

FY 2018-2022

# Infrastructure Improvement Plan



*Operations Division*



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## Executive Summary

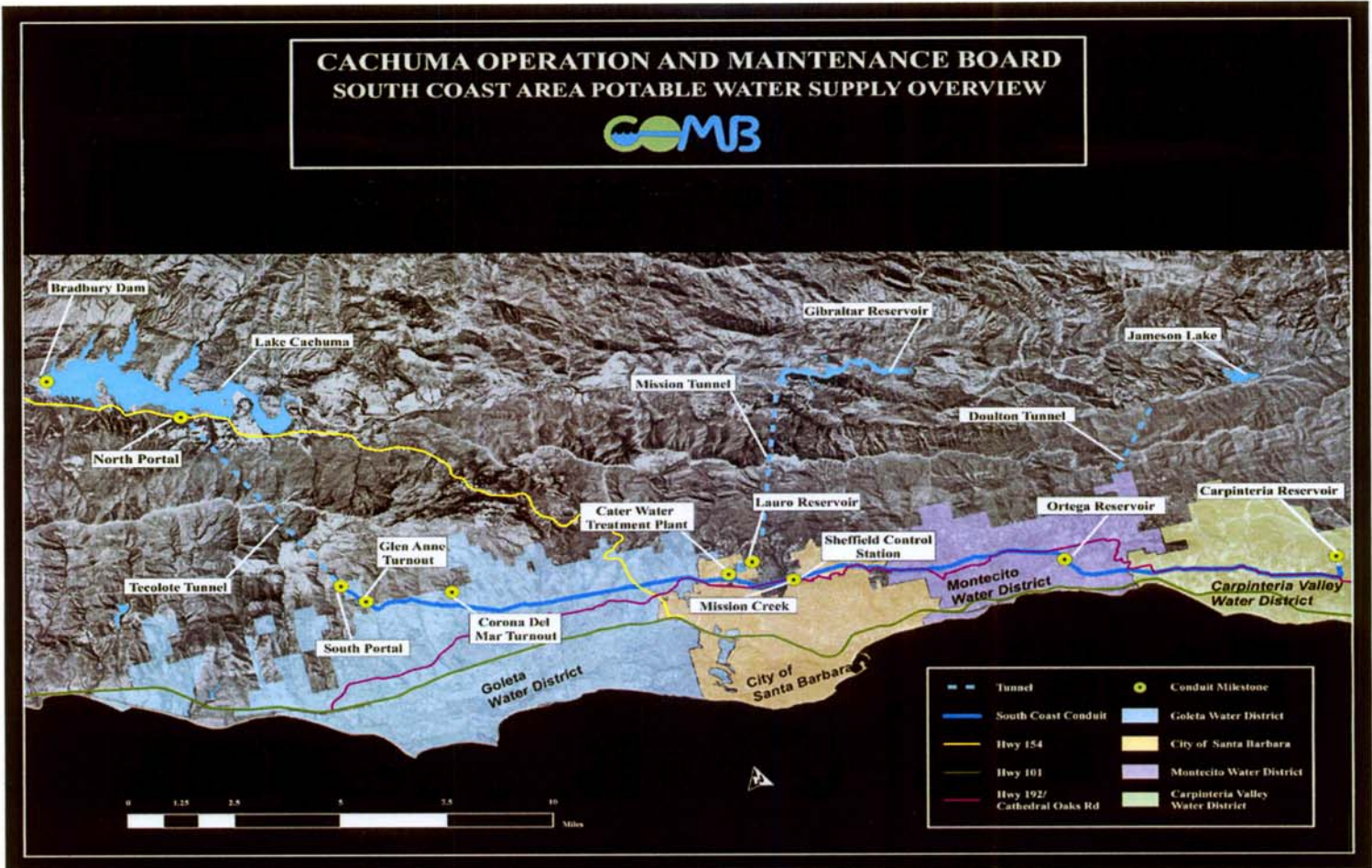
The Cachuma Project was constructed in the early 1950s by the United States Department of the Interior, U.S. Bureau of Reclamation under contract with the Santa Barbara County Water Agency on behalf of the Cachuma Project Member Units. The original cost of the Cachuma Project was approximately \$25.1 million. Using a CPI inflator, the present value is approximately \$212.7 million. This amount does not include labor costs increases, land use or environmental considerations that have evolved subsequent to original construction. Inclusion of these additional costs would result in a substantially higher replacement cost.

The Cachuma Member Units are the Carpinteria Valley Water District, City of Santa Barbara, Goleta Water District, Montecito Water District, and Santa Ynez River Water Conservation District-Improvement District No. 1. Cachuma Operation and Maintenance Board (COMB) is a California Joint Powers Agency formed in 1956 by the Cachuma Member Agencies pursuant to an agreement with the U.S. Bureau of Reclamation (Reclamation). The agreement transferred to the Cachuma 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 Member Agencies entered into contracts with the Santa Barbara County Water Agency for the purpose of receiving water from the Cachuma Project for use and benefit of the Member Agencies. Over the past fifty years, the Project has been the principal water supply for the Santa Ynez Valley and the South Coast Communities, delivering water to approximately 200,000 people.

Water from Lake Cachuma is conveyed to the South Coast Member Agencies through an intake tower located at the east end of the reservoir, which leads into the Tecolote Tunnel. The Tecolote Tunnel extends from Lake Cachuma 6.4 miles west through the Santa Ynez Mountains to Goleta. The South Coast conduit is concrete-lined; concrete encased steel extending twenty-six miles from Goleta to Carpinteria. There are four regulating reservoirs along the South Coast Conduit: Glen Anne Reservoir (518 acre-feet) (non-operational), Lauro Reservoir (600 acre-feet), Ortega Reservoir (65 acre-feet), and Carpinteria Reservoir (44 acre-feet).

The COMB Infrastructure Improvement Plan (IIP) provides critical component detail of the system to be improved, repaired or replaced to ensure the reliability of service. The IIP faces the challenge of balancing resource demands with available resources and provides the asset analysis necessary to determine project priority for budgetary decisions. The IIP guiding principal is to protect the dependent interest of the Member Units by ensuring each asset maintains regulatory compliance, reliability, and safety. The intent of the IIP is to set forth a reasoned decision-making methodology that will protect the asset to avoid increased future cost.

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



## Overview

### 1.1 Introduction

COMB's Five-Year Infrastructure Improvement Plan (IIP) is structured to identify and prioritize rehabilitation projects for COMB Board and Member Agency deliberation to enable budgetary decisions. The plan will facilitate the decision-making process for the allocation of resources to rehabilitate, improve and restore the Cachuma Project infrastructure to ensure the delivery of safe, reliable water to our Member Agencies. The IIP spans a five-year planning horizon and will be updated each year to reflect necessary changes. This dynamic document will be submitted to the Operations Committee for review of the project development process. The plan will correspondingly be submitted to the Administration Committee for budget development. Concurrent with Administration Committee review, the plan will be forwarded the Member Agency General Managers for review and comment. Following Committee review, the IIP will be presented to the Board to inform its consideration of the annual Operating Budget.

### 1.2 Background

Operation and maintenance rehabilitation projects are historically a component of the COMB annual budget. The comprehensive identification of near and long-term projects over a five-year planning horizon will be subject to annual addition and amendment as the identification and analysis of operation and maintenance evolves. Previously, substantial asset rehabilitation planning work has been accomplished with the assistance of contracted engineering firms. Those efforts developed a partial inventory of assets and prioritized those rehabilitation projects with short-term needs. The US Bureau of Reclamation (USBR) conducts site inspections every 3<sup>rd</sup> and 6<sup>th</sup> year of selected Cachuma Project facilities and components. However, the ranking categories used in their inspection reports do not provide a comprehensive basis for short and long-term planning and budgetary decision-making. This plan will incorporate elements of the previous contractually developed product, site inspections conducted by USBR, and projects identified by COMB Staff.

### 1.3 Purpose

The IIP provides an inventory of those assets determined to require rehabilitation over a five-year planning horizon. The IIP identifies the improvements needed in the Cachuma Project System and sets forth review criteria to enable the prioritization of projects for budgeting and scheduling improvements during the five-year period. The IIP is designed in anticipation of review by COMB Directors and the Member Agencies served by COMB prior to presentation to the COMB Board of Directors for adoption as a component of the annual Operating Budget.

Projects included in the IIP are those capital projects that exceed \$25,000. The Infrastructure Improvement Plan will:

1. Display project ranking criteria to enable a structured analysis by each Director and Member Agency.
2. Identify infrastructure rehabilitation and improvement funding requirements for asset management planning.
3. Provide a comprehensive list of assets reviewed.
4. Serve as a strategic planning document.
5. Serve as the basis for COMB capital budget planning and development.
6. Serve as the basis for COMB Member Agency budget planning.
7. Serve as a comprehensive planning document for the Board of Directors and the public.

## 1.4 Evaluation Methodology Process

### Step 1

- Evaluation and assessment of water delivery system and components.
- Deficiencies and Projects identified through contractor review, USBR, or COMB.

### Step 2

- Rating Criteria developed to quantify the level of importance of identified projects.

### Step 3

- Projects individually ranked and prioritized pursuant to rating criteria.
- Development of individual project summaries to provide information for decision-making review.

Projects may be shifted to out years and replaced with other approved projects based on conditions that would impact a shutdown of the South Coast Conduit or other considerations. Conversely, conditions that would allow a minimally disruptive shutdown may cause a project or projects to be moved forward. It is the intent to have projects shovel ready to enable completion during optimal conditions and to minimize shut-downs of the South Coast Conduit.

The South Coast Conduit has six shutdown valve locations extending from the South Portal that allows a locational shutdown of the system for maintenance and repair thereby reducing system disruption.



**Description of Rating Criteria  
Table 1**

32%	<u>Water Supply Reliability</u>		
	3	High	Major disruption to system and prohibits ability to operate and maintain water delivery
	2	Medium	Moderate impact to system and impedes ability to operate and maintain water deliver
	1	Low	No Impact to service or operation and maintenance activities
30%	<u>Risk</u>		
	3	High	Major consequence to O & M of system due to significant future cost increase by delaying project
	2	Medium	Minor consequence to O & M of system; between 25-50% future cost increase due to delay of project
	1	Low	Insignificant consequence to O & M of system and up to 25% future cost increase due to delay of project
18%	<u>Critical Need/Life Cycle of asset</u>		
	3	High	Potential to fail within one year or less; asset has reached expected service life
	2	Medium	Potential to fail with the next three years or identified as project by outside government agency
	1	Low	Potential to fail within the next five years
12%	<u>Safety</u>		
	3	High	Significant failure potential which will endanger agency personnel, property or other COMB assets
	2	Medium	Moderate failure potential which will endanger agency personnel, property or other COMB assets
	1	Low	Desirable safety upgrade for ease of operation and maintenance
8%	<u>Service Disruption Necessary to Accomplish Project</u>		
	3	High	Less than 12 hour service disruption to accomplish project
	2	Medium	12-48 hour service disruption to accomplish project
	1	Low	Greater than 48 hour service disruption to accomplish project
100%	<b>The criteria percentages were established using factors deemed important specifically to the Cachuma Project System.</b>		

## **1.5 Funding**

Funding of projects identified in the IIP will be determined annually by the COMB Board of Directors 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 Agency Agencies.

## **1.6 Cost Estimates**

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.

## **1.7 Overview of Funding**

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

Table: 5-year Infrastructure Improvement Plan Scoring Matrix

Infrastructure Improvement Plan Projects		Page No.	Water Supply Reliability		Risk		Critical Need		Safety		Service Disruption		Ranking
COMB I.D.	Project Name/Description		Score	Wt.	Score	Wt.	Score	Wt.	Score	Wt.	Score	Wt.	
2016-C-3	Sycamore Canyon Slope Stabilization	10	3	32%	3	30%	3	18%	3	12%	3	8%	100%
2014-C-62	South Coast Conduit AVAR Riser Pipe Replacement *	12	3	32%	3	30%	3	18%	3	12%	2	5%	97%
2012-1-26	South Coast Conduit Air Vacuum Air Release Valve Replacement / Relocation *	13	3	32%	3	30%	3	18%	3	12%	2	5%	97%
2013-1-42	South Coast Conduit Blow-Off Riser Pipe Replacement *	15	3	32%	3	30%	3	18%	3	12%	2	5%	97%
2013-C-47	Repair of Lateral 3 - Upper Reach	16	3	32%	3	30%	3	18%	2	8%	3	8%	96%
2017-C-2	Meter Replacement Project *	17	3	32%	3	30%	3	18%	2	8%	3	8%	96%
2012-2-35	Rehabilitate San Antonio Creek Blow-off *	18	3	32%	3	30%	3	18%	3	12%	1	3%	95%
2016-C-1	North Portal Tecolote Intake Tower Seismic Analysis & Conditions Assessment	19	3	32%	3	30%	2	12%	3	12%	3	8%	94%
2016-C-2	San Jose Creek - South Coast Conduit Crossing	20	3	32%	3	30%	3	18%	2	8%	2	5%	93%
2014-C-58	North Portal Slope Stabilization	21	3	32%	3	30%	2	12%	2	8%	3	8%	90%
2015-C-1	North Portal Jet Flow Valve Replacement *	22	3	32%	3	30%	2	12%	2	8%	3	8%	90%
2013-C-56	Mission Creek South Coast Conduit Crossing	23	3	32%	3	30%	2	12%	2	8%	3	8%	90%
2017-C-1	Upper Reach Reliability Project (MURRP) - Phase II	25	3	32%	3	30%	2	12%	2	8%	3	8%	90%
2011-C-57	Glen Annie Reservoir Rehabilitation	26	2	21%	3	30%	2	12%	3	12%	3	8%	83%
2015-C-3	Rehabilitate South Coast Conduit Lower Reach Lateral Structures *	29	3	32%	2	20%	2	12%	2	8%	2	5%	77%
2007-2-33	Sheffield Tunnel Inspection and Evaluation	30	3	32%	2	20%	1	6%	2	8%	3	8%	74%
2014-C-59	South Portal Slope Stabilization	31	2	21%	3	30%	2	12%	2	8%	1	3%	74%
2013-2-20	Inspect Interior of Ortega Outlet Pipe *	32	3	32%	2	20%	1	6%	2	8%	2	5%	71%
2001-2-28	Inspect Interior of Sheffield Tunnel Pipe *	32	3	32%	2	20%	1	6%	2	8%	2	5%	71%
2001-2-10	Inspect Interior of Lauro Dam Pipe *	32	3	32%	2	20%	1	6%	2	8%	2	5%	71%
2013-2-39	Inspect Interior of Carpinteria Control Station Pipe *	32	3	32%	2	20%	1	6%	2	8%	2	5%	71%
2012-2-36	Install a second sump pump in the lower chamber of the North Portal	34	2	21%	2	20%	2	12%	2	8%	3	8%	69%
2013-C-15	Rebuild inflow Rip Rap at Lauro Reservoir	35	2	21%	2	20%	2	12%	2	8%	2	5%	67%
2005-2-55	Tecolote Tunnel Concrete Deterioration Investigation *	36	1	11%	2	20%	2	12%	1	4%	2	5%	52%
2005-2-31	Clean clogged weep holes in Tecolote Tunnel *	37	1	11%	2	20%	2	12%	1	4%	2	5%	52%
2013-2-41	Investigate Steel collar between outlet works & 48" intake pipe at Lauro Tunnel	38	2	21%	1	10%	1	6%	1	4%	3	8%	49%
1999-2-53	Waterproof gate shaft in the North Portal	39	1	11%	1	10%	2	12%	1	4%	3	8%	45%
2013-2-43	Locate Discharge Pipe; Outfalls at Four Blow-off Stations	40	1	11%	1	10%	1	6%	1	4%	3	8%	39%
	*Indicates System Shutdown required												



Table: 5-year Budget Matrix

Project ID	Project Name	Ranking	2017-18	2018-19	2019-20	2020-21	2021-22	5-yr Totals
2016-C-3	Sycamore Canyon Slope Stabilization	100%	\$300,000					\$300,000
2014-C-62	SCConduit AVAR Riser Pipe Replacement	97%	\$100,000	\$100,000	\$100,000	\$100,000		\$400,000
2012-1-26	SCConduit AVAR Valve Replacement/ Relocation (6) (FY 2016-17 C/O funds) \$100,000	97%	\$0					\$0
2013-1-42	SCConduit Blow-Off Riser Pipe Replacement	97%	\$125,000	\$225,000	\$225,000	\$225,000		\$800,000
2013-C-47	Repair Lateral 3 - Upper Reach	96%	\$100,000					\$100,000
2017-C-2	Meter Replacement Project	96%	\$100,000	\$50,000	\$50,000	\$50,000		\$250,000
2012-2-35	Rehabilitate San Antonio Creek Blowoff	95%	\$35,000					\$35,000
2016-C-1	North Portal Intake Tower Seismic Analysis & Conditions Assessment	94%	\$100,000					\$100,000
2016-C-2	San Jose Creek - South Coast Conduit Crossing	93%	\$60,000	\$1,420,000				\$1,480,000
2014-C-58	North Portal Slope Stabilization	90%	\$30,000					
2013-C-1	North Portal Jet Flow Control Valve Replacement	90%		\$300,000				\$300,000
2013-C-56	Mission Creek - South Coast Conduit Crossing	90%		\$50,000	\$400,000	\$2,100,000		\$2,550,000
2017-C-1	Upper Reach Reliability Project - Phase II	90%		\$200,000	\$300,000	\$3,500,000	\$4,000,000	\$8,000,000
2011-C-57	Glen Annie Reservoir Rehabilitation	83%		\$0	\$0	\$0	\$0	\$0
2015-C-3	Rehabilitate South Coast Conduit Lower Reach Lateral Structures	77%		\$50,000	\$50,000	\$50,000	\$50,000	\$200,000
2007-2-33	Sheffield Tunnel Inspection and Evaluation of SCC components	74%		\$100,000	\$300,000			\$400,000
2014-C-59	South Portal Slope Stabilization	74%		\$50,000	\$750,000			\$800,000
2013-2-20	Inspect interior of Ortega Outlet Pipe	71%		\$36,000				\$36,000
2001-2-28	Inspect interior of Sheffield Tunnel Pipe	71%		\$20,000				\$20,000
2001-2-10	Inspect interior of Lauro Dam Pipe	71%		\$12,000				\$12,000
2013-2-39	Inspect interior of Carpinteria Control Station	71%		\$74,000				\$74,000
2012-2-36	Install a second sump pump in the lower chamber of the North Portal	69%		\$35,000				\$35,000
2013-C-15	Rebuild inflow Rip Rap at Lauro Reservoir	67%		\$200,000				\$200,000
2005-2-55	Tecolote Tunnel Concrete Deterioration Investigation	52%			\$100,000			\$100,000
2005-2-31	Clean clogged weep holes Tecolote Tunnel	52%			\$200,000			\$200,000
2013-2-41	Structural Assessment: Steel collar at Lauro Tunnel	49%			\$30,000			\$30,000
1999-2-53	Waterproof gate shaft in the North Portal	45%			\$70,000			\$70,000
2013-2-43	Locate Discharge Pipe; Outfalls at Four Blow- off Stations	39%			\$40,000			\$40,000
	<b>Totals</b>		<b>\$950,000</b>	<b>\$2,922,000</b>	<b>\$2,615,000</b>	<b>\$6,025,000</b>	<b>\$4,050,000</b>	<b>\$16,532,000</b>

**Sycamore Canyon Slope Stabilization  
(2016-C-3)**

**Project Ranking**

100%

**Total Estimated Cost:** \$300,000



**Background**

The South Coast Conduit is a concrete-lined, concrete encased steel pipeline extending twenty-six miles from the Goleta reach south to Carpinteria. The pipeline ranges in diameter throughout various reaches of the system and is designed to flow water from Cachuma Lake by gravity. Erosion caused by severe runoff on dry hillsides affected by the recent five year drought has caused exposure of the pipeline in the Sycamore Canyon section of the system.

**Need for Project**

The exposed portion of the South Coast Conduit is vulnerable to pipeline failure resulting from structural damage, corrosion, and or additional erosion material sliding over the conduit. This vulnerability poses a significant risk to system operation. This project would consist of securing the conduit at this location and restore appropriate engineered fill over the pipeline on the slope in order to eliminate risk associated with the continued hillside erosion during storm events.

**Description**

Engineering services would be retained to conduct a site evaluation and perform a geotechnical study and project design to stabilize the slope and ensure protection and access to the pipeline. The construction phase would implement the repair in accordance with the engineering design, recommendations and specifications.

Phase I (Fiscal Year 2017-18): Site evaluation and engineering design

Phase II (Fiscal Year 2017-18): Secure Pipeline - Slope Stabilization and Protection (based on design plan completed in Phase I).

**Regulatory Compliance**

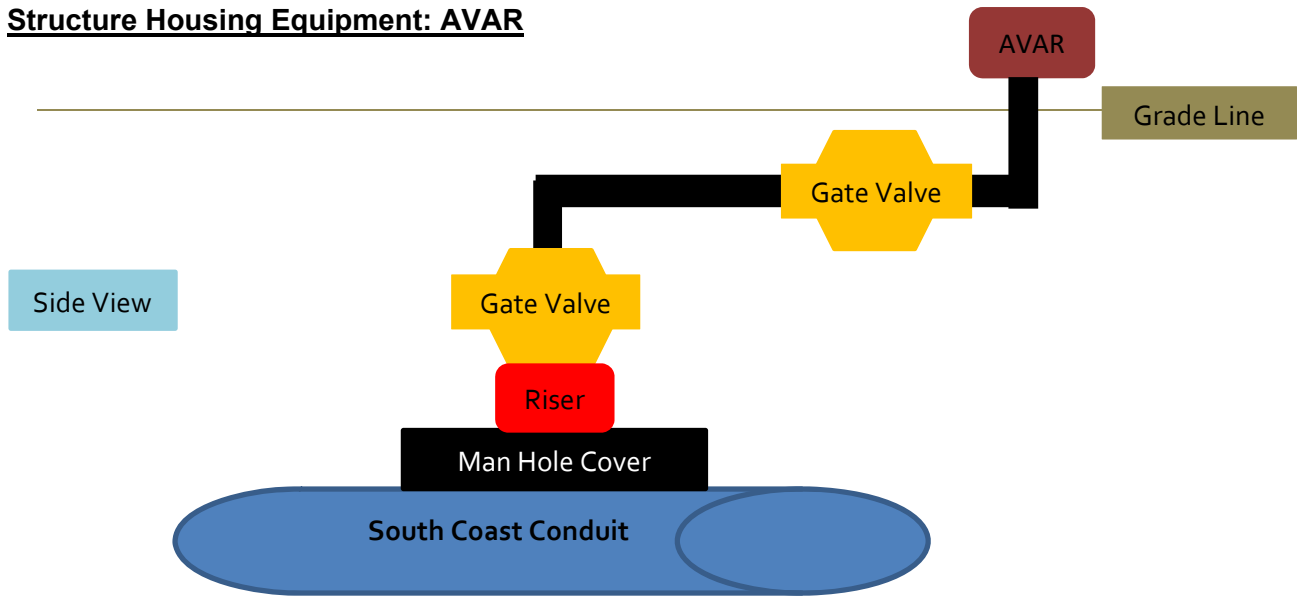
Located in USBR Right-of-Way

**Budget & Schedule**

**Internal Staff Estimate**

<b>Fiscal Year</b>	<b>Cost</b>
2017-18 (Phases I & II)	\$ 300,000
<b>Total</b>	<b>\$ 300,000</b>

**Structure Housing Equipment: AVAR**



The appurtenant structures involved with the South Coast Conduit system are depicted in the sketch above. These structures are identified as either Lateral structures, Air Vacuum Air Release (AVAR) structures, or Blow-off structures.

Divided into the Upper Reach (from the South Portal to Lauro Dam) and the Lower Reach (from the Cater Treatment Facility to Carpinteria), each structure contains a man hole cover, a riser, a gate valve and an air vacuum air release valve (AVAR). The concrete structures containing these components are called vaults and are located above and below ground level on top of the South Coast Conduit (SCC).

The total number of AVAR structures on the SCC is **57**.

The Upper Reach contains **31** AVAR structures and the Lower Reach contains **26** AVAR structures.

The internal components are described as follows:

- **Man Hole Cover** - sits directly on top of the pipe providing direct access inside the SCC.
- **Riser component** - serves as a connection between the manhole cover and the gate valve.
- **Gate Valve** - under normal operation this valve is open to allow the AVAR to function.
- **AVAR** - functions to allow volume of air to be exhausted from or admitted into the pipeline to protect the system from a loss of capacity and prevent the pipe from collapsing in the event of a break in the pipe.

AVARs	Total Structures	100% Complete	Need Man Hole	Need Riser	Need Gate Valve
Upper Reach	31	31	0	0	0
Lower Reach	26	6	20	20	20
<b>Total</b>	<b>57</b>	<b>37</b>	<b>20</b>	<b>20</b>	<b>20</b>

**South Coast Conduit Riser Pipe Replacement – Air Vacuum Air Release Valve (AVAR) Structures (2014-C-62)**

**Project Ranking**

97%

**Total Estimated Cost:** \$530,000



**Background**

The riser pipe is the functional connection between the SCC and air vacuum air release valves (AVARs) located in the system. The AVARs function to allow volumes of air to be exhausted from or admitted into the pipeline to protect the system from a loss of capacity and to prevent the pipe from collapsing in the event of a break in the pipe. The riser pipe sits directly on top of a man-hole cover and supports a gate valve that sits below the AVAR. Riser pipes exist at all 57 AVAR locations.

**Need for Project**

Twenty riser sections have been identified to be of questionable integrity because of varying degrees of corrosion and thus pose an operational risk. Replacement and/or relocation of the riser pipes affiliated with the air vacuum air release valves will ensure the functionality of this system component

**Description**

Replace manhole, riser pipes and the valves in the AVAR structures within designated locations in the system. The riser replacement and relocation project would be performed in several phases with consideration of operational impacts. For efficiency and to minimize cost, phases of this project will be performed concurrently with similar phases of the blow-off project. The project would require retention of engineering and contractor services. Project implementation will occur over time and during low water demand months to reduce the impact of system shutdown.

**Regulatory Compliance**

This is USBR Category 1 recommendation.

**Budget & Schedule**

**Internal Staff Estimate**

<b>Fiscal Year</b>	<b>Cost</b>
2015-16 (Phase I – Engineering)	\$ 60,000
2016-17 (Phase II – Construction)	\$ 70,000
2017-18 (Phase II – Construction)	\$100,000
2018-19 (Phase II – Construction)	\$100,000
2019-20 (Phase II – Construction)	\$100,000
2020-21 (Phase II – Construction)	\$100,000
<b>Total</b>	<b>\$530,000</b>

**South Coast Conduit Air Vacuum Air Release (AVAR) Valve Replacement / Relocation (2012-1-26)**

**Project Ranking**

97%

**Total Estimated Cost:** \$150,000



**Background**

Air vacuum air release valves (AVAR) are float operated valves which are common to water delivery systems. The AVAR's function to allow volumes of air to be exhausted from or admitted into the pipeline to protect the system from a loss of capacity and prevent the pipe from collapsing in the event of a break in the pipe. There are twenty-six AVARs on the Lower Reach of the SCC. Of these, twenty have been rehabilitated; the remaining six will be completed by an outside contractor over the next two fiscal years. Replacement of the AVARs is a USBR Category 1 recommendation.

**Need for Project**

Six remaining AVAR valves pose an operational risk and/or do not meet current required regulatory standards. Because of the location and operational configuration of the remaining six AVARs, this project would be completed by a retained contractor and require preliminary engineering.

**Description**

Replace and relocate to above ground sites six (6) AVARs in the Lower Reach. Consistent with other AVAR replacements, manhole covers, gate valves, risers, laterals and AVAR valves would be replaced at the same time. Each AVAR valve would be relocated and enclosed above grade. The project would require coordination with impacted MUs during the required shutdown of the SCC. The project would require retention of engineering and contractor services.

**Regulatory Compliance**

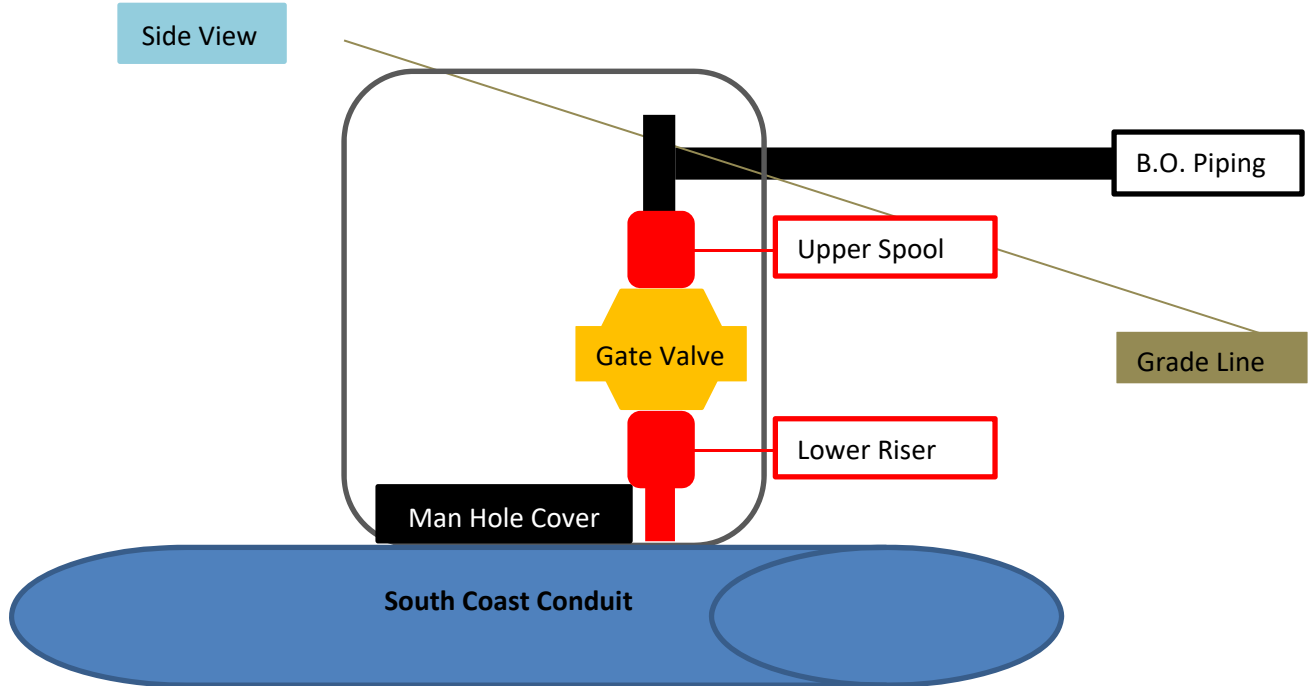
This is USBR Category 1 recommendation.

**Budget & Schedule**

**Internal Staff Estimate**

<b>Fiscal Year</b>	<b>Cost</b>
2015-16 (Phase I – Engineering)	\$ 50,000
2016-17 (Phase II – Construction)	\$100,000
2017-18 (Phase II – Construction)	\$ 0
<b>Total</b>	<b>\$150,000</b>

**Structure Housing Equipment: Blow Off**



The appurtenant structures involved with the South Coast Conduit system are depicted in the sketch above. These structures are identified as either Lateral structures, Air Vacuum Air Release structures, or Blow-off structures.

Divided into the Upper Reach (from the South Portal to Lauro Dam) and the Lower Reach (from the Cater Treatment Facility to Carpinteria), each structure contains a man hole cover, a lower riser, and upper riser, a gate valve and blow-off piping. The concrete structures containing these components are called vaults and are located above and below ground level on top of the South Coast Conduit (SCC).

The total number of blow-off structures on the SCC is **65**.

The Upper Reach contains **34** blow-off structures and the Lower Reach contains **31** blow-off structures.

The internal components are described as follows:

- **Man Hole Cover** - sits directly on top of the pipe providing direct access inside the SCC.
- **Riser component** - serves as a connection between the Man Hole Cover and the Gate Valve.
- **Blow-Off Valve (Gate Valve)** - functions to dewater the section of pipeline for the purpose of conducting repairs or responding to an emergency.

Blow Off	Total Structure	100% Complete	Need Man Hole	Need Lower Riser	Need Upper Riser	Need Gate Valve
Upper Reach	34	0	1	34	1	1
Lower Reach	31	0	27	31	27	27
<b>Total</b>	<b>65</b>	<b>0</b>	<b>28</b>	<b>65</b>	<b>28</b>	<b>28</b>



**South Coast Conduit Blow-off Riser Pipe Replacement  
(2013-1-42)**

**Project Ranking**

97%

**Total Estimated Cost:** \$1,000,000



**Background**

Blow-off structures exist on all low points of a water distribution system. The components included in these structures include man-hole covers, lower riser sections, an upper spool section, a gate valve, and blow-off piping. There are a total of sixty-five blow-off structures in South Coast Conduit system.

**Need for Project**

The existing blow-off components are of questionable operability because of corrosion. The dependability of these components is necessary to allow the system to be dewatered for maintenance and respond to an emergency break in the pipe. There are twenty-eight manhole covers identified for replacement. Sixty-five lower risers have been identified to be of questionable integrity because of corrosion. Twenty-eight gate valves and upper spools will need to be replaced due to age and fragility. Blow-off piping will be replaced on an as needed basis.

**Description**

The project consists of replacing the man hole covers, lower risers, gate valves, upper spools, and discharge piping within the Upper and Lower Reaches of the SCC. The project would be completed in conjunction with the AVAR valve replacement and relocation project and coordinated with the affected Member Units during the required system shutdown. Water released during the implementation of this project would require de-chlorination. The project would require retention of engineering and contractor services.

**Regulatory Compliance**

This is a USBR Category 1 recommendation.

**Budget & Schedule**

**Internal Staff Estimate**

<b>Fiscal Year</b>	<b>Cost</b>
2015-16 (Phase I – Engineering)	\$ 130,000
2016-17 (Phase II – Construction)	\$ 70,000
2017-18 (Phase II – Construction)	\$ 125,000
2018-19 (Phase II – Construction)	\$ 225,000
2019-20 (Phase II – Construction)	\$ 225,000
2020-21 (Phase II – Construction)	\$ 225,000
<b>Total</b>	<b>\$ 1,000,000</b>

**Repair Lateral 3 – Upper Reach  
(2013-C-47)**

**Project Ranking**

96%

**Total Estimated Cost:** \$120,000



**Background**

Lateral three is a multi-joint pipe configuration contained in a concrete vault located in the Upper Reach of the system. The vault contains a riser coming through the concrete floor, a meter, a valve, and affiliated piping. Lateral three originally functioned as an operational component of GWD. This lateral no longer operates as an operational component of GWD and currently functions as a blow-off structure.

**Need for Project**

The riser extending from the South Coast Conduit through the vaults' concrete floor was discovered to be leaking when the lateral was taken out of service. A temporary fix of mortar was placed on the pipe and the floor connection to eliminate leaking into the vault. Because of the fragility of this temporary fix, regular maintenance cannot be performed to the remaining components within the structure.

**Description**

The vault sits directly on top of the South Coast Conduit. The vault must be removed to access the riser component extending into the vault. Removing the vault will require replacing three sections of the South Coast Conduit. A new blow-off structure will be re-constructed in its place. The repair would require a shutdown of the SCC and coordination with impacted Member Agencies. The project would require retention of an engineering and contractor services.

**Regulatory Compliance**

N/A

**Budget & Schedule**

**Internal Staff Estimate**

<b>Fiscal Year</b>	<b>Cost</b>
2016-17 (Phase I – Engineering)	\$ 20,000
2017-18 (Phase II – Construction)	\$100,000
<b>Total</b>	<b>\$120,000</b>

**Meter Testing and Replacement Project  
(2017-C-2)**

**Project Ranking**

96%

**Total Estimated Cost:** \$250,000



**Background**

Cachuma Operation & Maintenance Board (COMB) is responsible for accurate reporting of water accounting on behalf of the Cachuma Project Member Agencies to the U.S. Bureau of Reclamation on a monthly basis. The process of water accounting entails recording data from twenty-five meters located along the conveyance system from the North Portal of Lake Cachuma to the Carpinteria Reservoir. In an effort to identify the accuracy of meters within the system, COMB hired Water System's Optimization, Inc. to conduct a system meter evaluation and water audit. The results of the water audit indicated the necessity of replacing several meters in the system.

**Need for Project**

To accurately account for water distribution within sections of the system, certain identifiable meters need to be replaced.

**Description**

This project consist of obtaining a qualified engineer, specializing in determining the appropriate meter type and associated installation requirements given the existing meter's desired function, location in the system and along the conduit, and physical constraints. Once the appropriate type of meter and installation location have been identified, depending upon the complexity, COMB staff will procure and install said meters.

**Regulatory Compliance**

N/A

**Budget & Schedule**

**Internal Staff Estimate**

<b>Fiscal Year</b>	<b>Cost</b>
2017-18 (Phase I)	\$100,000
2018-19 (Phase II)	\$ 50,000
2019-20 (Phase II)	\$ 50,000
2020-21 (Phase II)	\$ 50,000
<b>Total</b>	<b>\$250,000</b>

**Rehabilitate San Antonio Creek Blow-Off  
(2012-2-35)**

**Project Ranking**

95%

**Total Estimated Cost:** \$45,000



**Background**

The San Antonio Creek blow-off structure was constructed as an addition to the Cachuma Project facilities in 1958. It was constructed to provide a method for water release and draining of Lauro Reservoir during an Emergency Scenario. The structure's sole purpose is to respond to dam safety considerations.

**Need for Project**

The existing structure includes a 16-inch and a 12-inch gate valve that are both frozen in place and inoperable because of age and corrosion. The inoperable condition of the valves prevents regular maintenance. The two valves serve as a lifeline control response to an emergency that would require COMB to drain or reduce the elevation at Lauro Reservoir in response to dam safety considerations.

**Description**

San Antonio Creek blow-off structure is twenty-five feet deep and a quarter mile from the access road which crosses San Antonio Creek, making access difficult and potentially complicated. The 16 and 12 inch valves would be removed and replaced. The project will require a shutdown of the South Coast Conduit.

Phase I (Fiscal Year 15-16): Engineering and Design

Phase II (Fiscal Year 17-18): Construction

**Regulatory Compliance**

The structure is located in a county park and may require environmental review because of access restrictions. This project has been identified by the USBR as a Category 2 recommendation.

**Budget & Schedule**

**Internal Staff Estimate**

<b>Fiscal Year</b>	<b>Cost</b>
2015-16 (Phase I)	\$ 10,000
2016-17	\$ 0
2017-18 (Phase II)	\$ 35,000
<b>Total</b>	<b>\$ 45,000</b>

**North Portal Intake Tower Seismic Analysis & Conditions Assessment (2016-C-1)**

**Project Ranking**

94%

**Total Estimated Cost:** \$100,000



**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 stands 120 feet tall 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.

**Need for Project**

The North Portal Intake Tower 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 and, in fact, were largely nonexistent. Structural elements of the intake structure would be examined to determine the general reliability of the tower, recommendations for upgrades and refurbishments, if needed.

**Description**

This initial phase of the project consists of acquiring the consulting engineering services of a qualified structural engineering firm to perform a Seismic Reliability Analysis and Physical Condition Assessment of the Lake Cachuma Intake Tower located at the North Portal of the Tecolote Tunnel. It shall include a report of all findings and propose recommendations for structure rehabilitation to increase and/or ensure continued reliability of the structure in the occurrence of a large seismic event.

Phase I (Fiscal Year 17-18): Assessment; Engineering and Design

**Regulatory Compliance**

N/A

**Budget & Schedule**

**Internal Staff Estimate**

<b>Fiscal Year</b>	<b>Cost</b>
2017-18 (Phase I)	\$100,000
<b>Total</b>	<b>\$100,000</b>



**San Jose Creek – South Coast Conduit Crossing  
(2016-C-2)**

**Project Ranking**

93%

**Total Estimated Cost:** \$1,480,000



**Background**

The South Coast Conduit crosses San Jose Creek at approximately station 394+70. During routine maintenance of the nearby blow-off structure, a section of the conduit was discovered to be exposed within the western bank of the creek bed. After further review of original profiles, it has been determined that the original cover on the pipeline at that location was over 20' of material. Over time, the stream has eroded the material at that location and exposed the pipeline.

**Need for Project**

The exposed portion of the South Coast Conduit is vulnerable to pipeline failure resulting from structural damage, corrosion, and further erosion over the pipeline. This weakness poses a significant risk of failure and the associated loss of the ability to deliver water to Lauro Reservoir, which will ultimately serve the cities of Santa Barbara, Montecito, and Carpinteria.

**Description**

Procurement of consulting engineering services will be required in order to conduct a full site evaluation and develop the resulting, appropriate plan, given the current conditions. With a completed design, COMB will obtain the services of a qualified contractor per the bid process for plan implementation. The design shall be devoted in detail to mitigating the effects of all necessary system shutdowns and flow interruptions.

Phase I (Fiscal Year 17-18): Engineering and Design

Phase II (Fiscal Year 18-19): Construction / Remediation

**Regulatory Compliance**

This project requires full environmental review and compliance.

**Budget & Schedule**

**Internal Staff Estimate**

<b>Fiscal Year</b>	<b>Cost</b>
2017-18 (Phase I)	\$ 60,000
2018-19 (Phase II)	\$1,420,000
<b>Total</b>	<b>\$1,480,000</b>



**North Portal Slope Stabilization  
(2014-C-58)**

**Project Ranking**

90%

**Total Estimated Cost:** \$40,000



**Background**

The Lake Cachuma Intake Tower is accessed by a paved road accessed from State Highway 154. During 2002, staff expanded the road by encroaching into the hillside in reaction to erosion and sliding on the outside section of the road. Since the initial work in 2002, destabilization of the hillside has continued making portions of the road potentially unsafe.

**Need for Project**

Ongoing regular use of the road is necessary to access the North Portal area. Subsequent to 2002, additional interim methods of stabilization on the road had been implemented which produced a short term benefit. Since that initial work during 2002, the existing lake level has provided a visual indication the slope continues to suffer from significant stability issues.

**Description**

Engineering services would be retained to conduct a Geotechnical Study/ Design, to identify and design a plan to stabilize the slope and ensure road protection and access.

Phase I (Fiscal Year 2016-17): Engineering

Phase II (Fiscal Year 2017-18): Slope Stabilization and remediation based on design plan completed in Phase I.

**Regulatory Compliance**

This project requires USBR environmental review.

**Budget & Schedule**

**Internal Staff Estimate**

<b>Fiscal Year</b>	<b>Cost</b>
2016-17 (Phase I)	\$ 10,000
2017-18 (Phase II)	\$ 30,000
<b>Total</b>	<b>\$ 40,000</b>

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

**Project Ranking**

90%

**Total Estimated Cost:** \$300,000



**Background**

Located at the base of the Tecolote Tunnel, the Jet Flow Control Valve is the primary control for flow of water from Lake Cachuma into the South Coast Conduit. The valve is located within the red piping component as pictured above. It is operated through the SCADA system. The adjacent gate valve (black) can manually be used as an alternate method to control flow through the tunnel. The Jet Flow Control valve was replaced in 1990 and has a useful life of approximately thirty years. Internal replacement components of the valve were approved in the FY 2014-15 budget and have been purchased.

**Need for Project**

Due to the uncertainty of useful life, COMB will purchase a complete new valve. The new replacement valve would be installed during a planned shutdown and the current valve would be rebuilt with new components and kept on site to be used as a redundant valve in case of failure.

**Description**

This project consists of designs and specs to manufacture a new valve body which would be rebuilt using previously purchased internal components. Once the valve was ready for installation, a shutdown using the manual gate valve would occur. The current 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.

**Regulatory Compliance**

N/A

**Budget & Schedule**

**Internal Staff Estimate**

<b>Fiscal Year</b>	<b>Cost</b>
2018-19 (Design and Installation)	\$300,000
<b>Total</b>	<b>\$300,000</b>

**Mission Creek – South Coast Conduit Crossing  
(2013-C-56)****Project Ranking**

90%

**Total Estimated Cost:** \$2,600,000**Background**

The South Coast Conduit (SCC) crosses Mission Creek at approximate pipeline Station 74+00, 25 feet downstream of the County road Highway 192 Bridge. The SCC suffered damage in the 1970s when a large boulder tumbled on top of the pipe creating a hole in the pipe. Through an emergency retrofit project, a concrete cap was placed over the pipeline at the current flow line to prevent channel bed scour beneath the bridge footings and the SCC. The concrete cap acts as a grade control structure and is now undermined due to stream scour on the downstream side of the pipeline and concrete apron. The exposed pipe is subject to further damage from boulder impacts during stormflow events as well as material deterioration from exposure to oxygen and water. Although temporary repairs to the crossing were completed in Fiscal Year 2015-16, a more permanent solution will be necessary in the near future. As part of the U.S. Bureau of Reclamation (USBR) Phase 2 Reliability Study for the SCC conducted in 2006 and a subsequent site inspection during 2014, this site was identified as a priority due to the potential for failure of the SCC.

The existing concrete apron is intended to protect the pipeline and the Highway 192 Bridge footings but has resulted in a barrier to migrating juvenile and adult endangered southern steelhead (*Oncorhynchus mykiss*, *O. mykiss*) within the creek. Mission Creek has been identified as a Core 1 watershed for steelhead recovery by the National Marine Fisheries Service (NMFS) in their Southern California Steelhead Recovery Plan (NMFS, 2012). As a result, this project will be required to meet fish passage considerations and therefore constructed in conjunction with a fish passage project. The City of Santa Barbara has now completed three fish passage projects on Mission Creek downstream of the Hwy 192 Bridge. The subject project is the next significant fish passage impediment upstream. Questa Engineering was contracted by the City of Santa Barbara to evaluate fish passage options and provided a report in 2008. Several design workshops have been held since then with the regulatory agencies and a riffle and step-pool sequence has been determined to be the preferred alternative (Questa Engineering, 2012); design specifics will depend on the horizontal and vertical placement of the SCC below the streambed.

**Need for Project**

The SCC at Mission Creek is the primary water supply for the cities of Carpinteria, Montecito and a large portion of Santa Barbara. The vulnerability of the pipeline to failure resulting from further structural damage and/or corrosion poses an operational risk. The project would remove a section of the SCC and construct a new section encased in concrete at a lower elevation well below the streambed to protect it from damage by scour. At the same time, the concrete apron and channel downstream would be altered to provide fish passage while protecting the Highway 192 Bridge footings. Project designs would be reviewed and approved by the City of Santa Barbara, County of Santa Barbara, NMFS and California Department of Fish and Wildlife to meet road, pipe and fish passage design standards.

**Description**

COMB retained engineering services to conduct an evaluation of the site and develop and implement a temporary repair. Over the next few years, a permanent solution will be designed, reviewed and approved by local, state and federal regulatory agencies. Once an acceptable design has been developed, COMB would then determine funding options for construction of the project.

Phase I (Fiscal Year 2015-16): Temporary Repair

Phase II (Fiscal Years 2016-17 & 2018-19): Permanent Solution – Engineering and Design

Phase III (Fiscal Year 2019-20): Planning, Grant Writing, etc.

Phase IV (Fiscal Year 2020-21): Construction

**Regulatory Compliance**

EIR/EIS and full environmental review and compliance will be a required project component.

**Budget & Schedule**

**Internal Staff Estimate**

<b>Fiscal Year</b>	<b>Cost</b>
2015-16 (Phase I)	\$ 50,000
2016-17 (Phase II)	\$ 50,000
2017-18	\$ 0
2018-19 (Phase II – cont.)	\$ 50,000
2019-20 (Phase III)	\$ 400,000
2020-21 (Phase IV)	\$2,100,000
<b>Total</b>	<b>\$2,650,000</b>

**References**

“Phase 2 Reliability Study for South Coast Conduit Upper Reach Tecolote Tunnel to Corona Del Mar Water Treatment Plant and Carpinteria Reach South Coast Conduit Pump Station to Ortega Reservoir” Boyle April 2008 Page 100 and Table 8-1.

September 2006 Boyle “Phase 2 Reliability Study for South Coast Conduit Upper Reach Tecolote Tunnel to Corona Del Mar Water Treatment Plant and Carpinteria Reach South Coast Conduit Booster Pump Station to Ortega Reservoir” Page 100 and Table 8-1.

NMFS, 2012. Final Southern California Steelhead Recovery Plan, National Marine Fisheries Service (NMFS-NOAA), Long Beach, CA.

Questa Engineering, 2008. Highway 192 at Mission Creek South Coast Conduit Rehabilitation and Fish Passage Improvement Project. Questa Engineering Corporation. Prepared for the City of Santa Barbara, November.

Questa Engineering, 2012. Highway 192 at Mission Creek South Coast Conduit Rehabilitation and Fish Passage Improvement Project Design Review. Prepared for the Cachuma Operation and Maintenance Board.

**Upper Reach Reliability Project – Phase II  
(2017-C-1)**

**Project Ranking**

90%

**Total Estimated Cost:** \$8,000,000



**Background**

The Second Barrel Pipeline Project was designed to provide a redundant pipeline from the Tecolote Tunnel's South Portal to the Corona del Mar Filtration Treatment Plant. Said second pipeline provides increased operational flexibility and reliability, as well as additional conveyance capacity to help meet peak system demands. Completed in 2012, Phase I of the Second Barrel Project installed a new 48" diameter pipeline from the South Portal of the Tecolote Tunnel to the Glen Annie Turnout structure. Phase II will complete the project, installing approximately 10,000 additional linear feet of 48" diameter welded steel pipe from the Phase I endpoint at the Glen Annie Turnout structure, through to the Corona del Mar Filtration Treatment Plant.

**Need for Project**

The completion of Phase II is essential in order to benefit from the project as it was originally designed. This final phase connects pipeline installed during Phase I all the way to the project's initially designated endpoint, Corona del Mar Filtration Plant.

**Description**

Engineering services would be retained to conduct a full site evaluation and perform a geotechnical study along the proposed length of new pipeline, and to design the project accordingly. The construction phase would implement the repair per the engineering design, recommendations and specifications.

**Regulatory Compliance**

This project requires full environmental review and compliance.

**Budget & Schedule**

**Internal Staff Estimate**

<b>Fiscal Year</b>	<b>Cost</b>
2018-19 (Engineering Evaluation & Study)	\$ 200,000
2019-20 (Planning & Permitting)	\$ 300,000
2020-21 (Construction)	\$3,500,000
2021-22 (Construction)	\$4,000,000
<b>Total</b>	<b>\$8,000,000</b>



**Glen Annie Reservoir Safety of Dams Rehabilitation Project  
(2011-C-57)****Project Ranking**

83%

**Total Estimated Cost:** \$33,500,000*Federal share: \$28,475,000**MU Share: \$5,025,000**(SOD Act Repayment over time)***Background**

Glen Anne is one of four regulating reservoirs on the Cachuma Project facilities. Glen Anne Reservoir had an initial storage capacity of 500AF. Due to seismic stability requirements and risk of failure potentially causing catastrophic damage downstream, the maximum capacity was limited to 375AF in 1988. In 2002 it was limited again to 175 AF maximum capacity. Glen Anne Reservoir is no longer in service, but COMB continues regular maintenance and inspections as required by the USBR.

**Need for Project**

The ability to store water in all system reservoirs is critical to water delivery during a shutdown of the Tecolote Tunnel. Further, Glen Anne is important as a balancing reservoir to enable work on other system reservoirs and appurtenances to the SCC. The inoperability of Glen Anne impacts all Member Agencies.

Raw water storage in the Upper Reach is critical to allow the Tecolote Tunnel to shut down for repairs while allowing Goleta Water District to continue to deliver water to their customers. This can be accomplished by upgrading Glen Anne Reservoir and Dam. This project will benefit all of the Member Agencies on the South Coast, by providing additional storage capacity, increase efficiency and reliability of COMB facilities, reduce the complexity of shut-downs, simplify scheduled repairs of the Tecolote Tunnel and aid in fire protection and flood control.

**Description**

Dam seismic safety and other operational problems that exist because of deterioration would be addressed. Adjacent pumps and delivery system piping will be restored to operability. Remediation components will likely include removing the silt to allow operation at designed capacity and replacement of deteriorated 12 inch thick asphaltic concrete liner.

Seismic retrofit will like include installation of shear key and berm installed down to the bedrock to resolve the existing potential for liquefaction.

Phase I (Fiscal Year 18-19): Investigation of project phasing and potential grant funding

Phase II (Fiscal Year 19-20): Initial studies and preliminary Engineering

Phase III (Fiscal Year 20-21): Engineering

Phase IV (Fiscal Year 21-22): Construction



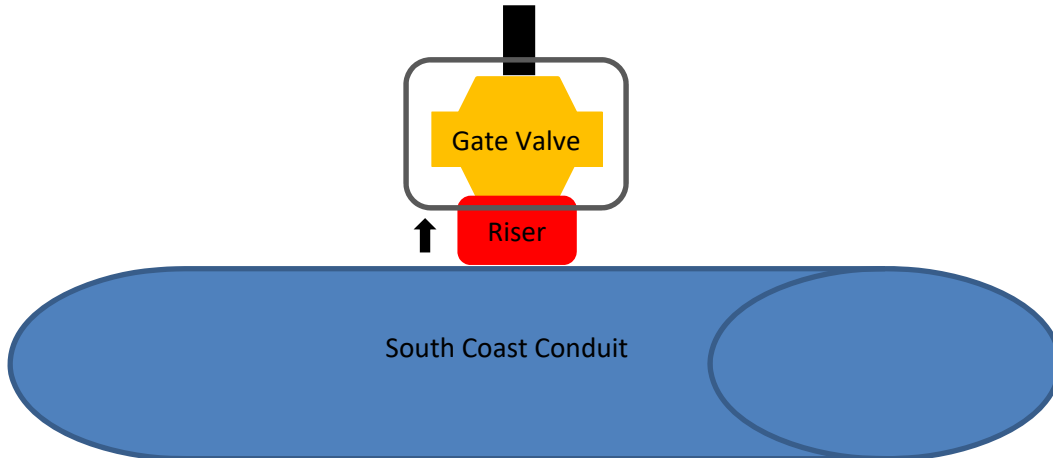
**Regulatory Compliance**

Environmental Review performed by USBR

<b>Budget &amp; Schedule</b>	<b>Internal Staff Estimate</b>
<b>Fiscal Year</b>	<b>Cost</b>
2018-19 (Phase I)	\$ 0
2019-20 (Phase II)	\$ 0
2020-21 (Phase III)	\$ 0
2021-22 (Phase IV)	\$ 0
<b>Total</b>	<b>\$33,500,000 (15% SOD Act repayment)</b>

**Structure Housing Equipment: Lateral**

Overview



The appurtenant structures involved with the South Coast Conduit system are depicted in the sketch above. These structures are identified as either Lateral structures, Air Vacuum Air Release structures, or Blow-off structures.

Divided into the Upper Reach (from the South Portal to Lauro Dam) and the Lower Reach (from the Cater Treatment Facility to Carpinteria), each structure contains a man hole cover, a lower riser, and upper riser, a gate valve and blow-off piping. The concrete structures containing these components are called vaults and are located above and below ground level on top of the South Coast Conduit (SCC).

The total number of lateral structures on the SCC is **65**.

The Upper Reach contains **21** lateral structures and the Lower Reach contains **44** lateral structures.

The internal components are described as follows:

- **Riser component** - serves as a connection between the Man Hole Cover and the Gate Valve.
- **Gate Valve** - under normal operation this valve is open to allow water flow to adjacent Member Unit delivery systems.

Lateral	Total Structure	100% Complete	Active	Non-Active	Need Riser	Need Gate Valve
Upper Reach	21	1	1	20	20	0
Lower Reach	44	1	43	1	43	43
<b>Total</b>	<b>65</b>	<b>2</b>	<b>44</b>	<b>21</b>	<b>63</b>	<b>43</b>

**Rehabilitate South Coast Conduit Lower Reach Lateral Structures (2015-C-3)**

**Project Ranking**

77%

**Total Estimated Cost:** \$200,000



**Background**

There are forty-four lateral connections housed in concrete cylinder structures on the lower reach of the South Coast Conduit. The function of these connections is to provide water to sections of the Montecito Water District and Carpinteria Valley Water District. Each connection contains a gate valve, a check valve and an air vent component.

**Need for Project**

Thirty-five of the existing lateral appurtenances pose an operational risk due to age, corrosion, and unreliable valve operating conditions. The dependability of these valves is necessary to provide reliable water service to customers served in sections of the Montecito and Carpinteria Water District Boundary areas.

**Description**

This project would replace corroded and inoperable valves, air vents, and check valves on active lateral connections. The project will require shutdowns for the specified turnout distribution supply areas and would be coordinated with the impacted Member Units. The project would require retention of engineering and contractor services; and, due to each site’s differing conditions, engineering would be required for each individual structure.

**Regulatory Compliance**

N/A

**Budget & Schedule**

**Internal Staff Estimate**

<b>Fiscal Year</b>	<b>Cost</b>
2018-19	\$ 50,000
2019-20	\$ 50,000
2020-21	\$ 50,000
2021-22	\$ 50,000
<b>Total</b>	<b>\$200,000</b>

**Sheffield Tunnel Inspection and Evaluation of South Coast Conduit Components (2007-2-33)**

**Project Ranking**

74%

**Total Estimated Cost:** \$400,000



**Background**

The Sheffield Tunnel is a concrete tunnel housing the 36" South Coast Conduit (SCC) that extends 6,100 feet through rising geology on the south side of Foothill Road. Within the tunnel, sections of concrete pipe are connected and joined with mortar joints and pipe supports to maintain the integrity of the pipe collar connections.

**Need for Project**

The USBR inspection report of the Sheffield Tunnel identified and recommended remediation of cracked pipe collars and adjoining deterioration of mortar joints and pipe supports. Deterioration potentially compromises the integrity of the tunnel and poses an operational risk. Heavy seepage appears to be a contributing factor to deterioration.

**Description**

Retain outside engineering to conduct an evaluation of the identified deterioration to determine the structural integrity and reliability of the connecting and support structure of Sheffield Tunnel. Engineering evaluation will include recommended repairs and determine how to eliminate areas of heavy seepage. It is possible the engineering evaluation could find a lower cost remedy to that recommended by USBR. Upon completion of the evaluation retain a qualified contractor to repair the deteriorated mortar joints and pipe supports at locations identified.

Phase I (Fiscal Year 18-19): Evaluation of Tunnel Deterioration

Phase II (Fiscal Year 19-20): Remediation Design (based on the evaluation)

**Regulatory Compliance**

This project has been identified by the USBR as a Category 2 recommendation.

**Budget & Schedule**

**Internal Staff Estimate**

<b>Fiscal Year</b>	<b>Cost</b>
2018-19	\$100,000
2019-20	\$300,000
<b>Total</b>	<b>\$400,000</b>

**South Portal Slope Stabilization  
(2014-C-59)**

**Project Ranking**  
74%

**Total Estimated Cost:** \$800,000



**Background**

The Modified Upper Reach Reliability Project (MURRP) is sited at the base of Glen Anne Canyon, which has a history of landslides because of unstable terrain. The MURRP contains open vents that are vulnerable to landslides. During 1995 a slide engulfed the old South Portal Structure. The hillside was excavated to create additional space for the new South Portal Configuration on the MURRP. Slope stabilization was not addressed as a component of the project. The site has been temporarily protected with concrete road barriers (K-rails), but a more adequate and permanent solution remains necessary.

**Need for Project**

Existing slope instability has the potential to cover the South Portal Configuration on the Modified Upper Reach Reliability Project, adversely affecting access and causing soil infiltration into the SCC. Multiple professionals have visited the site and concur with the risk identified.

**Description**

Phase I (Fiscal Year 2018-19): Geotechnical Study/Engineering Design (identify the most economic method to stabilize the slope and protect the asset).

Phase II (Fiscal Year 2019-20): Slope Stabilization and remediation (based on design plan completed in Phase I).

**Regulatory Compliance**

N/A

**Budget & Schedule**

**Internal Staff Estimate**

<b>Fiscal Year</b>	<b>Cost</b>
2018-19 (Phase I)	\$ 50,000
2019-20 (Phase II)	\$750,000
<b>Total</b>	<b>\$800,000</b>



**Inspect Interior of:**

- Ortega Outlet Pipe (2013-2-20)
- Sheffield Tunnel Pipe (2001-2-28)
- Lauro Dam Pipe (2001-2-10)
- Carpinteria Control Station (2013-2-39)

**Project Ranking**

71%

**Total Estimated Cost:** \$142,000



**Background**

Under the direction of USBR, the South Coast Conduit (SCC) was completed in the mid-1950s. During its service life, the archives indicate, aside from normal wear and tear, the system appurtenances have exceeded designed life. The USBR requires COMB to perform interior inspections on facilities every six years to determine physical integrity.

**Need for Project**

Because certain system components and appurtenances have exceeded projected useful life, an evaluation should be conducted to ensure system integrity and identify potential performance weaknesses. This inventory and examination will serve as a basis for future IIP development.

**Description**

Contract services would be retained to perform the examination and document current condition and issues requiring attention. It is anticipated entry into the conduit would likely occur through AVAR locations, which would allow the team to move from high points in the line toward the lower spots where blow-off structures exist. The conduit would need to be ventilated safely to ensure safe ingress/egress. This examination would require MU coordinated shutdowns.

The inspection will focus on locations subject to corrosion and wear beginning with the interiors of outlet piping from all reservoirs leading to the control building. Because of the unique structural characteristics of Ortega Reservoir, COMB would contract with an engineering firm with specialized capabilities including structural analysis, video inspections (piping/tunnel), etc. Each inspection would require the contractor to prepare an analysis in a format designed by COMB and coordinated with USBR. Once complete, COMB would submit the plans to USBR for review and approval.

**Regulatory Compliance**

USBR Category 2 recommendation and required to meet SOP requirements.

<b>Budget &amp; Schedule</b>	<b>Internal Staff Estimate</b>
<b>Fiscal Year 2018-19</b>	<b>Cost</b>
Ortega Outlet Pipe	\$ 36,000
Sheffield Tunnel Pipe	\$ 20,000
Lauro Dam Pipe	\$ 12,000
Carpinteria Control Station	\$ 74,000
<b>Total</b>	<b>\$142,000</b>

**Install Second Sump Pump in the Lower Chamber of the North Portal  
(2012-2-36)**

**Project Ranking**  
69%

**Total Estimated Cost:** \$35,000



**Background**

The bottom of the North Portal chamber contains a sump pump to mitigate the impact of water intrusion into the elevator shaft and upper and lower gate chambers. The sump pump is sited below grade at the bottom of the chamber and effectively removes standing water, acting as a protection against corrosion for all below ground equipment.

**Need for Project**

Installation of a second sump pump would provide redundancy to the existing sump pump. If the first sump pump fails or is overcome by excess water, the second sump pump would ensure water is pumped out of the chamber.

**Description**

Contracted electrical services would be retained to install and integrate the new pump into the existing pump control system.

**Regulatory Compliance**

This is a USBR Category 2 recommendation.

**Budget & Schedule**

**Internal Staff Estimate**

<b>Fiscal Year</b>	<b>Cost</b>
2018-19	\$35,000
<b>Total</b>	<b>\$35,000</b>

**Rebuild the Inflow Rip Rap at Lauro Reservoir  
(2013-C-15)**

**Project Ranking**  
67%

**Total Estimated Cost:** \$200,000



**Background**

The inflow into Lauro Reservoir from the South Coast Conduit commences with water flow on a channel composed of rip rap rock installed to slow and aerate the inflow of water and prevent erosion to reservoir side walls. The rip rap structure is composed of rock and concrete and is designed to prevent scour or erosion of the adjacent side walls.

**Need for Project**

The lower portion of the rip rap apron has been undermined across the base of the reservoir. The rip rap apron measures approximately twenty-five feet in length and is in need of repair. Without repair of the apron, water flow will erode the embankment and the base of the channel will become unable to support the rip rap structure. Loss of the rip rap would make the inflow structure unable to fulfill its required function.

**Description**

A structural engineering firm would conduct an evaluation to determine an appropriate repair to maintain the essential support and integrity of the rip rap channel. The reservoir would need to be lowered to accommodate inspections and repairs.

Phase I (Fiscal Year 2018-19): Engineering and Construction

**Regulatory Compliance**

N/A

**Budget & Schedule**

**Internal Staff Estimate**

<b>Fiscal Year</b>	<b>Cost</b>
2018-19	\$200,000
<b>Total</b>	<b>\$200,000</b>

**Tecolote Tunnel Concrete Deterioration Investigation  
(2005-2-55)**

**Project Ranking**

52%

**Total Estimated Cost:** \$100,000



**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 horse-shoe shaped cross section constructed of steel encased in 12 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 an inspection by the USBR in 2012, deterioration was discovered due to long-term exposure to hydrogen sulfide.

**Need for Project**

Hydrogen sulfide has caused some deterioration of the concrete lining of the tunnel. In areas, the interior concrete surface has peeled in sheets approximately 3/8 of an inch thick and fallen into the invert, creating sediment. The majority of the tunnel is in acceptable condition. However, a few locations exhibit small areas where leaching could affect the structural integrity of the concrete. Review is necessary.

**Description**

The Tecolote Tunnel is a 6.4 mile long tunnel which is considered a “confined space” location. The evaluation will require an engineer to identify the locations and extent of the concrete deterioration, severity of damage within the Tecolote Tunnel and recommend appropriate remediation.

**Regulatory Compliance**

This project has been identified by the USBR as a Category 2 recommendation.

**Budget & Schedule**

**Internal Staff Estimate**

<b>Fiscal Year</b>	<b>Cost</b>
2019-20	\$100,000
<b>Total</b>	<b>\$100,000</b>



**Clean Clogged Weep Holes in Tecolote Tunnel  
(2005-2-31)**

*(To be performed in conjunction with Tecolote Tunnel Investigation Project)*

**Project Ranking**

52%

**Total Estimated Cost:** \$200,000



**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 for Project**

There are numerous weep holes within the Tecolote Tunnel that have been subjected to mineral accumulation creating deposits. 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, thereby 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.

**Description**

The project would be conducted concurrent with the concrete lining repair and will require a shutdown of the tunnel and all safety precautions necessary for tunnel access because of hydrogen sulfide exposure and confined space issues.

**Regulatory Compliance**

This project has been identified by the USBR as a Category 2 recommendation.

**Budget & Schedule**

**Internal Staff Estimate**

<b>Fiscal Year</b>	<b>Cost</b>
2019-20	\$200,000
<b>Total</b>	<b>\$200,000</b>

**Investigate Structural Requirements of the Steel Collar between Outlet Works and 48-inch Intake Pipe at Lauro Tunnel (2013-2-41)**

**Project Ranking**  
49%

**Total Estimated Cost:** \$30,000



**Background**

The intake piping of the Lauro Reservoir outlet works intake structure includes a steel collar connection between the intake structure and intake pipe.

The intake component was replaced during 1981 by added a steel pipe that extends through the outlet works and through the top of the original concrete intake structure. A ¾ inch thick steel circular collar was installed on top of the existing intake structure to cover the opening between the intake structure and vertical pipe for either protection from debris intrusion, structural support or both. It is unknown if the steel collar is attached to the vertical steel pipe to connect the two components. The 2013 dive report, prepared by USBR, states the intake structure is in satisfactory condition with the exception of the steel collar. The Bureau was silent on the purpose of the collar and has been unable to verify the purpose the collar serves over and above simply providing a sealed connection between the two structures.

**Need for Project**

The collar has deteriorated because of corrosion and poses an operational risk for both the protection against outside intrusion of elements penetrating through the opening or potentially structural support.

**Description**

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

**Regulatory Compliance**

This project has been identified by the USBR as a Category 2 recommendation.

**Budget & Schedule**

**Internal Staff Estimate**

<b>Fiscal Year</b>	<b>Cost</b>
2019-20	\$30,000
<b>Total</b>	<b>\$30,000</b>

**Waterproof Gate Shaft in the North Portal  
(1999-2-53)**

**Project Ranking**  
45%

**Total Estimated Cost:** \$70,000



**Background**

The North Portal Elevator Shaft was constructed in the 1950s. The shaft extends approximately 125 feet below the control house. Water intrudes into the elevator shaft at construction joints and through cracks in the concrete structure. This moisture creates a corrosive environment for electrical and mechanical equipment.

**Need for Project**

The project anticipates either eliminating or reducing seepage into the elevator shaft and will protect the asset by extending its useful life and reducing maintenance costs.

**Description**

The work will require the retention of a contractor. Discussions with contractors have concluded the grout in all seams would be removed and a water stop polymer will be injected to eliminate water intrusion in the leaking seams and cracks. The top of the elevator car will be used as a work platform, and will require a certified elevator operator on site to move the work platform during the repair. Per contractor discussions, the work requires seepage to be visible to enable directing the polymer injection to the appropriate location in the shaft. Therefore, this work would be most successfully accomplished once the water table has increased in elevation.

**Regulatory Compliance**

This is a USBR Category 2 Recommendation.

**Budget & Schedule**

**Contractor Estimate**

<b>Fiscal Year</b>	<b>Cost</b>
2019-20	\$70,000
<b>Total</b>	<b>\$70,000</b>

**Locate Discharge Pipe; Outfalls at Four Blow-off Stations (2013-2-43)**

**Project Ranking**

39%

**Total Estimated Cost:** \$40,000



**Background**

Blow-off valves exist on all low points of a water system. Along the South Coast Conduit (SCC), these valves function to dewater the SCC should it be necessary to shut down a section to perform essential work. Certain valves and associated piping are over fifty years in age and in poor condition. The blow-off valve is located within a concrete structure and the discharge pipe extends to the outside from the vault.

**Need for Project**

Staff has been unable to locate point of discharge on four blow-off stations. Therefore, it appears the discharge piping has been buried in silt for an extended period of time and has no screening to prevent the migration of storm water and/or animals into the discharge pipe and subsequently into the structure.

**Description**

This project would locate and replace inoperable blow-off valve discharge piping and install flap valves on the discharge pipe within the identified Lower Reach blow-off stations. It is anticipated that the proposed work will be conducted by COMB Operations staff.

**Regulatory Compliance**

This project has been identified by the USBR as a Category 2 recommendation.

**Budget & Schedule**

**Internal Staff Estimate**

<b>Fiscal Year</b>	<b>Cost</b>
2019-20	\$40,000
<b>Total</b>	<b>\$40,000</b>

**Lauro Office Building Replacement  
(2014-C-59)**

**Project Ranking**

*This project is considered part of regular maintenance and will not be ranked along with the other Infrastructure Improvement Plan Projects. The project is identified in the Infrastructure Improvement Plan because it exceeds \$25,000.*

**Total Estimated Cost:** \$20,000



**Background**

COMB Administration, Fisheries, and Reception modular offices are aging and in various stages of deterioration. The Administration office is a 1979 model (36 years old), purchased in 1993; the Fishery office is a 1997 model (18 years old), purchased in 1999; and the Reception office is a 2002 model (13 years old), purchased used in 2002. The immediate issue is the Administrative office, which has uncorrectable structural problems attributable to roof leaks.

Initial information indicates the cost of a used/refurbished modular unit is approximately \$50 per square foot for a shell that would need modifications. New modular unit costs vary depending on design, ranging from \$75 to \$150 per square foot. Per square foot costs do not include the cost of delivery and setup cost that range from \$12,000 to \$19,000 for each 40 foot unit. Existing units do not have a resale value because of noncompliance with current state building codes and therefore must be demolished. The demolition cost of existing buildings is approximately \$9,000 for each 12 foot section of the 40 foot unit. Demolition cost will be a separate manufacturer quote.

**Need for Project**

The current modular office buildings are in various stages of deterioration.

**Description**

Purchase one to three new modular office buildings.

**Regulatory Compliance**

N/A

**Budget & Schedule**

**Internal Staff Estimate**

<b>Fiscal Year</b>	<b>Cost</b>
2017-18	\$ 20,000
<b>Total</b>	<b>\$ 20,000</b>



**Carpinteria Reservoir Security Fencing  
(2014-C-70)**

**Project Ranking**

*This project is considered part of regular maintenance and is not ranked with the other Infrastructure Improvement Plan Projects; Project exceeds \$25,000 and therefore identified in the Infrastructure Improvement Plan.*

**Total Estimated Cost:** \$41,500



**Background**

Carpinteria Reservoir is surrounded by security fencing used to protect the reservoir from unauthorized access. The chain-link fence is four-foot high with additional height accomplished using four strands of barb wire.

**Need for Project**

Fencing has deteriorated due to age and weather. The fencing needs to be bought up to a standard to avoid public intrusion. The USBR determined the appropriate fencing needed around drinking water reservoirs is six-foot high chain-link fencing topped with V-shaped barb wire fencing.

**Description**

Replacement of the fence would be performed by a contractor. The existing fence would be replaced with a 6-foot high V-shaped barb wire fencing consistent with USBR security requirements.

**Regulatory Compliance**

N/A

**Budget & Schedule**

**Internal Staff Estimate**

<b>Fiscal Year</b>	<b>Cost</b>
2019-20	\$ 41,500
<b>Total</b>	<b>\$ 41,500</b>

### Supervisory Control and Data Acquisition (SCADA) Upgrades (2014-C-61)

#### Project Ranking

*This project is considered part of regular maintenance and is not ranked with the other Infrastructure Improvement Plan Projects. This is an ongoing project.*

**Total Estimated Cost:** \$90,000



#### Background

The “Supervisory Control and Data Acquisition” system (SCADA) serves four objectives:

1. Allows the remote adjustment of valves which control the flow of water based on demand.
2. Collects and enables the retrieval of historical data at COMB Offices or via remote computer. Information includes flows, reservoir elevations, alarms, communication, turbidity, pH, temperature, and valve positions.
3. Provides phone alerts to COMB Operations staff to enable remote corrective action 24/7.
4. Increases the efficiency of Operations staff by avoiding onsite corrective action and enhances system reliability.

Installation of the COMB Supervisory Control and Data Acquisition (SCADA) system began in 2003. Budgetary constraints have deferred upgrades over the ensuing 10-years. Substantial information is generated through this system that is used internally by COMB and requested externally by MUs and other agencies. The FY 2014-15 budget approved Phase 1 of the system upgrade in the amount of \$22,000 to install a historian server backup, install a new cellular communication system, and update the PLC programming software.

#### Need for Project

Remaining system upgrades are currently under review by an engineering consultant. Therefore, defined project needs are not currently available. Identified components of system software are obsolete and no longer supported by the manufacturer and necessitate replacement.

#### Description

The current SCADA system is under evaluation by a consulting engineer to determine the upgrades necessary to meet minimum operational and information requirements. Phases two through ten would upgrade obsolete, critical Programmable Logic Controllers (PLC) in the field and install wireless technology communication devices to enable reliable and secure access. This approach may change based on evaluation from the engineering consultant. It is anticipated that the purchase, programming and installation of these devices would be phased over time. The cost per PLC could reach \$50k. COMB operates nine PLCs.

Phase I (Fiscal Year 14-15): Install historian server backup and new cellular communication system; update PLC programming software.

Phases II – IV (FYs 2016-2018): Update PLC Units / wireless communication devices in the field

**Regulatory Compliance**

N/A

<b>Budget &amp; Schedule</b>	<b>Internal Staff Estimate</b>
<b>Fiscal Year</b>	<b>Cost</b>
2014-15 (Phase I)	\$ 25,000
2015-16 (Phase II)	\$ 25,000
2016-17 (Phase III)	\$ 20,000
2017-18 (Phase IV)	\$ 20,000
<b>Total</b>	<b>\$ 90,000</b>

**Right Of Way Identification Program (2014-C-72)**

**Project Ranking**

*This project is considered part of regular maintenance and is not ranked with the other Infrastructure Improvement Plan Projects: This project is identified in the Infrastructure Improvement Plan because it exceeds \$25,000. This project is a five-year project identified during Fiscal Year 2013-14 budget preparation.*

**Estimated Cost: \$40,000**

**Background**

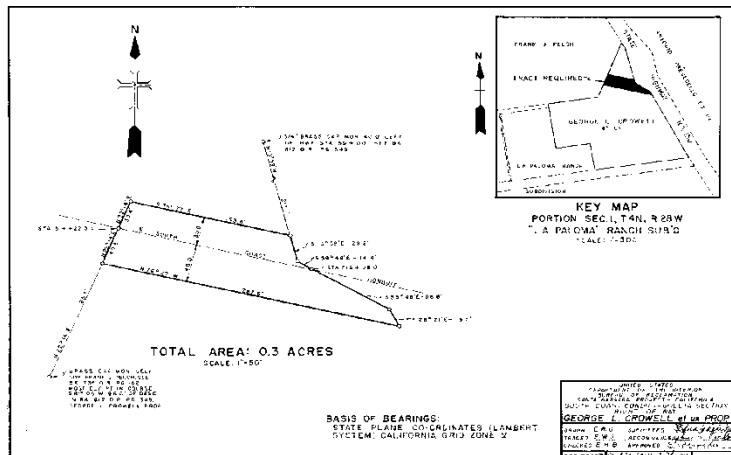
Use of the USBR Easements by someone other than COMB is referred to as an encroachment. Previous studies have noted that encroachment into the South Coast Conduit (SCC) pipeline easement is widespread. COMB regularly finds unpermitted encroachments within the Cachuma Project Easement. These encroachments are found utilizing USA Dig-Alerts along with regular visual inspections of the Cachuma Project easement. COMB also reviews planning minutes produced within Santa Barbara County each month to determine if a proposed development is within the Cachuma Project Easement. The 2013-14 and 2014-15 budgets included funds for this program. The program, when complete, will provide specific land use information for all sections of the USBR easement. This will include specific land owner information to enable communication on land use restrictions and permit requirements. Additionally, the program will enable the timely response to County permit processes.

**Need for Project**

Unpermitted and unknown encroachments on the SCC easement potentially affect the structural integrity of the South Coast Conduit. Therefore, it is important that all encroachments be documented. This project will input existing and future encroachment information into an electronic inventory of encroachments on the easement. This inventory will be utilized for communication and potential site remediation activity involving existing landowners and evaluation of proposed encroachments to the easement through the permit process. This data will be Geographical Information System (GIS) based and enable a more efficient and cost effective response to regular maintenance, testing, and monitoring activities. This GIS based system will largely replace time consuming staff site visits to review projects proposed involving the easement.

**Description**

The Right of Way Project (ROW) inventory will centralize information electronically to facilitate landowner communication regarding pending right-of-way work, provide communication with Santa Barbara permitting agencies, and enable COMB staff response to right-of-way disruptions and issues efficiently by utilizing the GIS inventory. Specific tasks of the project include identifying, locating, and labeling the pipeline through field mapping in GIS and surveying. Sequentially, as data is developed, landowners will be notified of property easements and of COMB's South Coast Conduit responsibilities. The project anticipates placing up to 400 pipeline markers at property lines and alignment changes along the pipeline. Concurrently, COMB will enhance and continue communication with public and private permitting agencies made possible by the inventory. The location and inventory will enable regular site inspection, expedite our ability to precisely locate and identify visible leakage, ground erosion, or new encroachments.



Phase III (Fiscal Year 2016-17): Mapping of Cachuma Project easements into GIS. Contact by letter to all easement impacted landowners regarding COMB pipeline system maintenance responsibility.

Phase IV (Fiscal Year 2017-18): Survey pipeline and insert pipeline location markers.

Phase V (Fiscal Year 2017-18): Develop the annual pipeline inspection program for inclusion in the work plan. The annual inspection effort conducted will provide for updating information into the data base.

**Regulatory Compliance**

N/A

**Budget & Schedule**

**Internal Staff Estimate**

<b>Fiscal Year</b>	<b>Cost</b>
2016-17 (Phase III)	\$20,000
2017-18 (Phases IV & V)	\$20,000
<b>Total</b>	<b>\$40,000</b>

**Reference**

September 2006 Boyle “Phase 2 Reliability Study for South Coast Conduit Upper Reach Tecolote Tunnel to Corona Del Mar Water Treatment Plant and Carpinteria Reach South Coast Conduit Booster Pump Station to Ortega Reservoir” Page 119

Boyle April 2005 “Reliability and Alternatives Study for the South Coast Conduit Carpinteria Reach Cater Booster Pump Station to Ortega Reservoir” Page 37 and Figure 17-A

Boyle April 2003 “Reliability Alternative Study for Upper Reach of the South Coast Conduit” Page 41.

**Clean and Apply Grout into Leaking Cracks Outlet Works Interior Walls at Lauro Reservoir (2010-2-8)**

**Project Ranking**

*This project is considered part of regular maintenance and is not ranked with the other Infrastructure Improvement Plan Projects: This project is identified in the Infrastructure Improvement Plan because it exceeds \$25,000.*

**Total Estimated Cost: \$0**



**Background**

In 1995, COMB staff attempted to seal and grout the Lauro Tunnel seams to prevent water intrusion. This and previous repairs were ineffective and have failed to prevent water intrusion over time.

**Need for Project**

Prevention of water intrusion in the tunnel would extend the useful life of the facility, ensure its reliability and promote a safer work environment.

**Description**

Removal of deteriorated grout and the injection of a water stop polymer would be conducted by a retained contractor.

**Regulatory Compliance**

This project has been identified by the USBR as a Category 2 recommendation.

**Budget & Schedule**

**Internal Staff Estimate**

<b>Fiscal Year</b>	<b>Cost</b>
2017-18	\$0
<b>Total</b>	<b>\$0</b>