Drinking Water System Needs Assessment and Alternatives Analysis

System Name/ID: Big Basin Water Company/CA4410001
Dates of Site Assessments: March - September 2024

Big Basin Water Company

Report Prepared By:
Lydia Rossiter
Reshet Gebremariam
Joy Pearson
Melat Zeyne

Advised By:
Henderson Brown, Esq.
Paul Jones, P.E.

MOONSHOT MISSIONS

Table of Contents

EXECUTIVE SUMMARY

The Big Basin Water Company (BBWC) is a utility that delivers drinking water to 540 customers 14 miles northwest of Santa Cruz, California, adjacent to Big Basin Redwoods State Park. The customer population is roughly 1,120 people. The BBWC system has experienced ongoing compliance violations as well as being significantly impacted by damage from the CZU Lightning Complex Fire in 2020, including destruction of the surface water treatment plant.

BBWC is currently under receivership following failure to comply with the State Water Resources Control Board Division of Drinking Water's directives, compliance orders and citations designed to improve delivery of sufficient, safe drinking water.

The violations were issued by the State prior to the appointment of the Receiver. Pursuant to the Court's order, the Receiver's primary focus has been on restoring and maintaining operational functionality and addressing critical compliance issues while negotiating and overseeing a transfer to a competent entity. Significant progress has been achieved in several key areas:

- **System Reliability:** Reliability has been enhanced with the installation of a generator at the main well and an upgrade to the intertie with San Lorenzo Valley Water District (SLVWD).
- **Funding and Infrastructure:** The Receiver has secured funding to support ongoing operations, replace fire-damaged infrastructure, and create redundancy.
- **Monitoring and Records:** Monitoring capabilities have been improved through the implementation of remote monitoring equipment. Additionally, efforts have included recreating records, such as a comprehensive inventory of all meters and fire hydrants, to improve system management.

In March 2024, Moonshot Missions (Moonshot) was engaged to 1) assess the system's technical, managerial and financial condition and its operational challenges, 2) analyze the long-term sustainability of available ownership and governance alternatives, and 3) provide background and advice regarding water rights preservation.

In order to conduct the technical, managerial and financial assessment, Moonshot visited BBWC facilities multiple times, as well as reviewing existing documentation and records and discussing the system with the previous management, current operator, the Receiver and other stakeholders such as the Fire Chief in whose jurisdiction the system is located.

This report has two parts. Part One offers recommendations that are likely to improve the delivery of safe drinking water to BBWC customers. Part Two of this report evaluates options for BBWC's future. The recommendations below are structured to prioritize actions into short-term, medium-term and long-term timelines based on their urgency and impact on health, safety, and operational stability.

Table 1. Short-Term Recommendations

Short-Term Recommendations (0-1 year)		
Priority	**Action Item**	**Notes**
1	Locate and assess potential contamination risk from Well 5 (horizontal well under surface water influence).	Immediate action required to ensure it does not pose a contamination risk to the system.
2	Investigate the raw water diversion from Jamison Creek to the 1,000-gallon plastic storage tank. Determine the source and usage of the diverted water, identify affected customers, and take necessary steps to reconnect them to the main treated water system if required.	BBWC is unsure how the water from the creek is being used.
3	Conduct a comprehensive cross-connection survey, which includes: - identifying and assessing high-risk sites such as the Country Club and the wastewater treatment plant, as well as - identifying cross-connection issues in the Everest, Bloom Grade and other areas, where customers are using their own wells, storage tanks and bladder tanks.	Prevents contamination and ensures system integrity.
4	Inspect and ensure Well 4's overflow pipe is properly screened or equipped with a fine mesh screen or flapper gate to prevent contamination.	Prevents critters and other debris from entering tank.
5	Complete fencing around Well 4/Well 4 Tank site for improved security.	Prevents unauthorized access.
6	Improve access road to Well 4 site and other critical infrastructure for better accessibility and emergency response.	Enhances emergency response capabilities. Ensures more efficient and timely access to critical sites.
7	Replace aging pump at Bloom Grade pump station.	Critical for maintaining operational reliability.
8	Confirm disconnection of inactive or fire-damaged infrastructure.	Critical for system integrity and safety.
9	Complete the inventory and assessment of all water meters.	Ensures accurate measurement and billing.
10	Address unauthorized connections and water use.	Prevents revenue loss.

11	Initiate fire hydrant inventory and condition assessment. Replace hydrants as needed.	Ensure functionality and readiness for emergency situations.
12	Develop immediate plan for water provision to disconnected customers (e.g., Hill House).	Ensures emergency provision of water service (e.g., hauling water) while planning for permanent connections.
13	Establish a formal agreement with SLVWD regarding the provision of water.	Establishes clear terms and conditions.
14	Secure access to all facilities such as wells, tanks, pump stations, and chemical storage with measures such as locks and fencing.	Consider programmable locks or Fire District-approved locks where feasible; ensures emergency access.
15	Assess pressure at temporary creek crossings (Rosita and Oberst Pump Stations) and develop an emergency response plan for potential failure of temporary pipes.	Ensures system stability.
16	Redirect Galleon Tank overflow away from customer's property.	Prevents potential damage to customer's property.
17	Develop a fire safety and action plan.	Ensures the protection of critical water infrastructure and enhances overall fire preparedness.
18	Purchase insurance to adequately cover liability or loss.	Protects the utility.
19	If considering selling property, implement a strategy to preserve water rights.	Preserves future options for water supply.
20	Consider another rate increase or other revenue generating actions.	Increases utility's ability to be sustainable financially.

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Table 2. Medium-Term Recommendations

Medium-Term Recommendations (1-3 years)		
Priority	**Action Item**	**Notes**
1	Well 4 Investigation and Rehabilitation Conduct a thorough investigation and rehabilitation of Well 4. This should include evaluating the current condition, identifying any potential issues or contaminants, and implementing necessary repairs or upgrades.	Ensures the well's operational efficiency.
2	Based on the cross-connection survey, install and test backflow preventers at high-risk sites.	Prioritize wastewater treatment plant and Country Club.
3	Install testable backflow prevention device at the SLVWD intertie and at all emergency interties (i.e. Bracken Brae and Forest Springs).	Prevents cross-connection.
4	Develop a cross-connection control program: - Acquire a cross-connection control program coordinator to oversee and implement the program. - Identify and document all backflow preventers in the service area, including details such as type, make, model, and location. - Establish a system for record-keeping, maintenance, and annual testing of backflow preventers. - Conduct annual testing of all system backflow preventers to ensure functionality and compliance.	State requirements and critical for preventing water contamination.
5	Implement meter calibration and replacement program.	Ensures accurate water usage measurement.
6	Connect all critical infrastructure to the SCADA system.	Enhances monitoring capabilities.
7	Implement emergency power solutions for critical infrastructure including the intertie connection to SLVWD and critical pump stations.	Ensures water supply during power outages.
8	Develop and implement a valve inspection and exercising program.	Crucial for system maintenance and fire readiness.
9	Implement a line and fire hydrant flushing program.	Maintaining functionality of hydrants and ensures emergency preparedness.

		Enhances water quality and system efficiency.
10	Develop and implement a Water Supply Emergency Plan.	Crucial for responding to supply disruptions and other emergencies.
12	Develop written procedures for emergency repairs.	Enhances emergency preparedness.
13	Establish a comprehensive record-keeping system, including off-site back-up.	Improves operational efficiency and compliance.
14	Formalize existing easements to protect access in case of future property transfers.	Ensures clarity and continuity.
15	Develop and periodically update formal management policies and plans.	Ensures clear management practices.

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Table 3. Long-Term Recommendations

Long-term Recommendations (3-5 years or post-consolidation)		
Priority	**Action Item**	**Notes**
1	Study long-term alternatives for sufficient supply.	Consider surface water treatment plant, increasing well capacity, or drilling new wells.
2	Establish cleaning, inspection, and maintenance programs for wells, tanks, and pump stations.	Enhance system reliability and extend infrastructure lifespan.
3	Upgrade or replace aging pump stations.	Improve reliability and efficiency of water distribution.
4	Upgrade SCADA capability from monitoring to control.	Increases operational efficiency.
5	Develop water main replacement program.	Prioritize areas with frequent breaks.
6	Replace temporary creek crossings (Rosita and Oberst).	Improves long-term system stability.
7	Conduct water audit to quantify and address water losses.	Helps identify and reduce water waste.
8	Implement comprehensive asset management system.	Improves long-term planning and operational efficiency.
9	Develop a long-term capital improvement plan.	Ensures systematic approach to infrastructure upgrades.
10	Assess and upgrade fire protection capabilities.	Improves system resilience.
11	Develop a long-term rate strategy so that revenues adequately cover operations, maintenance and capital expenses.	Plans for future sustainability.

In Part Two, this report evaluates options for BBWC's future by assessing available ownership, governance, and operations alternatives that have realistic potential to support sustainable operations. The considered alternatives involve three categories:

- **Dissolution and Annexation to San Lorenzo Valley Water District**
  - BBWC dissolves and becomes part of its neighboring utility, San Lorenzo Valley Water District.
  - SLVWD would become the full-service retail water provider for the BBWC service area and would provide all technical, managerial and financial resources to operate the system.
- **Hybrid**
  - BBWC becomes part of an entity that does not have neighboring infrastructure, benefiting from the advantages of an agency with greater resources but

operating the BBWC system with its own infrastructure within its current footprint. The alternatives under this category are:
        - Converting the areas served to a County Service Area similar to Davenport County Sanitation District,
        - Annexation with a non-neighboring utility, or
        - Acquisition by an existing private company.
    - Potential non-neighboring utilities include Central Water District, Scotts Valley Water District, Soquel Creek Water District, the City of Santa Cruz, the City of Watsonville, and Pajaro Valley Water Management Agency.
- **Stand-Alone**
    - BBWC continues to be an independent entity through some means of dissolution and reformation.
    - Alternatives include reforming as:
        - An independent special district
        - Mutual water company, or
        - New private corporation.

The sustainability analysis criteria used in Part Two were chosen because they encompass the critical aspects of delivering sustainable, safe, and affordable water service. The evaluation criteria are:

- **Level of Service:** Technical capacity to ensure competent and safe operations of the system, provide regulatory compliance, operations experience, ability to prepare for and respond to emergencies, and improve customer satisfaction.
- **Cost and Affordability:** Access to capital funding and financing, operational efficiencies, stable and sustainable rates, and customer affordability programs.
- **Ownership and Governance:** Accountability, transparency, retail water system management and oversight experience, and opportunities for community representation on governing bodies.

Based on the long-term sustainability analysis, the alternatives are ranked in the following order.

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Table 4. Ranking of Alternatives

Ranking	Alternative
1	Annexation into San Lorenzo Valley Water District
2	County Service Area
3	Annexation into Other Utility, except for Central Water District and Pajaro Valley Water Management Agency
4	Central Water District
5	Existing Investor-Owned Private Company
6	New Special District
7	Pajaro Valley Water Management Agency
8	New Mutual Water Company
9	New Private Company

The comparison of available governance alternatives is summarized in the table below.

Table 5. Summary of Sustainability Analysis

Criteria		*Annexation to SLVWD*	*Hybrid*			*Stand-Alone*		
			Formation into a County Service Area	*Consolidation with Other Utility*	*Acquisition by Private Company*	*Dissolve and form a Special District*	*Dissolve and form a Mutual Water Company*	*Dissolve and form a new Private Company*
Level of Service	***Technical Capacity Established***	High; No deficiencies in latest sanitary survey or outstanding violations. Appropriate certifications. Currently treats groundwater.	High; No outstanding violations. Treatment certifications appropriate. Current distribution certifications would need to be increased.	High: All except Pajaro Valley Water Management Agency (PVWMA). No deficiencies or active violations, appropriate certifications, groundwater experience. PVWMA: Low; No retail utility operations experience.	Assume High; Lack of deficiencies or outstanding violations. Appropriately certified operators.	TBD	TBD	TBD
	Operations Experience	High; Longstanding utility which currently treats groundwater.	High; Utility in operation since 2015. Currently treats surface water.	High: All except PVWMA; Longstanding utilities, currently treat groundwater. PVWMA: Low; No retail utility operations experience.	Assume High; If longstanding utility with groundwater experience.	TBD	TBD	TBD
	Emergency Preparedness and Response	High; Has an emergency response plan (ERP) and the ability to call in agency's other resources. Is a member of California Water/Wastewater Agency Response Network (CalWARN).	High; Has ability to call in agency's other resources and is a member of CalWARN.	High: All except Central and PVWMA; required to have ERP. Ability to call in other resources. Members of CalWARN. Central: Medium. No ERP required. Member of CalWARN. PVWMA: Low; No retail utility operations experience.	Assume High; Ability to call in agency's other resources. May be currently required to have ERP.	Assume Low; No additional resources available within the agency.	Assume Low; No additional resources available within the agency.	Assume Low; No additional resources available within the agency.
	Customer Satisfaction	High; Has a lack of extended/repeated outages. Has customer service and communications capacities. Able to pay online.	High: Has a lack of extended/repeated outages. Has customer service and communications capacities. Able to report issue or request service online.	High: All except Central and PVWMA. All except Central and PVWMA have no extended/repeated outages, have customer service/communications capacity, and offer online bill pay. Central: Medium; no extended/repeated outages, limited customer service capacity, no online bill pay. PVWMA: Low; No retail utility operations experience.	Assume High if no extended/repeated outages, has customer service and communications capacities, and customer-friendly features.	TBD	TBD	TBD

Table 5. Summary of Sustainability Analysis (cont.)

Criteria		*Annexation to SLVWD*	*Hybrid*			*Stand-Alone*		
			Formation into a County Service Area	*Consolidation with Other Utility*	*Acquisition by Private Company*	*Dissolve and form a Special District*	*Dissolve and form a Mutual Water Company*	*Dissolve and form a new Private Company*
Cost & Affordability	***Access to Capital Funding***	High	High	High	Medium	High	Medium	Medium
	Types of Capital Funding	Grants, Loans, Assessments, General Obligation (GO) Bonds	Grants, Loans, Assessments, GO Bonds	Grants, Loans, Assessments, GO Bonds	Loans. No assessments or GO Bonds, limitations on grants	Grants, Loans, Assessments, GO Bonds	Loans and assessments. No GO Bonds. Grants may be taxable.	Loans. No assessments or GO Bonds, limitations on grants
	Cost of Capital	Low; Majority public funds with as low as 2.3% interest State Revolving Fund (SRF) and potential for principal forgiveness.	Low; Majority public funds with as low as 2.3% interest (SRF) and potential for principal forgiveness.	Low; Majority public funds with as low as 2.3% interest (SRF) and potential for principal forgiveness.	Medium. May qualify for SRF loans (2.3%) but not GO Bonds. Private funding at 6-12%.	Low. Majority public funds with as low as 2.3% interest (SRF) and potential for principal forgiveness.	Medium. May qualify for SRF loans (2.3%) but no GO Bonds. Private funding at 6-12%.	Medium. May qualify for SRF loans (2.3%) but no GO Bonds. Private funding at 6-12%.
	Rate of Return to Investors	Not Applicable	Not Applicable	Not Applicable	10.7-11.9%	Not Applicable	Not Applicable	10.7-11.9%
	Customer Rates	Increase; Benefits of economy of scale with SLVWD. Public participation.	Increase; Fewer economies of scale with small customer base. Public participation.	Increase; Fewer economies of scale with small customer base. Public participation.	Assume increase; return to investors, economy of scale TBD.	Assume Increase; No economy of scale. Public participation.	Assume Increase; No economy of scale. Public participation.	Increase; Return to investors, no economy of scale. No public participation.
	Administrative Efficiencies (Back-Office)	High; Greater economy of scale and adjacent location.	Medium; May be some capacity with the staff that currently manage the other CSA or utility.	Medium; May be some capacity with the staff that currently manage the other CSA or utility.	Assume Medium	None	None	None
	Affordability Programs	Program available; Up to $240/year for eligible households.	None	Scotts Valley: Program available; discounted basic service charge and uniform rate for eligible households Remainder: None	TBD; As allowed by CPUC.	TBD; Would have to be Proposition 218 compliant[1].	TBD	TBD; As allowed by CPUC.

[1] Proposition 218, also known as the Right to Vote on Taxes Act, governs how local governments raise revenue. Proposition 218 Guide for Special Districts. https://www.waterboards.ca.gov/drought/pricing/docs/csda_guide_proposition_218.pdf

Table 5. Summary of Sustainability Analysis (cont.)

Criteria		*Annexation to SLVWD*	*Hybrid*			*Stand-Alone*		
			Formation into a County Service Area	***Consolidation with Other Utility***	***Acquisition by Private Company***	***Dissolve and form a Special District***	***Dissolve and form a Mutual Water Company***	***Dissolve and form a new Private Company***
Ownership & Governance	***Accountability***	High; SLVWD is managed by an elected board focused on water.	High; Overseen by the elected County Board of Supervisors.	High; All alternatives overseen by elected governing board except for PVWMD, which has elected and appointed board members.	Assume Low; Not generally elected but by investors.	Assume High; Boards are elected, composition varies by type of special district.	TBD; Governing body composition varies and is established in the by-laws. Property owners are eligible to serve.	Assume Low; Not generally elected but by investors.
	Transparency	High; SLVWD practices transparency with public records and regular audits. Available on website: financial reports, water quality reports, employee compensation, agendas and minutes.	High; Davenport CSD practices transparency with public records and regular audits. Available on website: financial reports, water quality reports, regulations, agendas and minutes.	High; all show high level of transparency with documents available online.	Assume Low; Meetings may be closed to the public. Required to publish water quality data.	Assume High; Meetings open to public. Required to publish water quality data, budgets and board agendas/minutes.	Assume Medium; Required to publish water quality data. Notice of meetings required. Shareholders/tenants/elected must be allowed to attend. Meetings may be closed to the public. Not subject to Public Records Act.	Assume Low; Meetings may be closed to the public. Required to publish water quality data.
	Governance Experience	High; The San Lorenzo Valley Water District was established in 1941 as an independent special district. The District is governed by a five-member Board of Directors, elected at-large from within the District's service area.	High; providing water service since 2015.	All except PVWMA: High with long-standing record of governing water service. PVWMA: Low because not experienced with managing a full-service retail water utility.	Assume High; longstanding record of governing water service.	TBD	TBD	TBD
	Community Representation	High; Board is elected at large, not by districts.	Medium; Overseen by the County Board of Supervisors, of which one represents BBWC customers.	TBD	Assume Low; Representation is from investors only.	Assume High; Will have elected officials from the district.	Assume Medium; Property owners are eligible to serve.	Assume Low; Representation is from investors only.

This report presents a detailed technical, managerial, and financial evaluation of the current system, reviews governance options and analyzes long-term sustainability factors, including funding alternatives. It is intended to support informed decision-making regarding the most appropriate and sustainable path forward for the Big Basin Water Company system.

The observations and analysis in this report do not speculate on the political dimension of the alternatives and options discussed or recommended. That said, the willingness of the ownership involved or governing body and/or customers to support merger or consolidation with BBWC in the future is important to the success of any proposed change in governance.

The alternatives were identified and evaluated based on available information. All alternatives should be further analyzed and refined to ensure all costs, benefits and concerns are properly identified. Regardless of which alternative is selected, Big Basin Water Company faces significant challenges with implementing important improvements and maintaining the affordability of water services to customers.

INTRODUCTION

Big Basin Water Company (BBWC) is a water system in Boulder Creek, California that provides drinking water service to approximately 540 service connections or roughly 1,120 people. BBWC is an investor-owned water utility that was incorporated in the 1940s.

Prior to August 2020, the BBWC system was supplied by both surface water and groundwater. In August 2020, BBWC infrastructure was seriously damaged during the CZU Lightning Complex Fire. The damage included destruction of the surface water treatment plant, leaving the system with only the well that was reserved for back-up supply before the fire and an intertie with the neighboring San Lorenzo Valley Water District. The BBWC system also suffered serious damage elsewhere, including the loss of tanks, pipelines, and connections to customers.

BBWC is regulated by the California State Water Resources Control Board, Division of Drinking Water (DDW). After documenting multiple, serious deficiencies in the system since 2018, DDW issued a series of directives, compliance orders and citations designed to improve delivery of sufficient, safe drinking water. Despite ongoing discussions with the BBWC owners and managers, no significant progress was made in solving multiple major problems. After the BBWC owners and managers failed to comply with the DDW directives and orders, DDW determined that BBWC "are unable and unwilling to adequately serve the System's customers and have been unresponsive to the Division's directives, compliance orders and citations…."[2] DDW sought the appointment of a receiver to restore reliable water service and to implement a holistic approach to the system's rehabilitation and long-term viability.

On September 29, 2023, the Superior Court of the State of California for the County of Santa Cruz, appointed Serviam by Wright LLP as the Receiver. The court's order gave full powers granted under Health & Safety Code § 116665 and Code of Civil Procedure section 564, *et seq*.[3], to operate and administer BBWC because of the significant technical, managerial, and financial challenges confronting BBWC. Serviam by Wright engaged Cypress Water Services to operate the system on a day-to-day basis.

Moonshot Missions (Moonshot) is a 501(c)(3) nonprofit water and wastewater utility consulting firm, based on the core principle that all people, particularly those in disadvantaged communities, have a right to safe, accessible, and affordable drinking water and clean waterways. Moonshot is a collective of water leaders, professionals, and engineers with more than 250 years of experience with utility management, governance, community engagement, engineering, utility operations and finance. Moonshot helps communities attain clean water objectives by working collaboratively as trusted peer advisors.

[2] Declaration of Jonathan Weininger in Support of Application for Appointment of Receiver under Health and Safety Code Section 116665.

[3] Order granting State Water Resources Control Board's Request for Appointment of Receiver for the Big Basin Water Company.

Moonshot was engaged in March 2024 to provide technical assistance to the Receiver by 1) assessing BBWC's current technical, managerial and financial condition, and operational challenges, 2) evaluating ownership, governance, and operations alternatives that have the potential to support sustainable operations, and 3) providing information and advice regarding water rights preservation. This technical assistance was provided at no cost to the Receiver or BBWC and its customers through a cooperative agreement with the Environmental Protection Agency (EPA) as part of the EPA National Environmental[4].

As part of the assessment process, Moonshot Missions conducted several site visits including:

- **March 5, 2024:** Initial site assessment.
- **April 2 and April 3, 2024:** Continued site assessment and data collection.
- **May 15, 2024:** Attendance at the Town Hall meeting, where the Receiver provided updates on the system. Presentation by Moonshot Missions to customers and stakeholders to explain Moonshot Missions' role and the assistance to be provided to Big Basin Water Company.
- **May 16, 2024:** Additional site assessment.
- **September 10, 2024:** Site visit to review records.

This report presents a detailed technical, managerial, and financial evaluation of the current system, reviews governance options and analyzes long-term sustainability factors, including funding alternatives. It is intended to support informed decision-making regarding the most appropriate and sustainable path forward for the Big Basin Water Company system.

The observations and analysis in this report do not speculate on the political dimension of the alternatives and options discussed or recommended. That said, the willingness of the ownership involved or governing body and/or customers to support merger or consolidation with BBWC in the future is important to the success of any proposed change in governance.

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[4] Environmental Finance Center Program. https://www.epa.gov/waterfinancecenter/efcn

PART ONE: ASSESSMENT

Part One of this report presents Moonshot Missions' evaluation of the Big Basin Water Company water system's technical, managerial, and financial components. This assessment covers system ownership and governance, source water quality, treatment processes, distribution, regulatory compliance, management structure, and financial health. By highlighting both strengths and areas for improvement, this analysis aims to provide a solid foundation for decision-making. The following sections offer detailed insights, concluding with a summary that encapsulates the key points of our evaluation.

System Ownership & Governance

1. Brief System Description

Big Basin Water Company is a water system in Boulder Creek, CA that provides drinking water service to approximately 540 service connections and 1,120 people. The service area covers roughly 2,400 acres along Highway 9 between Boulder Creek and Big Basin in Santa Cruz County, including 700 acres of watershed land owned by BBWC (see service area map in Figure 1 below).

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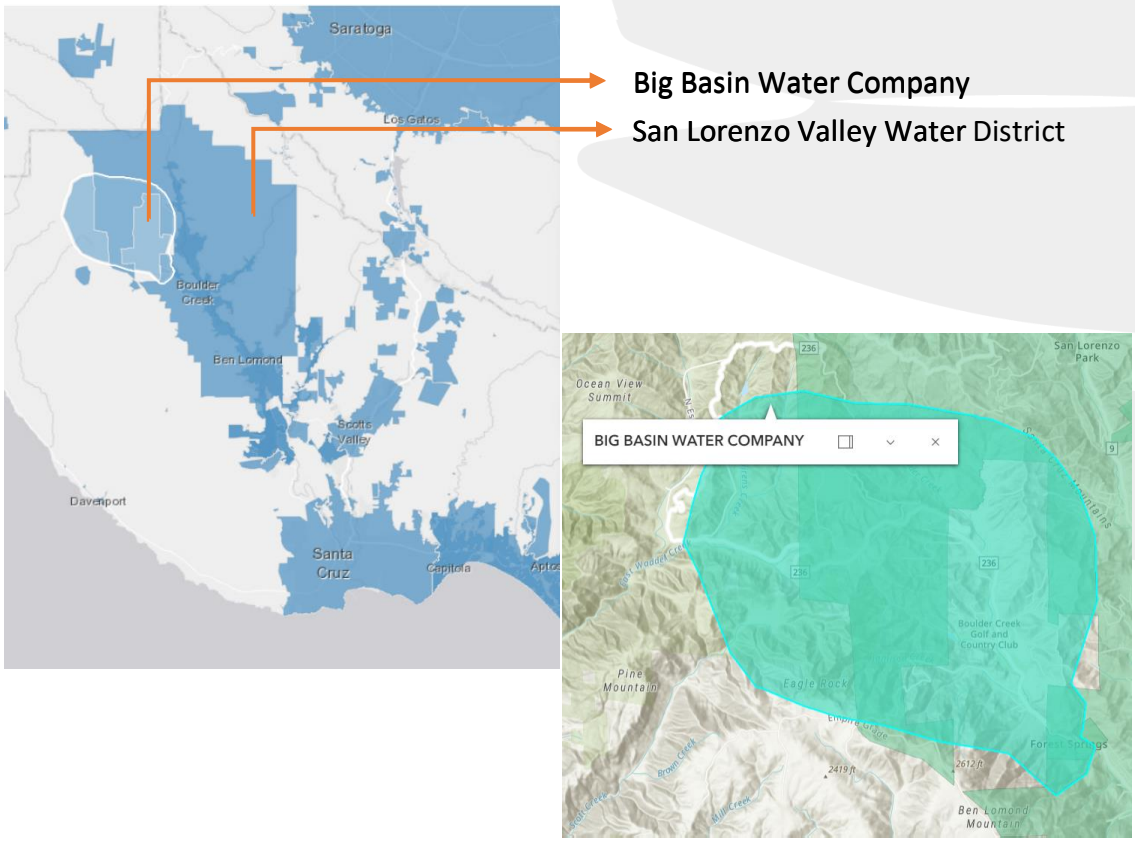

Figure 1. Big Basin Water Company Service Area Map (California State Water Resources Control Board)[5]

Prior to the 2020 CZU Lightning Complex Fire, the system relied on a combination of groundwater and surface water sources, with a surface water intake, treatment plant, wells, storage tanks, and pumping stations. The fire significantly damaged the system's infrastructure, particularly the surface water facilities. The fire led to a shift in the water supply sources and significant changes in the overall operation of the system.

Currently, the water supply primarily consists of purchased water from San Lorenzo Valley Water District (SLVWD) and groundwater from a single active well. The water is distributed to customers via storage tanks, pumping stations, and a distribution system pipeline network. While other wells exist, they are currently inactive/disconnected or non-producing.

[5] California State Water Resources Control Board. ArcGIS Hub. "California Drinking Water System Area Boundaries". https://hub.arcgis.com/datasets/waterboards::california-drinking-water-system-area-boundaries/explore?location=37.160263%2C-122.168436%2C13.69

BBWC also maintains interconnections with two mutual water companies, Forest Springs (126 service connections) and Bracken Brae Country Club (24 service connections), which are both pursuing consolidation with SLVWD. These interconnections are designed for one-way water flow whereby BBWC can supply emergency water to Forest Springs and Bracken Brae Country Club when necessary. However, these mutual water companies cannot supply water back to BBWC. While these connections typically remain inactive, BBWC has the capability to provide emergency water supply when needed. Both Forest Springs and Bracken Brae Country Club have been provided with emergency water under the receivership.

2. Ownership and Staffing

Big Basin Water Company is a Class C[6] investor-owned water utility incorporated in the 1940s. It is regulated by the California Public Utilities Commission (CPUC). It is registered as a Stock Corporation in California (Corporate Number: C1259077), with Thomas J. Moore as the company's registered agent.

In 2023, the system was placed in receivership because of chronic water outages, supply shortfalls, and aging infrastructure. The receivership was granted by the Santa Cruz County Superior Court in September 2023 at the request of the State Water Board after numerous enforcement actions against the previous owners. Serviam by Wright LLP ("Serviam", formerly Silver & Wright LLP, is the court-appointed receiver overseeing the drinking water system. Cypress Water Services ("Cypress") is the contracted operator and customer service contact. Routine operations and maintenance are performed by Cypress.

As the Receiver, Serviam is responsible for operating and managing the water system. The Receiver is collaborating with multiple stakeholders, including local and state agencies, to restore reliable water service and to implement a holistic approach to the system's rehabilitation and long-term viability. This effort involves addressing immediate infrastructure needs and developing sustainable management and financial practices.

Additionally, Serviam has implemented several community outreach initiatives, including regular town hall meetings and updates, to keep residents informed about ongoing system improvements and to provide a forum in which customers can relay their concerns.

3. Water System Primary Use

The water system is primarily used for residential purposes. It provides potable water to a single commercial customer, Boulder Creek Golf and Country Club. Additionally, the system is equipped with fire hydrants and storage tanks intended to support fire protection needs.

[6] A Class C Investor-Owned Utility serves between 2,000 and 10,000 service connections. Standard Practice for Processing Informal General Rate Cases of Small Water and Sewer Utilities (Class B, C and D) https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M531/K314/531314247.pdf

However, there are concerns about the functionality of some fire hydrants, the system's storage and delivery capacity and its readiness for emergency fire protection.

BBWC currently maintains one-way emergency interconnections with Forest Springs and Bracken Brae Country Club, allowing for water provision to these systems during emergencies.

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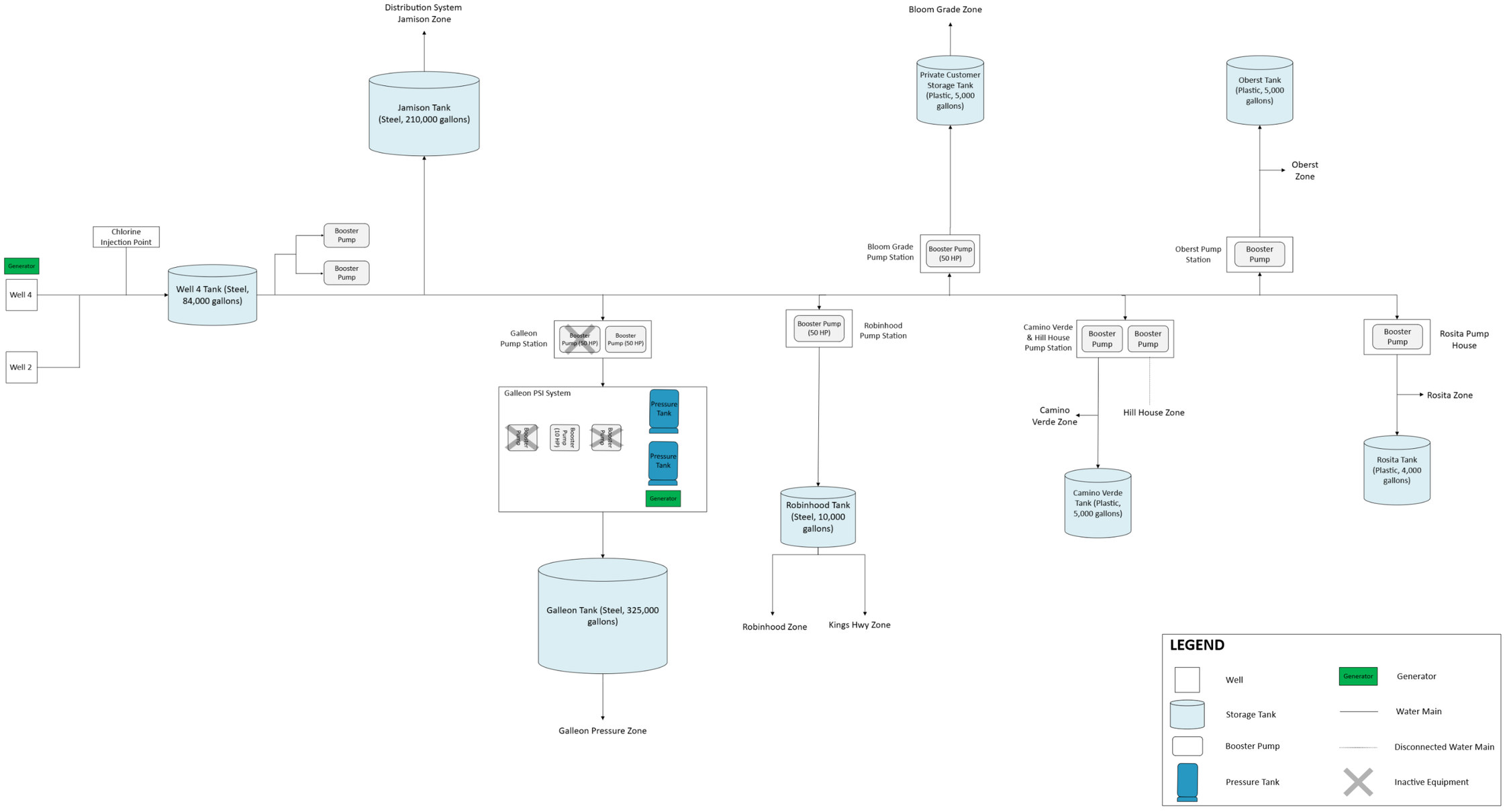

Figure 2. System Graphic (active/connected sites)

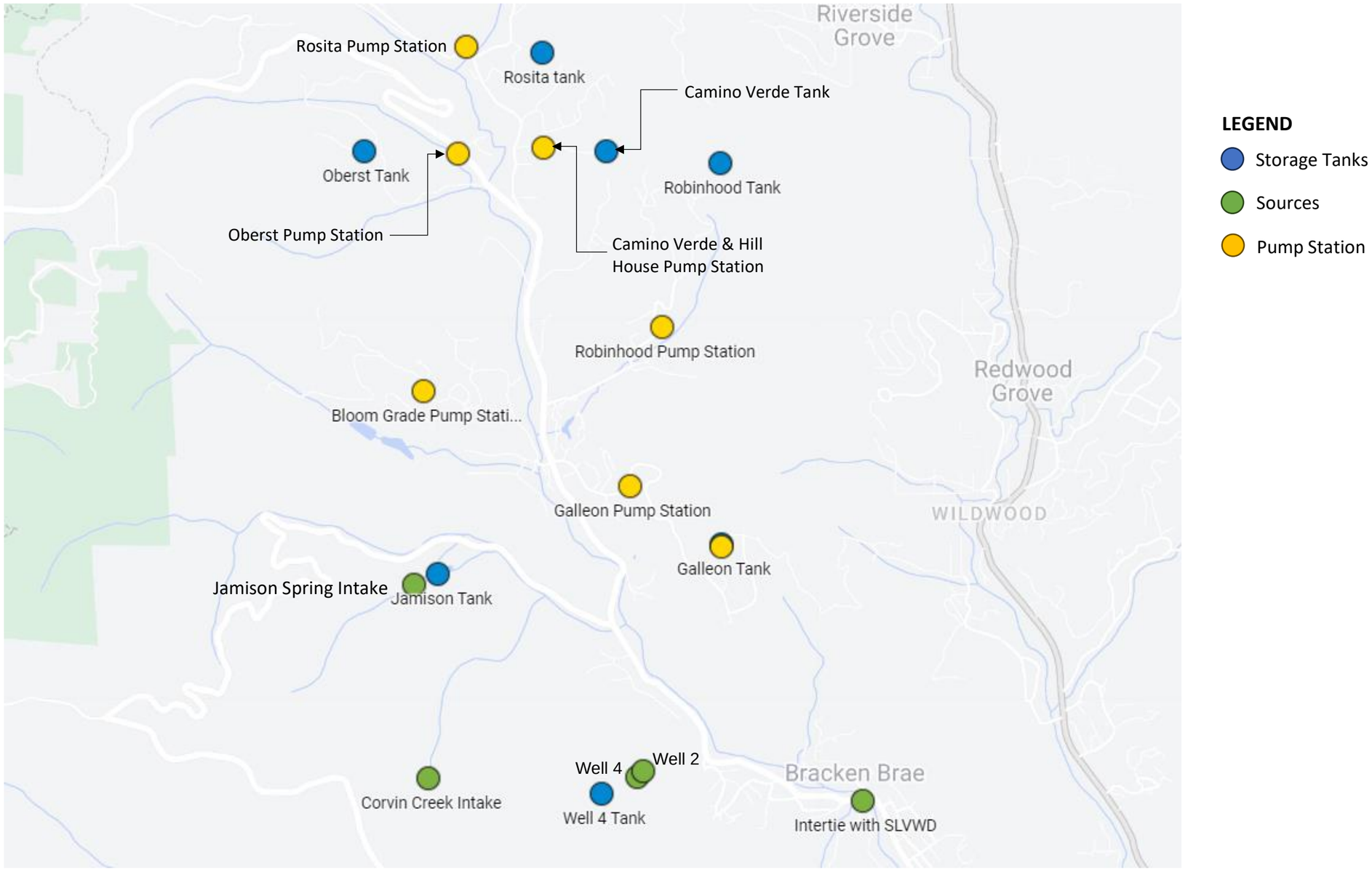

Figure 3. System Map (active/connected sites)

SANITARY DEFICIENCY QUESTIONS AND CONSIDERATIONS

Source Water

Quantity

The Big Basin Water Company (BBWC) system has undergone significant changes following the 2020 CZU Lightning Complex Fire. Currently, the primary water sources are:

1. Well 4: The main production well, with fluctuating output (observed at 200-280 gpm during recent site visit).
2. Interconnection with San Lorenzo Valley Water District (SLVWD).

Additional sources include:

1. Well 2 (also known as American Well): Connected to the system but is mostly kept offline. Its capacity is approximately 18 gpm.
2. Well 1: Inactive and disconnected from the system.
3. Well 5: Well 5 is a horizontal well that is under the direct influence of surface water. Its exact location could not be identified during the site visit. BBWC currently lacks information on its exact location and status.

Before the fire, BBWC relied on a combination of groundwater and surface water and maintained a surface water treatment system at Jamison Station. The company possesses surface water rights, some of which are not currently in active use.

Table 6 below shows the status and the condition of Big Basin Water Company's water sources/supply.

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Table 6. Water Sources

Type	Status	Description	Condition	Location
Well 4	Active	**Installation Date:** 1976 **Water Level:** Unknown **Well Depth:** Unknown **Casing Type/Diameter:** Unknown **Pump Motor Type:** Submersible pump **Pumping Capacity:** ~200-280 gpm	☒ Site secured/gated ☒ Adequate slab ☒ Air vent ☒ Meter ☒ Sanitary seal ☒ Raw water sample tap **Access:** Not easily accessible/hard drive uphill. **Notes:** Main well. The well is in generally good condition. Fluctuating well capacity. Fenced in, but the fencing is not fully enclosed.	37°08'21.0"N 122°09'23.4"W
Intertie with SLVWD	Active	In Vault **Capacity:** The capacity of the intertie is not directly specified. BBWC used 9,020,880 gallons from September 2023 to July 2024.	☒ Site secured/gated ☒ Meter ☒ Adequate drainage ☐ Backflow Prevention Assembly **Access:** Easily accessible – in vault, locked. **Notes:** No testable backflow prevention device at the intertie – there is a swing check valve. The intertie was recently upgraded with a timer system, variable frequency drive (VFD), and improvements to both electrical and plumbing systems.	37°08'17.2"N 122°08'36.3"W
Well 2 (also known as American well)	Active/ Connected to system	**Installation Date:** Unknown **Water Level:** Unknown **Well Depth:** Unknown **Casing Type/Diameter:** Unknown **Pump Motor Type:** Submersible pump **Pumping Capacity:** ~18 gpm	☐ Site secured/gated ☒ Adequate slab ☒ Air vent ☒ Meter ☐ Sanitary seal ☒ Raw water sample tap **Access:** Not easily accessible/hard drive uphill. Access is not restricted. **Notes:** The well is mostly kept offline but remains connected to the system. Equipped with VFD. Unable to verify if the well has a sanitary seal.	37°08'22.0"N 122°09'22.0"W
Well 1 (also known as Galleon well)	Inactive/ Disconnected	**Installation Date:** Unknown **Water Level:** Unknown **Well Depth:** Unknown **Casing Type/Diameter:** Unknown **Pump Motor Type:** N/A **Pumping Capacity:** N/A	☐ Site secured/gated ☒ Adequate slab ☐ Air vent ☐ Meter ☐ Sanitary seal ☐ Raw water sample tap ☐ Raw water sample tap **Access:** Easily accessible. Access is not restricted. **Notes:** Well has been air-gapped/physically disconnected from the system.	37°08'59.1"N 122°09'05.7"W

Well 5	Unknown	**Installation Date:** Unknown **Water Level:** Unknown **Well Depth:** Unknown **Casing Type/Diameter:** Unknown **Pump Motor Type:** Unknown **Pumping Capacity:** Unknown	☐ Site secured/gated ☐ Adequate slab ☐ Air vent ☐ Meter ☐ Sanitary seal ☐ Raw water sample tap **Access:** Unable to locate/assess well during site visit. BBWC is unsure of the exact location. **Notes:** Horizontal well under the influence of surface water. According to the 2018 San Jose Water Company Engineering Assessment and Acquisition Recommendation Report, Well 5 directly served the Moores without chlorination.[7] It is unclear whether Well 5 is still connected to the system or if it was properly abandoned or destroyed as its location and status are unknown. Further investigation is needed to ensure it does not pose a contamination risk to the system.	Possible location = 37°08'54.7"N 122°10'13.2"W
Jamison Spring Intake	Active	Raw water diversions on Jamison Creek	**Notes:** Currently, being diverted into a 1,000 gallon plastic storage tank and the open-air reservoir adjacent to Jamison Tank. No treatment plant on site. BBWC is not sure how the water is being used but is not actively treating or distributing it.	37°08'53.1"N 122°10'09.7"W
Corvin Creek Intake	Inactive	Raw water diversion on Corvin Creek	**Notes:** Destroyed during the fire.	Possible location = 37°08'20.7"N 122°10'06.8"W

[7] San Jose Water Company. Big Basin Water Company – Engineering Assessment & Acquisition Recommendation, 2018.

1. **Is the current water production capacity sufficient to meet current and future demands?**

The current groundwater production is not sufficient to meet current and future demands. In its 2021 assessment of the BBWC, the California State Water Board noted that BBWC cannot meet the 10-year maximum day demand of 0.62 MGD (recorded in 2012) with its available source capacity of 0.104 MGD from Well 4. As of 2024, Well 4's production ranges from 0.288 MGD to 0.4 MGD, which, while improved, still falls short of the 10-year maximum day demand of 0.62 MGD. This production gap, coupled with the continued need for supplemental water from San Lorenzo Valley Water District (SLVWD), indicates that the system's current demand still exceeds BBWC's existing supplies.

2. **Is the quantity of the source sustainable? Does the capacity/flow of the ground water source vary? If so, how does the water system meet demand during those periods?**

The quantity of the source is not sustainable. Well 4's capacity varies significantly (200-280 gpm observed during site visits), and Well 2 has a limited capacity of 18 gpm. During periods of low production or high usage, the system relies heavily on the SLVWD interconnection to meet demand. This reliance on a single main well and an interconnection demonstrates the system's vulnerability.

3. **Does the water system have plans or procedures to respond to variations in their source water supplies?**

The system does not have formal plans to address source water variations. Currently, the primary response is to purchase water from SLVWD and encourage customers to implement conservation measures. In its 2021 sanitary survey, the California State Water Board identified this lack of preparation as a significant deficiency and required BBWC to develop comprehensive plans for water supply emergencies and power outages.

4. **Has the water system had to increase pumping depths in their wells or drill deeper wells? Have any wells gone dry?**

No. The Receiver is currently prioritizing other critical upgrades to ensure that the system remains operational and that supplemental supplies are being provided by SLVWD.

5. **Does the water system track or have data regarding aquifer levels, recharge areas and related information for its source(s)?**

BBWC does not currently track or have data regarding aquifer levels, recharge areas, and related information for its sources.

6. **Does the water system have an operational master meter to measure production?**

Yes. All active wells have meters, and the connection to SLVWD is metered, allowing for production monitoring.

7. **Alternate/Emergency Source(s)**
    a. **Does the water system have redundant sources?**
    No. Well 2 (mostly inactive) and Well 1 (inactive, disconnected) provide minimal redundancy. Current redundancy is provided by the interconnection to SLVWD.
    b. **Does the water system have interconnections with neighboring water systems or a contingency plan for water outages?**
    One active interconnection with SLVWD serves as the primary backup source.
    c. **Are there constraints or limits on reserve or alternate sources (e.g., permits, water rights, hydraulic limitations, costs)?**
    The interconnection with SLVWD presents significant cost constraints, with a cost of $12.66 per hundred cubic feet, compared to $5.33 per hundred cubic feet for water from the BBWC system. Additionally, there is no formal agreement with SLVWD regarding the provision of water that establishes clear terms and conditions.
    d. **Does the system monitor and maintain alternate/emergency supplies (e.g., intakes, valves, pumps, consecutive connections) to assure good operational conditions?**
    Yes, the water system has several measures in place for managing alternate and emergency supplies related to its water sources:
        - A rented Whisperwatt diesel-powered AC generator is installed at the main well, Well 4, ensuring continued operation of the primary water source during power outages.
        - An interconnection with SLVWD serves as an alternate water source during periods of high demand or low well production. This intertie has been upgraded with a timer, VFD, and improvements to electrical and plumbing systems at the intertie pump station to enhance its reliability and efficiency. BBWC is also collaborating with SLVWD to evaluate the possibility of increasing the capacity of the intertie.
        - The system is integrating most of its critical assets, including well operations, into a Supervisory Control and Data Acquisition (SCADA) system. This upgrade will enhance real-time monitoring capabilities for the water sources.

Quality

1. **Is the well in a confined or unconfined aquifer?**
    Unknown. Well 4 is in the Santa Margarita Groundwater Basin.

2. **Is the well site subject to flooding?** No. According to the Federal Emergency Management Agency (FEMA) Flood Map Service Center[8], BBWC's service area is designated as an "Area of Minimal Flood Hazard. " This classification suggests that the location has a very low risk of flooding based on FEMA's analysis.

3. **Is the well site subject to wildfires or other natural hazards?**
   Yes. The BBWC well site is in a "Very High" Fire Hazard Severity Zone[9], indicating a significant risk of wildfire due to extreme conditions such as dense vegetation, challenging terrain, and high likelihood of intense wildfires.

4. **Is the well(s) located near any immediate or PSOCs (Potential Source of Contamination)?**
   Based on a visual inspection of the sites, the wells are not located near any immediate or PSOCs.

5. **Are there any other contamination sources?** No known additional contamination sources have been identified. However, well 5's status as a GUDI (Groundwater Under the Direct Influence of Surface Water) well inherently suggests a higher potential for contamination from surface influences. This horizontal well is potentially located at 37°08'54.7"N 122°10'13.2"W, though its exact position remains uncertain. In addition, raw water from Jamison Creek is currently diverted into a 1,000-gallon plastic storage tank with no treatment plant on site, and BBWC is unsure how the water is being used.

6. **Is there a Well Head Protection Program in place?** No.

7. **Is there a driller's log available?** Driller's log was not provided by BBWC.

8. **How often is drawdown measured?** Drawdown is not measured.

9. **Has there been any decline in water quality or quantity over time?** According to BBWC, there has not been any decline in water quality, and the system is not exceeding any Maximum Contaminant Levels (MCLs). It is unknown if there has been a decline in water quantity since production records are not available.

[8] FEMA Flood Map Service Center
https://msc.fema.gov/arcgis/rest/directories/arcgisjobs/nfhl_print/mscprintb_gpserver/jb33d15cb3ca346079817f8ee7b24c660/scratch/FIRMETTE_e1eccf2b-a388-4fcb-82c8-04c79e237c10.pdf

[9] Office of the State Fire Marshal. (n.d.). Fire Hazard Severity Zones. California Department of Forestry and Fire Protection. Retrieved August 27, 2024, from https://osfm.fire.ca.gov/what-we-do/community-wildfire-preparedness-and-mitigation/fire-hazard-severity-zones

Treatment

After the CZU Complex fire, Big Basin Water Company switched from treating surface water to using only groundwater and purchased finished water from the San Lorenzo Valley Water District (SLVWD).

Currently, BBWC does not have a treatment plant. The Jamison Water Treatment Plant, a surface water treatment facility located at 37°08'55.1"N 122°10'04.1"W, burned during the CZU Lightning Complex fire in 2020 and no longer exists. The system's only treatment now consists of disinfection with sodium hypochlorite at Well 4.

Chemical Feed Systems

Table 7. Treatment

Type	Status	Description	Condition	Location
Sodium hypochlorite chemical feed system	Active	**Installation date:** 2020	Good. Includes sodium hypochlorite solution, container, feed pump, flow meter.	37°08'18.4"N 122°09'30.6"W (injection point near intake of well 4 tank)

1. **Does the PWS have adequate process control monitoring and testing procedures?** Yes. The chlorine feed system is monitored via SCADA.

2. **What is the condition of the chemical feed equipment?** The equipment is in good condition.

3. **Does the operator routinely calibrate the chemical feed equipment?** Yes.

4. **Are instrumentation and controls for the process adequate, operational, and used?** Yes.

5. **Is chemical storage adequate and safe?** Yes.

6. **Is any outside chemical storage protected?** N/A. Sodium hypochlorite containers kept in the shed.

7. **Do daily operating records reflect chemical dosages and total quantities used?** Yes. The operator keeps a log of dosage and total quantities used.

8. **Is the chemical feed system tied to flow (i.e., flow-paced)?** Yes. The chemical feed pump turns on when the well pump turns on.

9. **Is there appropriate safety equipment (e.g., cartridge respirator for calcium hypochlorite) and PPE (e.g., goggles and gloves) available and in use? Do operators have the training needed to use the safety equipment?** Yes. The contracted operator maintains the necessary SDS and has the appropriate safety equipment and personal protective equipment (PPE) available for use.

10. **Is the building as clean and dry as possible?** Yes.

11. **Are all chemicals labeled and listed as NSF or UL approved for drinking water?** Yes. The sodium hypochlorite solution used conforms to ANSI/NSF Standard 60.

12. **Is a sufficient quantity of chemicals stored on site for regular use?** Yes.

Disinfection Methods

1. **Can the operator answer basic questions about the specifics of their disinfection process? Do they know when and where disinfection occurs and why they are dosing at particular sites?** Yes.

2. **Have there been any interruptions in disinfection? If so, why?** No.

3. **Are spare chemical feed pumps and repair kits available?** No.

4. **How is disinfectant residual measured and recorded?** On SCADA.

5. **Is test equipment maintained and are reagents replaced?** Yes.

6. **Is a proper residual entering the distribution system at all times?** Per the operator, yes.

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Finished Water Storage

Components

1. Inventory

Table 8. Storage Tanks

Tank Name	Status	Description	Condition	Location
Well 4 Tank	Active	**Material:** Steel **Installation Date:** Unknown **Capacity (gallons):** 84,000 gallons, Elevation is 216.5m. **Controls:** On SCADA, RTU (can see level & see the amp readings on all the pumps, can control the booster pumps – they alternate)	☒ Site secured/gated ☒ Adequate foundation ☐ Air vent ☒ Overflow pipe ☒ Drainpipe ☒ Access hatch ☒ Water level indicator **Access:** Not easily accessible. Hard drive uphill. **Notes:** The well 4 tank is fenced in, but the fencing is not fully enclosed. Fed by well 4 and well 2. The well 4 tank does not gravity feed down. Two booster pumps are used to provide the necessary pressure to move water from the tank to the distribution system. The overflow pipe is covered in riprap making it difficult to determine if it is screened or equipped with a flapper gate to prevent critters, animals and debris from entering the tank.	37°08'18.4"N 122°09'30.6"W
Jamison Tank	Active	**Material:** Steel **Installation Date:** Unknown **Capacity (gallons):** 210,000 gallons **Controls:** On SCADA (controls just to check levels in telemetry with wells)	☒ Site secured/gated ☒ Adequate foundation ☒ Air vent ☐ Overflow pipe ☒ Drainpipe ☐ Access hatch ☒ Water level indicator (on SCADA) **Access:** Easily accessible. **Notes:** The tank does not have an overflow pipe and a hatch. No visual signs of damage. The tank sits on concrete slab. The storage tank is equipped with air vents on the sides of the tank rather than on the roof. Vents are covered by large screens but it is unclear if there is a finer mesh screen inside the larger screen.	37°08'54.9"N 122°10'04.7"W
Galleon Tank (also known as Tradewinds tank)	Active	**Material:** Steel **Installation Date:** Unknown **Capacity (gallons):** 325,000 gallons **Controls**: RTU installed on Tradewinds transfer pump (put in controller) – based on the level of the tank)	☒ Site secured/gated ☒ Adequate foundation ☒ Air vent ☒ Overflow pipe ☒ Drainpipe ☒ Access hatch ☒ Water level indicator **Access:** Site is not gated but the storage tank ladder is locked. **Notes:** The tank overflows into a customer's yard.	37°08'59.7"N 122°09'05.8"W

Robinhood Tank	Active	**Material:** Steel **Installation Date:** ~2012 **Capacity (gallons):** 10,000 gallons **Controls:** Not on SCADA. On timer.	☐ Site secured/gated ☒ Adequate foundation ☒ Air vent ☒ Overflow pipe (flapper gate) ☐ Drainpipe ☒ Access hatch ☐ Water level indicator **Access:** Access is not restricted. **Notes:** No drain. No visual water level indicator and not on SCADA. On timer. Some rusting on overflow pipe.	37°10'02.9"N 122°09'06.0"W
Camino Verde Tank	Active	**Material:** Plastic **Installation Date:** Unknown. New – post 2020. **Capacity (gallons):** 5,000 gallons **Controls:** Not on SCADA. On timer.	☐ Site secured/gated ☐ Adequate foundation ☒ Air vent ☐ Overflow pipe ☐ Drainpipe ☒ Access hatch ☐ Water level indicator **Access:** Access not restricted. **Notes:** Old tank was destroyed during fire and was replaced with a 5,000-gallon plastic storage tank. The plastic tank does not have an overflow pipe, a drainpipe, or a water level indicator.	37°10'05.0"N 122°09'29.8"W
Oberst Tank	Active	**Material:** Plastic **Installation Date:** 2024 **Capacity (gallons):** 5,000 gallons **Controls:** Not on SCADA – no automation. On timer.	☐ Site secured/gated ☒ Adequate foundation ☒ Air vent ☐ Overflow pipe ☐ Drainpipe ☒ Access hatch ☒ Water level indicator **Access:** Access not restricted **Notes:** During the site visit, the Oberst tank was a steel tank with multiple leaks and signs of corrosion. This steel tank has since been replaced with a new plastic tank.	37°10'05.0"N 122°10'20.2"W
Rosita Tank	Active	**Material:** Plastic **Installation Date:** 2024 **Capacity (gallons):** 4,000 gallons **Controls:** Not on SCADA – no automation. On timer.	☒ Site secured/gated ☒ Adequate foundation ☒ Air vent ☐ Overflow pipe ☐ Drainpipe ☒ Access hatch ☐ Water level indicator **Access:** Site is fenced **Notes:** Old tank was destroyed during fire and was replaced with a 4,000-gallon plastic storage tank. The plastic tank does not have an overflow pipe, a drainpipe, or a water level indicator.	37° 10' 21.3" N 122° 9' 43.1"W
Hill House Tank	Destroyed during fire	N/A	**Notes:** The Hill House tank was destroyed in the fire. At the time of the site visit in April 2024, there were two customer-supplied plastic tanks at the previous Hill House tank location. There is a concern about potential cross-connection issues with these tanks, along with the presence of multiple customer wells, bladder tanks, and plastic storage tanks in the area.	37°10'20.0"N 122°09'30.5"W
Everest Tank	Destroyed during fire	N/A	**Notes:** The tank was destroyed in the fire, and some customers in the Everest Pressure Zone are using their own plastic storage tanks and bladder tanks, which could potentially create a cross-connection issue.	37°09'34.3"N 122°10'00.8"W

Bloom Grade Tank	Burned	N/A	**Notes:** The tank was damaged in the fire and remains on-site. A customer's plastic tank is located at the tank site, which could potentially create a cross-connection issue.	37°09'39.4"N 122°10'32.1"W

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2. **Is the storage capacity adequate? Is the storage over-sized?**
   California does not have specific storage capacity requirements for water systems. However, based on the U.S. Geological Survey's reported national average of 82 gallons per capita per day (gpcd) for public-supplied domestic water use in 2015, we can approximate daily demand using this per capita rate. For BBWC, with an estimated population of approximately 1,120 people, the total daily water demand would be approximately 91,840 gallons. To estimate peak daily demand, applying a common peak factor of 2.0 results in a peak daily demand of 183,680 gallons per day. BBWC has a total storage capacity of 639,000 gallons. Given this information, the current storage capacity is adequate to meet the peak daily demands of the system.

3. **Is there protection from natural hazard (fire, flooding, etc.) for the tank sites?** No. See section of fire safety and action plan.

4. **Does the system have cathodic protection?** BBWC does not have any cathodic protection for the tanks.

5. **Are the elevations of the tanks sufficient to maintain pressure throughout the distribution system?** Yes, the elevation of the tanks are generally sufficient to maintain pressure throughout the distribution system. For tanks where elevation may be insufficient, booster pumps are utilized to ensure adequate pressure delivery (e.g., well 4 tank).

6. **Controls**
   a. **Are there adequate settings for tank operating levels?** Yes, most tanks are equipped with telemetry systems that interface with well pumps or pump stations. Additionally, many tanks are monitored through SCADA systems.
   b. **Are emergency procedures established (low/high level alarm…)?** No.

7. **Can the tank(s) be isolated? Are there procedures to sustain the water supply when the storage tank(s) is/are out of service for maintenance?** Yes.

8. **Is there a cleaning, inspection, and maintenance program?** No. Currently, BBWC is focused on maintaining basic functionality of the system. Its primary efforts are directed towards keeping essential components operational and gradually replacing damaged or compromised storage tanks as resources allow. A formal cleaning, inspection, and maintenance program has not been established because of the ongoing recovery efforts from the fire damage.

Pressure

1. Inventory

Table 9. Pump Stations

Pump Station Name	Status	Description	Condition	Location
Galleon Pump Station	Active	**Installation Date:** Unknown **Equipment:** One 50 HP booster pump **Operation:** On SCADA	☒ Site secured/gated ☒ Pressure gauge ☒ Can be isolated/bypassed for repairs/replacements **Note:** The pump is housed in a locked building, although there are openings in the roof and other areas. No redundancy with just one 50 HP pump, which was old and had caused a major leak. The pump is oversized for its application, has a leak of 5 gpm, and generates frequent customer calls regarding the leak. This pump boosts water to the Galleon/Tradewinds Tank, serving approximately 50 connections.	37°09'09.2"N 122°09'24.8"W
Galleon PSI System (also known as Galleon Heights Transfer Station or Tradewinds Transfer Station)	Active	**Installation Date:** Pressure tanks installed in 1975. Booster pump installation date is unknown. **Equipment:** One 10HP booster pump, two Bladder tanks **Operation:** On SCADA	☒ Site secured/gated **Pressure Tanks:** ☒ Pressure gauge ☐ Pressure relief valve ☐ Operational water level gauge ☒ Equipped with a drain ☒ Can be isolated/bypassed for repairs/replacements **Note:** The system is housed in a locked, old building with holes on the sides. It includes a Winco generator that has been refurbished and automatically starts when needed. Big Basin Water Company (BBWC) maintains a full diesel tank for the generator. BBWC has rehabilitated the transfer station, including the installation of a new pump motor and VFD.	37°08'59.1"N 122°09'05.6"W

Rosita Pump Station	Active	**Installation Date:** Unknown **Equipment:** One booster pump **Operation:** Not on SCADA	☒ Site secured/gated ☒ Pressure gauge ☒ Can be isolated/bypassed for repairs/replacements **Note:** The Rosita Pump Station is situated inside a small pump house and is equipped with one booster pump. The electrical system is also very old. Currently, there is a significant leak from the valve. Following the damage when the bridge washed out in 2023, the line leading from the pump has been temporarily replaced with an unsecured plastic pipe that is suspended and spans the bridge. This pipe reduces in diameter from 6 inches to 3 inches, then to 2 inches, before expanding back to 6 inches. The pipe is undersized and may not meet the necessary requirements for fire protection. The pump station serves approximately 15 homes and supplies water to the Rosita Tank.	37°10'22.3"N 122°09'58.9"W
Robinhood Pump Station	Active	**Installation Date:** Unknown **Equipment:** One 50HP booster pump **Operation:** On Timer	☒ Site secured/gated ☒ Pressure gauge ☒ Can be isolated/bypassed for repairs/replacements **Note:** The pump and electrical systems are housed in the pump house and appear to be in good condition. This station supplies water to the Robinhood tank.	37°09'35.6"N 122°09'18.1"W
Bloom Grade Pump Station	Active	**Installation Date:** Unknown **Equipment:** One 50 HP booster pump **Operation:** On Timer	☒ Site secured/gated ☒ Pressure gauge ☒ Can be isolated/bypassed for repairs/replacements **Note:** The Bloom Grade pump station consists of one 50 HP booster pump housed in a small wooden shed. The pump appears to be quite old. The Bloom Grade pump station serves three connections in the Bloom Grade zone.	37°09'25.0"N 122°10'07.7"W
Camino Verde & Hill House Pump Station (also known as pump house #3)	Active	**Installation Date:** Unknown **Equipment:** Two booster pumps **Operation:** On Timer	☒ Site secured/gated ☒ Pressure gauge ☒ Can be isolated/bypassed for repairs/replacements **Note:** The pump station consists of two booster pumps housed in a small wooden pump house. One pump serves the Hill House zone (currently out of commission following the fire) while the other pump supplies the Camino Verde Tank. The system operates on a timer. The pump serving the Camino Verde tank appears to be quite old.	37°10'05.4"N 122°09'42.8"W

Oberst Pump Station	Active	**Installation Date:** Unknown **Equipment:** One booster pump **Operation:** On Timer	☒ Site secured/gated ☒ Pressure gauge ☒ Can be isolated/bypassed for repairs/replacements **Note:** The Oberst Pump Station consists of one booster pump that is located on a customer's property. An old wooden shed/pump house with a damaged pump remains on site, while the new pump is positioned nearby. The pump is not secured and is covered with a plastic container. The pump station predates the customer's property, and there is a prescription easement according to Jim Moore. Electricity is supplied by the customer, and BBWC is exploring submetering to facilitate reimbursement. The pump serves both the Oberst Tank and customers. The line from the pump station is a 2" suspended line crossing boulder creek.	37°10'04.4"N 122°10'00.8"W

2. Does the system maintain adequate operational records for pumping facilities? No. BBWC is rebuilding operational records for pumping facilities. All previous records were lost during the fire.

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Distribution System

Components

1. **Does the water system have an inventory of pipe materials used?** No, the water system does not currently have a complete inventory of pipe materials. Big Basin Water Company is in the process of recreating these records.

2. **Are there materials of concern such as lead service lines, wood pipe, unlined cast iron, thin wall PVC, pipe not approved for potable water use**? Unknown. Currently, BBWC is working on completing 20% of its materials inventory.

3. **Are there any lead goosenecks still in place and used for service connections? If yes, how many? Are there plans to remove these? If yes, by what date?** Unknown.

4. **Is there a water main replacement program?** No.

5. **Does the water system meter all service connections?** BBWC is currently mapping and checking all meters. As of May 2024, 330 meters had been assessed. The Receiver plans to locate and evaluate an additional 200 to 350 meters by the end of 2024. There are also issues with incomplete customer records. Four hundred thirty-five (435) accounts have past due balances out of a total of 697 accounts, some of which may be inactive. Additionally, there are problems with unauthorized water use, including illegal tapping and failure to report existing meters.

6. **Does the water system have a meter calibration and repair/replacement program?** The water system has made significant progress in developing a meter calibration and repair/replacement program. Approximately 90% of the process has been completed. Efforts have included locating and assessing meters, identifying unauthorized users, and replacing some meters. However, to fully complete the program, a comprehensive meter condition assessment is still needed. Finalizing these steps will ensure accurate billing, effective system management, and the resolution of any remaining meter-related issues.

7. **How old are the water meters? Does the water system replace water meters at the frequency recommended by primacy agency or AWWA standards?** The age of the water meters varies. The water system is currently assessing and replacing meters on an as-needed basis, including those identified as outdated or problematic.

8. **Is there any point in the water system where pressure drops below primacy agency pressure standards during peak demand or fire response?** Unknown.

9. **Are backflow prevention assemblies installed and tested at each commercial or industrial site where backflow could cause a reduction in water quality?** Boulder Creek Golf and Country Club is the only commercial site being served by BBWC. There are no backflow prevention assemblies at the Country Club. BBWC also serves the Big Basin Wastewater Treatment Plant, an industrial site. Based on visual inspection, it appears that the site does not have any backflow prevention devices. A cross-connection check should be conducted to confirm this observation and ensure proper backflow prevention measures are in place.

10. **Has management or the operator identified distribution system problem areas on a water system map?** No.

11. **Does the water system provide bulk water stations? How are they monitored and controlled?** No.

Operations & Maintenance

1. **Does management record and analyze customer water quality complaints?** Not at the moment. The Receiver is currently focused on stabilizing and maintaining the system's operations following the fire, with priority given to essential services.

2. **If the water system is fully metered, what is the percentage of total water produced that is non-revenue water?** BBWC is currently in the process of geotagging and assessing the condition of all meters. To date, 330 meters have been located and assessed. An estimated additional 200 to 350 meters have yet to be tagged and evaluated. BBWC is also discovering unauthorized connections. As a result, the percentage of total water produced that is non-revenue water is not yet determined, but likely significant. This assessment is ongoing. Detailed data will be available after the meter evaluation and identification of unauthorized connections have been completed.

3. **Does the water system experience significant water loss/leakage?** Yes, the distribution system experiences significant water loss and leakage. Although the exact extent of the loss has not yet been determined, BBWC continues to discover leaks throughout the distribution system. Efforts to identify and address these issues are ongoing as part of the recovery and assessment process.

4. **Is the water system managing water loss and supply efficiently?** BBWC is prioritizing keeping the system operational. Currently, efforts to manage water loss and supply efficiency are secondary to maintaining system functionality.

5. **Has the system implemented a leak detection program, including data collection and analysis?** No.

6. **Has the water system completed any water loss studies? If so, what is the water system doing in response to the findings?** No.

7. **What is the frequency of main breaks?** BBWC experiences frequent line breaks, most of which are minor. There have been a handful of significant main breaks since the Receiver was appointed in 2023.

8. **Are the breaks primarily in one area? What type of pipe is involved?** The breaks have not been confined to a specific area. The types of pipes involved mostly include ductile iron (DI) and small one-inch PVC lines.

9. **Is there a line flushing program? Are records maintained of frequency, location, and amount of time required?** No. N/A

10. **Does the system have fire hydrants and is there a fire hydrant flushing program separate from the line flushing program?** Yes, BBWC has fire hydrants, but a fire hydrant flushing program is not currently in place.

11. **Is there a valve inspection and exercising program? Does the system maintain the records?** No.

12. **Does the system experience significant pressure issues?** No.

13. **Does the system stock critical spare parts required to make emergency repairs?** The system does not maintain a dedicated inventory of critical spare parts. However, Cypress keeps essential spare parts on hand/in their trucks to handle emergency repairs promptly.

14. **Can the system make emergency pipeline, mechanical and electrical repairs using in-house resources? Are there written procedures?** Yes, the system can perform emergency repairs using in-house resources, as noted in response #13. However, there are no written procedures for these repairs.

15. **If answer to #14 is no, does the system have contractors on call for emergency repairs (e.g., well, pipeline, mechanical, electrical)?** Yes. Cypress assists BBWC in identifying and contracting specialists for certain emergency mechanical or electrical repairs. Additionally, Cypress oversees and procures the required work.

16. **Does the water system maintain an updated list of critical customers?** N/A. BBWC primarily serves residential customers, with one commercial connection (Boulder Creek Golf and Country Club) and one industrial connection (the wastewater treatment plant).
    It is recommended that BBWC develop a contingency plan for the wastewater treatment plant to address potential water outages or emergencies, ensuring uninterrupted operation and compliance.

17. **Does the water system have a corrosion control program?** No.

Monitoring & Reporting

1. **Is adequate monitoring in place?** Yes. The water system follows sampling requirements.

2. **Does the system properly maintain records of the monitoring program?** BBWC records including monitoring plans and samples were destroyed in the fire. Serviam is currently working on rebuilding these monitoring records – records of sampling data starting in 2023 are available.

Cross-Connections

1. **Does the water system have a written cross-connection control program?**

BBWC does not have a comprehensive cross-connection control program in place. The lack of a comprehensive cross-connection control program means that BBWC:

- does not know the location, number, or type of potential cross-connections within their system, including high-risk sites that require backflow prevention, and
- even if backflow prevention assemblies were installed at some locations, there is no system in place to ensure they are regularly tested and maintained.

This is a significant deficiency that needs to be addressed to comply with state regulations (California Code of Regulations, Title 17, §7584).
The loss of records in the fire and the transition to receivership have further complicated the development and implementation of a cross-connection control program.

2. **Are there any unprotected cross-connections?**

Yes, there are numerous cross-connections. The water system has not conducted a thorough survey to identify potential cross-connection points. This includes a lack of information on residents who have their own wells and storage tanks, which were observed during the site visits. The exact number and locations of these private systems are unknown, posing potential water quality risks to the public water supply.

3. **Are backflow prevention assemblies installed and tested at high-risk sites?**

No. The water system has no testing or maintenance program in place for backflow preventers. This is largely because they have not identified or documented what devices, if any, exist in their system. A complete inventory of the system's infrastructure and customer connections is needed to identify and address high-risk sites.

4. **Does the water system test backflow preventers at treatment plants and other facilities it owns?**

BBWC does not have any backflow preventers at its facilities.

5. **Does the system have a record-keeping system for backflow preventers?**

No, the water system lacks a comprehensive record-keeping system for backflow prevention devices. This includes information on the type, make, model, location, and testing history of installed devices.

6. **Is there a designated cross-connection control program coordinator?**

The water system has not appointed a qualified cross-connection control program coordinator, as required by state regulations.

7. **Does the water system have a program to control the use of fire hydrants?**

BBWC does not have a program to control and monitor the use of fire hydrants. Moreover, there is uncertainty about the current inventory and condition of fire hydrants in the system following the fire event. An inventory is underway.

8. **Are new services reviewed for cross-connection hazard?**

There is no established procedure for reviewing new service connections to identify and address potential cross-connection hazards.

9. **Does the water system have a program to control the use of fire hydrants?**

No. BBWC does not have a program to control and monitor the use of fire hydrants.

It should be noted that the State’s 2024 Drinking Water Needs Assessment lists BBWC as a failing system with risks in the following categories: past presence on the failing list for water quality, source capacity violations, drought and water shortage risk assessment results,

significant technical/managerial/financial capacity deficiencies, and monitoring and reporting violations.[10]

Status of State Compliance Items

The table below provides a detailed overview of the current status of State compliance items, as referenced in the Santa Cruz Local Agency Formation Commission (LAFCO) memo, hereafter referred to as the LAFCO memo.[11] The table below outlines the specific compliance items and their current statuses, with a particular emphasis on backflow directives.

It is important to note that the violations detailed were issued by the State prior to the appointment of the Receiver. The Receiver's primary focus is on restoring and maintaining operational functionality, though it is working to address critical compliance issues as part of its responsibilities.

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[10] SAFER Dashboard. https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/saferdashboard.html
[11] Santa Cruz Local Agency Formation Commission. Big Basin Water Company: Governance Options, 2024. https://santacruzlafco.org/wp-content/uploads/2024/02/Mar-2024-Entire-Agenda-Packet.pdf

Table 10. Status of State Compliance Items

State Directive	Date	Current Status
State Directive for Backflow Violations: **Following the 2018 Sanitary Survey Report, citation No. 02_05_19C was applied due to the system's violation of regulations to prevent backflow. The State Water Board has determined that the Big Basin WC has failed to comply with CHSC, Section 116555(a)(2) and CCR, Title 17, Sections 7584, 7585, and 7605. Follow 12 specific directions to correct violations of backflow regulations.**	09/12/2018 10/17/2018	
- Backflow Prevention (1): Submit a plan and schedule to fully implement a cross-connection control program that includes all elements contained in CCR, Title 17, Section 7584.		Not addressed
- Backflow Prevention (2): Provide a copy of Big Basin WC's adopted cross-connection control program operating rules or ordinances approved by the California Public Utilities Commission.		Not addressed
- Backflow Prevention (3): Conduct and document a survey and hazard evaluation to identify water user premises where cross-connections are likely to occur and submit a report summary.		In progress.
- Backflow Prevention (4): Require installation of appropriate backflow protection at locations identified in the cross-connection survey and ensure installations follow CCR standards.		In progress. Big Basin Water Company has contacted the only commercial customer it has, Boulder Creek Golf and Country Club, to discuss the installation of appropriate backflow protection.
- Backflow Prevention (5): Complete annual testing of all backflow preventers for 2019.		Not addressed.

- Backflow Prevention (6): Identify and document the total number of backflow preventers in the service area, including type, make, model, location, and 2019 testing report.		Not addressed.
- Backflow Prevention (7): Provide a written overview of the procedure and system for record keeping, maintenance, and annual testing scheduling and tracking.		Not addressed.
- Backflow Prevention (8): Provide the name and qualifications of Big Basin WC's cross-connection control program coordinator.		Not addressed.
- Backflow Prevention (9): Conduct annual testing of all system backflow preventers and submit annual proof to the Division.		Not addressed.
- Backflow Prevention (10): Send quarterly status updates on progress towards completing directives to the State Water Board.		Not addressed.
- Backflow Prevention (11): Include this violation in the 2018 Consumer Confidence Report, submit a draft for review, and distribute the approved report.		Not addressed.
- Backflow Prevention (12): Complete and return the "Notification of Receipt" form attached to the Citation to confirm receipt and understanding of directives.		Not addressed.
System Outage Prevention: Ensure backup power and submit an outage plan.	10/28-10/29/2019	BBWC has not yet submitted the outage plan. However, the following improvements have been made: • **Well 4 Site:** Installed a rented generator with manual operation.

		• **Galleon PSI System:** BBWC refurbished the generator and installed an automatic transfer switch. Additionally, BBWC has remote access and control at the Galleon PSI System and storage tank (level indication and power failure alerts).
Capacity Deficiency: Obtain a second water source or establish a permanent interconnection with a nearby water system.	4/9/2021	BBWC is actively working on addressing capacity deficiencies through potential consolidation with nearby systems such as SLVWD. In the meantime, BBWC has made several improvements to its existing intertie with SLVWD: • The intertie with SLVWD was previously operating at 15 gpm due to an electrical issue. The electrical issue has been resolved, and the intertie is now operating with an estimated flow rate of 60-80 gpm. • BBWC has engaged with SLVWD to explore increasing the flow rate to 100 gpm. A quote for this upgrade has been obtained and is under review.
Galleon Heights Booster Station: Submit a plan for replacing pumps and appurtenances and adding backup power.	6/27/2021 8/19/2021	Partially addressed. Pumps have been replaced.
Regulatory Compliance Obligation: Galleon Heights: Address the $21,000 fine for failure to comply with directives and pursue consolidation with SLVWD.	Immediate attention required	Not addressed.
Ongoing Issues and Infrastructure Issues: Install backup power at Well 4 and address infrastructure issues highlighted in February 2022 Sanitary Survey Report.		Partially addressed. BBWC has installed a rented Whisperwatt diesel-powered AC generator at Well 4.

Compliance Action Plan: Submit a compliance action plan prepared by a licensed California professional engineer including: proposal to comply with source capacity requirements, schedule for replacing fire-damaged infrastructure, and analysis of financial capacity to complete projects.	June 10, 2021 (extended to July 16, 2021)	Not completed. BBWC has been replacing fire-damaged infrastructure and is working with Moonshot Missions, which is conducting a comprehensive technical, managerial, and financial assessment of the system. This assessment aims to identify options for compliance and sustainable solutions for the Receiver.
Water Contingency Plan: Submit a plan describing how to secure temporary water supply in the event of Well 4 outage or failure. Include feasibility analysis for emergency/permanent interconnection with neighboring system.	May 10, 2021	Addressed. BBWC has established measures to secure a temporary water supply in the event of a Well 4 outage or failure: • An intertie with the San Lorenzo Valley Water District (SLVWD) is in place, with increased capacity and no usage limits per the Receiver, providing a reliable backup water supply. • A generator has been installed at Well 4 to ensure continued operation during power outages. • BBWC is purchasing a spare submersible pump and related equipment for Well 4 to minimize downtime and facilitate quick recovery in case of failure. Additionally, a feasibility analysis for an emergency or permanent interconnection with neighboring systems is ongoing.
Operations & Maintenance Plan: Submit a Water System Operations and Maintenance Plan including emergency response procedures, maintenance schedules, flushing procedures, tank inspection/cleaning, main repair	July 10, 2021 (extended to July 16, 2021)	Not addressed.

procedures, valve exercising, meter calibration, and staff qualifications.		
Monthly Progress Reports: Submit monthly progress reports by the 10th of each month showing actions taken to comply with corrective action plans.	Starting April 10, 2021	This requirement was applicable to the owners prior to receivership. At the moment, Serviam is in regular contact with regulators and has been meeting monthly with the California Water Boards, CPUC, Santa Cruz County, DWR, and other relevant agencies to provide updates on progress and improvements in the water and wastewater systems.

Fire Safety and Action Plan

According to the California Department of Forestry and Fire Protection, the Boulder Creek area remains highly susceptible to future fires.[9] This underscores the urgent need for a comprehensive fire safety and emergency action plan.

To ensure the protection of critical water infrastructure, it is crucial for water systems to adhere to the protocols established by the Boulder Creek Fire Protection District. While the fire department will lead emergency response efforts, water systems must still take proactive steps to prepare and collaborate. Clear communication and coordination with the fire department are essential to ensure that vital resources are protected and can be utilized effectively when needed.

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Table 11. Fire Safety and Protection Issues Identified During Moonshot's April 2024 Site Visit

Category	Issues Identified
Accessibility Concerns	- Well 4 site (main well) is not easily accessible due to a steep, difficult drive uphill, impeding emergency response during a fire. - Several critical infrastructure sites lack proper access roads for fire response vehicles.
Infrastructure Vulnerabilities	1. Lack of Backup Power for Critical Infrastructure: - Only the Galleon PSI system has a backup emergency power generator. Other pump stations lack backup generators or quick connections to facilitate the rapid deployment of portable generators. This is a critical vulnerability, as the electrical provider may cut off service during a fire, leaving unprotected pump stations inoperable. - The intertie connection to SLVWD does not have emergency backup power. This presents a significant vulnerability, as the intertie could become inoperable during power outages, limiting the system's ability to receive supplementary water from SLVWD when it might be most needed. 2. Vulnerable Pump Station Structures: - Most pump stations are housed in highly flammable wood structures, increasing fire risk. - The Rosita Pump Station supplies customers and fill the Rosta tank via a temporary, unsecured plastic pipe (installed following bridge damage), which could fail during a fire event. - The 2" plastic suspended line from the Oberst Pump Station crosses Boulder Creek and could be at risk of damage during a fire event. - The Oberst Pump Station is inadequately secured, covered only by a plastic container, making it highly vulnerable to fire damage and vandalism. 3. Storage Tank Vulnerability: - Storage tanks, particularly the plastic one, are not adequately shielded against heat. This leaves them susceptible to damage or failure during high-temperature events such as wildfires.
System Capacity and Redundancy Issues	- Well 4 exhibits fluctuating capacity, which could impact water availability during a fire emergency.
Maintenance and Inspection Deficiencies	- BBWC does not have a formal cleaning, inspection, and maintenance program for well sites, pump stations, and storage tanks. - BBWC does not have a fire hydrant inspection, flushing and replacement program. - There is no comprehensive inventory of pipe materials, complicating the assessment of system vulnerability to fire-related damage. - BBWC does not have a formal valve inspection and exercising program, which could lead to difficulties in isolating sections during a fire.

These identified issues emphasize the need for both immediate improvements and a comprehensive fire action plan. To address these vulnerabilities, we recommend that BBWC focus on the following enhancements to the water system and develop a detailed fire action plan.

I. Improvements Recommended for the Water System:

1. **Maintain Clear Access Paths:** Ensure that access paths to critical infrastructure are kept clear of obstructions. Implement and maintain clearance zones, such as a 100-foot buffer around wells and storage tanks and a 10-foot radius around fire hydrants, to facilitate easy access for firefighting equipment. Additionally, ensure that there is clear signage for critical infrastructure to aid emergency responders in quickly locating and accessing key components during an emergency. To protect against vandalism, labels should be abstract (e.g., BBWL4) rather than descriptive. This approach helps ensure that while essential details are available to personnel and the fire department, sensitive information remains protected.
2. **Facility Access:** Consider installing Fire District-approved "knox" boxes or "knox" padlocks on all gates or chains blocking access to infrastructure or access roads. Coordinate with the local fire department for approval and proper installation of these access systems.
3. **Upgrade Pump Stations to Fire-Resistant Materials:** Replace existing wooden structures at pump stations with fire-resistant materials such as concrete, steel, or treated wood that meets fire safety standards. Additionally, apply fire-resistant coatings to any remaining wooden elements to enhance their fire resistance.
4. **Conduct Regular Maintenance and Vegetation Management:** Perform routine inspections and maintenance of all infrastructure components. Manage vegetation around these sites by removing flammable materials and maintaining a defensible space to reduce fire risk.
5. **Improve Emergency Generator Deployment and Maintenance:** Equip critical infrastructure, such as pump stations, with backup generators or quick-connect systems and transfer switches to facilitate the rapid deployment of portable generators if needed. Ensure that all existing and new generators, whether temporary or permanent, are regularly maintained, fueled, and tested.
6. **Staff Identification during Emergencies:** Ensure that during an emergency event, all staff members have marked vehicles and carry credentials with the company name, position, and other relevant details. This will help validate their identity and role when operating in an evacuation zone or arriving to support the emergency response as representatives.

II. Components of an Effective Fire Action Plan:

The following actions outline the necessary components that the fire safety and emergency action plan should include to align with the Boulder Creek Fire Protection District's requirements and enhance overall fire preparedness:

1. **Identify Critical Infrastructure:** Begin by identifying and documenting all key components of the water system, including wells, storage tanks, and fire hydrants. Ensure that their precise locations are accurately recorded and mapped. In addition, clearly label critical infrastructure for internal use and emergency response.
2. **Coordinate with the Boulder Creek Fire Protection District:** Establish clear lines of communication with the Boulder Creek Fire Protection District. Share detailed information about the identified critical infrastructure, including maps and location data, to support their response efforts. This coordination ensures that firefighters have the necessary information to protect and utilize these resources effectively during emergencies.
3. **Emergency Contact Information:** Develop and regularly update a comprehensive list of emergency contacts, including key personnel and the Boulder Creek Fire Protection District. Ensure this information is readily accessible.
4. **Inform/Train Personnel:** Ensure that all relevant personnel are aware of their roles in supporting the fire department's response efforts. Additionally, train personnel annually on the action plan and integrate generator deployment procedures into staff fire preparedness activities. This should include routine drills to ensure readiness and familiarity with both emergency procedures and generator operation.
5. **Record Keeping:** Ensure that the fire action plan is reviewed annually and that documentation of the review is maintained as part of the official records.

Pictures and descriptions from Moonshot's site visits are available in Appendix A.

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MANAGEMENT

System Ownership and Governance

Big Basin Water Company is an investor-owned utility currently under receivership. Prior to the receivership, it was operated by Jim and Shirley Moore. The presence of Serviam by Wright as Receiver and Cypress Water Services as operator is temporary until the Court rules on how to proceed. As an investor-owned utility, Big Basin Water Company does not have a publicly elected board.

Staffing and Organizational Structure

Below are the current and previous organizational structures.

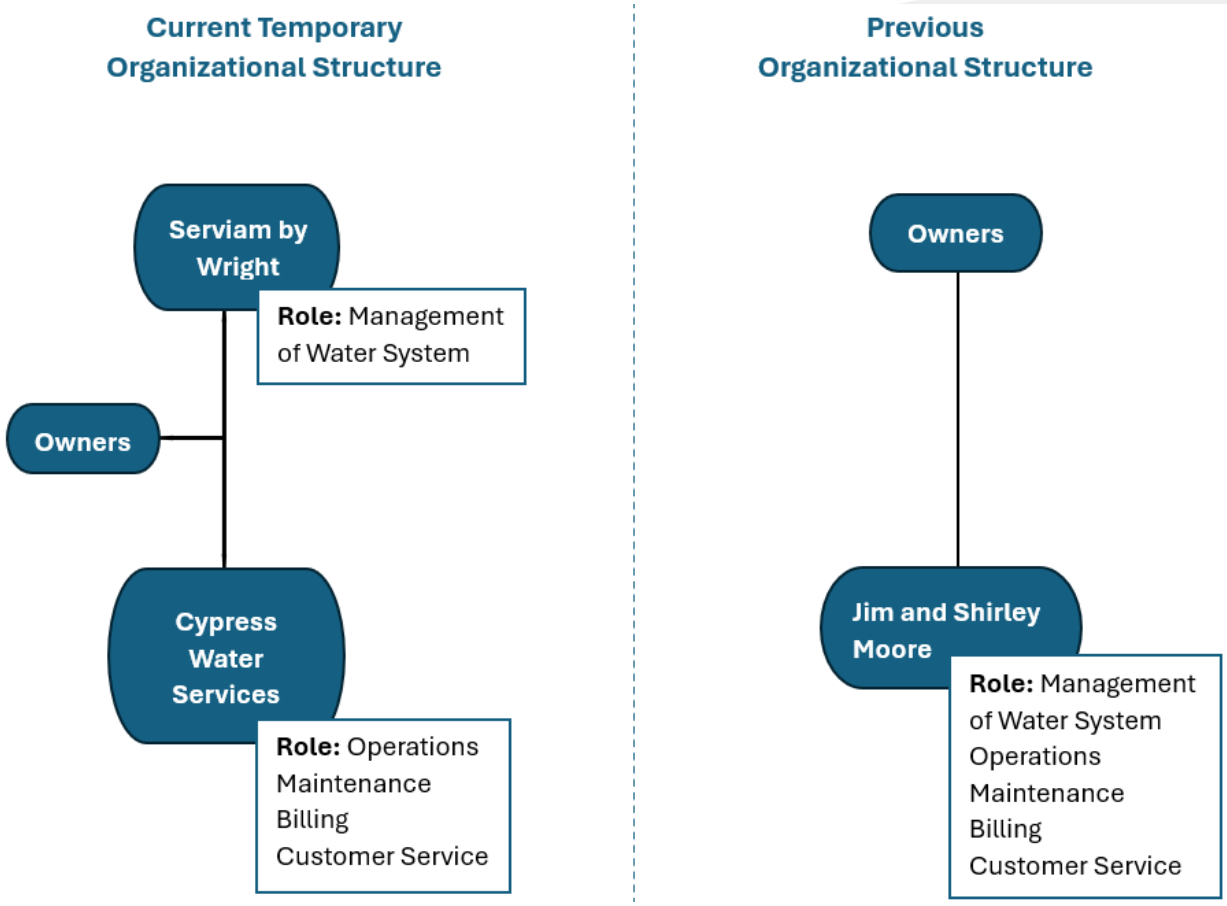

Figure 4. Current and Previous Organizational Charts

Cypress staff have the necessary certifications and adequate expertise to manage day-to-day operations. With a larger staff, they have some redundancies in the event of a staff absence. Previously, BBWC had one or two certified operators on staff.

BBWC currently has no internal staff to provide engineering support, technical/operations assistance, financial management and planning, legal counsel, or communications functions. It has no descriptions of jobs' roles and responsibilities, current succession plan, or workforce development plan.

External Linkages with Customers and Regulatory Bodies

Currently, the Receiver and Operator provide information to customers via bill inserts, the company website, and periodic town hall meetings. BBWC does not have the capacity to publish newsletters or engage with the public via social media. This ability would be helpful in alerting customers to time-sensitive information such as outages or the need to conserve in emergencies. Now customer issues are handled by Cypress or by the Receiver. Both have limited capacity to respond immediately given their roles and responsibilities with management and operations.

Currently, the Receiver interacts regularly with regulators and maintains open lines of communication given the receivership. With the length of time it will require to stabilize all aspects of the system, these open lines of communication are important to continue after the transition. Elected officials have also been part of regular status meetings and their continued engagement will benefit the system as it transitions.

Policies, Records and Plans

Best practices include having a set of formal policies, records and plans to support current and future operations. The following tables indicate which policies, records, and plans BBWC has in place.

Table 12. Policies

Policies	**Status**	**Notes**
Connecting to Water Service	☒ Yes ☐ No ☐ N/A	
Personnel	☐ Yes ☒ No ☐ N/A	
Security	☐ Yes ☒ No ☐ N/A	
Formal Rate Structure	☒ Yes ☐ No ☐ N/A	
Handling Customer Complaints	☐ Yes ☒ No ☐ N/A	
Shutting Off Water Service	☒ Yes ☐ No ☐ N/A	

As BBWC transitions in the future, development and adoption of these additional policies will provide a framework to guide consistent practices that set clear expectations, safeguard employees and customers, and promote fair treatment.

Table 13. Records

Records	Status	Notes
Operations and Maintenance Manual	☐ Yes ☒ No ☐ N/A	
Critical Documents (electronic and hard copy), including maps, as-built drawings, etc.	☒ Yes ☐ No ☐ N/A	Critical document records are incomplete
Customer Records	☒ Yes ☐ No ☐ N/A	Records are currently incomplete; work in progress
Regulatory Compliance Data	☒ Yes ☐ No ☐ N/A	
Data Management Systems for maintenance data	☐ Yes ☒ No ☐ N/A	
Operating Parameters such as non-revenue water and cost per unit of production of finished water	☐ Yes ☒ No ☐ N/A	

The 2020 fire heavily impacted the water system's recordkeeping. The Moores, as the previous system managers, do not have complete electronic records of important items such as facilities, customers, meter locations and fire hydrant locations. This lack of records hampers both day-to-day operations and future planning. The Receiver has been working with Cypress to create records of facility locations, customer lists, meter information, and other critical data lost in the fire.

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Table 14. Plans

Plans	Status	Notes
Source Protection	☐ Yes ☒ No ☐ N/A	
Sampling and Monitoring	☐ Yes ☒ No ☐ N/A	
Emergency or Contingency	☒ Yes ☐ No ☐ N/A	Water Quality Emergency Notification Plan only
Cross-Connection Control	☐ Yes ☒ No ☐ N/A	
Capital Improvement Plan for replacement and any future expansion	☐ Yes ☒ No ☐ N/A	
Distribution System Flushing Program	☐ Yes ☒ No ☐ N/A	
Asset Management Plan	☐ Yes ☒ No ☐ N/A	
Maintenance Plan for scheduling routine preventive maintenance for items such as pumps, meters, and storage tanks	☐ Yes ☒ No ☐ N/A	
Outage Plan (California requirement)	☐ Yes ☒ No ☐ N/A	

Plans include both near-term and long-term management and operational elements. Maintenance planning can ensure that periodic maintenance tasks are scheduled when needed. Distribution system flushing is a way to address water aging related water quality issues and should be planned as part of all the other day-to-day activities. Capital improvement planning allows a utility to set a schedule and financing strategy for rehabilitating and/or replacing infrastructure. All these items are important to a well-functioning utility with an eye towards sustainable operation in the future.

Other Items

During the assessment, it was discovered that the easements for BBWC infrastructure are all verbal agreements. Industry best practice is to have legally described and recorded easements that are clear and shown on title reports when properties change hands.

As of July 2024, BBWC's insurance has lapsed. It is important to carry current insurance to protect BBWC from liability claims and to allow for the replacement of assets should they be damaged, including in another disaster. The Receiver is currently working to restore insurance coverage.

FINANCE

Budget

BBWC has an annual operating budget for drinking water operations. BBWC regularly operates in deficit. The calculated operating ratio of revenue to expenses in 2022 was 0.92, lower than the 1.0 which indicates breaking even (revenues equal expenses). Looking at data from 2018-2022, both 2021 and 2022 are below 1.0.

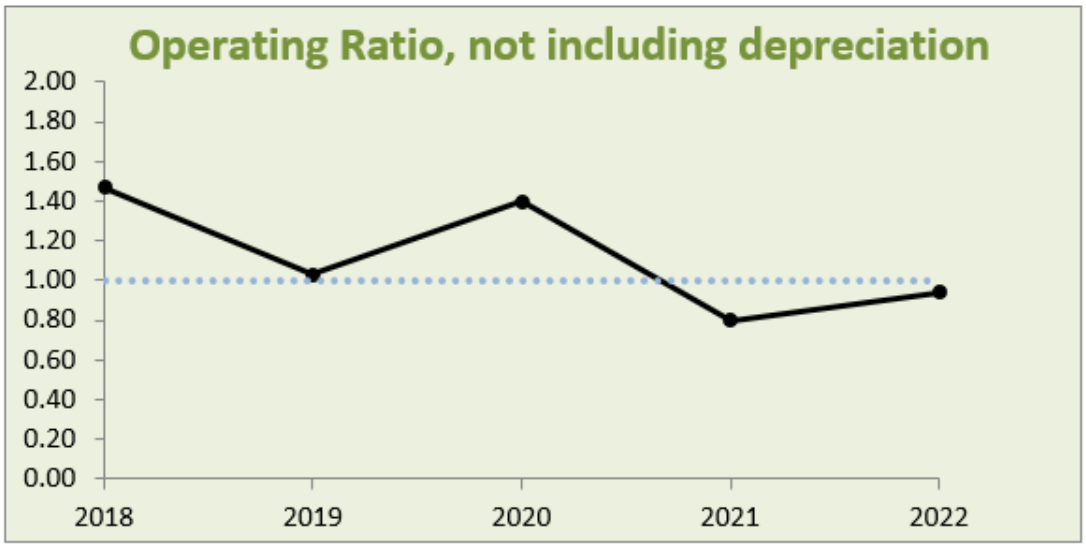

Figure 5. Operating Ratio

In six out of the 13 years from 2009-2022, BBWC was operating in a deficit, according to the financial analysis in the memorandum presented to LAFCO in March 2024.[11] The deficits of $135,928 in 2021 and $41,245 in 2022 were the largest deficits of the years analyzed. Note that in 2022, administration and general expenses accounted for almost half of BBWC's expenditures, which is significantly higher than most utilities.

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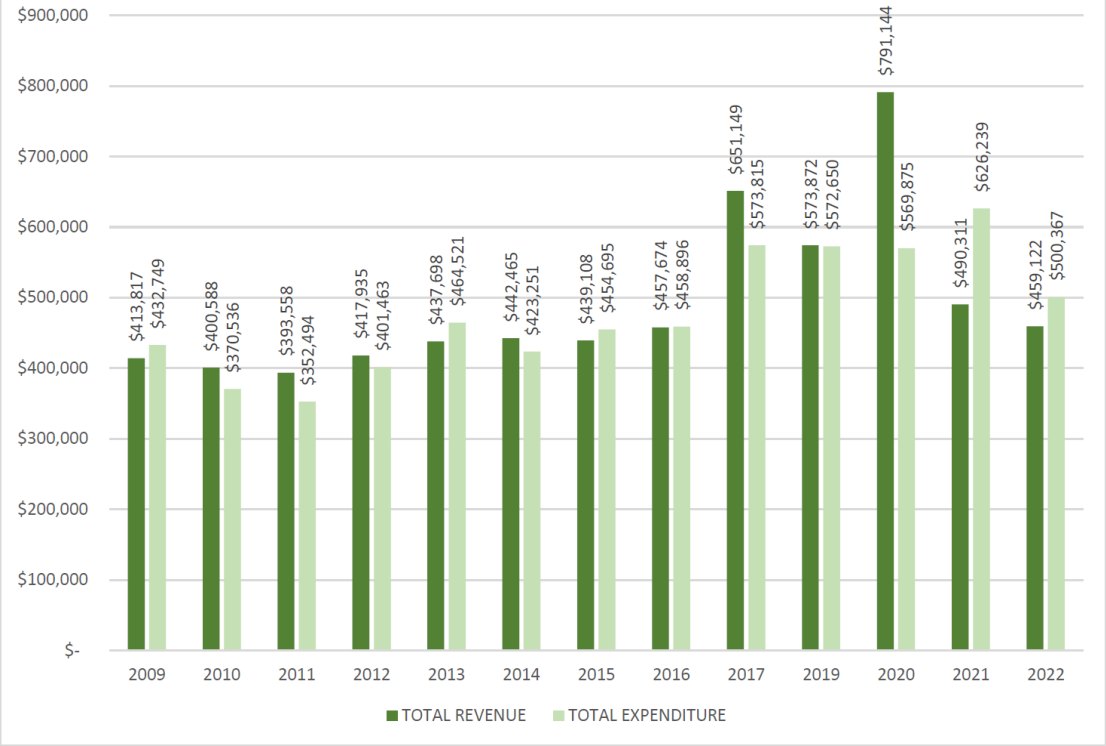

Figure 6. Historic BBWC Revenues and Expenditures[11]

After the Receiver was appointed, BBWC's expenditures continued to be higher than the revenue. One of the major factors affecting the budget currently is the need to purchase supplemental water supplies from SLVWD. With the loss of the ability to treat the surface water sources because of the fire damage, BBWC draws from Well No. 4 as its primary internal water source. Because Well No. 4 does not produce enough water to meet demand, BBWC must purchase water from SLVWD at a higher rate than it is able to recover from its customers under its current schedule of rates and chargers.

For every hundred cubic feet (CCF) BBWC purchases from SLVWD, BBWC pays $12.66 while only billing customers $5.33 per CCF. This means that for every CCF BBWC purchases from SLVWD, BBWC is spending $7.33 more than it can make. In September 2023 through July 2024, BBWC purchased a monthly average of 1,096 CCF (820,137 gallons) from SLVWD, for a total of 12,060 CCF (9,021,507 gallons). With this volume of water purchased, BBWC spent $88,400 more from September 2023 through July 2024 than it billed its customers.

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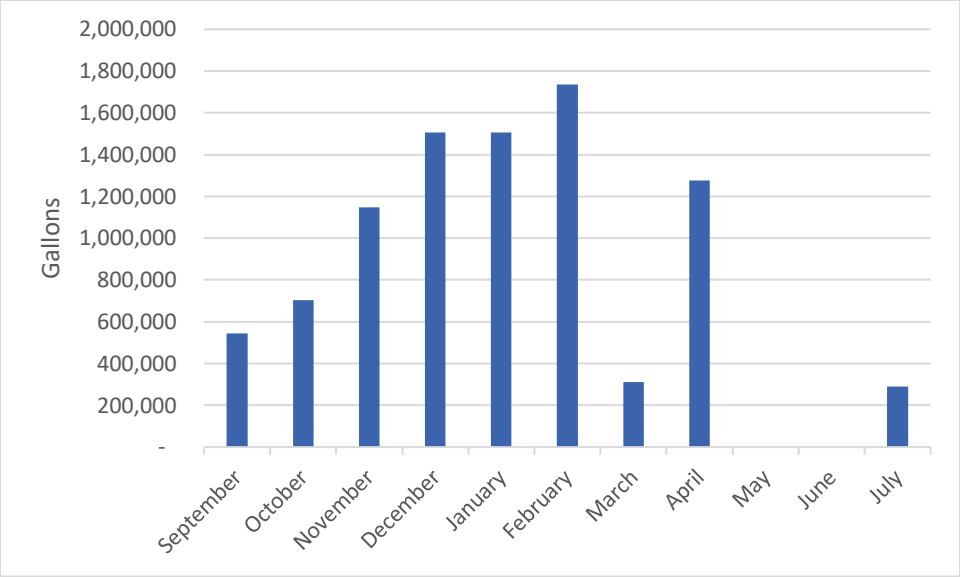

Figure 7. Big Basin Water Purchases from SLVWD

The CZU Lightning Complex Fire had a significant financial impact on BBWC. One major impact was a reduction in revenue from user rates. In 2020, metered water revenue fell from $517,000 to $420,000, and in 2021 (the first full year after the fire), it dropped again to $352,000. Given that 1) a good portion of operating expenses do not vary based on the amount of water produced (staff salaries, etc.) and 2) expenses increased because of items such as needed post-fire repairs, this exacerbated the already precarious financial situation. The insurance payout received in 2020 indicates that the company was underinsured and therefore in a difficult position to replace lost assets.

Currently, the County of Santa Cruz and the State of California have been subsidizing BBWC's operations and maintenance through grant funds in the amount of $475,000, of which $395,000 has been expended to date. Stakeholders are aware that this is not a sustainable practice.

BBWC owns significant property that is not actively used for operations. As the Receiver explores potential sale of some of that property to raise revenue, it acknowledges that preserving water rights for future use is important and requested that Moonshot to 1) provide information about the surface water diversion and storage water rights, 2) know if the water rights are in good standing and conditions of a license granted to BBWC have been met, and 3) if the water rights can be retained if the property owned by BBWC is sold and what steps should be taken to preserve the water rights. The memorandum on water rights is available in Appendix B.

Cash on Hand and Reserves

Cash on hand means cash readily available to pay immediate expenses. Best practice is to keep more than 180 days of cash on hand, which is equivalent to roughly six months. This allows for

the difference in timing between when expenses are incurred and when customers remit their payments. In addition, cash on hand also acts as an operating capital cushion for unforeseen circumstances and expenses. In 2022, BBWC had the equivalent of one day of cash on hand and no other capital reserves.

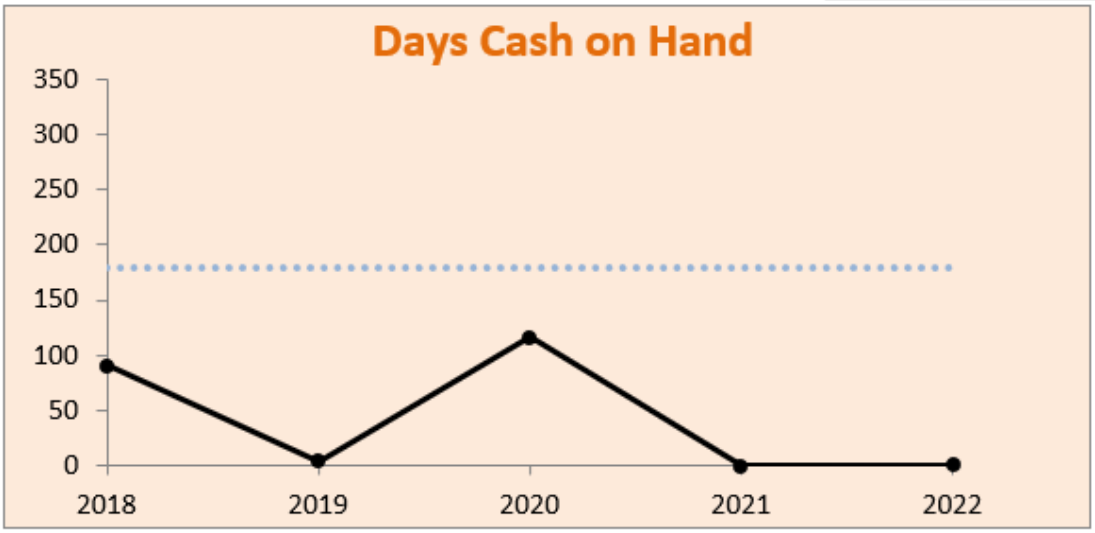

Figure 8. Days of Cash on Hand

Looking back historically using the financial analysis in the LAFCO memo, BBWC had very little cash on hand except for $180,654 in 2020, which was the year it received an insurance payout, but had significant investments consisting of property adjacent to the reservoir purchased in 2016. It is unclear why not more cash was kept readily available.

Available financial records do not show that BBWC kept any designated reserves. Lack of designated reserves inhibits a utility's ability to respond to emergencies or situations that could benefit from rate stabilization reserves, such as drought, in which demand and therefore user revenues drop. Moreover, industry best practices also call for the establishment of replacement and refurbishment (R&R) reserves for aging infrastructure replacement or significant repairs. The level of R&R reserves is established by preparing an asset management plan that analyzes the condition of aging infrastructure, projects remaining useful life, and calculates the cash requirements needed over time for large capital outlays when infrastructure needs to be rebuilt or replaced. This type of analysis can also inform the setting of rates and charges to incrementally build needed capital reserves over time. This is particularly important for agencies with limited ability to issue debt for large capital projects because their financial metrics (cash on hand, operating and debt service reserves) do not support creditworthiness.

Rates and Affordability/Assistance Program

BBWC's current rates that went into effect in June 2024, when the utility was under receivership, are shown below.

Table 15. BBWC Current Rates

Item	Rate
Quantity Rate per 100 cubic feet (CCF)	$5.33
Fixed Service Charge per Meter Size per Month	
5/8”	$53.49
3/4”	$80.23
1”	$133.72
1-1/2”	$267.44
2”	$427.90
3”	$802.31
Flat Rate Service	$117.09
Private Fire Protection Service per Year for each inch of diameter of service connection	$9.49

It is unclear how often rates have historically been reviewed at BBWC with an eye towards increasing them if necessary, or if a cost-of-service rate analysis has ever been completed. As a Class C investor-owned utility, the California Public Utilities Commission (CPUC) must approve any changes to BBWC rates. A search through the CPUC database shows periodic changes to new user fees and an increase to late payment charges, but the recent general rate cases in 2018 and 2020 were withdrawn. After the Receiver was appointed, the CPUC approved rate increases and BBWC has moved towards charging appropriate rates, however BBWC rates and charges still do not reflect its actual cost of service.

In comparing typical residential bills from neighboring utilities, BBWC ranks sixth out of eight when ranked from highest to lowest rates. A full comparison of local rates is available in Appendix C. BBWC does not have an affordability or assistance program for customers not able to pay their water bills.

Capital Improvement Plan

Although accounting for at least partial depreciation, it is apparent that, to date, BBWC has not invested appropriately in new capital improvements, preventative maintenance and infrastructure R&R. BBWC’s backlog of capital improvements was compounded by fire damage.

There is no capital improvement plan in place to identify and plan for long-term needs and financing strategies to meet those needs. Ideally there would be a capital improvement plan based on an asset management plan.

Debt

The BBWC’s current debt consists of a Safe Drinking Water Bond Act loan for previous system upgrades to the surface water treatment plant (no longer existing) and the distribution system,

according to the previous management. One measure of a utility's health is its debt service coverage ratio, which measures the utility's ability to pay their debt after paying operating expenses by dividing net operating income by debt service, including principal and interest. In 2022, BBWC had a debt service coverage ratio of -0.45. Best practice recommends a debt service coverage ratio of 1.2 or greater and indeed most financing terms and conditions require a minimum coverage ratio, along with a designated debt service reserve. The graph below shows BBWC's coverage ratio from 2018-2022. Only 2018 and 2020 had ratios above 1.2. In 2020, that ratio was affected by the income from insurance proceeds received after the CZU Lightning Complex Fire.

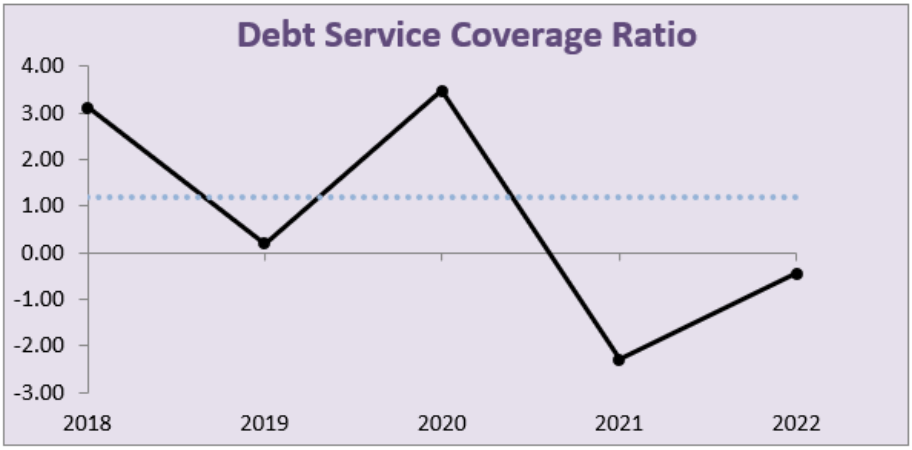

Figure 9. Debt Service Coverage Ratio

Given that current expenses are exceeding revenues without the operating grant provided by the County, the present estimated debt service coverage ratio is less than 1.0.

Financial Controls

BBWC had a local certified public accountant prepare its annual report, which included its financial reporting, for the CPUC. No annual audit was available. BBWC's previous management did not produce any policies regarding financial management, the use of generally accepted accounting principles, or oversight of cash and account management.

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ASSESSMENT SUMMARY

OBSERVATIONS

TECHNICAL:

1. **Water Supply and Infrastructure Challenges**
    a. The current production capacity from Well 4 fluctuates and is insufficient to meet current and future demands sustainably, necessitating water purchases from SLVWD through an interconnection.
    b. The intertie with SLVWD operates without a formal agreement and lacks emergency power backup.
    c. The system lacks adequate source redundancy and a comprehensive Water Supply Emergency Plan.
    d. Well 5's location and status remain uncertain.
2. **Distribution System Deficiencies**
    a. The distribution system lacks a comprehensive inventory of pipe materials and a water main replacement program.
    b. Significant water loss and leakage issues persist without an effective leak detection and repair program.
    c. Absence of critical maintenance programs, including line flushing, fire hydrant flushing, and valve inspection and exercising.
3. **Storage and Pump Station Inadequacies**
    a. Lack of SCADA at certain critical pump stations and storage tanks.
    b. Pump stations are housed in vulnerable structures with aging equipment, and most lack backup power.
    c. Some storage tanks do not meet regulatory standards, lacking features such as overflow protection, drains, or water level indicators.
4. **Cross-Connection Control and Backflow Prevention Issues**
    a. No comprehensive cross-connection control program is in place.
    b. Absence of backflow prevention assemblies at high-risk sites, including the Boulder Creek Country Club and the wastewater treatment plant.
    c. Potential cross-connection risks where there are customer-supplied tanks, wells, and storage systems.
5. **Operational and Maintenance Protocol Deficiencies**
    a. Lack of established cleaning, inspection, and maintenance programs for wells, storage tanks, and pump stations.
    b. Absence of complete operational records.
    c. Incomplete meter inventory and ongoing challenges with unauthorized water use.
    d. Incomplete meter assessment, calibration, and replacement program.

e. BBWC currently lacks a program for controlling and monitoring the use of fire hydrants, as well as a formal condition assessment or replacement program.

6. **Emergency Preparedness**
   a. Despite operating in a "Very High" Fire Hazard Severity Zone, BBWC lacks a comprehensive fire safety and action plan.
   b. Inadequate communication with the local fire department regarding essential water distribution system information.
   c. Critical infrastructure, including the main well and storage facilities, is situated on difficult, uphill roads that hinder maintenance efforts and timely emergency response.
   d. Lack of critical spare parts inventory and written procedures for emergency repairs.
7. **Record-Keeping and Compliance Concerns**
   a. BBWC's record-keeping and monitoring systems are incomplete.
   b. Unresolved issues with raw water diversion from Jamison Creek, including uncertainty about its use and lack of treatment.

MANAGERIAL:

1. While BBWC currently has sufficient qualified staff for operations through the contracted operator, it lacks sufficient staffing to handle engineering support, technical/operations assistance, financial management and planning, or legal counsel.
2. Without staff covering the communications functions, BBWC also is without the ability to proactively communicate on platforms other than the company website and bill inserts.
3. BBWC is currently without a full set of policies, records and strategic plans that can support its present day and future operations.
4. BBWC lacks recorded easements for its infrastructure located on private properties.
5. BBWC lacks current insurance to protect it from liability and the effects of disasters.

FINANCIAL:

1. BBWC’s current rates are unsustainably low, do not adhere to basic cost-of-service principles, and do not take into account the maintenance and R&R of important infrastructure.
2. BBWC does not have a capital improvement plan to guide investment in infrastructure or an asset management plan to project infrastructure R&R needs and costs.
3. BBWC’s financial situation has a detrimental effect on its ability to finance needed capital improvements.

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RECOMMENDATIONS

The recommendations below are structured to prioritize actions based on their urgency and impact on health, safety, and operational stability. The organization follows these key timelines and priorities:

1. **Short-Term Recommendations (0-1 year):** These actions focus on addressing urgent issues that impact immediate safety and operational stability. They include critical repairs, assessments, and improvements necessary to ensure the water system's functionality and public health in the short term.
2. **Medium-Term Recommendations (1-3 years):** These recommendations aim to enhance system performance and compliance over a slightly longer horizon. They involve implementing programs and upgrades that improve monitoring, maintenance, and operational efficiency.
3. **Long-Term Recommendations (3-5 years or post-consolidation):** These actions are aimed at achieving sustainable improvements and ensuring the water system's future resilience. They include major infrastructure upgrades and strategic initiatives designed to enhance long-term reliability. Some of these actions might be more effectively addressed after potential consolidation or changes in governance, as such transitions could impact priorities and available resources. This may involve re-evaluating priorities, integrating systems, and tackling any new challenges or opportunities that arise from the consolidation or restructuring process.

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Table 16. Short-Term Recommendations

Short-Term Recommendations (0-1 year)		
Priority	**Action Item**	**Notes**
1	Locate and assess potential contamination risk from Well 5 (horizontal well under surface water influence).	Immediate action required to ensure it does not pose a contamination risk to the system.
2	Investigate the raw water diversion from Jamison Creek to the 1,000-gallon plastic storage tank. Determine the source and usage of the diverted water, identify affected customers, and take necessary steps to reconnect them to the main treated water system if required.	BBWC is unsure how the water from the creek is being used.
3	Conduct a comprehensive cross-connection survey, which includes: - identifying and assessing high-risk sites such as the Country Club and the wastewater treatment plant, as well as - identifying cross-connection issues in the Everest, Bloom Grade and other areas, where customers are using their own wells, storage tanks and bladder tanks.	Prevents contamination and ensures system integrity.
4	Inspect and ensure Well 4's overflow pipe is properly screened or equipped with a fine mesh screen or flapper gate to prevent contamination.	Prevents critters and other debris from entering tank.
5	Complete fencing around Well 4/Well 4 Tank site for improved security.	Prevents unauthorized access.
6	Improve access road to Well 4 site and other critical infrastructure for better accessibility and emergency response.	Enhances emergency response capabilities. Ensures more efficient and timely access to critical sites.
7	Replace aging pump at Bloom Grade pump station.	Critical for maintaining operational reliability.
8	Confirm disconnection of inactive or fire-damaged infrastructure.	Critical for system integrity and safety.
9	Complete the inventory and assessment of all water meters.	Ensures accurate measurement and billing.
10	Address unauthorized connections and water use.	Prevents revenue loss.

11	Initiate fire hydrant inventory and condition assessment. Replace hydrants as needed.	Ensure functionality and readiness for emergency situations.
12	Develop immediate plan for water provision to disconnected customers (e.g., Hill House).	Ensures emergency provision of water service (e.g., hauling water) while planning for permanent connections.
13	Establish a formal agreement with SLVWD regarding the provision of water.	Establishes clear terms and conditions.
14	Secure access to all facilities such as wells, tanks, pump stations, and chemical storage with measures such as locks and fencing.	Consider programmable locks or Fire District-approved locks where feasible; ensures emergency access.
15	Assess pressure at temporary creek crossings (Rosita and Oberst Pump Stations) and develop an emergency response plan for potential failure of temporary pipes.	Ensures system stability.
16	Redirect Galleon Tank overflow away from customer's property.	Prevents potential damage to customer's property.
17	Develop a fire safety and action plan.	Ensures the protection of critical water infrastructure and enhances overall fire preparedness.
18	Purchase insurance to adequately cover liability or loss.	Protects the utility.
19	If considering selling property, implement a strategy to preserve water rights.	Preserves future options for water supply.
20	Consider another rate increase or other revenue generating actions.	Increases utility's ability to be sustainable financially.

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Table 17. Medium-Term Recommendations

Medium-Term Recommendations (1-3 years)		
Priority	**Action Item**	**Notes**
1	Well 4 Investigation and Rehabilitation Conduct a thorough investigation and rehabilitation of Well 4. This should include evaluating the current condition, identifying any potential issues or contaminants, and implementing necessary repairs or upgrades.	Ensures the well's operational efficiency.
2	Based on the cross-connection survey, install and test backflow preventers at high-risk sites.	Prioritize wastewater treatment plant and Country Club.
3	Install testable backflow prevention device at the SLVWD intertie and at all emergency interties (i.e. Bracken Brae and Forest Springs).	Prevents cross-connection.
4	Develop a cross-connection control program: - Acquire a cross-connection control program coordinator to oversee and implement the program; - Identify and document all backflow preventers in the service area, including details such as type, make, model, and location; - Establish a system for record-keeping, maintenance, and annual testing of backflow preventers; and - Conduct annual testing of all system backflow preventers to ensure functionality and compliance.	State requirements and critical for preventing water contamination.
5	Implement meter calibration and replacement program.	Ensures accurate water usage measurement.
6	Connect all critical infrastructure to the SCADA system.	Enhances monitoring capabilities.
7	Implement emergency power solutions for critical infrastructure including the intertie connection to SLVWD and critical pump stations.	Ensures water supply during power outages.
8	Develop and implement a valve inspection and exercising program.	Crucial for system maintenance and fire readiness.
9	Implement a line and fire hydrant flushing program.	Maintaining functionality of hydrants and ensures emergency preparedness.

		Enhances water quality and system efficiency.
10	Develop and implement a Water Supply Emergency Plan.	Crucial for responding to supply disruptions and other emergencies.
12	Develop written procedures for emergency repairs.	Enhances emergency preparedness.
13	Establish a comprehensive record-keeping system, including off-site back-up.	Improves operational efficiency and compliance.
14	Formalize existing easements to protect access in case of future property transfers.	Ensures clarity and continuity.
15	Develop and periodically update formal management policies and plans.	Ensures clear management practices.

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Table 18. Long-Term Recommendations

Long-term Recommendations (3-5 years or post-consolidation)		
Priority	**Action Item**	**Notes**
1	Study long-term alternatives for sufficient supply.	Consider surface water treatment plant, increasing well capacity, or drilling new wells.
2	Establish cleaning, inspection, and maintenance programs for wells, tanks, and pump stations.	Enhance system reliability and extend infrastructure lifespan.
3	Upgrade or replace aging pump stations.	Improve reliability and efficiency of water distribution.
4	Upgrade SCADA capability from monitoring to control.	Increases operational efficiency.
5	Develop water main replacement program.	Prioritize areas with frequent breaks.
6	Replace temporary creek crossings (Rosita and Oberst).	Improves long-term system stability.
7	Conduct water audit to quantify and address water losses.	Helps identify and reduce water waste.
8	Implement comprehensive asset management system.	Improves long-term planning and operational efficiency.
9	Develop a long-term capital improvement plan.	Ensures systematic approach to infrastructure upgrades.
10	Assess and upgrade fire protection capabilities.	Improves system resilience.
11	Develop a long-term rate strategy so that revenues adequately cover operations, maintenance and capital expenses.	Plans for future sustainability.

Given these recommendations, Moonshot developed an estimated capital improvement plan for the next five years. This plan includes both items that would be needed under all alternatives and items that would be needed for specific alternatives, as detailed below.

The costs provided are estimates and may fluctuate based on detailed engineering evaluations, market conditions, and unforeseen factors. These estimates do not include permitting costs, nor do they account for any additional upgrades that annexing agencies might implement, such as creating additional loops in the distribution system. To accommodate potential variability and unforeseen circumstances, a 50% contingency has been applied to the total estimated costs. Other unknowns include well depth, the number of cross connections, the number of hydrants, the number and location of valves, and complete distribution system mapping.

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Table 19. Estimated 5-Year Short Term Capital Improvement Plan (CIP)

Base		
Capital Improvement	**Estimate Lower Bound**	**Estimate Upper Bound**
Well 4 investigation and rehabilitation	$100,000	$150,000
Security upgrades (fencing, locks for all facilities)	$13,000	$19,000
Pump station upgrade (Bloom Grade)	$10,000	$20,000
Cross connection control implementation: 1. Conduct a comprehensive cross-connection survey. 2. Develop a cross-connection control program.	$25,000	$30,000
Fire hydrant assessment and replacement program	$140,000	$230,000
Leak detection and repair program	$50,000	$100,000
Tank inspection, maintenance and upgrades	$150,000	$300,000
SCADA upgrade from monitoring to full capability	$50,000	$100,000
Water meter replacement (automatic reading)	$110,000	$275,000
Valve replacement and exercising program	$50,000	$100,000
Water main replacement (priority areas)	$250,000	$500,000
SUBTOTAL	**$948,000**	**$1,594,000**

Additional Items Needed for Annexation		
Capital Improvement	**Estimate Lower Bound**	**Estimate Upper Bound**
Upgrades to existing SLVWD intertie	$50,000	$100,000
Trunkline installation	$2,000,000	$3,000,000
SUBTOTAL for Annexation Additional Items	**$2,050,000**	**$3,100,000**
TOTAL for Annexation	**$2,998,000**	**$4,694,000**

Additional Items Needed for Hybrid/Stand-Alone		
Capital Improvement	**Estimate Lower Bound**	**Estimate Upper Bound**
New water source development (planning and implementation)[12]	$400,000	$750,000
SUBTOTAL for Hybrid/Stand-Alone Additional Items	**$400,000**	**$750,000**
TOTAL for Hybrid/Stand-Alone	**$1,348,000**	**$2,344,000**

[12] New water source development may include options such as drilling a new well or establishing a surface water treatment plant. The cost estimate provided here specifically covers the drilling of a new well, including pilot well drilling, testing, design, completion and certification.

PART TWO: ALTERNATIVES ANALYSIS

Part One of this report detailed the findings from Moonshot Missions' evaluation of the systems' technical, managerial, and financial components. Part Two evaluates the options for BBWC's future. This part evaluates ownership, governance and operations models that have plausible potential to support sustainable BBWC operations.

ALTERNATIVES

Alternatives identified by the Santa Cruz Local Agency Formation Commission (LAFCO) fall into three distinct categories.[11] It should be noted that BBWC customers will need to take action to opt in for many of these alternatives, according to LAFCO. Accordingly, it is vital that customers be provided with adequate information on what each alternative will mean in terms of formation requirements, resulting governance, service capabilities, rate implications and related matters. In addition to the information provided here, for reference purposes the UCLA Luskin Center for Innovation has detailed descriptions of the various governance models in its publication *Designing Water System Consolidation Projects: Considerations for California Communities, Appendix A.*[13] The categories of alternatives are:

Dissolution and Annexation

This category involves BBWC dissolving and becoming part of its neighboring utility, San Lorenzo Valley Water District through annexation into SLVWD's service area. SLVWD is an independent special district authorized to provide water and related services under the County Water District Act.

The water system operations integration element of this alternative most likely involves extending a larger transmission main from the SLVWD system. Currently a large transmission main connecting from SLVWD to Bracken Brae and Forest Springs systems is in the planning stages. Well No. 4, which is currently being used as BBWC's primary water supply, would return to its previous status as a back-up water supply source. If desired, the BBWC surface water sources could be connected to an SLVWD treatment plant.

Under this alternative, SLVWD would become the full-service retail water provider for the BBWC service area and would provide all technical, managerial and financial resources to operate the system. The former BBWC service area would be governed by the SLVWD Board of Directors.

[13] Dobbin, Kristin McBride, Justin and Pierce, Gregory. Designing Water System Consolidation Projects: Considerations for California Communities. UCLA Luskin Center for Innovation, 2022. Accessed June 125, 2024. https://innovation.luskin.ucla.edu/wp-content/uploads/2022/10/Designing-Water-System-Consolidation-Projects.pdf

Hybrid

This category involves BBWC becoming part of an entity that does not have neighboring infrastructure. The alternatives under this category are converting the areas served to a County Service Area, annexation with a non-neighboring utility, or acquisition by an existing private company.

The County of Santa Cruz operates another County Service Area serving Davenport, with a total of 108 connections, that serves 350 people.

Potential non-neighboring utilities include Central Water District, Scotts Valley Water District, Soquel Creek Water District, the City of Santa Cruz, the City of Watsonville, and Pajaro Valley Water Management Agency. The below table gives a thumbnail sketch of the non-neighboring utilities.

Table 20. Non-Neighboring Utility Alternatives

Utility	Number of Connections	Population Served	Location
Central Water District	826	2,726	Aptos
Scotts Valley Water District	3,945	11,147	Scotts Valley
Soquel Creek Water District	14,493	40,788	Soquel
City of Santa Cruz	22,972	95,017	Santa Cruz and Live Oak
City of Watsonville	14,955	65, 231	Watsonville
Pajaro Valley Water Management Agency	N/A	N/A	Areas near Corralitos, La Selva Beach, Freedom, Watsonville, Pajaro, Las Lomas, Aromas

Sources: State Water Resources Control Board's California Drinking Water Watch, Pajaro Valley Water Management Agency website

Acquisition by an existing private company would involve another private investor-owned, utility (IOU) taking the risk and responsibility for operations and acquiring assets currently owned by BBWC. To date, no private company has expressed interest in acquiring the assets of BBWC.

The Dissolution and Annexation and Hybrid alternatives would involve Well No. 4 remaining as the primary source, at least initially. The County, annexing utility, or IOU would need to continue purchasing water from SLVWD via the existing intertie while exploring other water supply options, including additional wells or rebuilding the surface water treatment facilities.

Stand-Alone

This alternative category involves BBWC continuing to be an independent entity through some means of dissolution and reformation. Alternatives include reforming as an independent special district, a mutual water company, or a new private corporation. Operations could include an operator who is directly employed by the entity or a contract operation individual or company, similar to Cypress. Options in this alternative would have the reformed entity operate independently. The reformed entity could continue to contract with SLVWD for water purchases.

This alternative would likely involve the same sources of water supply as the hybrid alternatives, with Well No. 4 remaining as the primary source initially. The newly formed stand-alone entity would need to continue purchasing water from SLVWD via the existing intertie while exploring other water supply options, including additional wells or rebuilding the surface water treatment plant.

LONG-TERM SUSTAINABILITY ANALYSIS

The analysis compares each alternative to criteria chosen as critical and necessary factors for a public utility to deliver safe drinking water with the greatest positive community impact.

To evaluate each ownership, governance, and operations alternative, criteria were chosen that encompass the critical aspects of delivering sustainable, safe, and affordable water service. The evaluation criteria are:

- **Level of Service:** Technical capacity to ensure competent and safe operations of the system, provide regulatory compliance, operations experience, ability to prepare for and respond to emergencies, and improve customer satisfaction.
- **Cost and Affordability:** Access to capital funding and financing, operational efficiencies, stable and sustainable rates, and customer affordability programs.
- **Ownership and Governance:** Accountability, transparency, retail water system management and oversight experience, and opportunities for community representation on governing bodies.

The analysis begins with a description of the criteria used to evaluate the various governance models and evaluation of each alternative against these criteria. It is followed by a summary table with the evaluation for each alternative against the chosen criteria.

Some alternatives involve a specific, existing entity such as a neighboring water utility or the County. When an entity is identified, ratings are based on publicly available information on that entity. When a specific entity does not exist, the ratings are known based on the type of entity, such as what funding it would be eligible for, or assumed based on typical attributes of that type of entity. Whenever appropriate, the word “assume” is included in the table to distinguish between specific entities and conceptual alternatives.

Level of Service

The mission of all public water utilities is to provide safe, reliable, and affordable water services to the community, thereby ensuring public health and environmental protection. Water utilities are required to supply drinking water that meets all public health standards and maintain reliable service. By adhering to water quality standards, preparing for emergencies, and managing water resources sustainably, public water utilities play a critical role in protecting human health and the environment.

Determining whether an alternative possesses the operational capability to deliver service that meets public health and environmental standards is a major component of this evaluation. Important considerations in this analysis are whether any deficiencies were noted during the latest available sanitary survey, whether there are any outstanding violations, and whether the current staff were appropriately certified to operate BBWC.

Operational experience assessed included evaluation of how long the utility has been operating, and whether it currently treats groundwater, which is BBWC's current primary water supply.

Emergency preparedness is another key criterion because it is especially important to the community. Considerations here included whether the utility was currently required to have an emergency response plan, whether it has additional resources to deploy in an emergency, and whether it is a member of an emergency mutual assistance/mutual aid organization.

Level of service also assesses customer satisfaction. The entity's ability to provide service without extended or repeated unplanning outages, to respond to customer inquiries, proactively communicate with customers, and utilize online self-service features such as bill pay were considered. A utility's capability to meet customer expectations and to respond promptly to issues are important for long-term satisfaction and trust.

Dissolution and Annexation

SLVWD has significant technical capacity and operations experience. There were no deficiencies in the latest SLVWD sanitary survey and no outstanding violations (including water quality, treatment technique, monitoring/reporting, source capacity and water outage violations). These are considered indicators of whether the utility is operating appropriately. SLVWD operators have certification higher than those needed to operate the BBWC system and currently treat groundwater. SLVWD has a longstanding record of utility operation.

Regarding emergency preparedness and response, SLVWD is required to have an emergency response plan in place and has some additional resources to assist from within the agency to increase capacity in the event of an emergency. SLVWD is also a member of the California Water/Wastewater Agency Response Network (CalWARN), which supports and promotes

statewide emergency preparedness, disaster response, and mutual assistance processes for public and private water and wastewater utilities.

Under SLVWD, customer satisfaction for BBWC customers will increase greatly from previous BBWC management because SLVWD does not have a history of extended or repeated unplanned outages and SLVWD also has customer service and communications capabilities greater than BBWC in the past. SLVWD also offers customer-friendly features such as the ability to pay and manage accounts online.

More than four years after it occurred, SLVWD continues to work to recover from the CZU Lightning Complex Fire, which may affect their capacity and resources to take on additional significant projects. SLVWD has also experienced significant turnover and vacancies in upper management recently.

Hybrid

County Service Area

The County of Santa Cruz operates the Davenport County Sanitation District (DCSD) as a county service area (CSA). In operating DCSD, the County has significant technical capacity and operations experience, with no outstanding violations. There are no site visits listed in the California Drinking Water Watch database.

DCSD was established in 2015 and it treats surface water, which is a more complex process than disinfecting groundwater. Its operators currently meet the treatment certification requirements for BBWC but would need one additional level in distribution system certifications to operate BBWC's distribution system. The County could address this easily by assisting one or more of the operators in gaining the higher distribution system certification or potentially by hiring an operator with a higher distribution certification.

Regarding emergency preparedness and response, DCSD does not meet the threshold population served to require an emergency response plan. However, the County of Santa Cruz has an emergency operations plan and has additional resources to assist from within the agency to increase capacity in the event of an emergency. The County of Santa Cruz is also a member of CalWARN.

Customer satisfaction for BBWC customers will increase greatly if formed into a CSA because the DCSD does not have a history of extended or repeated unplanned outages and has customer service and communications capabilities greater than BBWC in the past. There are also customer-friendly features such the ability to report an issue or submit a service request online.

Consolidation with Another Utility

All non-neighboring utility alternatives with the exception of PVWMA have significant technical capacity and operations experience. There were no deficiencies in the latest available sanitary surveys or outstanding violations. Excluding PVWMA, all of the alternatives' current operators have certifications higher than those needed to operate BBWC and currently treat groundwater.

PVWMA is a groundwater water management district formed to manage existing and supplemental water supplies in Pajaro Valley in order to prevent further increase in groundwater overdraft. As such, PVWMA is not a retail water service provider and does not treat or distribute potable water to retail customers.

Regarding emergency preparedness and response, all the utilities except Central and PVWMA are required to have an emergency response plan in place and have additional resources to assist from within the agency to increase capacity in the event of an emergency. All agencies except for PVWMA are also members of CalWARN.

Customer satisfaction for BBWC customers will increase to a high degree with Scotts Valley, Soquel Creek, Santa Cruz and Watsonville because they are retail water agencies and do not have a history of extended or repeated unplanned outages, have customer service and communications capabilities, and an array of customer-friendly online features including bill pay in all cases.

Central has no extended or repeated unplanned outages, has limited customer service capability but no online bill paying option. PVWMA has no retail utility operation.

Acquisition by a Private Company

The established technical capacity and operations experience are assumed high if the IOU is without deficiencies or outstanding violations, has appropriately certified operators, and has longstanding experience, including with groundwater operations.

Its emergency preparedness and response are assumed high as it will likely have additional resources to assist from within the agency to increase capacity in an emergency and may already be required to have an emergency response plan for existing operations.

Customer satisfaction is assumed high if it has a record of no extended or repeated outages, has customer service and communications capacities and customer-friendly online features.

Stand-Alone

Both the technical capacity and operations experience of the stand-alone alternatives are to be determined. These factors will depend on how the system is operated (in-house staff versus contracted) and the knowledge and experience of those staff. Additionally, while it may be

possible to hire appropriate staff initially, smaller systems typically find it difficult to retain qualified staff. Because the options vary widely between the three alternatives and who manages and operates the system is currently unknown, no rating is given.

For all stand-alone alternatives, the emergency preparedness and response capacity are assumed low because, due to their small size, there will be no additional resources to assist from within the agency to increase capacity in the event of an emergency. It is recommended that any stand-alone alternative join CalWARN to provide some additional capacity during an emergency.

Customer satisfaction is also to be determined as all the alternatives are new and currently lack specifics, though it is likely that because of the size of the system, it will be difficult to justify having dedicated customer service or communications staff.

Cost and Affordability

Access to capital funding and the cost of borrowing capital are important factors in evaluating alternatives. Grants and loans, available through state revolving funds (SRFs), federal programs offered by the Department of Agriculture or Bureau of Reclamation, or by philanthropic foundations, can play a significant role by offering low interest funding or funding without the expectation of repayment (principal forgiveness). This type of funding can support a range of projects, from infrastructure improvements to maintaining potable water quality and environmental compliance. Access to such funding can significantly reduce the financial burden on the utility, making it possible to undertake projects that might otherwise be unaffordable.

However, grants are not always available, and no utility should completely rely on them for financial sustainability. The cost of borrowing capital is important because it directly impacts the long-term financial burden placed on the utility for repayment. Borrowing costs, which include interest rates, need to be carefully evaluated to make sure they do not create a financial burden on the utility and its customers. High borrowing costs will lead to increased rates for customers and can also potentially limit the utility's ability to invest in needed infrastructure. In addition, loans also require creditworthiness. This includes sufficient days cash on hand, the ability to provide a debt service coverage ratio above 1.2 and establishing a debt service reserve are all needed to secure outside financing. Therefore, understanding and managing these costs and the rate implications to establish creditworthiness is important for ensuring the utility remains financially viable while providing quality and affordable service to its customers.

Some grants or loans may require that the community be designated a disadvantaged community (DAC) in order to qualify. There are ongoing efforts to assess whether the BBWC service area qualifies for that definition.

Customer rates are composed of the cost of operations, maintenance and administration costs, and the cost of capital improvements. In analyzing alternatives, it is important to look at

whether customer rates are expected to change and what factors would affect the magnitude of any changes.

Rates are also affected by how many customers are sharing the administrative costs, including fixed costs that do not vary with the amount of water produced and sold. In this analysis, administrative efficiencies are broken out to highlight the differences between the alternatives. The graphic below shows some of the items on which a utility can save money by sharing between a larger number of customers. This also means that the fewer customers share these expenses, the more they will cost per customer at a smaller utility, in addition to sometimes not being able to achieve a bulk discount. In the past, BBWC's administrative expenses have been disproportionately high. While it may be possible to make some changes to reduce administrative overhead costs, some of the disparity between BBWC's costs and the industry standards will likely remain due to the small size of the operation and the inability to realize economies of scale.

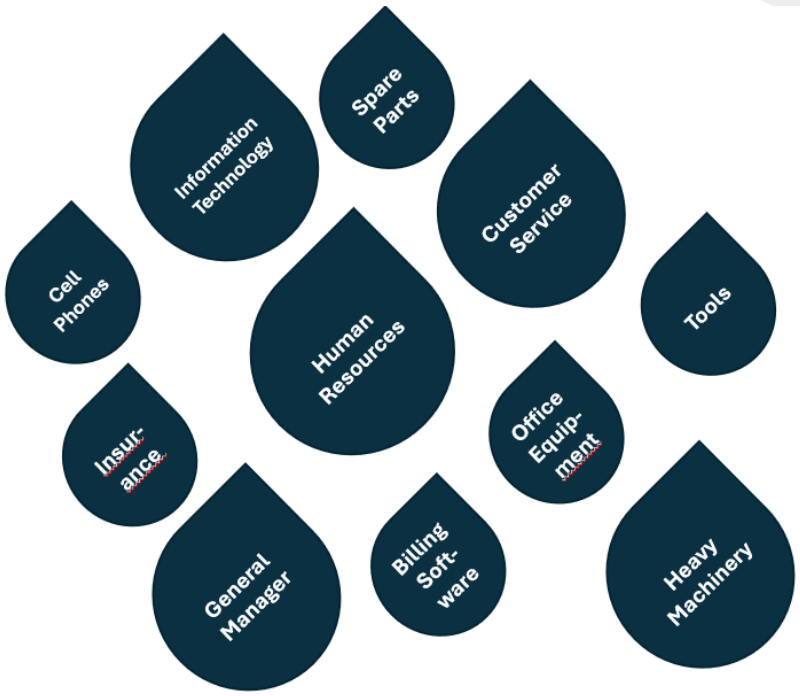

Figure 10. Opportunities for Economies of Scale

Affordability programs can offer low-income customers communities a way to better afford rising water bills while also ensuring the utility can bring in the required revenue to properly operate and maintain the system. Effective affordability programs provide financial assistance or reduced rates to vulnerable customers, thereby helping to ensure that everyone has access to essential water services regardless of their economic status. The availability of these types of programs is another important criterion that was used to compare different ownership and governance models.

Dissolution and Annexation

SLVWD's access to capital sources is relatively high. It may qualify for federal and state grants, loans potentially including principal forgiveness from the state revolving fund (SRF), as well as being able to levy assessments and issue general obligation bonds. For details of grant eligibility, see Appendix D.

The cost of capital for SLVWD is relatively low. The general obligation bond interest rate is 4.6% for 2024. If SLVWD were to receive an SRF loan, that interest rate is half of the general obligation bond rate, which is 2.3% in 2024.[14]

The annexation alternative does not include any rate of return to investors because SLVWD, as an independent special district, is governed by Proposition 218, which requires that all rates and charges have a nexus to the cost of providing service to the benefitted customer properties and do not generate revenue that is used for other purposes.

BBWC customer rates will increase with the annexation alternative because this scenario will require substantial capital investment to improve the BBWC system and to further connect the systems. The estimated five-year capital improvement plan for the annexation alternative is $2,998,000-4,694,000. As California prioritizes consolidation in its funding decisions, the funding available for annexation may be up to 100% of cost. While guaranteed funding is not known, it is likely more available than funding for stand-alone alternatives.

One potential approach to annexation is to create an acquisition balance, which is a calculation that financially partitions the net costs associated with integrating and providing needed improvements to serve the annexed area and allows those costs to be recovered over time from the customers in the annexed area. This ensures existing customers of the utility annexing the area are not paying for improvements, or "cross-subsidizing" costs to operationally integrate or repair the system in the annexed area. Under this approach, BBWC customers would pay down this acquisition balance over a period of time through a surcharge on their bills. More information on considerations for annexation, including the acquisition balance concept, are available in Appendix E.

There are some factors that could potentially offset a portion of the acquisition balance and the associated rate surcharge. The first is BBWC's existing surface water rights. These water rights are potentially more valuable to SLV than any of the other agency alternatives given that SLVWD and BBWC are adjacent. It is possible that BBWC customers could receive credit for the BBWC water rights as part of the acquisition balance because the asset has benefit to current SLVWD service area.

[14] California State Water Resources Control Board. "California Drinking Water State Revolving Fund Interest Rate History."https://www.waterboards.ca.gov/drinking_water/services/funding/documents/srf/dwsrf_interest_rate_history.pdf

The second factor that could potentially reduce BBWC customers' rates is the possibility of economies of scale and administrative efficiencies. The annexation alternative offers the greatest opportunity for administrative efficiencies. Administrative efficiencies include the cost of all overhead such as sharing the costs of a general manager or other staff, billing software, information technology, human resources, among other items. Because SLVWD has a larger customer base than BBWC and is adjacent to BBWC's service area, it is likely to have higher administrative efficiencies.

It should be noted that a ballot measure was placed on the November 2024 ballot that would eliminate the SLVWD fixed service charge and limit the future increases to the regular service charge to 2% per year through 2049. If this ballot measure is successful, it has the potential to affect SLVWD's future financial planning. An analysis with details of the effect of the measure on SLVWD operations will be published prior to the election, therefore this report cannot speak in detail to the effects at this time.

SLVWD has a rate assistance program to assist customers who may not be able to afford full rates. Eligible households must be a single-family dwelling with the account in the name of the occupant and must qualify for the Pacific Gas & Electric (PG&E) affordability program. Eligible households receive a discount of up to $240 per year.

Hybrid

The access to capital sources for County or other water agency is relatively high and higher than the access available to BBWC currently. Hybrid entities may qualify for federal and state grants, loans potentially including principal forgiveness from the state revolving fund (SRF), as well as being able to levy assessments and issue general obligation bonds. Access to capital for an existing private company is considered medium as it may qualify for SRF loans but cannot issue general obligation bonds and may have limitations on grants. For details of grant eligibility, see Appendix D.

The cost of capital for a CSA or other public utility alternatives is relatively low. The general obligation bond interest rate is 4.6% for 2024. If any of the hybrid alternatives were to receive an SRF loan, that interest rate is half of the general obligation bond rate, currently at 2.3% in 2024.[14] For an existing private company unable to secure SRF loans, the interest rate is projected to be between 6-12%, which is rated medium here.

The CSA or other public utility alternatives do not include any rate of return to investors because under Proposition 218, the rates must be tied to the cost of service and not used for

other purposes. An existing private company would have a rate of return between 10.7-11.9%, as of 2024.[15]

Under the hybrid alternatives, customer rates will increase. All alternatives will require substantial capital investment to improve the system and its water supply sustainability. The estimated five-year capital improvement plan for the hybrid alternatives is $1,348,000-2,344,000. The CSA alternative would have a lower economy of scale with its small customer base consisting of just former BBWC customers, although some economies may occur because it is a dependent special district of the County. The alternative involving consolidation with another, non-adjacent utility would have a low economy of scale. Its customer base would be larger than just former BBWC customers but being non-adjacent will counteract some of that efficiency. Economy of scale for an existing private company would depend on the size of its current operations. Under an IOU, customer rates would also include the rate of return.

BBWC's water right assets are less valuable in hybrid alternatives because the annexing agencies could not transport the raw water to their treatment plants and would therefore have to treat the surface water within BBWC's service area by rebuilding a surface water treatment plant. The CSA or other public utility alternatives have public participation components in their rate-setting process. Note also that the DCSD is currently charged at a set amount for residential customers, which is currently $2,281.28 per year.

Regarding administrative efficiencies, the CSA and other utilities are rated medium as there may be some capacity with the staff that currently manage the other CSA for Davenport or the other utilities. However, because the service areas are not adjacent, there would be lower efficiency than the annexation option because there would be additional effort, including travel time, to oversee a non-adjacent service area. The administrative efficiencies for an existing private utility are assumed medium as they would have existing administration.

Of the hybrid alternatives, only Scotts Valley Water District offers an affordability program. All the other utilities, including the CSA, do not offer any bill or rate assistance. The availability of an affordability program from an existing private company is to be determined, as allowed by the CPUC.

[The remainder of this page is intentionally blank.]

[15] California Public Utilities Commission. "Rates of Return and Rates of Margin for Class C, Class D Water and Sewer Utilities." https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/water-division/reports/wd-memorandum/rorandrom-classcd2024.pdf

Stand-Alone

The three stand-alone alternatives have varying access to capital sources, as shown below.[13]

Table 21. Sources of Capital Funding for Stand-Alone Alternatives

Source of Capital Funding	New Independent Special District	New Mutual Water Company	New Private Company
Grants	Yes	Yes, may be taxable	Yes, limited
Government Loans	Yes	Yes	Yes
Assessments	Yes	Yes	No
General Obligation Bonds	Yes	No	No
Private Loans	Yes	Yes	Yes

For details of grant eligibility for the alternatives, see Appendix D.

The cost of capital for the stand-alone alternatives varies. All alternatives may be eligible to receive an SRF loan with an interest rate of 2.3% as of 2024, should their projects be chosen.[14] For a new independent special district, it is relatively low because it can access SRF funding or a GO Bond. For both a new mutual water company and a new private company, it is considered medium as they cannot access GO Bonds and would only receive SRF loans if chosen to participate. If either of those were to borrow privately instead, the interest rate is projected to be between 6-12%.

Of the stand-alone alternatives, the special district alternative does not include any rate of return to investors because under Proposition 218, the rates must be tied to the cost of service and not used for other purposes. A mutual water company also does not include any rate of return as it would be required to provide must be delivered to shareholders at cost.[13] The private investor-owned alternative allows for a rate of return of 10.7-11.9% as of March 2024.[15]

Customer rates under all the stand-alone alternatives are assumed to increase significantly. These alternatives will require substantial capital investment to improve the system and its water supply resilience. The estimated five-year capital improvement plan for the stand-alone alternatives is $1,348,000-2,344,000. Additionally, there are limited opportunities for economies of scale of which to take advantage.

The stand-alone alternatives do not have any administrative efficiencies such as sharing the costs of a general manager or other staff, billing software, information technology, human resources, among other items, because there is no existing administrative structure or other customers with which to share the costs.

The existence of any affordability programs for the stand-alone alternatives is to be determined based on the regulations affecting and the decisions of the district, mutual water company, or

private company. There are currently existing entities that could offer an affordability program but choose not to, so none is guaranteed.

Ownership and Governance

Evaluating each alternative involved an analysis of the accountability and transparency of each ownership and governance model. Accountability involves examining how the utility is governed and the connection it has to its customers. Transparency in the entity's operations, decision-making processes, and reporting practices is essential for building trust with the community and establishing a culture of accountability.

The history and track record of each governance model in managing a water utility provides insight into its capability to handle the complexities of water utility governance. A long successful history of governing a water-specific organization often indicates significant experience with handling complex issues well even in circumstances in which resources are constrained.

Evaluating ownership and governance models also involves assessing each model's mechanisms for community engagement. Effective community involvement in decision-making and responsiveness to concerns are essential for building trust and meeting community needs.

Dissolution and Annexation

Regarding accountability, SLVWD is rated high because it is managed by an elected board of directors whose sole focus is water delivery. SLVWD management and staff reports to the board.

SLVWD scores well on transparency. There is easy access to public records such as financial reports, water quality reports, employee compensation and board agendas and minutes on the website.

SLVWD is rated highly on governance experience and on community representation. SLVWD has been in existence as an independent special district since 1941. It is governed by a five-member board which is elected at-large from within the District's service area. The board has been navigating its own recovery from the CZU Lightning Complex Fire.

Hybrid

Under the CSA alternative, accountability is high because the CSA would be overseen by the elected County Board of Supervisors. The current County-run CSA in Davenport practices transparency by posting agendas and minutes, water quality reports, financial reports, and regulations available on the website. The DCSD has been governed by the County Board of Supervisors since 2015. Given the structure of the County Board of Supervisors, only one of the Supervisors would directly represent the residents living in the BBWC service area. For this reason, community representation is considered medium.

For the alternatives involving being annexed by another utility, accountability is considered high because all agencies are overseen by elected officials, with the exception of PVWMA, which has a combination of four elected and three appointed directors. For all utilities, transparency is considered high because agendas and minutes, financial documents, and water quality reports are readily available on agency websites. The governance experience of all alternatives expect PVWMA are considered high because all have long-standing experience with governance of water utility operations. PVWMA is considered low as it does not have a full-service water utility. Community representation following annexation by another utility would be negotiated, with the possible outcome that BBWC customers would be able to vote for candidates, the same as other customers.

For the existing private company alternative, accountability, transparency, and community representation are assumed to be low because the governing body of an IOU is the owner or shareholders of the corporation, with rate setting oversight provided through the CPUC. Corporate board meetings are closed to the public, and agendas and minutes need not be published. Governance experience is assumed high if the company has a longstanding record of governing water service.

Stand-Alone

For the new special district alternative, accountability and community representation are assumed to be high because a district would be governed by an elected board, either at large or by division. Transparency is assumed to be high because meetings will be open to the public and the district is required to publish water quality data, budgets, and board agendas and minutes in accordance with the Brown Act.[13] Governance experience is to be determined as it would depend on whether any board members or key staff will have previous relevant experience elsewhere.

For the new mutual water company alternative, the governing body composition can vary depending on the company by-laws when the company is formed, therefore accountability is to be determined. This alternative requires notice of meetings and shareholders, tenants and elected officials must be allowed to attend, though meetings are typically closed to the general public.[13] Mutual water companies are not subject to the Public Records Act or the Brown Act. Governance experience is to be determined as it would depend on whether any board members or key staff have previous relevant experience elsewhere. Property owners are eligible to serve on the governing body, which is more restrictive than any resident being eligible. For a new mutual water company, transparency and community representation are assumed medium.

For the private company alternative, accountability, transparency, and community representation are assumed to be relatively low because the governing body is the owner or shareholders of the corporation, with rate setting oversight provided through the PUC. Meetings are typically closed to the public, and agendas and minutes need not be published.

Private companies are not subject to the provisions of the Public Records Act or of the Brown Act.[13] Governance experience is to be determined as it would depend on whether any board members or key staff have previous relevant experience elsewhere.

ANALYSIS SUMMARY

The following tables are a summary of the analysis of long-term sustainability.

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Table 22. Summary of Sustainability Analysis

Criteria		*Annexation to SLVWD*	*Hybrid*			*Stand-Alone*		
			Formation into a County Service Area	*Consolidation with Other Utility*	*Acquisition by Private Company*	*Dissolve and form a Special District*	*Dissolve and form a Mutual Water Company*	*Dissolve and form a new Private Company*
Level of Service	***Technical Capacity Established***	High; No deficiencies in latest sanitary survey or outstanding violations. Appropriate certifications. Currently treats groundwater.	High; No outstanding violations. Treatment certifications appropriate. Current distribution certifications would need to be increased.	High: All except Pajaro Valley Water Management Agency (PVWMA). No deficiencies or active violations, appropriate certifications, groundwater experience. PVWMA: Low; No retail utility operations experience.	Assume High; Lack of deficiencies or outstanding violations. Appropriately certified operators.	TBD	TBD	TBD
	Operations Experience	High; Longstanding utility which currently treats groundwater.	High; Utility in operation since 2015. Currently treats surface water.	High: All except PVWMA; Longstanding utilities, currently treat groundwater. PVWMA: Low; No retail utility operations experience.	Assume High; If longstanding utility with groundwater experience.	TBD	TBD	TBD
	Emergency Preparedness and Response	High; Has an emergency response plan (ERP) and the ability to call in agency's other resources. Is a member of California Water/Wastewater Agency Response Network (CalWARN).	High; Has ability to call in agency's other resources and is a member of CalWARN.	High: All except Central and PVWMA; required to have ERP. Ability to call in other resources. Members of CalWARN. Central: Medium. No ERP required. Member of CalWARN. PVWMA: Low; No retail utility operations experience.	Assume High; Ability to call in agency's other resources. May be currently required to have ERP.	Assume Low; No additional resources available within the agency.	Assume Low; No additional resources available within the agency.	Assume Low; No additional resources available within the agency.
	Customer Satisfaction	High; Has a lack of extended/repeated outages. Has customer service and communications capacities. Able to pay online.	High: Has a lack of extended/repeated outages. Has customer service and communications capacities. Able to report issue or request service online.	High: All except Central and PVWMA. All except Central and PVWMA have no extended/repeated outages, have customer service/communications capacity, and offer online bill pay.	Assume High if no extended/repeated outages, has customer service and communications capacities, and customer-friendly features.	TBD	TBD	TBD

Table 22. Summary of Sustainability Analysis (cont.)

Criteria		*Annexation to SLVWD*	*Hybrid*			*Stand-Alone*		
			Formation into a County Service Area	*Consolidation with Other Utility*	*Acquisition by Private Company*	*Dissolve and form a Special District*	*Dissolve and form a Mutual Water Company*	*Dissolve and form a new Private Company*
Cost & Affordability	***Access to Capital Funding***	High	High	High	Medium	High	Medium	Medium
	Types of Capital Funding	Grants, Loans, Assessments, General Obligation (GO) Bonds	Grants, Loans, Assessments, GO Bonds	Grants, Loans, Assessments, GO Bonds	Loans. No assessments or GO Bonds, limitations on grants	Grants, Loans, Assessments, GO Bonds	Loans and assessments. No GO Bonds. Grants may be taxable.	Loans. No assessments or GO Bonds, limitations on grants
	Cost of Capital	Low; Majority public funds with as low as 2.3% interest State Revolving Fund (SRF) and potential for principal forgiveness.	Low; Majority public funds with as low as 2.3% interest (SRF) and potential for principal forgiveness.	Low; Majority public funds with as low as 2.3% interest (SRF) and potential for principal forgiveness.	Medium. May qualify for SRF loans (2.3%) but not GO Bonds. Private funding at 6-12%.	Low. Majority public funds with as low as 2.3% interest (SRF) and potential for principal forgiveness.	Medium. May qualify for SRF loans (2.3%) but no GO Bonds. Private funding at 6-12%.	Medium. May qualify for SRF loans (2.3%) but no GO Bonds. Private funding at 6-12%.
	Rate of Return to Investors	Not Applicable	Not Applicable	Not Applicable	10.7-11.9%	Not Applicable	Not Applicable	10.7-11.9%
	Customer Rates	Increase; Benefits of economy of scale with SLVWD. Public participation.	Increase; Fewer economies of scale with small customer base. Public participation.	Increase; Fewer economies of scale with small customer base. Public participation.	Assume increase; return to investors, economy of scale TBD.	Assume Increase; No economy of scale. Public participation.	Assume Increase; No economy of scale. Public participation.	Increase; Return to investors, no economy of scale. No public participation.
	Administrative Efficiencies (Back-Office)	High; Greater economy of scale and adjacent location.	Medium; May be some capacity with the staff that currently manage the other CSA or utility.	Medium; May be some capacity with the staff that currently manage the other CSA or utility.	Assume Medium	None	None	None
	Affordability Programs	Program available; Up to $240/year for eligible households.	None	Scotts Valley: Program available; discounted basic service charge and uniform rate for eligible households	TBD; As allowed by CPUC.	TBD; Would have to be Proposition 218 compliant.	TBD	TBD; As allowed by CPUC.

Table 5. Summary of Sustainability Analysis (cont.)

Criteria		*Annexation to SLVWD*	*Hybrid*			*Stand-Alone*		
			Formation into a County Service Area	***Consolidation with Other Utility***	***Acquisition by Private Company***	***Dissolve and form a Special District***	***Dissolve and form a Mutual Water Company***	***Dissolve and form a new Private Company***
Ownership & Governance	***Accountability***	High; SLVWD is managed by an elected board focused on water.	High; Overseen by the elected County Board of Supervisors.	High; All alternatives overseen by elected governing board except for PVWMD, which has elected and appointed board members.	Assume Low; Not generally elected but by investors.	Assume High; Boards are elected, composition varies by type of special district.	TBD; Governing body composition varies and is established in the by-laws. Property owners are eligible to serve.	Assume Low; Not generally elected but by investors.
	Transparency	High; SLVWD practices transparency with public records and regular audits. Available on website: financial reports, water quality reports, employee compensation, agendas and minutes.	High; Davenport CSD practices transparency with public records and regular audits. Available on website: financial reports, water quality reports, regulations, agendas and minutes.	High; all show high level of transparency with documents available online.	Assume Low; Meetings may be closed to the public. Required to publish water quality data.	Assume High; Meetings open to public. Required to publish water quality data, budgets and board agendas/minutes.	Assume Medium; Required to publish water quality data. Notice of meetings required. Shareholders/tenants/elected must be allowed to attend. Meetings may be closed to the public. Not subject to Public Records Act.	Assume Low; Meetings may be closed to the public. Required to publish water quality data.
	Governance Experience	High; The San Lorenzo Valley Water District was established in 1941 as an independent special district. The District is governed by a five-member Board of Directors, elected at-large from within the District's service area.	High; providing water service since 2015.	All except PVWMA: High with long-standing record of governing water service. PVWMA: Low because not experienced with managing a full-service retail water utility.	Assume High; longstanding record of governing water service.	TBD	TBD	TBD
	Community Representation	High; Board is elected at large, not by districts.	Medium; Overseen by the County Board of Supervisors, of which one represents BBWC customers.	TBD	Assume Low; Representation is from investors only.	Assume High; Will have elected officials from the district.	Assume Medium; Property owners are eligible to serve.	Assume Low; Representation is from investors only.

CONCLUSIONS

Based on the analysis of long-term sustainability for the alternatives, Moonshot has ranked the alternatives in the following order. In assessing all the factors, emphasis was put on technical capability, access to capital funding, and customer rates.

Table 23. Ranking of Alternatives

Ranking	Alternative
1	Annexation into San Lorenzo Valley Water District
2	County Service Area
3	Annexation into Other Utility, except for Central Water District and Pajaro Valley Water Management Agency
4	Central Water District
5	Existing Investor-Owned Private Company
6	New Special District
7	Pajaro Valley Water Management Agency
8	New Mutual Water Company
9	New Private Company

The alternatives were identified and evaluated based on available information. All alternatives should be further analyzed and refined to ensure all costs, benefits and concerns are properly identified. Regardless of which alternative is selected, BBWC faces significant challenges with implementing important improvements and maintaining the affordability of water services to customers.

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APPENDIX A: Site Visit Photos and Descriptions

A. Pictures

WATER SOURCES

Well 4 Site

Description:

Well site includes:

- Well 4 (Main well), submersible pump, ~200-280 gpm
- Well 4 tank (see description on page 93).

Observations:

- The well site is not easily accessible due to difficult drive uphill.
- The well is in generally good condition and has a proper slab, air vent, sanitary seal, raw water sampling tap, meter, and check valve.
- The well site is clean. The well is fenced in, but the fencing is not fully enclosed.
- Fluctuating well capacity.
- Rented Whisperwatt diesel-powered AC generator installed at Well 4.

Well 2 (also known as American Well)

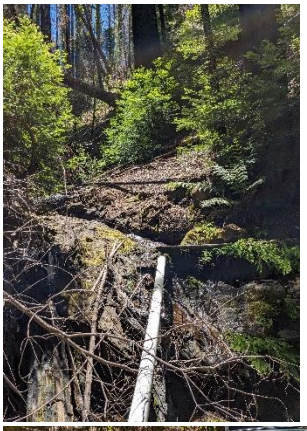
Description:

- Mostly kept offline but connected to the system.
- Submersible pump, ~18 gpm

Observations:

- The well site is not easily accessible due to difficult drive uphill.
- Well site not secured/fenced in.
- The well is in generally good condition and has a proper slab, air vent, raw water sampling tap, meter, and check valve.

Intertie with San Lorenzo Valley Water District	
 	**Description:** - Intertie with San Lorenzo Valley Water District. - Intertie located in a vault. **Observations:** - The equipment is in good condition. - No testable backflow prevention device. - Swing check valve in place. - Adequate drainage.

Jamison Spring Intake	
  	**Description:** - Raw water diversion on Jamison Creek. **Observations:** - Water is being diverted into a 1,000 gallon plastic storage tank. - No treatment plant on site. BBWC is not sure how the water is being used but is not actively treating or distributing it.

STORAGE TANKS

Well 4 Tank



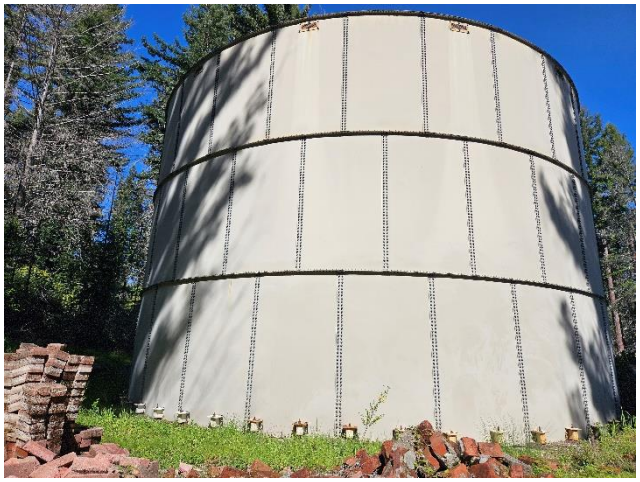

Description:

- Well 4 tank and chlorine injection point (inlet to tank).
- Steel tank, 84,000 gallons
- Fed by well 4 and well 2.
- The tank site is not easily accessible due to difficult drive uphill.
- On SCADA

Observations:

- Well 4 tank is fenced in, but the fencing is not fully enclosed.
- Overflow pipe covered in riprap. Difficult to determine if it is screened or equipped with a flapper gate to prevent critters, animals and debris from entering the tank.

Jamison Tank



Description:

- Steel, 210,000 gallons
- On SCADA

Observations:

- No visual signs of damage.
- The tank does not have an overflow pipe or a hatch.
- Air vents covered by large screens on the sides of the tank. Unclear whether there is a finer mesh screen inside the larger screen.

Galleon Tank (also known as Tradewinds Tank)


Description:

- Steel, 325,000 gallons
- Not on SCADA

Observations:

- No visual signs of damage.
- The tank overflows into a customer's yard.

Robinhood Tank	
	**Description:** - Steel, 10,000 gallons **Observations:** - Tank in generally good condition - Signs of minor rusting/corrosion on overflow pipe. - No drain. - No visual water level indicator. - Not on SCADA.
Camino Verde Tank	
	**Description:** - Plastic, 5,000 gallons - Not on SCADA **Observations:** - Replaced old tank destroyed during fire. - The plastic tank does not have an overflow pipe, a drainpipe, or a water level indicator.
Oberst Tank	
	**Description:** - Plastic, 5,000 gallons - On SCADA **Observations:** - During the site visit, the Oberst tank was a steel tank with multiple leaks and signs of corrosion. This steel tank has since been replaced with a new plastic tank, as shown.

Rosita Tank	
	**Description:** - Plastic, 4,000 gallons **Observations:** - In good condition. - The tank does not have an overflow pipe, a drainpipe, or a water level indicator.

PUMP STATIONS	
Galleon Pump Station	
	**Description:** - One 50 HP pump - Pump housed in locked building. **Observations:** - Pump is old and is leaking. - No redundancy. - Openings in the roof and other areas of the building.

Galleon PSI System (also known as Galleon Heights Transfer Station or Tradewinds Transfer Station)

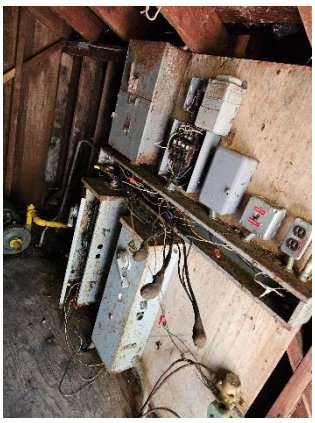
Description:

- One 10 HP booster pump and two bladder tanks.
- Winco generator that has been refurbished and starts automatically.
- On SCADA

Observations:

- Housed in a locked, old building with holes on the sides.

Rosita Pump Station



Description:

- Small pump house
- One booster pump

Observations:

- Very old electrical panel/system.
- Significant leak from the valve.
- Unsecured plastic pipe that is suspended and spans the bridge. This pipe reduces in diameter from 6 inches to 3 inches, then to 2 inches, before expanding back to 6 inches.

Robinhood Pump Station

Description:

- One 50 HP booster pump
- On timer

Observations:

- In pump house.
- In good condition.

Bloom Grade Pump Station

Description:

- One 50 HP booster pump
- Housed in small wooden shed.
- On timer

Observations:

- The pump appears to be quite old.

Camino Verde & Hill House Pump Station (also known as pump house #3)

Description:

- Two booster pumps housed in a small wooden pump house.
- On timer

Observations:

- The pump serving the Camino Verde tank appears to be quite old.
- Hill House pump is currently inactive.

Oberst Pump Station

Description:

- One booster pump that is located on a customer's property.
- The pump is not secured and is covered with a plastic container.
- An old wooden shed/pump house with a damaged pump remains on site, while the new pump is positioned nearby.

Observations:

- The line from the pump station is a 2" suspended line crossing boulder creek.

APPENDIX B: Water Rights Memorandum

Confidant Advisors, LLC

Memorandum

To:	Lydia Rossiter/Moonshot Missions, LLC
From:	Jeff Barry
CC:	Genevieve Mancuso Reshet Gebremariam
Date:	August 19, 2024
Subject:	Big Basin Water Company Water Rights

Introduction

This memorandum presents information regarding water rights held by the Big Basin Water Company (BBWC), located in Santa Cruz County, California. The objective of this work is to provide Moonshot Missions information to be included in its report to the receivership. Moonshot Missions would like to: 1) have information about the surface water diversion and storage water rights, 2) know if they are in good standing and conditions of a license granted to Big Basin Water Company have been met, and 3) if the water rights can be retained if the property owned by the Water Company is sold and what steps should be taken to preserve the water rights.

The source of information presented in this memorandum was obtained from the California State Water Resources Control Board (SWRCB) online water rights information system (eWRIMS – Electronic Water Rights Information Management System | California State Water Resources Control Board). Additional information was obtained from conversations with Mr. Damon Hess at the SWRCB, Ms. Jessica Diaz, water law attorney at Brownstein Hyatt Farber Schreck, and Mr. Jim Moore, former General Manager of BBWC. No field check was conducted to verify the information.

The specific scope of work included the following:

1. Review and compile information and data available online regarding the surface water rights including permit application, license granted by the SWRCB, points of diversion, place

of use, allowed uses, maximum diversion rates and storage volume, conditions that must be met, and annual water use reports. Obtain documentation, if available, on the well that is presently being used as a source of supply.

2. Prepare a map showing the points of diversion, place of use, and Water Company boundaries.

3. Contact Jim Moore, former Water Company Manager, to obtain additional information and answer questions about water rights and reporting practices.

4. Contact staff from SWRCB to discuss the water rights, answer questions, and learn about any concerns they may have about what is reported in their files.

5. Consult with a Water Law Attorney about the efficacy of retaining and transferring water rights such as those in question. More in-depth legal analysis may be required but is not included in this scope of work.

6. Prepare a memorandum discussing the findings of this investigation.

Results

Table 1 presents a summary of the active and inactive water rights held by Big Basin Water Company. The Company holds an active water right (Permit 17425) to divert up to 0.37 cubic feet per second (cfs) from 5 points of diversion (POD) and store up to 460 acre-feet per year (AFY) in Jamison Reservoir as shown on Figure 1. The total amount of water to be placed to beneficial use (direct diversion plus withdrawal from storage) cannot exceed 231 AFY. Allowed beneficial uses are domestic and fire protection within the boundaries of the BBWC service area and Forest Springs Improvement & Maintenance Association in Sections 2, 11, 12, 14, 15, 23, & 24, all within T9S, R3W, MDB&M, as shown on the map on file with SWRCB.

The points of diversion shown on Figure 1 are based upon the coordinates that are listed in the actual water rights. Attachment 1 contains the License issued by the SWRCB. Water use reports (report of Licensee) have been submitted to the SWRCB through December of 2022 (refer to Attachment 2). Given the fact that the water system was damaged in the last fire, it is the opinion of Jessica Diaz that they are not subject to forfeiture due to lack of use or reporting of use.

The Company also holds 3 inactive riparian surface water rights as shown on Figure 1. These diversions are from three springs and are likely original diversions when the Company was established. It is unknown if these springs and spring boxes are functional. It is not known when the riparian water rights were last used.

Table 1 – Big Basin Water Rights

Application Number	POD Num	POD ID	Latitude	Longitude	POD Type	POD Status	Parcel Number	Direct Diversion Rate	DD Unit	POD Storage	Source
ACTIVE											
A024804	04	12552	37.1353061	-122.15561106	Point of Direct Diversion	Licensed	083-251-71	0.37	Cubic Feet per Second	4.6	UNST
A024804	03	12553	37.13965603	-122.15879515	Point of Direct Diversion	Licensed	083-251-77	0.37	Cubic Feet per Second	4.6	UNST
A024804	05(POR)	5792	37.1486	-122.1671	Point of Storage - Unspecified	Licensed	083-251-77	0.0	Acre-feet per Year	4.6	
A024804	02	20250	37.14803213	-122.16858884	Point of Direct Diversion	Licensed	083-251-77	0.37	Cubic Feet per Second	4.6	UNST
A024804	01	20251	37.14774285	-122.16961187	Point of Direct Diversion	Licensed	083-251-76	0.37	Cubic Feet per Second	4.6	UNST
INACTIVE - RIPARIAN											
S008439	01	4859	37.13965603	-122.15879515	Point of Direct Diversion	Inactive	083-251-77	0.208	Cubic Feet per Second	0.0	CORVIN SPRING
S008440	01	19649	37.14803703	-122.16824579	Point of Storage - Unspecified	Inactive	083-251-77	0.0	Gallons per Day	0.0	JAMISON SPRING
S008441	01	31163	37.1353061	-122.15561106	Point of Storage - Unspecified	Inactive	083-251-71	0.0	Gallons per Day	0.0	FOREST SPRING

As shown on Figure 1, each POD is located in a different parcel (refer to APNs). It will be necessary to specifically exclude the water rights and have an easement to the PODs if any of the parcels owned by BBWC are sold. This was confirmed by Mr. Hess from the SWRCB. Likewise, a transfer application must be prepared and submitted to the SWRCB should it be desirable to move any of the PODs. It is unknown if infrastructure associated with any of the diversions crosses from one parcel to another; this must also be considered in an easement.

While the riparian/spring water rights are considered inactive and not used in recent years, it would be prudent to maintain access to them if the Company retains the land they are appurtenant to. Because the spring water rights are riparian, the claim goes with the land should the land be sold (according to Mr. Hess).

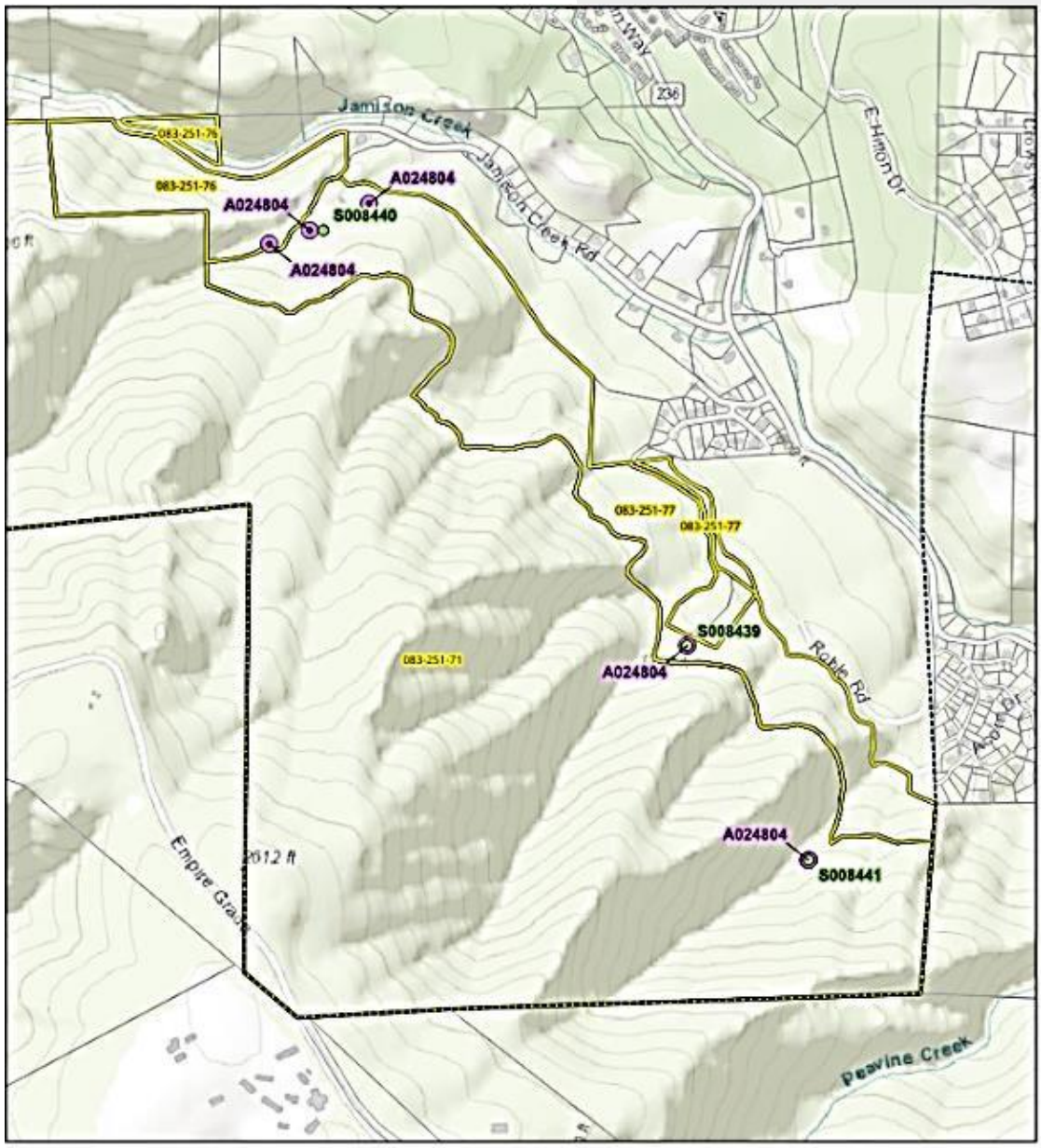
It is my understanding that since the fire in 2022, BBWC has utilized water produced from wells to supply water to the service area. According to Mr. Moore, Well 4 is now the primary source of supply for the water system. It is located near POD #AO24804 on parcel #083-251-77 (refer to Figure 1). According to Mr. Moore the well can produce 200 gpm and is 300 feet deep. Due to its depth, it is unlikely to be associated with any of the surface water PODs (not riparian). For this reason, groundwater produced by Well 4 is considered percolating water and is not subject to SWRCB regulation.
Because the beneficial use is for community purposes, it is considered appropriative by the SWRCB. Appropriative rights have a lower priority than overlying rights held by surrounding landowners, should there be a reduction in supply and overdraft of the aquifer. If the parcel that Well 4 is located on is sold, the well will go with the property unless a separate agreement is reached.

Mr. Moore mentioned a second well that produces less than 30 gpm. This flow has not been consistent. He referred to it as a shallow "horizontal well" and indicated that it is associated with one of the riparian rights. It is located uphill of Well #4 and discharges to "Jamison Tank". I was not able to conclusively locate this well. If this well is still being used and is associated with an inactive riparian right, notice should be provided to the SWRCB that this POD is still active. This well and associated water rights must also be retained if the parcel it is located on is sold.

Recommendations

Following are recommendations relating to preserving the water rights associated with BBWC:

1. It will be necessary to specifically exclude the water rights and establish an easement to the PODs in the sale contract if any of the parcels owned by BBWC are sold.
2. Hire a surveyor to specifically identify the location of all PODs and wells relative to the boundaries of any parcels to be sold.
3. Obtain a map showing the locations of pipes and infrastructure and hire a surveyor to prepare descriptions of easements to be included in a sale agreement.
4. If Well 4 is located on a parcel that is being sold, an agreement with the buyer and an easement will be needed in order to preserve access to the well and water.
5. Determine the location of the "horizontal" well, confirm whether it is being used, and find out what riparian water right it is associated with. If it is being used or will be used, notify the SWRCB regarding the status of the associated riparian right. Confirm whether the Department of Health is aware that this well is being used for drinking water purposes and determine if required testing and monitoring requirements have been followed.



LEGEND

- Point of Diversion (POD)
- POD - Inactive Riparian
- Big Basin Service Area
- Tax Lot of Interest
- Tax Lot

Data Sources: QGIS, ESRI, Santa Cruz Co., eWRIMS (2024), LAFCO (2024)

Figure 1 Big Basin Water Rights
Santa Cruz County

0 1/4 mi

The attachments referenced in this memo are included herein:

Attachments

APPENDIX C: Rates of Neighboring Water Providers

This table shows a comparison of some neighboring water providers, assuming a three-person household using roughly 50 gallons of water per person per day.

Agencies	Average Monthly Bill for 4,600 Gallons of Water
Soquel Creek Water District	$139.17
PureSource Water Inc.	$124.55
San Lorenzo Valley Water District	$122.40
City of Santa Cruz Water Department	$104.84
Scotts Valley Water District	$97.55
Big Basin Water Company	**$86.27**
San Jose Water Company	$85.82
Watsonville Public Works and Utilities	$54.66

APPENDIX D: Potential Capital Funding Options

Grant Name	Grant Description	Annexation into SLVWD	Annexation into Another Local Agency	County Service Agency	Independent Special District	Mutual Water Company	Private Company (Existing or New)	Source
State Water Board – Drinking Water State Revolving Fund (DWSRF) Loan - Planning Grants	Planning/design of drinking water infrastructure projects (e.g., treatment, distribution systems, consolidations, pipeline extensions, water sources, water meters, water storages, etc.). No specific maximum limit.	Eligible - Eligible for up to 100% grant/PF funding for planning projects related to consolidation and feasibility studies, especially if the project serves a small Disadvantaged or Severely Disadvantaged Communities (DAC or SDAC)	Eligible - Qualified if annexed into public entity, especially for consolidation studies	Eligible - managed by a county government, especially serving DAC and small communities	Eligible - Public Entity	Eligible - non-profit mutual water companies	Eligible - Privately-owned community water systems (e.g., for-profit water utilities)	https://www.waterboards.ca.gov/water_issues/programs/grants_loans/
State Water Board – DWSRF Loan - Construction Projects	Loan funding for construction projects related to treatment systems, distribution systems, interconnections, consolidations, pipeline extensions, water sources, water meters, water storages, etc. May offer incentives for consolidation, including up to $10 million in 0% financing and grants of $3,000-10,000 per connection.[16]	Eligible - Eligible for up to 100% grant/PF funding for construction projects related to consolidation if serving a small SDAC or DAC	Eligible - Qualified if annexed into public entity, especially consolidation	Eligible - managed by a county government, especially serving DAC and small communities	Eligible - Public Entity	Eligible - non-profit mutual water companies	Eligible - Privately - owned community water systems.	https://www.waterboards.ca.gov/drinking_water/services/funding/dwsrf_basics.html

[16] Drinking Water Grants – Drinking Water State Revolving Fund (DWSRF) Program Fact Sheet. https://www.waterboards.ca.gov/water_issues/programs/grants_loans/srf/docs/dw-grant-fact-sheet.pdf

Technical Assistance (TA) Program ad ministered by The State Water Resources Control Board's Office of Sustainable Water Solutions	Grant available for project coordination, funding application support, rate studies, income surveys, engineering and environmental analysis, legal support for entity formation and agreements, as well as various technical assistance activities. Must serve small community, DAC, and high demand for water. TA funding program primarily focused on systems serving small DACs.	Eligible - Public Entity.	Eligible - Qualified if annexed into public entity, especially under DAC criteria	Eligible - managed by a county government	Eligible - Public Entity	Eligible - non-profit mutual water companies	Eligibility for limited technical assistance, particularly if it operates as a community water system serving a disadvantage d community (DAC). However, priority is typically given to small DACs addressing drinking water needs.	https://www.waterboards.ca.gov/water_issues/programs/grants_loans/tech_asst_funding.html
Safe and Affordable Funding for Equity and Resilience (SAFER)	Funding is available to help small disadvantage communities with interim water supplies, planning or design, construction, consolidation (physical or managerial), administrator funding, operations and maintenance, and technical assistance needs. Additional consideration for DAC, small systems, and failing systems.	Eligible - Public Entity.	Eligible - Public Entity.	Eligible - Public Entity.	Eligible - Public Entity.	Eligible - non-profit mutual water companies. Must benefit the customers and not the shareholders.	Eligible - Privately - owned community water systems. Must benefit the customers of the system and not the investors.	https://www.waterboards.ca.gov/water_issues/programs/grants_loans/sustainable_water_solutions/docs/2023/final_policy_for_dev_fep_sadwf_0130.pdf
CoBANK Loan Program	Funds for rural water and wastewater infrastructure projects. Funds can provide interim & bridge financing, term loans for system upgrades and lines of credit.	Eligible - Public Entity.	Eligible - Public Entity.	Eligible - Public Entity	Eligible - Public Entity	Eligible - non-profit mutual water companies	Eligible - Privately - owned community water systems.	https://www.cobank.com/web/cobank/corporate//industry/water

National Rural Water Association Rural Water Loan Fund	Low-cost loans for short term repair costs, replacement equipment, small scale extensions, system upgrades, and small capital projects that are not part of regular maintenance and pre-development costs associated with larger infrastructure projects. Energy efficiency projects to lower costs and improve system sustainability.	Eligible - Public Entity.	Eligible - Public Entity.	Eligible - Public Entity	Eligible - Public Entity	Eligible - non-profit mutual water companies	Not Eligible	https://nrwa.org/members/products-services-portfolio/rural-water-loan-fund/
Rural Community Assistance Corporation (RCAC) Environmental Infrastructure Loan Program	The Environmental Infrastructure Loan program has several loan programs. Short term products cover eligible projects including feasibility studies (e.g., PER, EA) - NTE $50,000; planning and pre-development (e.g., engineering, legal, bond counsel) costs prior to receiving state and federal funding - NTE $350,000; and short-term construction costs for water & wastewater facilities that serve lower-income rural areas - NTE $3 million. Intermediate loans offer low interest and up to 20 years repayment - NTE $100,000. Long term loans must meet requirements of USDA's Water & Waste Disposal Grants including repayment ability & loan security.	Eligible - Public Entity.	Eligible - Public Entity.	Eligible - Public Entity	Eligible - Public Entity	Eligible - non-profit mutual water companies	Not Eligible	https://www.rcac.org/lending-2/environmental-loans/
RCAC Small Business Loan Program	Funds for private sector financing needs include short term loans for working capital & lines of credit; and long-term loans for real estate and equipment acquisition. The loan under consideration must result in job creation or retention.	Not Eligible	Not Eligible	Not Eligible	Not Eligible	Eligible - non-profit mutual water companies	Eligible - for profit organization	https://www.rcac.org/lending-2/small-business-loans/
RCAC Community Facilities Loan Program	To improve essential community facilities. Short-term loans for acquisition and pre-development needs (market studies, EA reports); interim construction costs and permanent financing.	Eligibility depends on whether population served has MHI is below state/county MHI, whichever is greater	Eligibility depends on whether population served has MHI is below state/county MHI, whichever is greater	Eligibility depends on whether population served has MHI is below state/county MHI, whichever is greater	Eligibility depends on whether population served has MHI is below state/county MHI, whichever is greater	Eligibility depends on whether population served has MHI is below state/county MHI, whichever is greater	Not Eligible	https://www.rcac.org/lending-2/community-facility-loans/

Rural Community Assistance Partnership Communities Unlimited Water/Wastewater Loans	Loans with terms up to 15 years for small, rural community water/wastewater projects. Funds may be used for construction projects & system improvements, extending service to new customers, purchase of equipment, or pre-development activities that allow systems to qualify for longer-term financing. Emergency financing in the event of a natural disaster or catastrophic system failure in as little as 1-3 business days.	Eligible - Public Entity.	Eligible - Public Entity.	Eligible - Public Entity	Eligible - Public Entity	Eligible - non-profit mutual water companies	Not Eligible	https://communitiesu.org/lending/#water-loans
United States Dept of Agriculture - Rural Development (USDA-RD) Emergency Community Water Assistance Grants	Eligible rural communities to recover from or prepare for emergencies that threaten the availability of safe drinking water. Grants up to $150,000 for waterline extensions, repair breaks or leaks in distribution system and related maintenance to replenish the water supply. Grants up to $1,000,000 for construction of a new water source, intake and/or treatment facility or waterline extension. "Emergency" includes drought, flood, earthquake, disease outbreak, chemical spill, leak or seepage, other. Can fund 100% of eligible costs.	Eligible - Public Entity.	Eligible - Public Entity.	Eligible - Public Entity	Eligible - Public Entity	Eligible - non-profit mutual water companies	Not Eligible	Website: https://www.rd.usda.gov/programs-services/water-environmental-programs/emergency-community-water-assistance-grants#overview
USDA-RD Water & Waste Disposal Direct Loan & Grant Programs	Funds may be used to finance the acquisition, construction or improvement of drinking water sourcing, treatment, storage & distribution; sewer collection, transmission, treatment & disposal; solid water collection, disposal and closure; stormwater collection, transmission & disposal. Fixed, low interest loans. Repayment up to 40 years. Grants may be available.	Eligible - Public Entity.	Eligible - Public Entity.	Eligible - Public Entity	Eligible - Public Entity	Eligible - non-profit mutual water companies	Not Eligible	https://www.rd.usda.gov/programs-services/water-environmental-programs/water-waste-disposal-loan-grant-program
USDA-RD Water & Waste Disposal Predevelopment Planning Grants	Funds for initial planning and development for application to USDA-RD W/WD direct loan/grant and loan guarantee program. Maximum is $30,000 or 75% of predevelopment planning costs. 25% local cash match required	Eligible - Public Entity.	Eligible - Public Entity.	Eligible - Public Entity	Eligible - Public Entity	Eligible - non-profit mutual water companies	Not Eligible	https://www.rd.usda.gov/programs-services/water-environmental-programs/water-waste-disposal-predevelopment-planning-grants

United States Dept. of Interior - Bureau of Reclamation (BOR) WaterSMART Grants Small Scale Water Efficiency Projects	Provides for 50/50 cost share funding for small scale on the ground water efficiency projects identified by previous planning efforts. Projects include: canal lining/piping to address seepage, municipal meter upgrades, irrigation flow measurement devices, SCADA systems and automation. Max award $75,000; total project costs shall not exceed $200,000. Requires 50% non-federal cost-share.	Eligible - Public Entity.	Eligible - Public Entity.	Eligible - Public Entity	Eligible - Public Entity	Not Eligible	Not Eligible	https://www.usbr.gov/watersmart/swep/index.html
BOR WaterSMART Water & Energy Efficiency Grants	Provides for 50/50 cost share funding for projects to conserve & use water more efficiently; increase the production of hydropower; mitigate conflict risk in areas at a high risk of future water conflict and other projects that contribute to water supply reliability. Water conservation projects including canal lining/piping, metering, SCADA & automation, groundwater recharge, landscape irrigation measures; energy-water nexus where use of renewable energy sources in the management & delivery of water is increased; benefits to endangered species & projects that implement or use water markets to make water available to meet other existing water supply needs. Projects must be completed within 24 - 36 months. Requires 50% non-federal cost share.	Eligible - Public Entity.	Eligible - Public Entity.	Eligible - Public Entity	Eligible - Public Entity	Not Eligible	Not Eligible	https://www.usbr.gov/watersmart/weeg/
BOR System Optimization Reviews thru WaterSMART Water Conservation Field Services Program	System optimization reviews (SORs) are to assess the potential for water management improvements and to identify a plan of action that contains recommendations for implementing specific improvements that have the potential to enhance water management. The review can include an analysis of the entire water delivery system, district, watershed, or portion thereof. SORs are intended to take a broad look at system-wide efficiency and are not focused on single project-	Eligible - Public Entity.	Eligible - Public Entity.	Eligible - Public Entity	Eligible - Public Entity	Not Eligible	Not Eligible	https://www.usbr.gov/waterconservation/

	specific planning. Requires 50% non-federal cost share.							
BOR Designing Water Management Improvements thru WaterSMART Water Conservation Field Services Program	Design of improvement projects may include pipelines, canal lining, water measurement structures, or other water management improvement projects. This would include the necessary preliminary work in preparation of the design such as surveying and gathering pertinent site specific information (e.g., hydraulic head available at site, soil testing, groundwater levels). Requires 50% non-federal cost share.	Eligible - Public Entity.	Eligible - Public Entity.	Eligible - Public Entity	Eligible - Public Entity	Not Eligible	Not Eligible	https://www.usbr.gov/waterconservation/

APPENDIX E: Annexation Considerations

There are two key issues at the heart of an annexation process that, when handled carefully, can contribute to its successful completion.

Cross-Subsidization

The first issue is cross-subsidization, which is when the customers of the utility annexing end up paying some of the costs incurred by the customers of the utility being annexed. In California, even though cross-subsidization is prohibited, customers and utilities tend to be cautious about the possibility. An approach to addressing this issue that can contribute to the success of the annexation is the concept of an acquisition balance.

An acquisition balance is a calculation that financially partitions the net costs associated with integrating and providing needed improvements to serve the annexed area and allows those costs to be recovered over time from the customers in the annexed area. The acquisition balance can be structured to provide credit for property and assets that the utility being annexed may have that provide a benefit to the customers of the annexing utility. The net acquisition balance is the amount that the customers of the utility being annexed will need to pay, less any credits received, for the improvements to fully integrate them into the annexing system. The assets that the utility being annexed brings include the water rights which would be transferred. The acquisition balance would be divided into monthly surcharges.

The acquisition balance period is the time it would take the customers of the utility being annexed to pay down the acquisition balance. Once the improvements needed for integration are completed, customers of the utility being annexed would pay the same rates as the customers of the annexing utility. This concept ensures that the costs of the improvements needed for annexation are fairly accounted-for and do not financially burden the annexing utility's current customers.

Representation

The second issue is how customers of the utility being annexed would be represented by the board of the annexing utility. This is an issue that should be decided before annexation. One approach that promotes success is an advisory committee made up of several customers of the utility being annexed and a member of the annexing utility's current board. This advisory committee is active during the acquisition balance period, creating a public process while allowing the annexing utility's board to have ultimate authority.

It should also be noted that once the dissolution and annexation occur, and the annexed area is within the service area boundaries of the annexing utility, residents of the annexed area will be eligible to run for the Board of Directors of the annexing utility.

Both the acquisition balance (including any credits) and representation can be included in a pre-consolidation agreement.

ABBREVIATION KEY

Abbreviation	Stands For
ANSI	American National Standards Institute
AWWA	American Water Works Association
BBWC	Big Basin Water Company
Brown Act	Ralph M. Brown Act
CalWARN	California Water/Wastewater Agency Response Network
CFS	Cubic feet per second
CPUC	California Public Utilities Commission
CSA	County Service Area
DAC	Disadvantaged community, defined as 80% of state Median Household Income
DCSD	Davenport County Sanitation District
CZU	CAL FIRE San Mateo-Santa Cruz Unit
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
GPD	Gallons per day
GPM	Gallons per minute
GUDI	Groundwater Under the Direct Influence of Surface Water
HCF	Hundred cubic feet
HP	Horsepower
IOU	Investor Owned Utility
LAFCO	Local Agency Formation Commission
MGD	Million gallons per day
NSF	National Science Foundation
PPE	Personal protective equipment
Proposition 218	Right to Vote on Taxes Act
PRV	Pressure reducing valve
PSOC	Potential source of contamination
PVC	Polyvinyl chloride
PVWMA	Pajaro Valley Water Management Agency
R&R	Replacement and refurbishment
RTU	Remote Telemetry Unit
SCADA	Supervisory Control and Data Acquisition
SDS	Safety data sheet
SLVWD	San Lorenzo Valley Water District
SRF	State Revolving Fund
SWRCB	State Water Resource Control Board
UL	Underwriters Laboratories
USDA	United States Department of Agriculture
VFD	Variable frequency drive

FOOTNOTES

[1] Proposition 218 Guide for Special Districts. https://www.waterboards.ca.gov/drought/pricing/docs/csda_guide_proposition_218.pdf

[2] Declaration of Jonathan Weininger in Support of Application for Appointment of Receiver under Health and Safety Code Section 116665.

[3] Order granting State Water Resources Control Board's Request for Appointment of Receiver for the Big Basin Water Company.

[4] Environmental Finance Center Grant Program. https://www.epa.gov/waterfinancecenter/efcn

[5] California State Water Resources Control Board. ArcGIS Hub. "California Drinking Water System Area Boundaries". Accessed June 16, 2024. https://hub.arcgis.com/datasets/waterboards::california-drinking-water-system-area-boundaries/explore?location=37.160263%2C-122.168436%2C13.69

[6] Standard Practice for Processing Informal General Rate Cases of Small Water and Sewer Utilities (Class B, C and D). https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M531/K314/531314247.pdf

[7] San Jose Water Company. Big Basin Water Company – Engineering Assessment & Acquisition Recommendation, 2018.

[8] FEMA Flood Map Service Center https://msc.fema.gov/arcgis/rest/directories/arcgisjobs/nfhl_print/mscprintb_gpserver/jb33d15cb3ca346079817f8ee7b24c660/scratch/FIRMETTE_e1eccf2b-a388-4fcb-82c8-04c79e237c10.pdf

[9] Office of the State Fire Marshal. (n.d.). Fire Hazard Severity Zones. California Department of Forestry and Fire Protection. Retrieved August 27, 2024, from https://osfm.fire.ca.gov/what-we-do/community-wildfire-preparedness-and-mitigation/fire-hazard-severity-zones

[10] SAFER Dashboard. https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/saferdashboard.html

[11] Santa Cruz Local Agency Formation Commission. Big Basin Water Company: Governance Options, 2024. https://santacruzlafco.org/wp-content/uploads/2024/02/Mar-2024-Entire-Agenda-Packet.pdf

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[14] California State Water Resources Control Board. "California Drinking Water State Revolving Fund Interest Rate History." Accessed August 15, 2024. https://www.waterboards.ca.gov/drinking_water/services/funding/documents/srf/dwsrf_interest_rate_history.pdf

[15] California Public Utilities Commission. "Rates of Return and Rates of Margin for Class C, Class D Water and Sewer Utilities." Accessed August 15, 2024. https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/water-division/reports/wd-memorandum/rorandrom-classcd2024.pdf

[16] Drinking Water Grants – Drinking Water State Revolving Fund (DWSRF) Program Fact Sheet. https://www.waterboards.ca.gov/water_issues/programs/grants_loans/srf/docs/dw-grant-fact-sheet.pdf