environmental issues

Four projects were selected to be considered for future development. This range of projects is to ensure that the agencies have the flexibility to choose which projects to implement as conditions change. These four projects are prioritized based on key criteria such as cost, increase in supply, and local control. These projects should provide a framework for future facility expansions.

- **Priority 1.** The ASR alternative has the highest priority due to relative low capital and yield costs, its ability to flexibly use the excess CVP supply, and the option to implement it in phases.
- **Priority 2.** Similarly, the North Area Groundwater alternative has the second priority due to lower costs. Although this option does not increase the use of CVP supply, it increases the amount of water available and will solve the high groundwater issue in the project area.
- **Priority 3.** The B.F. Sisk Dam Raise project has strong federal support, and SBCWD is negotiating its level of participation (i.e., volume of storage and cost share). The costs are also comparable with the ASR and North Area Groundwater projects. However, the earliest completion date is estimated to be 2031.
- **Priority 4.** SBCWD intends to participate in the Pacheco Reservoir Expansion project to secure extra storage capacity, supplemental to the B.F. Sisk Dam Raise project, and to foster interagency collaboration with Valley Water to collaborate on future projects. The exact nature of SBCWD's participation in PREP should continue to be evaluated due to the high costs.

Some preliminary studies have been completed for several of these options (i.e., North County Groundwater and ASR). Additional studies will be required to evaluate feasibility, estimated costs, and potential timing of these long-term water supply options.

All of the long-term water supply options listed in Table 4-8 should be retained as a menu of alternatives to contribute to a diverse water supply portfolio. Due to the inherent uncertainties in California's water supply (drought, environmental constraints, regulations, etc.), it is prudent to maintain maximum flexibility in planning for long-term water supplies. A summary of the long-term water supply options is provided in Table 4-9.

Table 4-9. Summary of Storage and Supply Capacities of Long-term Water Supply Options

Description	Estimated Storage and Supply Capacity (AF)	Annual Yield Capacity (AFY)
Surface Water		
Expand Paicines Reservoir	5,400[1]	1,620
Expand San Justo Reservoir	3,400	1,020
New Hawkins Reservoir	6,000	1,800
New Reservoir in Lone Tree Valley	6,000	1,800
B.F. Sisk Dam Raise	5,000	1,500
Pacheco Reservoir Expansion	6,000	720
Groundwater		
North Area Groundwater	2,000[2]	1,400
Aquifer Storage and Recharge	6,000	2,190

AF – acre-feet per year, CVP – Central Valley Project, TBD – to be determined

Notes:

1. Based on the assumption that Paicines Reservoir would be repurposed for CVP water storage during wet years only.
2. Combined Phase 1 and Phase 2 capacity.

5 Facilities Evaluation

One of the primary objectives of this Master Plan Update is to evaluate the need, timing, and estimated costs of additional water supply, storage, and treatment improvements. This evaluation will assist the agencies in planning and budgeting for capital improvements.

5.1 Evaluation Criteria

The following evaluation criteria were used to evaluate the need, timing, and estimated costs for infrastructure improvements.

5.1.1 Timing of Needs to Meet Water Demands

As described in Section 3 and summarized in Table 5-1, significant increases in water demands are projected through 2045. The increase in water demand requires additional infrastructure for water supply and treatment.

Table 5-1. Projected Water Demand and Production Requirements

Demand Condition	Existing	2025	2030	2035	2040	2045
Total Demand and Water Production Requirements						
Demand (AFY)	5,560	6,810	7,900	9,190	10,710	12,500
ADD (mgd)	5.4	6.1	7.1	8.2	9.6	11.2
MMD (mgd)	8.1	9.1	10.6	12.3	14.3	16.7
MDD (mgd)	10.8	12.2	14.1	16.4	19.1	22.3
Demand for High-quality Water and Surface Water Treatment Production Requirements to Achieve 180 mg/L Hardness						
Demand (AFY)	4,503	5,515	6,400	7,450	8,680	10,120
ADD (mgd)	4.4	4.9	5.7	6.6	7.7	9.0
MMD (mgd)	6.6	7.4	8.6	10.0	11.6	13.5
MDD (mgd)	8.7	9.8	11.4	13.3	15.5	18.1

ADD – average daily demand, AF – acre-feet per year, MDD – maximum daily demand, mg/L – milligrams per liter, mgd – million gallons per day, MMD – maximum month demand

5.1.2 Ability to Meet Water Quality Goals

In addition to the increases in water demands, water quality considerations are a key component of identifying the need for new facilities.

Significant improvements have been made in drinking water quality. However, additional high-quality water supplies and facilities will be needed to achieve the drinking water goals established by the agencies.

The demand for new, high-quality water, which is needed to achieve an average annual, system-wide average hardness of 150 to 180 mg/L was illustrated in Figure 4-1. The increase in demand over time is also summarized in Table 5-1 for average day, maximum month, and maximum day demands.

5.1.3 Cost Estimates and Economics

Preliminary cost estimates have been developed for the projects and alternatives identified during the development of this Master Plan Update. Capital cost estimates were prepared by applying unit costs, cost curves, and recent bid data to the estimated quantities or capacities for proposed improvement projects. Unless otherwise noted, allowances were added for contingency (30 percent) and for engineering, administration, and permitting (30 percent).

All preliminary cost estimates have been adjusted to 2021 dollars since many of the key projects were evaluated during 2021. The basis for the estimates is the Engineering News-Record (ENR) Construction Cost Index (CCI) for the San Francisco Bay Area for February 2021, which is 13,110. Estimates should be considered a Class 5 cost estimate, which has a high-end range of +50 percent and low-end range of –20 percent. Mid-range values have been used for alternatives analysis and screening purposes.

5.2 Water Supply

The evaluation of long-term water supply options was presented in Section 4. The results of the analysis and prioritization are summarized in Table 4-8.

To provide a reliable water supply for M&I use in the SBUA, a robust portfolio should be maintained. This portfolio of water supplies includes groundwater, imported surface water supplies, and local surface water supplies, as described in Section 4.

The phasing of the new water supply projects, and their estimated average annual yield, is shown in Figure 5-1. Similarly, Figure 5-2 illustrates the phasing of the new water supply projects and their estimated annual yield during a multi-year drought period.

Both the ASR and the B.F. Sisk Dam Raise projects are storage projects which will allow for greater flexibility in how annual CVP allocations are managed, particularly in years when the allocations exceed demand. These projects will also provide storage for other sources of imported water, such as that from spot market purchases and/or long-term transfer contracts. In these instances, water can be purchased during normal and wet years, when water might be more readily available, and at a marginally lower cost, and stored for future use during dry years when CVP allocations are curtailed, and other sources of imported water are less available. This operational strategy will greatly improve the reliability of high-quality water for the SBUA.

If Phase 1 of the ASR project reveals that ASR is not feasible, then Phase 1 of the North Area Groundwater Project should be accelerated, such that it would take the place of the ASR project. In that case, this Master Plan Update should be updated to evaluate the priority and sequence of future water supply projects beyond completion of the B.F. Sisk Dam Raise.

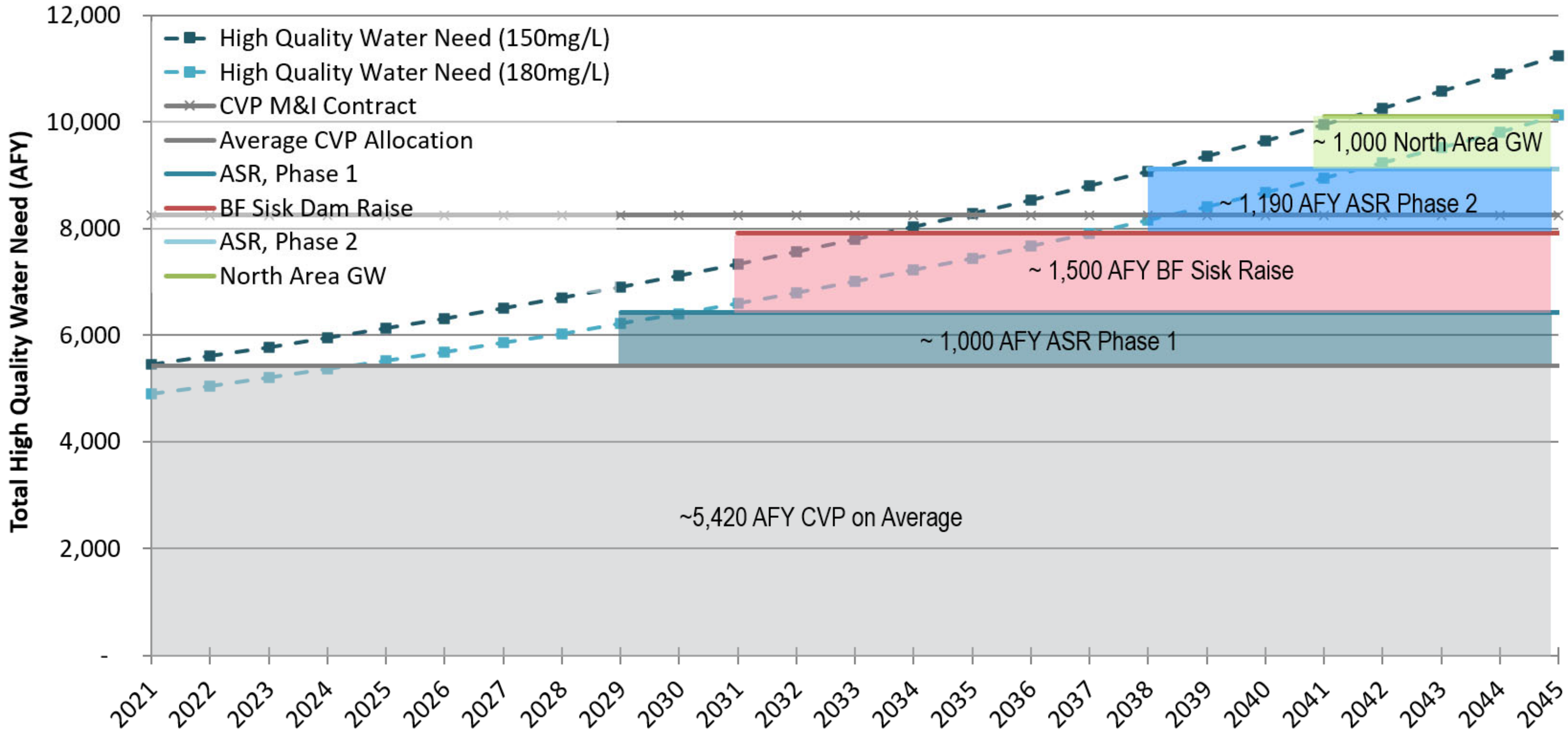


Figure 5-1. Water Supply Project Phasing and Average Annual Yield

Notes: The existing CVP contract entitlement is 8,250 AFY. However, even in years when allocations are 100 percent, the full amount is not available to be delivered to the treatment plants. That is because SBCWD allows for losses and has other commitments to small parcels, etc., for M&I deliveries. The average annual yield is an estimate based on the respective distribution of year types, assumed to be 30 percent wet year, 35 percent normal year, and 35 percent dry year. The M&I entitlement could be increased over time through conversion of agricultural water, which is allowed under the existing contract with USBR.

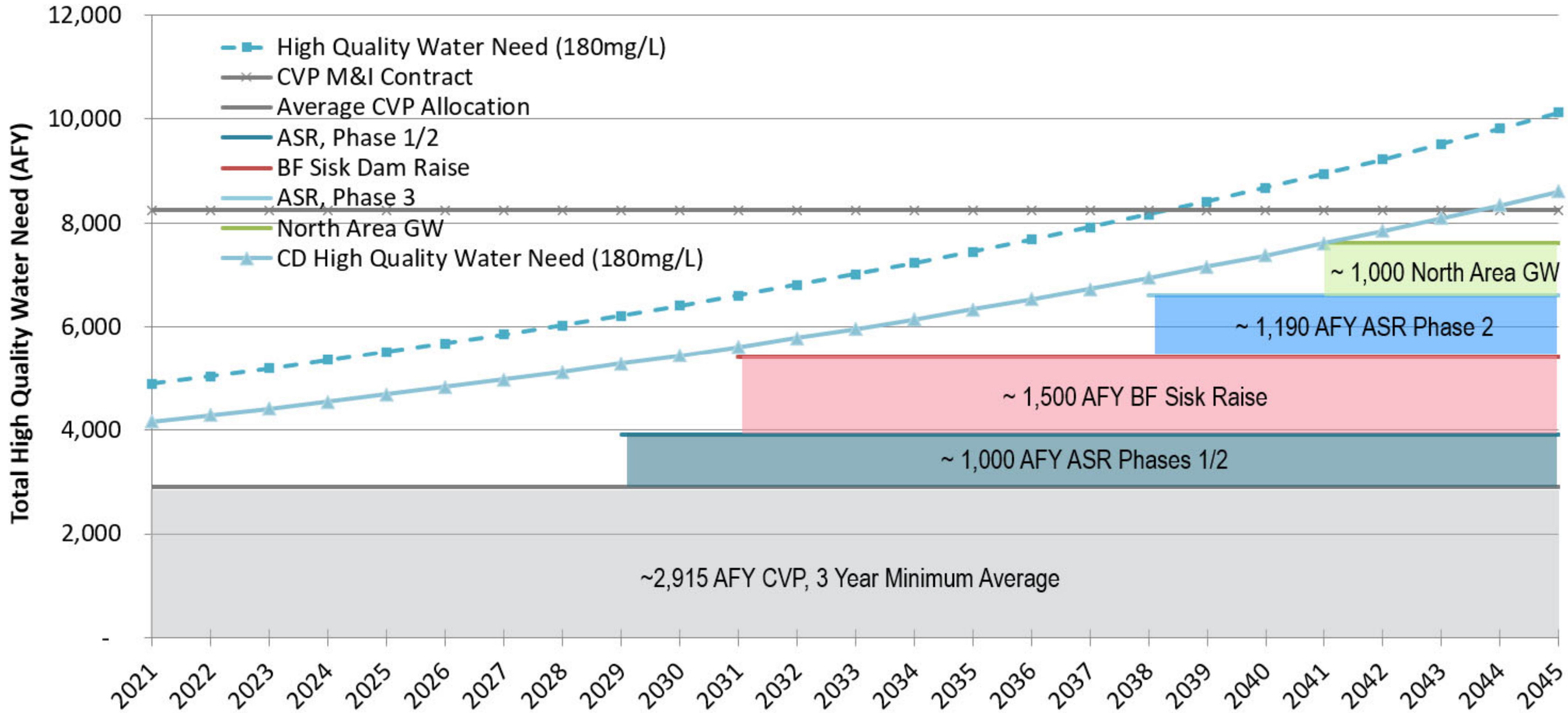


Figure 5-2. Water Supply Project Phasing and Annual Yield During a Multi-Year Drought

Notes: The available CVP allocation during a multi-year drought is estimated at 2,915 AFY based on the minimum 3-year average, which occurred between 2013 and 2015. During extended dry-year conditions, it might be necessary to relax the TDS and hardness goals. However, even during extended dry-year conditions, enough high-quality water supplies must be provided to meet the anticipated hexavalent chromium regulations. The CD (critically dry year) High-Quality Water Need above is based on a goal of meeting 85 percent of the need for high quality water in the second and subsequent years of a multi-year drought. Similar to average annual conditions, conversation of agricultural water to M&I supply could result in an increase of CVP water; however, storage is needed to provide reliability of supply during multi-year droughts.

5.3 Water Treatment and Transmission

Treated surface water and groundwater are delivered to the SBUA through SBCWD surface water treatment facilities and municipal wells and distribution systems.

5.3.1 Current Water Treatment Capacity

The Lessalt WTP and West Hills WTP provide high-quality treated surface water to the SBUA. The combined maximum production capacity of the two plants is 6.5 mgd (2.0 mgd for Lessalt and 4.5 mgd for West Hills). The West Hills WTP is designed for expansion to an ultimate maximum capacity of 9.0 mgd.

A comparison of the projected potable water demands, and the existing water production facilities is presented in Table 5-2. As shown, the combination of existing groundwater wells and surface WTPs have adequate production capacity to meet current and projected potable water demands through 2035. However, this comparison does not include the additional high-quality water needed to achieve the system-wide hardness goals.

Table 5-2. Evaluation of Treated Water Production Capacity

	Year					
	Existing	**2025**	**2030**	**2035**	**2040**	**2045**
Projected Demands (mgd)						
Average Day (ADD)	5.4	6.1	7.1	8.2	9.6	11.2
Maximum Month Daily Average (MMD)[1]	8.1	9.1	10.6	12.3	14.3	16.7
Maximum Day (MDD)[2]	10.8	12.1	14.1	16.4	19.1	22.3
Projected HQ Water Demands (mgd)						
HQ ADD	4.0	4.9	5.7	6.6	7.7	9.0
HQ MMD	6.6	7.4	8.6	10.0	11.6	13.5
Production Facilities (mgd)						
Surface Water						
Lessalt WTP	2	2	2	2	2	2
West Hills WTP	4.5	4.5	4.5	4.5	4.5	4.5
Subtotal Surface Water	**6.5**	**6.5**	**6.5**	**6.5**	**6.5**	**6.5**
City Groundwater Wells[3]						
No. 2 Bundeson (1,425 gpm)	2.05	2.05	2.05	2.05	2.05	2.05
No. 4 South (1,670 gpm)	2.40	2.40	2.40	2.40	2.40	2.40
No. 5 Nash (1,825 gpm)	2.63	2.63	2.63	2.63	2.63	2.63
No. 6 Airline (435 gpm)[4]	0	0	0	0	0	0
Subtotal City Wells	*7.09*	*7.09*	*7.09*	*7.09*	*7.09*	*7.09*
SSCWD Groundwater Wells[5]						
No. 2 Southside (1,095 gpm)	1.58	1.58	1.58	1.58	1.58	1.58
No. 5 Ridgemark (900 gpm)	1.30	1.30	1.30	1.30	1.30	1.30
No. 7 Enterprise (625 gpm)[6]	0.90	0.90	0.90	0.90	0.90	0.90
No. 8 Ridgemark (1,065 gpm)	1.53	1.53	1.53	1.53	1.53	1.53
No. 11 Lico (1,200 gpm)	1.73	1.73	1.73	1.73	1.73	1.73
Subtotal SSCWD Wells	*7.03*	*7.03*	*7.03*	*7.03*	*7.03*	*7.03*

	Year					
	Existing	2025	2030	2035	2040	2045
SJB Groundwater Wells[7]						
Well 1 (175 gpm)	0.25	0.25	0.25	0.25	0.25	0.25
Well 5 (425 gpm)	0.61	0.61	0.61	0.61	0.61	0.61
Well 6 (450 gpm)[8]	0	0	0	0	0	0
Subtotal SJB Wells	*0.86*	*0.86*	*0.86*	*0.86*	*0.86*	*0.86*
Subtotal Groundwater	**14.98**	**14.98**	**14.98**	**14.98**	**14.98**	**14.198**
Total Production Facilities	**21.48**	**21.48**	**21.48**	**21.48**	**21.48**	**21.48**
Total Production Firm Capacity[9]	**18.85**	**18.85**	**18.85**	**18.85**	**18.85**	**18.85**
ADD Surplus / (Deficit)[10]	**13.5**	**12.8**	**11.8**	**10.7**	**9.3**	**7.7**
MMD Surplus / (Deficit)[10]	**10.8**	**9.8**	**8.3**	**6.6**	**4.6**	**2.2**
MDD Surplus / (Deficit)[10]	**8.1**	**6.8**	**4.8**	**2.5**	**(0.3)**	**(3.5)**

City – City of Hollister, gpm – gallons per minute, MDD – maximum daily demand, mgd – million gallons per day, MMD – maximum month demand, No. – number, SSCWD – Sunnyslope County Water District, WTP – water treatment plant

Notes:
1. Maximum Month Daily Average = 1.5 × Average Day.
2. Maximum Day = 2.0 × Average Day.
3. All operating City wells are above the potential Chromium VI MCL. The compliance plan developed in 2017 planned for Well 2, 4 and 5 to blend with WHWTP treated water.
4. City Well No. 6 (0.61 mgd) is offline with no plans to rehabilitate.
5. SSCWD Well 7 is above the potential Chromium VI MCL level, and Well 8 has been historically above the MCL during drought years, but is currently under the MCL limit. The compliance plan developed in 2017 planned for blending at Well 7 and shutting down Well 8 when deemed necessary, as Well 8 does not have a feasible blending option.
6. SSCWD Well No. 7's design capacity is 760 gpm but throttled to 625 gpm for Chromium VI Compliance.
7. Source: 2020 City of San Juan Bautista Water Master Plan. SJB's past testings show that the city's groundwater supply is below the potential Chromium VI MCL.
8. SJB Well 6 is offline due to high nitrite levels.
9. Firm capacity assumes the largest well, City Well No. 4 (2.63 mgd) is out of service, and that water can be fed back from SSCWD's system to the City's system through existing interties.
10. Rounded.

As described in Section 4.2.2, drinking water quality goals are a major driver for future water system infrastructure improvements. Figure 4-1 illustrated the demand for additional high-quality water, and Table 5-2 summarized surface water treatment capacity needed to achieve total average day and maximum month demands.

In comparison to the existing maximum production capacity of the existing Lessalt and West Hills WTPs, there is a slight deficit under existing conditions during the maximum month condition. That deficit grows over the planning horizon. The production capacity of the existing plants is sufficient to meet average day high-quality demands through about 2035.

Recognizing that there is already a deficit of existing treatment capacity during the maximum month condition and that the average yield of the existing CVP supplies is insufficient to meet future demands, three water quality alternatives were considered. These near-term alternatives consider expanding the treatment capacity to provide additional high-quality surface water to the distribution system to achieve the drinking water quality goals. These alternatives include a combination of treatment and water supply strategies that would be implemented in the near term until Phase 2 of the ASR project comes online in approximately 2029.

The three water quality alternatives are the following:

1. **Alternative 1: Achieve Average Day and Maximum Month Water Quality Targets** with a near-term expansion of the West Hills WTP to a capacity of 6.75 mgd and augment CVP supply with spot market purchases while pursuing implementation of the ASR Phase 2 project and the B.F. Sisk Dam Raise.
2. **Alternative 2: Achieve Average Day Water Quality Targets** (but not maximum month) with additional imported surface water (e.g., conversion of agricultural water, long-term transfers, or spot market purchases) used to maximize production at the existing West Hills WTP while pursuing implementation of the ASR Phase 2 project and the B.F. Sisk Dam Raise. This alternative does include expanding the West Hills WTP in the near term.
3. **Alternative 3: Optimize Treatment of Existing CVP Water** to achieve water quality targets in low-demand months. This alternative does not include expanding the West Hills WTP or spot market purchases in the near term. Water quality would continue to degrade during the summer months. Instead, this alternative would optimize treatment of existing CVP water while pursuing implementation of the ASR Phase 2 project and the B.F. Sisk Dam Raise.

Figure 5-3 illustrates the monthly ratio of surface water and groundwater in the system and the resulting average, system-wide hardness for each alternative. These values are based on the projected demand for 2029, which corresponds to the first year of operation of the ASR Phase 2 project (which would be the groundwater injection year).

Although each of the three alternatives is able to meet the total demand requirements, only Alternative 1 is able to meet the water quality hardness goal during the maximum month conditions in the near term. Alternative 2 would provide additional imported surface water via spot market purchases such that water quality could be improved throughout the year. Alternative 3 would substantially degrade water quality (i.e., hardness) during the summer months.

The evaluation of these alternatives is summarized in Table 5-3.

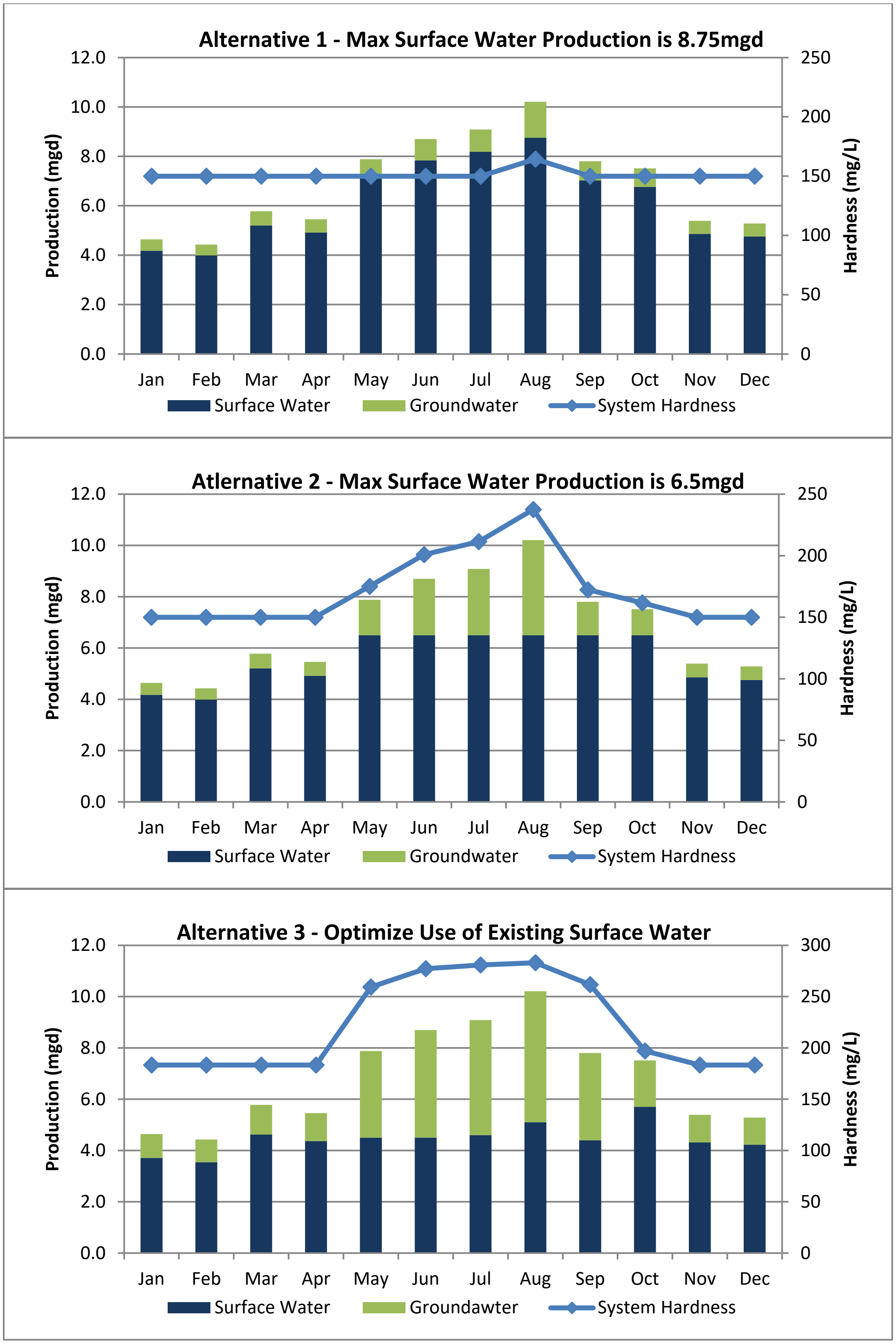


Figure 5-3. Near-term Water Quality Alternatives, System Average Hardness, 2029

Table 5-3. Evaluation of Near-term Water Quality Alternatives

	Alternative 1	Alternative 2	Alternative 3
Alternative Description	**Expand West Hills + Spot Market Purchases**	**Maximize West Hills Production + Spot Market Purchases**	**Optimize Existing CVP Allocations at Existing Treatment Plants**
10-Year Capital Investment for Project Components			
West Hills WTP Expansion[1]	$11.2	-	-
Spot Market Purchases[2]	$8.8	$6.7	-
Total 10-Year Cost	**$20**	**$6.7**	**$0**
Meets Water Production Requirements?	**Yes**	**Yes**	**Yes**
Meets Water Quality Goals?	**Meets ADD & MMD Hardness Goals**	**Meets Only ADD Hardness Goals**	**Does Not Meet Hardness Goals**

ADD – average daily demand, AF – acre-feet, CVP – Central Valley Project, mg/L – milligrams per liter, mgd – million gallons per day, MMD – maximum month demand, WTP – water treatment plant

Notes:

1. Expand West Hills WTP by 2.25 mgd to a capacity of 6.75 mgd.
2. Present value of 10-year estimated spot purchases to achieve a target hardness of 180 mg/L and $1,200 per AF.

Alternative 2 was selected as the preferred alternative because it can achieve the water quality goals the majority of the time while reducing near-term capital costs.

5.3.2 Water Transmission

The City, SJB, and SSCWD have Capital Improvement Programs (CIPs) to address the repair of, replacement of, and upgrades to their respective water distribution systems. Water distribution facilities for new development are the responsibility of the developer. The following subsections address only major improvements to the water transmission system that are required to move treated surface water from the WTPs to the municipal systems for further distribution.

5.3.2.1 SAN JUAN BAUTISTA PIPELINE

As described in Section 1.5, SJB was fined by EPA for violating discharge limits at its wastewater facility due in part to high sodium, chloride, and TDS concentrations. As part of the resolution, SJB evaluated options for higher-quality source water for its municipal customers and reached an agreement with SBCWD to divert treated water from the West Hills WTP. The San Juan Bautista Pipeline will form the infrastructure backbone for delivering high-quality surface water from the West Hills WTP to SJB to improve water quality in the distribution system. The pipeline is a 10-inch-diameter, gravity-fed, treated water transmission pipeline that will extend approximately 6.75 miles from the West hills WTP to SJB's distribution system, where it will connect near Well No. 6. A conceptual alignment is illustrated in Figure 5-4.

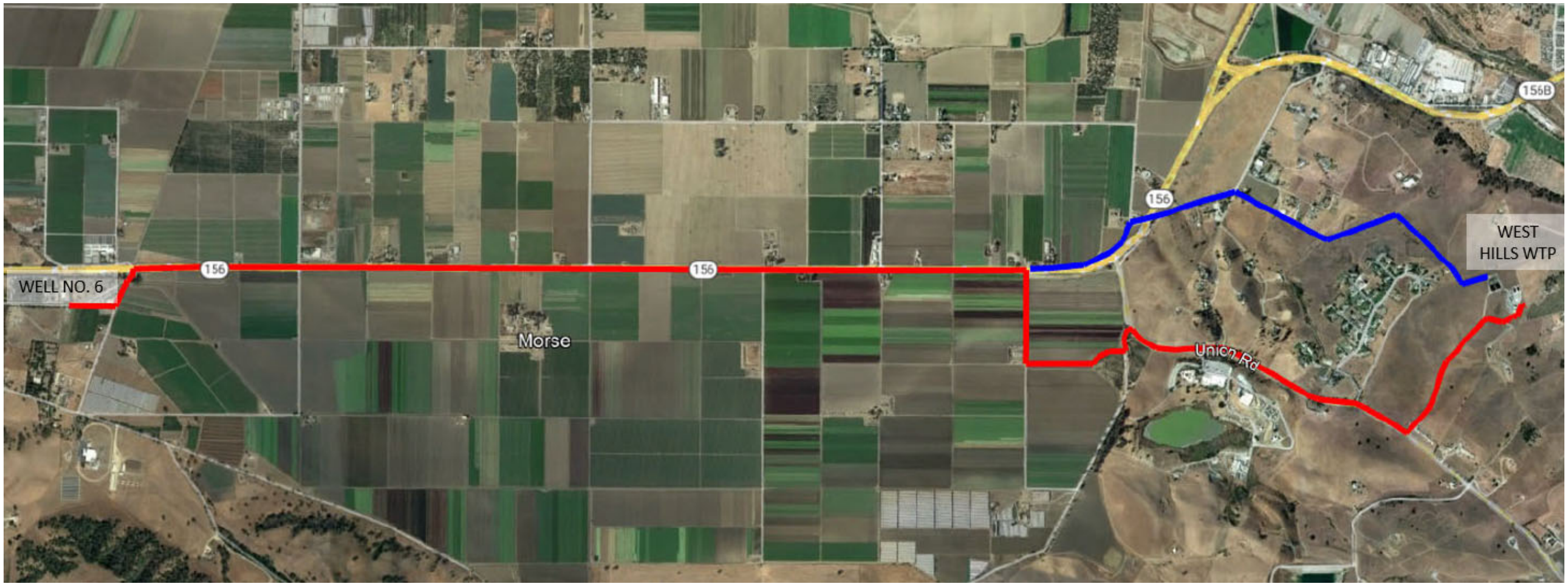


Figure 5-4. Conceptual San Juan Bautista Pipeline Alignments

5.4 Water Conservation

The Water Resources Association of San Benito County's existing water conservation program should be continued and expanded as appropriate to continue bringing awareness to water use efficiencies, conservation opportunities, and waste avoidance.

5.5 Summary of Facilities Evaluation

Based on the information presented, recommendations were developed for water supply, water treatment, and water transmission. The recommended facilities are summarized in Table 5-4.

Table 5-4. Recommended Facilities

Description[1]	Estimated Cost ($M) and Timeframe						
	2023	2024	2025	2026–2030	2031–2035	2036–2045	Total
Water Supply							
ASR Phase 1	5.3	0.9	0.9				7.1
ASR Phase 2[2]			2.9	38.4			41.3
B.F. Sisk Dam Raise[3]	1.8	1.8	1.7	44.8			50.0
ASR Phase 3[4]					2.9	38.7	41.6
North Area Groundwater Phase 1[5]					0.3	13.8	14.0
Pacheco Reservoir							TBD
Spot Market Purchases[6]	0.2	0.4	0.5	4.1	-	1.4	6.7
Subtotal	**7.3**	**3.1**	**6.0**	**87.3**	**3.2**	**53.9**	**160.7**
Water Treatment							
ASR Phase 2 (costs included above)[1]							-
ASR Phase 3 (costs included above)[4]							-
Subtotal	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Water Transmission							
San Juan Bautista Pipeline[7]	8.7	4.0					12.7
Subtotal	**8.7**	**4.0**	**-**	**-**	**-**	**-**	**12.7**
Total	**16.0**	**7.1**	**6.0**	**87.3**	**3.2**	**53.9**	**173.4**

AF – acre-feet, AF – acre-feet per year, ASR – aquifer storage and recovery, CCI – Construction Cost Index, ENR – Engineering News-Record, mg/L – milligrams per liter, mgd – million gallons per day, TBD – to be determined

Notes:

1. Costs are referenced to the ENR, San Francisco Bay Area CCI Index for February 2021, at 13,110. TBD costs to be determined based on further studies.
2. ASR Phase 2 has an annual yield of 1,000 AFY and includes a 2.5 mgd WTP.
3. Storage of 5,000 AF will provide an average annual yield of 1,500 AFY for dry-year reliability.
4. ASR Phase 3 has an annual yield of 1,190 AFY and includes an additional 3.0 mgd water treatment.
5. The North Area Groundwater Phase 1 project has a yield of 1,000 AFY.
6. Estimated spot purchases to achieve a system-wide average hardness target of 180 mg/L at $1,200 per AF.
7. Based on the Class 4 estimate prepared and presented in the Basis of Design Report, October 2021.

The proposed phasing strategy for the water treatment facilities is presented in Figure 5-5. Note that if the ASR Project Phase 1 reveals that an ASR project is not feasible, an expansion of the West Hills WTP would be needed to replace the treatment capacity provided by the ASR project.

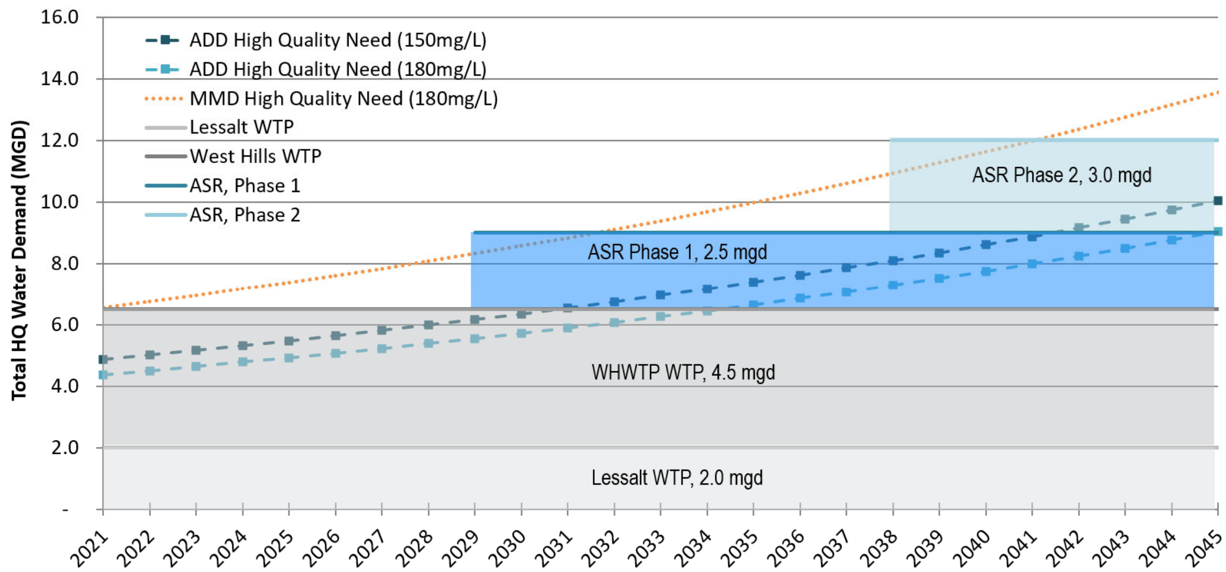


Figure 5-5. Proposed Phasing Strategy for Water Treatment Projects

6 Recommended Implementation Program

The 2008 Master Plan, and the subsequent 2017 Master Plan Update, provided the foundation for major improvements to the water and wastewater infrastructure in the region. Those improvements have provided significant benefits to drinking water quality, the ability to comply with waste discharge requirements, and the use of recycled water. This Master Plan Update provides recommended facilities and programs for additional water supply and treatment improvements through 2045.

NOTE TO READER: Following the completion of the water supply analysis presented in this Master Plan Update, the scope of ASR Phases 1 and 2 was updated to facilitate the pursuit of federal and state grant funding opportunities and ultimately deliver the project on an accelerated timeline. Although the facilities and phasing of the ASR project were updated, the total projected supply generated by the overall ASR program remains unchanged. Referred to as ADRoP (Accelerated Drought Response Project), the first phase of the ASR program now relies on the expansion of the West Hills WTP for treatment of imported water prior to injection, whereas the original project included a new dedicated water treatment plant. The first phase is also anticipated to include three to five ASR wells, capable of injecting 1,600 AFY to 2,700 AFY in wet years and generating an average annual yield of 650 AF to 1,035 AF. A more detailed description of ADRoP, including a full description of facilities, estimated cost and implementation schedule, is included in Appendix C.

6.1 Facilities and Programs

The facilities and programs recommended as part of this Master Plan Update are summarized in the following subsections.

6.1.1 Water Supply

The projected increase in water demand in the SBUA between now and 2045 is approximately 6,940 AFY (Table 3-1). The water quality goals for hardness and TDS drive the need for additional high-quality water supplies. The recommended priorities and actions for long-term water supply are summarized in Table 6-1. These recommendations are described in Section 4 and include continuation of ongoing programs and new projects requiring further investigation. All of the long-term water supply options should be retained as a menu of alternatives to contribute to a diverse and drought resilient water supply portfolio. Due to the inherent uncertainties in California water supply (drought, environmental constraints, regulations, etc.), it is prudent to maintain maximum flexibility in planning for long-term water supplies.

Table 6-1. Recommended Priorities and Actions for Long-term Water Supply Program

Description	Priority Level[1]	Estimated Average Annual Supply (AFY)	Recommended Action
Surface Water			
B.F. Sisk Dam Raise	3	1,500	Collaborate with USBR, Secure Storage Volume of 5,000 AF
PREP	4	TBD[2]	Evaluate Appropriate Level of Engagement due to High Costs
Local Surface Water Storage	Future	TBD[3]	Further Investigation Required
Groundwater			
ASR	1	1,000–2,190[4]	Conduct Pilot Study
North Area Groundwater	2	1,000–2,000[5]	Complete Feasibility and Environmental Studies
Ongoing Programs			
Water Conservation	1	—[6]	Continue Existing Program
Imported Surface Water	1	As Needed[7]	Continue Existing Program
Semitropic Water Bank	1	Drought Supply[8]	Continue Existing Program
Local Wells for Large Landscape Areas	1	—[9]	Continue Existing Program

AF – acre-feet, AF – acre-feet per year, ASR – aquifer storage and recovery, CVP – Central Valley Project, PREP – Pacheco Reservoir Expansion Project, TBD – to be determined, USBR – U.S. Bureau of Reclamation

Notes:

1. Priority level from Table 4-8.
2. Negotiations are required to determine the appropriate level of engagement.
3. Further investigations of an expansion of Paicines, or other local surface water storage options, is needed to confirm feasibility and yield.
4. Requires a pilot study to confirm feasibility. Could be implemented in phases.
5. Preliminary investigations indicated that up to 5,000 AFY during normal years and up to 2,000 AFY during dry years.
6. Significant reductions have already been achieved through regional efforts in water conservation. Further reductions to be determined based on results of ongoing efforts.
7. Conversion of Agricultural CVP water to M&I, long-term transfers, and/or spot market purchases are needed to augment M&I CVP supplies to meet water quality goals.
8. Semitropic Water Bank enhances dry-year reliability, but water might not be available during critically dry years if water is not available for diversion from San Luis Reservoir.
9. The demand for high quality water could be offset with this strategy. However, the volume of water has not been estimated.

As described throughout this Master Plan Update, additional high-quality water will be required to meet the TDS and hardness goals. While the current supply portfolio is capable of meeting the demand for existing customers in a normal year, additional water is needed to meet the demands of future growth. During normal years, the additional increment of high-quality water is estimated to be approximately 785 AFY by 2025, 2,690 AFY by 2035, and 5,380 AFY by 2045 with an 81 percent blend ratio (assuming a water quality similar to imported CVP water). Furthermore, during a multi-year drought, the existing M&I CVP supply is not sufficiently reliable to meet the demands of existing customers. An additional 1,250 AFY of high-quality water is needed to meet the demands of existing customers during a multi-year drought.

The water supply options listed in Table 6-1 provide “building blocks” to meet the need for high-quality water.

The quantity and timing of additional high-quality water needs will depend on actual demand growth, hydrologic conditions (wet, normal, and dry years), and allocations of existing CVP supplies by USBR. Both the ASR and B.F. Sisk Dam Raise projects will improve the reliability of the existing CVP water by providing opportunities for long-term storage of excess CVP water during wet years. That water would then be available during dry years, when CVP allocations are curtailed.

During extended dry-year conditions, it might be necessary to relax the TDS and hardness goals. However, even during extended dry-year conditions, sufficient high-quality water supply is needed to meet the anticipated hexavalent chromium regulations.

6.1.2 Water Supply and Treatment Facilities

The recommended water supply and treatment facilities are summarized in Table 6-2. Table 6-2 is limited to the facilities and improvements that are recommended for implementation through 2031, which coincides with the estimated completion schedule for the B.F. Sisk Dam Raise Project. Improvements needed beyond 2031 should be revisited in a subsequent Master Plan Update which should be completed no later than 2027. At that time, the actual growth in water demand, water quality requirements, new regulations, and other factors can be reconsidered to develop recommendations and for appropriate scope and timing for facilities beyond 2031.

6.2 Coordination with Related Planning Activities

Implementation of this Master Plan Update should be coordinated with other ongoing programs to provide opportunities for optimizing facilities sizing, reducing costs, and obtaining outside financing. Some of the major ongoing programs for coordination include the following:

- Local Water Distribution System Master Plans and Infrastructure Investments
- Groundwater Sustainability Plan
- Valley Water’s Pacheco Reservoir Expansion Project (PREP)
- Pajaro River Watershed Integrated Regional Water Management Program
- USBR’s San Luis Reservoir Low Point Improvement Project
- USBR’s B.F. Sisk Dam Seismic Upgrade and Dam Raise Project

Table 6-2. Estimated Costs, Schedule and Actions for Recommended Facilities

Description[1]	Estimated Cost ($M) and Timeframe				Total	Recommended Action
	2023	2024	2025	2026–2031		
Water Supply and Treatment						
ASR Phase 1	5.3	0.9	0.9		7.1	Complete design and environmental studies
ASR Phase 2[2]			2.9	38.4	41.3	Complete Pilot Project and initiate design and environmental studies
B.F. Sisk Dam Raise[3]	1.8	1.8	1.7	44.8	50.0	Collaborate with USBR and secure 5,000 AF storage
Imported Water[4]	0.2	0.4	0.5	4.1	5.2	Purchase as needed to maximize production at West Hills WTP to meet water quality goals
Subtotal	**7.3**	**3.1**	**6.0**	**87.3**	**103.6**	
Water Transmission						
San Juan Bautista Pipeline	8.7	4.0			12.7	Confirm financing plans, design, and construct
Subtotal	**8.7**	**4.0**			**12.7**	
Total[5]	**16.0**	**7.1**	**6.0**	**87.3**	**$116.3**	

$M – millions of dollars, AF – acre-feet, ASR – aquifer storage and recovery, CCI – Construction Cost Index, CIP – capital improvement program, City – City of Hollister, ENR – Engineering News-Record, mgd – million gallons per day, SBCWD – San Benito County Water District, SJB – City of San Juan Bautista, SSCWD – Sunnyslope County Water District, USBR – U.S. Bureau of Reclamation, WTP – water treatment plant

Notes:

1. Costs are referenced to the ENR, San Francisco Bay Area CCI Index for February 2021, at 13,110.
2. ASR Phase 2 includes a 2.5 mgd WTP.
3. Costs provided by SBCWD. Project relies on state and federal partners.
4. Needed in the near term to maximize production of the West Hills WTP to meet system hardness goals. Costs estimated at $1,200 per AF based on spot market purchases but could be lower if alternate imported sources are used (e.g., conversion of Ag CVP to M&I CVP).
5. Table does not include CIP costs for water distribution system improvements for the City, SJB, or SSCWD.

6.3 Water System Operations

To achieve the water quality goals, the SBUA will increasingly use treated surface water. Therefore, it is critical for the City, SJB, SSCWD, and SBCWD to cooperate in the efficient operation of the water supply, treatment, and distribution facilities.

The cooperation and coordination of system operations will be required to provide efficiencies and maximize the following benefits to consumers in the SBUA:

- Efficient use of limited high-quality water supplies
- Compliance with state and federal drinking water standards, especially the California hexavalent chromium limits

- Continued progress toward meeting TDS and hardness goals established for drinking water in the SBUA
- Continue compliance with waste discharge requirements for local wastewater treatment plants
- Production of Title 22 recycled water from the City's WRF for reuse by SBCWD for agricultural irrigation

To achieve these benefits, the 2013 System Operations Technical Memorandum should be updated to ensure efficient operation of new facilities and to incorporate facilities developed since 2013. Specifically, some of the issues to be addressed in the update should include the following:

1. Production scheduling for the Lessalt and West Hills WTPs for seasonal and daily flow variations.
2. Scheduling of well operations to complement treated surface water deliveries and provide comparable average run times for all wells.
3. Production scheduling for the new ASR WTP for various year types and seasonal variations. For example, it is expected that, during wet years, the ASR WTP would treat excess CVP for injection; during normal years, the ASR WTP would treat CVP water for distribution, in balance with the West Hills WTP; and during dry years, the ASR WTP would treat recovered groundwater for distribution.

6.4 Engineering

The technical work completed for this Master Plan Update provides a framework for water supply and treatment facilities required through 2045. The recommended facilities are described in Section 5, and those near-term facilities recommended for implementation through 2031 are summarized in Figure 6-1. The locations of facilities presented throughout this Master Plan Update are conceptual, and final locations will be determined during facilities planning and preliminary design work.

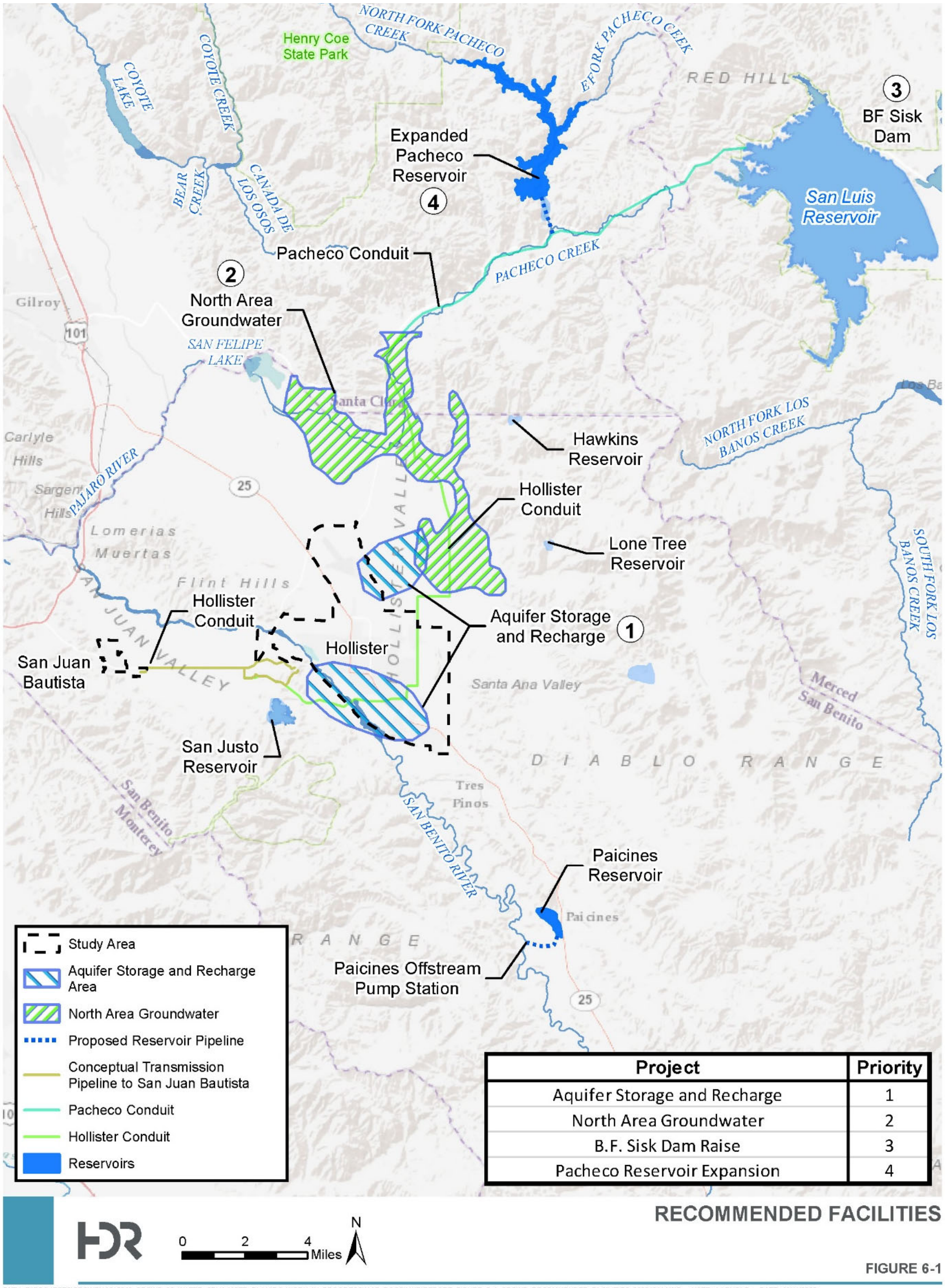


Figure 6-1. Recommended Facilities

The next step in implementation will be to conduct engineering and related technical investigations for the recommended facilities. Engineering work would include facilities planning, preliminary design, design, construction management, and startup. The preliminary design of the San Juan Bautista Pipeline project has been completed, and an initial feasibility study for the ASR project was completed as part of the Groundwater Sustainability Plan, which was submitted to the State in early 2022. An initial phase of the ASR project, referred to as ADRoP, is anticipated to rely on the expansion of the West Hills WTP for treatment of imported surface water prior to injection at an ASR wellfield. The location of the wellfield is conceptual. Actual well locations will need to be evaluated based on hydrogeological studies, infrastructure costs to convey water to the wellfield, available land, and environmental impacts, among others factors. Additional information about ADRoP is included in Appendix C.

Many of the improvements proposed in this Master Plan Update will be phased, and the engineering work would be scheduled accordingly. Construction contract packaging should also be evaluated to provide the greatest opportunities for competitive bidding by contractors.

6.5 Environmental Compliance

The recommended facilities will require environmental compliance with the California Environmental Quality Act (CEQA) to evaluate the environmental impacts of the projects. Project-specific compliance would be determined on a case-by-case basis for individual projects. For large, complex projects, such as the North Area Groundwater Project or the ASR project, a complete EIR will be required.

The region is known to be home to several federally listed species, including the California tiger salamander, California red-legged frog, and San Joaquin kit fox. As projects are developed, consideration should be given regarding how to minimize impacts to their habitat.

If federal grants or loans are used to pay for specific facilities, additional environmental review might be required to comply with the National Environmental Policy Act (NEPA). In addition, if federal facilities, such as the Hollister Conduit, are impacted, NEPA compliance might also be triggered.

6.6 Permitting

Numerous federal, state, and local permits will also be required for implementation. The required permits will be identified during the preparation of the engineering predesign studies and environmental compliance documents. A permitting strategy should be developed to minimize project delays and potential mitigation costs.

6.7 Institutional Agreements

Institutional agreements between and among agencies will be required to implement projects that provide joint benefits. Multiple institutional agreements are anticipated to be required in order to implement the recommended projects. The following agreements might be required:

- Update to the Water Supply and Treatment Agreement to add SJB and incorporate the new suite of projects.
- Update to operating agreements for the treatment plants to reflect a new cost allocation to include SJB.
- Agreement between SBCWD and SJB to construct and operate the San Juan Bautista Pipeline.
- Agreement between USBR and SBCWD to use the Hollister Conduit to receive concentrate from the ASR WTP, which would be blended with CVP water in the conduit to minimize overall water losses.
- Agreement with USBR and partner agencies to document storage volume and cost share in the B.F. Sisk Dam Raise.
- Update to the MOU between SBCWD and Valley Water for the PREP to record SBCWD's status of participation going forward.

  Agreement between USBR and SBCWD to use the Hollister Conduit to transmit North Area groundwater (Warren Act).

6.8 Financing

Recommended projects might be financed local funding and/or state and federal grants and loans. Past projects, such as the Hollister Urban Area Water Project, have been implemented through a combination of local financing and state grants. Opportunities for outside financing (grants or loans) should be fully explored from state water programs and federal infrastructure funding.

For local financing, the agencies will need to update their financial plans and rate studies. Rate study updates should include a review of both rates and connection fees. For the recommended new water facilities, benefits and costs should be allocated to water quality improvements and growth. Staff from each water agency should meet periodically to discuss strategies to accommodate these new facilities and the status of their individual financing plans.

It is recommended that the projected water demands, facilities timing, and financing plan be reviewed by 2027. This interim milestone would give the agencies the opportunity to verify actual trends in water demand growth and adjust the schedules for implementing and financing facilities as appropriate.

SBCWD has initiated efforts to pursue over $30 million in grant funding from federal and state programs for an accelerated ASR project, ADRoP, including:

- Small Storage Grant Program by United States Bureau of Reclamation (USBR)
- Round 2 Integrated Regional Water Management (IRWM) Implementation Grant Program by California Department of Water Resources (DWR)
- Round 2 Sustainable Groundwater Management (SGM) Grant Program by DWR

If funds are awarded, the funding programs impose certain limits on the performance completion date which is when the funded project needs to be completed. With the performance due dates set as early as December 2026 and as late as March 2027, the original scope of the first phases of the ASR project was updated to facilitate the pursuit of grant funding. The updated ASR project, ADRoP, is described in further detail in Appendix C.

6.9 Stakeholder Outreach

Stakeholder outreach has been an integral part of implementing past master plans. Continued successful implementation of the recommendations of this Master Plan Update will require a proactive approach to the various interest groups and stakeholders in the SBUA, including:

- General public,
- Local interest groups (business, environmental, and others),
- Regulatory agencies,
- City, County, SBCWD, SJB, and SSCWD elected officials and staff, and
- Regional interests outside San Benito County.

A first step in developing a responsive stakeholder outreach program would be to revisit the communications strategy that was previously implemented to support the upgrade of the Lessalt WTP and new West Hills WTP.

6.10 Recommended Implementation Schedule and Next Steps

Implementing this Master Plan Update will require overall program and individual facilities activities. Some of the recommended projects are already in design or have advanced through the feasibility phase.

The next major infrastructure improvements would be completed through 2031. Table 6-3 summarizes the recommended projects and programs along with a timeline and responsibilities for implementation. It is also recommended that this Master Plan Update be updated no later than 2027. An update in this timeframe is necessary to adjust the recommendations for facilities beyond 2027 based on actual growth rates, progress made in program implementation, new regulations, and potential new issues and opportunities.

Table 6-3. Summary of Timing and Responsibility for Recommended Improvements

Description	Date	Responsible Agency
Water Supply		
Continue and/or Expand Existing Programs		
Continue Importing Surface Water	Ongoing	SBCWD
Renew Semitropic Water Agreement	Ongoing	SBCWD
Continue Water Conservation Program	Ongoing	WRA
New Programs		
Complete ASR Phase 1 Project	2022–2024	SBCWD
Secure 5,000 AF of Storage in the B.F. Sisk Dam Raise Project	2022	SBCWD
Determine Appropriate Level of Continued Engagement in PREP	2022	SBCWD
Further Investigate Local Surface Water Supplies and Storage	2024+	SBCWD
Complete Feasibility and Environmental Studies for North Area Groundwater Supply	2024+	SBCWD
Water Treatment		
Confirm Treatment Requirements for the ASR Project	2022–2024	SBCWD
Expand West Hills WTP to 9 mgd	Future	SBCWD
Water Distribution		
Construct the San Juan Bautista Transmission Pipeline	2022–2024	SJB, SBCWD
Complete Additional Operations Studies and Modeling to Provide Uniform Distribution of High-quality Water	Ongoing	City, SJB, SSCWD
Implement CIPs for Water Distribution System Improvements	Ongoing	City, SJB, SSCWD
Updates to Planning Documents		
Update Water System Operations TM	2022	All Agencies
Complete Master Plan Update	By 2027	All Agencies

AF – acre-feet, ASR – aquifer storage and recovery, CIP – capital improvement program, City – City of Hollister, CVP – Central Valley Project, mgd – million gallons per day, PREP – Pacheco Reservoir Expansion Project, SBCWD – San Benito County Water District, SJB – City of San Juan Bautista, TM – Technical Memorandum, USBR – U.S. Bureau of Reclamation, WRA – Water Resources Association of San Benito County, WTP – water treatment plant

Notes:

Refer to Table 6-2 for estimated costs.

Appendices

A

Appendix A

Water Demand Projections Technical Memorandum

Water Demand Projections Technical Memorandum

Master Plan Update

City of Hollister, City of San Juan Bautista, San Benito County, San Benito County Water District, and Sunnyslope County Water District

June 2022

Table of Contents

List of Tables

List of Figures

Summary

Demand projections are required for the San Benito Urban Area (SBUA) Water Master Plan Update to identify future urban water supply needs for the planning horizon of 2045. The demand projections presented in this technical memorandum follows the framework set by previous studies with updated population growth within the service area, unit demands, new additions to the service area, and other factors such as economic and social conditions.

The average annual water demands for the SBUA are approximately 5,559 acre-feet per year (AFY) based on the production data from 2018 to 2019, excluding 2020 due to the singularity of the pandemic. The annual water demand is projected to increase to approximately 9,192 AFY by 2035 and to approximately 12,496 AFY by 2045, as summarized in Figure 1. By comparison, the previous master plan update, completed in 2017, projected the annual water demand would be 10,170 AFY by 2035. The decrease in projected future demands is attributed to changes in consumer behavior due to past droughts, conservation, and moderated population growth rates. The significant difference between the average 2018 through 2020 demand and the estimated 2021 demand is largely due to the inclusion of City of San Juan Bautista.

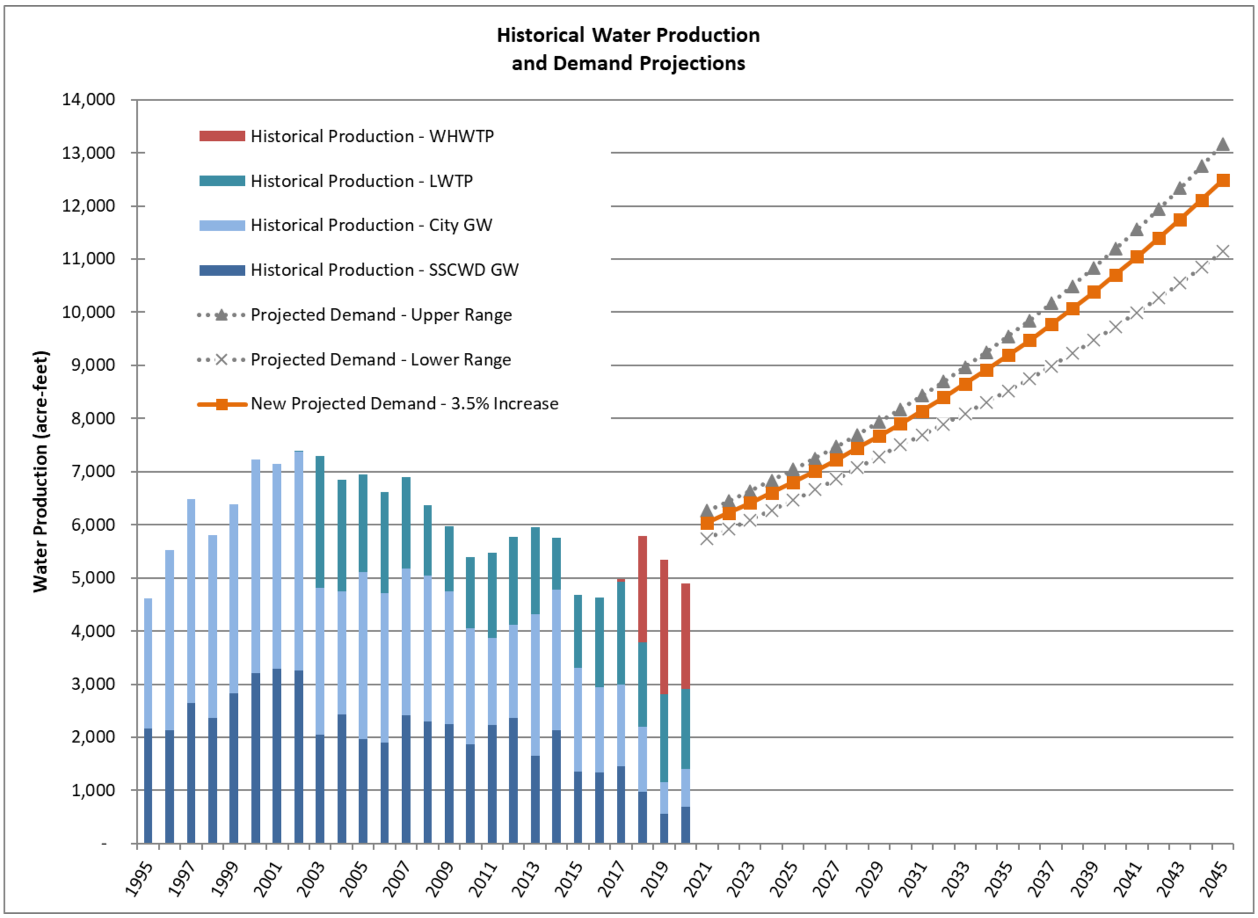


Figure 1. Existing and Projected Water Demands

1.0 Previous Projections

Demand projections are required for the San Benito Urban Area Water Master Plan Update to identify future urban water supply needs for the planning horizon of 2045. The following subsections present a summary of past projections that have been prepared for the 2008 Master Plan, the 2010 Urban Water Management Plan, and the 2017 Master Plan Update.

1.1. 2008 Master Plan

The 2008 Hollister Urban Area Water and Wastewater Master Plan (2008 Master Plan) included a detailed analysis of historical water use and future water projections. The analysis incorporated land use planning data from the adopted General Plans for the City of Hollister (City) and San Benito County (County), respectively, evaluation of unit demands, system losses, and water conservation projections.

At the time of the 2008 Master Plan, the average annual water demand was estimated to be approximately 7,965 AFY and was projected to increase to 11,840 AFY 2023 and to 20,150 AFY by buildout of the Hollister Urban Area (HUA).

The growth in demands presented in the 2008 Master Plan is presented in Figure 2.

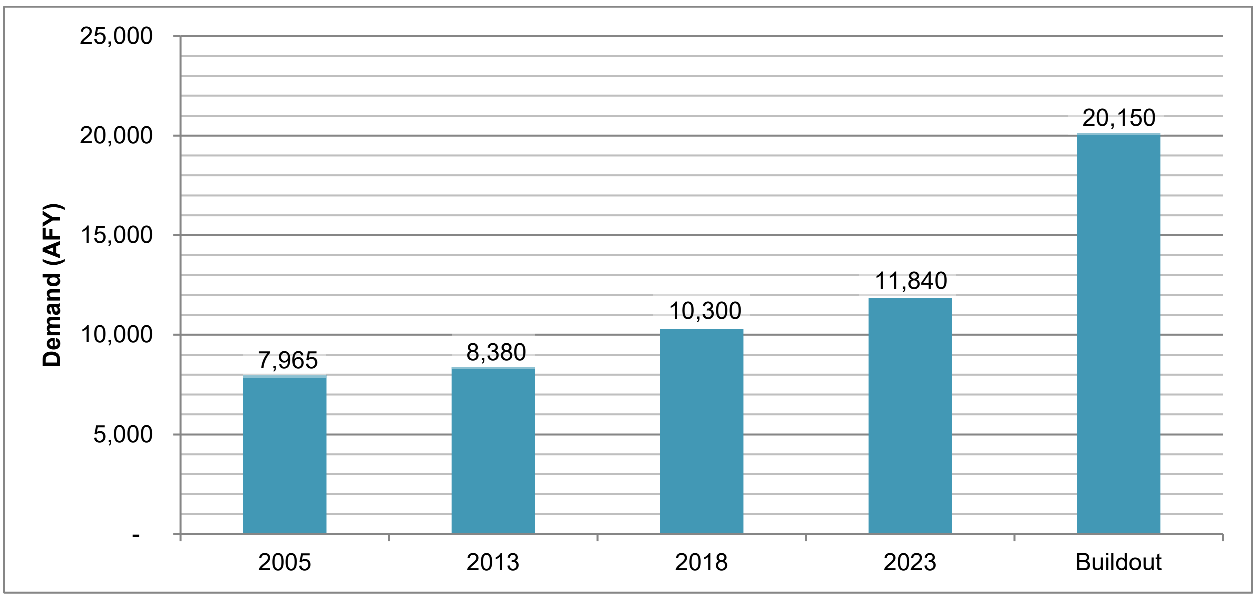


Figure 2. 2008 Master Plan Water Demand Projection

1.2. 2010 UWMP

The 2010 Urban Water Management Plan (UWMP) included an analysis of past and projected water demands, as required by the State and prescribed in the 2010 UWMP Guidebook. As presented in the 2010 UWMP, the total water use from 2005 to 2010 decreased from approximately 6,791 AFY to 5,856 AFY, despite a relatively consistent population in the HUA. The factors believed to contribute to this decrease are described in the following section.

Water demand was projected to increase to 8,624 AFY in 2020 and to 11,583 by 2030, which included estimated system losses at approximately 7 percent of demand.

1.3. 2017 Master Plan Update

The 2017 Hollister Urban Area Water and Wastewater Master Plan Update (2017 Update) updated water demand projections based on plans and schedules for future developments provided by the City and the Sunnyslope County Water District (SSCWD), the updated unit demands, system losses, and water conservation projections.

The average annual water demand of the HUA at 2017 was estimated to be approximately 5,830 AFY and was projected to increase 10,170 by 2035.

The demand projections from the 2017 Update for the City and SSCWD through 2035 are presented in Table 1.

Table 1. 2017 Master Plan Update Demand Projections

	Existing	2020	2025	2030	2035
City	3,150	3,580	3,980	4,460	5,040
SSCWD	2,680	3,240	3,760	4,380	5,130
Total	**5,830**	**6,820**	**7,740**	**8,840**	**10,170**

2.0 Changed Conditions Since Prior Projections

Since the Master Plan Update in 2017, several key conditions changed. The changed conditions include factors which would increase demands and factors which would tend to decrease demands.

2.1. Economic Development

With the recovery of the economy since the "Great Recession", and the boom of the technology industry at Silicon Valley, San Benito County has become the fastest growing county in the Association of Monterey Bay Area Governments (AMBAG) region. According to the 2020 U.S. Census, San Benito County was the third fastest growing county in California since 2010. San Benito County is anticipated to continue to grow significantly in long term in both housing and employment (AMBAG, 2020).

2.2. New Additions to the HUA

San Juan Bautista is a city within the County approximately 7.5 miles east to the City of Hollister. Like other cities in the County, San Juan Bautista is expecting to grow in population due to economic recovery and expansion. In a recent MOU with the San Benito County Water District (District), San Juan Bautista will finance the infrastructure required to convey treated surface water from the West Hills Water Treatment Plan (WHWTP) to meet its future demand as well as to improve distribution water quality.

2.3. County Master Plan Update

The San Benito County 2035 General Plan, adopted on July 21, 2015, provides land use designations within the county, as well as within the HUA area (outside the City's sphere of influence). Urbanization/densification of agricultural, low density and/or vacant parcels will result in an increase in the potable water demand.

2.4. Drought

San Benito County, like all of California, has experienced severe drought conditions. Since 2008, two state-declared drought emergencies have occurred, one in 2007 to 2009 and the other in 2012 to 2016. During the 2012 to 2016 drought emergency, a mandatory 25 percent reduction was enforced throughout the state. Future severe droughts might see similar mandatory measures. In addition, other conservation laws focusing on water suppliers' water efficiency and water budgets have passed in recent years, such as the Senate Bill 606 and Assembly Bill 1668 passed in 2018. Drought conditions and conservation measures will continue to have significant impacts on water demands.

2.5. Conservation

The Water Conservation Bill of 2009, Senate Bill x7-7, required a 20 percent reduction in per-capita urban consumption by 2020 (often referred to as 20 by 2020). SBx7-7 requires that urban water purveyors are not eligible for state water grants or loans unless they comply with their water conservation requirements. In addition, Senate Bill 606 and Assembly Bill 1668 requires water suppliers to annually calculate water efficiency standard based beginning in November 2023.

The effect of water conservation laws has been a heightened awareness and implementation of conservation measures in the HUA. The Water Resource Association of San Benito County (WRA) is responsible for managing the conservation efforts, including providing incentives for new plumbing fixtures (e.g., low flush toilets, etc.), and providing information and education on conservation measures for the public. As described later in this memorandum, the WRA has been very successful in its efforts to upgrade plumbing fixtures.

3.0 Methodology

The 2008 Master Plan was based on planned future land uses and the application of water use factors to those respective lands. The land use designations and densities were identified in the City and County General Plans for vacant lands within the Study Area. The future demands were then added to the existing demand to determine a total forecasted demand for 2023 and beyond.

The 2017 Update partially relied on earlier projections to understand the total potential demand, but used population growth, revised water use factors, and other use trends provided by the City's Planning Department and SSCWD to complete the demand projections.

The 2022 Update continues the approach set in 2017 to project future demands, by updating population growth, development plans, and water use factors based on the City and SSCWD's input.

4.0 Analysis of Recent Historical Data

The following subsections present an analysis of recent water consumption, unit factors, conservation, and unaccounted for water.

4.1. Water Consumption

Historical water consumption data in the past five years are presented in Table 2 by summarizing water production data by source. The water supply sources are local groundwater from wells and imported CVP surface water, treated at the two water treatment plants. Over the past five years, after a slight decline in 2016, water consumption increased until peaking in 2018. Consumption started to decrease in 2019 and continued decreasing in 2020. However, 2020 data is excluded from the demand projection due to the singularity of the pandemic.

Table 2. Historical Water Production (AFY)

	2015	**2016**	**2017**	**2018**	**2019**	**2020**
SSCWD GW	1,348	1,331	1,449	978	565	694
COH GW	1,960	1,615	1,543	1,217	588	707
Lessalt WTP	1,364	1,682	1,940	1,596	1,660	1,503
West Hills WTP	-	-	51	1,990	2,524	1,990
Total	**4,672**	**4,628**	**4,983**	**5,781**	**5,337**	**4,894**
Annual Increase		**(44)**	**355**	**798**	**(444)**	**(443)**

4.2. Unit Factors

Since the majority of developments in the HUA between 2017 and 2021 have been Single Family Residential (SFR) projects, this 2022 Update evaluated the latest unit factor for SFRs and assumed that the unit factors of other customer types remains the same. The SFR unit factor is based on data provided by SSCWD based on meter data of "new" residential construction since 2018. The City's unit factors for new connections are assumed to be the same as those of the SSCWD. The new unit factor, 0.25 AFY/connection, is approximately 76% of the 2017 estimate of 0.33 AFY/connection. Although this recent data suggests that water consumption for new SFR customers has decreased, to account for variability in lot size, unforeseen growth or other plans, as well as the lifestyle changes introduced by the pandemic, this 2022 Update continues to use a unit factor of 0.33 AFY/connection for a conservative baseline projection.

4.3. Conservation

The Water Resource Association of San Benito County (WRA) began tracking water conservation activities in 2003. Between 2003 and 2013, total water savings generated from fixture replacements are approximately 2,623 AFY. In addition to the indoor plumbing retrofits, approximately 74,500 square feet of turf has been removed and/or replaced with drought tolerant landscaping since early 2014, which has helped reducing water loss due to evaporation. The 2017 Update pointed out that many of the quantifiable indoor conservation retrofits are reaching saturation in the existing system, and turf removal due to drought and mandatory rationing is not expected to continue.

4.4. Unaccounted for Water

The 2017 Master Plan Update compared the total water production, including the water produced at the City's wells, SSCWD's wells, and the Lessalt Water Treatment Plant (LWTP), to the total metered water in the combined system. It was estimated that the average of unaccounted for water is approximately 7% of annual consumption. The 2022 Update continues to use the 7% ratio.

5.0 Population Projections

As previously described, residential growth was used as the basis to update the water demand projections. Like the 2017 Update, the distribution between yearly new SRFs and MRFs is approximately five to one, and the annual incremental commercial, industrial and institutional use is kept at 12.5 AFY.

A summary of population projections from various sources are listed in Table 3. Compared to the 4% rate of increase used in the 2017 Update, population growth is likely to decrease in the future. The County's existing population and future growth are concentrated in the urban areas; therefore, the increase in water demands should at a minimum match the growth within and around these urban areas.

Table 3. Review of Population Growth Rates

Source	Planning Period	Planning Area	Average Annual Growth Rate
AMBAG	2005 - 2045	AMBAG Region	0.5%
2020 San Benito County Water District UWMP	2000 - 2020	San Benito County	2.5%
2022 Final AMBAG Regional Growth Forecast	2010 - 2045	San Benito County	1.2%
2035 County General Plan EIR Update	2010 - 2035	San Benito County	2.6%
2005 City General Plan	2000 - 2023	City of Hollister	2.0%
SSCWD Development Plans	2021 - 2040	SSCWD	3.5%
2020 HUA UWMP	2020 - 2040	City and SSCWD	3.6%
2020 San Juan Bautista Water Master Plan	2020 - 2045	San Juan Bautista	1.9%

Considering the population growth will be disproportional in different areas, population projections for the AMBAG regional area and the County are less reflective than those of the urban locations. Additionally, recent historical records are also analyzed to verify this assumption. Table 4 summarizes the average annual growth in actual demand and water accounts from 2015 to 2019. This period saw significant changes in production quantity, but the average trend is a net water demand increase, at a rate slightly below the 4% population increase used in the 2017 Update.

Table 4. 2015 - 2020 Production Data and Account Data

	Production (AFY)	Annual Increase Rate	Avg Annual Increase in Rate of Water Production[1]
2015	4,672	--	3.8%
2016	4,628	(0.9%)	
2017	4,983	7.7%	
2018	5,781	16%	
2019	5,337	(7.7%)	

Notes:
1. Average annual production increase rate is calculated as the average of increase rate of each year.

Based on the information presented in Tables 3 and 4, and discussions with the District and its partner agencies, a population growth rate of 3.5% is selected as the basis for the demand projections. Table 6 presents the population growth, by year, for the planning horizon.

Table 5. Projected Population Growth, at 3.5% per Year

Year	New Population[1]	New Units[2]	Year	New Population[1]	New Units[2]
2021	1,553	470	2034	2,428	736
2022	1,607	487	2035	2,513	762
2023	1,663	504	2036	2,601	788
2024	1,721	522	2037	2,692	816
2025	1,782	540	2038	2,786	844
2026	1,844	559	2039	2,884	874
2027	1,908	578	2040	2,985	904
2028	1,975	599	2041	3,089	936
2029	2,044	619	2042	3,197	969
2030	2,116	641	2043	3,309	1,003
2031	2,190	664	2044	3,425	1,038
2032	2,267	687	2045	3,545	1,074
2033	2,346	711			

1. Population growth is projected based on 3.5% growth per year.
2. New units are based on 3.3 people per household, consistent with the 2017 Update.

6.0 Water Demands

In discussions with the District and the partner agencies, there are no significant changes to the distribution between single family residential (SFR) and multifamily residential (MFR). Therefore, the ratio of 5:1 (SFR:MFR) used in the 2017 Update is kept the same in this update. Based on the unit demands presented in Section 4, the projected water demands in the conventional HUA, excluding SJB, are summarized in Table 6. The conventional HUA refers to the previously defined service area in the 2017 Update. SJB demands are added separately.

Table 6. New Water Demand by Customer Class (AFY) in the conventional HUA

	2021 - 2025	2026 - 2030	2031 - 2035	2036 - 2040	2041 - 2045	Total
SFR[(a)]	699	831	986	1,172	1,391	5,079
MFR[(b)]	89	106	126	149	177	647
Commercial/Industrial[(c)]	63	63	63	63	63	313
Losses[(d)]	55	66	78	92	110	401
Total	**906**	**1,064**	**1,253**	**1,476**	**1,741**	**6,440**

1. SFR demand is based on a unit demand of 0.33 AFY.
2. MFR demand is based on a unit demand of 0.21 AFY.
3. Commercial / Industrial demands were estimated based on 12.5 AFY of new demand per year.
4. Losses were estimated at 7 percent of residential demand.

Table 7 summarizes the total estimated Average Day Demand (ADD), Maximum Month Demand (MMD) and Maximum Day Demand (MDD) for the combined systems as well as for individual entities. As shown, the total system demand is expected to increase from approximately 5,560 AFY in recent years to 12,500 AFY in 2045.

Table 7. Projected Water Demand (AFY) for Major Entities and the Combined System

	Existing (Avg of 2018 and 2019)	2025	2030	2035	2040	2045
City	2,417	2,813	3,274	3,817	4,461	5,217
SSCWD	3,142	3,657	4,256	4,963	5,799	6,783
San Juan Bautista[1]	-	340.2	372.4	410.0	451.3	496.9
Total Annual	5,559	6,810	7,902	9,190	10,711	12,497
Total ADD (mgd)		6.1	7.1	8.2	9.6	11.2
Total MMD (mgd)[2]	-	9.1	10.6	12.3	14.3	16.7
Total MDD (mgd)[3]	-	12.2	14.1	16.4	19.1	22.3

Notes:

1. SJB demands are based on most recent SJB Water Master Plan.
2. MMD is estimated at 1.5 times ADD, same as the 2017 Update, based on historical consumption data.
3. MDD is estimated at 2.0 times ADD, same as the 2017 Update, based on historical consumption data.

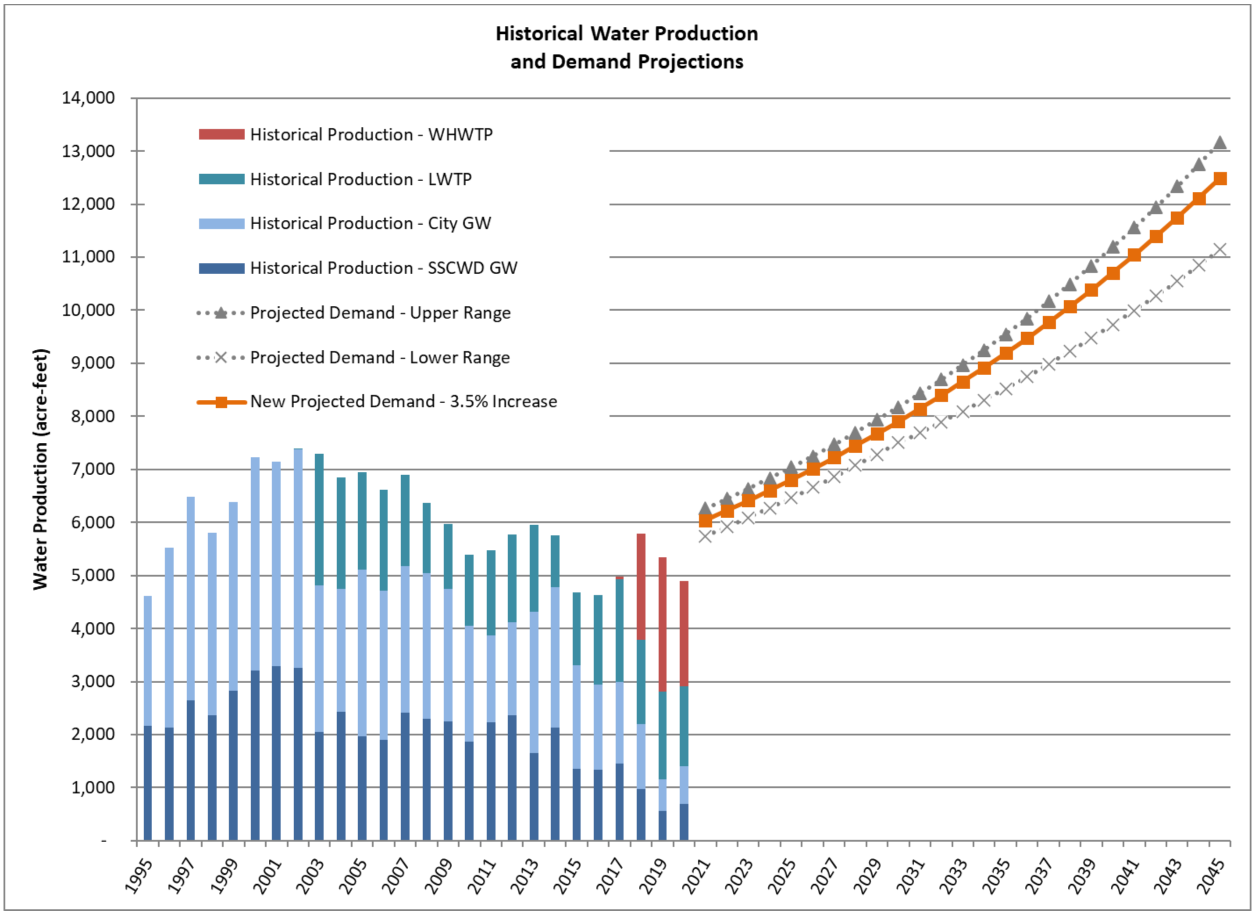


Figure 3. Projected Water Demand

Due to the inherent uncertainty in projecting future conditions, a range is presented in Figure 3. The difference from 2018 and 2019 compared to the estimated 2021 demand is largely due to the inclusion of the demands of the City of San Juan Bautista. The upper band of the range uses the peak 2018 consumption data as the existing condition and a 4% population increase rate. The lower band uses the average of 2018 and 2019 consumption data as the existing condition and adopts the smaller 0.25 AFY/connection SFR unit factor as described in Section 4. Due to the inherent uncertainty in forecasting future conditions, it will be important to identify triggers such that the implementation of new water supply infrastructure needed to serve the future demand is complete in a timely manner. Further, the demand forecast should be updated within five years.

B

Appendix B

Climate Change Strategic Plan

Climate Change Strategic Plan

San Benito County Water District

December 13, 2022

Table of Contents

List of Tables

1.0 Introduction

1.1. Background

The San Benito County Water District (District) is located in San Benito County that has long dry seasons that characterizes the Mediterranean climate. The District has a contract with the United States Bureau of Reclamation (USBR) to import surface water for agricultural (Ag) and municipal/industrial (M&I) uses to its service area via the Central Valley Project (CVP), a system of reservoirs, canals and pumping stations. The District's contract with USBR is for a total supply of 43,800 acre-feet per year (AFY), of which 35,550 AFY is for Ag use and 8,250 AFY is for M&I use. The USBR establishes allocations on an annual basis depending on hydrologic conditions in the state. Once imported, the M&I supply is treated at local surface water treatment plants and delivered to the City of Hollister (Hollister) and Sunnyslope County Water District (Sunnyslope), where the water is blended with groundwater from municipal wells to improve water quality in the municipal drinking water system. The District will also begin delivering treated surface water to the City of San Juan Bautista (San Juan Bautista) in 2025.

The overall San Benito Urban Area (SBUA) foresees an increase in population and commercial development. The 2022 Water Supply and Treatment Plan Update (2022 Plan) evaluated the reliability of the existing CVP supply and concluded that although the supply is sufficient to meet M&I demands in wet and normal years, during dry years, there is a supply deficit for existing users. In addition, when reduced imported supply quantity during dry years, when the CVP allocations are curtailed, municipal groundwater pumping increases which can result in overdraft conditions in the groundwater basin. The impacts of climate change will negatively impact the availability and reliability of future CVP water deliveries, resulting in more frequent years with reduced allocations. These impacts will not only affect the District's supply for future growth, but also limits its ability to maintain water quality for existing customers in dry years.

1.2. Purpose

The purpose of this Climate Change Plan (Plan) is to review and summarize the analysis performed to date assessing the anticipated impacts of climate change on the District's water supply. In addition, this Plan also documents the District's efforts in identifying system vulnerabilities and risk mitigation strategies. This Plan will be appended to the 2022 Water Supply and Treatment Plan Update.

This Plan reviews and references the following reports and documents, in addition to information provided by District staff, to bring related information into one common location:

- 2015 Hollister Urban Area Urban Water Management Plan (2015 UWMP)
- 2017 Hollister Urban Area Water and Wastewater Master Plan Update (2017 Plan Update)
- 2020 Hollister Urban Area Urban Water Management Plan (2020 UWMP)
- 2021 North San Benito Groundwater Sustainability Plan (2021 GSP)
- 2022 Water Supply and Treatment Plan Update (2022 Plan Update)

2.0 Climate Science and Assessment

Climate change science and its hydrological impacts to the District's local water supply were investigated and modeled as part of the 2021 GSP. Aside from reviewing both surface and groundwater water balances from 1975 to 2017, the 2021 GSP presented additional numerical modeling forecasting scenarios. The forecasting considers conditions expected to occur over the next 50 years using a baseline scenario assuming a continuation of existing land use, urban water demand, water, and wastewater treatment and CVP availability. Climate, stream flow, and imports are adjusted to model for climate change impacts, these adjustments referenced projections by the California Department of Water Resources (DWR). The general result is that the climate in 2070 will be warmer and wetter in the District's service area, and while CVP imports are expected to be reduced, they are still needed to maintain the basin in balance over longer durations.

2.1. Projection of Future Climate Change

The model prepared for the 2021 GSP included a future baseline scenario, without adjustments climate change as well as a scenario with adjustments for climate change. The results are taken relative to each other to assess the impacts that climate change would have relative to baseline conditions. The following sections describe this further.

2.1.1 Model Setup of Future Condition Simulation

In the 2021 GSP, the climate change scenario assumed land use and water use patterns were the same as in the future baseline scenario. Adjustments to the rainfall and reference evapotranspiration (ETo) time series for the rainfall-runoff-recharge model were made using data sets provided by the DWR. DWR produced multipliers representing climatic conditions for 2030 and 2070. The 2070 data set was selected to fully reveal anticipated climate-change effects.

DWR also produced monthly stream flow multipliers at a basin scale, with a single time series of values for the entire watershed area tributary to the model. Those multipliers were applied only to the Pacheco Creek and San Benito River inflows because the simulated inflows for other streams entering the basin already reflected climate change effects through the precipitation and ETo adjustments in the rainfall-runoff-recharge model.

CVP supplies under the 2070 climate conditions are expected to be consistently less than under future baseline conditions due to a loss of snowpack in the CVP source areas. The CVP projections were based on Cal Sim II simulations that reflected the most up to date CVP operational forecast given climate change. The future modeling, on which the sustainable yield was based, represented a continuation of existing land and water use patterns, but with anticipated effects of future climate change on local hydrology (rainfall recharge and stream percolation) and on the availability of imported water supplies.

2.1.2 Results of Future Condition Simulations

The general result of the climate change analysis indicated by the precipitation and ETo multipliers is that the climate in the District's service area, in 2070, will be warmer and wetter than the current climate. Precipitation and rainfall recharge are expected to increase in winter, and crop water demand — and hence groundwater pumping for irrigation — are expected to increase in summer.

In all management areas, rainfall recharge was considerably higher in wet years under climate change, but about the same as under historical conditions in dry and normal years. In contrast, groundwater pumping was greater in all years. The increase in groundwater pumping was substantially larger in the Hollister and San Juan Management Areas (MA) because CVP imports would be reduced by climate change, which results in even greater reliance on groundwater.

The 2021 GSP calculated the average annual water balances for the 50-year future analysis period for each management area. In addition to the changes in rainfall recharge and groundwater pumping noted above, subsurface bedrock inflow from tributary watersheds was slightly higher in the climate change scenario than the baseline scenario due to increased rainfall recharge combined with negligible pumping in the upper watersheds. In most management areas, percolation from streams increased and groundwater discharge to streams decreased under climate-change conditions. While this may be partly attributed to an increase in surface water inflow, the primary driver is an increase in groundwater pumping for irrigation, which will outpace the increase in surface water inflow. Municipal groundwater pumping was the same under 2070 climatic conditions except in the Hollister MA, where it increased due to climate-related reductions in CVP availability.

The projected shift in local hydrology toward wetter and warmer conditions increased simulated pumping and water-level declines in summer and during most droughts, but increased stream inflow and net percolation generally offset those declines. That notwithstanding, in the most impacted area — the central part of the Hollister MA — simulated water levels remained lower by as much as 20 feet for decades before an exceptionally wet period provided enough recharge to recover back to baseline water levels. The CalSim II projected CVP supplies under the 2070 climate conditions, used in the GSP, were expected to be consistently less than under future baseline conditions due to a loss of snowpack in the CVP source areas (the Sierra Nevada Mountain range). In the simulation, the reduced CVP imports caused further increases in agricultural pumping in the Hollister and San Juan MAs relative to the Southern and Bolsa MAs and accentuated drawdown in summer and during most droughts. Its notable that actual CVP supplies may be more variable than previously simulated, and this variability may further accentuate drawdowns during prolonged droughts.

In summary, the GSP modeling indicated that continued CVP imports (as simulated) will be required to avoid any long-term groundwater-level or changes in storage trends that would otherwise be associated with the climate change scenario. However, recent CVP allocations have been substantially decreased below previous projections, including the long-term projections used in the climate-change scenario.

2.2. Assessment of Impacts

The 2021 GSP concluded that the effects of climate change and future growth would be additive. The combination might be enough to initiate long-term storage declines and will certainly lower the minimum groundwater levels during drought periods. Further, the analysis confirmed that continued deliveries of imported CVP water supplies are necessary to combat the impacts of climate change. Since the actual CVP supplies may be more variable than those that were used in the GSP model simulations, the minimum groundwater levels may be further accentuated in the future without mitigation.

3.0 Vulnerability and Risk Assessment

In recent UWMPs, SBCWD conducted climate change vulnerability assessment, as required and instructed by UWMP guidelines. System vulnerabilities are mostly reflected in growing demand during drought periods, and risks are largely associated with consequences of reduced surface water supply and increased groundwater pumping. These vulnerabilities and risks are further described below.

3.1.1 Drought Vulnerability

The 2020 UWMP reported that recorded droughts had been sufficiently intense and prolonged to temporarily affect groundwater levels in the basin but had not affected the long-term consistency of supply. However, paleoclimatic data indicate that extreme prolonged droughts have occurred in prehistoric California and current climate research indicates that extreme drought may occur more frequently as the climate changes in the future. Furthermore, based on the analysis performed for the 2021 GSP, it is clear that the anticipated local hydrology will trend toward wetter and warmer conditions due to climate change, resulting in increased groundwater pumping and associated declines in the groundwater-level during drought periods. Moreover, in the most impacted area, the central part of the Hollister MA, simulated water levels remained lower by as much as 20 feet for decades before an exceptionally wet period provided enough recharge to recover back to baseline water levels. It is notable that CVP imports are required to keep the basin in balance and prior to the construction of the San Felipe Division of the CVP system, which was completed in 1987 and facilitates CVP imports into the basin, the basin was in a state of overdraft for a prolonged period.

3.1.2 Water Demand Vulnerability

The 2020 UWMP explained that climate change may also increase regional temperatures and cause more variable weather patterns. The minimum daily temperature in California has increased over one degree Fahrenheit and continues to rise. Higher temperatures and the increased duration of high temperature periods could increase water demand by more than 50 percent seasonally. The increase in demand will be through increased agricultural irrigation, landscape irrigation, other residential uses, outdoor residential and commercial irrigation, with particular ramifications for summer months.

3.1.3 Legal Vulnerability

The 2020 UWMP documented that the Hollister groundwater basin has not been adjudicated, so specific groundwater rights have not been quantified. This was largely due to the success of local groundwater management activities with stakeholder involvement, so that lengthy and costly legal action has not been needed. However, interruption of imported water would induce additional groundwater pumping. Depending on the magnitude and persistence of the interruption, groundwater storage and the reliability of groundwater supply would be reduced, leading to an increased need to legally define water rights among stakeholders.

3.1.4 Supply Reduction Risk

According to the Intergovernmental Panel on Climate Change, global warming could significantly alter California's hydrologic cycles and water supply. The 2020 UWMP described that these impacts could include decreased Sierra snowpack, increased temperatures, more severe droughts, sea level rise, and increased floods. Climate models indicate that precipitation as rainfall is expected to increase as snowfall decreases over the Sierra Nevada and Cascade mountain ranges. By the end of this century, the Sierra snowpack is projected to be 48 to 65 percent less than the historical average. Sierra snowmelt feeds rivers that flow to the Sacramento-San Joaquin River Delta (Delta), the source of the District's imported CVP water. This reduction would directly impact the volume of imported water available for all the District CVP customers, including Hollister and Sunnyslope, and soon to be San Juan Bautista. The Delta is also at risk from the predicted increases in climate variability associated with climate change. More severe flooding and rising sea levels threaten the waterways that serve as a vital link in the CVP system within the Delta. All of these impacts to the Delta or CVP infrastructure could result in a reduction in future CVP allocations for the District.

3.1.5 Groundwater Basin Overdraft Risk

As previously noted, imported CVP supply is required to keep the basin in balance. A reduction in imported CVP supply coupled with increasing demand could lead to substantially increased pumping from groundwater users, resulting in basin overdraft. The Sustainable Groundwater Management Act (SGMA) defines overdraft as involving undesirable impacts including chronic lowering of groundwater levels, reduction of groundwater storage, seawater intrusion, degraded water quality, land subsidence, and surface water depletions with adverse impacts on beneficial uses. Seawater intrusion is an unlikely impact as the District is situated in an inland basin. Deteriorated water quality, a result of groundwater basin overdraft, such as high levels of nitrate, would limit some uses of groundwater to comply with regulations, further impairing reliability of supplies. As with groundwater, the water quality of recycled water may be impaired due to increased use of groundwater, therefore reducing the District's ability to supplement its agricultural water supply with recycled water.

3.1.6 Other Risks

Other factors that can disrupt water supply include heat waves, wildfires, flooding, earthquakes and other climate induced natural disasters. These conditions may impact the supply source, the District's ability to operate its water treatment plants, and damages to water delivery infrastructure.

4.0 Mitigation Options and Strategies

The climate change modeling scenario indicates that the local climate in 2070 will be not only warmer but also wetter than the current climate. The 2021 GSP recommended that given the challenges presented by cumulative effects of growth and climate change, consideration should be given to projects that can increase storage and use of local surface water supplies. The District is addressing potential constraints on water supply through development of a portfolio of supplies, improvement of facilities (e.g., treatment plant expansion and groundwater banking), and through demand management such as the Water Shortage Contingency Plan described in the 2020 UWMP. The 2022 Master Plan Update summarized the success and necessary continuation of regional collaboration.

4.1. Regional Collaboration

There is a long history of regional collaboration in the SBUA to develop water and wastewater projects that serve the urban area, dating back to a Memorandum of Understanding (MOU) between the City of Hollister (City), San Benito County (County), and the District in 2004. The following sections detail the history of regional collaboration efforts.

4.1.1 2004 Memorandum of Understanding

The 2004 MOU was developed among the City, County, and the District and subsequently amended in 2008 to include the Sunnyslope County Water District (SSCWD). The 2004 MOU described the principles, objectives, and assumptions that formed the basis of the original water and wastewater master plan that was prepared 2008, focusing on the following goals:

- Improve municipal, industrial, and recycled water quality.
- Increase the reliability of the water supply.
- Coordinate infrastructure improvements for water and wastewater systems.
- Implement the goals of the Groundwater Management Plan.
- Integrate recommendations of the long-term wastewater management plans prepared by the City and SSCWD.

4.1.2 2009 Coordinated Water Supply and Treatment Plant

In 2009, the Coordinated Water Supply and Treatment Plan (Coordinated Plan) was prepared to refine water supply and treatment recommendations, including the following:

- Upgrade the existing Lessalt Water Treatment Plant (WTP) to address new water quality regulations.
- Construction of the new West Hills WTP to expand surface water treatment capacity to make use of imported CVP supplies, thereby improving municipal water quality and reducing the reliance on the local groundwater basin.
- Firm up the existing imported M&I CVP supply to increase water supply reliability.
- Further investigate a conjunctive-use project with local surface water supplies and groundwater in the North County area.

4.1.3 2014 Memorandum of Understanding

The 2014 MOU incorporated and updated the principles, objectives, and assumptions from the 2004 MOU, to facilitate and guide the update of the water and wastewater treatment plan to plan for future growth and new regulations. In addition, the following issues were identified for evaluation:

- Update water demand and wastewater flow projections.
- Review and evaluate previously identified long-term water supply options.
- Review drinking water goals for total dissolved solids (TDS) and hardness.
- Review goals for recycled-water TDS.
- Evaluate the need, timing, and estimated cost recommended facilities and activities.

The 2014 MOU also reaffirmed the institutional framework and responsibilities of the Governance and Management Committees, which represent each of the participating agencies in the MOU.

4.1.4 2017 Master Plan Update

The 2017 Master Plan Update presented water demand and wastewater flow projections through 2035 considering economic, climate, and water usage changes since the 2008 Master Plan. The 2017 Master Plan Update addressed the issues identified in the 2014 MOU and recommended the following supply augmentation and facility expansion projects:

- Further investigate local surface water supply and storage.
- Complete feasibility and environmental studies for the North Area Groundwater Project.
- Identify a location for a new well with wellhead treatment in the north part of the City's distribution system to provide high-quality drinking water and improve fire suppression flow.
- Expand the West Hills WTP to continue to improve the water quality of the municipal supply and to meet the demands of new connections.
- Connect City Wells Nos. 4 and 5 to the West Hills WTP transmission pipeline and construct the Crosstown Pipeline to extend the reach of high-quality water and address hexavalent chromium concerns.
- Add flow equalization at the City's WRF to improve recycled water production.
- Expand the recycled-water distribution system to new customers, as needed.

4.1.5 2021 Memorandum of Understanding

The 2021 MOU continues the institutional collaboration among the City, County, Sunnyslope, and the District, and adds the City of San Juan Bautista (SJB) as a partner in future master plan updates and facility planning.

In 2020, SJB was fined by the U.S. Environmental Protection Agency (EPA) for violating discharge limits at its wastewater facility. The violations were in part due to the wastewater influent being high in sodium, chlorides, and total dissolved solids (TDS) concentrations. Such influent is a result of poor-quality water for domestic use. As part of the resolution, SJB evaluated options for higher-quality source water for its municipal customers and reached an agreement with the District to provide treated water from the West Hills WTP.

4.1.6 2022 Water Supply and Treatment Plan

Most recently, the MOU participants collaborated on the development of the 2022 Water Supply and Treatment Plan, with the following objectives:

- Increase dry-year water supply reliability, particularly for existing users.
- Provide continuous improvement toward achieving drinking water quality goals for hardness and TDS.
- Provide a reliable and sustainable water supply to respond to long-term growth needs.
- Coordinate with ongoing programs including the SGMA and the supply of treated surface water to SJB.
- Continue to address water needs through coordinated regional solutions.

4.2. Maintain Imported Water Supply

The water imported through the San Felipe Division of the CVP system is critical to the ongoing maintenance and long-term health of the groundwater basin. Prior to the completion of the San Felipe Division, groundwater pumping was the primary source of water for agricultural irrigation, which began in 1878. The nearly 90 years of groundwater pumping resulted in significant drawdown of groundwater levels, by as much as 180 feet in some areas of the basin. Today, approximately 20,000 AFY (J. Cattaneo, 2022) of imported water is necessary to maintain the groundwater basin in balance and avoid long-term draw downs and overdraft.

The District should continue to collaborate with the USBR to maintain and renew its CVP contract, which provides 43,800 AFY of contracted supply, of which 35,550 AFY is for agricultural use and 8,250 AFY is for M&I use. The current contract extends until 2027 and may be renewed thereafter. The District renegotiated its baseline for the M&I portion of the CVP contract in 2014, which set the historical use at the full M&I contract amount of 8,250 AFY. That is important relative to the USBR Shortage Policy, because the annual allocations are set at a percentage of the baseline amount, typically ranging from 50 to 100 percent of baseline.

Over the past decade, the District has had an ongoing practice of purchasing out-of-basin water supplies to supplement its imported CVP supplies. These purchases have totaled 13,550 AF over the period, or an average of 2,258 AFY which is used to augment the M&I supply, particularly in years with reduced CVP allocations. Purchases are made, when available and cost-effective, from a variety of sources including irrigation districts north of the Sacramento-San Joaquin River Delta, the San Joaquin River Exchange Contractors, and other sources. These purchases range from single-year (spot market) purchases to multi-year agreements (typically up to 5 years). The District should continue to explore and secure these additional sources of imported supplies, particularly when storage is available (e.g., San Justo Reservoir, San Luis Reservoir, groundwater basin percolation, or other future storage projects per next section).

4.3. Long-term Planning

The 2022 Master Plan Update projected that the annual water demand will increase from 5,560 acre-feet per year (AFY) to approximately 9,190 AFY by 2035 and to approximately 12,500 AFY by 2045, an increase of approximately 6,940 AFY. The plan evaluated a series of projects and programs that support securing water supply and storage. These projects were further assessed and prioritized, as summarized in Table 1. These recommendations include continuing ongoing programs and new projects requiring further investigation. All of the long-term water supply options should be retained as a menu of alternatives to contribute to a diverse water supply portfolio. Due to the inherent uncertainties in California water supply (drought, environmental constraints, regulations, etc.), it is prudent to maintain maximum flexibility in planning for long-term water supplies.

The water supply options in Table 1 provide “building blocks” to meet the need for high-quality water. For example, the proposed aquifer storage and recovery (ASR) Phase 1 project could provide enough supply to meet the 2030 high-quality water need. If the ASR Phase 1 project reveals that ASR is not viable, then the North Area Groundwater project could be accelerated to provide that same increment of new supply.

Table 1. 2022 Master Plan Update Recommended Projects

Description	Priority Level	Estimated Average Annual Supply (AFY)	Recommended Action
Surface Water			
B.F. Sisk Dam Raise	3	1,500	Collaborate with USBR; Secure Storage Volume of 5,000 AF
PREP	4	TBD	Evaluate Appropriate Level of Engagement due to High Costs
Local Surface Water Storage	Future	TBD	Further Investigation Required
Groundwater			
ASR	1	1,000–2,190	Conduct Pilot Study
North Area Groundwater	2	1,000–2,000	Complete Feasibility and Environmental Studies
Ongoing Programs			
Water Conservation	1	—	Continue Existing Program
Imported Surface Water Transfers / Spot Market	1	As Needed	Continue Existing Program
Semitropic Water Bank	1	Drought Supply	Continue Existing Program
Local Wells for Large Landscape Areas	1	—	Continue Existing Program

4.4. Monitoring and Modeling

Key performance indicators (KPIs) should be monitored regularly to establish trends and refine the forecast for climate change impacts as well as additional mitigations (e.g., development of new sources of supply or storage) that may be needed. KPIs to track include:

- **Climate Data**. Climate data are regularly compiled from DWR’s California Irrigation Management Information System (CIMIS) and include total solar radiation, soil temperature, air temperature/relative humidity, wind direction, wind speed, and precipitation. Two CIMIS stations are active in the area, both of which also measure evapotranspiration (ETo):

   - #126 San Benito, located at the SBCWD office on Mansfield Road with a record beginning in June 1994.
   - #143, San Juan Valley, located at the San Juan Golf Course with a record beginning January 1998.

- **Groundwater**. As part of the Annual Groundwater Management Plan that the District prepares, groundwater levels, recharge, irrigation pumping, and other key metrics for the groundwater basin should continue to be monitored and tracked.
- **Water Supply**. The sources and quantity of water supply needed to meet the SBUA demand should be monitored and quantified on a monthly basis. Sources should include: imported CVP supply; local municipal groundwater; spot market water; and other sources of water that may be developed in the future. In addition, the District should track any CVP allocations that go unused, particularly in wet years.
- **Water Demands**. The potable water demand for the City, SSCWD, and SJB should be collected on a monthly basis and compared to projected water demands.
- **Potable Water Quality**. Key water quality metrics should continue to be tracked and monitored, including hardness, TDS, hexavalent chromium, and nitrate.
- **Recycled Water Quality.** Key water quality metrics should continue to be tracked and monitored for the wastewater effluent and recycled water, including specifically TDS.

The data described above should be reviewed periodically to evaluate trends, update models (e.g., groundwater model, water demand model, supply forecasts, etc.), and revisit risks, vulnerabilities, and mitigation strategies that may be needed.

4.5. Emergency Response Planning

The District, the City, and Sunnyslope have all passed ordinances or resolutions to address shortages in water supply. In addition, the Water Shortage Contingency Plan (WSCP) was updated in the recent 2020 UWMP. This Plan serves as a guide for adjusting supply and demand in response to a water shortage.

In response to the 2012-2016 drought, a new state mandate requires WSCPs to provide a more detailed analysis of supply and demand contingency actions and plan implementation. Additions to the 2020 WSCP include the documentation of plan procedures and implementation, standardization of water supply stages of action for the water supply plan, and quantification of contingency action effects on supply and demand.

The 2020 UWMP summarized that during a water shortage emergency, the agencies may choose to augment the water supply by increasing the proportion of groundwater in delivered water. Groundwater can make up for any decrease in CVP allocation during a drought. Local potable water is a blend of CVP water and groundwater, and the preferred ratio is established to meet aesthetic standards. The average proportion of the supply that is CVP water was approximately 60 percent over the past five years. The proportion of groundwater can be temporarily increased if the CVP supply is limited or is insufficient to meet demand. Decreasing the proportion of potable water that is CVP is at the discretion of the agencies and may be enacted during stages 2 through 6. Augmenting the supply through increasing the proportion of groundwater in potable water is estimated to enhance the supply by up to 20 percent; however, it will result in higher hardness concentrations in the potable supply. Drought reserves in San Justo Reservoir can also augment supply during a water shortage emergency.

Hollister, Sunnyslope, and the District also have water shortage emergency response plans in place. Sunnyslope and the City have a general Emergency Disaster Response Plan as well as a Power Failure Emergency Response Plans. The plans include steps to be taken during and after a disaster and the use of the Standard Emergency Management System (SEMS). The District relies on their current Water User's Handbook and County emergency plans.

The 2020 UWMP mentions that under normal water supply conditions, potable water production values for Hollister and Sunnyslope are recorded daily and reported monthly. Water use will be monitored and analyzed through billing data. During a Stage 1, Stage 2, or Stage 3 water shortage, daily production figures will be reported to the Water Supervisor of each agency. The Supervisor will compare the weekly production to the target weekly production to verify that the reduction goal is being met. Weekly reports will be forwarded respectively to the General Manager of Sunnyslope, the Public Works Director at the City and to the Program Manager of the WRA. During a Stage 4, 5, or 6 water shortage, the daily production report will be provided to the General or City Manager of each agency. In Stages 1 through 6, monthly reports will be sent to the City Council and the Sunnyslope Board of Directors. If reduction goals are not met, the respective managers will notify the governing board of each agency that additional action is required. Once SJB is connected to the West Hills WTP, similar reporting mechanisms will be enacted.

5.0 Legislation

As described in the 2020 UWMP, Hollister, Sunnyslope, the District, and San Benito County have all established "No-Waste" ordinances, policies, and resolutions for their respective jurisdictions. The District has a Water Users Handbook that explains how each water user must take steps to control tailwater. If these policies are not followed, the District has the authority to discontinue service.

In addition to these existing ordinances, Emergency Water Conservation Regulations were passed in 2015 that added outdoor water restrictions. The Emergency regulations also added penalties for violating these restrictions including fines for repeated violations.

In accordance with Senate Bill 7, water suppliers must define a 10- or 15-year water use Base Period. This Base Period is used to calculate a Base Daily per Capita Water Use, which is the baseline for computation of required future reductions. Senate Bill 7 requires retailers to reduce per capita daily water use 10 percent by 2015 and 20 percent by 2020, as compared to Base Daily per Capita Water Use.

Water agencies must demonstrate compliance with their established water use target for the year 2020. Water use targets are calculated separately for Hollister and Sunnyslope and the associated information is provided by agency in the WUE portal to allow for each agency to have local control. Compliance is verified by DWR's review of the SB X7-7 Verification Form submitted with an agency's 2020 UWMP.

Based on estimated population (using the DWR population tool) and gross water use, the actual 2020 per capita daily water use was 114 gpcd and 119 gpcd, for Hollister and Sunnyslope, respectively. Both agencies not only met but exceeded their 2020 goals (119 gpcd and 135 gpcd, for Hollister and Sunnyslope respectively).

Assembly Bill 1668 and Senate Bill 606 built on California's efforts to make water conservation a way of life and created a new foundation for long-term improvements in water conservation and drought planning. Assembly Bill 1668 and Senate Bill 606 established guidelines for efficient water use and a framework for implementing and overseeing the new standards, which must be in place by 2022. The two bills strengthen the state's water resiliency in the face of future droughts with provisions that include the following:

- Establishing water use objectives and long-term standards for efficient water use that apply to urban retail water suppliers
- Providing incentives for water suppliers to recycle water
- Identifying small water suppliers and rural communities that might be at risk of drought and water shortage vulnerability and providing recommendations for drought planning
- Requiring both urban and agricultural water suppliers to set annual water budgets and prepare for drought

6.0 Community Engagement

The 2020 UWMP summarized that the Water Resources Association of San Benito County (WRA) already has water conservation programs to encourage drought tolerant landscaping, improve efficient irrigation practices, and reduce water waste and these programs have and will continue to reduce potential impacts from climate change.

Public outreach is central to the SBUA water conservation efforts. The 2020 UWMP summarizes that ongoing activities were ramped up in response to the State mandated water conservation in recent droughts. Specific activities include:

- Newsletter articles on conservation.
- Flyers and/or brochures, bill stuffers, messages printed on bill, information packets.
- Development and update of a website with resources for water conservation: www.wrasbc.org.The website provides details about ongoing water conservation programs and has three different water wise landscape plans available for download. Last updated in December 2020.
- Booths at Children's Festivals and Farmer's Market.

- Engagement with the community through responsiveness to emailed questions and concerns.
- Water Awareness Festival in May.

The full-time water conservation coordinator records the number and type of outreach activities. Newsletters are sent with water bills and are estimated to reach 40,000 people per year. Booths at festivals reached over 4,650 people in the last five years. Other outreach includes the website and email communication which reached about 800 people since 2016.

While there is no direct way to quantify public outreach, it is the foundation for all other programs. With methods to advertise and connect customers to other programs and information, all other demand management measures would be less effective. In addition, the expanded public outreach in response to the drought shows a direct connect between increased public outreach and decreased water use.

Public outreach and education, coupled with demand reduction programming like rebates and home surveys, can decrease long-term demand, increase reliability, and minimize the need to import water from other regions.

7.0 References

Akel Engineering (Akel), 2020, City of San Juan Bautista Water Master Plan, City of San Juan Bautista, November. https://cms6.revize.com/revize/sanjuanbautistaca/document_center/water/2020%20Master%20Plans/SJB_2020WMP_FINAL_HARDCOPY_012921.pdf

California Department of Water Resources (DWR), 2020a, CalSim II Water Resources Simulation Model. https://water.ca.gov/Library/Modeling-and-Analysis/Central- Valley-models-and-tools/CalSim-II.

Cattaneo, J. Personal Communication. 13 December, 2022.

HDR, 2008, Hollister Area Urban Water and Wastewater Management Plan, City of Hollister, San Benito County Water District, and Sunnyslope County Water District, November. http://www.sbcwd.com/reports/Hollister%20Urban%20Area%20Water%20&%20WasteWater%20Master%20Plan%20110308.pdf

HDR, 2010, Hollister Urban Area Masterplan Implementation Program Coordinated Water Supply and Treatment Plan, San Benito County Water District, and Sunnyslope County Water District, January

HDR, 2017, Hollister Area Urban Water and Wastewater Management Plan, City of Hollister, San Benito County Water District, and Sunnyslope County Water District, June. http://www.sbcwd.com/reports/Hollister%20Urban%20Area%20Master%20Plan%20Update%20%20July%202017.pdf

HDR, 2022, San Benito Urban Areas Water Supply and Treatment Management Plan, City of Hollister, San Benito County Water District, and Sunnyslope County Water District, June 30.

Pajaro Valley Water Management Agency (PVWMA), San Benito County Water District (SBCWD), and Santa Clara Valley Water District (SCVWD), 2014, Pajaro River Watershed Integrated Regional Water Management Plan, August.

San Benito County Water District (SBCWD), 2022, Resolution No. 2022-27, A Resolution of the Board of Directors of the San Benito County Water District to Submit an Application to the Bureau of Reclamation to Obtain a Grant Under the Bipartisan Infrastructure Law (BIL) for a Small Surface Water and Groundwater Storage Program to Assist Funding for the Aquifer Recharge and Recovery (ASR) Program, October 26.

Todd Groundwater (Todd), 2022, 2021 Annual Groundwater Report, prepared for SBCWD and Valley Water, March.

Todd Groundwater (Todd), 2021, North San Benito Groundwater Sustainability Plan, November. https://www.sbcwd.com/gsp-development/

Todd Groundwater (Todd), 2020, Hollister Urban Area Water Management Plan, July. https://sbcwd.temp312.kinsta.cloud/wp-content/uploads/2021/06/HUA-UWMP-2020-FINAL-vol-1-of-2-062521.pdf

C

Appendix C

Summary of the Accelerated Drought Response Project (ADRoP) Technical Memorandum

Technical Memorandum

Date: October 25, 2022

Prepared By: Sifang Shan

Reviewed By: Holly Kennedy

Subject: **Summary of the Accelerated Drought Response Project (ADRoP)**

Background

San Benito County Water District (SBCWD) has a contract with the United States Bureau of Reclamation (USBR) to import surface water for agricultural (Ag) and municipal/industrial (M&I) uses to its service area via the Central Valley Project (CVP), a system of reservoirs, canals and pumping stations. SBCWD's contract with USBR is for a total supply of 43,800 acre-feet per year (AFY), of which 35,550 AFY is for Ag use and 8,250 AFY is for M&I use. The USBR establishes allocations on an annual basis depending on hydrologic conditions in the state. Once imported, the M&I supply is treated at local surface water treatment plants and delivered to the City of Hollister (COH) and Sunnyslope County Water District (Sunnyslope), where the water is blended with groundwater from municipal wells to improve water quality in the municipal drinking water system. SBCWD will also begin delivering treated surface water to the City of San Juan Bautista (San Juan Bautista) in 2025.

The 2022 Water Supply and Treatment Plan Update (2022 Plan) evaluated the reliability of the existing CVP supply and concluded that although the supply is sufficient to meet M&I demands in wet and normal years, during dry years, there is a supply deficit for existing users. Moreover, the 2022 Plan noted that in approximately 25 percent of years (wet and above normal years), there is approximately 6,000 AFY of excess CVP supply that goes unused. As a result, the 2022 Plan evaluated various water supply alternatives to increase the resiliency of the water supply, with many alternatives designed to provide storage of water available in wet years for later use during dry years. The highest-ranking alternative in the 2022 Plan is Aquifer Storage and Recovery (ASR), which would create the ability to capture excess CVP water in wet years and later extract that water for use during drought years.

In addition to reduced imported supply quantity during dry years, when the CVP allocations are curtailed, local groundwater is pumped from municipal wells owned by the City, Sunnyslope, and San Juan Bautista. The local groundwater has higher levels of hardness, salts, and elevated levels of hexavalent chromium and, in some cases, nitrate. As a result, the delivered water quality is also impacted during dry years, when the allocations are reduced and a greater portion of the demand is met with groundwater. The ASR project will address this as well, as the project is expected to deliver a water quality similar to that of the imported supply (although some mixing with native groundwater could occur).

The overall ASR project has the capacity to inject and store 6,000 AF of water. The ASR project consists of eleven ASR wells, expansion of the West Hills Water Treatment Plant (WHWTP), a new dedicated water treatment plant and associated transmission and conveyance pipelines. The overall project cost is itemized in Appendix A. As described in the 2022 Plan, the ASR project was envisioned to be constructed in three phases. The first phase would rely on potable water from the City's distribution system (a blend of treated surface water and groundwater) for injection into the groundwater basin at one well. The second phase would include five additional wells and a dedicated water treatment plant to treat the imported surface water prior to injection. The third phase would include six additional wells and an expansion of the dedicated water treatment plant.

Due to the ongoing drought, the ASR project has been re-envisioned to facilitate greater storage on an accelerated timeline. This accelerated project is the subject of this memorandum and described further below.

Project Description

The Accelerated Drought Response Project (ADRoP) is an ASR project that will store treated excess CVP water via ASR wells and extract the stored water from the same wells with wellhead treatment, such as disinfection, during drought periods. ADRoP can store between 1,600 acre-feet-per-year (AFY) and 2,700 AFY of excess CVP surface water in wet years and generate an average annual yield of 650 AF to 1,035 AF[1]. The project components consist of three to five ASR wells, the expansion of the existing West Hills Water Treatment Plant (WHWTP), and associated transmission pipelines. The wells are spaced to allow for efficient injection, the WHWTP is expanded to treat excess CVP water to be injected into the ASR wells, and the pipelines are sized to convey the injection and extracted water as well as to remove hydraulic bottlenecks in the existing COH distribution system. Figure 1 presents the study area, including the locations of cities and Disadvantaged Communities (DACs) that will benefit from ADRoP. Figure 2 demonstrates the major project components of ADRoP and their general locations around the City of Hollister.

[1] Average annual yield is calculated for a cycle of wet, normal, and dry years of frequency of 30%, 35% and 35%, respectively.

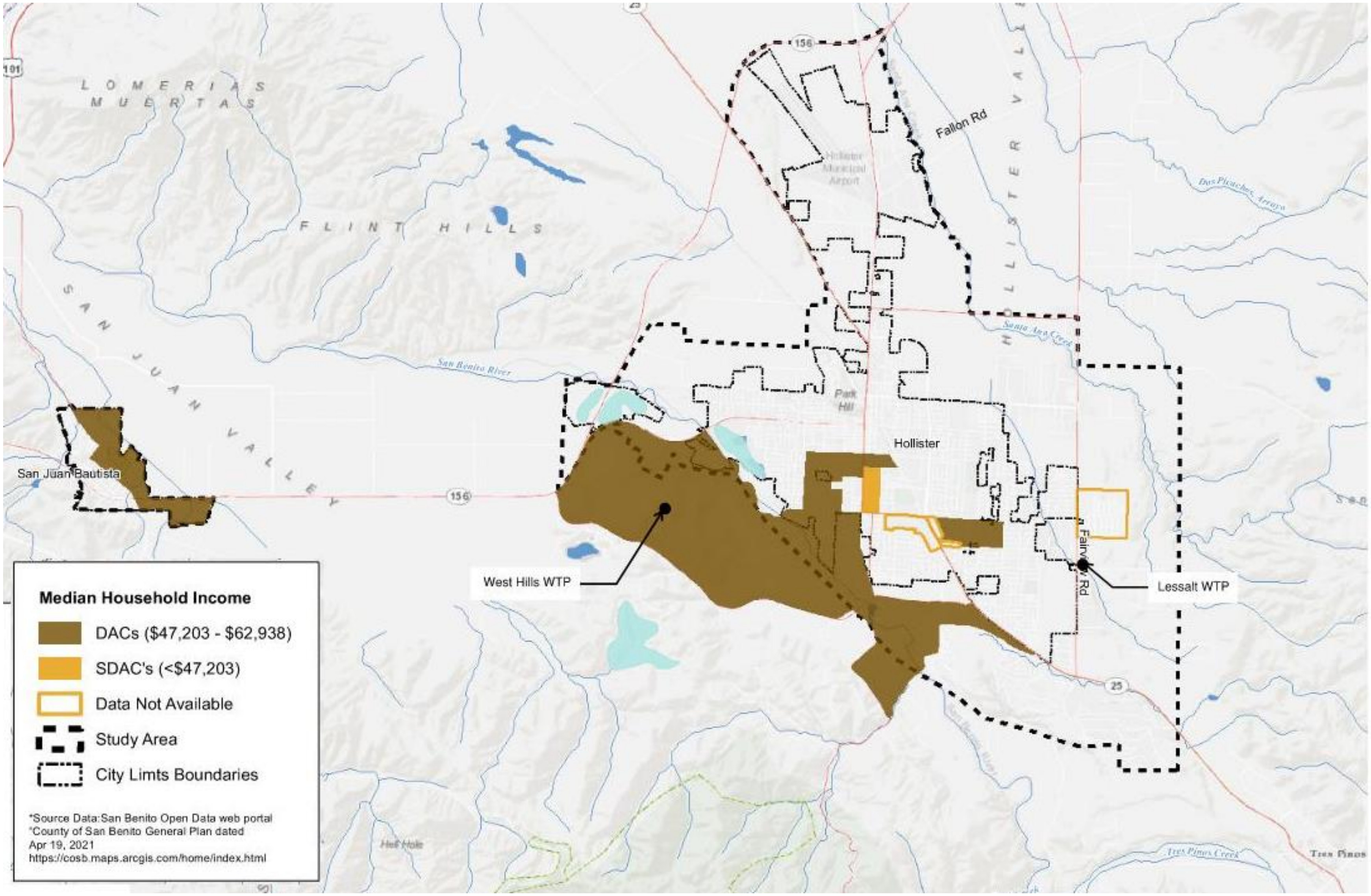


Figure 1. Project Service Area and Existing Treatment Facilities.

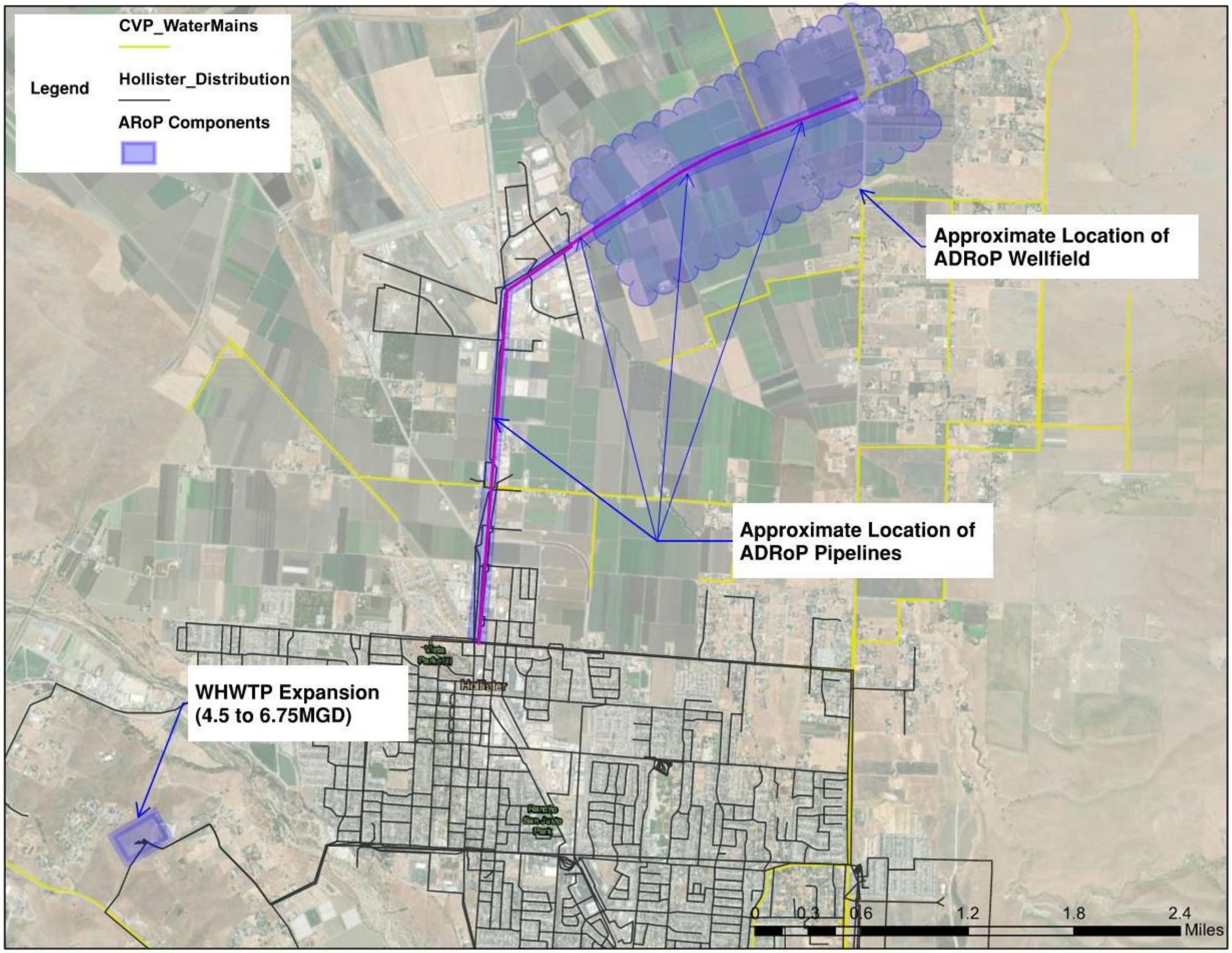


Figure 2. Major Project Components and Their Locations

Table 1 summarizes the design criteria of the major project components for the ADRoP.

Table 1. Preliminary Project Component Design Criteria

Element	Unit	ADRoP
Injection Wells		
Total Number	-	3 - 5
Max Injection Capacity (Each)	GPM	500
Max Extraction Capacity (Each)	GPM	1,000
WHWTP Expansion		
Total Flowrate	MGD	2.25
Wellfield Transmission Pipelines		
Diameter	Inches	16 - 18
Length	Miles	0.6 - 1.2
Distribution Transmission Pipeline		
Diameter	Inches	18
Length	Miles	0.75
Parallel Distribution Pipeline		
Diameter	Inches	12
Length	Miles	2.5

Project Cost Summary

Table 2 summarizes the capital and operation and maintenance (O&M) costs for the ADRoP project versus the overall ASR project.

Table 2. Summary of Estimated Capital Cost

	Capital Cost(1)	Capacity (AF)	Capital Cost/AF	Annual O&M Cost(2)	Total Present Worth Lifecycle Cost(2)
3 Wells	$32,400,000	1,600	$20,300	$1,457,000	$59,200,000
5 Wells	$40,100,000	2,700	$14,900	$2,448,000	$85,200,000
ASR Total	$105,400,000	6,000	$17,500	$5,433,000	$205,400,000

Notes:

(1) Capital costs are itemized in Appendix A.

(2) Annual O&M cost and lifecycle cost calculations are presented in Appendix B.

Table 3 presents the cost per acre foot per year, referred to as the yield cost.

Table 3. Summary of Estimated Yield Cost

	Annual Capital Cost(1)	Annual O&M Cost	Total Annual Cost	Estimated Annual Yield (AFY)	Yield Cost/AFY
3 Wells	$1,762,000	$1,457,000	$3,213,000	650	$4,960
5 Wells	$2,180,000	$2,448,000	$4,623,000	1,035	$4,480
ASR Total	$5,731,000	$5,433,000	$11,164,000	2,190	$5,100

Notes:

(1) Capital cost is annualized with a 3.5% interest rate over 30 years of lifespan.

Project Benefits

Multiple benefits will be provided with the implementation of ADRoP, including enhanced reliability of water supply, improved water quality, and environmental and social benefits. Each of these is further described below.

Water Supply

The Project will capture and store excess CVP water in wet years to reduce dependencies on native groundwater or CVP spot market purchases in dry years. The Project facilities will be designed to store up to 2,700 AFY of high-quality, imported surface water in wet years, therefore optimizing the use of imported supplies in wet years and groundwater storage and maximizing conjunctive use for the region. The DACs in the area have traditionally relied on groundwater production for the majority of their demands, especially in the City of San Juan Bautista. The project will improve the reliable delivery of a high quality drinking water in dry years.

Water Quality

The Project will not only help SBCWD meet drought demands, but also improve drought water quality due to ability to recover high quality ASR water in dry years. The native groundwater is high in hardness, TDS, nitrate and/or Chromium VI. The most recent concentration of Chromium VI in City of Hollister production wells was 12.25 µg/L. Through blending with ASR water via existing and new infrastructure, the system-wide concentration of these constituents will drop significantly. Assuming the water supply is blended with 70 percent CVP water, the resulting concentration would be approximately 3.675 µg/L Chromium VI. In addition, the project will benefit DAC water quality needs. The DACs in the area have traditionally relied on groundwater production for the majority of their demands, especially in the City of San Juan Bautista.

Environmental and Social Benefits

The Hollister service area has several DAC areas in the southern parts of the city, and the City of San Juan Bautista has DACs in the northern and western area. These areas have traditionally been heavily dependent on groundwater production. The local groundwater is high in hardness, TDS, nitrate (in San Juan Bautista wells) and Chromium VI (in Hollister wells). The storage and recovery process will not only provide these areas with higher quality water during droughts, but also improve basin health through reduced pumping of native groundwater. The reduced groundwater pumping and improved basin health will also benefit local agricultural communities.

Project Schedule

As previously described, the original ASR concept described in the 2022 Plan was reconfigured to accelerate the timeline of the project. ADRoP relies on an expansion of the WHWTP as opposed to a new water treatment plant. This change facilitates significant schedule savings, resulting in a completed project in early 2026. The detailed project scheduled is included in Appendix C.

Appendix A

Accelerated Drought Response Project (3 Wells)					
	Unit	Unit Cost Oct 22	Quantity	Subtotal	Notes
ASR Wells (3 x 500 gpm)				**$4,490,000**	
Sitework	LS	$82,515	3	$247,546	1 Wellsite
Deep Well with 12" Casing	VLF	$660	2,400	$1,584,293	800' Depth for Each Well
ASR Well Pumps	EA	$77,014	3	$231,043	
ASR Well Pump VFD	EA	$33,006	3	$99,018	
Prefabricated Enclosure	LS	$132,024	3	$396,073	
Down-Hole Control Valve	EA	$110,020	3	$330,061	
Wellhead Disinfection	LS	$200,000	3	$600,000	
Onsite Piping, Valves and Appurtenances	LS	$220,041	3	$660,122	
Electrical	LS	$243,267	1	$243,267	3% of Civil and Mechanical
Instrumentation	LS	$162,178	1	$97,307	2% of Civil and Mechanical
Transmission and Distribution Pipeline				**$3,710,000**	
Wellfield Transmission Pipe (Well 2&3)	FT	$170	1,600	$272,427	16" HDPE
Wellfield Transmission Pipe (Well 1&2)	FT	$192	1,610	$308,396	18" HDPE
Distribution Pipe to Hollister System	FT	$192	4,000	$766,202	18" HDPE
Parallel Distribution Pipe along San Felipe Rd	FT	$128	13,000	$1,660,104	12" HDPE
Connection to Existing Systems	LS	$110,020	3	$330,061	
Misc Valves, Fittings and Appurtenances	LS	$121,022	3	$363,067	
WHWTP Expansion (4.5 to 6.75 MGD)				**$7,095,547**	**Quantity is adjusted to describe expansion to 6.75MGD as opposed to 9MGD**
Site Civil	LS	$163,775	0.5	$81,887	
Actiflo Carb	LS	$3,041,534	1.0	$3,041,534	Actiflo Carb only comes in 4.5MGD modules
Gravity Filters	LS	$3,217,007	0.5	$1,608,503	
Clearwell	LS	$1,754,731	0.5	$877,366	
Chemical Feed/Storage Equipment	LS	$244,493	0.5	$122,246	
Drying Beds	LS	$409,437	0.5	$204,719	
Yard Piping	LS	$463,249	0.5	$231,624	
Electrical	LS	$1,392,087	0.5	$696,043	
Instrumentation	LS	$463,249	0.5	$231,624	
Subtotal Capital Cost				**$15,300,000**	
Contractor OH&P	12%			$1,836,000	
General Conditions	6%			$918,000	
Mobilization, Bonds & Insurance	6%			$918,000	
Subtotal				**$18,972,000**	
Contingency	30%			$5,691,600	
Subtotal w/Contingency				**$24,663,600**	
Engineering, Permitting, Admin & CM	30%			$7,400,000	
Land Acquisition	LS	100,000	0.7	$100,000	Assuming 0.23AF per well. Unit cost is based on Redfin sales data
ROW	FT	20	7,210	$141,234	Only pipes along Fallon Rd
Total Conceptual Capital Cost			**$32,400,000**		
High End of Range		**50%**	**$48,600,000**		
Low End of Range		**-25%**	**$24,300,000**		

(1) Unit Costs of well construction are esclated based on cost estimates enclosed in the Draft Evaluation of Water Supply and Storage Alternatives submitted in July 2021. July 2021 ENR CCI is 13762 and October 2022 CCI is 15141 for San Francisco Bay Area.

(2) Unit Costs of pipelines are esclated based on cost estimates enclosed in the final Groundwater Recharge Alternatives Facility Plan submitted in January 2022. Decemebr 2021 (time of estimate) ENR CCI is 14228 and October 2022 CCI is 15141 for San Francisco Bay Area.

(3) Unit Costs of treatment plant are adjusted based on cost estimates completed for the Final Draft San Benito Urban Areas Water Supply and Treatment Master Plan Update submitted in June 2022. Januray 2022 (time of estimate) ENR CCI is 14301 and October 2022 CCI is 15141 for San Francisco Bay Area.

Accelerated Drought Response Project (5 Wells)	Unit	Unit Cost Oct 22	Quantity	Subtotal	Notes
ASR Wells (5 x 500 gpm)				**$7,590,000**	
Sitework	LS	$82,515	5	$412,576	1 Wellsite
Deep Well with 12" Casing	VLF	$660	4,000	$2,640,488	800' Depth for Each Well
ASR Well Pumps	EA	$77,014	5	$385,071	
ASR Well Pump VFD	EA	$33,006	5	$165,031	
Prefabricated Enclosure	LS	$132,024	5	$660,122	
Down-Hole Control Valve	EA	$110,020	5	$550,102	
Wellhead Disinfection	LS	$200,000	5	$1,000,000	
Onsite Piping, Valves and Appurtenances	LS	$220,041	5	$1,100,203	
Electrical	LS	$405,444	1	$405,444	3% of Civil and Mechanical
Instrumentation	LS	$270,296	1	$270,296	2% of Civil and Mechanical
Transmission and Distribution Pipeline				**$4,220,000**	
Wellfield Transmission Pipe (Well 2&3)	FT	$170	1,600	$272,427	16" HDPE
Wellfield Transmission Pipe (Well 3&4)	FT	$170	1,500	$255,401	16" HDPE
Wellfield Transmission Pipe (Well 4&5)	FT	$170	1,500	$255,401	16" HDPE
Wellfield Transmission Pipe (Well 1&2)	FT	$192	1,610	$308,396	18" HDPE
Distribution Pipe to Hollister System	FT	$192	4,000	$766,202	18" HDPE
Parallel Distribution Pipe along San Felipe Rd	FT	$128	13,000	$1,660,104	12" HDPE
Connection to Existing Systems	LS	$110,020	3	$330,061	
Misc Valves, Fittings and Appurtenances	LS	$121,022	3	$363,067	
WHWTP Expansion (4.5 to 6.75 MGD)				**$7,095,547**	**Quantity is adjusted to describe expansion to 6.75MGD as opposed to 9MGD**
Site Civil	LS	$163,775	0.5	$81,887	
Actiflo Carb	LS	$3,041,534	1.0	$3,041,534	Actiflo Carb only comes in 4.5MGD modules
Gravity Filters	LS	$3,217,007	0.5	$1,608,503	
Clearwell	LS	$1,754,731	0.5	$877,366	
Chemical Feed/Storage Equipment	LS	$244,493	0.5	$122,246	
Drying Beds	LS	$409,437	0.5	$204,719	
Yard Piping	LS	$463,249	0.5	$231,624	
Electrical	LS	$1,392,087	0.5	$696,043	
Instrumentation	LS	$463,249	0.5	$231,624	
Subtotal Capital Cost				**$18,910,000**	
Contractor OH&P	12%			$2,269,200	
General Conditions	6%			$1,134,600	
Mobilization, Bonds & Insurance	6%			$1,134,600	
Subtotal				**$23,448,400**	
Contingency	30%			$7,034,600	
Subtotal w/Contingency				**$30,483,000**	
Engineering, Permitting, Admin & CM	30%			$9,145,000	
Land Acquisition	LS	100,000	1.2	$200,000	Assuming 0.23AF per well. Unit cost is based on Redfin sales data
ROW	FT	20	10,210	$200,000	Only pipes along Fallon Rd
Total Conceptual Capital Cost			**$40,100,000**		
High End of Range		**50%**	**$60,150,000**		
Low End of Range		**-25%**	**$30,075,000**		

(1) Unit Costs of well construction are esclated based on cost estimates enclosed in the Draft Evaluation of Water Supply and Storage Alternatives submitted in July 2021. July 2021 ENR CCI is 13762 and October 2022 CCI is 15141 for San Francisco Bay Area.

(2) Unit Costs of pipelines are esclated based on cost estimates enclosed in the final Groundwater Recharge Alternatives Facility Plan submitted in January 2022. Decemebr 2021 (time of estimate) ENR CCI is 14228 and October 2022 CCI is 15141 for San Francisco Bay Area.

(3) Unit Costs of treatment plant are adjusted based on cost estimates completed for the Final Draft San Benito Urban Areas Water Supply and Treatment Master Plan Update submitted in June 2022. Januray 2022 (time of estimate) ENR CCI is 14301 and October 2022 CCI is 15141 for San Francisco Bay Area.

Overall ASR Project					
	Unit	Unit Cost Oct 22	Quantity	Subtotal	Notes
ASR Wells (11 x 500 gpm)				**$16,440,000**	
Sitework	LS	$90,767	11	$998,435	1 Wellsite
Deep Well with 12" Casing	VLF	$726	8,800	$6,389,982	800' Depth for Each Well
ASR Well Pumps	EA	$84,716	11	$931,872	
ASR Well Pump VFD	EA	$36,307	11	$399,374	
Prefabricated Enclosure	LS	$198,037	11	$2,178,403	
Down-Hole Control Valve	EA	$121,022	11	$1,331,246	
Onsite Piping, Valves and Appurtenances	LS	$242,045	11	$2,662,492	
Electrical	LS	$926,003	1	$926,003	3% of Civil and Mechanical
Instrumentation	LS	$617,335	1	$617,335	2% of Civil and Mechanical
Transmission and Distribution Pipeline				**$7,410,000**	
CVP Diversion Pipe to WTP	FT	$253	3,120	$789,506	20" HDPE
New WTP Influent and Effluent Pipes	FT	$192	5,460	$1,045,866	18" HDPE
Wellfield Transmission Pipe (Well 1&2)	FT	$192	1,610	$308,396	18" HDPE
Wellfield Transmission Pipe (Well 2&3)	FT	$170	1,600	$272,427	16" HDPE
Wellfield Transmission Pipe (Well 3&4)	FT	$170	1,500	$255,401	16" HDPE
Wellfield Transmission Pipe (Well 4&5)	FT	$170	1,500	$255,401	16" HDPE
Wellfield Transmission Pipe (Well 5&6)	FT	$170	1,600	$272,427	16" HDPE
Wellfield Transmission Pipe (Well 6&7)	FT	$132	1,500	$198,037	12" HDPE
Wellfield Transmission Pipe (Well 8&9)	FT	$132	1,940	$256,127	12" HDPE
Wellfield Transmission Pipe (Well 9&10)	FT	$170	2,360	$401,830	16" HDPE
Wellfield Transmission Pipe (Well 10&11)	FT	$132	1,750	$231,043	12" HDPE
Distribution Pipe to Hollister System	FT	$192	4,000	$766,202	18" HDPE
Parallel Distribution Pipe along San Felipe Rd	FT	$128	13,000	$1,660,104	12" HDPE
Connection to Existing Systems	LS	$110,020	3	$330,061	
Misc Valves, Fittings and Appurtenances	LS	$121,022	3	$363,067	
Concentrate Management				**$1,160,000**	
Concentrate to Hollister Conduit Pipe	FT	$121	9,510	$1,150,923	6" HDPE
New Water Treatment Plant (5.5 MGD)				**$17,560,000**	
Influent Flow Control	EA	$60,511	2.0	$121,022	
MF Feed Pumps	EA	$48,409	3.5	$169,431	
Microfiltration Membranes Skids	MGD	$568,805	5.5	$3,128,429	
Nanofiltration Membrane Skids	MGD	$896,776	2.8	$2,510,972	50% Bypass to NF during Injection
NF Feed Pumps	EA	$84,716	4.4	$372,749	
Membrane Reject Pumps and Storage Tanks	LS	$363,067	2.2	$798,748	
Clearwell Steel Tank	EA	$242,045	1.0	$242,045	
Finished Water Pumping Station	LS	$363,067	2.2	$798,748	
Chemical Processes	LS	$484,090	2.0	$968,179	
Solids Drying Beds	LS	$423,578	2.0	$847,157	
Plate Settler Sedimentation Basin for Solids	LS	$242,045	2.0	$484,090	
Admin/Chemical/Treatment Building	SF	$242	8,000	$1,936,358	

Sitework and Access Roads	LS	$242,045	2.0	$484,090	
Onsite Piping, Valves and Appurtenances	LS	$968,179	1.8	$1,694,313	
Electrical	LS	$1,159,842	1.5	$1,739,762	
Instrumentation and Controls	LS	$749,265	1.5	$1,123,898	
Low Head Concentrate Pumps	EA	$33,006	4.0	$132,024	
WHWTP Expansion (4.5 to 6.75 MGD)				**$7,095,547**	**Quantity is adjusted to describe expansion to 6.75MGD as opposed to 9MGD**
Site Civil	LS	$163,775	0.5	$81,887	
Actiflo Carb	LS	$3,041,534	1.0	$3,041,534	Actiflo Carb only comes in 4.5MGD modules
Gravity Filters	LS	$3,217,007	0.5	$1,608,503	
Clearwell	LS	$1,754,731	0.5	$877,366	
Chemical Feed/Storage Equipment	LS	$244,493	0.5	$122,246	
Drying Beds	LS	$409,437	0.5	$204,719	
Yard Piping	LS	$463,249	0.5	$231,624	
Electrical	LS	$1,392,087	0.5	$696,043	
Instrumentation	LS	$463,249	0.5	$231,624	
Subtotal Capital Cost				**$49,670,000**	
Contractor OH&P	12%			$5,960,400	
General Conditions	6%			$2,980,200	
Mobilization, Bonds & Insurance	6%			$2,980,200	
Subtotal				**$61,590,800**	
Contingency	30%			$18,477,300	
Subtotal w/Contingency				**$80,068,100**	
Engineering, Permitting, Admin & CM	30%			$24,021,000	
Land Acquisition	LS	100,000	6.0	$700,000	Assuming 0.23AF per well and 3.5AF for the new WTP. Unit cost is based on Redfin sales data
ROW	FT	20	28,870	$600,000	Only pipes among wells and to Distribution
Total Conceptual Capital Cost			**$105,400,000**		
High End of Range		**50%**	**$158,100,000**		
Low End of Range		**-25%**	**$79,050,000**		

(1) Unit Costs of well construction are esclated based on cost estimates enclosed in the Draft Evaluation of Water Supply and Storage Alternatives submitted in July 2021. July 2021 ENR CCI is 13762 and October 2022 CCI is 15141 for San Francisco Bay Area.

(2) Unit Costs of pipelines are esclated based on cost estimates enclosed in the final Groundwater Recharge Alternatives Facility Plan submitted in January 2022. Decemebr 2021 (time of estimate) ENR CCI is 14228 and October 2022 CCI is 15141 for San Francisco Bay Area.

(3) Unit Costs of treatment plant are adjusted based on cost estimates completed for the Final Draft San Benito Urban Areas Water Supply and Treatment Master Plan Update submitted in June 2022. Januray 2022 (time of estimate) ENR CCI is 14301 and October 2022 CCI is 15141 for San Francisco Bay Area.

Appendix B

Lifecycle Cost Calculations

	ADRoP 3 Wells	ADRoP 5 Wells	Overall ASR	Notes	
Construction Cost (w/o WTP)	$8,200,000	$ 11,810,000	$ 25,010,000		
O&M Cost Factor	0.50%	0.50%	0.50%		
Total Annual O&M Cost	$41,000	$59,050	$125,050		
P/A Factor for 30 Years @ 3.5% Interest Rate	18.4	18.4	18.4		
Total Lifecycle O&M Cost	*$754,400*	*$1,086,520*	*$2,300,920*		
Water to be Treated Per Year	1,600	2,700	6,000		
				Used Lassalt WTP operation cost data and CVP Wate fixed costs from July 2021.	
WTP Treatment Cost/AF	$885	$885	$885	Escalated to October 2022 using ENR CCIs	
Water Treatment Yearly O&M Cost	$1,415,302	$2,388,322	$5,307,381	CVP Water Fixed Costs/AF	$404
Water Treatment Lifecycle O&M Cost	*$26,041,552*	*$43,945,119*	*$97,655,819*	LSWTP Costs/AF	$400
Water Purchase for Blending	*$0*	*$0*	*$0*		
Water Purchase Lifecycle Cost	*$0*	*$0*	*$0*		
Total Lifecycle O&M Cost (30 Years)	**$26,800,000**	**$45,100,000**	**$100,000,000**		
Capital Cost	$32,400,000	$40,100,000	$105,400,000		
Total Lifecycle Cost	**$59,200,000**	**$85,200,000**	**$205,400,000**		

Capacity Calculations

	3 Wells	5 Wells	Overall ASR
Injection Capacity (AF)	1,600	2,700	6000
To Dist System (AF)	-	-	-
To Wells (AF)	1,600	2,700	6,000

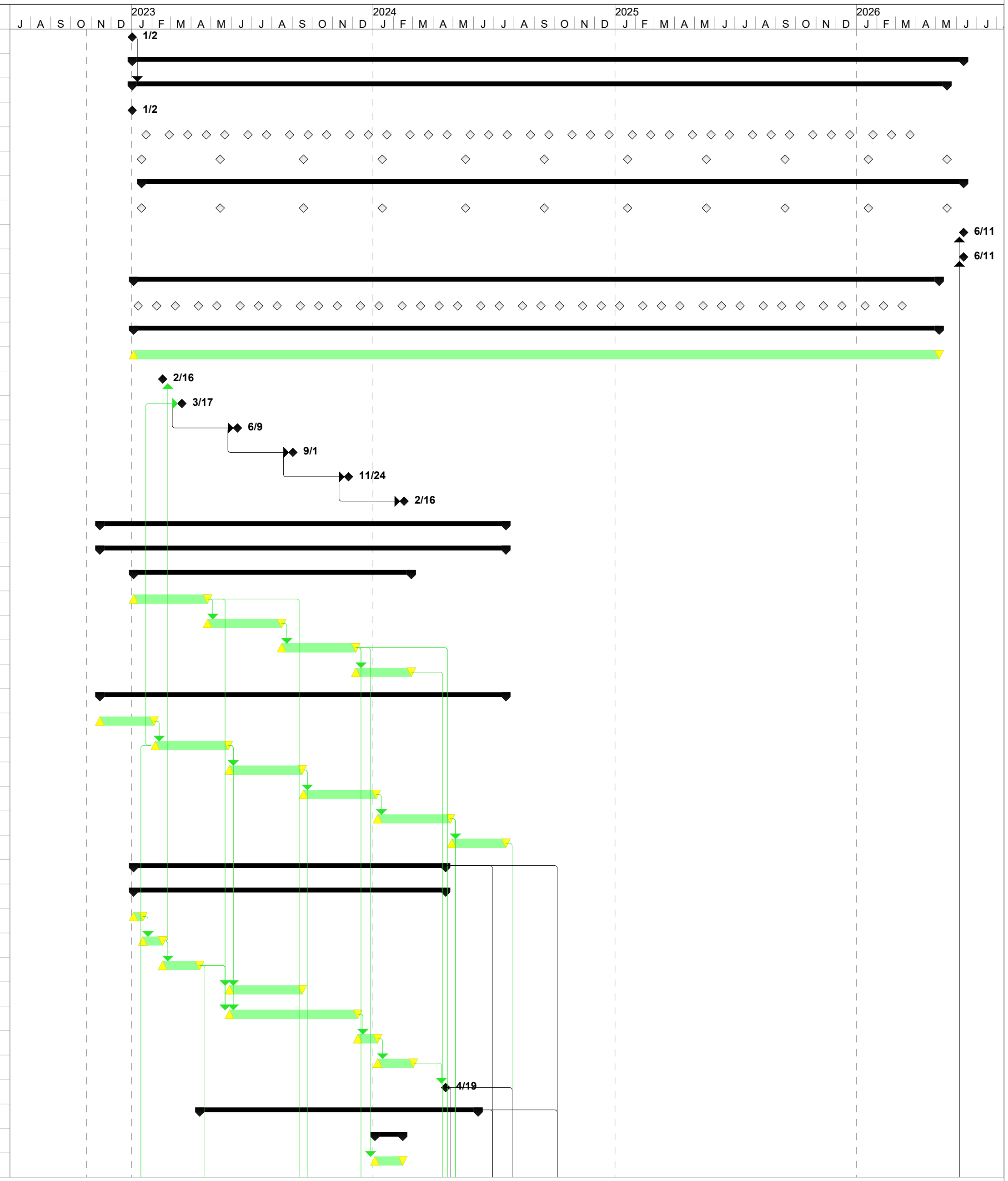
Yield Calculations

Wet Year Frequency		30%	
Normal Year Freq		35%	
Dry Year		35%	
Wet Year (AF, for demand or fireflow)	300	300	300
Normal Year (AF)	-	-	-
Dry Year (AF)	1,600	2,700	6,000
Average Annual Yield	**650**	**1,035**	**2,190**

Appendix C

ADRoP Program Schedule

ID	Task Name	Start	Finish	Duration	Predecessors
1	Grant Award Date	Mon 1/2/23	Mon 1/2/23	0 days	
2	**Direct Project Administration**	**Mon 1/2/23**	**Thu 6/11/26**	**899 days**	
3	**Project Management**	**Mon 1/2/23**	**Mon 5/18/26**	**880 days**	1
4	Project Baseline Schedule	Mon 1/2/23	Mon 1/2/23	0 days	
5	Monthly Project Budget and Schedule Update	**Mon 1/23/23**	**Mon 3/23/26**	**825 days**	
45	Grant Project Quarterly Invoices	**Mon 1/23/23**	**Mon 3/23/26**	**826 days**	
57	**Grant Reporting**	**Mon 1/16/23**	**Thu 6/11/26**	**889 days**	
58	Grant Project Quarterly Reports	**Mon 1/23/23**	**Mon 3/23/26**	**826 days**	
70	Final Project Completion Report	Thu 6/11/26	Thu 6/11/26	0 days	192FS+90 edays
71	Post Completion Report	Thu 6/11/26	Thu 6/11/26	0 days	192FS+90 edays
72	**Engagement**	**Wed 1/4/23**	**Tue 5/5/26**	**870 days**	
73	Partner Agency Engagement	**Wed 1/11/23**	**Wed 3/11/26**	**825 days**	
113	Public Engagement and Outreach	**Wed 1/4/23**	**Tue 5/5/26**	**870 days**	
114	Public Outreach Materials	Wed 1/4/23	Tue 5/5/26	870 days	
115	Scoping	Thu 2/16/23	Thu 2/16/23	0 days	138
116	Project Development	Fri 3/17/23	Fri 3/17/23	0 days	130SS+30 days
117	Real Estate Acquisition	Fri 6/9/23	Fri 6/9/23	0 days	116SS+60 days
118	Project Update / Public Input	Fri 9/1/23	Fri 9/1/23	0 days	117SS+60 days
119	Project Update / Public Input	Fri 11/24/23	Fri 11/24/23	0 days	118SS+60 days
120	Project Update / Public Input	Fri 2/16/24	Fri 2/16/24	0 days	119SS+60 days
121	**Engineering/Environmental/Permitting**	**Mon 11/14/22**	**Fri 7/19/24**	**440 days**	
122	**Task 3 Design**	**Mon 11/14/22**	**Fri 7/19/24**	**440 days**	
123	**West Hills WTP Final Design Submitted**	**Wed 1/4/23**	**Tue 2/27/24**	**300 days**	
124	Preliminary Design Submittal	Wed 1/4/23	Tue 4/25/23	4 mons	
125	50% Design Submittal	Wed 4/26/23	Tue 8/15/23	4 mons	124
126	90% Design Submittal	Wed 8/16/23	Tue 12/5/23	4 mons	125
127	Final Design Submittal	Wed 12/6/23	Tue 2/27/24	3 mons	126
128	**Wellfield and Pipelines**	Mon 11/14/22	Fri 7/19/24	440 days	
129	Test Wells	Mon 11/14/22	Fri 2/3/23	3 mons	
130	Well Site Selection	Mon 2/6/23	Fri 5/26/23	4 mons	129
131	Preliminary Design Submittal	Mon 5/29/23	Fri 9/15/23	4 mons	130
132	50% Design Submittal	Mon 9/18/23	Fri 1/5/24	4 mons	131
133	90% Design Submittal	Mon 1/8/24	Fri 4/26/24	4 mons	132
134	Final Design Submittal	Mon 4/29/24	Fri 7/19/24	3 mons	133
135	**Task 4 Environmental Documentation**	**Wed 1/4/23**	**Fri 4/19/24**	**338 days**	
136	**ADRoP EIR / EIS**	**Wed 1/4/23**	**Fri 4/19/24**	**338 days**	
137	NOP / NOI	Wed 1/4/23	Tue 1/17/23	10 days	
138	Scoping	Tue 1/17/23	Thu 2/16/23	30 edays	137
139	Project Description	Fri 2/17/23	Thu 4/13/23	2 mons	138
140	Biological Field Studies	Mon 5/29/23	Fri 9/15/23	4 mons	139,130
141	Draft EIR / EIS	Mon 5/29/23	Fri 12/8/23	7 mons	124,130,139
142	Public Review Period	Fri 12/8/23	Sun 1/7/24	30 edays	141
143	Draft Final EIR / EIS	Mon 1/8/24	Fri 3/1/24	2 mons	142
144	EIR / EIS Certification	Mon 4/15/24	Fri 4/19/24	5 days	143FS+30 days
145	**Task 5 Permitting**	**Fri 4/14/23**	**Fri 6/7/24**	**301 days**	
146	**West Hills WTP Permits**	**Thu 1/4/24**	**Wed 2/14/24**	**30 days**	
147	DDW Permit	Thu 1/4/24	Wed 2/14/24	30 days	126

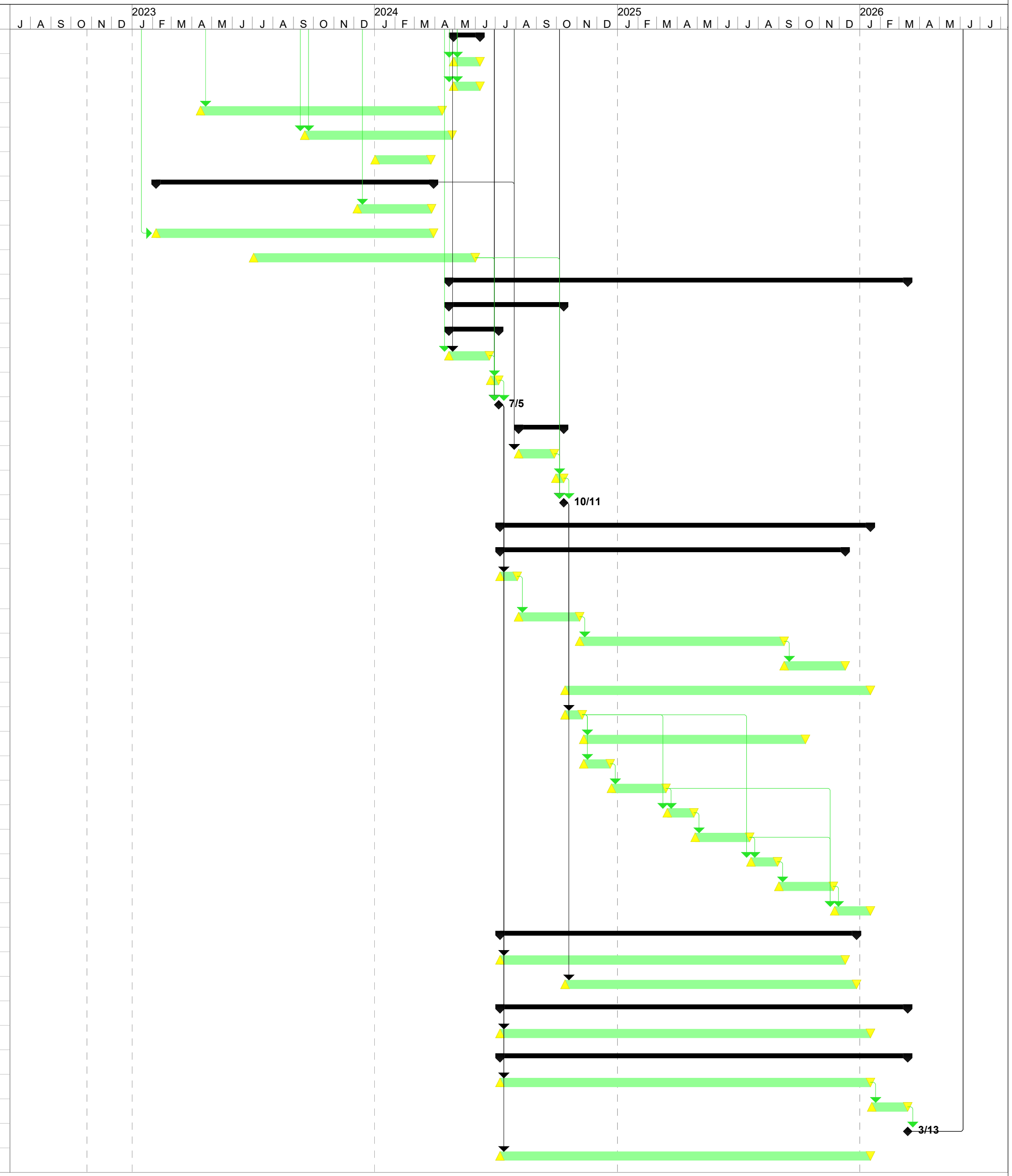


Project: ADRoP Schedule_221022
Date: Tue 10/25/22

Task	Summary	External Milestone	Inactive Summary	Manual Summary Rollup	Finish-only
Split	Project Summary	Inactive Task	Manual Task	Manual Summary	Progress
Milestone	External Tasks	Inactive Milestone	Duration-only	Start-only	Deadline

ADRoP Program Schedule

ID	Task Name	Start	Finish	Duration	Predecessors
148	**Wellfield and Pipelines**	**Mon 4/29/24**	**Fri 6/7/24**	**30 days**	
149	NPDES Stormwater Permit	Mon 4/29/24	Fri 6/7/24	30 days	133,126
150	Encroachment Permits	Mon 4/29/24	Fri 6/7/24	30 days	133,126
151	Federal Permitting	Fri 4/14/23	Thu 4/11/24	13 mons	139
152	**ADRoP DDW Authorization**	Mon 9/18/23	Fri 4/26/24	8 mons	124,131
153	**Task 6 Project Performance Monitoring Plan**	**Tue 1/2/24**	**Mon 3/25/24**	**60 days**	
154	**Task 7 Real Estate**	**Mon 2/6/23**	**Fri 3/29/24**	**300 days**	
155	Right of Way Acquisition, Pipelines	Wed 12/6/23	Tue 3/26/24	4 mons	126
156	Land / Easement Acquisition, Well Sites	Mon 2/6/23	Fri 3/29/24	15 mons	130SS
157	**Task 8 Financing**	**Mon 7/3/23**	**Fri 5/31/24**	**12 mons**	
158	**Construction / Implementation**	**Mon 4/22/24**	**Fri 3/13/26**	**495 days**	
159	**Task 7 Construction Contracting**	**Mon 4/22/24**	**Fri 10/11/24**	**125 days**	
160	**7.1 West Hills WTP Expansion**	**Mon 4/22/24**	**Fri 7/5/24**	**55 days**	
161	Bid Period	Mon 4/22/24	Fri 6/21/24	45 days	127FS+10 days,144
162	Bid Summary	Mon 6/24/24	Fri 7/5/24	10 days	161
163	Contract Award and NTP	Fri 7/5/24	Fri 7/5/24	0 days	162,145,135,157
164	**7.2 Wellfield and Pipelines**	**Mon 8/5/24**	**Fri 10/11/24**	**50 days**	
165	Bid Period	Mon 8/5/24	Fri 9/27/24	40 days	134FS+10 days,144,154
166	Bid Summary	Mon 9/30/24	Fri 10/11/24	10 days	165
167	Contract Award and NTP	Fri 10/11/24	Fri 10/11/24	0 days	166,145,135,157
168	**Task 8 Construction**	**Mon 7/8/24**	**Fri 1/16/26**	**400 days**	
169	**Task 8.1 West Hills WTP Expansion**	**Mon 7/8/24**	**Tue 12/9/25**	**372 days**	
170	8.1.1 Mobilization, Establishing Laydown Areas, Establishing Storm Water BMPs	Mon 7/8/24	Fri 8/2/24	20 days	163
171	8.1.2 Clearing, Grubbing, Fencing, Grading and Site Preparation	Mon 8/5/24	Mon 11/4/24	66 days	170
172	8.1.3 Treatment Plant Construction	Tue 11/5/24	Mon 9/8/25	220 days	171
173	8.1.4 Performance Testing & Demobilization	Tue 9/9/25	Tue 12/9/25	66 days	172
174	**Task 8.2 Wellfield and Pipelines**	**Mon 10/14/24**	**Fri 1/16/26**	**330 days**	
175	8.2.1 Mobilization and Laydown Areas	Mon 10/14/24	Fri 11/8/24	20 days	167
176	8.2.2 Pipeline Installation	Mon 11/11/24	Fri 10/10/25	12 mons	175
177	8.2.3 Well 1 Site Clearing, Grubbing, Fencing, Grading and Site P	Mon 11/11/24	Fri 12/20/24	30 days	175
178	8.2.4 Well 1 Installation	Mon 12/23/24	Fri 3/14/25	60 days	177
179	8.2.3 Well 2 Site Clearing, Grubbing, Fencing, Grading and Site P	Mon 3/17/25	Fri 4/25/25	30 days	175,178
180	8.2.4 Well 2 Installation	Mon 4/28/25	Fri 7/18/25	60 days	179
181	8.2.3 Well 3 Site Clearing, Grubbing, Fencing, Grading and Site P	Mon 7/21/25	Fri 8/29/25	30 days	175,180
182	8.2.4 Well 3 Installation	Mon 9/1/25	Fri 11/21/25	60 days	181
183	8.2.4 Performance Testing and Demobilization	Mon 11/24/25	Fri 1/16/26	2 mons	180,182,178
184	**Task 9 Environmental Compliance / Mitigation / Enhancement**	**Mon 7/8/24**	**Fri 12/26/25**	**385 days**	
185	Task 9.1 West Hills WTP Expansion	Mon 7/8/24	Tue 12/9/25	372 days	163
186	Task 9.2 Wellfield and Pipelines	Mon 10/14/24	Fri 12/26/25	315 days	167
187	**Task 10 Construction Administration**	**Mon 7/8/24**	**Fri 3/13/26**	**440 days**	
188	Construction Management	Mon 7/8/24	Fri 1/16/26	20 mons	163
189	Engineering Services During Construction	Mon 7/8/24	Fri 3/13/26	440 days	
190	Engineering Services During Construction	Mon 7/8/24	Fri 1/16/26	20 mons	163
191	As-Built Record Drawings	Mon 1/19/26	Fri 3/13/26	2 mons	190
192	Notice of Completion	Fri 3/13/26	Fri 3/13/26	0 days	191
193	Labor Compliance during Construction	Mon 7/8/24	Fri 1/16/26	20 mons	163



Project: ADRoP Schedule_221022
Date: Tue 10/25/22

Task	Summary	External Milestone	Inactive Summary	Manual Summary Rollup	Finish-only
Split	Project Summary	Inactive Task	Manual Task	Manual Summary	Progress
Milestone	External Tasks	Inactive Milestone	Duration-only	Start-only	Deadline