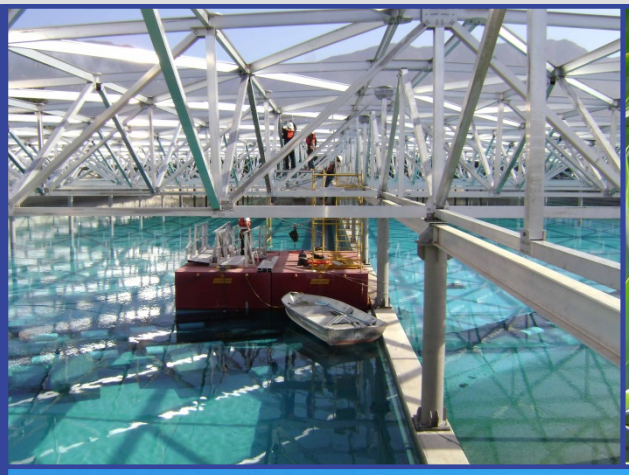
CACHUMA OPERATION AND MAINTENANCE BOARD

INFRASTRUCTURE IMPROVEMENT PLAN FY 2025-2029



ENGINEERING - OPERATIONS

CACHUMA OPERATION AND MAINTENANCE BOARD

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EXECUTIVE SUMMARY

Protecting and Improving Water Conveyance Reliability

The Cachuma Project was constructed in the early 1950s by the United States Department of the Interior, Bureau of Reclamation (Reclamation) under contract with the Santa Barbara County Water Agency on behalf of the Cachuma Member Units. The Cachuma Member Units are the Goleta Water District (GWD), the City of Santa Barbara (City of SB), Montecito Water District (MWD), Carpinteria Valley Water District (CVWD), and the Santa Ynez River Water Conservation District - Improvement District No. 1 (ID#1).

The Cachuma Operation and Maintenance Board (COMB) is a California Joint Powers Agency formed in 1956 by the Cachuma Member Units pursuant to an agreement with Reclamation. COMB Member Agencies are the GWD, the City of SB, MWD, and CVWD. An agreement with Reclamation transferred to the COMB Member Agencies the responsibility to operate, repair, and maintain all Cachuma Project facilities exclusive of Bradbury Dam. COMB is the mechanism through which the Member Agencies carry out that responsibility.

The Cachuma Member Units entered into contracts in 1949 (ID#1 in 1954) with the Santa Barbara County Water Agency for the purpose of receiving water from the Cachuma Project for use and benefit of the Cachuma Member Units. Over the past seventy years, the Cachuma Project has been the principal water supply for the Santa Ynez Valley and South Coast Communities, delivering water to over 200,000 people.

Water from Lake Cachuma is conveyed to COMB Member Agencies through the North Portal Intake Tower located at Lake Cachuma approximately mid-reservoir. The North Portal Intake Tower conveys water into the Tecolote Tunnel, which extends 6.4 miles southeast through the Santa Ynez Mountains to its southern terminus (South Portal) located in the foothills of Goleta. Conveyed water continues into the South Coast Conduit (SCC), which is primarily a concrete-lined, concrete encased, large diameter steel cylinder pipeline extending 26 miles from Goleta to Carpinteria. Overall, the conveyance system is comprised of these major infrastructure elements: the North Portal Intake Tower (inclusive of the Secured Pipeline), Tecolote Tunnel, South Coast Conduit, Sheffield Tunnel, four regulating reservoirs (Glen Anne, Lauro, Ortega, and Carpinteria), and appurtenant structures along the entire system (control stations, blow offs, Air Vent Air Release (AVAR) Valves, turnouts, flow control valves, meters, instrumentation, etc.).

This COMB Infrastructure Improvement Plan (IIP) outlines critical system components to be improved, repaired, or replaced to ensure reliability of service, and provides project prioritization, scheduling, and cost estimates for budgetary decisions. The guiding principle contained within this IIP is to protect the interests of the COMB Member Agencies by ensuring each asset maintains regulatory compliance, reliability, and safety. The intent of this IIP is to

set forth a reasoned decision-making methodology that will protect infrastructure, water conveyance abilities, and avoid exorbitant future cost.

COMB management and staff developed this IIP to provide a methodology for COMB Directors to make cost effective capital improvement decisions. The Board of Directors and staff are proud to serve as stewards of this public asset which provides the lifeline conveyance of water necessary for the economy and quality of life on the South Coast of Santa Barbara County.

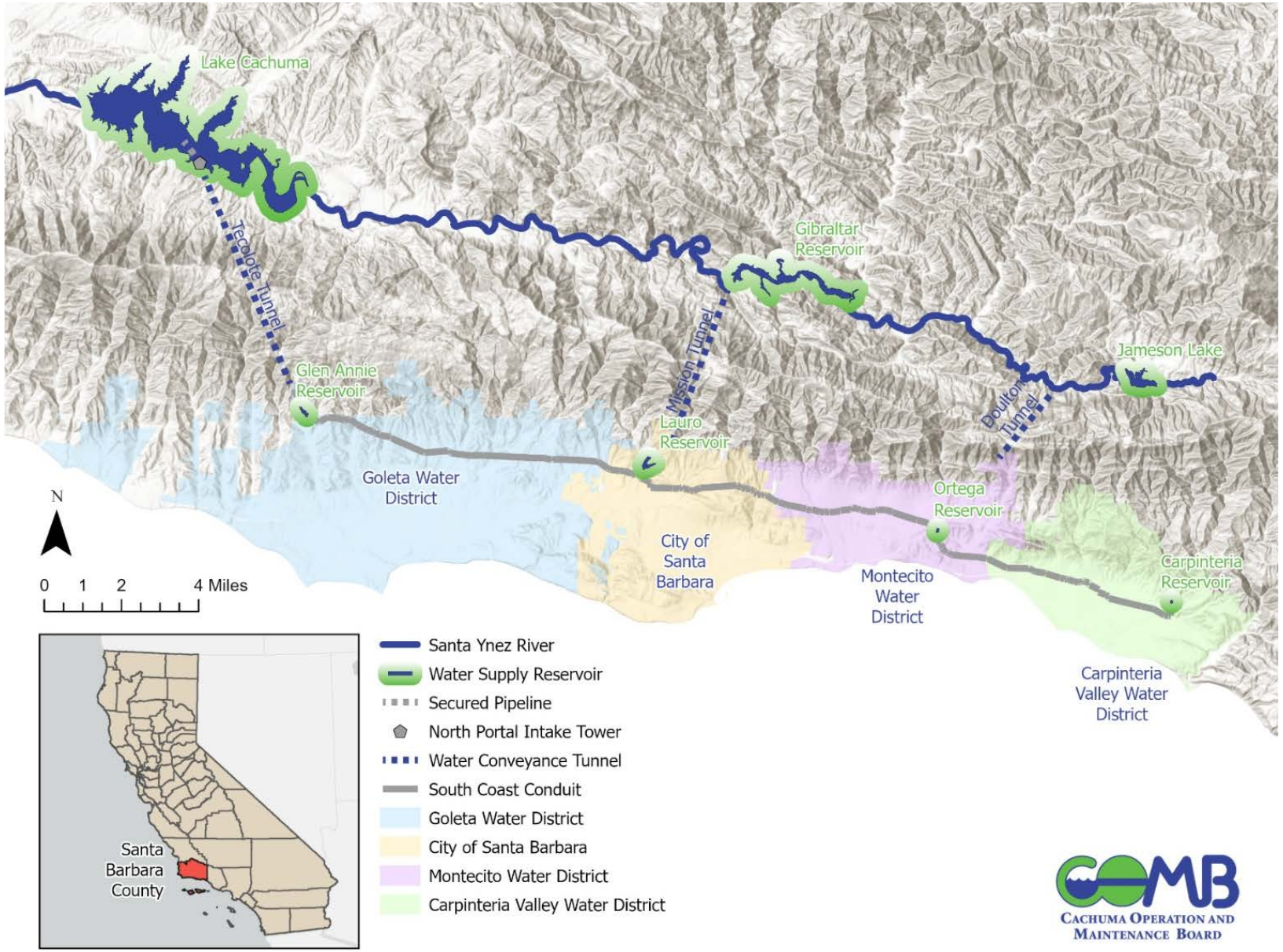


Figure 1. *Cachuma Project Infrastructure and Location Overview Map*

ACROMYMS AND ABBREVIATIONS

AMS - Asset Management Spreadsheet
ASI - Annual Site Inspection
BA – Biological Assessment
BO – Biological Opinion
CCRB – Cachuma Conservation Release Board
CCWA – Central Coast Water Agency
CD - Carpinteria Dam
CFR - Comprehensive Facility Review
City of SB – City of Santa Barbara
COMB – Cachuma Operation and Maintenance Board
CVWD – Carpinteria Valley Water District
EPA - United States Environmental Protection Agency
GAD - Glen Anne Dam
GWD – Goleta Water District
ID#1 – Santa Ynez River Water Conservation District, Improvement District No.1
IIP – Infrastructure Improvement Plan
IRWMP – Integrated Regional Water Management Plan
LD - Lauro Dam
MA – Member Agencies
MU – Member Units
MURRP – Modified Upper Reach Reliability Project
MWD – Montecito Water District
OD - Ortega Dam
OSR - Other Staff Recommendations
PFR - Periodic Facility Review
RO&M - Review of Operation and Maintenance
SBCWA – Santa Barbara County Water Agency
SCC - South Coast Conduit
SIR - Special Inspection Report
SSCPO - Slope Stabilization and Channel Protection Observations
ST - Sheffield Tunnel
SWP – State Water Project
SWRCB – State Water Resources Control Board

ACROMYMS AND ABBREVIATIONS (cont'd)

SYR - Santa Ynez River
SYRWCD – Santa Ynez River Water Conservation District, or Parent District
TT - Tecolote Tunnel
USBR – United States Bureau of Reclamation, or Reclamation

COMB INFRASTRUCTURE IMPROVEMENT PLAN
FISCAL YEAR (S) 2025-2029

Figure 2. *Lake Cachuma North Portal Intake Tower Maintenance*

ENGINEERING - OPERATIONS

1. INFRASTRUCTURE IMPROVEMENT PLANNING

1.1. Introduction

The COMB IIP formalizes the capital projects implementation strategy needed to complete COMB Board objectives. The IIP identifies, prioritizes, schedules, and costs out capital projects necessary to protect, improve, and sustain a reliable source of water conveyed from the Cachuma Project to Santa Barbara County South Coast communities. The IIP provides decision-making workflows for allocating resources in a structured manner. The IIP spans a five-year planning horizon and will be updated and annually submitted to the Operations Committee for review and comment. Following Operations Committee review and recommendations, the IIP and its annual amendments will be presented to the Board of Directors for final approval and used as a planning document for budget creation.

1.2. Background

Capital projects have historically been a component of the COMB annual budgetary planning process. The comprehensive identification of near and long-term projects over a five-year planning horizon is subject to annual amendments as the identification and analysis of capital projects evolves and cost estimates are refined.

Prior to drafting this IIP, COMB conducted a critical needs assessment, which included an internal inventory of assets, condition assessments, estimates of replacement costs, and the date by which assets require immediate or near-term replacement for major infrastructure and appurtenances. This assessment and documentation have been supplemented with Reclamation site inspection recommendations (periodic and comprehensive reviews) of selected Cachuma Project facilities and components every 3rd and 6th year. This IIP incorporates elements of COMB internal analysis and Reclamation site inspections to produce a list of projects for further consideration. The projects included in this IIP represent a level of investment necessary to continue to meet regulatory requirements, critical needs, and sustain vital infrastructure, as well as projects which will proactively protect or improve the system to better serve the community.

1.3. Purpose

The IIP identifies capital project recommendations to maintain or improve the Cachuma Project System level of service and sets forth review criteria for prioritizing and scheduling during the five-year period. The IIP is intended to serve many purposes including:

➢ Long Range Planning Document

As a long-range planning document, the IIP describes the key infrastructure improvements required over the five-year horizon and identifies additional projects that should be evaluated on a regular basis for potential future inclusion. The goal of the five-year plan is to put into writing a path forward for project implementation, taking into consideration a complex set of constraints.

➢ Cachuma Project Cost Analysis

The IIP provides best available cost estimates for each capital project, and clearly communicates the assumptions underlying the cost estimates. When applicable, potential grant, loan, or alternative funding mechanisms will be provided as a note, modifying the project costs on an individual basis. Cost estimates prepare the Member Agencies for anticipated future costs and provide realistic inputs for their respective rate analysis efforts.

➢ Budget Development

The annual COMB operating budget outlines discrete projects and affiliated costs to communicate needed investment for the forthcoming fiscal cycle. The IIP will provide detailed guidance on priority projects to be included in the annual operating budget.

Note: the inclusion of a project in the plan does not authorize its implementation and construction. Funding is only authorized for projects in the upcoming FY2025 in accordance with the adoption of the FY2025 annual budget. Before each project is allowed to move forward, it must be demonstrated that the capital funding is assured and that the ongoing maintenance and operating requirements can be sustained within forecasted operating resources.

➢ Communication to Stakeholders

The IIP communicates to COMB's stakeholders the array of infrastructure improvements necessary to maintain a reliable supply of water. Communicating the condition of assets and the challenges associated with competing financial resources provides transparency and a basis for our Member Agencies to consider how COMB capital projects relate to their own priorities.

➢ Established Goals

The IIP was developed by balancing the following established goals: 1) carryout COMB Mission of providing a reliable source of water to our Member Agencies; 2) identify infrastructure vulnerabilities and operational deficiencies (Risk Management); 3) provide for a systematic selection of critical projects; 4) maintain current level of service while allocating infrastructure improvement costs over time; 5) seek out funding requirements for long term capital planning; 6) use as a basis for annual budget development; 7) create a framework for ensuring reliable and sustainable operations; and 8) deliver as a planning document for the Board of Directors.

2. Summary of Managed Assets

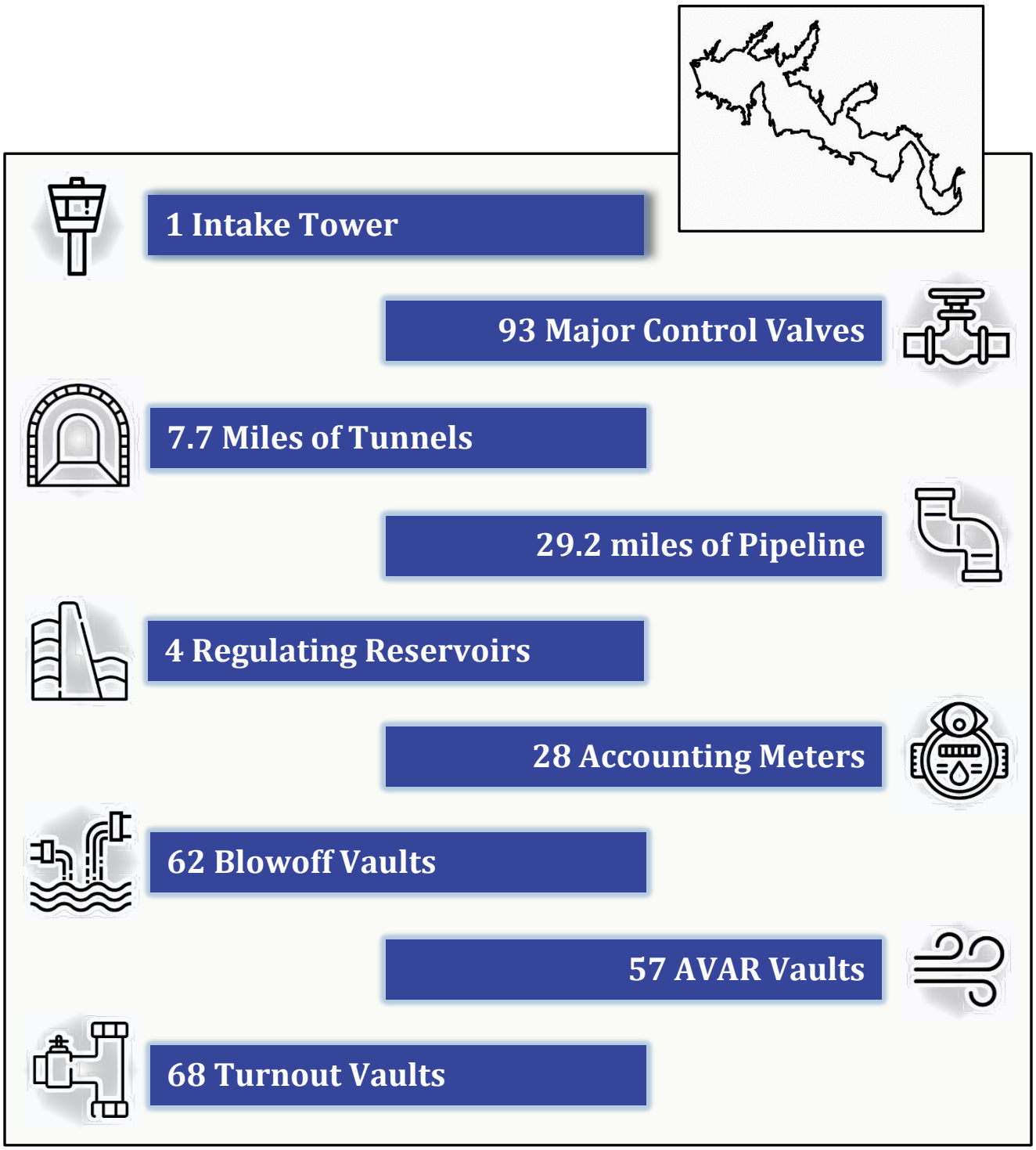


Figure 3. *Summary of Managed Assets Figure*

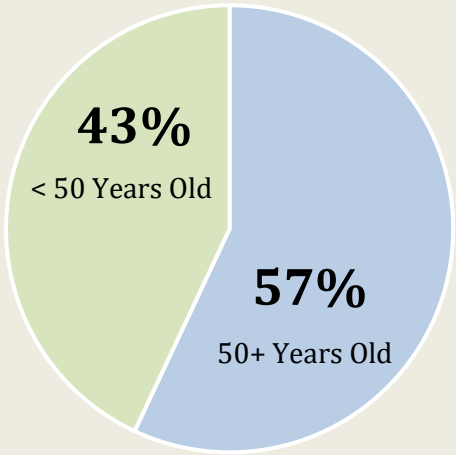
INTAKE TOWER

COMB operates and maintains the North Portal Intake Tower, which diverts water from Lake Cachuma into the Tecolote Tunnel and to the South Coast Conduit (SCC) for delivery to COMB Member Agencies. The vertical intake tower was built by the U. S. Bureau of Reclamation during construction of the Cachuma Project and stands 120 feet tall. The intake tower is located approximately mid-reservoir and contains five slide gates, each at varying levels on the pentagonal-shaped tower. The slide gates are used to manage the conveyance of water from the lake at various elevations depending on lake conditions. In February 2023, the Lake Cachuma Emergency Pumping Facility Secured Pipeline Project modified the system to increase drought resilience and access to better water quality. This was achieved by connecting 3,600 feet of bottom-anchored HDPE pipeline from the bottom slide gate (Gate 5) to deeper waters, with a new screened gravity intake at "Site 1."

VALVES

COMB maintains 93 large control valves and slide gates located within gate chambers, control stations, dam inlet-outlet works, and key blow off locations. Most of the large control valves measure 30 inches or more in diameter. The large control valves are located throughout the system and allow distribution or service area isolation when maintenance on the system is required. COMB performs annual maintenance to ensure their operability. Fifty-seven percent of the valves existing in the system are over 50 years old and are subject to increased risk of inoperability. The large blow off valves near San Antonio Creek were rehabilitated in 2018 and the La Mirada Isolation Valve was added in 2022.

Figure 4. *Lauro Control Station Gate Valve*



Newer valves up 12% since IIP FY 2021-2025*

**Increase partially due to inclusion of major blow off valves*

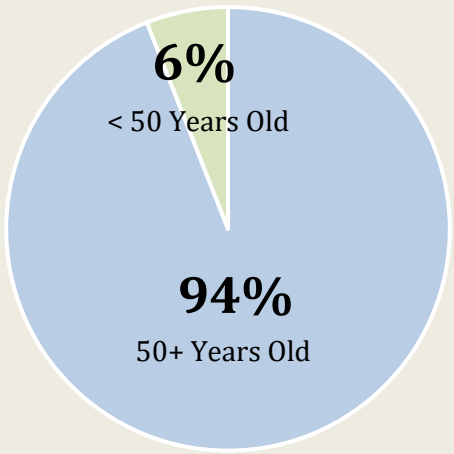
TUNNELS

COMB maintains five separate tunnels covering over 7.7 miles throughout the Cachuma Project system. The tunnels vary in size, with the most significant being the 6.4-mile Tecolote Tunnel, which provides water conveyance from Lake Cachuma through the Santa Ynez Mountains to the South Coast Conduit where it is delivered to the water districts. The tunnels are 7 feet tall, horseshoe shaped, concrete walled tunnels built by Reclamation during the creation and installation of the Cachuma Project. The building of the tunnels required years of difficult work within confined spaces prone to extreme temperatures and flooding.

PIPELINE

COMB operates and maintains over 29.2 miles of concrete conveyance pipeline throughout the system. The primary pipeline is referred to as the South Coast Conduit (SCC) and is composed of over 9.5 miles of 48-inch diameter reinforced concrete cylinder pipe in the upper reach of the system, and 17.0 miles of 27 to 36-inch bar-wrapped concrete cylinder pipe within the lower reach. The SCC is original with the exception of 330 feet installed as part of a Highway 154 realignment in 1970, 2,900 feet of welded steel pipe installed in 1980, and approximately 2,000 feet of welded steel pipe installed in the upper reach as part of the Modified Upper Reach Reliability Project (MURRP) in 2012. In February 2023, 4,025 feet of 36-inch HDPE pipeline was added for the primary alignment plus the flexible connection for the Lake Cachuma Emergency Pumping Facility Secured Pipeline Project. Ninety-four percent of the South Coast Conduit is over fifty years old.

Figure 5. *Terminus of MURRP Second Barrel*



Newer pipeline up 3% since IIP FY 2021-2025

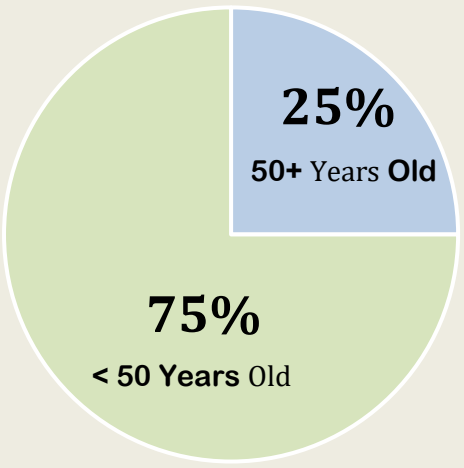
RESERVOIRS

COMB operates and maintains four regulating reservoirs which balance conveyance operations within the South Coast area of the Cachuma Project system. Two of the reservoirs are zoned earth-filled embankment dams originally designed and installed by the Bureau of Reclamation. Lauro Dam has a structural height of 137 feet, a crest length of 540 feet, and a storage capacity of 518 acre-feet. Seismic safety modifications were completed in 2006, which brought the facility into seismic compliance. Glen Anne Dam located in the upper reach is currently non-operational. The two reservoirs located in the lower reach of the system are Ortega Reservoir and Carpinteria Reservoir. They are homogenous earth-filled structures and provide for over 100 acre-feet of storage capacity combined. Both Ortega and Carpinteria Reservoirs have two separate bays divided by a center wall and were covered with aluminum roofs in 2007 and 2005, respectively.

METERS

COMB reads and maintains 28 accounting meters throughout the system. Some of the meters are original venturi style meters installed in the early 1950s. Other meter styles found within the system include propeller, compound, and nine recently installed high accuracy mag-meters. Of the 28 meters, 11 are integrated with SCADA to allow remote tracking and historical logging of flow measurements. COMB also tracks pressure and water quality parameters such as turbidity, specific conductance, pH, and temperature using sensors located at the North Portal.

Figure 6. *Montecito Pump Station Meter*

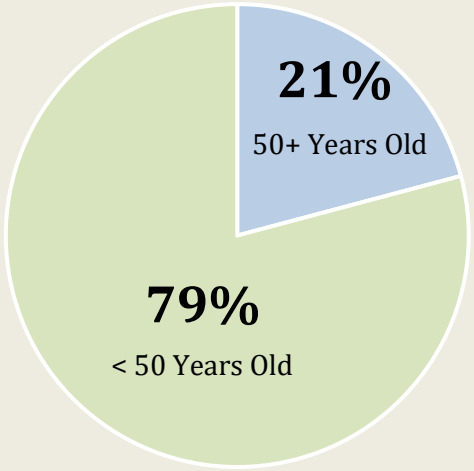


Newer meters up 14% since IIP FY 2021-2025

STRUCTURES

COMB operates and maintains approximately 200 SCC structures throughout the system. This includes 62 blow-off vaults, 57 air-vacuum air-release (AVAR) vaults, and 68 turnouts through the peaks and valleys of SCC system. Each structure is unique, but generally consists of a concrete vault structure, metal lid with lock box, ladder rungs, SCC access hole with lid, and either blow-off pipe plumbing, AVAR plumbing, or turnout plumbing with risers and valves. The purpose of these appurtenant structures is to allow staff access to system components, in order to release/admit air for pipeline protection, release water for maintenance purposes or emergencies, and to service internal assembly and/or valves. Over 20 percent of these components are over fifty years old. Significant progress has been made within the last five years, and now almost 80 percent of the structures have been rehabilitated as part of a structure rehabilitation program started in the early 2000s, with additional work being proposed during this IIP cycle.

Figure 7. *Blow Off Structure at Station 99+22*



Newer structures up 9% since IIP FY 2021-2025

3. PROJECT IDENTIFICATION

3.1. Introduction

Projects outlined in the IIP have been identified based on Reclamation inspection recommendations, COMB asset inventory analysis, and other staff observations and recommendations. The identification of a project within the five-year plan does not guarantee construction. The initiation of any project requires other evaluations and approvals that must be completed for a project to advance to design and ultimately construction. Additionally, the COMB Board has the ongoing ability to review and revise projects based upon unforeseen conditions, priorities, and financial resources.

3.2. Reclamation Identified Projects

Inspection Recommendations

Reclamation inspects selected Cachuma Project facilities and components operated and maintained by COMB as part of their Annual Site Inspections (ASI) every year, Periodic Facility Reviews (PFR) every three years, Comprehensive Facility Reviews (CFR) every six years, Review of Operation and Maintenance (RO&M) when needed, and Special Inspection Reports (SIR) when needed. After the inspections are completed, Reclamation provides a report to COMB summarizing the corrective actions recommended for implementation. The recommendations fall under three categories:

- **Category 1** recommendations involve the correction of severe deficiencies where immediate and responsive action is required to ensure structural safety, operational integrity of a facility, or operating personnel/public safety.

  Note: completion of the SCC AVAR Valve Replacement / Relocation Project Schedule F work in the Carpinteria area allowed COMB to close all current Category 1 recommendations with Reclamation during the previous IIP cycle FY 2021-2025.

- **Category 2** recommendations cover a wide range of important matters where action is needed to prevent or reduce further damage, preclude possible operational failure of a facility, or reduce safety risks to operating personnel/public.

- **Category 3** recommendations cover less important matters but are believed to be sound and beneficial suggestions to improve or enhance the O&M of the project or facility.

3.3. COMB Identified Projects

Asset Inventory Analysis

The first step in identifying projects internally is to evaluate and record the current state of existing assets. Asset management plans assist agencies in maintaining a desired level of service at the most appropriate cost for rehabilitating, repairing or replacing an asset. The development of an asset management plan requires a comprehensive inventory and characterization of major assets, including valves, meters, blowoffs, air vents, and other important structures. COMB operates and maintains the Cachuma Project critical infrastructure assets which include the North Portal, Tecolote Tunnel, South Coast Conduit, Sheffield Tunnel, and Glen Anne, Lauro, Ortega, and Carpinteria Reservoir locations. A comprehensive inventory was assembled for COMB assets using the Gutteridge, Haskins & Davey (GHD) asset management spreadsheet available through the EPA website.[1] The GHD spreadsheet allows for organizing a hierarchy of assets, which can be characterized by asset class, original cost, replacement cost, effective life, probability of failure, and renewal strategy (abandon, maintain, repair, replace), among other inputs. It is useful for viewing assets and their current conditions in a single location, while identifying assets or categories of assets that will need near or long-term work. The consequence of failure was rated from 1 to 10, with 10 being the most consequential, according to the expected impacts to the system according to Table 1. The condition of each asset was assessed utilizing a rating from 1 to 10 based on the conditions in Table 2. The assets were then sorted by the consequence of failure rating and then by the condition rating to determine project criticality.

Table 1. *Consequence of Failure (COF) Rating*

CoF Rating	Description	Percent Affected	Level
1	Minor Component Failure	0-25%	Asset
2	Major Component Failure	25-50%	Asset
3	Major Asset Failure	0-25%	Asset
4	Multiple Asset Failure	25-50%	Facility / Sub-System
5	Major Facility Failure	50-100%	Facility
6	Minor System Failure	20-40%	Total System
7	Medium System Failure	40-60%	Total System
8	Intermediate System Failure	60-80%	Total System
9	Significant System Failure	80-90%	Total System
10	Total System Failure	90-100%	Total System

[1] EPA. 2016. https://www.epa.gov/sites/production/files/2016-01/epa_smsm.xls

Table 2. *Condition Assessment Rating*

Condition Rating	Description	Maintenance Level
1	New or Excellent Condition	Normal periodic maintenance (PM)
2 to 3	Minor Defects Only	Normal PM , Minor corrective measures (CM)
4 to 5	Moderate Deterioration	Normal PM, Major CM
6 to 7	Significant Deterioration	Major repair, rehabilitate
8 to 9	Virtually Unserviceable	Rehabilitation unlikely
10	Unserviceable	Replace

Slope Stabilization and Channel Protection Observations

The SCC is a 26-mile water conveyance pipeline that delivers Cachuma Project water to over 200,000 residents along the South Coast of Santa Barbara County. Strategically located along the foothills, the pipeline crosses drainages, culverts, creeks, and other vulnerable areas where downcutting and/or aggradation occurs. COMB staff monitors these areas frequently, looking for signs of SCC exposure to protect exposed pipeline as soon as possible and to avoid subsequent damage and weathering. Key slope stabilization and channel protection projects have been included as an important mode of project identification and characterization. Historically, field observations by COMB staff have been instrumental for protecting the system. In addition to field observations, COMB staff keeps an inventory of all creek crossings, and uses engineering drawings and the latest lidar or Digital Elevation Model (DEM) data to perform depth of cover vulnerability assessments as a desktop exercise. Desktop GIS exercises allow COMB staff to quickly screen areas of concern for focused field observations alongside general observations.

Other Staff Recommendations

COMB staff may identify projects that are not included in the Asset Management Spreadsheet or the Slope Stabilization and Channel Protection Observations. These projects typically represent improvements to the system that could increase system capacity, efficiency, flexibility, or reliability. These projects could include the installation of new line valves, new meters, or other new elements or upgrades. COMB Staff is constantly brainstorming ideas to improve operations and/or decrease costs by making the system more efficient. This category also includes directives from the COMB Board. For example, projects under this category would include those contributing towards meeting sustainability goals, conservation of water, cooperation between agencies, etc.

4. PROJECT SORTING

4.1. Introduction

To evaluate projects systematically, COMB created project priorities and ranked the projects in order of criticality. The purpose of utilizing this methodology was to accurately separate the projects into categories from high to low priority category. The ranking informs the COMB Board when reviewing, approving, and budgeting for implementation of important capital projects. COMB staff prioritized a comprehensive list of proposed projects using six priority categories described below.

4.2. Priorities

Priority 1: Regulatory, Legal, or Safety Requirement
These projects are subject to the requirements of federal, state, or local regulatory agencies and laws, with noncompliance resulting in fines or other adverse actions. This priority ranking also includes projects that reduce or eliminate unsafe working conditions for staff.

Priority 2: Required to Maintain Level of Service
These projects maintain the current level of service to COMB's Member Agencies. These projects reduce potential disruptions, water loss, property damage that could occur without replacement. In general, these projects replace valves and infrastructure that are currently inoperable and whose failure would result in an unplanned shutdown of deliveries or disruption in the transmission of critical operations data.

Priority 3: Addresses Critical Deficiency
A critical deficiency has the potential to significantly jeopardize COMB's ability to serve its Member Agencies. These deficiencies have been identified by Reclamation, COMB staff, or outside experts. Projects under Priority 3 address known critical deficiencies that could result in major infrastructure failure, deteriorated water quality, or limited water production.

Priority 4: Evaluates Significant Deficiency
A potential significant deficiency which requires further engineering investigation and design. These projects would evaluate the significance of the deficiency and potential solutions to mitigate the deficiency.

Priority 5: Proactive Aging Infrastructure Replacement
These projects provide funding for the proactive replacement, upgrade, or improvement of a facility that is at the end of its useful service life. Although an asset may be at its assumed

end of useful life, it may remain functional for many years; therefore, the replacement is considered proactive until the asset becomes inoperable.

Priority 6: System Reliability and Improvements

These projects consist of improvements to the system reliability, providing backup systems to better maintain levels of service during and after emergency events (i.e., wildfires, earthquakes, floods). Additionally, projects under this category may contribute to relate to broader goals in providing improvements to the overall system.

The project priorities are summarized in Table 3 below, which also provides the project identifier and project name. For additional information on these projects, please see Appendix A: IIP Project Descriptions and Appendix B: Projects for Future Consideration. For ease of use, the order in which the projects are listed in Table 3 is mirrored in Appendix A, Appendix B, and later in this report within the 5-year budget matrix.

Table 3. *Project Priority Characterization*

Priority	Project ID*	
Priority 1: Regulatory, Legal, or Safety Requirement	2025-C-10	Lauro Outlet Works Tunnel Safety Improvements
	2025-C-3	North Portal Elevator Modification
Priority 2: Required to Maintain Level of Service	2004-2-B	Rehabilitate South Coast Conduit Lateral Structures
	2013-2-L	Lower Reach South Coast Conduit Blow Off / AVAR Valve Replacement
Priority 3: Addresses Critical Deficiency	2018-C-4	Lauro Reservoir Bypass Channel Road Improvements
	2007-2-B	Sheffield Tunnel Assessment and Repair
	2016-C-1	North Portal Intake Tower and Gate Chamber Seismic Assessment
	2025-C-5	Critical Access Road Maintenance and Improvements
	2018-2-A	Lauro Reservoir Intake Design and Repair
	2025-C-4	Upper Reach Blow Off Riser Nozzle Rehabilitation
	2013-C-1	Meter Replacement Program
	2019-C-4	Critical Control Valve Replacement
Priority 4: Evaluates Significant Deficiency	2019-C-10	South Coast Conduit Interior Pipeline Inspection
	2005-2-B	Tecolote Tunnel Weep Hole Restoration
	1999-2-A	Tecolote Tunnel Concrete Deterioration Investigation
Priority 5: Proactive Aging Infrastructure Replacement	2025-C-1	North Portal Log Boom Replacement
	2013-C-1	North Portal Jet Flow Control Valve Replacement
Priority 6: System Reliability and Improvements	2025-C-2	Multi-Site Renewable Energy and Resiliency

**Project ID: Year – Source [USBR Category 1,2, or 3 or C for COMB] – Tracking Code [USBR letter or COMB number]*

5. FUNDING

5.1. Introduction

Funding of projects identified in the IIP will be determined annually by the COMB Board as a component of the development and approval of the annual budget. Fund sources for IIP implementation will be derived from either long-term or short-term financing, grants, or ongoing assessments from each of the participating Member Agencies. The cost estimates included for each IIP project are derived from internal estimates or developed by professional engineering consultants. Estimates may change as more precise information becomes available.

The allocation of IIP funds is a separate component of the annual COMB Budget. Amendments to the IIP during the fiscal year will be reviewed by the COMB Operations Committee and require approval by the Board of Directors for any expenditure modification exceeding ten percent of the project amount, per the COMB procurement policy. Expenditure authority for individual projects, unless otherwise directed, is available for the current fiscal year following the date of approval.

5.2. Five-Year Budget Matrix

The five-year budget matrix presents important projects to be completed within the five-year planning horizon outlined in this document. Accordingly, COMB has prepared a proposed Five-Year Budget Matrix for Infrastructure Improvement Projects (Table 4). For planning purposes, the projects were sorted in priority categories by the condition rating followed by the consequence of failure rating. Projects that are proposed to occur earlier have been scheduled as such due to high criticality or personnel safety issues. Projects have been scheduled in a manner that reduces risk and spreads costs across fiscal years, taking advantage of grant opportunities when available.

Unknown conditions and timing of future project implementation could affect the five-year budget planning matrix. For example, the Emergency Pumping Facility Pump Station is a significant capital expenditure (~$1.2m) that is required to maintain service during drought conditions but would only be implemented if drought conditions occur. This five-year budget matrix will be updated as emergency and/or environmental conditions require implementation of extraordinary capital improvement projects.

Table 4. *Five-Year Budget Matrix for All Projects*

Priority	Project ID	Project Name	2024-25	2025-26	2026-27	2027-28	2028-29	5-yr Total
1	2025-C-10	Lauro Outlet Works Tunnel Safety Improvements	$100,000	$100,000				$200,000
	2025-C-3	North Portal Elevator Modification	$100,000	$100,000	$100,000	$400,000	$500,000	$1,200,000
2	2004-2-B	Rehabilitate South Coast Conduit Lateral Structures	$305,000					$305,000
	2013-2-L	Lower Reach South Coast Conduit Blow Off / AVAR Valve Replacement	$90,000	$220,000				$310,000
3	2018-C-4	Lauro Reservoir Bypass Channel Road Improvements*	$1,320,000					$1,320,000
	2007-2-B	Sheffield Tunnel Assessment and Repair	$75,000	$130,000	$300,000			$505,000
	2016-C-1	North Portal Intake Tower and Gate Chamber Seismic Assessment	$100,000	$200,000				$300,000
	2025-C-5	Critical Access Road Maintenance and Improvements	$75,000	$200,000	$325,000	$300,000	$300,000	$1,200,000
	2018-2-A	Lauro Reservoir Intake Design and Repair**	$50,000	$100,000				$150,000
	2025-C-4	Upper Reach Blow Off Riser Nozzle Rehabilitation		$150,000	$200,000	$250,000		$600,000
	2013-C-1	Meter Replacement Program		$100,000	$100,000	$150,000		$350,000
	2019-C-4	Critical Control Valve Replacement		$250,000	$250,000	$150,000		$650,000
4	2019-C-10	South Coast Conduit Interior Pipeline Inspection				$300,000	$300,000	$600,000
	2005-2-B	Tecolote Tunnel Weep Hole Restoration	$100,000	$100,000	$100,000			$300,000
	1999-2-A	Tecolote Tunnel Concrete Deterioration Investigation		$150,000				$150,000
5	2025-C-1	North Portal Log Boom Replacement	$135,000					$135,000
	2013-C-1	North Portal Jet Flow Control Valve Replacement			$200,000	$200,000		$400,000
6	2025-C-2	Multi-Site Renewable Energy and Resiliency***	$50,000	$250,000	$150,000			$450,000
		Subtotal	**$2,500,000**	**$2,050,000**	**$1,725,000**	**$1,750,000**	**$1,100,000**	**$9,125,000**
		Member Agency Offsets / Grant Funding	**($800,000)**	**($350,000)**				**($1,150,000)**
		Total	**$1,700,000**	**$1,700,000**	**$1,725,000**	**$1,750,000**	**$1,100,000**	**$7,975,000**

*The Lauro Reservoir Bypass Channel Road Improvements (2018-C-4) project schedule depends upon grant funding opportunities (placeholder $800,000)

**Lauro Reservoir Intake maintenance is required to be compensated (per 1980 Agreement No. 0-07-20-L1582) via the Cater JPA (current estimate $150,000)

***The Multi-Site Renewable Energy and Resiliency (2025-C-2) project schedule depends upon grant funding opportunities (placeholder $200,000)

APPENDIX A: IIP PROJECT DESCRIPTIONS

Lauro Outlet Works Tunnel Safety Improvements (2025-C-10)

Background

Operations staff conducts the Ongoing Visual Inspection Checklist (OVIC) for the outlet works tunnel housing the outlet works conduit as required by Reclamation's Standing Operating Procedure (SOP) for Lauro Dam and Reservoir on at least a monthly basis. This requires entry through an above-ground conduit access structure, ladder descension into the confined space, and walking an 869-foot long, 7-foot high tunnel underneath the dam and reservoir to its terminus. A new railing system, ladders, and entrance hatch modifications were added to the conduit access structure in November 2004.

Need

The need for this project is due to ongoing safety concerns for personnel entering the outlet works tunnel. Due to the slope of the tunnel floor, water accumulating within the tunnel would drain and accumulate near the conduit access structure. Small volumes of water will escape through the existing drain structure, but in the event of a sudden break in the outlet works conduit (due to aging infrastructure, earthquake, or other causes), any entrants would quickly become engulfed as the exit floods. The current design is not acceptable in terms of routing large volumes of water away from the single exit and maximizing personnel safety in the event of an emergency scenario. Reclamation has recommended several projects be conducted within the tunnel. However, COMB currently minimizes the time spent in the tunnel to reduce risks.

Description

The project includes modifying the existing conduit access structure to improve draining and safety elements. A combination ground level access door and drainway would be added to facilitate faster personnel egress and to evacuate large volumes of water from the facility, preventing floodwaters to backup within the tunnel. In addition, a communication system will be installed as an improvement to existing handheld radio communication. Other safety features will be considered as recommended during the design and engineering phase.

Figure A.1 *Lauro Outlet Works Tunnel Access House*

PRIORITY CATEGORY

1. Regulatory, Legal, or Safety Requirement

ESTIMATED COST

$200,000

Fiscal Year	Phase	Cost
2025	Design/Construction	$100,000
2026	Construction	$100,000

Environmental / Permitting Considerations:
Reclamation Technical Center would need to review and approve any changes to the dam infrastructure to ensure that no changes are made which could impact dam safety.

North Portal Elevator Modification (2025-C-3)

Background

This study will improve safety and functionality in one of COMB's critical facilities. The North Portal Elevator is the only access point to the jet flow control valve and bypass controlling flow into the Tecolote Tunnel. Routine staff entry into the gate chamber is required to calibrate instrumentation, access valves, and to inspect or make other adjustments as needed. The existing elevator shaft is 8ft in diameter and 156ft deep, containing an enclosed elevator car for descension into the gate chamber. In an emergency, entrants need to utilize a small emergency door on the ceiling of the elevator car and ascend 140 ft of ladder rungs up to the surface doors using a full body harness and fall arrest self-extraction system. Staff cannot be below the elevator at any time due to risks of being stuck below the elevator with no exit available.

Need

The existing elevator has been a longstanding concern due to its limited escape options and narrow shaft design. The study will result in a safer escape design and detailed evaluation of a modified elevator design with improved escape features, a secondary escape shaft, installation of modernized extraction systems, or other safety improvements as recommended. The overarching need is to modernize the extraction capabilities in the North Portal, ensuring that in case of an emergency, personnel can swiftly and safely evacuate the gate chamber. The current elevator system presents a significant challenge in terms of escape during emergencies.

Description

The study encompasses a comprehensive assessment and redesign of the existing elevator system in the North Portal facility. This project will include a detailed analysis of the elevator's limitations and its escape features. A suite of potential solutions will be explored and the best solution will be recommended. The study will include a thorough evaluation of safety protocols, engineering requirements, and modernization possibilities to determine the most viable solution for COMB's needs. Smaller common sense safety modifications will occur simultaneous to the study.

Figure A.2 *North Portal Elevator Shaft*

PRIORITY CATEGORY

1. Regulatory, Legal, or Safety Requirement

ESTIMATED COST

$1,200,000*

Fiscal Year	Phase	Cost
2025	Study/Modifications	$100,000
2026	Study/Modifications	$100,000
2027	Study/Modifications	$100,000
2028	Construction	$400,000
2029	Construction	$500,000

**Construction costs are highly variable and dependent upon the outcome of the study.*

Environmental / Permitting Considerations: *There will be OSHA requirements to consider in the development of this study to modify this facility; other environmental, permitting, historic building considerations, and collaboration with Reclamation will be required.*

Rehabilitate South Coast Conduit Lateral Structures (2004-2-B)

Background

There are approximately 68 lateral connections along the South Coast Conduit. The function of these connections is to provide water to the treatment plants and specific sections of the Member Agencies distribution systems requiring direct feed. Each connection generally contains two gate valves, a meter, and an air vent component. All the SCC Upper Reach laterals have now been blind-flanged and air gapped except for the larger functional laterals: Goleta West Conduit and Corona Del Mar Water Treatment Plant box turnouts. Several laterals in the SCC Lower Reach were abandoned or rehabilitated in the 1980s, 2005, or more recently in the F1 (2023) and F4 (2021) Schedule F work, concluding Phase I of a cooperative agreement between COMB and Carpinteria Valley Water District (CVWD).

Need

As of the date of this IIP, 14 of the 30 laterals in the CVWD service area have reached their maximum life and need rehabilitation. Ten of these high-risk laterals will be rehabilitated during Phase II of the COMB-CVWD cooperative agreement (LAT 7-10, 12-16, and 28). Four lower risk laterals remain original and will be rehabilitated by COMB when required (LAT 22, 25, 26, and 27). The dependability of these valves is necessary to perform maintenance and shutdowns of the South Coast Conduit. The consequence of not completing this project could result in lateral failure/inoperability limiting deliveries to customers served by those laterals or complicating operations if leak-by or a major failure occurred.

Description

The project would require coordination with CVWD. For efficiency and to minimize cost, the work on the laterals would be conducted in the same area and year as the Lower Reach South Coast Conduit Blowoff Nozzle/Valve replacement project.

Figure A.3 *SCC Lower Reach Lateral 22*

PRIORITY CATEGORY

2. Required to Maintain Level of Service

ESTIMATED COST

$305,000

Fiscal Year	Phase	Cost
2025	F5	$305,000

Environmental / Permitting Considerations: *This project has been identified by the USBR as a Category 2 recommendation.*

Lower Reach South Coast Conduit Blow Off / AVAR Valve Replacement (2013-2-L)

Background

Blow-off structures exist on all low points of a water distribution system. Blow-offs allow the conduit to be dewatered to conduct necessary maintenance and to perform emergency work. Combination air vacuum air release valves (AVARs) are located at high points along the pipeline and act to automatically expel air and relieve vacuum accumulation in pipes. If air is not adequately expelled, air pockets can constrict flows. If the vacuum is not relieved, serious damage or collapse of the pipeline can occur. Of the sixty-two blowoffs on the SCC – five need to have their valve replaced and/or be rehabilitated and four of fifty-seven AVARs need their valve replaced. Four shutdowns are needed to complete these replacements (F2, F3, F4, and F5).

Need

The remaining original and partially rehabilitated blow-offs need full rehabilitation due to extensive corrosion. The dependability of these components is necessary to allow the system to be dewatered for maintenance and response to an emergency break. Three blow-off structures are original (STA 698+55, 732+72, and 880+05) plus two additional blow-offs requiring replacement of the first valve (STA 804+24 and 902+96). Although all the AVARs are now above grade and coated, there are two (2) AVAR structures which require a shutdown to replace the first valve off the SCC at STA 703+00 and STA 755+84. Not completing this project could result in a major facility failure in multiple locations, uncontrolled loss of water, and inability to respond to an emergency.

Description

The project would require coordination with impacted Member Agencies during the required shutdowns of the SCC. The project consists of replacing manhole covers, blow-off nozzles, gate valves, upper spools, and discharge piping for original blow-offs and replacing first valves for partially rehabilitated structures. The work would be phased throughout four shutdowns (F2, F3, F4, and F5).

Figure A.4 *Inside of Blow Off Structure*

PRIORITY CATEGORY

2. Required to Maintain Level of Service

ESTIMATED COST

$310,000

Fiscal Year	Phase	Cost
2025	F3, F4	$90,000
2026	F2, F5	$220,000

Environmental / Permitting Considerations: *This project has been identified by the USBR as a Category 2 recommendation.*

Lauro Reservoir Bypass Channel Road Improvements (2018-C-4)

Background

Lauro Reservoir is the Cachuma Project's primary balancing reservoir on the South Coast and forebay for Cater Water Treatment Plant. Natural watershed flows upstream of Lauro Reservoir are required by the Division of Drinking Water to be routed around the reservoir for public safety. Watershed flows are captured by Lauro Debris Basin and diverted into a 24" HDPE storm drain, or onto the Lauro Reservoir Bypass Channel during more extreme storm events. In addition to routing emergency overflow, the bypass channel also collects runoff from the surrounding slopes, prevents shallow landslides, and provides vehicle access around the reservoir. Portions of the bypass channel were improved with a concrete road and retaining walls in 2007 and in 2023 after a significant washout.

Need

The need for this project is illustrated through repeated damages and public safety concerns since the 1960s. Damages have occurred in the following years: 1962, 1964, 1965, 1967, 1969, 1973-74, 1977-78, 1980, 1983-85, 1991-92, 1993-94, 1995, 1998, 2000, 2005, and 2023. Damages from excessive storm inputs included slides, washouts, erosion, high turbidity levels, water quality concerns, and the need to take Lauro Reservoir offline for varying periods. These storm events caused disruptions to water supply and quality and necessitated repairs. There remains 800ft of unimproved bypass channel with asphalt and gravel vulnerable to damage.

Description

Includes removal of the current asphalt and gravel sections and installation of a significantly more robust concrete bypass channel with curbs and retaining walls to match previously improved sections. The total length of the improved bypass channel would be approximately 800ft and would include retaining walls to hold back the slope and prevent shallow landslides onto the bypass channel and washouts of the road. The project would complete the bypass channel around Lauro Reservoir and prevent repetitive damages.

Figure A.5 *Lauro Reservoir Bypass Channel Washout January 2023 Winter Storms*

PRIORITY CATEGORY
3. Addresses Critical Deficiency

ESTIMATED COST
$1,320,000*

Fiscal Year	Phase	Cost
2025	Construction	$1,320,000

*The Lauro Reservoir Bypass Channel Road Improvements (2018-C-4) project schedule depends upon grant funding opportunities. This estimate includes improving the access road to the bypass channel which is ~$340,000 of the cost.

Environmental / Permitting Considerations:
Environmental and permitting will follow the same procedure as previous installations, and will include updated requirements and/or grant requirements

Sheffield Tunnel Assessment and Repair (2007-2-B)

Background

The Sheffield Tunnel is a concrete tunnel housing the 30" Centrifugal Concrete Pipe (CCP) South Coast Conduit (SCC) that extends 6,100 feet in 12-ft segments between the Sheffield Control Station east of Mission Creek to Parma Park. Within the tunnel, sections of concrete pipe are connected and joined with steel bands, double gaskets, and mortar to maintain the integrity of the pipe collar connections. Water collected within Sheffield Tunnel accumulates and is routed into a creek drop inlet culvert downstream of the west portal of the tunnel.

Figure A.6 *Sheffield Tunnel and Pipeline*

Need

The USBR inspection report of the Sheffield Tunnel identified and recommended evaluating the deteriorating mortar joints and determine if they are needed to ensure the structural integrity and proper function of the pipeline. Heavy seepage appears to be a contributing factor to deterioration. Deterioration potentially compromises the integrity of the tunnel and poses an operational risk. The 6,100-ft tunnel does not have redundancy and any damage to the SCC in this area would cause potential water supply disruptions, significant access challenges for repair work, and environmental damage in the uncontrolled release of water from the pipeline.

Description

An engineering firm would conduct a condition assessment to determine which joints could be repaired without a shutdown during the regularly scheduled inspection in 2025. Following the inspection, a qualified contractor would be selected to repair the cracks in the mortared joints without a shutdown the following year. In addition, an internal pipeline inspection would be conducted. Following the inspection, internal joint seals would be installed on the most severely deteriorated joints via the manholes accessible in the structure. Sheffield Control Valves will need to be replaced prior to the internal pipeline work.

PRIORITY CATEGORY

3. Addresses Critical Deficiency

ESTIMATED COST

$505,000

Fiscal Year	Phase	Cost
2025	Engineering	$75,000
2026	Engineering/Cons	$130,000
2027	Construction	$300,000

Environmental / Permitting Considerations: *This project has been identified by the USBR as a Category 2 recommendation.*

North Portal Intake Tower and Gate Chamber Seismic Assessment (2016-C-1)

Background

Water diversions from Lake Cachuma occur from the North Portal Intake Tower facility into the Tecolote Tunnel and to the South Coast Conduit for water delivery to the Cachuma Project Member Agencies. The vertical intake tower free-stands 120ft and is located approximately mid-reservoir and contains five slide gates, each at varying levels on the pentagonal shaped tower. The slides gates are covered with mesh fish screens to prevent fish and debris from entering the tunnel. Water diversions are controlled 800 feet away through a 140ft shaft to the gate chamber in the Tecolote Tunnel.

Figure A.7 *North Portal Intake Tower*

Need

The North Portal Intake Tower and Gate Chamber was constructed by the Bureau of Reclamation in the 1950's, at which time the standards for structural design requirements were not as stringent as today's compliance requirements. Structural elements of the intake structure and gate chamber would be examined to determine the general reliability of the tower, and recommendations for upgrades and refurbishments would be provided if needed. The consequence of not completing this project would be uncertainty in structure reliability during a seismic event, which could result in losing ability to deliver water to the South Coast while emergency repairs are made.

Description

This initial phase consists of acquiring consulting services of a qualified structural engineering firm to perform a Seismic Reliability Analysis and Physical Condition Assessment of the North Portal Intake Tower and Gate Chamber. It shall include a report of all findings and propose recommendations for structural rehabilitation to increase and/or ensure continued reliability of the structure in the occurrence of a large seismic event. It should also include recommendations for a temporary pump system from the lake to the gate chamber in the event of earthquake damage. An assessment of the intake tower is easier to perform during low lake levels, however this project is high priority and will likely occur staring in 2025.

PRIORITY CATEGORY

3. Addresses Critical Deficiency

ESTIMATED COST

$300,000

Fiscal Year	Phase	Cost
2025	Assessment	$100,000
2026	Engineering	$200,000

**A condition assessment of the North Portal Intake Tower is ideally completed when the lake level is low exposing for examination.*

Environmental / Permitting Considerations: *No regulatory compliance measures are expected for this project as it is an assessment.*

Critical Access Road Maintenance and Improvements (2025-C-5)

Background

COMB maintains a network of critical access roads, often in remote locations, which allow passage to vital water conveyance facilities. Maintaining these access roads is a challenge due to the rugged terrain, steep surrounding hillslopes, periodic natural hazards, and natural weathering. Recent events, such as the damages inflicted by California Severe Winter Storms, Flooding, Landslides, and Mudslides (DR-4683-CA) in early January 2023, underscore the urgent need for elevated maintenance and improvements in these areas.

Need

The purpose of this project is to prevent interrupted access to essential water conveyance infrastructure. These access roads serve as the lifelines for maintenance crews, emergency responders, and equipment transportation, especially in cases of unforeseen events such as severe weather and natural disasters. The continuous weathering of these roads puts the safety of both personnel and the reliability of the water conveyance infrastructure at risk. This project is not only about road repair but also about fortifying the critical transportation arteries that connect essential facilities.

Description

COMB staff will prioritize fixing or improving roads in clear disrepair, those that provide non-redundant access to key facilities, and low-cost improvements. Solutions are site-specific, but will include erosion control measures, landslide mitigation, regrading, road resurfacing, and improvements to drainage systems at target locations including the North Portal Road, Glen Annie Road, Lauro Reservoir Bypass Channel, Sheffield Control Station Road, Ortega Reservoir Road, Greenwell Canyon, and Carpinteria Reservoir Road Additionally, the improvements will incorporate measures to enhance the roads' resilience to extreme weather events and natural disasters, thereby reducing the risk of future damage.

Figure A.8 *Glen Annie Road Damage following January 2023 Winter Storms*

PRIORITY CATEGORY
3. Address Critical Deficiency

ESTIMATED COST
$1,200,000

Fiscal Year	Phase	Cost
2025	Ortega/Carp/Lauro	$75,000
2026	North Portal/Sheffield	$200,000
2027	Glen Annie	$325,000
2028	Lauro/Greenwell	$300,000
2029	Other	$300,000

Environmental / Permitting Considerations: *This project has been identified by the USBR as a Category 2 recommendation.*

Lauro Reservoir Intake Design and Repair (2018-2-A)

Background

The Lauro Reservoir intake structure was modified in 1981 by adding a stainless steel circular intake screen connected to a steel pipe which was inserted in the original concrete intake structure. A 1/2 inch thick steel circular bearing plate was installed on top of the existing concrete intake structure to cover the opening between the intake structure and vertical pipe and provide structural support. The 2018 dive report prepared by Reclamation states the intake structure is in satisfactory condition with the exception of the bearing plate. The bearing plate was observed to be fully covered with corrosion and rust nodules.

Figure A.9 *Corroded Steel Bearing Plate on Lauro Reservoir Intake Structure*

Need

The steel bearing plate on the intake structure has deteriorated because of corrosion and poses an operational risk for both the protection against outside intrusion of elements penetrating through the opening or structural support of the intake pipe and screen.

Description

Engineering services will be retained to determine the expected level of performance from the steel bearing plate (protection from outside element intrusion or structural). Engineering will need to be conducted by a structural engineer to determine if the steel bearing plate is necessary for support, and if required, a method to design a repair that will allow for continued structural support of the intake structure. The reservoir may need to be lowered to accommodate inspections and repairs.

PRIORITY CATEGORY

3. Addresses Critical Deficiency

ESTIMATED COST

$150,000*

Fiscal Year	Phase	Cost
2025	Engineering	$50,000
2026	Construction	$100,000

**The cost estimates assumes structural support may be added to the structure. However, it may be that the entire structure may need to be replaced which would increase costs significantly. This structure was added as part of the Reclamation agreement with the City of Santa Barbara No. 0-07-20-L1582. Based on the agreement, the costs of maintenance are to be compensated by the City of Santa Barbara through the Cater JPA.*

Environmental / Permitting Considerations: *This project has been identified by the USBR as a Category 2 recommendation.*

Upper Reach Blow Off Riser Nozzle Rehabilitation (2025-C-4)

Background

Blow off structures exist on all low points of a water distribution system and are important features of the South Coast Conduit (SCC) for draining the pipe during maintenance and emergency activities. There are 34 blow off structures in the SCC Upper Reach. Most of the blow off structures were rehabilitated from 2003 to 2007, however in many cases the blow off riser nozzles were left in their existing condition. On October 20, 2022, a leak caused by several pinholes and cracks in the SCC Upper Reach blow off riser nozzle at STA 639+50 was discovered and repaired. This event led to the broader discovery of several riser nozzles severely corroded and in need of repair.

Need

Several of the existing blow off riser nozzles in the Upper Reach are in need or rehabilitation due to extensive corrosion. The dependability of these components is necessary to allow for pipeline dewatering for maintenance and emergency pipeline breaks. The consequence of not completing this project could result in periodic emergency leaks causing unplanned outages, facility failures in multiple locations, and potential risk of water contamination.

Description

There are 34 blow offs in the upper reach, of which 17 could be recoated and anode installed without a shutdown. 15 blow off risers appear to be corroded where an internal sleeve would need to be welded on the inside similar to the emergency work completed at STA 639+50. Two blow off risers were fully rehabilitated following a leak in 2022. The internal sleeve rehabilitation would require a shutdown of sections of the SCC to facilitate repair, which would be coordinated with Goleta Water District and other affected Member Agencies. A contractor would then weld a smaller diameter pipe sleeved inside the corroded blow off riser nozzle from the inside of the SCC, and clean, coat, and protect with a sacrificial anode prior to recharge.

Figure A.10 *Corroded Blow Off Riser Nozzle at SCC Upper Reach Station 639+50 Before Repairs*

PRIORITY CATEGORY
3. Addresses Critical Deficiency

ESTIMATED COST
$600,000

Fiscal Year	Phase	Cost
2026	Rehabilitation	$150,000
2027	Shutdown/Rehab	$200,000
2028	Shutdown/Rehab	$250,000

Environmental / Permitting Considerations: *Water quality monitoring of the discharged water will need to be recorded in compliance with COMB NPDES Permit.*

Meter Replacement Program (2013-C-1)

Background

COMB is responsible for accurate water accounting on behalf of the Cachuma Project Member Agencies to the U.S. Bureau of Reclamation monthly. In addition, the State Water Resources Control Board is requiring meter audits at the water district level and may require water audits for wholesale agencies in the future. The process of water accounting entails recording data from twenty-nine meters located along the conveyance system from the North Portal of Lake Cachuma to the Carpinteria Reservoir. COMB monthly performs a mass balance and analysis of water accounting losses as part of its normal accounting procedures.

Need

COMB's water meters are critical to the water accounting and system operations. Several meters in the system have reached limited-life cycle phase and are likely in need of replacement in the next five years. Not completing the project could impact operations, system water accounting accuracy, and jeopardize compliance with Section 64561 of Titles 17 and 22 California Code of Regulations, which states "each water system shall: (b) meter the quantity of water flow from each source and record the total monthly production each month."

Description

COMB operates several electronic magmeters that are critical to system operations and water accounting that have reached limited-life cycle phase and are likely in need of replacement in the next five years. COMB operates electronic magmeters at Glen Anne Turnout, Goleta West, Ortega Inflow, Ortega Southflow, and Boundary which are utilized to manage system operations on a day-to-day basis and for monthly accounting of water use. Replacements would be purchased and installed for the Ortega Inflow, Ortega Southflow, and Boundary meters as the most critical, with additional meter replacement locations chosen based on priority.

Figure A.11 *Montecito Pump Station Meter*

PRIORITY CATEGORY
3. Addresses Critical Deficiency

ESTIMATED COST
$350,000

Fiscal Year	Phase	Cost
2025	Buy/Install	$100,000
2026	Buy/Install	$100,000
2027	Buy/Install	$150,000

Environmental / Permitting Considerations:
Annual water audit reporting may be required for wholesale water agencies in the future as follow-up to SB 606

Critical Control Valve Replacement (2019-C-4)

Background

A majority of the valves located at control stations along the South Coast Conduit are original and were installed in the 1950s. There are at least 93 large diameter valves in the system, ranging in size from 16" to 48". Several of these valves are critical for operations, but many of the valves are obsolete and are not utilized for operations. During previous maintenance work and shutdowns, key valves in the system have been characterized as exhibiting excessive leak-by. This program would replace critical valves in the system at key control station locations.

Need

In-line isolation and control valves are needed to properly operate and maintain the system. Valves with excessive leak-by or poor operability impact system operations. The system is operated differently than originally designed after the installation of the William B. Cater Water Treatment Plant. Many system valves are no longer needed for operations. Obsolete valves and piping are potential points of failure and increase maintenance needs. The consequences of not completing this project include loss of control within control stations and excessive leak-by, which will impact operations during repair work requiring pipeline shutdown.

Description

This project would involve the systematic replacement of key control valves in the system with known operational deficiencies. Control station piping would be streamlined to reflect current operations and obsolete valving would be removed from the control stations. Lauro and Sheffield Control Stations will be prioritized as they have not been recently evaluated and have not had any original valves replaced.

Figure A.12 *Lauro Control Station Gate Valve*

PRIORITY CATEGORY
3. Addresses Critical Deficiency

ESTIMATED COST
$650,000

Fiscal Year	Phase	Cost
2026	Sheffield	$250,000
2027	Lauro	$250,000
2028	Carpinteria	$150,000

Environmental / Permitting Considerations:
Changes to the South Coast Conduit system to remove obsolete valves and piping would require Bureau of Reclamation review and approval.

South Coast Conduit Interior Pipeline Inspection (2019-C-10)

Background

The South Coast Conduit (SCC) was installed in the late 1950's under a Reclamation design, using concrete pipe manufactured by American Pipe and Construction Company. During its service life, the archives show that aside from normal wear and tear, the conduit has been subjected to a number of slides and strike damage from debris. In October through December of 2007, Flowers & Associates, Inc. conducted a South Coast Conduit Examination and Repair Project (Phase 1) for the SCC Upper Reach STA 99+22 to 428+28 (15,557 feet inspected). In March of 2009, Phase 2 was completed for SCC Upper Reach STA 428+28 to 543+34 (11,629 feet inspected). Both inspections produced a number of useful observations, photos, and recommendations, including the location and degree of joint separation, cracks, grout spalling, and other signs of damage.

Need

Examination of the SCC would allow COMB to obtain condition status and preemptively repair sections of the pipeline before leaks occur. About 40% of the SCC Upper Reach (19,000 feet) and 100% of the SCC Lower Reach (85,000 feet) remains to be inspected.

Description

Contracted services would be procured for confined space inspection and related deliverables. The project will generally consist of an internal examination of sections of the South Coast Conduit. The inspection would require shutdown of the SCC, which will be coordinated with Member Agencies. After inspection is complete, a full report including detailed inspection notes, photos, and recommendations would be provided to COMB. In the Upper Reach, manned inspections would be performed in a similar fashion as was completed in 2007 and 2009. However, due to the smaller pipe diameter and potable water transmission, the Lower Reach would need to be inspected via a remotely operated vehicle. The inspection of the Lower Reach is also challenging due to the limited available windows for a shutdown.

Figure A.13 *Previous Inspection of SCC Interior*

PRIORITY CATEGORY
4. Evaluates Significant Deficiency

ESTIMATED COST
$600,000

Fiscal Year	Phase	Cost
2028	Inspection	$300,000
2029	Inspection	$300,000

Environmental / Permitting Considerations: *There will be OSHA, confined space, lockout/tagout requirements to consider in the development of this project.*

Tecolote Tunnel Weep Hole Restoration (2005-2-B)

Background

Included in the construction of the Tecolote Tunnel were a series of "weep holes" that allow ground water to flow into the tunnel. The weep holes serve two purposes: 1) to relieve the ground water pressure on the outside of the tunnel structure and 2) provide for the importation of usable ground water into the tunnel.

Need

There were 576 2-inch diameter weep holes installed in the Tecolote Tunnel during construction. Many of the weep holes have been subjected to mineral accumulation creating deposits which clog the flow into the tunnel. Hydrogen sulfide has contributed to corrosion of the concrete structure adjacent to the weep holes. The mineral accumulation and corrosion have eliminated or reduced the ability of the weep holes to function, potentially affecting the stability of the structure. The weep holes need to be cleaned to allow proper water drainage into the tunnel to protect the tunnel structure. Clearing out the weep holes will likely increase water production from the Tecolote Tunnel at a very low cost compared to other sources of water in the region.

Description

The project will require a shutdown of the tunnel and all safety precautions necessary for tunnel access due to increased temperatures and geothermal activity, hydrogen sulfide exposure, and confined space issues. Entry would require coordination with Reclamation and specialized safety personnel. An electric tunnel utility vehicle could be used to power specialized hand-held drills and vacuums to clear the hardened mineral deposits and dislodge debris. A pilot program would be conducted in the winter 2024-25 and if flow increases were measured additional effort would be undertaken to drill out the weep holes in subsequent years. Work would be limited to a 2-3 day shutdown during the winter months.

Figure A.14 *Clogged Weephole in Tecolote Tunnel*

PRIORITY CATEGORY

4. Evaluates Significant Deficiency

ESTIMATED COST

$300,000

Fiscal Year	Phase	Cost
2025	Pilot	$100,000
2026	Construction	$100,000
2027	Construction	$100,000

Environmental / Permitting Considerations: *This project has been identified by the USBR as a Category 2 recommendation.*

Tecolote Tunnel Concrete Deterioration Investigation (1999-2-A)

Background

The Tecolote Tunnel was completed in 1956 to divert water from Lake Cachuma to the South Coast Conduit. The tunnel provides water delivery through the mountain to the South Portal. The tunnel structure consists of a modified circular horseshoe shaped cross section constructed of steel encased in 12-24 inches of concrete and operates in open channel flow that is approximately 7' inside and is 6.4 miles long with a gradual shallow slope to enable gravity feed. The only ingress and egress are at the North Portal and South Portal. During periodic inspections by the USBR, deteriorations have been observed in the tunnel lining due to long-term exposure to hydrogen sulfide gas.

Need

Hydrogen sulfide gas in the tunnel is believed to have caused the deterioration of the concrete lining of the tunnel. The deterioration occurs from Station 158+00 to 335+40. In areas, the interior concrete surface has peeled in sheets approximately 3/8 of an inch thick and fallen into the invert, creating sediment and the concrete lining is softening into a mushy brown paste. A tunnel collapse could interrupt deliveries for an extended period and would be very technically difficult to repair.

Description

The project requires engineer evaluation of concrete deterioration. These would include accurate internal diameter measurements to estimate concrete losses, concrete core samples with compression tests and petrographic samples to determine the extent and cause of deterioration. 2012-2-Q, which recommends COMB "prepare and implement a repair plan to perform all necessary repairs to address all damaged concrete and remediate the widespread concrete deterioration in the Tecolote Tunnel to restore safe and reliable service of the facility." The work will likely require a drone to scan the inside of the tunnel and an electric tunnel vehicle with the ability to power concrete coring tools. The work would occur during the next scheduled inspection in winter 2024-2025.

Figure A.15 *Concrete Lining Deterioration within the Tecolote Tunnel*

PRIORITY CATEGORY

4. Evaluates Significant Deficiency

ESTIMATED COST

$150,000

Fiscal Year	Phase	Cost
2026	Engineering	$150,000

Environmental / Permitting Considerations: *This project has been identified by the USBR as a Category 2 recommendation.*

North Portal Log Boom Replacement (2025-C-1)

Background

According to the second amendment to contract for the transfer of the operation and maintenance of the Cachuma Transferred Project Works (No. 14-06-200-5222RB) between Reclamation and COMB, COMB is transferred the operation and maintenance of the Tecolote Tunnel including all water situated within a 1,500-foot radius of the intake of the Tecolote Tunnel. Log booms constructed of timber have been placed around the Intake Tower as early as September 1957 to keep floating debris from damaging infrastructure and clogging screens. More recently, COMB has maintained shackled polymer booms encircling the Intake Tower. The existing booms were purchased in 2007 and are close to 20 years old.

Need

The previous shackled design is flawed, as the connecting hardware fails under light wind and wave events. The Operations Division staff responds to boom failures several times a year requiring mobilization to Lake Cachuma, boat rental, and hours of staff time maneuvering booms back into place and reinstalling connection hardware. During boom failure, the exclusion zone is open to boaters and floating debris can wash towards the Intake Tower causing damage and clogging.

Description

The new boom designs feature shackle-free connections and high load bearing internal steel to resist horizontal and vertical loads. The new designs are much more resistant to shackle failures and are expected to withstand the types of varied weather conditions observed at Lake Cachuma. New booms would be purchased to replace the existing booms at the Intake Tower with the same location and anchor points. The existing booms would be removed and stored for possible use in other parts of the system with less wind and wave potential.

Figure A.16 *Log Boom Shackle Failure*

PRIORITY CATEGORY

5. Proactive Aging Infrastructure Replacement

ESTIMATED COST

$135,000

Fiscal Year	Phase	Cost
2025	Buy/Install	$135,000

Environmental / Permitting Considerations: *No regulatory compliance measures are expected for this project.*

North Portal Jet Flow Control Valve Replacement (2013-C-1)

Background

Located at the base of the Tecolote Tunnel, the Jet Flow Control Valve is the primary control for flow from Lake Cachuma into the South Coast Conduit. The valve is located within the red piping component as pictured to the right. The adjacent gate valve (black) is utilized to shutdown flows from Lake Cachuma. The Jet Flow Control valve was replaced in 1990 and has a useful life of approximately thirty years. As part of this project, COMB would purchase new parts and utilize previously acquired internal components to build a new valve to be installed during a planned shutdown. The current valve, after being removed, would be rebuilt using new components and would be kept on site and used as a redundant valve in case of failure.

Need

The consequence of not completing the project includes using a valve beyond the expected useful life, coupled with a lack of redundancy for one of the most critical flow control valves within the system. Because the North Portal Jet Flow Control Valve controls the flow into the Tecolote Tunnel, failure could prevent or impact water deliveries to the cities of Goleta, Santa Barbara, Montecito, Summerland, and Carpinteria. This is a proactive replacement based upon the expected service life at purchase, as the valve in its current state is functioning adequately. Because of the important function of the valve, it is critical that it not be used beyond the manufacturer's recommended service life, and that redundancy exists on site.

Description

This project consists of producing designs and specifications to manufacture a new valve body and to rebuild using new and previously purchased internal components. Once the jet flow valve is ready for installation, a coordinated shutdown would occur using the gate valve. The current jet flow valve would be removed from service and the new valve would be lowered by crane into the lower gallery of the North Portal through the elevator shaft for installation.

Figure A.17 *North Portal Jet Flow Control Valve*

PRIORITY CATEGORY

5. Proactive Aging Infrastructure Replacement

ESTIMATED COST

$400,000

Fiscal Year	Phase	Cost
2027	Buy	$200,000
2028	Buy/Install	$200,000

Environmental / Permitting Considerations: *This project requires approval from Reclamation.*

Multi-Site Renewable Energy and Resiliency (2025-C-2)

Background

On June 27, 2022, the COMB Board of Directors adopted the 2022 Sustainability Plan, which included an initiative to explore alternate sources of renewable energy. Specifically, staff was instructed to explore opportunities for alternate sources of renewable energy (solar, hydroelectric, etc.) to be installed at the COMB office and/or outlying facilities. The design of the Cachuma Project water conveyance system is already remarkably low-energy relying on gravity feed to deliver water throughout the system as opposed to pumps with electrical demand. The primary locations requiring electricity are at the COMB office headquarters (including EV chargers), the outlying North Portal building near Lake Cachuma, and smaller dispersed locations requiring power for meter boxes and appurtenances.

Need

The envisioned benefit is to incorporate clean energy components into COMB's energy system, while participating in regional and global efforts towards cleaner air, lower carbon emissions, and conservation of natural resources. Also of interest is the long-term cost savings associated with reduced conventional energy consumption, and increased energy resilience through on-site battery storage. Currently there are generators at the COMB office and North Portal building locations. On-site storage could replace or augment existing back-up systems and provide flexibility in avoiding increased electricity prices during peak hours.

Description

A system-wide assessment of electrical demand, location specific resiliency needs, and opportunities for renewable energy generation and cost savings would be conducted initially. Initial system installation would offset electrical demands at Lauro Office and North Portal. The system would be expanded in the future as more electrical vehicles would be added to COMB's fleet. The initial system installed would be approximately 40 kw and expanded to approximately a total of approximately 100 kw in the future.

Figure A.18 *COMB 2022 Sustainability Plan Image*

PRIORITY CATEGORY

6. System Reliability and Improvements

Project Notes: *COMB utilizes ~70,000 kwh of electricity and ~7,000 gallons of fuel in vehicles to delivery ~20,000 AF/yr. Using 33.7kwh/gallon of fuel this equates to 15 kwh/AF. For reference, SWP utilizes 2,800 kwh/AF to deliver raw water from the Delta to the Coastal Branch.*

ESTIMATED COST

$450,000*

Fiscal Year	Phase	Cost
2025	Plan	$50,000
2026	Install	$250,000**
2027	Install	$150,000**

*The Multi-Site Renewable Energy and Resiliency (2025-C-2) project schedule depends upon grant funding opportunities.

***Installation costs would be offset by reduced electrical and fuel costs. The capital costs could be minimized by option of entering into a purchase power agreement.*

Environmental / Permitting Considerations: *MP-620 would be required from Reclamation, and coordination with SB County Fire Department for meeting building setbacks and defensible space standards.*

CACHUMA OPERATION AND MAINTENANCE BOARD
3301 Laurel Canyon Road
Santa Barbara, California 93105
http://www.cachuma-board.org

RESOLUTION NO. 796

RESOLUTION OF THE GOVERNING BOARD OF THE CACHUMA OPERATION & MAINTENANCE BOARD ADOPTING THE COMB FISCAL YEAR(S) 2025-2029 INFRASTRUCTURE IMPROVEMENT PLAN

WHEREAS, the Cachuma Operation & Maintenance Board ("COMB") is a joint powers authority and public entity, organized and existing in the County of Santa Barbara in accordance with Government Code Section 6500 et seq., and operating pursuant to the 1996 Amended and Restated Agreement for the Establishment of a Board of Control to Operate and Maintain the Cachuma Project - Cachuma Operation And Maintenance Board, dated May 23, 1996 ("Amended and Restated Agreement"), as amended by an Amendment to the Amended and Restated Agreement made effective September 16, 2003, and a Second Amendment to the Amended and Restated Agreement made effective November 20, 2018 (collectively the "Joint Powers Agreement"); and

WHEREAS, the Member Agencies of COMB are the Goleta Water District, the City of Santa Barbara, the Montecito Water District, and the Carpinteria Valley Water District; and

WHEREAS, COMB operates and maintains Cachuma Project facilities pursuant to a Transfer of Operation and Maintenance Contract ("O & M Agreement") with the United States Bureau of Reclamation ("Reclamation"), including the North Portal Intake Tower, the Tecolote Tunnel, the South Coast Conduit, the Sheffield Tunnel, four regulating reservoirs, flow control valves, meters, instrumentation at control stations, turnouts and appurtenant structures along the entire system; and

WHEREAS, COMB staff proposes certain projects in the FY 2025-2029 Infrastructure Improvement Plan ("IIP") based on Reclamation's inspection recommendations, COMB's asset inventory analysis, and additional staff observations and recommendations; and

WHEREAS, it is in COMB's best interest to adopt the IIP, as set forth in Exhibit 2 to the accompanying staff memorandum (as modified as directed by the Board), which will formalize the strategy for the implementation of capital projects and programs needed to carry out the goals and policy objectives of the COMB Board; and

WHEREAS, the Draft IIP was presented and reviewed by technical staff of COMB's Member Agencies on January 31, 2024, with their respective comments incorporated into the draft version presented to COMB's Operations Committee; and

WHEREAS, on February 15, 2024, COMB's Operations Committee reviewed the Draft IIP and subsequently, forwarded it to the COMB Board, with a recommendation to approve and adopt the IIP; and

WHEREAS, the IIP will facilitate the decision-making process for allocation of resources to ensure the delivery of quality, reliable water to COMB's Member Agencies and the communities they serve.

NOW, THEREFORE, BE IT RESOLVED BY THE GOVERNING BOARD OF COMB AS FOLLOWS:

1. The Governing Board finds and determines that the facts set forth in the above recitals and in the documents referenced herein are true and correct.

2. The Governing Board approves the adoption of the FY 2025-2029 Infrastructure Improvement Plan, as set forth in Exhibit 2 to the accompanying staff memorandum, as modified as directed by the Board.

3. This Resolution shall take effect immediately.

PASSED, APPROVED AND ADOPTED by the Governing Board of the Cachuma Operation and Maintenance Board, this 26th day of February 2024, by the following roll call vote:

Ayes: **Sneddon, Hayman, Hanson, Holcombe**

Nayes:

Absent/Abstain:

APPROVED:

President of the Governing Board

ATTEST:

Secretary of the Governing Board