COUNTY of SAN LUIS OBISPO

DESALINATION EXECUTABLE SOLUTION AND LOGISTICS PLAN

United States Bureau of Reclamation Title XVI Feasibility Study

July 2026 / DRAFT

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This document is released for the purpose of information exchange review and planning only under the authority of: Anthony M. Cemo, July 2026, State of California, C-87929; and Lydia A Holmes, July 2026, State of California, C-56616.

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Feasibility Study Purpose and Intended Use

This DESAL Plan Feasibility Study provides a planning-level review of possible desalination projects in San Luis Obispo County. Its purpose is to support future regional water supply planning. The Study identifies and evaluates a variety of potential desalination project sites, applies consistent screening criteria to compare them, and narrows the options to five feasible desalination project concepts.

This Study was prepared as a deliverable under the United State Bureau of Reclamation (USBR) WaterSMART: Water Recycling and Desalination Planning grant program. It follows USBR Title XVI Feasibility Study guidance; however, additional work such as detailed site analysis, engineering, environmental review, financial planning, and stakeholder outreach will be required before any project can move forward. For this reason, this Study will be submitted to USBR as a grant deliverable but not for completeness review for desalination project construction funding.

This Study was developed in collaboration with the DESAL Plan partner agencies which agreed to participate in the planning effort and allow potential project concepts within their service areas to be evaluated. Their participation does not indicate a commitment to build a project or fund future work.

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Abbreviations

3CE	Central Coast Community Energy
2015 Report	2015 Desalination Opportunities Summary Report
AB	Assembly Bill
AC	acre
AF	acre-feet (foot)
AFY	acre-feet per year
Agreement	Streambed Alteration Agreement
AMWC	Atascadero Mutual Water Company
APCD	Air Pollution Control District
APE	Area of Potential Effects
Atascadero Basin	Atascadero Groundwater Basin
Atascadero MWC	Atascadero Mutual Water Company
Avila Beach CSD	Avila Beach Community Services District
AWTP	Advanced Water Treatment Plant
B	billion
BC	benefit/cost
BMC	Basin Management Committee
BMP	best management practice
BWRO	Brackish Water Reverse Osmosis
C	Celsius
Cal Poly	California Polytechnic University - San Luis Obispo
CalEEMod	California Emissions Estimator Model
Cambria CSD	Cambria Community Services District
Carollo	Carollo Engineers
CAWO	Cayucos Area Water Organization
CBC	California Building Code
CCA	California Coastal Act
CCC	California Coastal Commission
CCoIC	Central Coast Information Center
CCWA	Central Coast Water Authority
CDFW	California Department of Fish and Wildlife
CDP	chemical disinfection by-product
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
cfs	cubic feet per second
CLOMR	Conditional Letter of Map Revision
CNDDB	California Natural Diversity Database

CNPS	California Native Plant Society
CNRA	California Natural Resources Agency
CO	carbon monoxide
CSA	Community Service Area
CSD	Community Services District
CSDIG	2023 California Seawater Desalination Interagency Group
cu ft	cubic foot
CWA	Clean Water Act
CWAT	Countywide Water Action Team
CWC	California Water Code
CWHR	California Wildlife Habitat Relationships
CWSRF	Clean Water State Revolving Fund
DAC	Disadvantaged Community
DBPs	Disinfection Byproducts
DCR	Delivery Capability Report
DDW	Division of Drinking Water
Delta	Sacramento-San Joaquin Delta
DESAL Partners	DESAL Plan partners
DESAL Plan	Desalination Executable Solution and Logistics Plan
District	San Luis Obispo County Flood Control and Water Conservation District
D&S	Directive and Standard
DPR	direct potable reuse
DSOD	Division of Safety of Dams
DWR	Department of Water Resources
EA	Environmental Assessment
eARs	California Electronic Annual Report
ECOS	Environmental Conservation Online System
EIR	Environmental Impact Report
Electricity	Power
EMT	Estero Marine Terminal
EPA	United States Environmental Protection Agency
ESDC	engineering services during construction
°F	degrees Fahrenheit
FEMA	Federal Emergency Management Agency
FONSI	finding of no significant impact
Fort Bragg	City of Fort Bragg
FRP	fiberglass reinforced polymer
GIS	geographic information system
gpcd	gallons per capita per day

gpd/ac	gallons per day per acre
gpm	gallons per minute
GSA	Ground Sustainability Agency
GSI	GSI Water Solutions, Inc.
GSP	Groundwater Sustainability Plan
HDPE	high density polyethylene
HUC	hydrologic unit codes
IDRS	Interim Downstream Release Schedule
IPAC	Information for Planning and Consultation
IPR	indirect potable reuse
IRWMP	Integrated Regional Water Management Plan
IS/MND	Initial Study/Negative Declaration
Jepson eFlora	Jepson Herbarium online database
km	kilometers
LCP	Local Coastal Program
LOBMC	Los Osos Basin Management Committee
LOC	levels of concern
Lopez Water	Lopez Water Treatment Plant
LOWRF	Los Osos Water Reclamation Facility
LRRP	Low Reservoir Response Plan
LSA	Lake or Streambed Alteration
LSWR	Large-Scale Water Recycling
LUST	leaking underground storage tank
LWP	Lopez Water Project
LVMWD	Las Virgenes Municipal Water District
µg/L	micrograms per liter
M	million
MAF	million acre-feet
MCL	maximum contaminant limit
MF	Membrane Filtration
MG	million gallons
mgd	million gallons per day
mg/L	milligrams per liter
MHI	median household income
MLD	most likely descendant
mm	millimeter
MND	mitigated negative declaration
MOA	Memorandum of Agreement
Morro Basin	Lower Morro Valley Groundwater Basin

MOU	Memorandum of Understanding
MPA	Marine Protected Areas
MS4	Municipal Separate Storm Sewer System
msl	mean sea level
NAHC	Native American Heritage Commission
NCMA	Northern Cities Management Area
NCSD	Nipomo Community Services District
ND	negative declaration
NEPA	National Environmental Policy Act
Nipomo CSD	Nipomo Community Services District
NMFS	National Marine Fisheries Service
NMMA	Nipomo Mesa Management Area
NMS	National Marine Sanctuaries
NO_2	nitrogen dioxide
NO_x	Nitrogen Oxide
NOAA	National Oceanic Atmospheric Association
NOFO	notice of funding opportunity
NPDES	National Pollutant Discharge Elimination System
NPR	non-potable reuse
NPV	net present value
NWI	National Wetlands Inventory
NWP	Nacimiento Water Project
NRCS	Natural Resources Conservation Service
O_3	Ozone
Ocean Plan	Water Quality Control Plan for Ocean Waters of California
OCSD	Oceano Community Services District
OEHHA	Office of Environmental Health Hazard Assessment
Oneka	Oneka Technologies
O&M	operations and maintenance
PFAS	Per- and polyfluoroalkyl substances
PG&E	Pacific Gas and Electric
PM_{10}	particulate matter less than 10 microns in size
$PM_{2.5}$	particulate matter less than 2.5 microns in size
ppt	Parts Per Thousand
PRC	Public Resources Code
PRS GSP	Paso Robles Subbasin
psi	pounds per square inch
PVC	polyvinyl chloride
PWSs	Public Water Systems

QA/QC	quality assurance/quality control
RCD	Resource Conservation District
Refinery	Nipomo Mesa Refinery
RHNA	Regional Housing Needs Assessment
RM	Reclamation Manual
RO	reverse osmosis
ROC	reverse osmosis concentrate
ROG	reactive organic gases
ROW	right-of-way
RWMG	Regional Water Management Group
RWQCB	Regional Water Quality Control Board
S. SLO	South San Luis Obispo
San Luis Obispo Basin	San Luis Obispo Valley Groundwater Basin
SCADA	supervisory control and data acquisition
SCCAB	South Central Coast Air Basin
SFR	Single Family Residential
SHPO	State Historic Preservation Office
SGMA	Sustainable Groundwater Management Act
SLC	State Lands Commission
SLO	San Luis Obispo
SLO County	San Luis Obispo County
SLO County APCD	San Luis Obispo County Air Pollution Control District
SLOFC&WCD	San Luis Obispo County Flood Control and Water Conservation District
SLOV	San Luis Valley Groundwater Basin
SMCA	State Marine Conservation Area
SMCP	State Marine Conservation Area
SMP	State Marine Park
SMRMA	State Marine Recreational Management Areas
SMVMA	Santa Maria Valley Management Area
SO_2	sulfur dioxide
SRF	State Revolving Funds
SSC	species of special concern
SSJVIC	Southern San Joaquin Valley Information Center
State	State of California
State Water	Treated surface water from the State Water Project
Streamlining Report	Streamlining Report to Expedite Permitting
Study	USBR Title XVI Feasibility Study
SWP	State Water Project
SWPPP	Storm Water Pollution Prevention Plan

SWRCB	*State Water Resources Control Board*
TAFY	thousand acre-feet per year
TCE	tetrachloroethylene
TDS	total dissolved solids
Thermal Plan	Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California
TRMR	Temporary Reclamation Manual Release
U.S.	United States
USACE	United States Army Corps of Engineers
USCG	United States Coast Guard
USBR	United States Bureau of Reclamation
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UWMP	Urban Water Management Plan
UV/AOP	Ultraviolet/Advanced Oxidation
WDR	Waste Discharge Requirements
WIFIA	Water Infrastructure Finance and Innovation Act
WL	Watch List
WRAC	Water Resources Advisory Committee
WRC	Water Resource Center
WRF	water reclamation facility
WRRF	water resource recovery facility
WSA	Water Service Amount
WSCP	Water Shortage Contingency Plan
WTR	water
WWTP	wastewater treatment plant
WTP	water treatment plant
WY	Water Year

EXECUTIVE SUMMARY

ES.1 Background and Summary of Project

This USBR Title XVI Feasibility Study (Study) is funded jointly by a United States Bureau of Reclamation (USBR) WaterSMART Grant and the San Luis Obispo County Flood Control and Water Conservation District (District). The District is investigating the feasibility of developing an ocean desalination treatment facility to supplement and offset existing potable water supplies in the region through a 5-phase effort called the Desalination Executable Solution and Logistics Plan (DESAL Plan). The DESAL Plan aims to collaborate with local partners to identify and, if feasible and supported, implement an ocean desalination project. The 5 phases of the DESAL Plan are described below:

- **Phase 1 - DESAL Plan Agreement Phase (Completed)**: District worked with local agencies to confirm their interest, develop an initial planning scope, launch stakeholder outreach, and pursue funding opportunities. Sixteen agencies agreed to become DESAL Plan partners to be considered in the DESAL Plan.
- **Phase 2 - DESAL Plan Development Phase (this project study)**: Focuses on preparing a USBR feasibility study to identify, evaluate and compare desalination project alternatives.
- **Phase 3 - Project Development Agreement Phase**: Identify and confirm commitment from project partners to pay for and proceed with project development. The agreement would cover all activities needed to get to construction phase.
- **Phase 4 - Project Development Phase**: Detailed design, environmental and construction permits, operation and distribution plans, right of way negotiations, water supply and governance agreement negotiations and financial plan.
- **Phase 5 - Project Governance Agreement and Construction**: Execute governance agreement for construction and ongoing operation.

San Luis Obispo County (SLO County) is located along the central coast of California, approximately 200 miles directly south of San Francisco and 150 miles northwest of Los Angeles. SLO County has seven incorporated cities and 14 community services districts (CSD)s that account for smaller communities located throughout. SLO County has a total population of approximately 281,843 (Census, 2024) and 29 separate retail water agencies with populations greater than 1,000 (Waterboards, 2026). Retail water agencies in SLO County rely on imported water, local surface water, and groundwater to meet demands. Additionally, agricultural and rural users within SLO County heavily rely on the groundwater basins. Some agencies have diversified portfolios including recycled water potable reuse, and others rely solely on groundwater.

Local surface water supplies are susceptible to drought conditions and imported supplies are expected to decrease in the future and increase in cost. Local groundwater basins face regulatory constraints to reduce overdraft. A new source of potable water could increase water supply reliability and resiliency for the region and reduce reliance on vulnerable existing supplies. This Study investigates suitable locations and potential combinations of end users in a series of project concept alternatives. This study does not select a preferred location or alternative as the local partners need to determine how to proceed.

ES.2 Report Outline and Crosswalk

This feasibility study was intended to address requirements of a USBR Title XVI Water Reclamation and Reuse Program Feasibility Study as detailed in WTR 11-01. Because some of the alternatives exceed $500 million (M), the Large-Scale Water Recycling (LSWR) Program Feasibility Study requirements, as detailed in WTR TRMR-128, would also apply. This report's contents crosswalk is shown in Table ES.1 below for both the WTR 11-01 and WTR TRMR-128 requirements. Due to the phased approach of the DESAL Plan as described above, not all sections of this report can be completed in accordance with the USBR requirements at this time. For example, since a single preferred project is not selected as part of this study, Chapter 6 (Selection of Proposed Project) cannot be fully completed. All sections have been completed to the furthest extent possible at this stage in the development.

Table ES.1 Feasibility Study Report Contents Crosswalk

Reclamation Manual Outline	Abbreviated Directives and Standards Section Title	Corresponding Report Location	Summary of Section
WTR 11-01 Section 1 INTRODUCTORY INFORMATION			
1a	Non-federal project sponsor	Section 1.1	San Luis Obispo County Flood Control and Water Conservation District (District)
1b	Study area description	Section 1.2	SLO County is study area. Project background discussed including planned phases.
1c	Site specific project area	Section 1.2 and 1.3	Along the coast of SLO County, no specific site has been identified. DESAL Plan partners and median household income identified.
WTR 11-01 Section 2 STATEMENT OF PROBLEM AND NEEDS			
2a	Problem and need	Section 2.1	Uncertain water supplies, especially in drought conditions. Impacts to surface water supplies due to environmental flow requirements. Groundwater basins overdrafted.
2b	Current and projected water supplies	Section 2.2, 2.3	Groundwater is largest supply, with imported water, surface water and some recycled water supplies. Supplies are highly variable with drought, expected regulatory reductions and infrastructure vulnerabilities.
2c	Current and projected water demands	Section 2.4	The region has implemented significant conservation, but demands are anticipated to increase in the future due to population growth to meet the State of California housing requirements. During droughts demands can exceed supplies. Regulatory restrictions and projected population growth will exacerbate this imbalance.
2d	Water quality concerns	Section 2.5	Supplies impacted by seawater intrusion, nitrates, salts, PFAS, and disinfection by-products.

Reclamation Manual Outline	Abbreviated Directives and Standards Section Title	Corresponding Report Location	Summary of Section
WTR 11-01 Section 3 WATER RECLAMATION, RECYCLING OR DESALINATION OPPORTUNITIES			
3a	Uses for desalinated water	Section 3.1	Desalinated water to be used to offset or supplement potable supplies.
3b	Desalinated water market	Section 3.4	Market is to meet partner requests for supply and to help offset unreliability and risk in regional supplies
3bi	Potential users, peak use, conversion costs, letters of intent	Section 3.4.1.1	Potential urban users, average demands and seasonal use patterns discussed. No letters of intent.
3bii	Consultation with potential desalinated water customers	Section 3.4 and 3.5	DESAL Plan Partner meetings during development of project, public meetings to discuss project options. Conducted a utility survey and public surveys. Project information is posted on website.
3biii	Market assessment procedures	Section 3.4	Water use records, pumping records, publicly available data and outreach to end users utilized to assess market.
3c	Discussion of considerations, community incentives	Section 3.5	Reliability and resiliency, regional connectivity, meeting current and future needs, building off past investments, and environmental protection are all considerations and incentives.
3d	Water and wastewater agencies jurisdictions	Section 3.3	Numerous agencies with water responsibilities operate in the service area including private utilities, and cities.
3e	Sources of water	Section 3.2	Ocean water is to be treated and used for supply.
3f	Source water facilities	Section 3.2	New subsurface extraction wells, pipelines, reverse osmosis (RO) treatment and delivery systems (pipes, pumps, storage and wells) will be required.
3g	Current desalination and water reuse taking place	Section 3.3.3	No public utilities are currently doing desalination. Five agencies currently are recycling with tertiary effluent for urban irrigation. Two agencies have facilities for potable reuse that are not operating.
3h	Current and projected wastewater and disposal options, and new wastewater facilities	Section 3.3.2	RO brine from the proposed project would be discharged to existing ocean outfalls. Assuming outfall modifications to the diffusers.
3i	Desalination technologies currently in use	Sections 3.3.3, 3.3.4, and 3.6	There are no public desalination facilities in SLO County. Desalination technologies include subsurface intakes, brine management with outfalls and reverse osmosis treatment.

Reclamation Manual Outline	Abbreviated Directives and Standards Section Title	Corresponding Report Location	Summary of Section
WTR 11-01 Section 4 and TRMR-128 Section 1 DESCRIPTION OF ALTERNATIVES			
4a	Non-federal funding condition	Section 4.1	Without federal funding the cost would have to be borne by local end users or with state grants and the region is less likely to be able to afford desalination.
4b	Objective of alternatives	Section 4.2	Objective of alternatives is to provide reliable and resilient water supply for the DESAL Plan Partners.
4c	Proposed project: complete description	Section 4.2, 4.3, 4.4, 4.5	Ocean desalination alternative locations and sizes are identified along with cost estimates.
4d	Estimated cost requirements	Sections 4.4, 4.5	Construction, total project and operation and maintenance costs for alternatives described.
4e	Waste stream discharge	Sections 4.2.2.2, 4.2.4	RO brine from a desalination project would be discharged to ocean outfalls.
4f	List of alternative measures or technologies	Section 4.6	Other desalting technologies (not RO) are not as proven for ocean desalination, therefore RO is selected. Options to reduce impacts of intakes and outfalls through new offshore technologies are discussed.
TRMR 128 1a	Description of similar viable alternatives	Section 4.7	No similar viable water supply options available.
TRMR 128 1b	Description of baseline condition without project or alternatives	Section 4.1	With increased climate variability, region would be vulnerable to unreliable supply, especially during drought, requiring demand reduction.
TRMR 128 1c	Alternative tradeoffs	Section 4.3 and 4.5	Alternatives are compared and tradeoffs discussed.
TRMR 128 1d	Consideration of climate change in tradeoffs and comparisons	Section 4.1, 4.2.2.3, 4.3, 4.4, 4.5, 4.7	Climate changes will exacerbate drought cycles and water reliability issues in the region. Alternatives that provide more water supply help alleviate this issue.
WTR 11-01 Section 5 and TRMR-128 Section 2 ECONOMIC ANALYSIS			
5a and TRMR 128 2a	Conditions that exist and projection of future without the project as well as contributions plan could make toward meeting future water demand	Section 5.1	The current conditions include uncertain water supplies. Under the No Project Alternative this situation gets worse. With desalination alternatives, new reliable water supplies are provided to alleviate this issue.
5b and TRMR 128 2b	All project-related costs for selected project and alternatives (planning, design, construction, O&M)	Section 4.3, Table 5.3	Costs for the alternatives are presented.
5c	Description of alternatives including benefits	Section 4.2, 4.4 and Table 5.2	Desalination project concept alternatives are discussed and benefits highlighted.
5d	Cost of the alternative most likely to be implemented in absence of the proposed project	Table 5.4 and Section 5.2	In absence of a desalination project there are limited options for new supplies and demand reductions would be required during droughts.

Reclamation Manual Outline	Abbreviated Directives and Standards Section Title	Corresponding Report Location	Summary of Section
TRMR 128 2c	Quantified and monetized benefits	Section 5.3, 5.4	The benefits of avoiding water shortages are calculated.
TRMR 128 2d	Comparison of benefits and costs at NPV with a resulting B/C ratio and discussion about the extent the selected project maximizes benefits	NA	With no preferred project selected, the B/C ratio is not calculated, but the avoided costs associated with water shortages are discussed.
5e and TRMR 128 2e	Qualitative benefits	Section 5.5	Qualitative benefits such as water supply reliability, avoiding use of surface water and groundwater, and water quality are discussed.
TRMR 128 2f	Summary table of NPV of benefits, costs, and ranked qualitative benefits	NA	With no preferred project selected, the summary table is not provided.
WTR 11-01 Section 6 SELECTION OF PROPOSED WATER RECLAMATION, RECYCLING OR DESALINATION PROJECT			
6a	Justification for the selected project	Section 6.1	Desalination is selected as a complete solution to the region's issues.
6b	6b(i-iv) Reduction, postponement, or elimination of new supplies, existing diversions, federal supplies, wastewater facilities	Section 6.2	See items 6b(i)-(iv) below.
6b(i)	Selected project's reduction, postponement, or elimination of development of new or expanded water supplies;	Section 6.2.1	Desalination would work in conjunction with rather than replacing recycled water supply projects by increasing the amount of local water supply available for use. It will also reduce the region's need for reservoir expansion.
6b(ii)	Selected project's reduction or elimination of the use of existing diversions from natural watercourses, or withdrawals from aquifers;	Section 6.2.2	Desalination improves water quality for the region and addresses water shortfalls. While not eliminating use of existing diversions or aquifer pumping, it does reduce reliance.
6b(iii)	Selected project's reduction of demand on existing Federal water supply facilities; and	Section 6.2.3	Desalination would reduce the region's reliance on the Salinas Dam and State Water Project, which have federal nexus, and support water supply projects that received federal funding.
6b(iv)	Selected project's reduction, postponement, or elimination of new or expanded wastewater facilities	Section 6.2.4	Desalination does not use recycled water, nor does it generate wastewater that would be treated. Recycled water efforts are ongoing in the region.

Reclamation Manual Outline	Abbreviated Directives and Standards Section Title	Corresponding Report Location	Summary of Section
WTR 11-01 Section 7 ENVIRONMENTAL CONSIDERATIONS AND POTENTIAL EFFECTS			
7a	Environmental discussion on each alternative	Section 7.1	It is anticipated that with mitigation adverse effects could be mitigated to less than significant levels for: special status species, public health/safety, natural resources, regulated waters and cultural resources.
7a(i)	Discussion of potential impacts on endangered or threatened species, public health or safety, natural or cultural resources	Section 7.1.1-7.1.4	There are plants and wildlife special status species that have potential to occur in the study area. Archaeology remains have a potential to be encountered. These impacts along with those identified for health and safety are anticipated to be mitigated.
7a(ii)	Discussion of potential environmental effects, or undefined environmental risks	Section 7.1.5	There are potential impacts, but it is anticipated that the effects can be avoided or minimized.
7a(iii)	Discussion of potential environmental compliance measures for the proposed water reclamation, recycling or desalination project, including copies of any documents that have been prepared, or results of any relevant studies	Section 7.1.6	CEQA and NEPA documentation and reviews have not been completed yet. Additional studies are required. However, it is anticipated that through proper project design, many impacts can be avoided. Sites and type of technologies selected in this study would avoid impacts.
7a(iv)	Discussion of any other information available for NEPA assessment	Section 7.1.7	CEQA and NEPA documentation and reviews have not been completed yet. Section lists applicable laws to be followed.
7a(v)	Discussion of potential impacts to regional water supply and water quality	Section 7.1.8	Projects would address regional water supply issues including insufficient supplies during drought, surface water cutbacks for environmental flows, chronic groundwater overdraft and providing a high-quality new water supply.
7a(vi)	Public involvement with study	Section 7.1.9	Numerous public activities, including public meetings and outreach, have been held where this project has been discussed.
7a(vii)	Effect on historical properties	Section 7.1.10	No historical properties are expected to be impacted.
7b	If Reclamation funds construction, NEPA compliance prior to ground disturbing activities.	Section 7.2	CEQA and NEPA documentation and reviews have not been completed yet. However, it is expected that an Environmental Assessment (EA) leading to a Finding of No Significant Impact (FONSI) would satisfy requirements of NEPA.

Reclamation Manual Outline	Abbreviated Directives and Standards Section Title	Corresponding Report Location	Summary of Section
WTR 11-01 Section 8 LEGAL AND INSTITUTIONAL REQUIREMENTS			
8a	Water rights analysis	Section 8.1	Water rights are outlined. Ocean water is not "owned" by any state or individual.
8b	Legal and institutional requirements	Section 8.2	State requirements are discussed. No contractual agreements have yet been made.
8c	Need for interagency agreements	Section 8.3	There are a number of interagency agreements that would be required for a regional project solving regional problems. Agreement was made to develop the DESAL Plan and this study.
8d	Permitting procedures	Section 8.4	Anticipated federal, state and local permits required for a desalination project are detailed.
8e	Unresolved issues	Section 8.5	Unresolved issues include selecting an alternative to advance, cultural resources consultation with Tribes and completion of CEQA/NEPA.
8f	Current and projected wastewater discharge requirements	Section 8.6	Evaluation of the RO brine impact not completed yet, however requirements include meeting all Ocean Plan water quality requirements.
8g	Rights to wastewater discharges	Sec 8.7	This project is not using wastewater. No right to wastewater discharge is needed.
WTR 11-01 Section 9 FINANCIAL CAPABILITY OF SPONSOR			
9a	Schedule	Section 9.1, 9.2	A potential schedule for implementation based on the DESAL Plan is presented.
9b	Willingness to pay	Section 9.3	Financial analysis not completed as preferred alternative is not yet selected.
9c	Funding Plan	Section 9.4, 9.5	Funding options are discussed. Funding plan is still being developed.
9d	Sources of funding	Section 9.5	A combination of WIFIA, SRF, state grants, federal grants and local rates would be used to pay for the project.
WTR 11-01 Section 10 RESEARCH NEEDS			
10a	Description of research needs and objectives to be accomplished	Section 10.1, 10.2	Additional research is needed for offshore desalination options as well as site specific considerations for conventional desalination.
10b	Basis for reclamation participation in research	Section 10.3	Funding from the Bureau would support advancing this critically important project.
10c	Parties who will conduct necessary research	Section 10.4	District or DESAL Plan partners
10d	Timeframe necessary to complete research	Section 10.5	Potential research timelines summarized.

Reclamation Manual Outline	Abbreviated Directives and Standards Section Title	Corresponding Report Location	Summary of Section
TRMR-128 Section 3 INDEPENDENT PEER REVIEW			
TRMR 128 3a	Description of all independent peer review/quality assurance and/or control conducted on analyses presented in the study	Section 11.1	Describes that reviews by the DESAL Plan partners, Water Advisory Committee, QA/QC Reviewers and Public Stakeholders were conducted and comments considered/incorporated.
TRMR 128 3b	Identification of the number of technical reviewers and their expertise and affiliation	Section 11.2	List of reviewers and their affiliations and technical backgrounds is provided.
TRMR 128 3c	Comment disposition summary of issues raised during peer review/quality assurance and/or control and how they were addressed	Section 11.3	Major comments and how they are addressed is provided.

Notes:
BC - benefit/cost; CEQA - California Environmental Quality Act; EA - Environmental Assessment; FONSI - finding of no significant impact; NA - not available; NEPA - National Environmental Policy Act; NPV - net present value; O&M - operations and maintenance; Ocean Plan - Oceano Community Services District; QA/QC - quality assurance/quality control; SRF - state revolving fund; RO = reverse osmosis; TRMR - temporary reclamation manual release; WIFIA - Water Infrastructure Finance and Innovation Act.

CHAPTER 1 INTRODUCTION

San Luis Obispo County Flood Control and Water Conservation District (District) is investigating the feasibility of developing an ocean desalination treatment facility to supplement and offset existing potable water supplies in the San Luis Obispo County (SLO County) through a 5-phase effort called the Desalination Executable Solution and Logistics Plan (DESAL Plan). Chapter 1 provides an introduction to the project sponsor and study area, with project referring to a desalination project. This chapter includes the following sections and a crosswalk of relevant sections per United States Bureau of Reclamation (USBR) WTR11-01 is shown in Table 1.1 below.

Section 1.1: Project Sponsor for Feasibility Study – This section briefly describes the project sponsor.

Section 1.2: Project Background and Study Area Description – This section briefly describes the County setting and background on the project.

Section 1.3: Study Area Characteristics – This section describes project partners, land use, population and median income in study area.

Table 1.1 Chapter 1 Crosswalk

WTR 11-01 Section 1 INTRODUCTORY INFORMATION			
Reclamation Manual Outline	Abbreviated Directives and Standards Section Title	Corresponding Report Location	Reclamation Manual Guidelines
1a	Non-federal project sponsor	Section 1.1	Identification of non-Federal sponsor(s)
1b	Study area description	Section 1.2	Description of the study area and an area/project map
1c	Site specific project area	Section 1.2 and 1.3	Definition of the study area in terms of both the site-specific project area where the water supply will be needed and developed, and any reclaimed water distribution systems

1.1 Project Sponsor for Feasibility Study

This feasibility study (Study) follows the USBR Manual Directives and Standards Document WTR 11-01 – Title XVI Water Reclamation and Reuse Program and Desalination Construction Program Feasibility Study Review Process as well as the Large-Scale Water Recycling (LSWR) Program Feasibility Study as detailed in WTR TRMR-128. This study into desalination alternatives for SLO County is funded jointly by a USBR WaterSMART Grant and the District as the non-federal sponsor of the study. Once a preferred project is selected, this study is intended to be submitted to USBR for acceptance for future funding opportunity qualification. Depending on the project alternative selected, the District may or may not be the future non-federal sponsor. It is not part of the current scope of work to determine project sponsor for the preferred project. This will require further collaboration with local partners.

1.2 Project Background and Study Area Description

The District is investigating the feasibility of developing an ocean desalination treatment facility to supplement and offset existing potable water supplies for several retail water agencies within SLO County. SLO County is located in the State of California (State) along the central coast region and is approximately 200 miles directly south of San Francisco and 150 miles northwest of Los Angeles. Figure 1.1 below shows a vicinity map of SLO County. SLO County has seven incorporated cities and 14 community services districts (CSD) that account for smaller communities located throughout. SLO County's primary industries are agriculture in the north and central regions with tourism along the coast. The inland parts of SLO County are rural and largely consist of undeveloped mountainous terrain comprised of the California Coastal Mountain Range. SLO County has a total population of approximately 281,843 (Census, 2024) and 29 separate retail water agencies with populations greater than 1,000 (Waterboards, 2026). For this Study, the study area is defined as the SLO County boundary.

Retail water agencies in SLO County rely on a combination of local and imported surface water, and groundwater to meet demands. Additionally, agricultural and rural users within SLO County rely on the groundwater basins. Some agencies have diverse portfolios including surface water and/or recycled water, and others rely solely on groundwater. On average, approximately 9 percent of the region's urban water supply is imported water from the State Water Project (SWP), via the California Aqueduct and Coastal Branch Pipeline, 40 percent is provided by local surface water sources, 47 percent is provided by groundwater, and the remaining 42 percent is provided by recycled water. Local and imported water supplies are susceptible to drought conditions. Imported supplies are also expected to decrease in the future due to climate change and increase in cost due to the need to adapt or replace aging infrastructure. An additional source of potable water could increase water supply reliability and resiliency for communities in SLO County which would reduce reliance on vulnerable existing supplies.

The District developed a 5-phase effort called the Desalination Executable Solution and Logistics Plan (DESAL Plan) to collaborate with local partners to identify and, if feasible and supported, implement an ocean desalination project. The 5 phases of the DESAL Plan are described below:

- **Phase 1 - DESAL Plan Agreement Phase (Completed)**: District worked with local agencies to confirm their interest, develop an initial planning scope, launch stakeholder outreach, and pursue funding opportunities. Sixteen agencies agreed to become DESAL Plan partners to be considered in the DESAL Plan.
- **Phase 2 - DESAL Plan Development Phase (current)**: Focuses on preparing a USBR feasibility study to identify, evaluate and compare desalination project alternatives. This phase is broken into two part: Phase 2a – development and short listing feasible alternatives and Phase 2b – additional studies and selection of preferred project(s).
- **Phase 3 - Project Development Agreement Phase**: Identify and confirm commitment from project partners to pay for and proceed with project development. The agreement would cover all activities needed to get to construction phase.
- **Phase 4 - Project Development Phase**: Detailed design, environmental and construction permits, operation and distribution plans, right of way negotiations, water supply and governance agreement negotiations and financial plan.
- **Phase 5 - Project Governance Agreement and Construction**: Execute governance agreement for construction and ongoing operation.

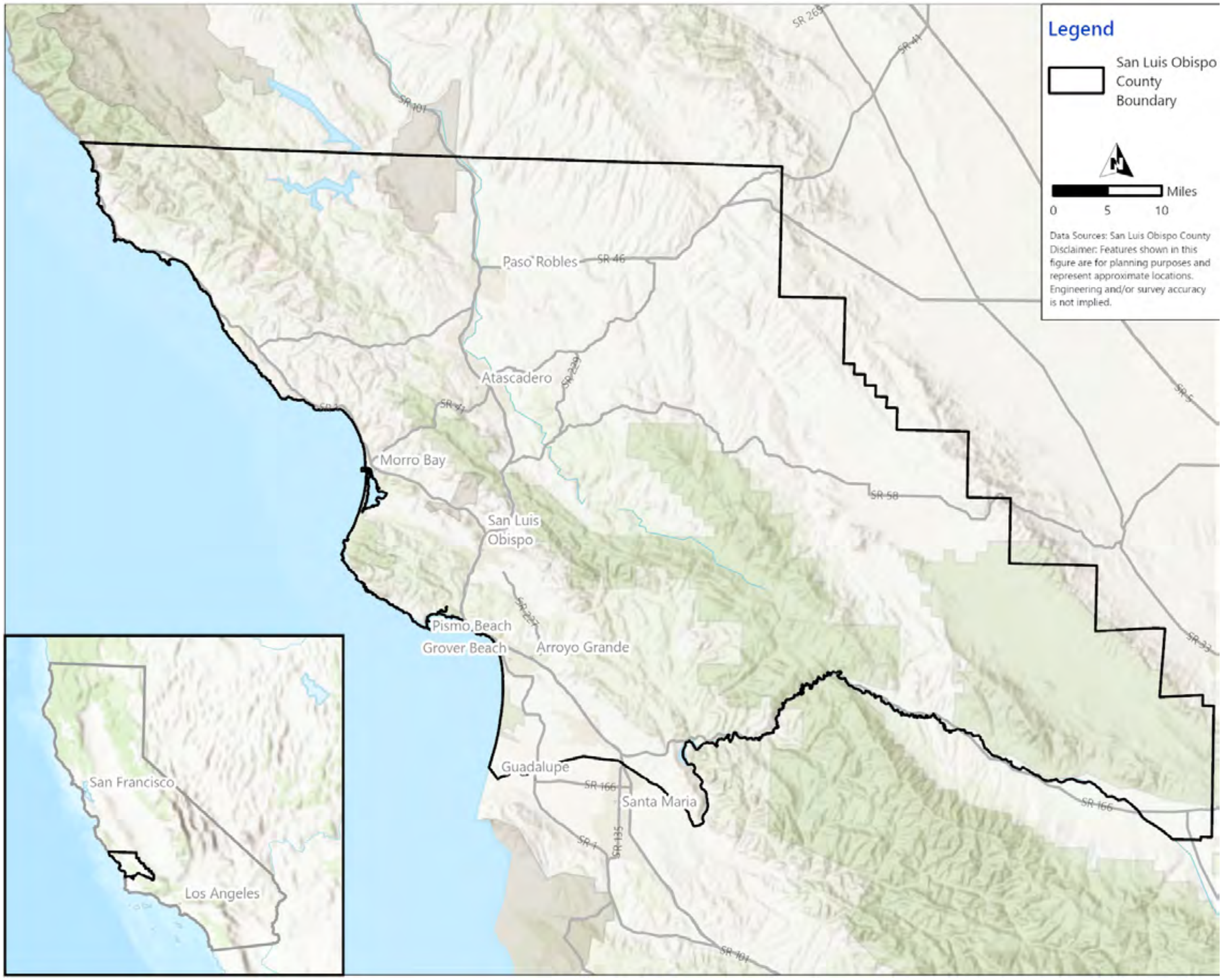


Figure 1.1 Vicinity Map

As noted above, this phase (Phase 2a) of the DESAL Plan is not intended to complete a USBR Feasibility Study for all requirements since project selection is not occurring until Phase 2b. All sections of this study have been completed to the furthest extent possible at this stage in the development.

In 2015, the District developed the San Luis Obispo County Desalination Opportunities Summary Report which identified the opportunities and challenges of desalination as a water supply for the County (District, 2015). This study expands on past efforts by the District exploring some of the sites evaluated in 2015, as well as additional desalination opportunities in more detail. The District continues to collaborate extensively with its DESAL Plan partners, the community, and regulatory agencies through the DESAL Plan to further investigate the feasibility of desalination and the development of a new coastal water supply.

1.3 Study Area Characteristics

The project study area is delineated as the SLO County boundary and is located on the central coast of California. In phase 1 of the DESAL Plan, the District worked with local agencies to confirm their interest to participate in the feasibility study, develop an initial planning scope, launch stakeholder outreach, and pursue funding opportunities. During this initial phase, several agencies became DESAL Plan partners by formally agreeing to be considered in the initial planning phases of the DESAL plan. The DESAL Plan partners include the following retail water agencies:

- City of Arroyo Grande
- Avila Beach CSD
- Golden State Water Company:
  - Edna Valley
  - Nipomo
  - Cypress Ridge
  - Los Osos
- Los Osos CSD
- Nipomo CSD
- City of Paso Robles
- San Miguel CSD
- City of San Luis Obispo
- Atascadero Mutual Water Co.
- Cambria CSD
- City of Grover Beach
- City of Morro Bay
- Oceano CSD
- City of Pismo Beach
- Santa Barbara County
- Templeton CSD

Other agencies who are not official DESAL Plan partners (DESAL Partners), but are included in this project analysis as “potential end users” are listed below:

- California Polytechnic University – San Luis Obispo (Cal Poly).
- San Simeon CSD.
- Paso Robles Subbasin Groundwater Sustainability Agency (GSA).
- San Luis Obispo Valley GSA.
- Nipomo Mesa Management Area.
- Northern Cities Management Area.
- Santa Maria Valley Management Area.

This study focuses on SLO County, includes the DESAL Partners, and potential end users listed above. Note that Santa Barbara County signed on as a DESAL Partner although the County itself does not have demands and no water agencies in Santa Barbara County have identified a need for this study. The desalination facility and intake structures are envisioned to be in the western portion of the County for accessibility to the coast and source water. The study area can be broken into four regions: north county, north coast, central county, and south county. The facility site is anticipated to be located along the coast given the need for seawater intake and an ocean outfall for brine discharge. As part of this study, specifics are not selected, but potential sites will be refined down to preferable areas that display the least amount of impacts to natural resources and surrounding communities.

1.3.1 Land Use and Population

The County's land use is categorized and shown in Figure 1.2 below. Non-agricultural land use and population centers are generally located in the western regions of the County, near the coast. The US Census Bureau estimates a total population within the County of 281,843 as of July 2024 (Census, 2024). The 2024 United States Census data show the median household income (MHI) is $97,446 Countywide. MHI comparisons to larger population centers throughout the County are listed in Table 1.2 below.

Table 1.2 Median Household Income Comparisons Countywide

City	Median Household Income(1)
Arroyo Grande	$102,553
Cambria	$99,147
Morro Bay	$95,843
Nipomo	$110,022
Paso Robles	$92,228
Pismo Beach	$118,072
San Luis Obispo	$73,685
County-Wide	$100,724

Notes:
(1) United States Census Bureau, 2024.

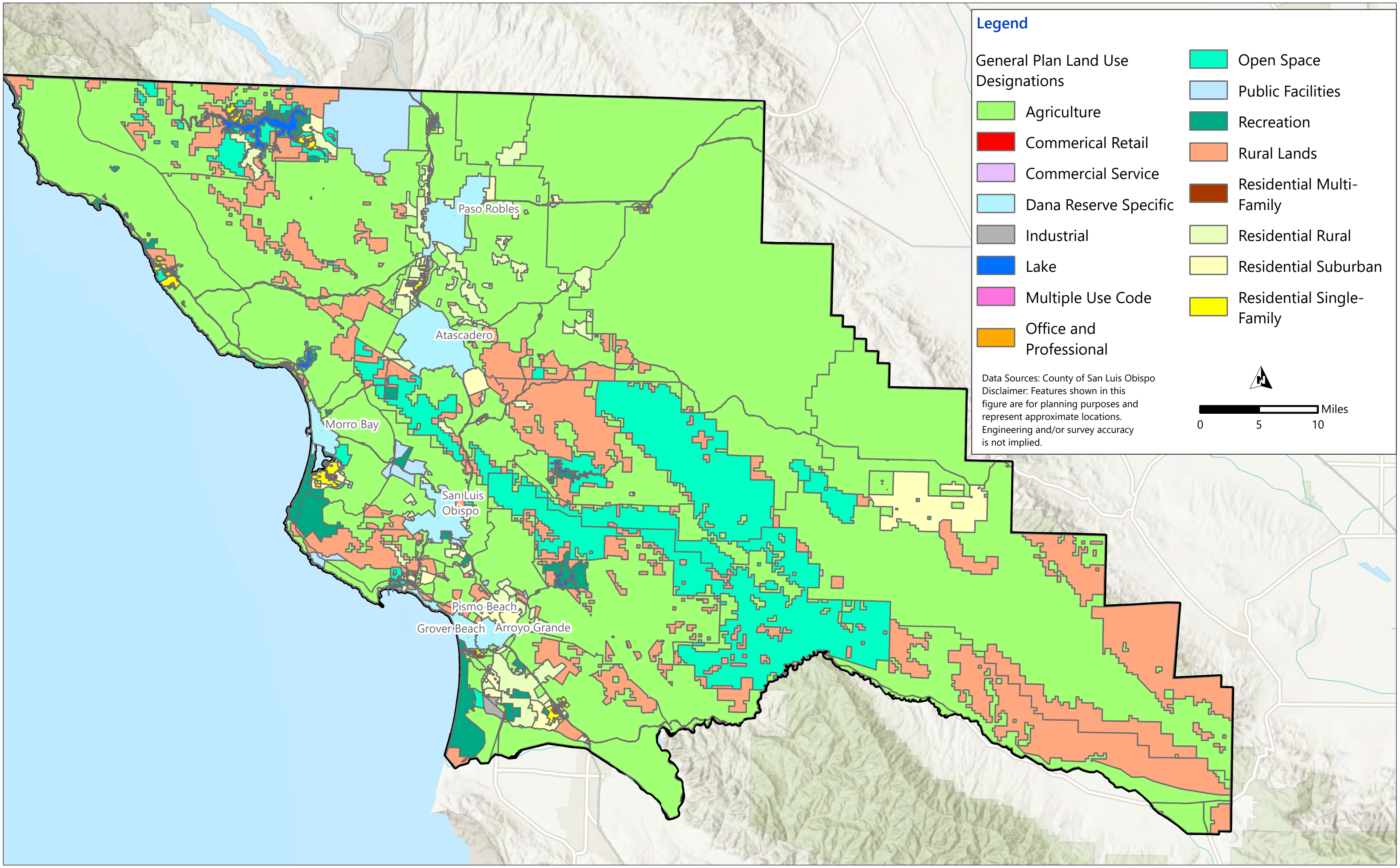


Figure 1.2 SLO County General Plan Land Use Designations

CHAPTER 2 PROBLEMS AND NEEDS

Chapter 2 describes the key water resource management problems and needs that a desalination project would help solve. This chapter includes the following sections and a crosswalk of relevant sections per United States Bureau of Reclamation (USBR) WTR11-01 is shown in Table 2.1, below:

Section 2.1 – Summary of Problem and Need – This section includes a summary of the problems that water agencies in San Luis Obispo County (SLO County) are facing and identifies a need for a new water supply to help address these problems.

Section 2.2 – Current and Projected Water Supply Sources and Facilities – This section includes a detailed description of the current and projected water supply sources in SLO County and the infrastructure associated with these supplies.

Section 2.3 – DESAL Plan Partners and Potential End Users – This section includes a brief summary of the Desalination Executable Solution and Logistics Plan (DESAL Plan) DESAL Plan partners (DESAL Partners) and potential end users included in this USBR Title XVI Feasibility Study (Study) and their estimated water use.

Section 2.4 – Historic and Projected Water Use Trends and Demands – This section includes a summary of all current estimated water use in SLO County and anticipated projected demands.

Section 2.5 – Quality of Water Supplies – This section provides a brief description of water quality issues of existing water supplies in SLO County based on available information.

Table 2.1 Chapter 2 Crosswalk

WTR 11-01 Section 2 STATEMENT OF PROBLEM AND NEEDS			
Reclamation Manual Outline	Abbreviated Directives and Standards Section Title	Corresponding Report Location	Reclamation Manual Guidelines
2a	Problem and need	Section 2.1	Description of the problem and need for a water reclamation, recycling, or desalination project.
2b	Current and projected water supplies	Section 2.2, 2.3	Description of current and projected water supplies, including water rights, potential sources of additional water, and plans for new facilities, other than the proposed project.
2c	Current and projected water demands	Section 2.4	Description of current and projected water demands, including a description of the current and projected water supply and demand imbalances.
2d	Water quality concerns	Section 2.5	Description of water quality concerns for the current and projected water supply.

2.1 Summary of Problem and Need

Water agencies in SLO County rely on groundwater, local surface water supplies, and imported State Water Project (SWP) water to meet customer water demands. Each supply type has its benefits and limitations. Several coastal groundwater basins in SLO County offer limited storage capacity and are vulnerable to seawater intrusion when relied upon too heavily, while other groundwater basins in SLO

County are subject to regulations requiring sustainable management to prevent overdraft. Local droughts impact surface water availability by limiting watershed runoff and reservoir storage. Regional and statewide droughts have further reduced imported supply reliability through lower SWP Table A allocations.[1] Specific details on the water quality and supply reliability challenges faced by the local water agencies are included in Section 2.3 (DESAL Plan Partners and Potential End Users Supplies).

Many utilities in SLO County cannot sustainably produce enough groundwater to meet user demands and must rely on local or imported surface water, the availability of which depends on drought conditions and infrastructure limitations. There are few countywide options to improve long-term water supply reliability and resiliency at the regional level. As a result, utilities have largely pursued small, localized projects to strengthen their individual water supply portfolios. These efforts include promoting water conservation, developing and implementing recycled water projects to provide non-potable water supplies that offset potable demand, implementing potable reuse recycled water projects to increase sustainable potable supply, exploring opportunities to obtain or increase imported water deliveries from the SWP, and management actions through the Sustainable Groundwater Management Act (SGMA).

These projects and actions by individual utilities have made incremental improvements in reliability and groundwater sustainability for certain individual water supply portfolios, but these efforts do little to improve the regional water supply portfolio.

In summary, SLO County lacks a local, reliable, and drought resilient water source that can achieve the following key goals:

1. Provide water supply during extreme drought conditions.
2. Offset existing overused water supplies.
3. Offset water supply during imported water infrastructure maintenance/failures.
4. Support long-term water demand increases to match growth projections.

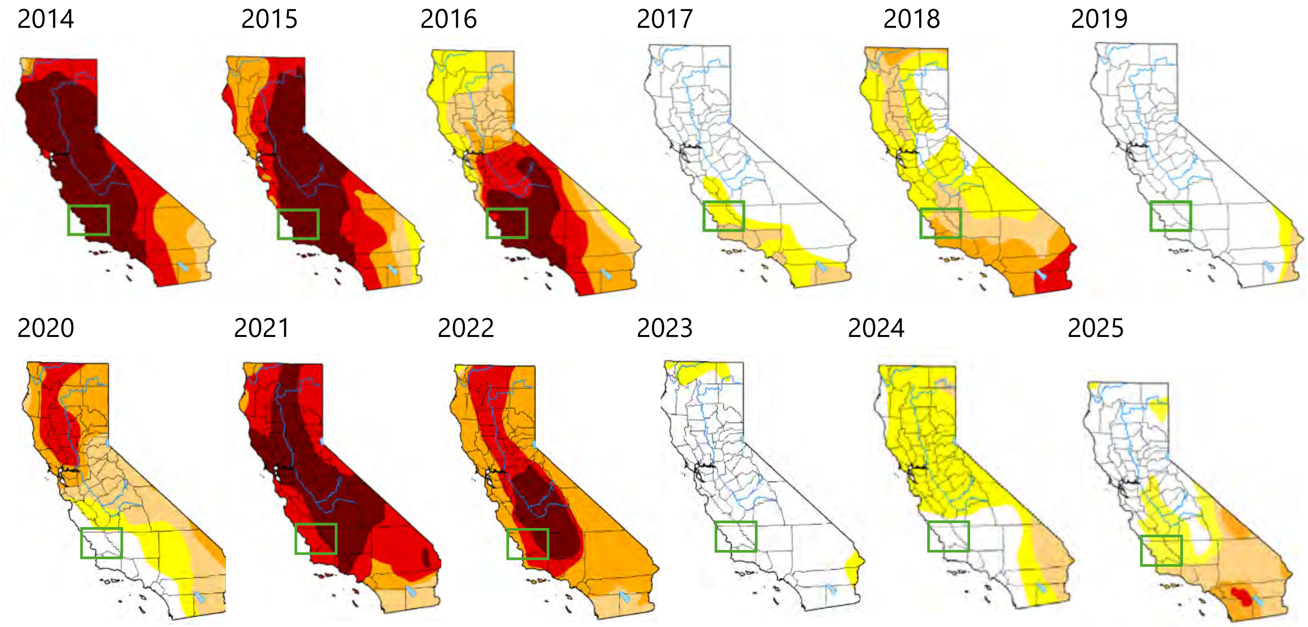
As part of the DESAL Plan, the San Luis Obispo County Flood Control and Water Conservation District (District) has the unique opportunity to create a new water supply that could address local water agencies' needs by providing a reliable water supply source for both existing and future conditions. The following sections expand on critical vulnerabilities associated with water supplies in SLO County.

2.1.1 Climate and Drought Conditions

Groundwater, surface water, and imported water supplied to agencies throughout SLO County are vulnerable to local and statewide droughts. Figure 2.1, below, shows the United States Drought Monitor maps for the State of California (State) in October of each year from 2014 through 2025, with SLO County's location and drought status highlighted in the green square. Along with the entire state, SLO County faced exceptional drought conditions throughout 2014 and 2016, as well as extreme drought conditions in 2021 and 2022. A statewide drought began in 2020, with moderate drought conditions affecting SLO County beginning in December. The drought extended through 2021 and 2022, with January, February, and March 2022 being the driest on record statewide. These conditions, with wet

[1] Table A Allocations are the contractual allocation of surface water from the SWP by the Department of Water Resources for SWP contractors. Table A allocations differ each year based on availability of surface water for deliveries and drought conditions. A list of SWP contracts can be found at water.ca.gov.

seasons producing minimal precipitation and snowpack, pushed SLO County into extreme drought. In 2023, historic precipitation and resultant snowpack allowed much of California, including SLO County, to exit drought conditions. Significant precipitation helped replenish depleted reservoirs. However, limited storage capacity restricts the capture of high runoff volumes, reducing the ability to use this water in the future. In 2024-2025, the conditions across California started trending back towards dry weather, with the potential for another drought period in the near future. In 2025, conditions were mostly abnormally dry (as shown by the October 2025 map in Figure 2.1), but SLO County had no drought conditions by December of that year (US Drought Monitor, 2026).



Legend

None

Abnormally Dry

Moderate Drought

Severe Drought

Extreme Drought

Exceptional Drought

Source: United States Drought Monitor

Figure 2.1 US Drought Monitor Western Region Conditions

2.1.2 Impacts from Overused Supplies

Water supplies within SLO County are constrained by several different factors on both a local and regional level. The following sections identify concerns related to overuse associated with different water supplies within SLO County.

2.1.2.1 Seawater Intrusion

Several coastal groundwater basins in SLO County are subject to seawater intrusion if relied upon heavily. Seawater intrusion occurs when saltwater from the ocean enters a coastal freshwater aquifer (United States Geological Survey [USGS], 2026). Coastal aquifers typically have connectivity to the ocean, which creates the potential for seawater to intrude. When there is an imbalance of inflows and outflows within a coastal groundwater basin, there isn't sufficient freshwater pressure differential within the aquifer to hold back the seawater, causing intrusion to occur. When the outflows exceed the inflows, the groundwater levels decline and create a hydraulic gradient that allows seawater to move inland and contaminate the freshwater aquifers. Figure 2.2, below, shows the process of seawater intrusion.

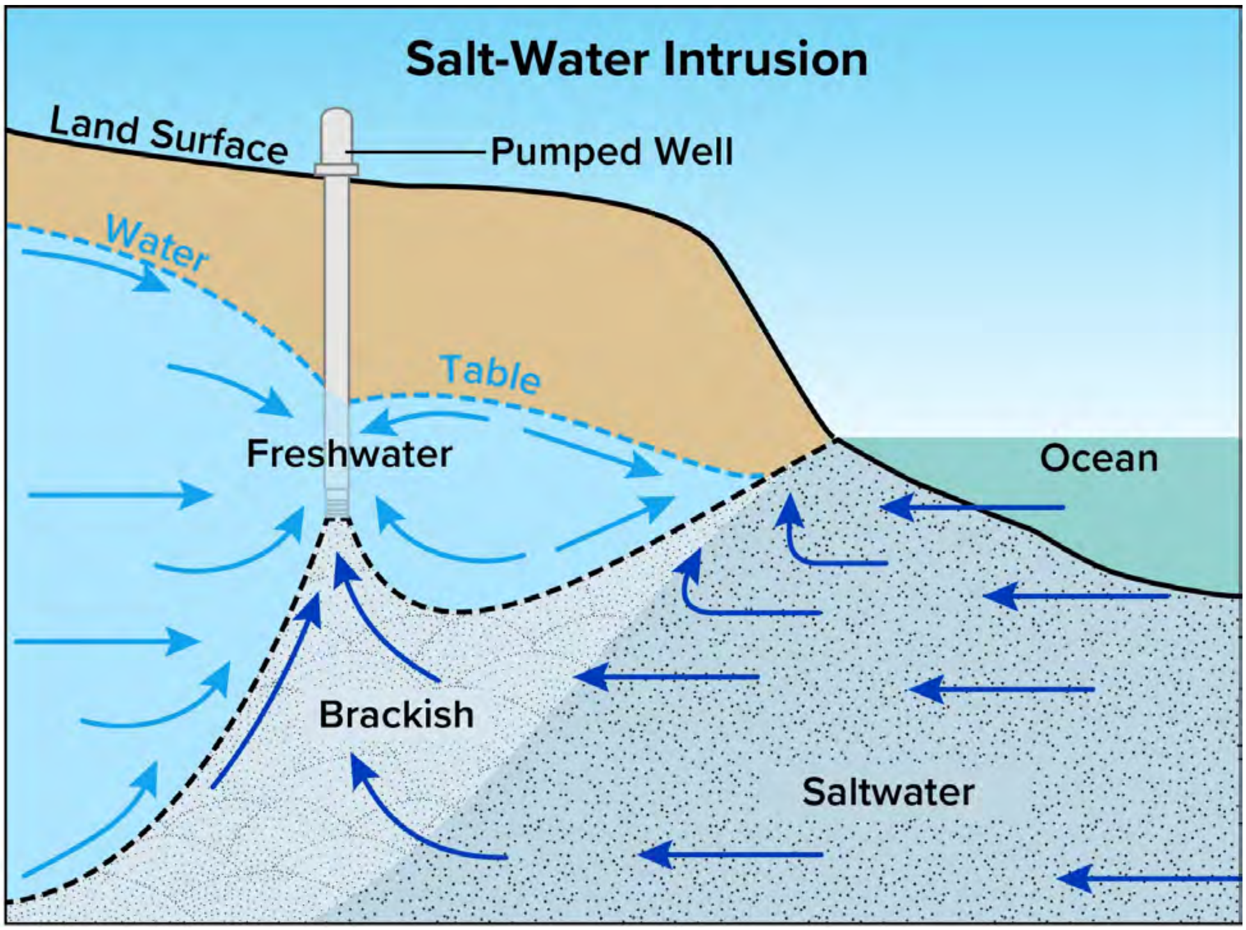


Figure 2.2 Seawater Intrusion Example

Seawater, or saltwater, is denser than freshwater, so it naturally exerts a greater pressure against freshwater, which can contribute to seawater intrusion. This seawater intrusion further progresses inland with continual overextraction. When seawater enters the aquifer, it creates "brackish" water, which is a mixture of seawater and freshwater and can possibly contaminate wells, exceeding drinking water standards for total dissolved solids, chloride, sodium, and other constituents. Untreated brackish groundwater from wells can only be used in limited applications.

Implementation of a desalination project can decrease SLO County's reliance on local groundwater sources and thus reduce or halt seawater intrusion by reducing or eliminating overextraction in basins experiencing seawater intrusion. In locating an intake for seawater desalination, special attention would need to be paid to location of intakes to avoid exacerbating the potential for seawater intrusion.

2.1.2.2 Water Quality Degradation

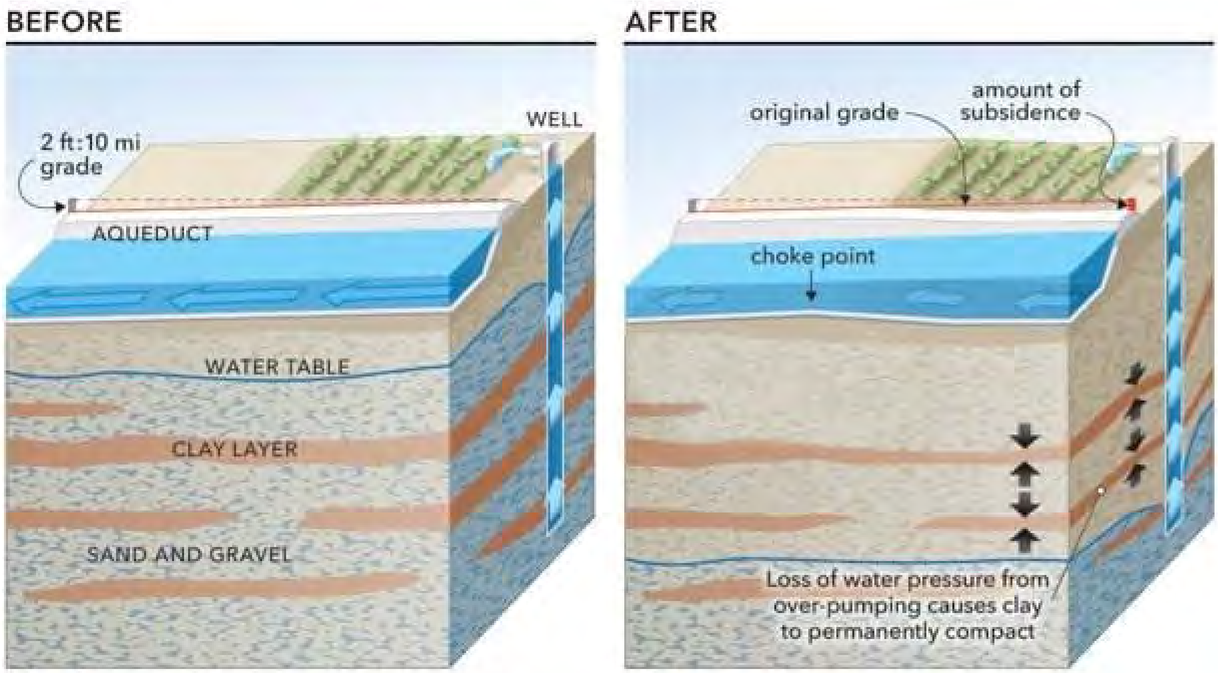
A regional desalination facility would reduce reliance on local groundwater basins in the study area, many of which face water quality degradation from nitrate pollution from agriculture runoff and percolation, historical industrial waste accidents, and naturally forming deposits in the geology (e.g., arsenic) in addition to seawater intrusion, discussed in the previous section. The water quality concerns in some groundwater basins are so significant that costly treatment systems are required. For example, the City of Morro Bay uses a brackish water reverse osmosis (RO) system to treat their groundwater supply for elevated nitrates due to agricultural runoff and high total dissolved solids (TDS) from seawater intrusion.

Other local suppliers rely on blending low quality groundwater with higher quality water (e.g. treated surface water from the Lopez Water Treatment Plant (WTP) or treated surface water from the SWP), to lower the contaminant levels below the maximum contaminant limit (MCL) required for potable water supplies. For example, per their Consumer Confidence Report, the City of Grover Beach blends low nitrate water from Lopez Reservoir with groundwater to reduce the elevated nitrate levels found in the groundwater. This method can be operationally challenging, as suppliers are unable to blend when the high-quality water surface water source is unavailable due to planned or emergency maintenance shutdowns. A desalination facility would provide a local, reliable, and resilient source of water for suppliers within SLO County to use for blending during these planned or emergency maintenance shutdowns.

2.1.2.3 Water Level Lowering and Subsidence

Subsidence is the sinking of land, most often caused by groundwater overextraction (DWR, 2025). Portions of the study area have experienced subsidence due to declining groundwater levels due to overextraction of the local shallow groundwater basins. For example, subsidence in the San Luis Obispo Valley Basin has caused the ground surface to settle by over a foot, causing damage to buildings and houses (SLO County, 2017). Subsidence can additionally lead to an irreversible loss of groundwater storage as the pore space in the aquifer is compressed. Subsidence remains a concern wherever groundwater levels continue to decline. A regional desalination project would provide a reliable alternative water supply to help meet regional demands. By supplementing existing groundwater users with desalinated water, groundwater pumping could potentially be reduced to sustainable levels, helping slow or prevent further subsidence.

Outside of SLO County, subsidence presents the largest threat to the SWP's California Aqueduct-San Luis Canal. The California Department of Water Resources (DWR) has stated that subsidence caused by significant groundwater overextraction has reduced the capacity of the SWP in areas of the Central Valley. This has required implementing projects to raise the canal and has reduced canal capacity due to hydraulic limitations. These subsidence impacts ultimately increase overall delivery costs and reduce delivery reliability for DESAL Partners who are Table A contractors. Figure 2.3, below, shows a graphical representation of subsidence's impact on the California Aqueduct. A desalination project would reduce reliance on the SWP and provide the study area with a reliable source of water while SWP water is unavailable during repairs related to subsidence, routine maintenance, or other challenges.



Source: https://water.ca.gov

Figure 2.3 Subsidence Impact to California Aqueduct

2.1.3 Infrastructure Deficiencies

Many water agencies throughout SLO County receive water imported from the SWP or locally from surface reservoirs. Figure 2.4, below, shows the various water supply pipelines throughout SLO County. Water agencies rely on these regional infrastructure systems for water conveyance and delivery of their surface water supplies. The transmission infrastructure has little to no redundancy in the event of equipment failure, maintenance outages, or natural disasters. Additionally, several infrastructure components within the systems are over 60 years old yet are still currently in use.

SLO County has experienced several major infrastructure outages that have occurred despite the District implementing best management practices and continual operation and maintenance efforts associated with the regional infrastructure. These issues have included, but are not limited to, persistent leaks, major failures, and complete destruction of facilities due to natural disasters. Furthermore, the transmission pipelines cross major seismic zones within the State and may not accommodate major displacement in the event of a major earthquake. If regional infrastructure outages were to occur, some communities within SLO County would have very limited water supplies with minimal backup. Several communities have recently installed interties between agencies to provide some redundancy; however, this is not a feasible solution for all vulnerable water agencies and offers only a temporary solution to the underlying vulnerability of the regional infrastructure. Moreover, the emergency connections may not be able to deliver water if the outage also affects the neighboring utility.

Since several water sources in SLO County are vulnerable to failure and shutdowns due to infrastructure deficiencies, it is important that water agencies have a diverse water supply portfolio. A desalination facility would provide a local, reliable, and resilient source of water for suppliers within SLO County to use during these planned or emergency maintenance shutdowns.

Figure 2.4 Countywide Regional Infrastructure

2.2 Current and Projected Water Supply Sources and Facilities

This section summarizes the current and projected water supplies for the DESAL Plan partners and potential end users listed in Chapter 1 (Introduction). Current water supplies vary from year to year due to seasonal project water adjustments and groundwater conditions.

The DESAL Partners and potential end users rely on imported water from the SWP, local surface water from regional reservoirs, and groundwater to meet demands. Some agencies have diversified portfolios, including recycled water with various types of beneficial reuse, and others rely solely on groundwater. The different water supply uses within the region with respect to the total water use, excluding agricultural use (which uses significantly more water than urban uses, all from groundwater), is shown in Figure 2.5, on the next page. Approximately 9 percent of the region's non-agricultural water supply is imported SWP water from the California Aqueduct, 40 percent is provided by local surface water sources, 47 percent is provided by groundwater, and the remaining 4 percent is provided by multiple reuse categories of recycled water.

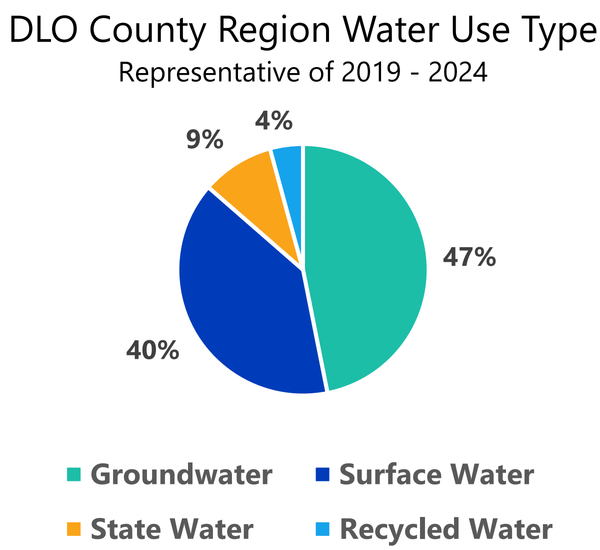


Figure 2.5 DESAL Partner and Potential End User Water Use (2019–2024)

Water agencies have contractual allotments, also referred to as allocations or entitlements, of water supplies from imported SWP water and local surface water sources. Imported and surface water supplies depend on drought conditions and prior use (e.g., stored supplies from the prior water year). Allotments are not the actual supply volumes that are available on an annual basis; instead, they represent paper volumes that could be available given, but not limited to, existing supplies, demand, financial ability, and hydrologic conditions. Historically, agencies have relied significantly on surface water supplies; however, with varying climate conditions anticipated in the future, the reliability of these supplies is in question.

Groundwater is withdrawn from both managed and unmanaged aquifers. Managed groundwater basins include those subject to the requirements of the SGMA and adopted Groundwater Sustainability Plans (GSPs) or those that have been adjudicated with established management plans. Availability of groundwater can be impacted by demand exceeding yield over time, limits set by management actions and water rights determinations, drought conditions and water quality issues.

The overall water supply portfolio in SLO County represents a diverse grouping of water supplies; however, it is still vulnerable to drought conditions, management actions, and overuse. The following sections present existing and projected groundwater, imported water, local surface water, and recycled water supplies within SLO County.

2.2.1 Groundwater

Figure 2.6, below, shows the groundwater basins and the adjudicated basin management areas in the study area. Figure 2.7, on the next page, shows groundwater sustainability agency (GSA) boundaries as well as the adjudicated areas in SLO County. Groundwater is heavily used in the region for agricultural irrigation and for all rural residential use, but it also supplies approximately 47 percent of the DESAL Plan partners' potable water demands throughout SLO County. Typically, agencies consider their groundwater supply equal to demand, since an agency will only supply water as needed to meet demand, compared to a reservoir, which can hold a set volume and carry over that volume to a subsequent year if not all is used. The DESAL Plan partners and potential end users reported groundwater use between 2019 and 2024; Table 2.2, on page 2-12, shows their projected use in 2045 within each basin.

Figure 2.6 Groundwater and Adjudicated Basins in SLO County

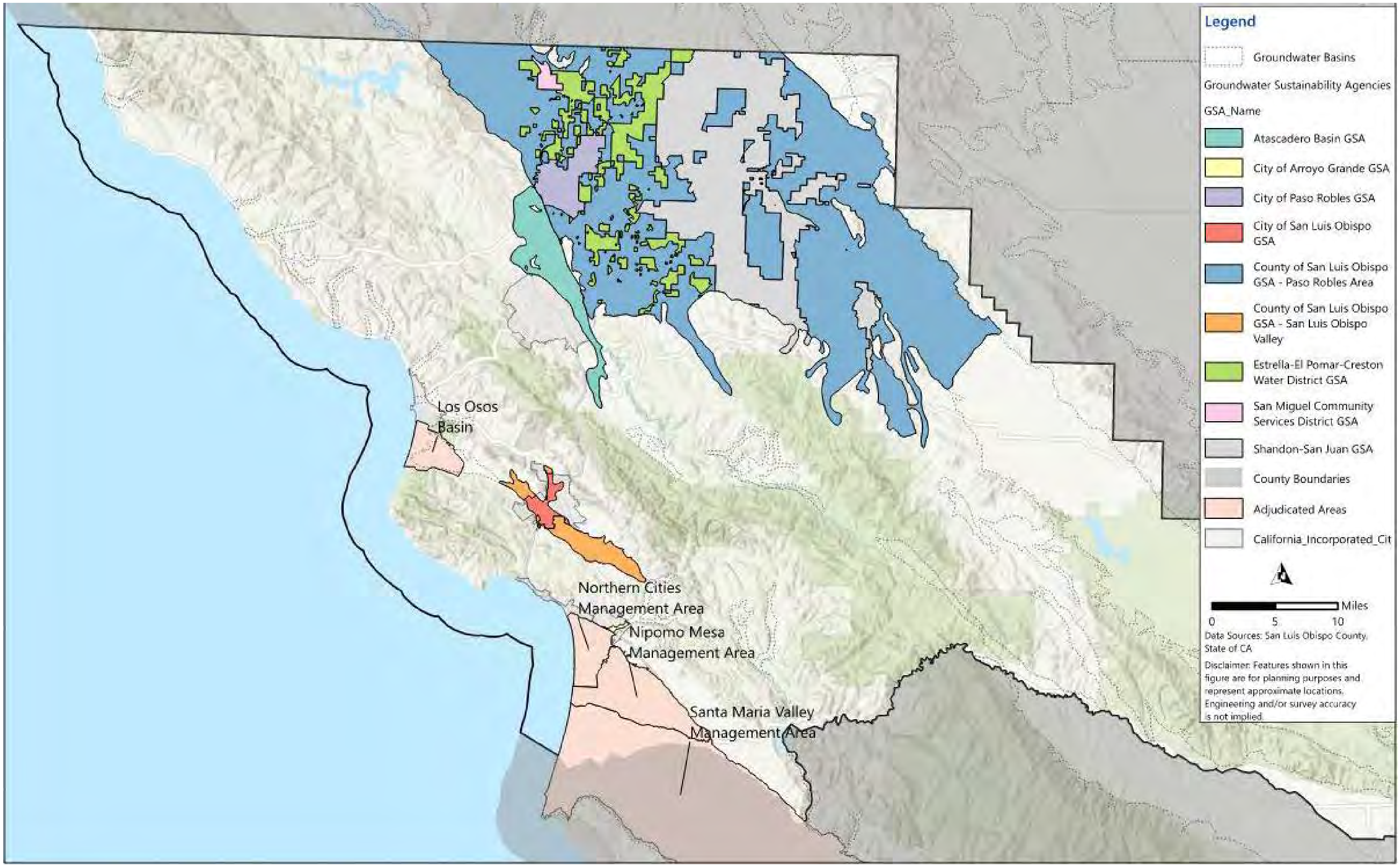


Figure 2.7 Groundwater Sustainability Agency Boundaries Within Study Area

Table 2.2 DESAL Plan Partners and Potential End Users Groundwater Supplies in Study Area

Agency	Annual Avg. Groundwater Use (2019–2024)(1)	Projected Groundwater Use 2045	Groundwater Sources
Atascadero Mutual Water Company(4)	4,320	6,567	Salinas Valley Groundwater Basin–Atascadero Area Subbasin
Avila Beach CSD	No groundwater	No groundwater	N/A
Cambria CSD(1)	510	730	Santa Rosa Valley Groundwater Basin San Simeon Valley Groundwater Basin
Cal Poly University(3)	120	140	San Luis Obispo Valley Groundwater Basin
City of Arroyo Grande(2)	0	717	Santa Maria River Valley Groundwater Basin
City of Grover Beach(2)	440	600	Santa Maria River Valley Groundwater Basin
City of Morro Bay(2)	90	407	Morro Valley Groundwater Basin
City of Paso Robles(2)(4)	4,810	6,079	Salinas Valley Groundwater Basin–Paso Robles Area Subbasin
City of Pismo Beach(2)	50	189	Santa Maria River Valley Groundwater Basin
City of San Luis Obispo(2)	0	600	San Luis Obispo Valley Groundwater Basin
Golden State Water Company – Cypress(2)	530	613	Santa Maria River Valley Groundwater Basin
Golden State Water Company - Edna(2)	180	214	San Luis Obispo Valley Groundwater Basin
Golden State Water Company - Los Osos Los Osos Community Services District(1)(2)	990	1058	Los Osos Groundwater Basin
Golden State Water Company - Nipomo(2)	680	785	Santa Maria River Valley Groundwater Basin
Nipomo CSD(2)	860	2,533	Santa Maria River Valley Groundwater Basin
Oceano CSD(3)	80	95	Santa Maria River Valley Groundwater Basin
San Miguel CSD(3)	290	337	Salinas Valley Groundwater Basin–Paso Robles Area Subbasin
San Simeon CSD(3)	80	75	San Simeon Valley Groundwater Basin
Templeton CSD(2)	1,110	1,732	Salinas Valley Groundwater Basin–Atascadero Area Subbasin
Total	15,140	23,471	

Notes:
CSD = community services district
(1) CA eARS database and data request survey directly provided by agencies.
(2) DWR 2020 UWMPs and 2025 SLO County Master Water Report Demand Projections.
(3) Data not available; 2024 value projected by 1 percent to 2040.
(4) Assumes volumes of basin wells as well as underflow wells.

2.2.1.1 Sustainable Groundwater Management Act

SGMA was enacted in 2014 as California legislation to protect groundwater resources and achieve sustainable groundwater supplies by 2040. To facilitate the implementation of SGMA, groundwater basins, as defined in DWR's Bulletin 118, were prioritized using the eight criteria outlined in California Water Code Section 10933(b). They were split into one of four priority categories: high, medium, low, and very low. Additionally, groundwater basins were evaluated and designated, where applicable, as being in a state of critical overdraft. SGMA required the development of local groundwater sustainability agency(ies) (GSAs) for the medium and high priority basins. GSAs could be formed from any existing local agency or combination of local agencies overlying a groundwater basin. The GSAs were required to develop and implement GSPs for all the medium and high priority basins in a way that considers the interests of all beneficial uses and users of groundwater in the basin. A GSP is a plan that outlines how a basin can achieve groundwater sustainability in 20 years. In areas within a high or medium priority groundwater basins that are not covered by another GSA, the County of San Luis Obispo acts as the GSA for that area.

SGMA defines sustainability as "the management and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results." It is expected that current groundwater pumping rates in the medium and high priority basins within SLO County will need to be reduced to achieve sustainability and avoid undesirable results. The undesirable results related to groundwater management identified by SGMA include:

1. Chronic lowering of groundwater levels.
2. Reductions of groundwater in storage.
3. Seawater intrusion.
4. Land subsidence.
5. Water quality degradation.
6. Depletion of interconnected surface water.

The GSP must identify undesirable results, minimum thresholds, measurable objectives, and interim milestones for each of the groundwater management criteria identified above and be approved by DWR. GSPs for critically overdrafted basins were required to be submitted by January 31, 2020, and GSPs for other medium and high priority basins were required to be submitted by January 31, 2022. DWR's designations of medium and high priority basins in SLO County defined by the DWR Bulletin 118 are as follows:

- Salinas Valley - Paso Robles Area (3-004.06) - High priority, critically overdrafted. The estimated safe yield[2] of this basin is 61,100 acre-feet per year (AFY), while the long-term average annual groundwater extraction total is 74,900 AFY.
- Cuyama Valley (3-013) - High priority, critically overdrafted. The estimated safe yield of this basin is 20,370 AFY, which is approximately half of the current annual groundwater extraction total.
- San Luis Obispo Valley (3-009) - High priority. The estimated safe yield of this basin is 5,800 AFY, while the long-term average annual groundwater extraction total is 6,200 AFY.

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[2]Safe yield is the amount of water that can be withdrawn from a water source without causing long-term storage depletion.

2.2.1.2 Adjudicated Basins

An adjudicated basin is a groundwater basin that has had legal disputes over who has rights to the groundwater within said basin, and a court has made legal determinations and defined the rights of all users to extract and use the water. Adjudications can cover an entire basin, a portion of a basin, or a group of basins and all non-basin locations in between (DWR, 2026). The adjudicated basins within SLO County are presented in the following sections.

Los Osos Groundwater Basin

The Los Osos Groundwater Basin was adjudicated by a court-approved stipulated judgement (a legally binding settlement agreement between the involved water users) in 2015 due to concerns about overdraft and water quality. The Los Osos Groundwater Basin is now managed by the Los Osos Basin Management Committee (LOBMC), which consists of representatives from each community water purveyor (S&T Mutual Water Company, Los Osos CSD, and Golden State Water Company) and a representative from SLO County. The LOBMC oversees implementation of the Los Osos Basin Plan for the area.

The adjudicated area of the basin is designated by DWR as a very low priority basin subject to critical conditions of overdraft. Provided that certain requirements are met, as outlined in the California Water Code §10720.8, SGMA does not apply to the adjudicated areas. The fringe areas of the basin (outside of the adjudicated area) are also designated by the DWR as very low priority and are not subject to the requirements of SGMA.

Santa Maria River Valley Groundwater Basin

The Santa Maria River Valley Groundwater Basin was adjudicated by a 2005 stipulation and a 2008 judgement after trial. The adjudication was triggered by litigation over groundwater pumping rights in the basin. Management of the basin is undertaken by three different management areas, as specified in the 2005 Stipulation: the Northern Cities Management Area (NCMA), the Nipomo Mesa Management Area (NMMA), and the Santa Maria Valley Management Area (SMVMA). The NCMA and NMMA portions of the basin are located completely within SLO County. The SMVMA straddles the SLO County line, and the majority of its area falls within Santa Barbara County.

The adjudicated area of the basin is designated by DWR as a very low priority basin. The Arroyo Grande Subbasin, previously a fringe area of the Santa Maria River Valley Groundwater Basin, is also designated by DWR as very low priority and is not subject to certain SGMA requirements.

Northern Cities Management Area

The NCMA encompasses the Cities of Arroyo Grande, Grover Beach, and Pismo Beach, as well as Oceano CSD. The court-accepted safe yield for the NCMA portion of the basin is 9,500 AFY. Each of the municipal water purveyors in the NCMA have water supply portfolios that include surface water and groundwater resources. In recent years, the total annual groundwater pumping in the NCMA has only been around a third of this total. Despite significant municipal water conservation efforts and pumping below the court-accepted safe yield, the basin remains susceptible to drought and seawater intrusion due to its location.

Nipomo Mesa Management Area

The NMMA borders the NCMA to the east and the south and the SMVMA to the north. The NMMA contains four primary water purveyors and stipulating parties to adjudication: Nipomo CSD, Golden State Water Company, Woodlands Mutual Water Company, and Philips 66. Historically, the NMMA has relied entirely on groundwater resources to supply its annual water demand. However, the Nipomo Supplemental Water Project was recently completed, which is expected to deliver 2,500 AFY of SWP water to the area. The annual water demand in the NMMA is approximately 10,500 AFY (including purveyors, agriculture, golf, and estimated rural demand).

2.2.2 State Water Project

The SWP is managed by the DWR and distributes water across the entire State, from Northern California to Southern California. The system includes dams, hydroelectric facilities, pumping plants, canals, and pipelines, spanning over 700 miles from Lake Oroville in Northern California to Lake Perris in Southern California. Both SLO County and Santa Barbara County receive water from the SWP via the California Aqueduct Canal, the Coastal Branch Pipeline, and several pumping plants. Figure 2.8 shows the layout of the SWP infrastructure for the entire State as well as the coastal branch facilities, below.

Water from the Sacramento-San Joaquin Delta is conveyed south through the California Aqueduct. SWP water is pumped from the main aqueduct canal just south of Kettleman City to the Polonio Pass Water Treatment Plant, which is near the junction of Highways 41 and 46 in SLO County. From the Polonio Pass Water Treatment Plant, SWP water is then delivered via gravity through the Coastal Branch to the Chorro Valley Turnout into the Chorro Valley Pipeline, and Lopez Turnout into the Lopez Pipeline, which serve both SLO County and Santa Barbara County SWP users. The Chorro Valley Pipeline serves the City of Morro Bay, the California Men’s Colony, the County Operations Center, and Cuesta College. The Lopez Pipeline delivers water to the Lopez Water Treatment Plant, where it is blended and utilized to serve the City of Pismo Beach, Oceano Community Services District, San Miguelito Mutual Water Company Avila Beach Community Services District, Avila Valley Mutual Water Company, and San Luis Coastal Unified School District.

In 1963, the District entered into a long-term water supply contract with DWR (Master Contract) for a Table A Allocation of up to 25,000 AFY of water from the SWP. In the 1990s, 11 water agencies (11 subcontracts), which will be referred to as SWP subcontractors, within SLO County entered into contracts with the District to take delivery of up to a total of 4,830 AFY of Project Water (treated SWP water). The District also entered into agreements with DWR and the Central Coast Water Authority (CCWA) for the construction and operation of a water treatment plant, pumping plants, and pipelines to bring potable SWP water to their points of delivery in SLO County.

The SWP subcontractors also entered into agreements with the District for an additional 5,747 AFY of Table A Allocation under the District’s Drought Buffer Program to provide additional water supply reliability for years when SWP allocations are less than 100 percent.

The remaining 14,423 AFY of the District’s Table A Allocation is referred to as the “District’s Reserve Amount” and represents the unsubscribed State Water Project contractual supply available to support future reliability and regional water management objectives.

Source: Metropolitan Water District of Southern California

Figure 2.8 Map of California State Water Project Infrastructure

Table 2.3 on the next page shows each SWP subcontractor's Water Service Amount (WSA). Annual water available to each subcontractor is determined by the District based on DWR's annual Table A allocation in combination with applicable District water management programs and policies. For example, under the District's current Drought Buffer Program, the City of Morro Bay's contracted Drought Buffer Allocation of 2,290 AFY is intended to improve the reliability of receiving its full WSA of 1,313 AFY during years with reduced Table A allocations. Under the current program, Morro Bay would generally be expected to receive its full WSA when the annual Table A allocation is approximately 37 percent or greater. DWR's annual Table A allocation is initially announced before the start of the calendar year and may subsequently be revised – either upward or downward – as hydrologic conditions evolve.

The District manages available SWP supplies in accordance with the Master Contract with DWR and applicable District policies. Subject to DWR requirements, a portion of undelivered supplies may be retained by the District under the Master Contract for use in subsequent years through storage in San Luis Reservoir (DWR, 2024).

Table 2.3 Water Service Amounts and Drought Buffer in SLO County

SWP Turnout Location	Subcontractor	Water Service Amount (AFY)	Drought Buffer (AFY)	Total Allocation (AFY)	2024 Allocation Year (AFY) (40 percent)	District's 2024 Surplus Water Required to Deliver Full Water Service Amount (AF)
Shandon	CSA 16 (Shandon)	100	-	100	40	60
Chorro Valley	CMC	400	400	800	320	80
	County Ops Center	425	425	850	340	85
	Cuesta College	200	200	400	160	40
	City of Morro Bay	1,313	2,290	3,603	1,441	0
Lopez	City of Pismo Beach	1,240	1,240	2,480	992	248
	Oceano CSD	750	750	1,500	600	150
	San Miguelito MWC	275	275	550	220	55
	Avila Beach CSD	100	100	200	80	20
	Avila Valley MWC	20	20	40	15	0
	San Luis Coastal USD (for Bellevue-Santa Fe)	7	7	14	6	1
	Total	4,830	20,170	25,000	10,000	739

Recent changes to the District's SWP water supply contracts with DWR (i.e., the Water Management Tools Amendment) provide new opportunities for how the District and subcontractors can manage their water supplies to provide additional water supply reliability, resiliency against infrastructure failures, and cost recovery opportunities. Additionally, the District issued a letter in January 2023 to SWP subcontractors indicating its intent to make a final opportunity available to SWP subcontractors to purchase additional Drought Buffer Allocation before it evaluates other potential uses for the unsubscribed supply. As portions of unsubscribed supply become committed to other potential uses, less water will be available to support subcontractor reliability during extended drought periods.

The future availability of SWP water may also impact water supply reliability within SLO County. Forecasts completed by DWR indicate that the average amount of SWP water available to users will decrease in future years due to changes in climatic conditions and potential environmental restrictions (See Chapter 3

– Opportunities for Desalination). Accordingly, SWP subcontractors should continue to evaluate opportunities to diversify and strengthen their water supply portfolios where appropriate.

2.2.3 Local Surface Water Sources

There are four primary local surface water sources in SLO County. These sources, shown in Figure 2.9, on the next page, include Nacimiento Reservoir (also known as Lake Nacimiento), Whale Rock Reservoir, Lopez Reservoir, and Salinas Reservoir (also known as Santa Margarita Lake). Each supply and reservoir is discussed in the following sections.

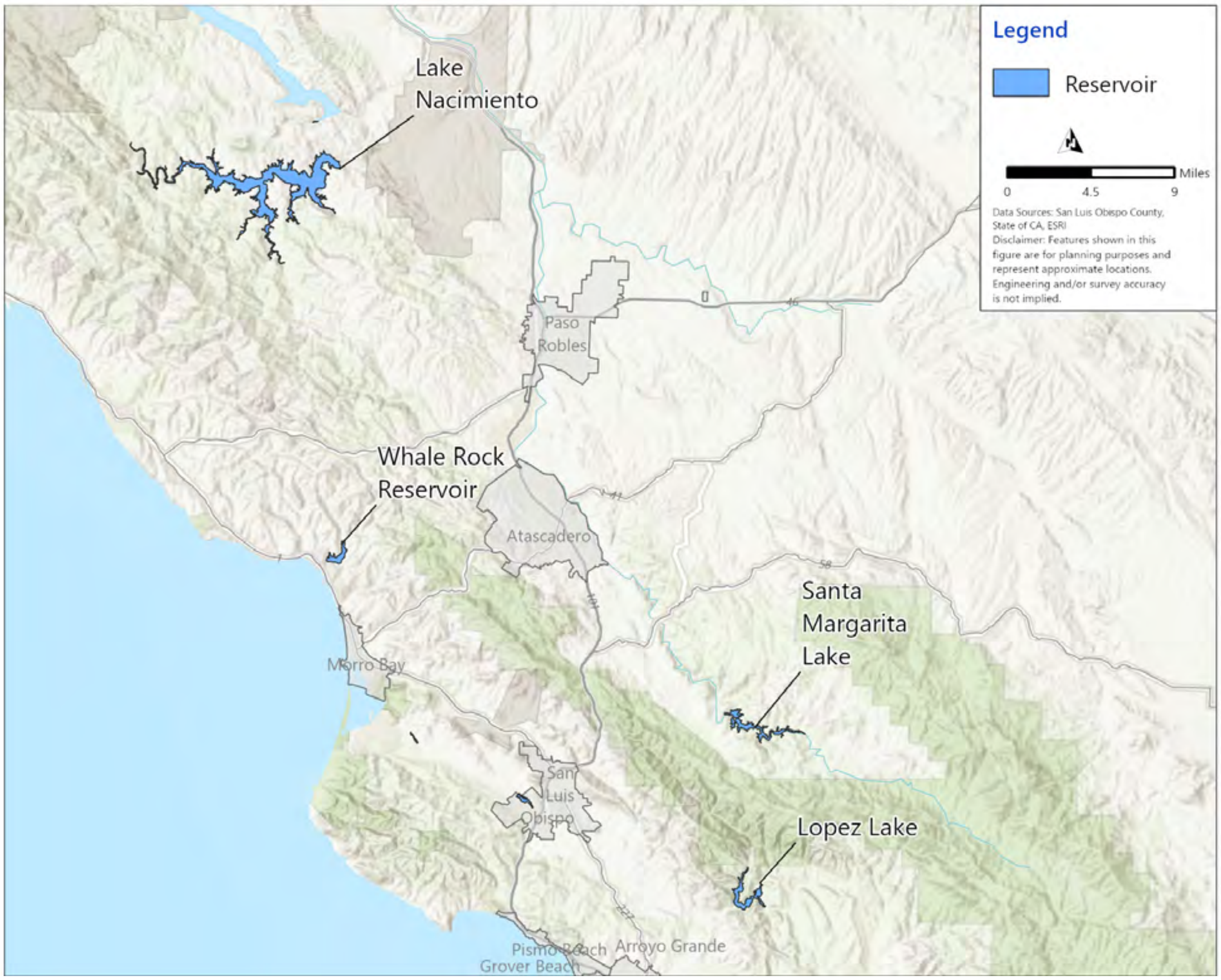
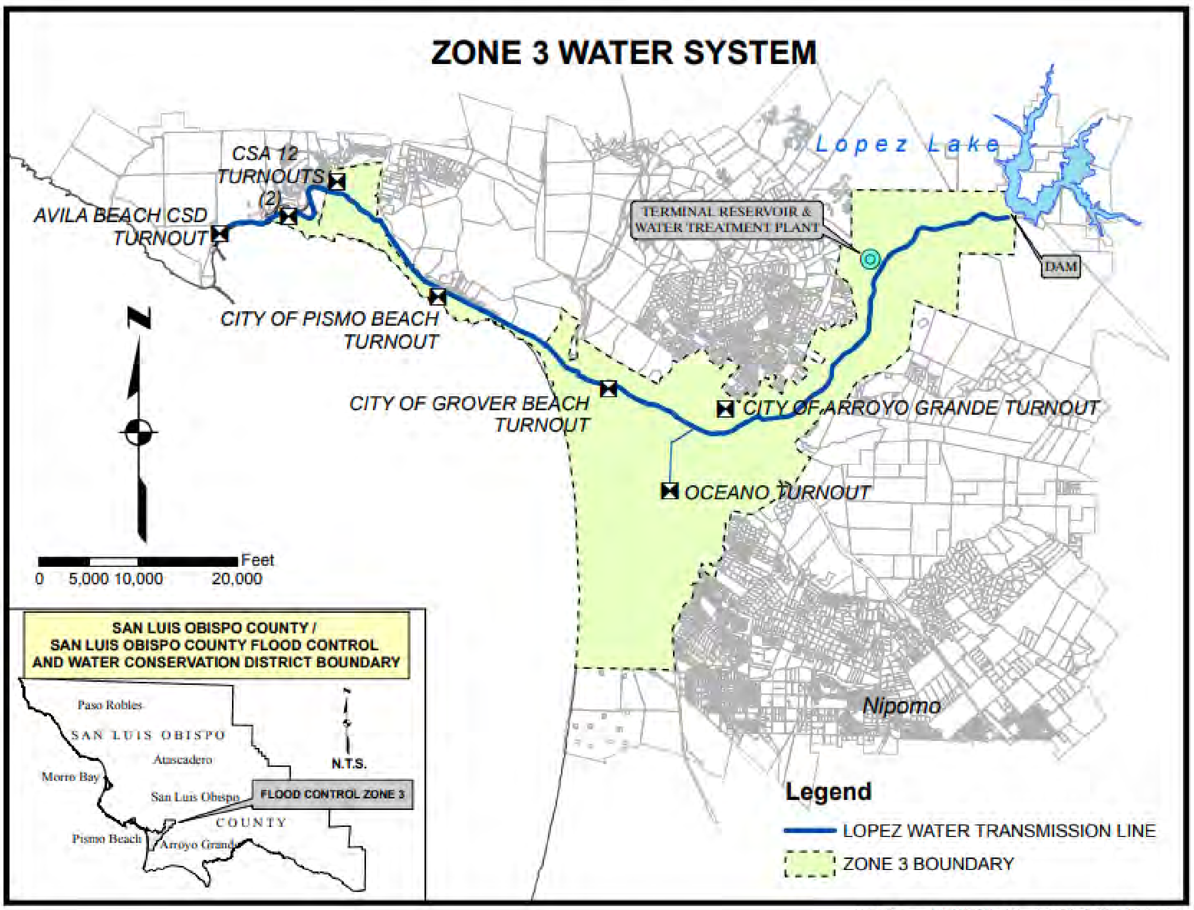


Figure 2.9 Surface Water Reservoirs in SLO County

2.2.3.1 Lopez Water Project

The Lopez Water Project is a wholesale supplier (District Zone 3) and serves a blend of treated surface water and State water to its contractors in South SLO County. Note not all contractors in District Zone 3 are SWP subcontractors. Lopez Water Project contractors include Arroyo Grande, Avila Beach, Grover Beach, Oceano, and Pismo Beach as shown in Figure 2.10, on the next page, along with the relevant infrastructure. The infrastructure of the Lopez Water Project includes the Lopez Lake, Lopez Dam, Lopez

Terminal Reservoir, Lopez Water Treatment Plant, and distribution pipelines. Lopez Reservoir is located in the Arroyo Grande Creek Watershed. Water from Lopez Lake is conveyed three miles via pipeline to the Lopez Terminal Reservoir, where it is then treated at the Lopez Water Treatment Plant (WTP). Treated water from the SWP is conveyed via the Lopez Pipeline to the Lopez Turnout, where it is combined with water from the Lopez WTP. Treated surface water from the Lopez Reservoir and treated State water are blended on site at the treatment plant and then delivered through the Lopez Water Transmission Line to the contractors. During an emergency shutdown of the Lopez Water Treatment Plant, agencies are able to receive State water instead of a blend of State water and treated water from the Lopez Reservoir. During yearly SWP shutdowns, agencies receive only treated Lopez Lake water. Agencies that rely heavily on potable water from the Lopez Treatment Plant are especially vulnerable to concurrent emergency shutdowns of the Lopez Water Treatment Plant and SWP.



Source: San Luis Obispo County Public Works

Figure 2.10 Lopez (Zone 3) Water System

The availability of water from the Lopez Water Project is heavily impacted by drought. The Low Reservoir Response Plan (LRRP) was developed as an emergency response plan to manage the water supply when Lopez Terminal Reservoir water levels reach critical conditions. The LRRP is triggered when the reservoir's stored water falls below 20,000 acre-feet (AF) and then the following actions are taken to conserve water:

- Municipal diversions are reduced.
- Downstream environmental releases are reduced.
- No new allocations of surplus water are made.
- Water delivery extensions are permitted to reduce immediate demand for Lopez water (District, 2026).

The safe yield for Lopez Lake is 8,730 AFY. Of the safe yield, 4,530 AFY is delivered to Lopez Water Project Contractors (see Table 2.4 below), and 4,200 AFY is reserved for downstream releases.

Table 2.4 Lopez Lake Safe Yield and Allocations

Description of Allocation to Agency	Lopez Lake Allocations (AFY)
Allocation to City of Pismo Beach	896
Allocation to Oceano CSD	303
Allocation to City of Grover Beach	800
Allocation to City of Arroyo Grande	2290
Allocation to County Service Area (CSA) 12 (Avila Beach Area)	241
Total	4,530
Reserve for Downstream Releases	4,200
Total Safe Yield	8,730
Source: (SLO County Public Works, 2018)	

The District's operations of the Lopez Dam include releases into the Arroyo Grande Creek. The Interim Downstream Release Schedule (IDRS) was designed to manage water releases from the Lopez Dam to balance municipal, agricultural, and environmental needs, including the protection of endangered species. The District may be required to increase releases on a long-term basis to provide sufficient flows for the migration of the federally endangered South-Central California Coast steelhead trout. Increased releases may reduce the water supply available to the Lopez Water Project contractors, which may increase vulnerabilities or exacerbate existing vulnerabilities for these southern SLO County utilities that rely on this water supply. Given this operational change, decreased future supply availability for Lopez reservoir is expected. The safe yield for municipal diversions is lowered during low reservoir emergency conditions in the corresponding amounts shown in Table 2.5 below.

Table 2.5 Reduction of Safe Yield During Low Reservoir Emergency Conditions

Stored Water Available in Reservoir (AF)	Municipal Safe Yield Reduction (AFY)	Municipal Safe Yield (AFY)
20,000	0 percent	4,530
15,000	10 percent	4,077
10,000	20 percent	3,624
5,000	35 percent	2,941
4,000	100 percent	0

2.2.3.2 Nacimiento Water Project

The Nacimiento Water Project (NWP) is a regional raw water transmission facility that delivers water from Lake Nacimiento to communities in SLO County. The District is the Owner of the NWP and has an entitlement of 17,500 AFY from Lake Nacimiento, of which 1,750 AFY is designated for lakeside users. The remaining 15,750 AFY is delivered to NWP Participants. The NWP Participants are listed in Table 2.6 on the next page and Figure 2.11 shows the NWP transmission infrastructure, on the following page.

Table 2.6 Lake NWP Participants Delivery Entitlement Volumes

Agency	NWP Water Delivery Entitlement Volume (AFY)
City of Paso Robles	6,488
Templeton CSD	406
Atascadero Mutual Water Company (MWC)	3,244
Santa Margarita Ranch Water Company	80
City of San Luis Obispo	5,482
County Service Area 10A	40
Bella Vista Mobile Home Park	10
Total	15,750

A handful of other small utilities have allocations for NWP water but are provided with water from other sources in lieu of this water. For example, the purveyors of Cayucos each have entitlements to the NWP but are served water from the Whale Rock Reservoir instead and the NWP water is then used by the City of SLO (SLO County Public Works, 2026).

The NWP pipeline has a history of ruptures and associated water service disruptions. Since the project came online in 2011, there have been several incidents and repairs undertaken in areas where the pipeline crosses underneath creeks and the Salinas River. Many of these incidents have resulted in NWP water supply outages and limited deliveries lasting several years for downstream customers. Furthermore, there is no projected increase to the Nacimiento water supply availability or use from the current entitlements.

Source: San Luis Obispo County Public Works

Figure 2.11 Nacimiento Water Project Transmission Infrastructure

2.2.3.3 Salinas Reservoir (Santa Margarita Lake)

The Salinas Dam is used to operate releases of the Salinas Reservoir (which is also referred to as Santa Margarita Lake), which has a capacity of 23,843 AF and only serves water to the City of San Luis Obispo. The Salinas Dam is owned by the United States Army Corps of Engineers (USACE) and is operated by the District. The reservoir was originally planned to have a capacity of 45,000 AF, but because the spillway gate was not installed as planned during construction due to seismic stability concerns, the capacity is limited to 23,843 AF.

As a result of siltation since the original construction, the reservoir capacity has been reduced to 22,508 acre-feet. A 2024 analysis conducted by the County of San Luis Obispo indicates that the siltation rate at Salinas Reservoir is approximately 46 acre-feet per year. Transferring ownership and installing the gate has been identified as a potential way to increase water storage capacity in the future.

Water is gravity fed from the reservoir to a three million gallon (MG) concrete holding basin at the Santa Margarita Booster Station, where it is then pumped up to the mile-long Cuesta Tunnel, where it flows via gravity before entering a pipe which flows to the City’s surface water treatment plant (San Luis Obispo Public Works, 2019). The City has water rights to store up to 45,000 AF but currently stores up to 23,843 AF due to the limitations previously discussed (City of San Luis Obispo, 2026). Figure 2.4 (Countywide Regional Infrastructure) shows the Salinas Pipeline with respect to the other regional infrastructure countywide. Chapter 3 (Opportunities for Desalination) provides examples of the vulnerabilities associated with the Salinas Reservoir due to climate impacts and similar to the other local reservoirs, there is no anticipated projected increase in supply for the Salinas Reservoir, however the district is investigating expanding the water right volume of the Salinas Reservoir which could take decades to execute (SLO County Public Works, 2025).

2.2.3.4 Whale Rock Reservoir

Whale Rock Reservoir was designed to store an estimated 40,662 AF of water. However, siltation caused by the accumulation of sediments at the bottom of the reservoir has reduced its storage capacity to an estimated 38,967 AF. Allocations of Whale Rock Reservoir are shown in Table 2.7 below. The reservoir is jointly owned and operated by the City of San Luis Obispo, the California Men's Colony, and California Polytechnic State University, SLO (Cal Poly). There is no anticipated projected increase in supply for Whale Rock Reservoir.

These users receive water from the Whale Rock Pipeline, which is a 30-inch diameter steel pipeline. The alignment of Whale Rock Pipeline follows Highway 1 between Morro Bay and the City of San Luis Obispo and is shown in Figure 2.4 (Countywide Regional Infrastructure). The pipeline was constructed in 1961, making it 65 years old. There was a recent pipeline rupture in 2024, which left the pipeline temporarily out of service. The Whale Rock Commission recently approved a three-phase plan to conduct spot repairs, a 2028 system-wide inspection, and possible full replacement depending on the outcome of that inspection (City of San Luis Obispo, 2025). The aging infrastructure of this project makes it less reliable until very costly repairs and replacement are completed.

Table 2.7 Whale Rock Reservoir Allocations

Utility	Allocation (AFY)[1]
City of SLO	21,451
California Polytechnic State University, SLO	13,136
California Men's Colony	4,380
Utility	**Downstream Entitlements (AFY)**
Cayucos Area Water Organization (CAWO)	582

Notes:
(1) SLO County Public Works, 2018

2.2.4 Recycled Water Facilities

Figure 2.12 on the next page shows the wastewater treatment plants and wastewater authorities in SLO County. With the exception of a few ocean outfalls, all other wastewater discharges are to local streams or percolation into groundwater, where they replenish flows (some are even required to maintain minimum flows). There are several recycled water projects in the study area as summarized in the following sections. Table 2.8, below, summarizes recycled water capacities of these projects, although availability of wastewater and viable end users limits full use of recycled water capacity. Each project aims to produce tertiary treated recycled water for non-potable reuse or advanced purified recycled water for indirect potable reuse (IPR). Direct potable reuse (DPR) projects are not explored in SLO County at this time. IPR projects are not the sole water supplies; they are supplemental to existing water supplies for their respective cities.

Of the current supplies within SLO County, recycled water projects show anticipated increases through increased beneficial reuse and expanded local recycled water systems. However, recycled water project expansion is limited by remaining wastewater available for treatment. In general, many of the larger agency recycled water projects have already been implemented with no plans to expand them to regional systems. Due to the distributed nature of the wastewater treatment plants and current commitments for reuse and discharge minimum flows, there are limited opportunities for large new reuse projects to offset regional potable demands. In 2024, the District identified 9 million gallons per day (mgd) of total discharged effluent across SLO County that could be converted to recycled water, 1.2 mgd is currently recycled and approximately 5.1 mgd is dedicated to beneficial use (maintaining stream flows or groundwater recharge). A significant amount of the remaining wastewater has been accounted for in recycled water systems that are expected to be online in the near future (e.g. Morro Bay). There are no current regional recycled water projects in SLO County.

Table 2.8 Recycled Water Production Capacity in Study Area

Utility	Recycled Water Production Capacity (AFY)
Morro Bay Water Reclamation Facility	412.5 (anticipated)
Los Osos Water Reclamation Facility Project	541
Cambria Community Services District Water Reclamation Facility	945 (during emergency conditions)
Paso Robles Recycled Water Program	2,200
City of San Luis Obispo Water Resource Recovery Facility	4,488

Figure 2.12 Wastewater Agency Service Area Boundaries Within Study Area

2.2.4.1 Morro Bay Water Reclamation Facility Project

Morro Bay is in the process of implementing its Water Reclamation Facility Project, which will produce treated wastewater for IPR. An advanced treatment facility was recently constructed as part of the City of Morro Bay's new Water Resource Center (WRC) wastewater treatment plant. The new facility includes RO and ultraviolet/advanced oxidation (UV/AOP) treatment processes that allow the City of Morro Bay to produce advanced purified recycled water that can be injected into the Morro Basin and later be extracted for use in the City of Morro Bay's drinking water system.

The wastewater treatment plant and wastewater conveyance facilities have been constructed. The recycled water facilities (injection wells, equipping, IPR recycled water conveyance, etc.) have not yet been constructed. Implementation of the recycled water facilities project will likely be phased, with the first phase including 3 to 4 injection wells and producing an anticipated 412.5 AFY. Construction of the first phase is anticipated to be completed in September 2026. It is estimated that, at full build-out, the City's IPR Program could have approximately eight injection wells and the capacity to treat and inject up to 887 AFY of advanced purified recycled water into the Morro Basin to increase recharge, create a barrier against seawater intrusion, reduce concentration of nitrate contamination, and allow the City of Morro Bay to extract up to 1,000 AFY of groundwater (Morro Bay, 2023).

2.2.4.2 Los Osos Water Reclamation Facility Project

The Los Osos Water Reclamation Facility (LOWRF) produces tertiary treated water that is used for non-potable reuse for irrigation, agricultural use, and groundwater recharge. More recycled water users are anticipated to be connected to the distribution system. In 2024, a total of 541 AFY of recycled water was produced. In 2024, a total of 470 AF was delivered to the community's two leach fields (Broderson and Baybridge leach fields) which recharges the groundwater basin, 68 AF was delivered for non-potable (golf course) irrigation, and about 3 AF was delivered for agricultural use (LOBMC, 2025).

2.2.4.3 Cambria Community Services District Water Reclamation Facility

Cambria CSD has an IPR water recycling facility called the Water Reclamation Facility (WRF), formerly known as the Advanced Water Treatment Plant (AWTP). Cambria CSD installed the WRF in 2015 under an emergency permit, and it can currently only be operated under emergency conditions to recharge the San Simeon Valley Groundwater Basin. The WRF treats the source water via membrane filtration (MF), RO, and UV/AOP processes for injection into the San Simeon Valley Groundwater Basin.

In total, the WRF can produce up to 945 AFY of product water of varying quality and 173 AFY of wastewater in the form of RO concentrate and membrane filtrate backwash under regular operating conditions. Around 161 AFY of treated and de-chlorinated advanced purified recycled water would be discharged into San Simeon Creek to maintain and enhance water quality in the San Simeon Creek Lagoon during the dry season, and the remainder could be utilized for injection for indirect potable reuse. Cambria CSD is in the process of obtaining permits to allow use of the facility under normal conditions.

2.2.4.4 Paso Robles Recycled Water Program

The City of Paso Robles Recycled Water Program is currently in progress, and, once operational, will produce tertiary treated recycled water for non-potable reuse. The recycled water will be used for irrigation of sport fields and agricultural irrigation. The treatment facilities have been constructed to produce tertiary treated recycled water from wastewater using filtration and UV light disinfection. The distribution facilities are partially completed and are currently under construction. Facilities also include flow equalization basins, a recycled water storage pond and pump station, a nutrient harvesting system, and a new maintenance shop (Paso Robles, 2026[a]). Per the City's draft 2025 Urban Water Management Plan, this source is anticipated to supply up to 2,050 AFY (Paso Robles, 2026[b]).

2.2.4.5 City of San Luis Obispo Water Resource Recovery Facility

The City of San Luis Obispo Water Resource Recovery Facility (WRRF) produces tertiary treated non-potable recycled water for irrigation and construction use. The WRRF produces enough recycled water to irrigate over half of the City's parks, including Damon Garcia Park, Laguna Lake Park, DeVaul Park, French Park, and Laguna Lake Golf Course. These deliveries reduce the City's annual potable water demand by 5 percent. Treated water is stored in a 700,000-gallon tank and distributed through 14 miles of recycled water pipeline with the capacity to deliver up to 2.5 million gallons (MG) of recycled water daily. The City is required to discharge a daily average of 1.6 mgd of treated water to San Luis Obispo Creek for protection of downstream biological resources, as required by National Oceanic Atmospheric Association, National Marine Fisheries Service (NOAA NMFS). In 2025, the City utilized 276 AF on irrigation, 12 AF on construction water, and 1,792 AF on required creek releases. An additional 2,408 AF of recycled water was produced and discharged to San Luis Obispo Creek (City of San Luis Obispo, 2026).

2.2.4.6 Central Coast Blue

Central Coast Blue is a recycled water project located in South SLO County area, specifically the City of Grover Beach. The goal of Central Coast Blue is to construct a new advanced water purification city to treated wastewater from the City of Pismo Beach. This highly treated wastewater was then to be injected into the groundwater basin for recharge and extracted through existing municipal wells. The project was originally envisioned to be a regional project but was unable to gain support and funding needed. Currently the Central Coast Blue project is in a redevelopment phase to reevaluate the project approach and development and will be implemented solely by City of Pismo Beach.

2.3 DESAL Plan Partners' and Potential End Users' Supplies

The DESAL Plan partners are listed in Section 1.3 (Study Area Characteristics). Other water agencies who are not officially DESAL Partners but who may have some interest in being an end user are also included as "potential end users". Figure 2.13 (DESAL Plan Partners and Potential End Users) shows the location of the partner agencies and end users included in this study. The following sections describe the water supply issues for the DESAL Plan partners and end users in detail, based on regions of SLO County, which are listed in Table 2.9 on the next page.

Table 2.9 Water Supply Regions and Water Agencies in SLO County Considered in Study

Region	Water Agency(1)	Service Area Population	Supply Sources(2)
North Coast County	Cambria CSD(1)	6,000	GW
	City of Morro Bay(1)	10,757	GW, SWP, RW (future)
North County	City of Paso Robles(1)	31,176	GW, SW (NWP)
	Paso Robles Subbasin GSA	N/A	
	Templeton CSD(1)	8,011	GW
	Atascadero Mutual Water Company(1)	30,618	GW
	San Miguel CSD(1)	2,600	GW
Central County	City of SLO	47,788	SW (Whale Rock, Salinas, NWP)
	Los Osos CSD(1)	7,086	GW
	Golden State Water Company – Los Osos	5,924	GW
	Cal Poly University	23,245	GW, SW (Whale Rock)
	San Luis Obispo Valley Groundwater Basin	N/A	
	Golden State Water Company – Edna Road Water System(1)	1,493	GW
South County	City of Grover Beach(1)	12,701	GW, SW (Lopez)
	City of Pismo Beach(1)	8,036	GW, SW (Lopez, SWP)
	Avila Beach CSD(1)	1,630	SWP
	Golden State Water Company – Cypress Ridge(1)	2,026	GW
	Golden State Water Company – Nipomo(1)	4,506	GW
	Nipomo CSD	13,771	GW
	Nipomo Mesa Management Area(1)	N/A	
	City of Arroyo Grande(1)	17,963	GW, SW (Lopez)
	Oceano CSD(1)	7,601	SW (SWP, Lopez)
	San Miguelito CSD	1,600	GW, SW (Lopez)
	Northern Cities Management Area	N/A	
Santa Barbara County(1)	Various agencies, see Section 2.3.4 (South County)		

Notes:
(1) DESAL Partner.
(2) GW = groundwater; SW = surface water (incl. 4 reservoirs shown in Figure 2.8 (Map of California State Water Project Infrastructure); SWP = imported State Water Project water; RW = recycled water, NWP = Nacimiento Water Project

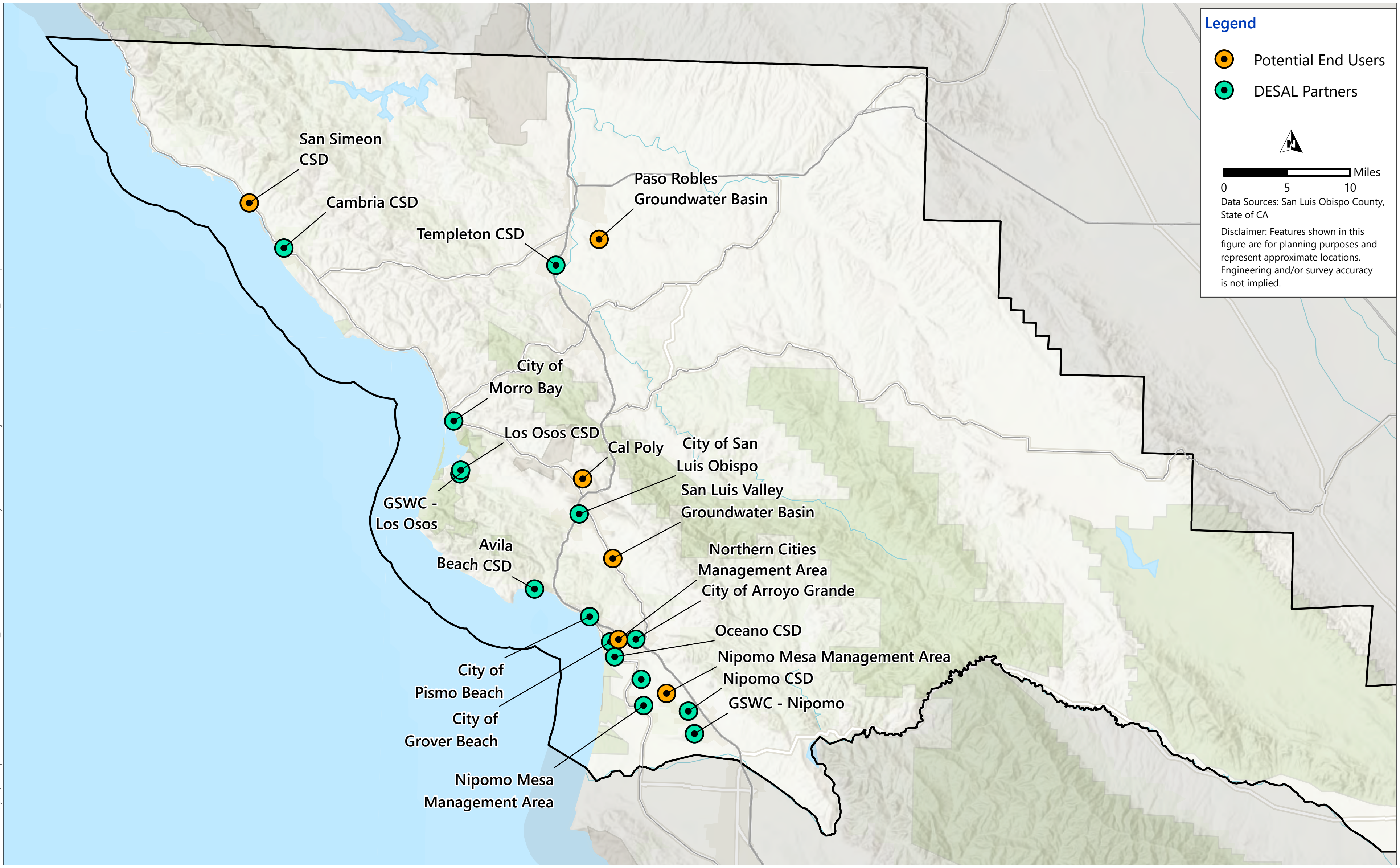


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Figure 2.12 DESAL Plan Partners and Potential End Users

2.3.1 North Coast

2.3.1.1 Cambria Community Services District

Cambria CSD relies on groundwater to serve their residential population of 6,000 and their weekend tourist transient population of approximately 2,100. Cambria CSD is currently extracts groundwater from the San Simeon Valley Groundwater Basin and the Santa Rosa Valley Groundwater Basin and avoids excessive pumping in the San Simeon Valley Groundwater Basin to avoid adverse impacts, such as seawater intrusion. One of the biggest challenges for Cambria CSD is the limited storage in its groundwater basins. It relies heavily on precipitation each winter to recharge the basin with sufficient water to supply its customers throughout the rest of the year (Cambria CSD, 2024).

2.3.1.2 City of Morro Bay

The City of Morro Bay serves a residential population of 10,757 and a transient population of 3,000, being a popular local tourist destination. Currently, the City of Morro Bay has two primary sources of water: imported water from the SWP and groundwater from the Lower Morro Valley Groundwater Basin (Morro Basin). Morro Bay uses imported SWP water as its primary water supply, but when imported SWP water is unavailable due to maintenance, unplanned shutdowns, or no allocation, the City of Morro Bay pumps Morro Basin groundwater to meet its water system customer demands. The City of Morro Bay is particularly vulnerable during SWP shutdowns, as its groundwater extraction and treatment infrastructure struggle to meet demands when operated continuously.

The City of Morro Bay’s SWP water service amount is 1,313 AFY, and the City typically purchases 2,290 AFY in additional SWP water from the District’s available “drought buffer.” Morro Bay's reliance on the District’s drought buffer makes it particularly vulnerable to water shortages. The City of Morro Bay also has existing groundwater rights in the Morro Basin. This water source has a history of water quality concerns, specifically high TDS concentrations associated with seawater intrusion and high nitrates. The two wells closest to the coast have the most significant seawater intrusion. Due to the need to either treat groundwater from the Morro Basin through its Brackish Water Reverse Osmosis (BWRO) facility to address water quality concerns, or blend with SWP water, the City of Morro Bay typically prioritizes delivery of SWP water and relies on groundwater when SWP water is inaccessible or to supplement supplies in low SWP allocation years.

2.3.2 North County

2.3.2.1 City of Paso Robles

The City of Paso Robles serves a residential population of 31,568 (Census, 2024). Paso Robles relies on groundwater from the Paso Robles Area Subbasin within the Salinas Valley Groundwater Basin and surface water from the Nacimiento Water Project (NWP). The City receives untreated water from Lake Nacimiento distributed through the Nacimiento pipeline, as shown in Figure 2.11 (Nacimiento Water Project

Transmission Infrastructure). In Water Year[3] (WY) 2024, the City of Paso Robles extracted 690 AF of groundwater from the Paso Robles Subbasin and produced 3,151 AF from the Atascadero Area Subbasin. Both the Paso Robles Area and the Atascadero Area Subbasins are subject to the SGMA. As of the date of this report, the basin is still in active litigation. The City of Paso Robles is entitled to 6,488 AFY of non-potable water from the NWP. In WY 2024, the City of Paso Robles took 2,148 AF of their NWP entitlement. This includes 487 AF of Paso Robles' NWP allocation that was recharged and recovered with groundwater extraction wells in the Atascadero Area Subbasin. The remaining 1,660 AF of non-potable water was treated for potable use at the City's surface water treatment plant.

2.3.2.2 Paso Robles Subbasin Groundwater Sustainability Agency

The Paso Robles Subbasin lies in the northern region of SLO County and is the southernmost portion of the Salinas Valley Groundwater Basin, as shown in Figure 2.14 on the next page. Two principal aquifers exist in the Paso Robles Subbasin: the Alluvial Aquifer and the Paso Robles Aquifer. DWR has assigned the Paso Robles Subbasin as a high priority basin and determined it to be in critical overdraft. According to SGMA, a basin is subject to critical overdraft when continuing present water management practices would most likely result in significant negative environmental, social, or economic impacts related to overdraft. The Paso Robles Subbasin serves the City of Paso Robles, San Miguel CSD, and SLO County for Community Service Area 16 (CSA 16), providing service to the community of Shandon. In water year (WY) 2024, the Paso Robles Subbasin had a total water use of 79,900 AF, with a significant use from agriculture.

In WY 2024, the Paso Robles Subbasin experienced an annual decrease of groundwater in storage of 25,500 AF. The resulting decline in groundwater levels has impacted local well owners. Total groundwater extractions continue to exceed the estimated future sustainable yield, which is particularly concerning for communities and rural residential areas that rely solely on groundwater for their water supply. The estimated total overdraft of the Paso Robles subbasin is 13,700 AFY. New water supplies must be imported into the Paso Robles Subbasin, or demand management activities must be implemented, to mitigate declines in groundwater levels, avoid undesired results as required by SGMA regulations, and meet their sustainability goal by 2040 (Paso Robles Subbasin, 2024).

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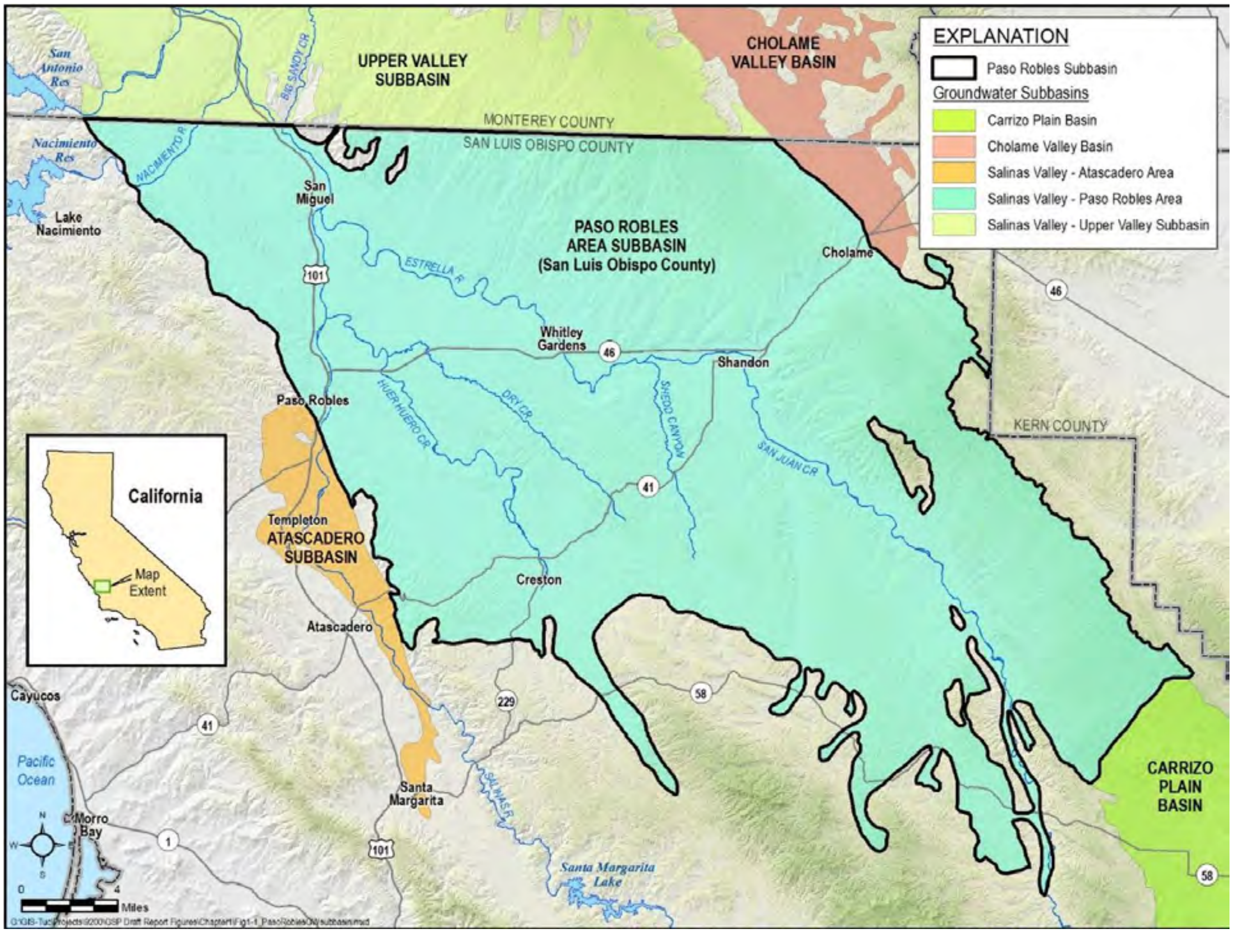
[2]A Water Year is defined as the period between October 1 and September 30 of the following calendar year.



(SLO County, 2026)

Figure 2.14 Paso Robles Subbasin and Surrounding Subbasins (Paso Robles Subbasin Groundwater Sustainability Plan, 2020)

2.3.2.3 Templeton Community Services District

Templeton CSD serves a residential population of 8,011. Templeton CSD receives its water from the Salinas River underflow, the Atascadero Groundwater Basin (Atascadero Basin), and the NWP. Templeton CSD's wells pull from the Atascadero Basin and the underflow of the Salinas River (Templeton, 2024). Templeton CSD employs a water blending strategy to mitigate minor water quality issues with some of their Basin aquifer wells by blending in higher quality water from their underflow wells. In WY 2024, Templeton CSD served 1,159 AF of groundwater and 38 AF of NWP water.

2.3.2.4 Atascadero Mutual Water Company

Atascadero Mutual Water Company (AMWC) serves a residential population of 29,743 (Census, 2024). AMWC receives its water from the Salinas River underflow, the Atascadero Basin, and the NWP (AMWC, 2026). AMWC uses a water blending strategy to mitigate minor water quality issues with some of their basin aquifer wells by blending in higher quality water from their underflow wells. In WY 2024, AMWC extracted 5,042 AF of groundwater from the Atascadero Basin. AMWC is contracted for 3,244 AF of water from the NWP. In WY 2024, AMWC only used 220 AF of their entitled amount from the NWP.

2.3.2.5 San Miguel Community Services District

San Miguel CSD serves a residential population of 2,600. San Miguel CSD uses wells in the Paso Robles Area Subbasin of the Salinas Valley Basin. These wells are considered vulnerable to contamination by nearby septic and sewer collection systems, but there have been no detected contaminants in the water supply associated with these potential contamination sources (San Migues CSD, 2026).

2.3.3 Central County

2.3.3.1 City of San Luis Obispo

The City of San Luis Obispo operates a surface water treatment plant and serves a residential population of 49,729 (Census, 2024) and a very large transient population of approximately 22,000 students from Cal Poly. The City of SLO is the largest city in SLO County. The City of San Luis Obispo has three active water sources: Nacimiento Reservoir, Whale Rock Reservoir, and Santa Margarita Lake (Salinas Reservoir). The City of SLO NWP water supply is delivered by the Nacimiento pipeline; however, sections of this pipeline were destroyed by severe flooding along the Salinas River in 2023. Currently, the City of SLO has an emergency temporary (and seasonal) connection to the NWP.

As of July 2026, the City is advancing a groundwater cleanup project that is expected to restore the City's ability to physically extract and treat groundwater for potable use. The City completed a comprehensive characterization of a tetrachloroethylene (TCE) plume that underlies the most productive areas of the groundwater basin and is implementing a groundwater cleanup program that includes installation of eight new monitoring wells, two new extraction wells, and a treatment system utilizing granular activated carbon for PCE removal. This project is supported by State grant funding and is expected to restore groundwater as a supplemental potable water supply beginning in 2027. Once completed, the project is expected to provide the City with wells and treatment facilities capable of producing and treating groundwater consistent with the volumes identified through the GSP and related planning efforts. The City estimates that the new groundwater wells could increase available water supplies by approximately 600 to 700 acre-feet per year.

The City of SLO has a water supply allocation of 21,452 AFY from Whale Rock Reservoir, 15,750 AFY from Santa Margarita Lake, and 5,482 AFY from the NWP (San Luis Obispo, 2021). These surface water supplies are all vulnerable to drought, and full allocations may not be available as reservoir levels drop. The City of San Luis Obispo also produces tertiary treated recycled water at their recently completed Water Resources and Recovery Center and uses recycled water for city park irrigation, new development landscape, construction water, and potentially potable reuse in the future.

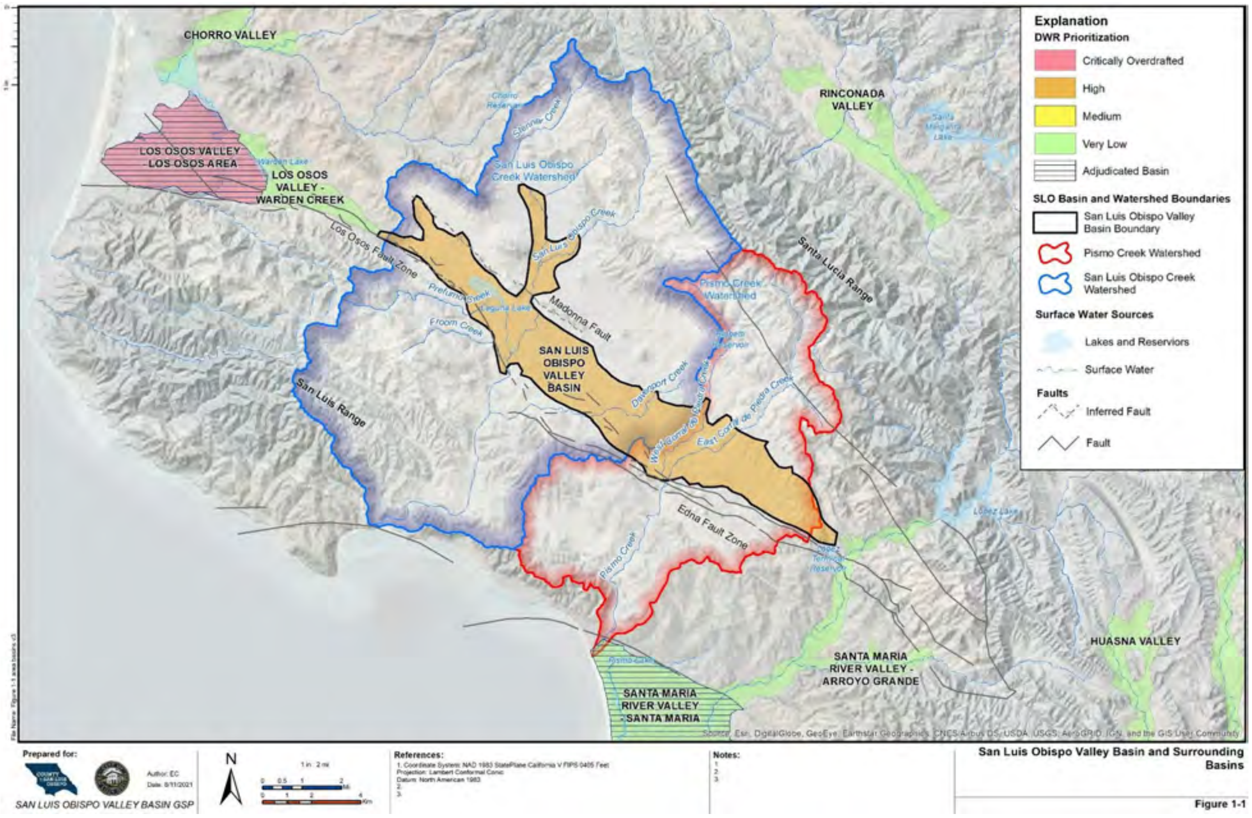
2.3.3.2 Los Osos Water Purveyors

The community of Los Osos is served by three water purveyors: S&T Mutual Water Company, Los Osos CSD, and Golden State Water Company. The fringe areas (outside of the purveyor service areas) are served by domestic wells. The CSD is in the design phase of a project to connect to the SWP which is anticipated to allow for importation of up to 600 AFY.

The community relies solely on groundwater from the Los Osos Groundwater Basin. Rapid development in the 1970s-1980s led to higher water demand and unsustainable levels of groundwater pumping in the Los Osos Groundwater Basin and resulted in seawater intrusion, occurring at rates estimated to exceed 500 feet per year. Additionally, the upper aquifer has elevated nitrate concentrations above the MCL, making it unsafe to drink without treatment. These conditions led DWR to declare the basin critically overdrafted and additionally resulted in an adjudication. Through implementation of the Basin Management Plan and other measures, the LOBMC and community of Los Osos are working towards halting seawater intrusion, raising groundwater levels, and reducing nitrate contamination. The LOBMC monitors seawater intrusion in the basin via a network of monitoring wells. 2,010 AFY was extracted from the basin in 2022. 1,650 AFY was extracted in 2023. The sustainable yield has been estimated to be 2,380 AFY from 2021-2025. The 2026 sustainable yield was lowered to 2,000 AFY based on the findings of the updated groundwater flow model known as the transient model.

2.3.3.3 San Luis Obispo Valley Groundwater Basin Users

The San Luis Obispo Valley Groundwater Basin (San Luis Obispo Valley Basin) lies within the San Luis and Edna Valleys in the central portion of SLO County, as shown in Figure 2.15 on the next page. DWR has designated the San Luis Obispo Valley Basin as a high priority basin (DWR, 2026). The San Luis Obispo Valley Basin serves the City of San Luis Obispo and the communities of Edna, Edna Ranch, and Varian Ranch. In 2019, 45 small public water systems (PWS), which are defined as systems serving 10,000 or fewer customers, were identified as pumping groundwater from the San Luis Obispo Valley Basin. Three of the small PWSs provided metered production records: Golden State Water Company (Golden State Water Company, 2026), Varian Ranch Mutual Water Company, and Edna Ranch Mutual Water Company. These small PWSs provide public water supply by pumping groundwater from the Edna Valley subarea. Golden State Water Company – Edna uses two active wells, Varian Ranch Mutual Water Company uses three active wells, and Edna Ranch Mutual Water Company uses two active wells. The estimated groundwater extractions by small PWSs are 220 AF from the San Luis Valley and 630 AF from Edna Valley, summing to a total of 850 AF. The estimated total amount of groundwater extractions in the San Luis Obispo Valley Basin for WY 2024 is 5,760 AF.



Source: San Luis Obispo County

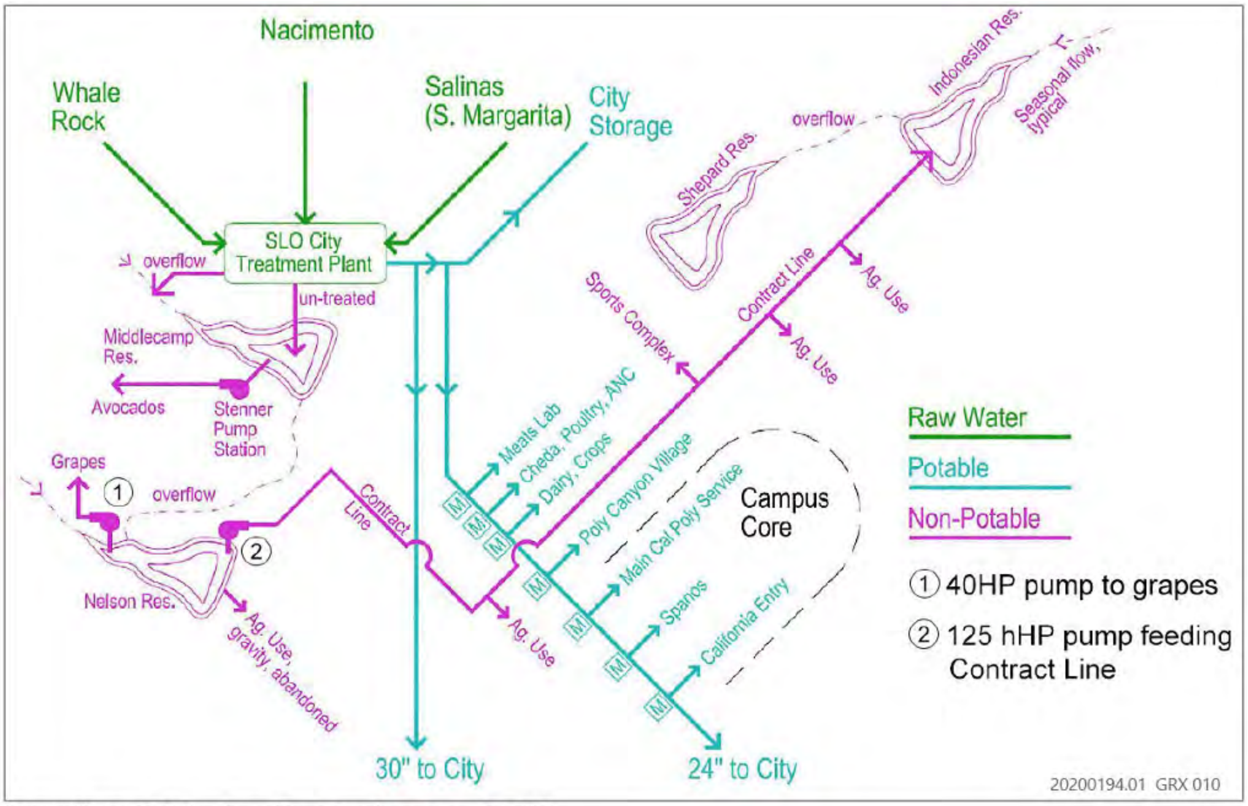
Figure 2.15 San Luis Obispo Valley Basin and Surrounding Basins

2.3.3.4 California Polytechnic State University

Cal Poly is located in SLO County but lies outside of the City of SLO. As of Fall 2025, Cal Poly employs 3,427 staff members and has a student population of 23,245. Cal Poly primarily receives its water from Whale Rock Reservoir, located in Cayucos, and local groundwater from the Chorro Valley and Stenner Creek watersheds. Cal Poly receives its groundwater from agricultural wells located on university land, but their supply is limited due to relatively shallow and low-capacity aquifers, especially during drought years (Cal Poly, 2026[a]). In 2024, 120 AF of groundwater was pumped from two wells and used to irrigate agricultural crops on the main campus.

The City of SLO, California Men's Colony, and Cal Poly were the original developers of Whale Rock Reservoir. Due to this, Cal Poly owns rights to 34 percent of Whale Rock Reservoir's capacity, which is sufficient to meet existing campus needs. Cal Poly is allowed to bank water at the reservoir up to their allocated storage limit of 12,485.8 AF. Cal Poly's safe annual yield from Whale Rock Reservoir is 959 AF. In any given year, Cal Poly may take more or less water than its safe annual yield but may not take more than its stored water volume (Cal Poly, 2024). As a water right holder, Cal Poly does not pay for its water supply, but it does pay fees to the City of San Luis Obispo for water delivery and treatment (Cal Poly, 2026[b]). Cal Poly has used capital funds to purchase a capacity share of the City of San Luis Obispo's water treatment plant and receives a discounted rate for treatment costs. Additionally, an SWRCB permit allows Cal Poly to own surface water rights to Old Creek, which supplies Whale Rock Reservoir and Brizzolara

Creek, the latter of which is located on the Cal Poly campus. In 2024, Cal Poly sourced 959 AF of surface water from Whale Rock Reservoir (Cal Poly, 2024). Figure 2.16, below, shows the interrelationship of water supplies for Cal Poly and the City of San Luis Obispo.



Source: Watearth 2019a; adapted by Ascent Environmental in 2021.

Source: Final Environmental Impact Report for the Cal Poly Water Reclamation Facility Project, 2024

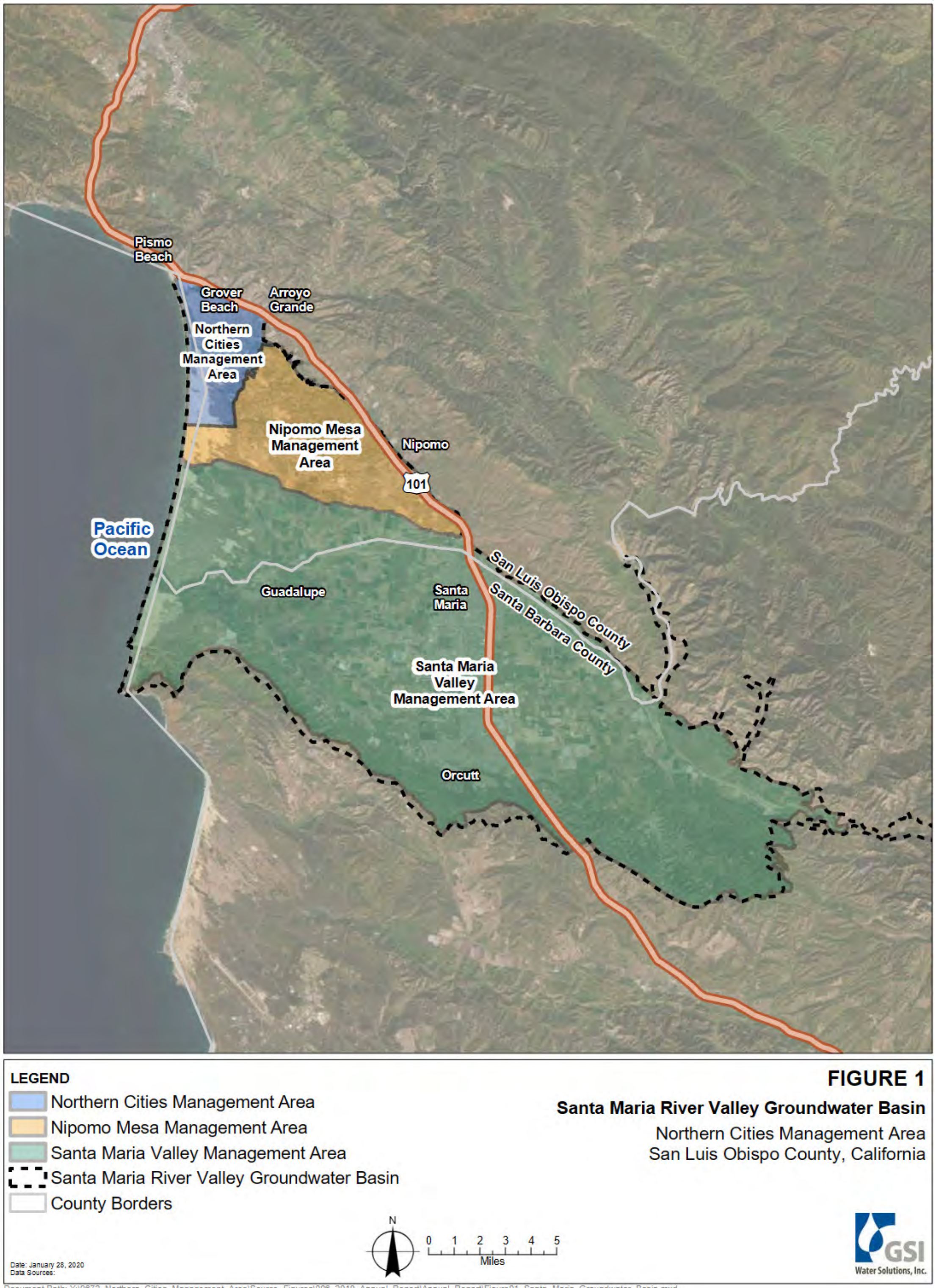
Figure 2.16 Water Supply Relationship Between the City of San Luis Obispo and Cal Poly

Cal Poly's Campus Master Plan identified potable water supply and treatment capacity as their primary constraints limiting campus growth. To solve this, Cal Poly is constructing an on-campus Water Reclamation Facility and recycled water storage and distribution system to treat a portion of the raw campus wastewater instead of sending it to the City of San Luis Obispo's treatment plant. The facility will be able to produce and deliver disinfected tertiary recycled water that meets the requirements of Title 22 of the California Code of Regulations for unrestricted reuse. The non-potable recycled water will be used for agricultural crops, pastures, and recreational fields on campus, which were previously irrigated by untreated water from Whale Rock Reservoir. Due to this, Cal Poly will have increased water availability from Whale Rock Reservoir to meet future potable water demand associated with projected campus growth. Cal Poly will continue to pump groundwater for agricultural purposes. The Water Reclamation Facility is expected to be completed in Summer 2026. (Cal Poly, 2026[b])

2.3.4 South County

2.3.4.1 Northern Cities Management Area

The Santa Maria Valley Groundwater Basin is partially adjudicated and the adjudicated portion serves the Northern Cities Management Area (NCMA). In response to an incipient seawater intrusion event identified in 2009, the NCMA agencies, including the Cities of Arroyo Grande, Grover Beach, Pismo Beach, and the Oceano CSD, collectively made voluntary reductions to groundwater production to protect against potential future seawater intrusion events. Each of the NCMA agencies are currently producing less groundwater than their adjudicated entitlement, and it is collectively understood that seawater intrusion would be the likely outcome if the agencies were to attempt to produce their full entitlement of groundwater (Oceano, 2024). In CY 2024, total water use in the NCMA was 7,783 AF. The Santa Maria River Valley Groundwater Basin is shown in Figure 2.17 on the next page.



Source: Northern Cities Management Area 2024 Annual Monitoring Report, 2025

Figure 2.17 Santa Maria River Valley Groundwater Basin

2.3.4.2 City of Grover Beach

The City of Grover Beach serves a residential population of 12,701 (Census, 2024). Typical annual demand has been about 1,200 AF since 2015. The City has two sources of water: 1) treated surface water blended with State water from the Lopez Water Treatment Plant (note, City of Grover Beach is not a SWP subcontractor); and 2) groundwater from the Santa Maria River Valley Groundwater Basin. Currently, the City utilizes water from the Lopez Water Treatment Plant as its primary water supply but supplements it with groundwater on a near daily basis. Due to water quality issues associated with nitrate contamination in the basin, Lopez water is blended with groundwater to lower nitrate levels before it is distributed. Treated water is delivered through the Lopez Water Transmission Line to the City via the Grover Beach Turnout. The City has a groundwater allocation of 1,407 AFY from the adjudicated NCMA portion of the Santa Maria Valley Groundwater Basin; however, since 2014, it has only used about 470 AFY of groundwater on average due to the water quality concerns, specifically high nitrate concentrations and corrosive water. In 2025, the City utilized 519 AFY of groundwater and 708 AF of Lopez Water.

2.3.4.3 City of Pismo Beach

The City of Pismo Beach serves a residential population of 8,036 (Census, 2024). The City uses its two active wells and receives treated surface water from the SWP (CCWA) and the Lopez Treatment Plant (Waterboards, 2026). The utility has an emergency connection with Arroyo Grande. In WY 2024, Pismo used a total of 1,513 AF of potable water. The City prioritizes using its surface water sources over Santa Maria Basin groundwater to prevent undesirable results such as seawater intrusion and has voluntarily reduced their use. The City’s water supplies include groundwater, Lopez Lake surface water and State Water. The City was also pursuing the original Central Coast Blue recycled water project before it was put on hold. As of recently, the City has began reevaluating the project and is currently pursuing its development at a reduced capacity. The City is entitled to 700 AFY of groundwater and utilized 27.4 AF in WY 2024. The City is entitled to 892 AFY of Lopez Lake and utilized 776. AFY of their entitlement in WY 2024. The City has a State water allocation of 1,240 AFY and the City used 710 AF of this entitlement in WY 2024 (delivered through the Lopez transmission line).

2.3.4.4 Avila Beach Community Services District

Avila Beach CSD serves a residential population of 1,630 (Census, 2024). Avila Beach CSD is a State Water subcontractor and the community relies solely on the Lopez Water Project (blended State water and treated surface water). Avila Beach CSD has water delivered through the Lopez pipeline. While they do not purchase any Lopez Lake allocation, their purchased State water is blended at the Lopez treatment plant, and they are delivered their total allocation.

2.3.4.5 Golden State Water Company - Cypress Ridge

Golden State Water Company - Cypress Ridge is a privately owned water system located south of Pismo Beach. The utility serves a residential population of 2,026 extracts groundwater from the Santa Maria Groundwater Basin. There has been some seawater intrusion observed.

2.3.4.6 City of Arroyo Grande

The City of Arroyo Grande serves a population of 18,441 and is located in Southern SLO County, between the City of Pismo Beach and Nipomo (Census, 2024). The City sources its water from the Lopez Water Treatment Plant and its groundwater from the Santa Maria River Groundwater Basin and the Pismo Formation of the Pismo-Huasna Basin. The City has emergency interconnections with Oceano CSD, the City of Grover Beach, and the City of Pismo Beach. Arroyo Grande extracts groundwater from the Santa Maria River Groundwater Basin and the Pismo Formation. Arroyo Grande has water rights to 1,323 AF of groundwater from the Santa Maria Groundwater Basin and 160 AF from the Pismo Formation. Arroyo Grande is also entitled to 2,290 AF of surface water from the Lopez Reservoir. In 2024, Arroyo Grande used 2,024 AF of water from the Lopez Reservoir. Arroyo Grande is not an SWP participant and can only buy State water during a locally declared water emergency.

2.3.4.7 Oceano Community Services District

Oceano CSD is located in SLO County and serves a population of 7,601. Oceano CSD sources its water from the SWP through CCWA and receives treated surface water from the Lopez Water Treatment Plant via the Lopez Reservoir. Oceano CSD has an emergency interconnection that serves as water supply back up with the City of Arroyo Grande and Grover Beach. In 2024, Oceano CSD’s water system used State and Lopez Project water supplemented with groundwater. Oceano CSD pumped 12 AF of groundwater from the Santa Maria Valley Groundwater Basin in 2024, 489 AF of water from the Lopez Project and 218 AF from the SWP. Oceano CSD is contractually entitled to 303 AF of water from Lopez Lake. Oceano CSD has a Table A allocation of 750 AF and a drought buffer of 750 AF from the SWP (Oceano, 2025).

2.3.4.8 Nipomo Mesa Management Area

From 1997 to 2008, over 1,000 parties with competing claims to pump groundwater were in litigation for the rights to water extraction from the Santa Maria Groundwater Basin. In 2008, the court divided the Santa Maria Groundwater Basin into three separate management areas and one of these is the NMMA. The NMMA is made up of the Nipomo CSD, Golden State Water Company - Nipomo, Phillips 66, and Woodlands Mutual Water Company. Nipomo CSD serves a population of 13,771. It sources its water from the City of Santa Maria Utilities Department. Golden State Water Company – Nipomo serves a population of 4,506. It sources its treated water from Nipomo CSD. In 2024, Nipomo CSD produced 656 AF of groundwater, the Golden State Water Company produced 1,146 AF, the Woodlands Mutual Water Company produced 806 AF, and Phillips 66 produced 40 AF. The Court requires the Nipomo CSD to purchase a minimum of 2,500 AF of Nipomo supplemental water each year from the City of Santa Maria and transmit this water to the NMMA. However, the NMMA may require Nipomo CSD to purchase and transmit an amount greater than 2,500 AF if this amount is necessary to protect or sustain groundwater supplies in the NMMA. The NMMA may also periodically reduce the required amount of Nipomo supplemental water, so long as it finds that the groundwater supplies are not endangered based on the reduction. Once the Nipomo supplemental water was capable of being delivered, the court also required Nipomo CSD, Woodlands Mutual Water Company, and the Golden State Water Company to purchase varying percentages of the Nipomo supplemental water. Nipomo CSD delivered 1,179 AF of imported water from the City of Santa Maria through the Nipomo Supplemental Water Project in CY 2024.

2.3.4.9 Santa Barbara County

Santa Barbara County is located directly south of SLO County. Lake Cachuma is the terminus of the SWP coastal branch pipeline and serves several water purveyors in Santa Barbara County. Santa Barbara County is a DESAL Plan partner, but has not identified a demand. Individual water agencies adjacent to or near the SWP Coastal Branch pipeline were identified as potential water purveyors who could possibly receive desalinated water directly or an exchange with State water from this project. Agencies south, west, and east of Lake Cachuma along Highway 101 and 154 were not considered.

2.4 Historic and Projected Water Use Trends and Demands

This section describes the historic and projected water use trends and demands for the DESAL Plan partner agencies and potential end users for both potable and recycled water use. Contractual allocations and water rights do not represent actual supplies that are available on an annual basis and in general, supplies are equal to demand, since agencies typically only use as much water as they need. This section describes actual demands (e.g., actual water use and consumption) and anticipated future projected water use throughout SLO County.

2.4.1 Current Water Uses

Section 2.2 (Current and Projected Water Supply Sources and Facilities) presents the approximate water use by type across the entirety of SLO County. Figure 2.5 (DESAL Plan Partner and Potential End User Water Use (2019–2024)) shows that the majority (87 percent) of County's water supply is a combination of groundwater and surface water, while only 9 percent is imported via the California. Table 2.10 on the next page shows the average current potable water use for the DESAL Plan agencies and potential end users within the study area. The agencies' current supply was determined by documenting their past water supplies from 2019 to 2024, through the State of California's Electronic Annual Report (eAR) system or by requesting data directly from the agencies. The average of each agency's water supplies from 2019 to 2024 was calculated to populate Table 2.11 on the next page. As discussed in Section 2.3 (DESAL Plan Partners and Potential End Users), several groundwater basins are currently experiencing overdraft, and Table 2.11 shows these basins' respective overdraft volumes as reported in their GSPs or published basin plans.

Table 2.10 Current Water Supply and Demand

DESAL Partner and Potential End User	Water Use Average 2019 – 2024 (AFY)[1]				
	Groundwater	Total Surface Water	Recycled Water	Purchase Water	Total Avg. Water Use
Atascadero MWC	4,320	960	160	0	5,440
Avila Beach CSD	0	20	0	60	80
Cambria CSD	510	0	190	0	700
Cal Poly University	120	960	0	0	1,080
California Men's Colony	0	40	0	650	690
City of Arroyo Grande	0	2,120	0	0	2,120
City of Grover Beach	440	790	0	0	1,230
City of Morro Bay	90	0	0	1,010	1,100
City of Paso Robles	4,810	900	0	0	5,710
City of Pismo Beach	50	1,630	0	0	1,680
City of San Luis Obispo	0	4,780	270	0	5,050
Golden State Water Company - Cypress	530	0	0	0	530
Golden State Water Company - Edna	180	0	0	0	180
Golden State Water Company - Los Osos	490	0	0	0	490
Golden State Water Company - Nipomo	680	0	0	0	680
Los Osos CSD	500	0	290	0	790
Nipomo CSD	860	0	210	1,060	2,130
Oceano CSD	80	450	0	240	770
San Miguel CSD	290	0	0	0	290
San Simeon CSD	80	0	0	0	80
Templeton CSD	1,110	120	250	0	1,480
Total	**15,140**	**12,770**	**1,370**	**3,020**	**32,300**

Notes:
(1) Totals rounded up to the nearest 10 AFY.

Table 2.11 Overdrafted Groundwater in Study Area

Groundwater Management Agency	Estimated Groundwater Overdraft Volume AFY	Associated Groundwater Basin
Nipomo Mesa Management Area[1]	40	Santa Maria River Valley
Northern Cities Management Area[1]	566	Santa Maria River Valley
Paso Robles Subbasin Groundwater Sustainability Agency[2]	13,700	Salinas Valley – Paso Robles Area Groundwater Basin
San Luis Valley Groundwater Basin (SLOV)[3]	400	San Luis Valley Groundwater Basin
Santa Maria Valley Management Area[1]	511	Santa Maria River Valley
Total Estimated Groundwater Overextraction	15,217	

Notes:
(1) Central Coast Blue Phase 1B Groundwater Model Report.
(2) Paso Robles Subbasin Groundwater Sustainability Plan, section 9.4.1.
(3) Combination of San Luis Valley Surplus of 400 AFY and Edna Valley Overdraft of 1,100 AFY. SLO Valley Basin GSP.

2.4.2 Future Water Supply and Demand

As described in earlier sections, DESAL Partners and potential end users have a range of supplies and a variety of vulnerabilities related to each of these supplies. As stated in Section 2.2 (Current and Projected Water Supply Sources and Facilities), for each of the existing sources, there is no expected increase in local surface supplies, imported water supplies are variable due to statewide climate impacts, and recycled water production is expected to increase, although it is limited. Moreover, some of the supplies are expected to reduce due to regulatory requirements under SGMA and environmental flow requirements. The District and individual agencies throughout SLO County are already taking into consideration management of these existing supplies to try to accommodate growth and implement water use efficiency and conservation efforts, and they are also investing in existing infrastructure to ensure that demands are met.

Growth in SLO County is anticipated in the future. The US Census Bureau estimates a total population within SLO County of 281,843 as of July 2024 (US Census Bureau, 2024). The San Luis Obispo County Council of Governments (SLOCOG) regional growth forecasts an increase in population of 8.6 percent, or 24,132 people, between 2025 and 2060 for a total population rise from 279,337 to 303,469. A 14.8 percent increase in housing units by 2060 is anticipated between 2025 and 2060 for a total housing unit rise from 127,921 to 146,866 (SLOCOG, 2025).

Figure 2.18 below shows the estimated projected water supplies and demands to 2045 within the study area. Agencies that serve over 3,000 AF or 3,000 customer connections must complete an Urban Water Management Plan (UWMP) every five years to report on existing water use, supplies, anticipated future supply availability under normal and drought conditions, and expansion of supplies due to population growth, development, or other needs. The information presented in Figure 2.18 comes from available UWMP information, District Master Water Report projections, and information provided by the DESAL Plan partners and potential end users. These values represent supply and demand totals from agencies' UWMPs or from reasonable projections included in the District's MWR, assuming supplies remain available into the future.

Future conditions indicate that some supplies are vulnerable, this is discussed further in Chapter 3 (Opportunities for Desalination). Projections for multi-year drought conditions are accounted for in UWMPs and take into consideration reduction in supplies. Multi-year drought projections typically show that most supplies remain available at a reduced capacity but do not account for severe vulnerabilities, as discussed in Chapter 3. It should be noted that all projected water supply and demand projects are subject to change.

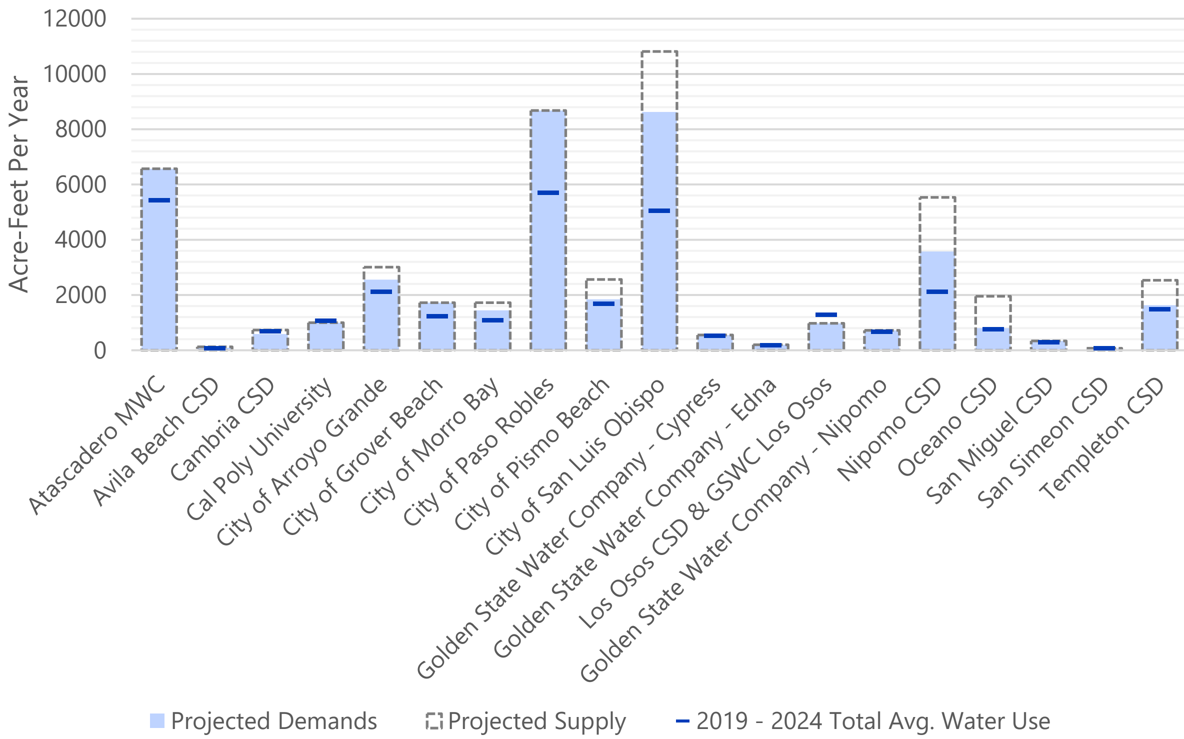


Figure 2.18 Projected Supplies and Demands

2.5 Quality of Water Supplies

The water supplies in the study area have multiple water quality concerns, as discussed in this section.

2.5.1 Groundwater Quality Concerns

Constituents of concern in the groundwater basins of the study area include TDS, chloride, nitrate, iron, manganese, arsenic, and PFAS. Multiple basins in SLO County have elevated levels of nitrate and TDS. Sources of nitrate contamination in groundwater include the use of agricultural fertilizers or other sources such as septic systems. Section 2.1.2 (Impacts from Overused Supplies) discussed seawater intrusion. In summary, coastal groundwater basins, such as those found along much of SLO County's coast, are often shallow and vulnerable to seawater intrusion. Seawater intrusion occurs when saltwater from the ocean enters a coastal aquifer. Coastal aquifers typically have connectivity to the ocean, which creates the potential for seawater to intrude. When there is an imbalance between groundwater recharge and groundwater extractions, a cone of depression can develop that results in seawater intrusion into the aquifer. Certain areas have elevated levels of iron and manganese and perchloroethylene and trichloroethylene are contaminants of concern in the SLO Valley basin. Groundwater quality concerns are treated on a case-by-case basis by the agency having jurisdiction over the supply throughout SLO County.

2.5.2 Surface Water Quality Concerns

Surface water sources can experience a variety of water quality concerns due to operations, physical conditions, and impacts from their surrounding environments. Operations related to the maintenance of the SWP and surface water supplies like NWP or Lopez Water Project can result in temporarily elevated levels of disinfection byproducts (DBPs), a regulated drinking water contaminant. Typically, a free chlorine burn is conducted after an SWP shutdown. The SWP and Lopez Water Project (along with many of the receiving utilities) use chloramines for disinfection during regular operations to avoid formation of DBPs.

Water levels in Lopez Reservoir decline due to seasonal fluctuations in inflows, drought conditions, water use fluctuations, etc. As water levels decline while the level of nutrients remain the same, the concentration of nutrients (phosphorus and nitrate) increases. Shallower water additionally provides higher light availability and allows water to warm more easily. All of these factors create an environment that promotes algal growth, which can lead to taste, odor, and aesthetic issues. Lopez Reservoir frequently has blue and green algae, which produce toxins, though they can typically be removed through treatment.

Similarly, the Salinas Reservoir has also experienced algae growth due to low water levels. The Salinas Reservoir has also experienced contaminant contributions from land use surrounding the reservoir. Agricultural operations may contribute nutrients such as nitrogen and phosphorous from fertilizers, while grazing activities can introduce bacteria and increase sediment loads. Lastly storm events can contribute to runoff thus increasing sediment loads into the reservoir (District, 2025).

Nacimiento Reservoir specifically, is a very popular recreational area within SLO County and its greatest water quality risk is from body contact recreation and watersports, extensive adjacent cattle grazing, and close proximity to small domestic wastewater facilities (District, 2025). Specifically microbial contaminants such as viruses and bacteria can result from exposure to sewage treatment facilities, septic systems and livestock operations.

2.6 Conclusions

The key problems and needs identified in this chapter include:

- **Groundwater overdraft** – Several groundwater basins within the Study Area are overdrafted, critically overdrafted, or subject to groundwater management requirements that will require reductions in groundwater pumping to achieve long-term sustainability.
- **Land subsidence** – Continued groundwater overextraction has resulted in subsidence within portions of the study area and contributes to reduced aquifer storage capacity, infrastructure damage, and reduced reliability of imported water conveyance facilities.
- **Seawater Intrusion** – Coastal groundwater basins remain vulnerable to seawater intrusion, limiting the long-term reliability of groundwater supplies and requiring reduced pumping or costly treatment.
- **Water quality degradation** – Several groundwater basins within the Study Area have water quality concerns, including elevated nitrate, total dissolved solids, chloride, arsenic, iron, manganese, PFAS, and other constituents, which require blending or advanced treatment to meet drinking water standards.
- **Limited expansion potential for recycled water** – Although recycled water projects are expanding throughout the region, future production is constrained by wastewater availability and therefore may not be able to fully meet projected future demands or replace existing potable supplies.

- **Aging and vulnerable water infrastructure** – Much of the regional conveyance infrastructure is several decades old and has limited redundancy, leaving agencies vulnerable to planned or unplanned maintenance outages, equipment failures, natural disasters, and seismic events.
- **Population growth and increasing water demands** – Continued population growth and development are projected to increase potable water demands while existing local surface water, imported State Water Project supplies, and groundwater sources are expected to remain constrained or become less reliable due to drought, regulatory requirements, and climate variability.

Collectively, these identified key problems demonstrate the need for a new, reliable, drought-resilient, and locally controlled water supply to supplement existing water resources. A regional seawater desalination project would diversify the County's water supply portfolio by providing a dependable source of potable water that is independent of precipitation or wastewater flows, reduces reliance on overdrafted groundwater basins to help protect against seawater intrusion and subsidence, improves regional resilience during infrastructure outages and droughts, and provides the additional water supply needed to support future growth while enhancing overall water supply reliability.

CHAPTER 3 OPPORTUNITIES FOR DESALINATION

Chapter 3 describes the opportunities for desalination in the study area, identifying the sources of water that could be desalinated, how those sources would be used (e.g. augmenting supply shortfalls or addressing vulnerabilities), and quantifying the volume of desalinated water that can be provided. This chapter includes the following sections and a crosswalk of relevant sections per United States Bureau of Reclamation (USBR) WTR11-01 as shown in Table 3.1, below:

- **Section 3.1: Uses for Desalinated Water** – This section briefly describes what desalinated water can be used for.
- **Section 3.2: Potential Water Sources to be Desalinated and Source Water Facilities** – This section briefly describes which water sources are being used for desalination.
- **Section 3.3: Current Water and Wastewater Jurisdictional Agencies** – This section describes which water and wastewater agencies are currently involved in desalination efforts within the study area.
- **Section 3.4: Available Water Market in the Study Area** – This section quantifies the volume of desalinated water that could be produced based on identified need within the study area.
- **Section 3.5: Desalinated Water Supply Considerations** – This section describes considerations that would prevent a desalination project from being implemented.
- **Section 3.6: Desalination Technologies Currently in Use** – This section describes the current desalination technology in use within the study area.

Table 3.1 Chapter 3 Crosswalk

WTR 11-01 Section 3 WATER RECLAMATION, RECYCLING OR DESALINATION OPPORTUNITIES			
Reclamation Manual Outline	Abbreviated Directives and Standards Section Title	Corresponding Report Location	Reclamation Manual Guidelines
3a	Uses for desalinated water	Section 3.1	Description of all water uses, or categories of potential water uses, for reclaimed or desalinated water, and any associated water quality and treatment requirements.
3b	Desalinated water market	Section 3.4	Description of available market for a desalinated water supply.
3bi	Potential users, peak use, conversion costs, letters of intent	Section 3.4.1	Identification of existing and potential water users, and their expected use, peak water use, on-site conversion costs, and desire to use desalinated water.
3bii	Consultation with potential desalination water customers	Section 3.4 and 3.5	Description of any consultation with potential desalinated water customers.
3biii	Market assessment procedures	Section 3.4, 3.4.2	Description of the procedures used to assess the desalination water market.

WTR 11-01 Section 3 WATER RECLAMATION, RECYCLING OR DESALINATION OPPORTUNITIES			
Reclamation Manual Outline	Abbreviated Directives and Standards Section Title	Corresponding Report Location	Reclamation Manual Guidelines
3c	Discussion of considerations that would prevent implementation and community incentives	Section 3.5	Discussion of considerations that will prevent the implementation of a desalination project and identification of methods to stimulate desalination water demand and eliminate obstacles that inhibit its use.
3d	Description of water and wastewater agencies with jurisdiction	Section 3.3	Description of all water and wastewater agencies that have jurisdiction in the potential service area or over the sources of desalinated water.
3e	Sources of water to be desalinated	Section 3.2	Description of the potential sources of water to be desalinated.
3f	Description of source water facilities	Section 3.2	Description and location of source water facilities available to meet new desalinated water demands.
3g	Current desalination taking place in study area	Section 3.3	Description of water reclamation, recycling, or desalination currently taking place in the study area.
3h	Current and projected desalination disposal options	Section 3.3	Description of current and projected wastewater and disposal options other than the proposed desalination project, and plans for new wastewater facilities.
3i	Summary of desalination technologies currently used in study area	Section 3.3.3, 3.3.4 and 3.6	Summary of any water reclamation, recycling, and desalination technology currently in use in the study area, and opportunities for development of improved technologies.

3.1 Uses for Desalinated Water

Desalination is the production of fresh water through the process of desalting saline or brackish water (mixture of salt and fresh water) through mechanical or thermal processes. Mechanical processes include membrane filtration, such as reverse osmosis (RO), and thermal processes include distillation or other means. The water produced through desalination can be used for domestic potable use, landscape and agricultural irrigation, industrial and commercial use, and groundwater recharge. Given the high production cost and the high quality of desalinated water, it is typically only used as potable water supply. For this study, it is assumed that the desalinated water sourced from the Pacific Ocean will be used solely as a potable water supply.

Communities along the coast have a unique opportunity to create a new water supply that can offset or supplement existing water supply portfolios, which may include a combination of groundwater, imported water, surface water, and recycled water. Desalinated water offers a drought resilient supply for coastal communities throughout San Luis Obispo County (SLO County) through direct deliveries and can indirectly provide supply for inland users through regional transfers. In addition, desalinated water can be used to benefit over drafted groundwater basins through in-lieu use, where current groundwater users reduce pumping and use desalinated water instead.

3.2 Potential Desalination Water Supply Sources and Facilities

Water sources that have the potential to be desalinated are defined by an elevated level of total dissolved solids (TDS), which are comprised of chloride, calcium, and sodium constituents that have dissolved within the water volume. This study focuses on desalination of saltwater, (i.e. raw water supply with a high TDS). The specific source of the saltwater is the Pacific Ocean. Approximately 97 percent of the Earth's water is found in the ocean and is currently not potable in its raw form. Saltwater from the Pacific Ocean generally has a TDS level of approximately 35,000 milligrams per liter (mg/L), compared to the secondary drinking water maximum contaminant level (MCL) of 500 mg/L.

Because the only source water considered is the Pacific Ocean, the source water facilities would be located along SLO County's coastline. A typical ocean desalination facility includes an ocean intake, desalination treatment facilities to meet potable water criteria, an outfall for brine disposal, and conveyance facilities (pumps and pipelines) to deliver desalinated water to local water utilities and/or retail customers, which in this case would be the Desalination Executable Solution and Logistics Plan (DESAL Plan) partners and/or potential end users. The capacity of the ocean source water has no practical limit, so the locations and sizes of the desalination alternatives were determined based on the local demands anticipated to be served, as discussed in this chapter.

3.3 Current Water and Wastewater Jurisdictional Agencies

Within the study area, there are multiple water and wastewater agencies that serve customers on both a regional and retail level. Regional purveyors include agencies that provide water or wastewater service to smaller cities, communities, or districts (e.g., water wholesale agencies). Retail agencies are individual agencies that only serve an individual customer base, such as a city or water district. Section 2.2 (Current and Projected Water Supply Sources) describes the existing water sources within the study area. Of the agencies in SLO County, no agency has jurisdictional authority over ocean water. The following sections describe the current jurisdictional agencies with respect to the study area's water sources as well as their current and future water and wastewater facilities.

3.3.1 Current Water Source Jurisdictional Agencies

Section 2.2 (Current and Projected Water Supply Sources) describes the existing water sources within the study area as well as the jurisdictional agencies that manage each one. The California Coastal Commission (Coastal Commission) oversees ocean water within the coastal zone. The coastal zone extends three miles off the coast and the inland distance varies depending on location along the SLO County coastline. The Coastal Commission oversees development within the coastal zone, however once water is extracted and treated, the California Department of Drinking Water oversees water quality treatment standards.

3.3.2 Current and Projected Wastewater Disposal Options

Figure 2.12 in Section 2.2.4 (Recycled Water Facilities), shows the wastewater treatment and disposal locations in SLO County. No new wastewater facilities are proposed in SLO County at the time of this study. Facilities with existing ocean outfalls are considered in this study as potential disposal options for brine waste from a desalination facility. Outfall modifications would be required to comply with dilution and other regulatory requirements. These disposal options are discussed in more detail in Chapter 4 (Description of Alternatives).

3.3.3 Current Agencies Performing Water Recycling and Desalination

As described in Section 2.4.1 (Current Water Uses) and listed in Table 2.10 (Current Water Supply and Demand), the current volume of recycled water being used is estimated to be approximately 1,370 acre-feet per year (AFY) and it is typically used for landscape irrigation and groundwater recharge through percolation ponds. Currently, none of this recycled water is currently being used to offset drinking water supplies through indirect or direct potable reuse. Although the City of Morro Bay and Cambria Community Services District (Cambria CSD) both have indirect potable reuse facilities capable of treating wastewater to potable standards, neither facility is online as of June 2026.

The only operating ocean desalination facility in the region is at the Diablo Canyon Power Plant. This ocean desalination facility uses the power plant's cooling water intake and outfall and produces approximately 1.44 million gallons per day (mgd) (1,613 AFY) of water for use at the power plant only. The permits for this facility do not allow desalinated water to be sent to other potential potable water users in the area.

The City of Morro Bay had an ocean desalination facility with a capacity of approximately 0.57 mgd (645 AFY) to be used only for emergency purposes, which supplemented the City's water supply starting in the 1990s. The ocean desalination scheme included five seawater wells that provided source water for the desalination facility. The City originally constructed the facility in response to drought conditions but used it intermittently for domestic water production. Initial coastal development permits were issued on an emergency basis and allowed the City to operate the ocean desalination facility for only 2 years before requiring a new costal development permit to continue operation. In 2010, the desalination facility served as the City's primary source of water during a partial shutdown of the State Water Project (SWP). In 2016, the City requested a coastal development permit to continue intermittent operation of the seawater wells and facility discharge. This permit was granted on the condition that the Regional Water Quality Control Board (RWQCB) approve its discharge during operations using seawater. The total desalination treatment capacity was 400 gallons per minute (gpm), and the permitted annual production capacity was 645 AFY. The City has since decommissioned the desalination facility and removed the treatment equipment.

The City of Morro Bay currently operates a brackish water treatment facility with an instantaneous capacity of 800 gallons per minute (gpm), but is limited by the total annual water rights from the Morro Well Field of 581 AFY. The City of Morro Bay's brackish water treatment facility treats groundwater from the Morro Well Field, which has been impacted by seawater intrusion. Today, the City only uses its Brackish Water Reverse Osmosis (BWRO) facility as a secondary water supply to imported State of California (State) water.

3.3.4 Agencies Proposing to Perform Water Recycling and Desalination

As described in Section 2.2.4 (Recycled Water Facilities), there are five recycled water facilities within the study area. Only two of those facilities (the City of Morro Bay and Cambria CSD) have the ability to augment drinking water supplies with advanced wastewater treatment through indirect potable reuse (IPR), while the other three facilities at the City of San Luis Obispo, City of Paso Robles, and Los Osos CSD produce Title 22 quality water that can only be used for non-potable reuse (NPR). The two advanced treatment facilities are currently not online; however, they are expected to be in the next five years. All other existing recycled water and treatment facilities that produce recycled water use it solely for irrigation purposes or discharge it for environmental benefits to maintain minimum stream flow requirements or to augment existing groundwater sources. The City of Pismo Beach has been working on a potable reuse project, Central Coast Blue, that would treat wastewater for potable use; however, that project has not yet been constructed. There are no proposed ocean desalination facilities within the study area.

3.4 Available Water Market in the Study Area

Table 2.8 in Section 2.4.1 (Current Water Use) lists the total average water use by source from 2019 through 2024 for each agency. Figure 3.1, below, summarizes this information. As shown, the Atascadero MWD and the cities of Paso Robles and San Luis Obispo have the highest total water use ranging from more than 5,000 to over 7,000 AFY to serve both potable and non-potable demands. Moreover, the City of San Luis Obispo is the highest surface water user, while Atascadero Mutual Water Company (Atascadero MWC) and the City of Paso Robles are groundwater users, all exceeding 5,000 AFY. The remaining water utilities in the study area have significantly lower water use, mostly ranging from 500 to 2,000 AFY.

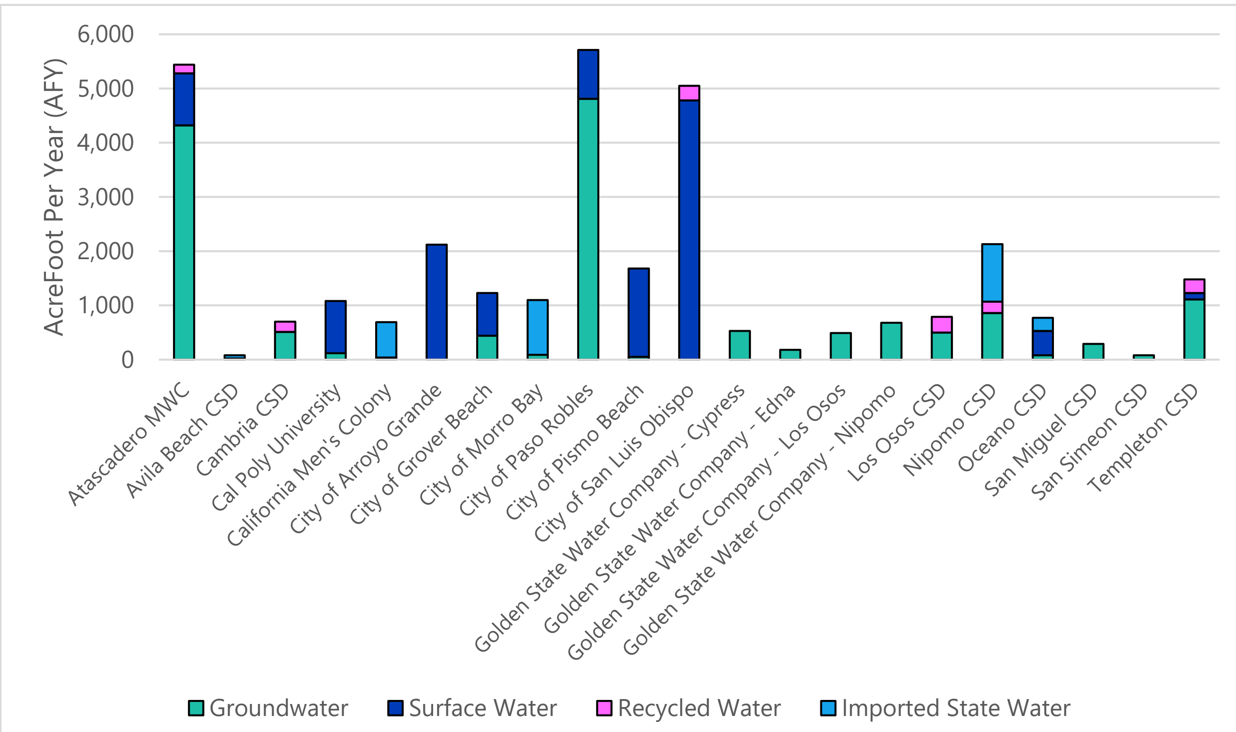


Figure 3.1 Total Average Water Use by Source from 2019 through 2024 for the Respective Agencies

This study assumes that a new desalinated water supply could offset existing supplies and/or create new supplies for water purveyors. Existing water supplies and infrastructure inherently provide the least expensive water available to agencies. Replacing any agency's entire supply is not considered an option, nor is it desired by any of the DESAL Plan partners or potential end users. A desalinated water supply would only be added to existing water supply portfolios to address supply reliability, improve resilience, and/or address additional supply needs for future growth.

Identifying the available water market in the study area requires quantifying the volume of water supply that could be needed above an agency's existing supplies. In addition to identifying local needs based on water supply vulnerabilities, looking ahead is a strategic effort conducted statewide. The State's current Water Supply Strategy developed by the California Natural Resources Agency (CNRA) aims to increase production of desalination water statewide to 28,000 AFY by 2030 and 40,000 AFY by 2040 (CNRA 2022). Given the geographic location of the study area, SLO County can explore developing ocean desalination as a new supply, which aligns with the State's strategy of creating a resilient water supply for future generations.

The following sections describe the water market analysis that was conducted to quantify desalination opportunities within the study area.

3.4.1 Quantifying Desalinated Water Volume

This section quantifies the volume of water that could be used by the DESAL Plan partners and potential end users for existing and future water supplies. This section is organized into three subsections:

- **Section 3.4.1.1:** Identifying a direct need or request for desalinated water.
- **Section 3.4.1.2:** Direct offset of existing water supplies due to climate and physical vulnerabilities.
- **Section 3.4.1.3:** Offset of existing water supplies due to management actions.

3.4.1.1 Stakeholder Direct Requests

To better develop an understanding for each DESAL Plan parter and potential end user, the San Luis Obispo County Flood Control and Water Conservation District (District) sent each agency a fillable data request survey on their water supply with questions directly related to desalination. The water supply data request was used to fill data gaps, verify values that were identified in the California Electronic Annual Report (eARs) database, and document each agency's respective water supply contractual entitlements.

The survey questions were designed to identify whether agencies were experiencing or foreseeing a supply gap and whether agencies were planning future water projects to address those gaps. The survey asked each agency if there was a desalinated water volume that the agency could use to fill supply gaps. If a specific volume was provided, the agency was asked to estimate when that new supply would be needed. These responses were considered a "direct request volume".

A total of 19 surveys were sent to the DESAL Plan partners and potential end users. Sixteen responses were received and a total volume of 5,375 AFY was identified, as shown in Table 3.2 Desalinated Volumes Identified from Data Request Survey, with most results identifying a need for desalinated water supply in the future. Only Avila Beach CSD and Cambria CSD identified an immediate need for a desalinated water source. This volume of "direct request" desalinated water is non-binding but represents the water supply volume estimated to be needed by each agency to supplement their existing water supply portfolio. The water supply volumes for this study are provided on an annual basis. Peak hour, peak day, and maximum month demands were not considered.

Table 3.2 Desalinated Volumes Identified from Data Request Survey

Agency	Desalinated Volume (AFY)	Supply Type
Pismo Beach	100	Annual
Avila Beach CSD	75	Annual
Cambria CSD	250	Annual
Cal Poly University	300	Annual
City of Grover Beach	650	Annual
Los Osos CSD	600	Annual
Nipomo CSD	500	Annual
Templeton CSD	100	Drought Only
City of Arroyo Grande	200	Drought Only
City of San Luis Obispo	2,600	Drought Only
Total Volume (AFY)	5,375	

3.4.1.2 Offset of Existing Supplies Due to Climate and Physical Vulnerabilities

This section describes the justification for offsetting water supplies due to climate and physical vulnerabilities. This section is separated into two subsections: one describing SWP climate vulnerabilities and another describing local reservoir climate vulnerabilities.

Offset of State Water Project due to Climate Vulnerabilities

California has already experienced more frequent and severe weather events, including extreme heat, droughts, wildfires, flooding, and sea level rise. All of these can occur as standalone events or cascading and compounding disasters (CA Climate Adaptation Strategy, 2026). These natural disasters, compounded by the impacts from climate change, are expected to exacerbate water supply shortages throughout California. By 2040, the State is anticipating an overall 10 percent reduction in water supply, which is equivalent to approximately 6 to 9 million acre-feet (MAF). California's statewide water systems were designed for, and historically have been operated for, a winter Sierra snowpack and a spring snowmelt. The snowpack releases runoff slowly throughout the late spring and early summer, contributing to a steady inflow to reservoirs across the State. This extends the water supply throughout the late summer and into the fall. With the increase in temperatures and more precipitation consisting of rain than snow, there is a greater risk of early runoff flooding during the winter season. Reservoirs are used for flood protection in the winter, with less water captured to maintain flood protection, which ultimately reduces long term availability during the summer and fall months. These statewide impacts also affect SWP deliveries to SLO County.

Future climate scenarios have been modeled by the California Department of Water Resources (DWR) to compute a water balance across the State to identify climatic water deficits. Climatic water deficits represent evaporative demand that exceeds available supplies. Simply put, climatic water deficits are areas where more water is being removed from a system than entering (DWR, 2023). Figure 3.2, below, shows regions with the most significant climatic water deficits, according to climate models CNRM-CM5 and HadGEM-ES presented in the California Water Plan. This figure shows that under a dry/hot scenario, SLO County would experience between a 10 percent and 20 percent change in annual water deficits.

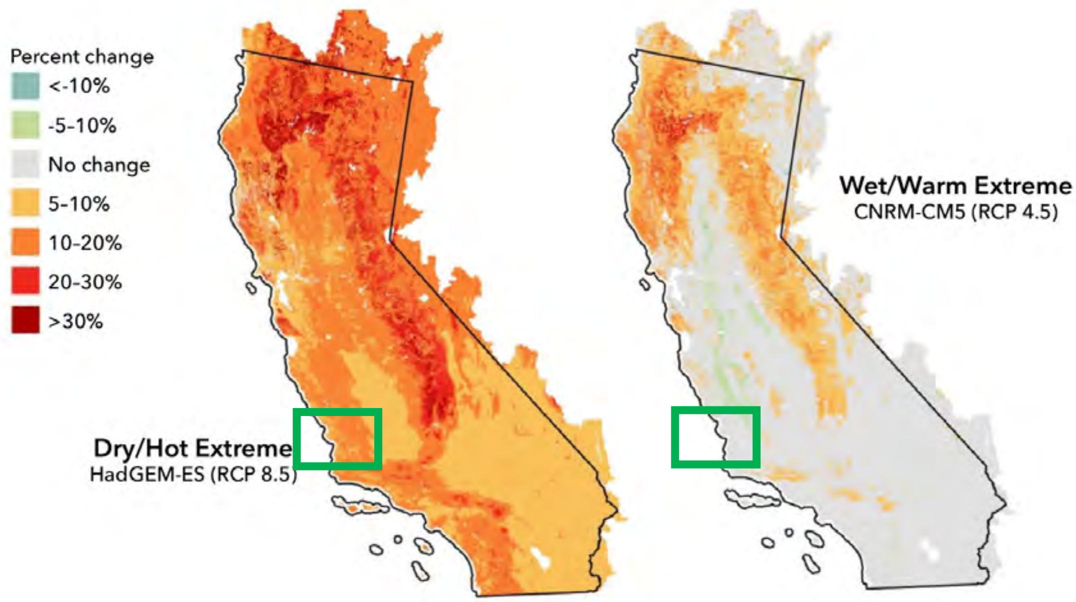


Figure notes: Statewide percent change in average annual climatic water deficit for dry/hot and wet/warm climate scenarios show that much of California is expected to experience climate impacts.

Source: California Water Plan

Figure 3.2 Dry/Hot and Wet/Warm Climatic Deficit Impacts for the State of California

California has experienced an increase in average temperature of 2.5 degrees Fahrenheit (ºF) since late 1895 (Office of Environmental Health Hazard Assessment [OEHHA], 2025). Climate change impacts have drastically altered hydrologic patterns, changing the operational strategies of statewide water supplies and ultimately changing the total volume of water delivered from the SWP.

The DWR SWP Delivery Capability Report (2025 DCR) evaluated projected deliveries of SWP Table A allocation through 2043 under multiple climate scenarios, which are referred to as levels of concern (LOC). The different LOC scenarios represent varying degrees of projected change in temperature, average precipitation, precipitation intensification, and sea level rise.

The 2025 DCR (Table 5-2 in DCR) projects SWP deliveries (in thousand acre-feet per year – [TAFY]) to Table A contractors under different climate LOC scenarios with respect to the estimated long-term average deliveries as well as the estimated 2025 current hydrologic conditions under both wet and dry years. For example, during a 2-year wet period the anticipated Table A deliveries under a 95 percent LOC shows a 88 percent of the total Table A allocations to State Water contractors. Similarly, during a 2-year dry period the anticipated Table A allocations to State Water contractors drops to 9 percent. This demonstrates the expected variability of State Water allocations now and into the future.

Historically, deliveries from SWP during regional (SLO County) drought periods are approximately 25 percent less than the contracted amount. Figure 3.3, below, shows actual Table A allocation deliveries to SWP subcontractors in SLO County with respect to SWP Table A allocation deliveries for SWP Contractors statewide. Because actual deliveries reflect both available imported supplies and local operational decisions, the historical delivery data shown in Figure 3.3 should not be interpreted as representing the total amount of SWP water available to participating subcontractors. Figure 3.3 illustrates that historical imported water deliveries to participating SLO County subcontractors generally followed statewide Table A allocations during wetter periods but diverged during drought periods, reflecting the influence of the District's water management programs and local operational decisions. The District's Drought Buffer Program and other water management tools improve the reliability of imported water deliveries during years with reduced Table A allocations. For example, when DWR's annual Table A allocation was 5 percent in 2014, SLO County subcontractors still received approximately 66 percent of their contracted Water Service Amounts.

Since 2010, the total annual average allocations for all Table A contractors have been approximately 46 percent statewide. During the same period, participating SLO County subcontractors took delivery of an average of approximately 66 percent of their combined contracted Water Service Amounts (4,830 acre-feet [AF]), reflecting both imported water availability and local operational decisions. When only considering drought years since 2010, the total deliveries to SLO County have been approximately 75 percent of their allocated total or, in other words, SWP allocation deliveries show a reduction of approximately 25 percent. The DESAL Plan partners and potential end users agreed on assuming a 25 percent offset of imported State water with a desalinated water supply to be considered as a demand scenario for this study.

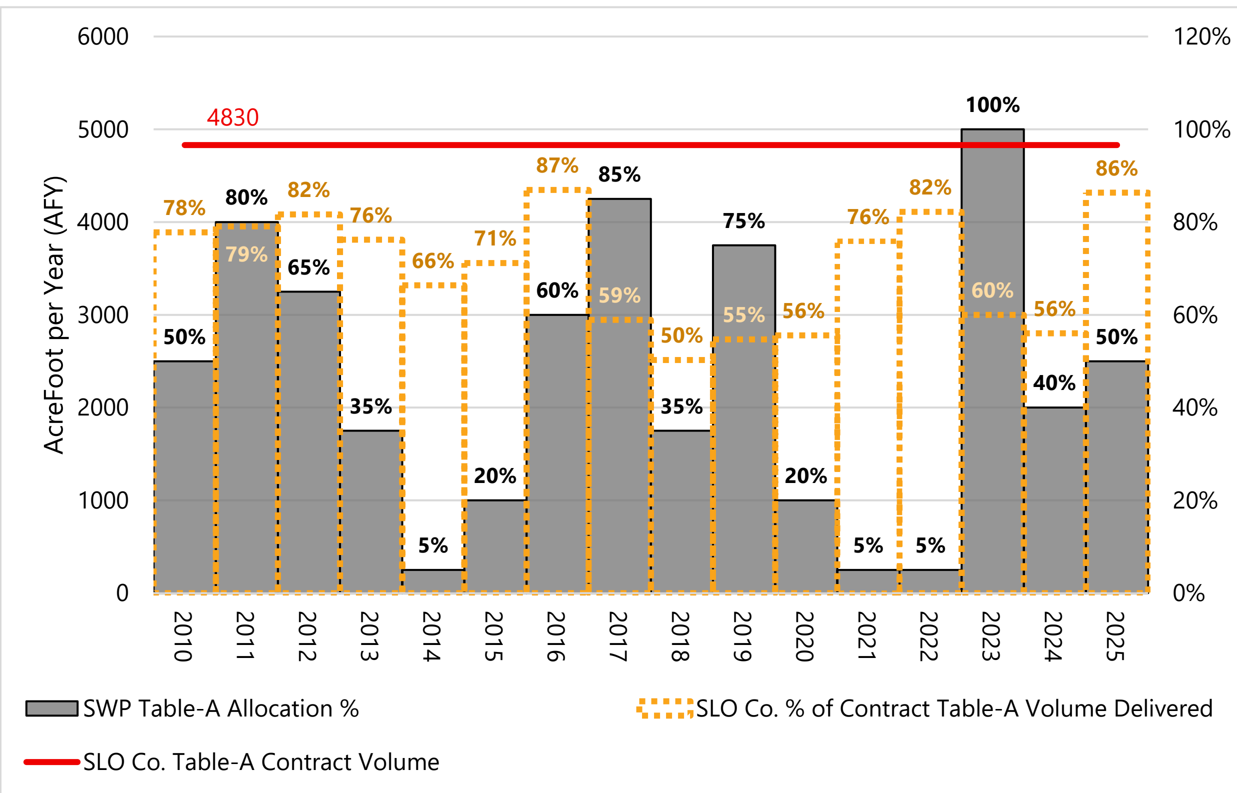


Figure 3.3 SLO County Table A Deliveries with Respect to SWP Table A Allocation

Local Surface Water Supplies Supply Climate Vulnerabilities

This section describes the drought-related vulnerabilities of local reservoirs and how dry periods can reduce their availability and use. For this study, reductions in local surface water supplies are assumed to be partially offset by a desalinated water supply. However, the local reservoirs and associated infrastructure represent significant long-term investments that will continue to play a critical role in meeting the current and future water demands of the DESAL Plan partners and potential end users. As a result, completely replacing these local supplies with desalinated water is neither practical nor desirable. Consistent with the approach used for the SWP, the analysis assumes that desalinated water can offset up to 25 percent of the average water use currently supplied by local reservoirs.

Drought conditions in California have been increasing in intensity and during, punctuated by more intense storms, (CNRA, 2023). Key vulnerabilities that impact local and statewide surface water supplies are these more intense, extended drought periods. Furthermore, the severe wet seasons that have followed recent droughts have indeed resupplied much needed surface reservoirs but have caused extensive infrastructure damage on both a local and statewide level. These extremes are defined as climate whiplash effects and can have a direct impact on available water supplies.

Climate whiplash effects that occur statewide can be represented by varying Table A allocations. For example, Figure 3.3 (on the previous page) shows the SWP allocation values between 2022, 2023, and 2024 were 5 percent, 100 percent, and 40 percent, respectively. Figure 3.4, on the next page, presents historical SLO County reservoir data, showing that the whiplash effects do not appear as severe in the local reservoirs but that a sustained decrease in precipitation from extended drought periods leads to low surface water availability.

Figure 3.4 also shows the relationship between the four surface water elevation of the local reservoirs in SLO County with respect to the average monthly precipitation depth and the actual monthly precipitation depth countywide. It should be noted that the reservoir levels of Lopez, Nacimiento, Salinas, and Whale Rock Reservoirs are not cumulative, but reflect water levels in feet above mean sea level (ft msl). This figure displays the relationship between reservoir storage increases from precipitation inflows which is shown by the increasing surface water elevation and storage decreases over time from releases to meet demands. Above average rainfall results in large increases in reservoir surface water elevation, whereas below average to average precipitation causes a steady decline in surface water elevation, which is expected, but is not sustainable during extended drought periods.

Figure 3.5 (Santa Margarita Reservoir Capacity 2014-2019) shows that the Santa Margarita (Salinas) Reservoir volume was at 10 percent of its total storage in fall 2016, during an exceptional drought period (see Figure 2.1 - US Drought Monitor Western Region Conditions), and 116 percent of its total storage capacity in February 2017, after a heavy month of precipitation. This shows that local reservoirs are very reactive to local precipitation, if capacity allows. The figure also shows that reservoir storage levels following wet years remained relatively stable, with a slight decreasing year-over-year trend, indicating that normal precipitation is generally able to sustain reservoirs to levels that can meet normal water deliveries and releases. However, the wet years help the reservoirs recover from long-term declines in storage and extended periods of drought lead to significant decreases in available reservoir supplies. This is shown in Figure 3.4 by the slowly declining year-over-year surface water elevations during the period between 2017 to 2020, followed by an increase in surface water elevations above the 2017 elevations from a large precipitation event in spring 2023, which increased reservoir levels to near maximum, again.

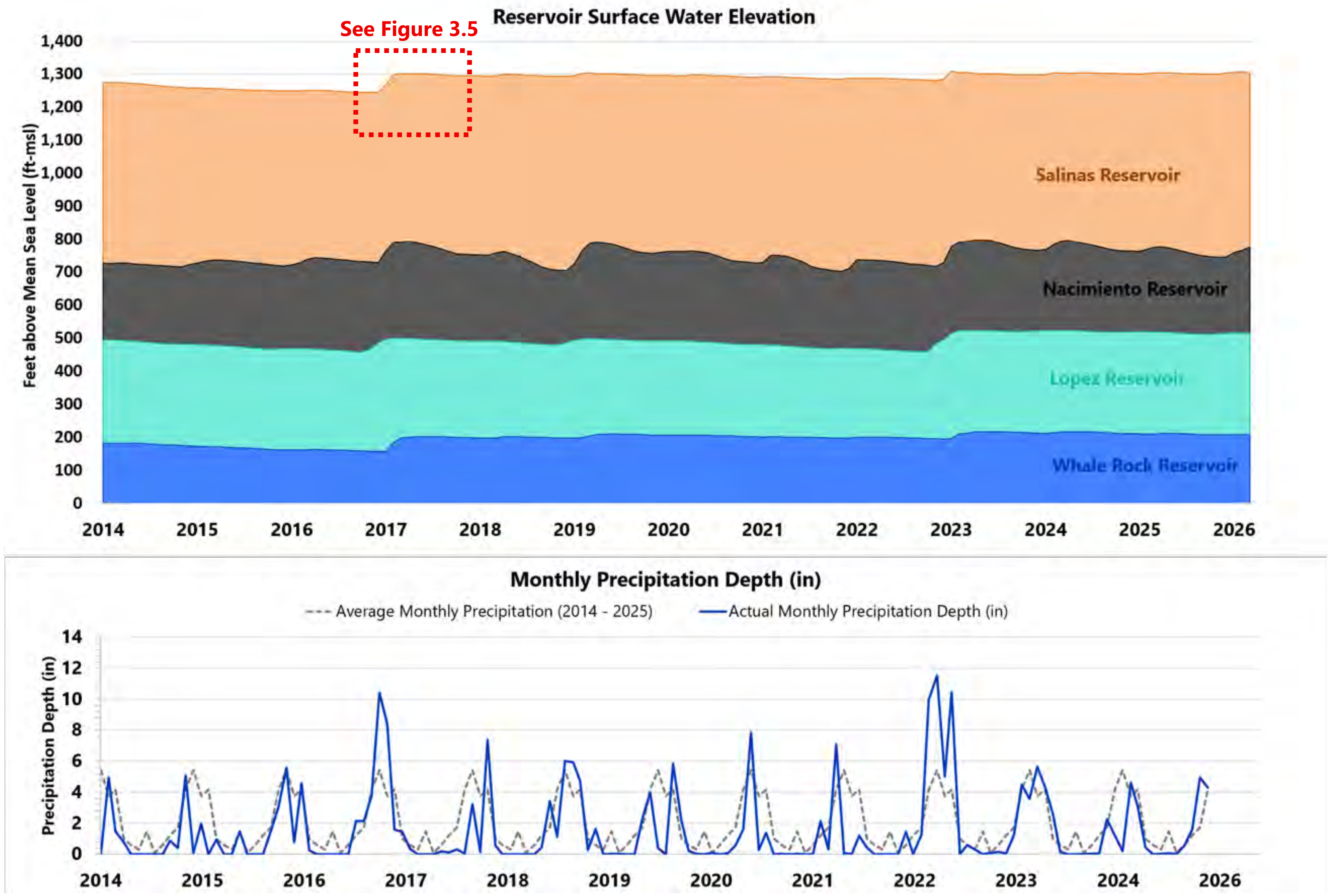


Figure 3.4 SLO County Monthly Reservoir Levels with Respect to Rainfall Depths (2014–2025)

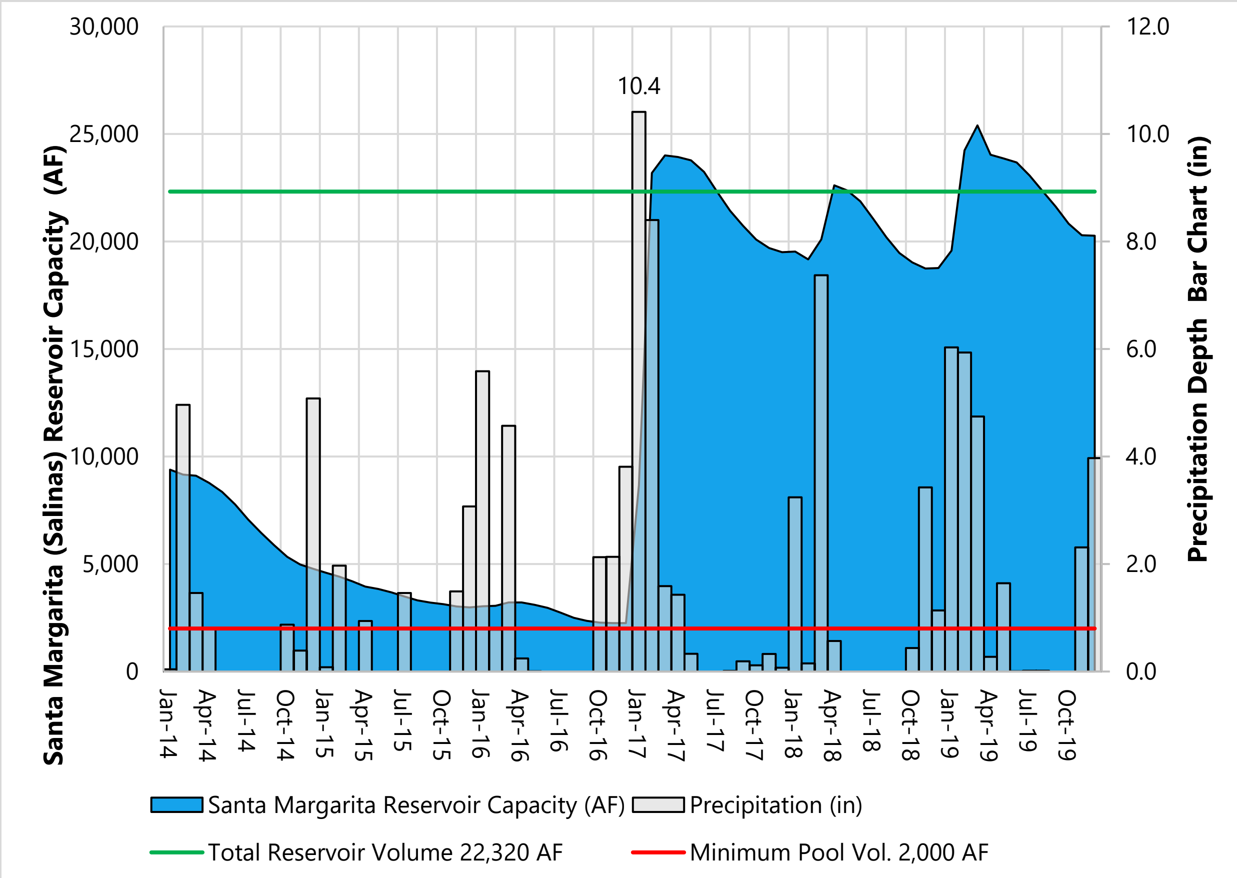


Figure 3.5 Santa Margarita Reservoir Capacity 2014–2019

This analysis of demand data from the local reservoirs found that in drought years, demands from these reservoirs decreased. This decrease in local reservoir supplies is most likely due to conservation efforts implemented in anticipation of prolonged drought periods.

As an example, Figure 3.6, on the next page, shows water demand on local reservoirs for the City of San Luis Obispo was approximately 40 percent less during droughts periods than the 2014–2022 average demand. Similar trends are seen for other users within SLO County. South SLO (S. SLO) County users who receive water from the Lopez Reservoir reduced water use from Lopez by approximately 35 percent during drought periods.

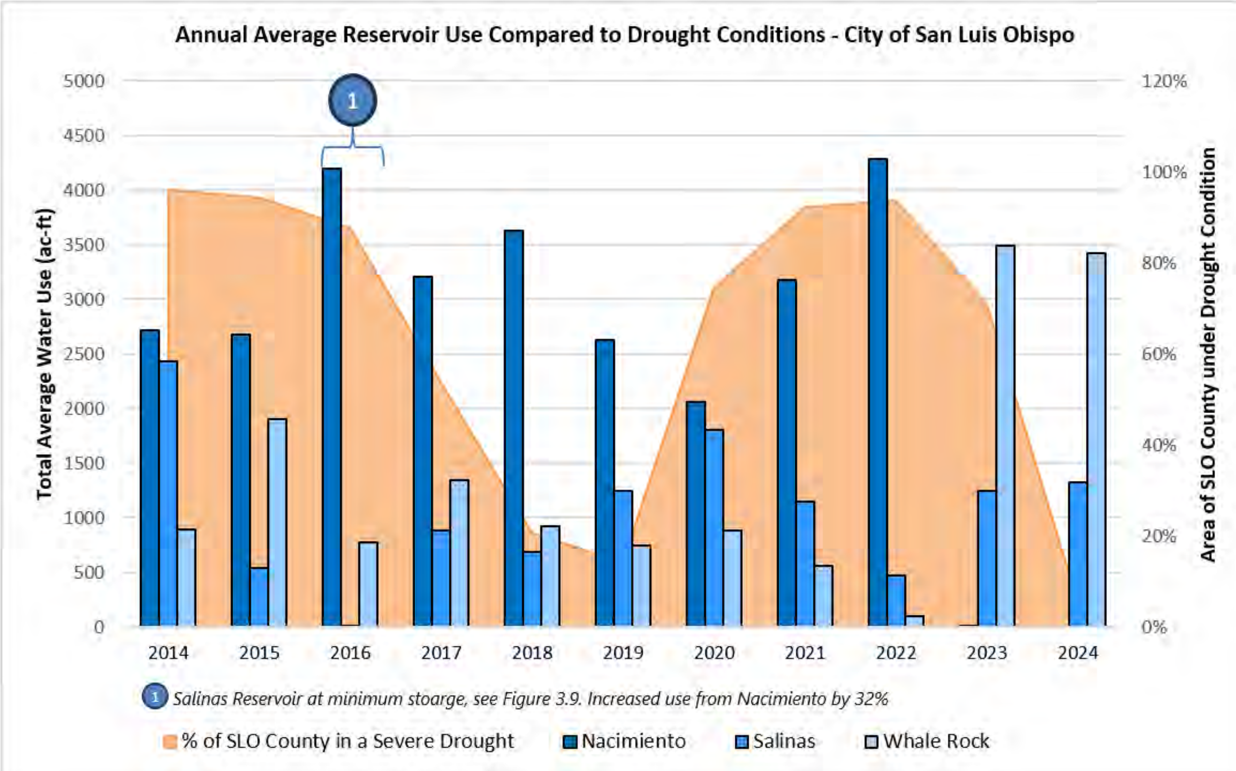


Figure 3.6 City of San Luis Obispo Average Reservoir Use Compared to Drought Conditions Countywide

Infrastructure Vulnerabilities

The regional infrastructure that conveys surface water to different regions within SLO County includes multiple pipelines countywide. Infrastructure vulnerabilities can include, but are not limited to, long stretches of pipes exposed to multiple natural hazards, as well as aging infrastructure failures such as leaks and breaks. The existing regional pipelines show signs of aging and need rehabilitation and replacement to prevent emergency supply shortages from the local reservoirs. Furthermore, these facilities are vulnerable to natural disasters from earthquakes, crossing floodplains, poorly supported structures leading to stress, and/or exposure to the coastal elements, which can lead to corrosion and eventually failure.

As an example, the City of SLO relies heavily on water from Nacimiento Reservoir, which typically offers a robust, dependable yield (San Luis Obispo, 2021). However, in 2023, the Nacimiento pipeline was washed out due to severe flooding and erosion on the Salinas River. Figure 3.7, below, shows an image of the flooding which causes the pipeline to be out of service. This caused a significant increase in use of water from Whale Rock reservoir and near zero use of Nacimiento water in 2023 and 2024.

Figure 3.7 Nacimiento Pipeline Damage from 2023 Salinas River High Flows

Figure 3.8 shows the mapped natural hazards that exist in SLO County with respect to the regional conveyance pipelines. Major infrastructure pipelines intersect active earthquake fault lines, designated flood zones and fall within high-risk fire hazard regions throughout SLO County. Most recently, the Gifford Fire in 2025 burned 166,000 acres in both SLO County and Santa Barbara County and was within 3 miles of the Santa Margarita Reservoir. Fire hazards throughout the State and SLO County pose threats to the SWP and regional conveyance infrastructure, which can ultimately impact water quality and availability to end users.

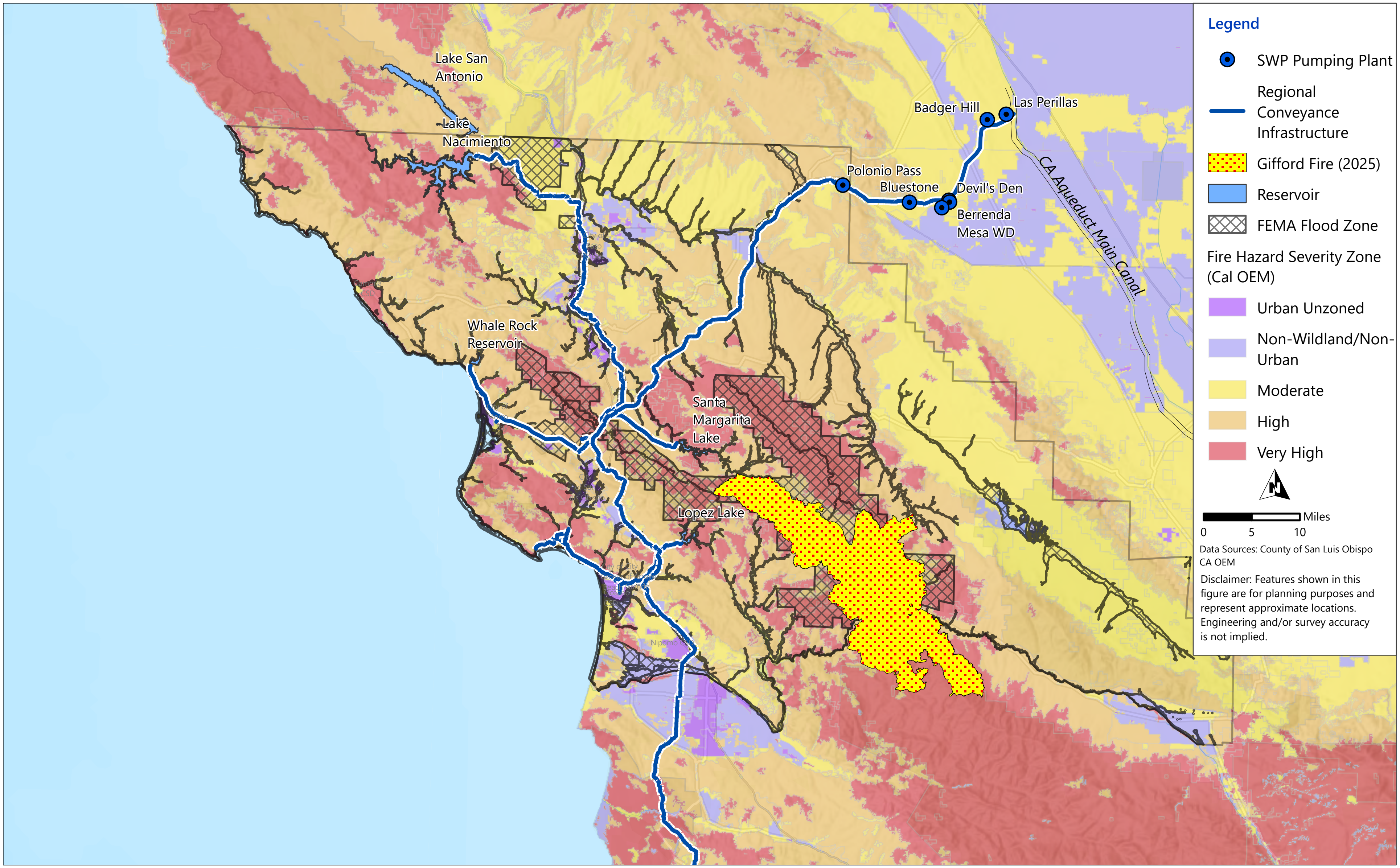


Figure 3.8 Natural Hazards within Study Area and Regional Conveyance Pipelines

DESAL Plan partners (DESAL Partners) and potential end users acknowledge the vulnerabilities of the existing regional conveyance facilities from natural disasters, water quality impacts, and degrading pipe assets. However, for this study, the DESAL Partners decided not to assume a water supply offset for infrastructure reliability concerns. To accommodate potential infrastructure outages, a desalination facility would need to be sized significantly larger to directly offset a complete loss in supply sourced from regional infrastructure. The DESAL Partners did not find this a realistic assumption, and it would be cost-prohibitive to oversize a desalination facility to plan for occasional emergency events. Instead, the DESAL Partners acknowledged that a combination of a new desalination facility sized for 25 percent offset of the current local surface water supply deliveries would be the appropriate sizing criterion. It was concluded that a new desalination plant along with proactive interagency emergency water system connections, diversified local supplies (e.g., recycled water, groundwater, imported water, and other surface water sources), and a well-coordinated emergency communication protocol can successfully accommodate an infrastructure outage until a temporary solution is installed.

3.4.1.3 Offset of Existing Water Supplies due to Management Strategies

This section describes the estimation of existing water supplies within the study area that are currently under management of the Sustainable Groundwater Management Act (SGMA), part of an adjudication, or part of a local jurisdictional authority that could be offset using desalinated water.

SGMA and Adjudicated Basins

Groundwater has traditionally been much less expensive to produce than potable water from ocean desalination. Special cases exist, such as contaminated groundwater requiring treatment; however, in the study area, most groundwater sources are the least expensive water supply.

Groundwater is the primary source of water for both domestic use and agricultural use in SLO County. Section 2.4.1 (Current Water Uses) lists the estimated overdraft of the three groundwater basins included in the study area that are used by DESAL Plan partners and potential end users, namely the Paso Robles Area Basin, San Luis Obispo Valley, and the Santa Maria River Valley. These basins are categorized as either high priority or adjudicated groundwater basins by the State and are considered “managed basins”.

Due to the relatively high cost of desalinated water, it was assumed that desalted water would be used for drinking water. Agricultural irrigation water does not have to meet drinking water standards and desalinated water is very expensive compared to typical agricultural irrigation water. Therefore, it is assumed that there will be no available market for direct supply of desalinated water to agriculture uses. However, desalinated water could play a role in offsetting demands in overdrafted groundwater basins through in-lieu deliveries. Although, desalinated water supply will not completely offset groundwater due to the existing investment and reliance on groundwater in the region, a reduction in groundwater use by potable users could help achieve groundwater sustainability goals.

Together, the groundwater basins discussed above, are estimated to be 15,213 AFY in overdraft, (see Table 2.9 - Overdrafted Groundwater In Study Area). Reducing groundwater use by this volume would help these basins achieve their sustainability goals and ensure long-term availability of groundwater. Achieving sustainability and balancing use in the groundwater basins will require management actions in addition to reducing groundwater pumping. The expectation for this study was to contribute to that reduced groundwater pumping effort by offsetting a portion of the estimated overextracted groundwater use with a desalinated supply. Completely offsetting the total basin overextraction amounts was not considered. Instead, it was determined that a 25 percent offset of the groundwater basin's overextraction volumes (not total extraction volume) would be used to quantify the volume of potential desalination supply.

Environmental Management

The Lopez Water Project and the Lopez Reservoir serves end users in the southern part of SLO County via deliveries through the Lopez Pipeline. A recent court decision requires increased water releases from the Lopez Dam to support steelhead migration in Arroyo Grande Creek. In response, the District has developed the Interim Downstream Release Schedule (IDRS). The IDRS is designed to manage water releases from Lopez Dam to balance municipal, agricultural, and environmental needs, including the protection of endangered species. The District is required to increase releases on a long-term basis to provide sufficient flows for the migration of the federally endangered South-Central California Coast steelhead trout. Increased releases may reduce the water supply available to S. SLO County utilities and increase costs with management and ongoing litigation, which may exacerbate existing vulnerabilities for the utilities that rely on this water supply. To account for this scenario, it was assumed that a 25 percent reduction in Lopez water use could be offset with a desalinated supply.

Future Emergency Supplies

As part of the City of San Luis Obispo's General Plan, the Water and Wastewater Element is a guiding policy document that includes goals, policies, and programs related to water supply, demand, and other emerging issues (San Luis Obispo, 2025). As part of this element, the City identified proposed water supply and demand projections for their primary water supply, a reliability reserve, and a secondary supply that is based on the City's population. Given the City's existing supply sources, they have identified that in 2050, based on an annual population projection increase of 1 percent from the General Plan, the City will not have the desired volume of their secondary water supply available, since their current sources will be allocated for primary uses. Based on the City's Water and Wastewater Element water supply accounting formula, the volume of secondary supply for the City's projected 2050 population is approximately 2,600 AF. The City of San Luis Obispo included their projected secondary water supply volume of 2,600 AF for the year 2050 to be considered as their demand for the project alternatives.

Through discussions with the City of San Luis Obispo, it was determined this volume of secondary supply (2,600 AF) would only be needed in emergency situations such as water supply disruptions and extreme extended drought. Since the City of San Luis Obispo receives water from the Nacimiento Pipeline, demand scenarios considered exchanging this 2,600 AF of Nacimiento water with other users along the Nacimiento Pipeline in exchange for the City receiving a desalinated supply. This would both preserve the secondary supply for the City of San Luis Obispo and provide supply exchange opportunities with North SLO County end users to promote water supply diversification and contribute to groundwater sustainability goals.

3.4.2 Total Demand for New Desalinated Water Supply

Table 3.3, below, summarizes the existing supply offset percentages and direct request volumes discussed in the preceding sections that were used in developing the demand scenarios for this study. Volumes shown in Table 3.3 were determined by applying the offset percentages listed below to the average water use volumes listed in Section 2.2 (Current and Projected Water Supply Sources and Facilities). Actual demand requests would vary, as this is an exercise in assessing how much desalinated water could theoretically be used. As shown in Table 3.3, nearly over 12,000 AFY of demands were identified, although only 5,375 AFY were requested. This amount represents the potential market for desalinated water considered in this feasibility study.

Table 3.3 Total Demands of Desalinated Water Market Identified

Water Supply Source	Offset Factor/Volume
Partner Requested New Desalinated Water Supply(1)	5,375 AFY
Imported State Water	25 percent of 5-year average water use of partners = 595 AFY
Existing Surface Water	25 percent of 5-year average water use of partners = 3,180 AFY
Groundwater Overextraction	25 percent of overextraction volume (Table 2.9)= 3,800 AFY
Total Market for Desalinated Water	12,950 AFY (11.6 mgd)

Notes:
(1) See Section 3.4.1 - Stakeholder Direct Requests.

3.5 Desalinated Water Supply Considerations and Consultations with Potential Customers

The DESAL Partners provided significant input during the market assessment efforts. This project also included several community engagement efforts to inform the public and project stakeholders about what would be considered in a future desalinated water supply project within the study area. Stakeholder engagement efforts included virtual question and answer sessions, quarterly meetings with DESAL Partners and potential end users, in-person community engagement presentations, website updates, and subscribed email updates. These efforts identified what would dissuade the implementation of a desalination facility and what would incentivize stakeholders to implement a project alternative. Furthermore, existing conditions, such as established investments in future water supplies or land preservation, are also considered in the project considerations. The following sections summarize the factors considered with the implementation of a future desalinated water supply.

3.5.1.1 Existing Water Supply Investment

Existing water supplies within the study area are the result of significant past financial investments and represent a large expense to maintain and operate. Eliminating or completely offsetting these water supplies was not considered. In general, agencies want to continue utilization of their local water supplies and to promote water supply diversification region wide. Existing water supplies are currently the least expensive water sources. Furthermore, imported water supplies, though less reliable and resilient, are still anticipated to be less expensive than a desalinated water supply for the foreseeable future.

Communities have made significant investment in advanced recycled water treatment facilities to further diversify their water supply portfolios (e.g., Morro Bay). These recycled water projects create drought resilient supplies, however new large regional recycled water projects are unrealistic given that the largest agencies within SLO County have already established systems such as the City of San Luis Obispo, Morro Bay and Paso Robles.

3.5.1.2 Preservation of Land

The landscape of the California central coast is known to include a variety of protected areas to preserve natural resources from environmental impacts through conservation easements, wildlife preserves, and lands protected for open spaces (e.g. National Forests or State Parks). Land development within SLO County is limited and, where development does occur, community engagement is very focused on transparency, natural resource thoughtfulness, and environmental impacts to surrounding regions. New development of a coastal site for a future desalination facility could disincentivize community support, whereas using existing brownfield sites or co-locating with existing or new wastewater facilities could incentivize support.

3.5.1.3 Incentives for Desalination Project Implementation

There are several incentives to implement a desalination project within SLO County. Finding new water supplies in California is difficult. Being along the coast provides a unique opportunity to create a drought resilient water supply to further diversify local water supply portfolios. Additionally, DESAL Plan partners and potential end users already have a strong history of regional connectivity through large infrastructure projects, such as the Nacimiento Water Project. Increasing the interconnectedness across agencies and broadening the reach of a regional water supply can further support smaller communities who lack diverse water supplies. Lastly, Section 2.1(Summary of Problem and Need) and Section 3.4 (Available Water Market in the Area) describe vulnerabilities of existing water supplies, presenting an incentive to offset a portion of existing supplies to secure a resilient water future within SLO County.

3.6 Desalination Facilities and Technologies Currently in Use

Currently, there are no active public desalination facilities in the study area. As mentioned in Section 3.3.3 (Current Agencies Performing Water Reclamation and Desalination), Diablo Canyon currently has an active desalination facility, but it is not permitted for public distribution, nor does it include conventional subsurface intakes or an ocean outfall with a diffuser section.

CHAPTER 4 DESCRIPTION OF ALTERNATIVES

Chapter 4 presents the development of the desalination project concept alternatives and describes the five alternatives in detail that were determined to be viable for further consideration. This chapter includes the following sections and a crosswalk of relevant sections per United State Bureau of Reclamation (USBR) WTR11-01 and TRMR-128 as shown in Table 4.1 below.

- **Section 4.1: Non-Federal Funding Condition** – This section details the initial funding received from USBR which allowed for the development of project alternatives and identifies the need for additional funding to continue planning to further progress implementing a desalination project in San Luis Obispo County (SLO County)
- **Section 4.2: Development of Alternatives** – This section details the methodology and components used to determine if a project alternative was viable, which include, favorable site location that minimizes negative environmental impacts, ability to reliably meet desired water demand, and the infrastructure and treatment technology needed for water conveyance and producing a resilient desalination water supply.
- **Section 4.3: Alternative Screening Analysis** – This section describes the screening process used to narrow down the alternatives to five concept alternatives to be developed in more detail.
- **Section 4.4: Alternatives Under Consideration** – This section describes the five project concept alternatives and justification for each one's selection for further investigation, as well as, presenting each alternative's location, range of total demand volume, treatment and conveyance infrastructure, an evaluation of its environmental impact, and its estimated costs.
- **Section 4.5: Alternatives Summary and Comparison** – This section summarizes all five alternatives and presents a comparison between them.
- **Section 4.6: Description of Alternatives Technology** – This section identifies non-traditional desalination technologies that are under development and acknowledges pilot studies using alternative desalination technologies currently taking place in California.
- **Section 4.7: Similar Viable Alternatives** – This section describes viable alternatives to a desalination project that would satisfy the same water demand, do not exist within the region or are not feasible.

Table 4.1 Chapter 4 Crosswalk

WTR 11-01 Section 4 and TRMR-128 Section 1 DESCRIPTION OF ALTERNATIVES			
Reclamation Manual Outline	Abbreviated Directives and Standards Section Title	Corresponding Report Location	Reclamation Manual Guidelines
4a	Non-federal funding condition.	Section 4.1	A description of the non-Federal funding condition and actions that the non-Federal project sponsor would take if Federal funding would not be provided for the proposed desalination project.
4b	Objective of alternatives.	Section 4.2	A statement of the specific objectives all alternatives are designed to address.

WTR 11-01 Section 4 and TRMR-128 Section 1 DESCRIPTION OF ALTERNATIVES			
Reclamation Manual Outline	Abbreviated Directives and Standards Section Title	Corresponding Report Location	Reclamation Manual Guidelines
4c	Proposed project: complete description.	Section 4.2, 4.3, 4.4, 4.5	A description of the proposed desalination project including detailed cost estimates for its annual operation, maintenance, and replacement, and life cycle costs.
4d	Estimated cost requirements.	Section 4.4, 4.5	Estimated costs presented in dollars per million gallons (MG) and/or dollars per acre-foot (AF) of capacity and identification of references, design data, and assumptions.
4e	Waste stream discharge.	Section 4.2.2.2, 4.2.4	A description of waste-stream discharge treatment and disposal water quality requirements for the proposed desalination project.
4f	List of alternative measures or technologies.	Section 4.6	A description of one or more alternative technologies that could be used in the proposed desalination project, as well as alternative plans for distribution or implementation.
TRMR 128 1a	Description of similar viable alternatives.	Section 4.7	A description of a reasonable range of viable alternatives that would satisfy the same water demand as the proposed project, including other water supply sources and/or project types that are practicable, feasible, and meet the planning objectives.
TRMR 128 1b	Description of baseline condition without project or alternatives.	Sec 4.1	A description of the baseline condition without the proposed project or any of the alternatives.
TRMR 128 1c	Alternative tradeoffs.	Section 4.5	Alternative plans must clearly identify and evaluate the tradeoffs among stakeholders and resources. The viability of an alternative will be determined through an evaluation of its acceptability, efficiency, effectiveness, and completeness. Alternative plans will be formulated based on most likely future conditions expected with and without implementation of a plan.
TRMR 128 1d	Consideration of climate change in tradeoffs and comparisons.	Section 4.4	Consideration of the impact of climate change in the tradeoff analysis and the comparison of alternatives.

4.1 Non-Federal Funding Condition

The San Luis Obispo County Flood Control and Water Conservation District (District) was awarded a USBR WaterSMART planning grant to help pay for the Desalination Executable Solution and Logistics Plan (DESAL Plan) initial USBR Title XVI Feasibility Study (Study). With this initial investment, USBR has helped the District and the DESAL Plan partners (DESAL Partners) to start identifying viable project alternatives for desalination in the region to help augment and/or offset local water supplies that are vulnerable to drought, susceptible to regulatory reductions and at risk of failures due to age, flood and seismic events. A future investment by USBR to continue identifying preferred projects and start implementing new supply projects would help offset costs to the region and provide support for addressing federal regulatory requirements.

Without federal funding support, the region is less likely to implement a desalination project(s), which is costly but the only viable new water supply that can provide the volume of water needed to address future water supply shortfalls. In absence of a new supply, existing water supplies will continue to be overleveraged leading to undesirable consequences such as continued over pumping of groundwater basins, which can lead to declining water levels and wells going dry, seawater intrusion, land subsidence, etc. During droughts, the most likely outcome of the lack of a new desalination supply is that significant cutbacks would be required. With climate variability predicted to result in more frequent and extended drought periods, the number of years requiring demand reductions from local urban users will increase. Potentially agricultural users would also be required to reduce pumping to address overuse of the groundwater basins, resulting in a reduction of the economic output of the region that produces $1 billion a year in agricultural products.

4.2 Development of Alternatives

The objective of the project concept alternatives developed in this chapter are to provide reliable, drought proof water supplies to meet the needs identified by the DESAL Partners and other end users in the region. Not every alternative provides water to each DESAL Partner and potential end user, as there may be different ways to meet the region's needs through either distributed smaller systems or larger regional systems. The alternatives were designed to consider this range of potential implementation scenarios.

Each project concept alternative includes three different components: 1) an approximate site location; 2) a desalinated water demand scenario; and 3) the infrastructure necessary to desalinate ocean water and convey treated water to end users. The following sections describe the development of each component. An overview of the alternative development process is schematically shown in Figure 4.1 below.

Figure 4.1 Alternatives Development Process

4.2.1 Site Identification

The site screening process included identifying potential areas that could be feasible locations for a desalination project. For this Study, identifying a specific parcel of land for each project alternative was not included in the scope. The intent was to stay at a high-level for this phase of work with specific locations to be evaluated in more detail at a later phase of the DESAL Plan. Hence, for the site screening analysis, the term "site" does not represent a specific lot or parcel for the project, but a small region representing the approximate location of a facility in each alternative.

A 2015 Report prepared for the District recommended six locations out of 12 sites identified (see Appendix A Desalination Opportunities Summary Report - 2015). The recommended sites identified in the 2015 Report are listed, from north to south, below:

- Cambria area.
- Estero Marine Terminal.
- Morro Bay area.
- Diablo Power Plant.
- South SLO (S. SLO) County Wastewater Treatment Plant.
- Nipomo Mesa Refinery (Refinery).

These six sites were included in this study's site screening analysis because they had been previously identified in the 2015 Report as potential locations for further consideration. Since the 2015 Report, these sites have been identified as preferred locations through discussions with the DESAL Partners. For transparency and consistency between the 2015 Report and this Study, the six sites listed above were included to be evaluated with respect to screening criteria as part of this study.

Furthermore, an additional 16 sites were identified based on potentially suitable geologic conditions. A desktop analysis was performed, identifying 16 sites along the coast with preferrable subsurface hydrogeology to accommodate sub-seafloor extraction of seawater (see Appendix B –Geologic Site Screening Evaluation). These potential sites were selected based on publicly available geologic surveys from the United Stated Geological Survey (USGS) and supplemented by aerial photography. The nature, depth, and width of the geologic materials at each site have not been verified with field work and would need to be tested and confirmed along with extensive hydrogeologic investigations should any of the sites be selected for future use. These 16 sites with preferrable geologic conditions were considered for the site screening analysis.

Figure 4.2 on the next page shows all 22 sites that were initially identified, with six (6) being from the District's 2015 Desalination Opportunities Summary Report (2015 Report) and 16 being identified through a desktop geologic evaluation. The potential sites are presented as individual locations but are intended to refer to the general area of each site, which are mostly sandy beaches or confluence locations between the ocean and inland streams/rivers through years of deposited sediments. Riverine sediment deposition often creates favorable hydrogeologic conditions that support high-yield wells which would be required for a subsurface intake.

The following sections describe the site screening process, which used publicly available information to evaluate and score potential sites and identify those carried forward for consideration in the project alternatives.

Figure 4.2 All Sites Included in Site Screening Process

4.2.2 Site Screening Process and Criteria

The site screening analysis for this study included criteria that were used to assign scores to determine which sites would best be suited for the project alternatives. The goal of the evaluation process was to categorize which sites are considered most feasible, which present implementation challenges, and which have fatal flaw(s). The site screening criteria are listed below:

- Preferrable geology for a subsurface ocean intake location.
- Presence/use of existing ocean outfalls or the need for a new outfall.
- Aquatic environmental impacts.
- Land based environmental impacts.

- Vicinity to existing regional water infrastructure (regional connectivity).

The site screening criteria was used to evaluate individual project sites from different perspectives so that each could be ranked with respect to one another. Each site screening criterion has a scoring system from one to five, with one being a low score, three moderate, and five high with respect to the criterion definition. Criteria that included a fatal flaw score are assigned a zero. The evaluation criteria are shown in Table 4.2, below. The following sections describe the details of each criterion.

Table 4.2 Site Screening Evaluation Criteria

Screening Criteria	High Score (5)	Medium Score (3)	Low Score (1)	Fatal Flaw (0)
Intake Location	Existing useable Intake or negligible impacts for a new intake.	Suitable for a new subsurface Intake or minimal intake impacts.	Unlikely suitable for a subsurface intake.	Not suitable geology for permittable intake.
Outfall	Existing outfall present with sufficient capacity and blending water available.	Existing outfall with moderate blending water availability or moderate capacity.	New outfall required due to lack of outfall or existing outfall having very limited blending water availability.	Not Applicable.
Aquatic Environmental Impacts	Minimal Impacts.	Moderate Impacts.	High Impacts.	Not permittable nor mitigatable (multiple significant adverse impacts per CEQA/NEPA)..
Land Impacts (Environmental, Social and Technical)	Minimal Impacts (previously disturbed site, brownfield).	Moderate Impacts (Green or brownfield site, but low impacts to surrounding land).	High Impacts (Greenfield, protected land), known protected species that could be impacted by intake/outfall construction.	Not permittable nor mitigatable (multiple significant adverse impacts per CEQA/NEPA).
Conveyance Infrastructure (total distance of infrastructure)	<5 miles of new infrastructure needed in total.	6 to 12 miles of new infrastructure needed in total.	>12 miles of new infrastructure needed in total.	Not Applicable.

Notes:
CEQA - California Environmental Quality Act; NEPA - National Environmental Policy Act.

The initial 22 sites were consolidated for the evaluation process since sites in close proximity to each other have very similar constraints. As a result of this consolidation, 10 singular sites were selected for the screening analysis to represent the general geographies of regions of SLO County. Three additional site configurations were included that considered construction of new ocean outfalls at the Cambria area, Diablo Canyon, and Avila Beach sites. This resulted in a total of 13 site configurations being evaluated in the site screening analysis. The full analysis of the 13 site configurations considered is presented in detail in Appendix C (Site Screening Evaluation Project Memorandum), and these sites are listed below and spatially shown in Figure 4.3 below:

1. Cambria.
2. Cambria (new outfall).
3. Morro Strand North.
4. Estero Marine Terminal.
5. Morro Bay.
6. Los Osos.
7. Diablo Canyon Power Plant (existing intake and outfall).
8. Diablo Canyon Power Plant (new intake and outfall).
9. Avila Beach (existing outfall).
10. Avila Beach (new outfall).
11. Pismo Beach.
12. S. SLO County WWTP.
13. Nipomo Mesa Refinery (Refinery).

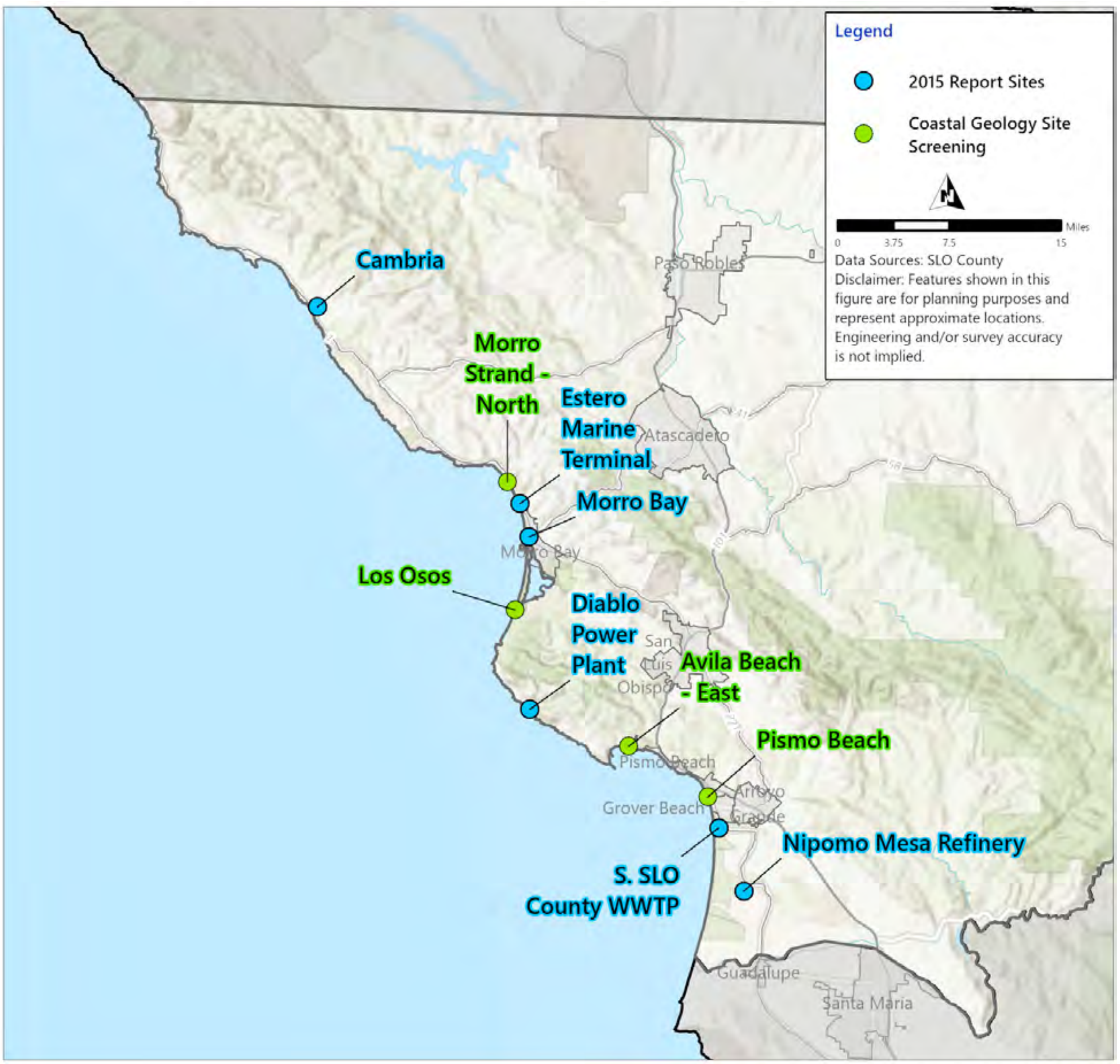


Figure 4.3 Recommended Consolidated Sites Included in the Site Screening Analysis

The following sections describe each of the site screening evaluation criteria.

4.2.2.1 Preferable Subsurface Intake Geology

This site screening criteria considers whether the coastal geology for each site facilitates a subsurface intake. If not, the site was considered not feasible and was not considered for further evaluation. Subsurface intakes are facilities that extract ocean water for desalination using underground intakes, similar to an inland groundwater well. Subsurface intakes limit mortality rates of all forms of marine life. The Water Quality Control Plan for Ocean Waters of California (Ocean Plan) as well as the 2023 California Seawater Desalination Interagency Group (CSDIG) Seawater Desalination Siting and Streamlining Report to Expedite Permitting (Streamlining Report) specify that a desalination site shall support subsurface intakes for ocean desalination treatment facilities as a preferred technology that will result in the most permittable project. As evidenced by the two most recent desalination projects approved in California (Monterey Peninsula Desalination Project and Doheney Ocean Desalination Project) which both used subsurface intakes, use of subsurface intakes increases the ability to receive a permit from the Coastal Commission. Therefore, for this study, subsurface intakes are the only ocean water intake technology being considered. Slant well subsurface intakes were assumed in the project alternative development, however, if a project moves forward additional detailed evaluation of subsurface intakes would need to be conducted. Several examples of an ocean subsurface intake are shown in Figure 4.4 below.

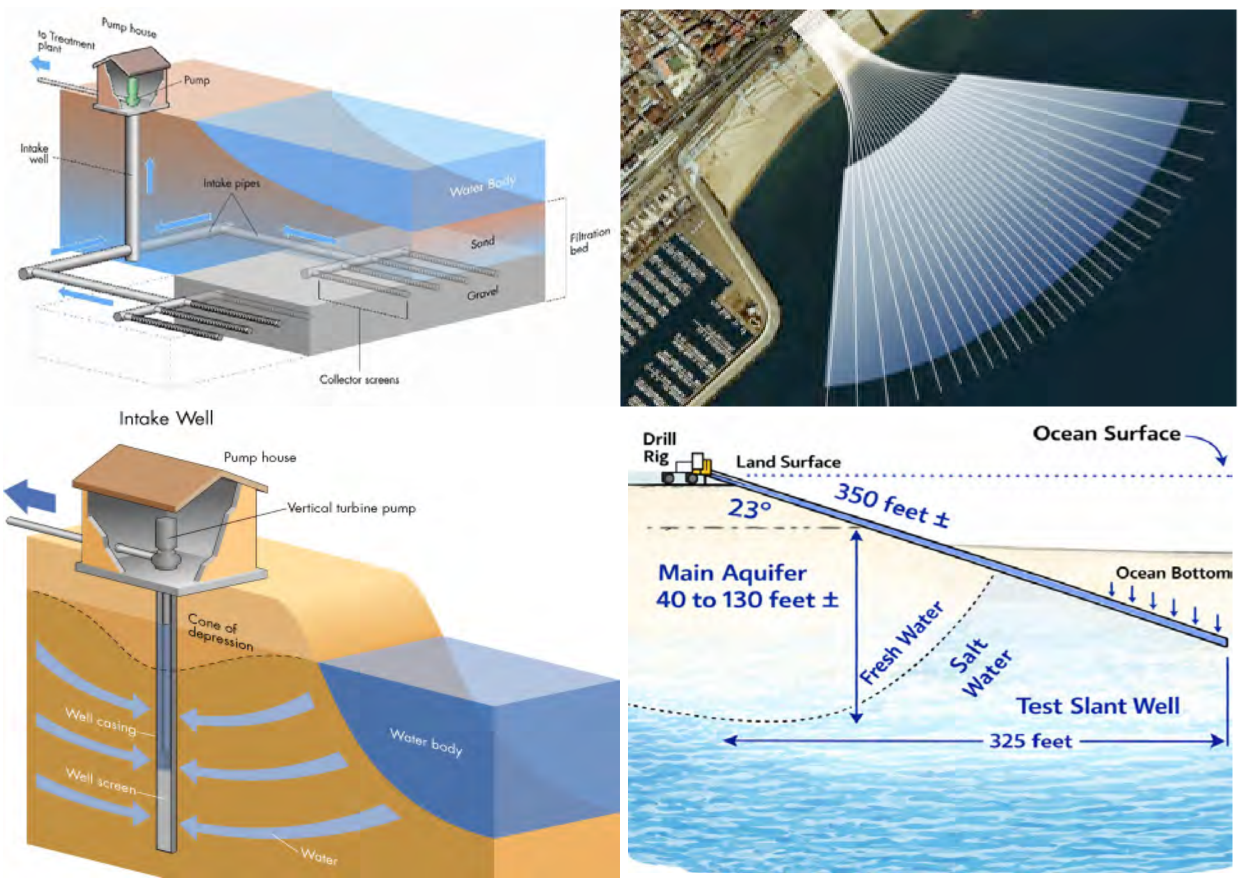


Figure 4.4 Examples of Subsurface Intakes

Sites identified as having preferrable geology have defined and laterally extensive offshore geology that is suspected to extend to significant depths. Preferrable sediments include course to medium-grained nearshore geologic materials. Conversely, sites with unfavorable geology are those with narrow beaches, steep surrounding cliffs, rocky outcrops and/or thin or narrow offshore sediments. Maps with sediment types and description of the geological considerations are included in Appendix B (Geologic Site Screening Evaluation).

4.2.2.2 Existing Outfalls

Given that the construction of a new ocean outfall along the Central Coast involves a complex permit approval process and is very expensive, the Streamlining Report recommends using existing discharge infrastructure that is compliant with current water quality laws and regulations to avoid construction-related mortality to marine life. Simply stated, the use of an existing ocean outfall is the preferred approach when evaluating various potential sites. This both avoids major construction activities that could harm aquatic species and, if the outfall is currently in use, helps improve dilution of brine effluent (the eliminated waste product from a desalination facility). Seven existing outfalls along the SLO County coast have the potential to be used for a desalination project. These are listed below and shown on the next page in Figure 4.5:

- San Simeon Community Services District (CSD).
- Cayucos Estero Marine Terminal.
- City of Morro Bay.
- Diablo Canyon (No Diffuser/Pipe).
- Avila Beach CSD Wastewater Treatment Plant (WWTP).
- S. SLO County WWTP.
- Santa Maria (Nipomo Mesa) Refinery (not in use).

The evaluation criteria include prioritization of existing outfalls that have adequate capacity, are currently in use discharging non-saline effluent to the ocean and are located in areas with suitable intake hydrogeology. On the other hand, having to install new outfalls with no available effluent discharges for dilution or that are further away from feasible intake sites are not preferred.

Figure 4.5 Existing Ocean Outfalls within SLO County

The Streamlining Report states a project should comingle reverse osmosis (RO) brine with treated wastewater effluent if possible to best minimize mortality of marine life resulting from RO brine discharge. The comingling of effluent reduces RO brine concentrations which increases buoyancy and provides better dilution upon discharging to the ocean.

Regardless of the potential for comingling, the addition of RO brine to existing outfalls will most likely require modifications to existing outfall diffusers, located at the end of the outfall pipe, to ensure that the comingled discharge receives adequate dilution to meet salinity limits for receiving waters. Diffuser improvements could include increasing the size of the diffuser or changing the diffuser port diameters and configurations.

With the exception of Diablo Canyon, which is a direct open ocean outfall, all the existing ocean outfalls listed above include pipelines that extend into the ocean and, as such, can be evaluated for their available outfall capacity for the purpose of sizing a future desalination facility. Available outfall capacity for RO brine discharge can be defined as:

$$Available\ Capacity\ =\ Outfall\ Hydraulic\ Capacity\ -\ Average\ Daily\ Discharge\ Flow$$

Average daily discharge flow is used to calculate available capacity, since during peak wet weather events when outfall discharge flows increase, the RO brine discharges from desalination facilities can be shutdown or temporarily stored. This operational strategy allows outfall hydraulic capacity to be available for wet weather wastewater effluent flows. Figure 4.6 below graphically shows the available capacity for the existing six outfalls. Available capacity is represented as the difference between the outfall hydraulic capacity (dashed line) and the 2024 average daily discharge flow (dark blue).

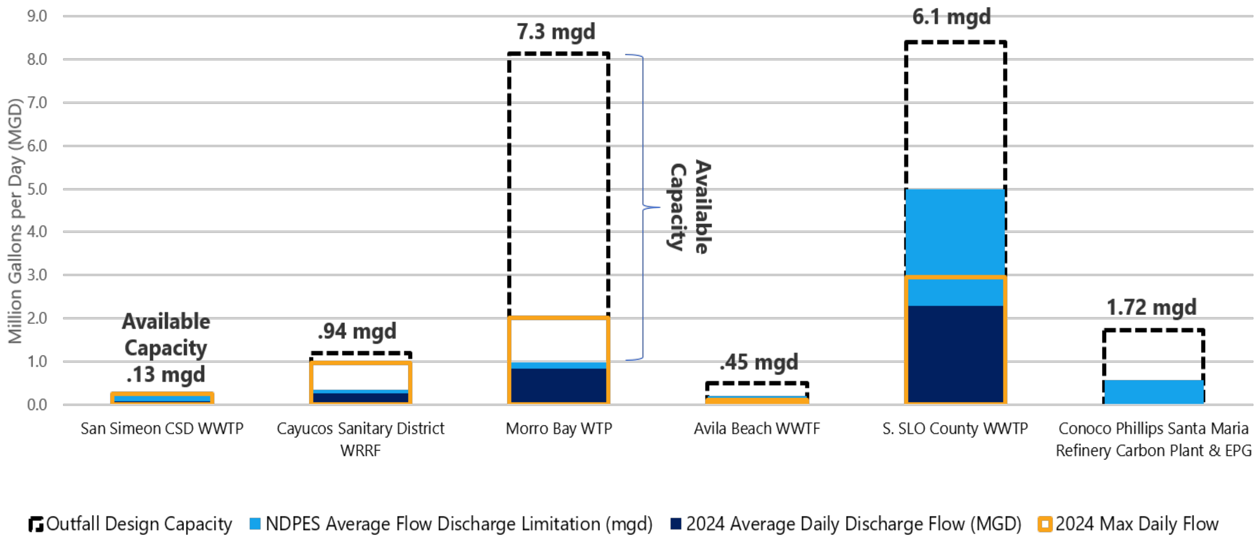


Figure 4.6 Ocean Outfall Capacity Evaluation

Table 4.3 below presents the available discharge capacity for the six existing outfalls. As shown, the available outfall capacity for Diablo Canyon is not calculated due to it being an open ocean outfall that would not be permittable for a new desalination facility. Table 4.3 also presents the resulting ocean intake capacity based on the outfall capacity limitations and a 50 percent recovery from the RO treatment.

Table 4.3 Capacities of Available Ocean Outfalls and Future Desalination Facilities

Wastewater Facility	Outfall Design Capacity (mgd)	NPDES Average Discharge Limitation (mgd)	2024 Average Daily Discharge Flow (mgd)	Available Discharge Capacity (mgd)	Ocean Water Intake Capacity (mgd)(1)
San Simeon CSD WWTP.	0.2	0.2	0.07	0.13	0.26
Cayucos Sanitary District WRRF.	1.2	0.34	0.26	0.94	1.88
Morro Bay WTP.	8.1	0.97	0.84	7.3	14.6
Avila Beach WWTF.	0.5	0.2	0.06	0.45	0.89
S. SLO County WWTP.	8.4	5	2.3	6.1	12.2
Conoco Phillips/Nipomo Mesa.	1.7	0.6	0	1.7	3.4

Notes:
mgd – million gallons per day; NPDES - National Pollutant Discharge Elimination System; WTP - water treatment plant; WRRF - water resource recovery facility.
(1) Assumed that approximately (approx.) 50 percent of intake water would be discharged as RO brine, therefore RO brine discharge capacity allows for two times that amount to be treated, but only the same amount produced as potable water.

4.2.2.3 Aquatic Environmental Constraints

Several marine-based environmental constraints were considered when evaluating potential sites. Within the study area, there are a number of regulated, protected, and aquatic habitat areas along the coast that could impede the development of a project alternative's ocean-based infrastructure. These constraints pose both permitting and construction challenges depending on the type of regulated area or habitat. The evaluation of the aquatic-based environmental constraints was strictly a desktop analysis and was spatial with respect to the 22 originally identified sites. The aquatic-based environmental constraints considered in the site screening analysis are described below and shown on the next page in Figure 4.7 (Aquatic Based Environmental Constraints Mapped).

Marine Protected Areas

Marine Protected Areas (MPAs) are discrete geographic marine or estuarine areas designed to protect or conserve marine life and habitat. No new development is allowed is within an MPA. Maintenance and operation of grandfathered infrastructure (e.g., infrastructure that existed prior to the formation of the MPA) is also strictly regulated. Under California's MPA Network (California State MPA, 2026), other types of MPAs along the Central Coast include:

- **State Marine Conservation Areas (SMCA)** are MPAs where some recreational and/or commercial activities are allowed but severely restricted.
- **State Marine Recreational Management Areas (SMRMA)** are marine managed areas where some take of marine resources may be allowed and legal waterfowl hunting is allowed (restrictions vary).
- **National Marine Sanctuaries (NMS)** are federally designated areas within U.S. waters that maintain natural biological communities, protect and restore habitats, protect cultural and historical resources, and enhance ecological processes while allowing for multiple uses such as recreation, tourism, education and commerce (Chumash Heritage National Marine Sanctuary, 2026).
- **State refuges** are protected areas in the ocean where marine species and their habitats are safeguarded from human activities that harm them (e.g., California Sea Otter Game Refuge).

Additional critical habitats, or specific areas that contain the physical or biological features essential to the conservation of endangered and threatened species, should also be avoided. These high value ocean habitats along the coast include:

- **Rocky reef habitats (benthic)**, or submerged rock outcrops with varying relief, creating refuges from predators in addition to surface area for colonization of algae and invertebrates. Additionally, these habitats are vulnerable to ocean infrastructure construction and do not support sea moored linear infrastructure due to its rough terrain.
- **Kelp canopies**, or dense, floating layers of canopy-forming kelp that support and protect aquatic life off the coast. Kelp canopies serve as prime habitats for various marine species, specifically the California Sea Otter which is a protected species in SLO County. Kelp canopies also inhibit ocean-based infrastructure operations due to potential entanglement during any maintenance activities.
- **Estuarine habitats**, or habitats in partially enclosed coastal waters where freshwater from rivers mixes with saltwater from the ocean. Estuarine areas provide a diverse habitat for a variety of species and protect coastal areas from erosion and flooding.

Figure 4.7 Aquatic Based Environmental Constraints Mapped

Land-Based Environmental Constraints

Land-based environmental constraints are also considered in the site screening analysis. These constraints are not all environmentally sensitive areas, but are areas that could pose a risk to a project alternative (e.g. flood zones, sea level rise, or tsunami inundation zones). Within the study area, there are several regulated and protected areas, protected habitats, and areas that are recommended to be avoided due to permitting challenges, hazards, and physical restrictions. Similar to the aquatic based environmental constraints, the land-based constraints were identified through a desktop spatial data gathering effort and subject matter expert delineation. Constraints considered include:

- **Protected Lands** are areas that are under strict oversight and regulation by a governing agency. Protected lands typically have established development restrictions or conservation goals such as protecting wild and scenic areas and preserving habitats. Protected lands constraints are shown in Figure 4.8 (Land Based Protected Areas) and detailed below:
  - » **State Parks** are public areas that are protected by the State of California Department of Parks and Recreation to preserve outstanding examples of natural, scenic, cultural values, indigenous aquatic and terrestrial fauna and flora. State parks have very strict use guidelines and typically prohibit any type of development unless it is specifically for beneficial use of the Park itself (CA Public Resource Code, 2026).
  - » **Conservation Easements** is a portion of a property that is created and is the form of a deed, conversant, restriction, easement or condition that has been executed on behalf of the owner of the land to retain land for its conservation value preserving its natural, scenic, historical, agricultural, forested, and open-space condition. Conservation easements are unique in that they are each different depending on the specific restrictions or conservations goals executed by the landowner, while having a similar goals to conserve existing land in perpetuity (CA Dept. of Conservation, 2026).
- **Hazardous Areas** are considered in this study as coastal hazards that can pose a potential threat to a population, structure, or man-made environment by a natural disaster. Coastal hazards can be categorized as erosion, storm surges, flooding, tsunamis, and sea-level rise (SLR). Land-based hazardous areas are shown in Figure 4.9 (Land Based Hazards).
- **Habitats** are generally identified as individual ecosystems that support biodiverse species. Some species in the State of California are categorized as either endangered or protected, therefore their habitats are also categorized as protected or special status and could pose permitting challenges or restrictions. Land-based special habitats are shown in Figure 4.10 (Land Based Special Habitats):
  - » **Riparian Habitats** are vital ecosystems occurring along rivers, streams, and other flowing waterways, providing critical habitat, water quality benefits, and flood control. Riparian habitats are typically protected areas and present permitting challenges along the central coast.
  - » **Vegetation Habitats** are critical for native plants, wildlife, and ecosystem health (e.g., Riparian Vegetation). There are several protected plant species within SLO County, which could pose permitting challenges, restrictions or siting fatal flaws.

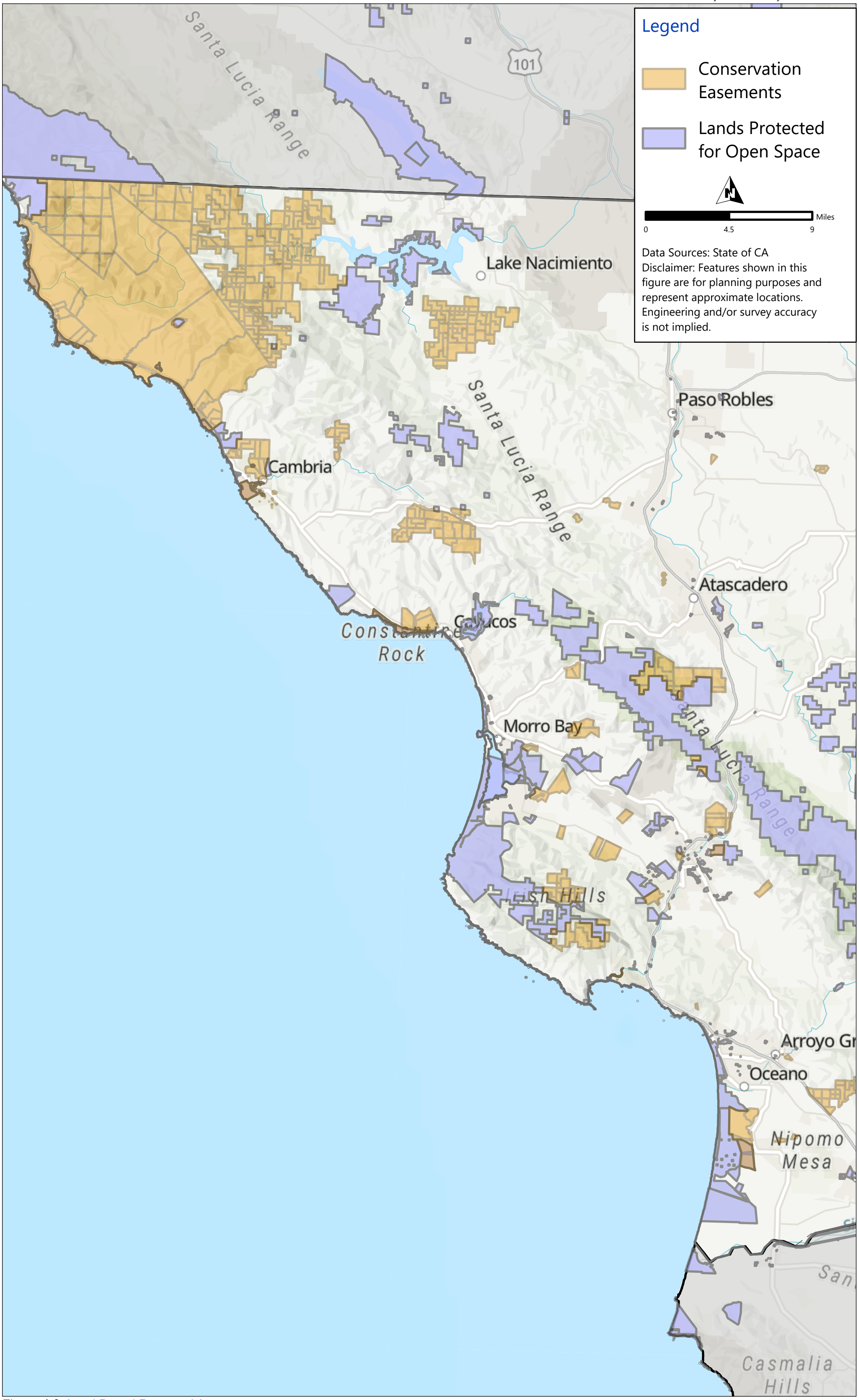


Figure 4.8 Land Based Protected Areas

Figure 4.9 Land Based Hazards

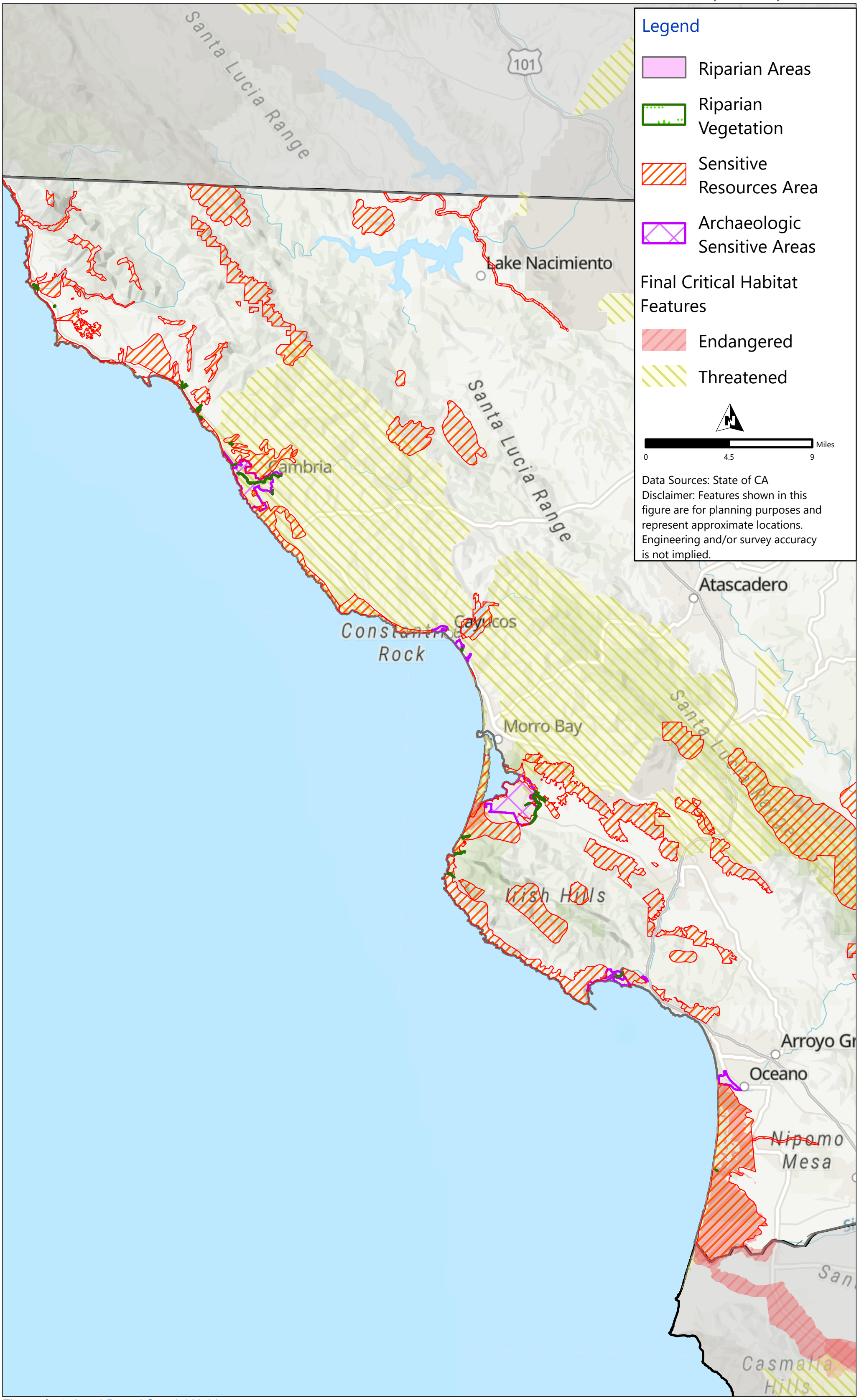


Figure 4.10 Land Based Special Habitats

- **Cultural Resources** include historic, archaeological, and cultural sites of significance that provide information or create public interest of a historic culture or way of life. Per CEQA, cultural resources are defined as buildings, sites, structures, or objects, each of which may have historic, architectural, archaeological, cultural, or scientific importance. Furthermore, local Native American Tribes within the region play a significant role in the history of the California Central Coast; therefore, many sites in the region are found to be culturally sensitive. This means that if sites are selected near sensitive cultural resources, project specific details will either need to be developed to avoid them or, if not possible, require extensive permitting efforts to mitigate any significant impacts. Known sensitive cultural resource areas are not considered public information so this information cannot be shared in a figure (CA, 2020).

4.2.2.4 Vicinity to Existing Conveyance Infrastructure

SLO County and the local utilities have made past investments in an extensive regional system that conveys treated or untreated water to end users within the County. Some of these systems are connected (e.g., Lopez – State Water Project (SWP)) and some are standalone systems for individual cities (e.g., Salinas pipeline). Using existing conveyance infrastructure in the region presents the opportunity to identify sites that could connect project end users to each other through the existing regional transmission mains via interties. This adds the ability to serve more users with less impact. By using existing pipes, the project alternatives would minimize the amount of new infrastructure required. Table 4.4 below lists the existing regional conveyance infrastructure and which DESAL Partners and potential end users they currently serve. Figure 4.11, on the following page, shows the existing regional conveyance infrastructure.

Table 4.4 Regional Infrastructure Connections with End Users/DESAL Plan Partners

Regional Infrastructure	DESAL Plan Partner or Potential End User
SWP – Coastal Branch Pipeline.	▪ Avila Beach CSD. ▪ Morro Bay area. ▪ Oceano CSD. ▪ Nipomo CSD. ▪ Pismo Beach. ▪ Santa Barbara County.
Nacimiento Pipeline.	▪ Paso Robles. ▪ Templeton CSD. ▪ Atascadero MWD. ▪ City of San Luis Obispo.
Salinas Pipeline.	▪ City of San Luis Obispo.
Lopez Pipeline.	▪ Arroyo Grande. ▪ Grover Beach. ▪ Avila Beach CSD. ▪ Oceano CSD. ▪ Pismo Beach.
Whale Rock Pipeline.	▪ City of San Luis Obispo. ▪ California Men's Colony. ▪ Cal Poly University.

Figure 4.11 Existing Regional Infrastructure

4.2.2.5 Results of Site Screening

Table 4.13 below shows the resulting scores of the site screening evaluation for the 13 sites.

Table 4.5 Regional Infrastructure Connections with End Users/DESAL Plan Partners

Site No.	Site Title	Intake Location	Outfall Location	Aquatic Impacts	Land Impacts	Conveyance Distance	Total Score
1A	Cambria (existing outfall).	5	1	1	3	1	11
1B	Cambria (new outfall).	5	1	1	3	1	11
2	Morro Strand North/Estero Outfall.	5	3	5	1	3	17
3	Estero Marine Terminal.	1	3	5	3	5	17
4	Morro Bay.	5	5	5	3	5	23
5	Los Osos.	5	3	5	1	1	15
6A	Diablo Canyon (existing intake & outfall).	5	5	0	3	1	14
6B	Diablo Canyon (new intake and new outfall).	0	1	3	3	1	8
7	Avila (existing outfall).	4	1	5	3	3	16
8	Avila (new outfall).	4	1	3	3	3	14
9	Pismo Beach.	5	5	4	1	3	18
10	S. SLO County WWTP.	5	5	4	1	5	20
11	Nipomo Mesa Refinery.	5	3	4	1	3	16

The results of the site screening evaluation were presented to the Countywide Water Action Team (CWAT) on August 19, 2025, with following key findings from the site screening evaluation:

- Sites that have suitable offshore geology for a subsurface intake are preferred and have higher scores.
- Nearby existing outfall with moderate capacity are preferred over sites that require new outfalls.
- Minimal distance to connect to regional infrastructure scored the highest.
- Aquatic impacts and land impacts were generally consistent scores through all sites with the exception of those sites within the vicinity of known marine habitats or nearby/within protected lands.
- The Diablo Canyon Power Plant site location was fatally flawed due to the offshore subsurface geology not being conducive to support a subsurface ocean intake, as would be required for a new/expanded desalination project at the site.
- Although Cambria scored low, having an immediate need for an alternative water supply, site 1B was selected to be carried forwarded regardless of having a low score.

The screening analysis resulted in six sites to be considered for developing into alternatives.

1. 1B – Cambria Area – New Outfall or alternative technology considered.
2. 2 – Morro Strand North Area (Cayucos)/Estero Marine Terminal Outfall Area.
3. 4 – Morro Bay Area.
4. 8 – Avila Beach Area - New Outfall.
5. 10 – S. SLO County WWTP Area.
6. 11 – Nipomo Mesa Refinery Area.

As mentioned in Section 4.2 (Development of Alternatives), an alternative includes an approximate site location, a desalinated water demand scenario, and infrastructure. The following sections describe the demand scenarios and the typical infrastructure that is included in the project alternatives.

4.2.3 Demand Scenarios

Desalination facilities have a recovery percentage which represents how much treated water can be produced from a volume of salt water. For example, an assumed 50 percent RO system recovery requires the ocean water intake volume to be twice as much as the produced volume. Saltwater desalination facilities typically dispose of brine produced from the RO process through an ocean outfall; therefore the maximum volume of desalinated water that can be produced is dependent on the amount of brine that can be discharged through a treatment facility's ocean outfall. Taking the information listed in Table 4.3 (Capacities of Available Ocean Outfalls and Future Desalination Facilities) and assuming a 50 percent recovery for the RO treatment facility, the maximum volume of desalinated water that can be produced is equivalent to the volume of the existing ocean outfall that is being considered.

For example, if the Morro Bay outfall has 7.3 mgd of discharge capacity available, the maximum volume of water that can be produced to meet demands is 7.3 mgd (≈8,177 acre-feet per year [AFY]). A total of 14.6 mgd of ocean water must be extracted from the ocean to produce 7.3 mgd of treated water.

Considering the existing hydraulic constraints of the existing ocean outfalls and the total desalinated water supply potential quantified in Chapter 3 (Opportunities for Desalination), demand scenarios were developed to reflect realistic conditions consistent with the offset assumptions described in Section 3.4 (Available Water Market in the Study Area). These demand scenarios were developed in coordination with the DESAL Partners and potential end users. The demand scenarios are summarized below:

- Cutback of groundwater use for management areas and Ground Sustainability Agency's (GSAs) (offset of over-extraction).
- Offset of existing surface supplies - representing a local drought.
- Offset of existing surface supplies and imported supplies - representing a regional drought.
- All DESAL Partner direct requests.
- Existing water supply infrastructure failure offset.

The different scenarios were then applied spatially to the DESAL Partners and sites to identify if the total water demands were within the hydraulic constraints of existing ocean outfalls. If available capacity existed, then another demand scenario was included. This process of developing alternatives using demand scenarios is graphically shown on the next page in Figure 4.12. Meeting the demand scenarios dictated what infrastructure, exchange or water wheeling transfers would be necessary to deliver water to end users across the study area. For example, the demand scenario shown on the left of Figure 4.12 shows that more end users could be added beyond local direct requests since there is still ocean outfall capacity available. This available capacity could accommodate including another demand scenario, such as offsetting vulnerable surface water supplies, which would likely require additional infrastructure to deliver the added demands.

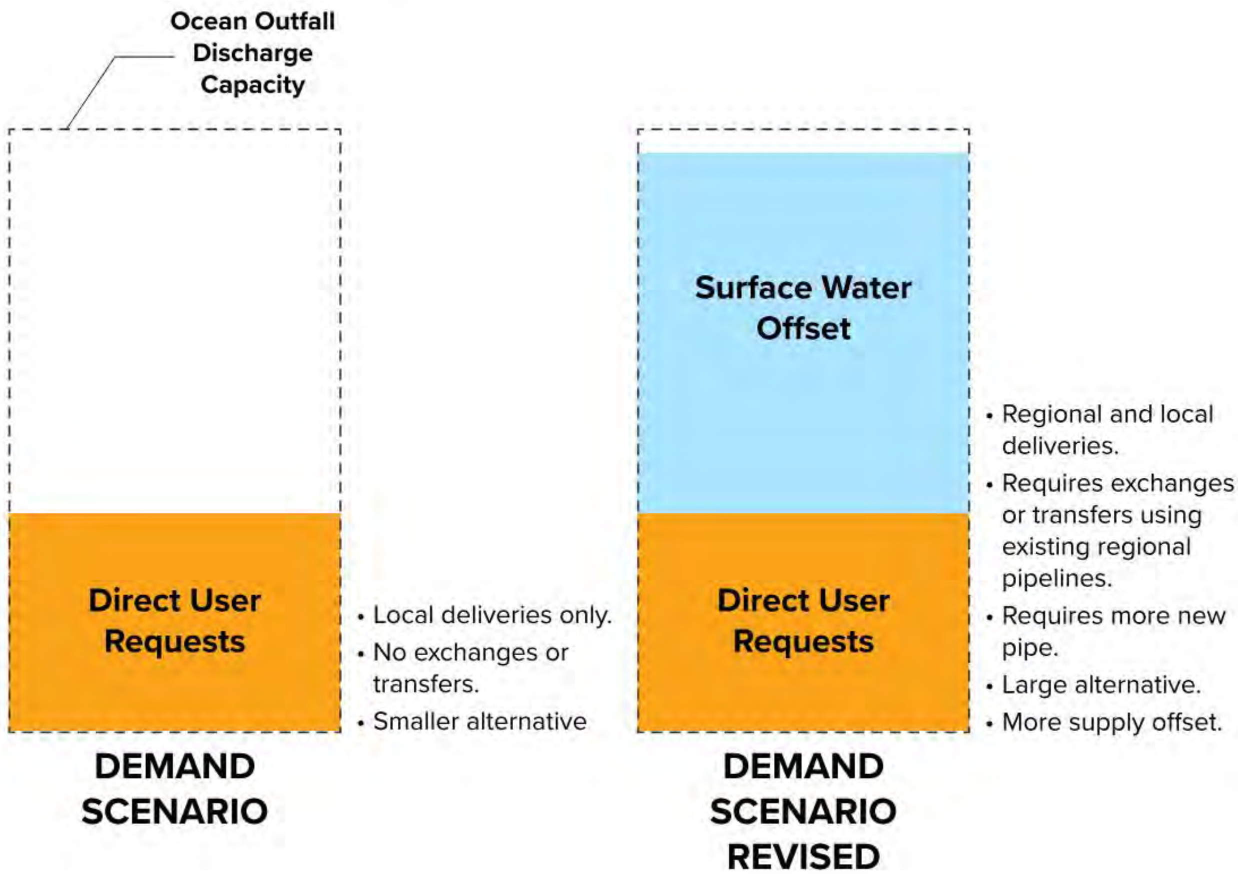


Figure 4.12 Building Demand Scenarios

4.2.4 Infrastructure and Treatment Technology

All developed project alternatives include the same type of infrastructure and treatment technology. Infrastructure used to handle ocean water requires specialty materials to resist corrosion due to high saltwater content as well as the harsh coastal environment. Similarly, RO treatment technology will be used as the standard treatment technology across all project alternatives given its proven application for desalination. The following sections briefly describe the infrastructure and treatment technology assumed to be used in each project alternative.

4.2.4.1 Traditional Desalination Treatment Technology

This section describes the technology required per the California Ocean Plan for a desalination facility. The technology component involves the types of equipment, materials, and methods that will be used to construct and operate the desalination facility.

Desalination Treatment Technology

Currently the primary forms of desalting treatment technology include distillation (thermal), electrodialysis reversal, or membrane separation technologies such as RO. For water sources with high salts like seawater, RO is the most common technology used. Alternative technologies for desalination are in development and are discussed further in Section 4.6 (Description of Alternative Technology) but all rely on RO. RO is the most widely used seawater desalination technology and is the only one considered for this study. Note that Section 4.2.2.2 (Existing Outfalls) described the ocean outfall pipelines used to discharge RO brine. For this study, a 50 percent RO recovery is assumed therefore as an example a treatment plant that is referred to as "5 million gallons per day (mgd)" requires 10 mgd of saltwater influent.

A typical ocean desalination process flow diagram is shown in Figure 4.13, below. The major systems at a typical desalination plant using RO are the pretreatment system, the high-pressure pumps, membrane unit, and post treatment system. During the RO process, the salt water is pretreated via filtration to eliminate dissolved organics, suspended sediments, and contaminants. Pretreatment systems for desalination facilities are included and can vary depending on the membrane material, source water quality, frequency of membrane cleaning, and desired recovery. Salt water then water goes through an RO membrane under pressure and is separated into two streams, permeate, which is the filtered water, and brine, which contains concentrated salts and other chemicals. Post treatment is performed on the permeate after it exits the RO membrane and typically consists of disinfection to maintain water quality during storage and distribution. This is a common process for treating and delivering potable drinking water and is not unique to desalination. Stabilization, or adding minerals back into the RO permeate, is required to prevent the corrosive water from damaging downstream infrastructure and to maintain water quality.

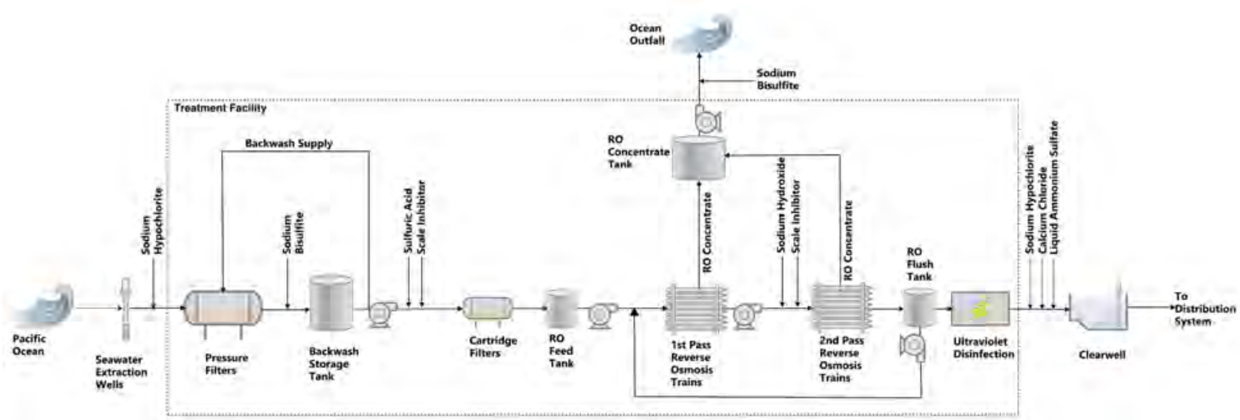


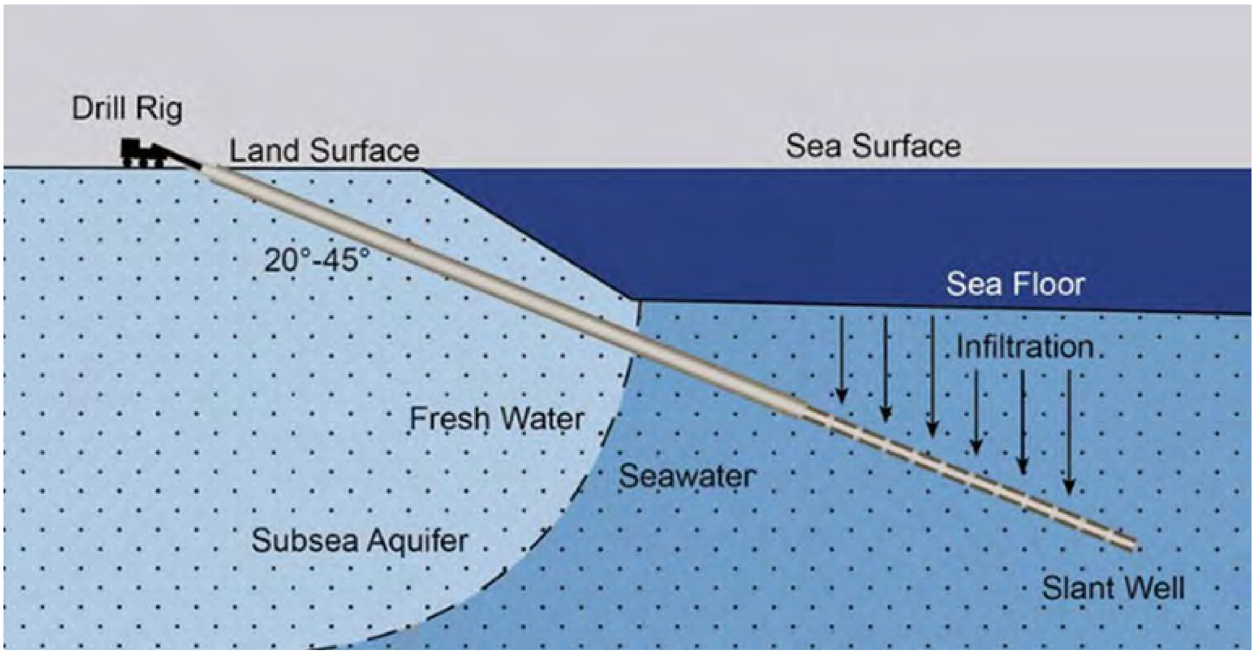
Figure 4.13 Typical Ocean Desalination Process Flow Diagram

Recovery is the percentage of permeate, or filtered water, that results from the RO process. Recovery rates for RO systems can range from 40 percent to 85 percent, which means of the volume of influent salt water, only 40 to 85 percent of that water can be produced to potable water. For this study, a 50 percent recovery is assumed.

The brine from an RO ocean desalination process can have up to twice the amount of salinity as average seawater and chemicals such as antiscalants, coagulants, and heavy metals from corrosion. Brine is usually discharged back into the ocean, but it must be responsibly managed to reduce negative environmental impacts to marine life due to high salinity, toxic substances, and temperature differences. For this study, brine management is assumed to be through discharging back into the ocean through an outfall pipeline and a diffuser.

Ocean Intake Technology

The State Water Board requires subsurface intakes unless it is determined that subsurface intakes are not feasible or practical. Subsurface intakes withdraw seawater from the area under the ocean floor. The State Water Board considers the feasibility of subsurface intake technologies based on geotechnical data, hydrogeology, topography, ocean conditions, the presence of sensitive species and habitats, the energy use for the entire facility, design constraints, and project life cycle cost. The installation and maintenance of subsurface intakes must avoid disturbing sensitive habitats and species to the maximum extent possible. For this study it is assumed that slant well subsurface intakes will be used as shown in Figure 4.14 below.



Source: State Water Resources Control Board

Figure 4.14 Example of a Slant Well Subsurface Intake

Ocean Outfall Pipeline

A desalination facility that discharges brine produced from the RO treatment process to the ocean requires an ocean outfall. An ocean outfall includes a pipeline that conveys brine from the treatment facility into the ocean and a diffuser section at the end of the pipeline to promote dilution of the brine effluent with the surrounding ocean water. The outfall pipeline is similar to the intake pipeline in that it must be a corrosion resistant material to withstand the high salt concentrations of the brine. Typical outfall materials can be polyvinyl chloride (PVC), High Density Polyethylene (HDPE), or fiberglass reinforced polymer (FRP) pipe. A profile of an outfall system is shown in Figure 4.15 on the next page.

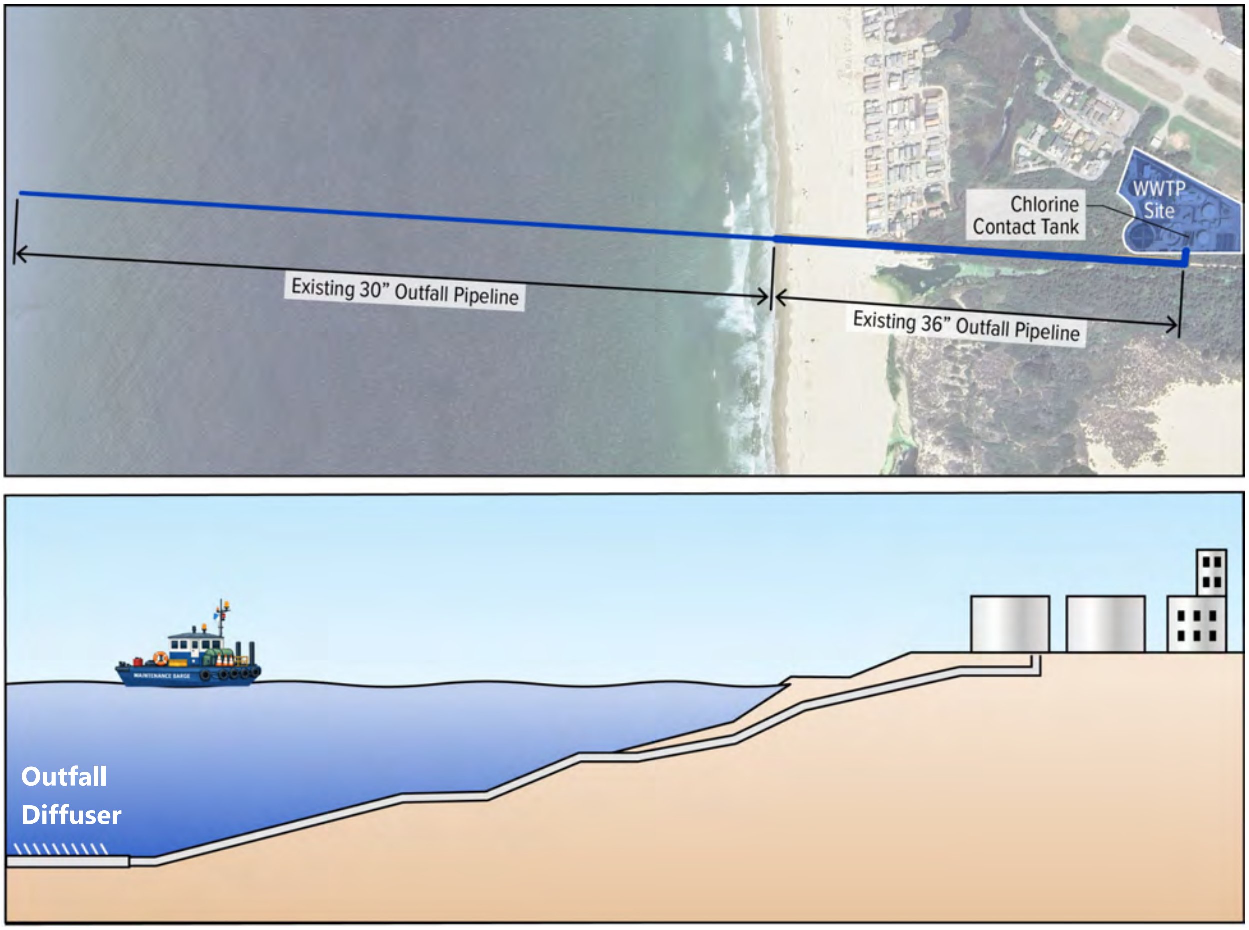


Figure 4.15 Typical Ocean Outfall Plan and Profile

Ocean Outfall Diffuser Section

Comingling RO brine with wastewater before discharging into the ocean is the preferred brine discharge method for reducing intake and mortality of all forms of marine life. The wastewater must provide sufficient dilution to ensure that the comingled discharge's salinity meets the receiving water limitations. If the brine cannot be adequately diluted by wastewater, then multiport diffusers are the next best technology to reduce brine concentrations to minimize mortality of all forms of marine life. Multiport diffusers are linear structures with spaced ports or nozzles installed on submerged marine outfalls; they discharge brine waste into the ocean in a way that allows the brine to be rapidly mixed, dispersed, and diluted within a small area. Figure 4.16 shows an example of a multiport diffuser. The multiport diffusers must be engineered to maximize dilution, minimize the size of the brine mixing zone, minimize the suspension of benthic sediments, and minimize harm to all forms of marine life.

Brine from ocean desalination typically has a total dissolved solid (TDS) concentration of 52,000 to 64,000 milligrams per liter (mg/L) while the ambient ocean water TDS is approx. 35,000 mg/L. With a higher TDS, the brine is denser than ambient seawater, causing it to sink and not adequately mix with ocean water if directly discharged into the ocean (USGS, 2018). To facilitate rapid mixing, a diffuser is affixed to the end of the outfall pipeline with ports at specific angles that jet the brine into ambient ocean water under hydraulic pressure from the pipeline. With diffuser ports, the initial jet is up away from the ocean bottom (as shown in Figure 4.16 below) and the heavier discharge brine sinks and, while sinking, adequately diffuses with ambient ocean water. This process results in rapidly lowering the TDS concentration near the diffuser ports to safe levels to mitigate aquatic life mortality.

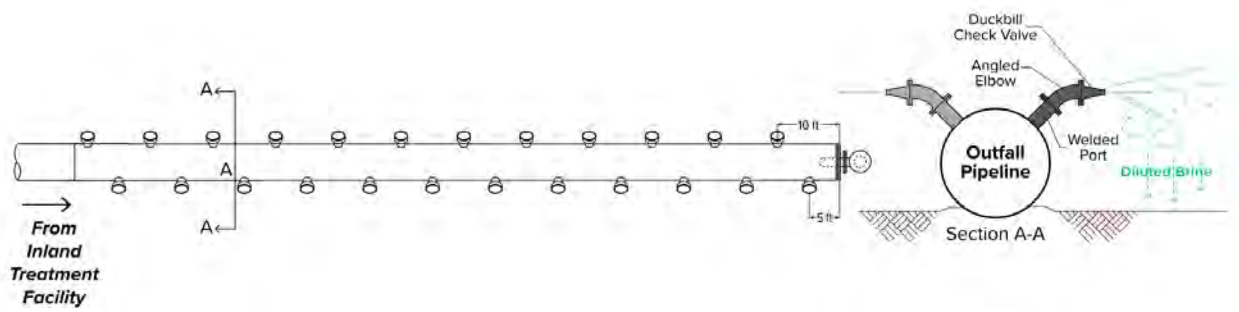


Figure 4.16 Typical Ocean Outfall Diffuser

For this study it is assumed that existing ocean outfalls will be used with modifications to the diffusers to meet dilution requirements. New outfalls would also be designed to meet dilution requirements with multiport diffusers.

4.2.4.2 Treated Water Linear Infrastructure

Treated water infrastructure includes linear facilities and pump stations that will be used to convey and deliver desalinated water to end users. Treated water infrastructure materials will be typical potable water distribution facility materials which include, but are not limited to, PVC, ductile iron pipe, or steel, and are assumed to be installed in a typical open trench method where feasible. Infrastructure that cannot be installed by open trench methods would be installed via trenchless technology including, but not limited to, auger bore and jack, horizontal directional drilling, or tunnel boring/microtunneling machine.

As discussed in Section 4.2.3 (Demand Scenarios), if outfall capacity is available, demand scenarios can expand beyond local demands by using existing regional infrastructure or building new regional infrastructure and doing supply exchanges. On the next page Figure 4.17 demonstrates how exchanges between end users could be made with existing supply offsets and desalinated water. All interties, exchanges or transfers are hypothetical and would need to be further evaluated and refined in a future stage of project development, should one advance. Costs associated with use of existing pipelines have not been included in the project alternative estimates and would require negotiation and financial assessment. Lastly, hydraulic capacity of the existing regional pipelines was estimated with best available information provided by the District. Hydraulic calculations estimate that existing facilities provide adequate capacity, given that for the most part, a desalinated supply is being used to offset existing supplies. Infrastructure upsizing is needed to accommodate offsetting existing supply while also delivering a new requested desalinated supply is included in the project infrastructure costs, as necessary.

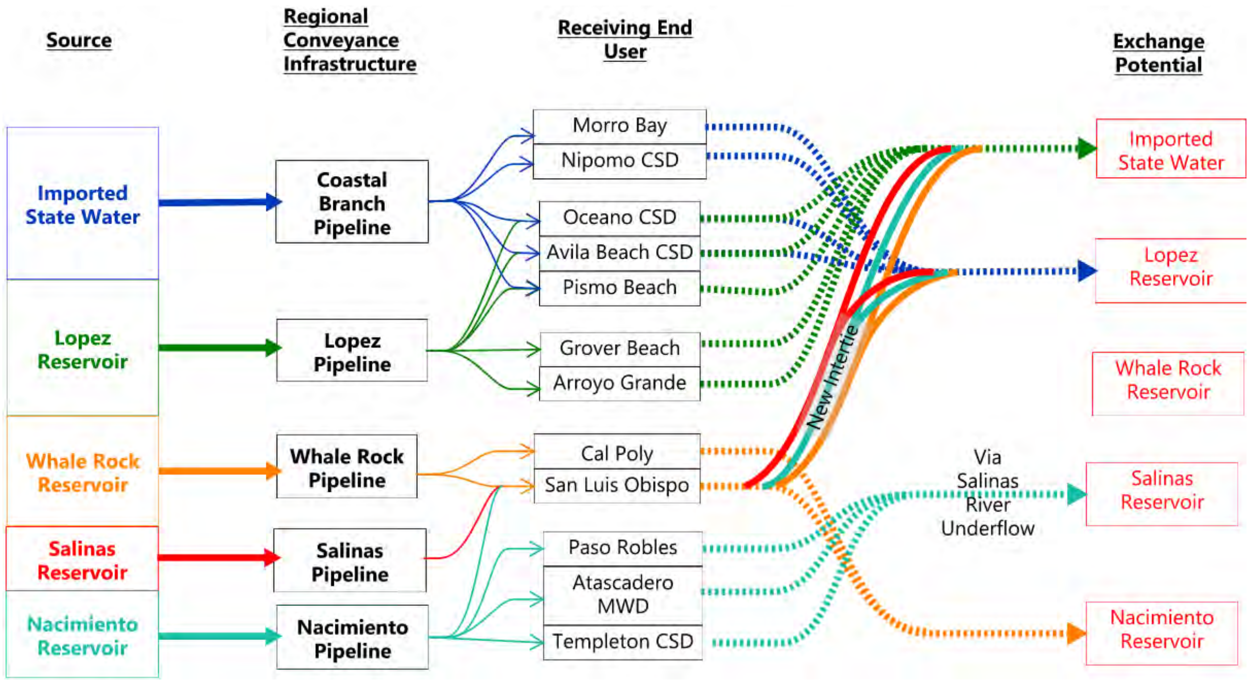


Figure 4.17 Regional Infrastructure Exchange Potential

4.3 Alternative Screening Analysis

An alternative includes three major components: 1) an approximate site location, 2) a desalinated water demand scenario, and 3) the infrastructure necessary to desalinate ocean water and convey treated water to end users. After the site screening was complete, demand scenarios were applied, and the required conveyance infrastructure identified for the six sites that passed the site screening evaluation. This resulted in the development of 12 alternatives that included a wide array of alternative sizes, both physically by delivery volume and geographically in different areas throughout SLO County.

Table 4.6 below lists the 12 alternatives that were developed as part of the alternative screening analysis. The evaluation of the 12 alternatives was similar to the site screening analysis. Evaluation criteria were applied to each alternative to develop a score. The evaluation criteria used in the alternative site screening included a weighted percentage to each criteria.

Table 4.6 Project Alternatives included in Alterative Screening Analysis

Alternative No.	Alternative Title	Production Volume (AFY)
1(1)	Cambria Area and San Simeon Direct Requests Only.	330
2	Cayucos/Estero Area with S. SLO. County Exchange.	1,250
3(1)	Cayucos/Estero Area Direct Requests Only.	1,005
4	Morro Bay Small.	1,850
5	Morro Bay Medium.	4,450
6(1)	Morro Bay Large.	8,020
7	Avila to Central SLO County.	2,430

Alternative No.	Alternative Title	Production Volume (AFY)
8	S. SLO WWTP Small.	2,270
9	S. SLO WWTP Medium.	3,475
10	S. SLO WWTP Large.	6,770
11	Nipomo Mesa Refinery South County.	1,420
12	Offshore Technology at Estero Marine Terminal.	2,255

Notes:
(1) Project alternative selected for further evaluation and refinement, see Section 4.4 - Alternatives Under Consideration.

The evaluation criteria were applied to the 12 alternatives in Table 4.6 and the scores using both unweighted and weighted percentages were calculated. Table 4.7 (Alternative Site Screening Evaluation Criteria) lists the evaluation criteria and its respective weighted percentages. The raw results of this analysis is included in Appendix D – Alternative Screening Analysis Scores.

The scores for the 12 alternatives were presented to CWAT on November 17, 2025. Based on discussion at the meeting, the highest ranking scored alternatives were not directly selected as the five alternatives to evaluate further. The philosophy in selecting alternatives was to include five project alternatives that would include a wide breadth of attributes. For example, it was preferred that the project alternatives included both small and large alternatives that served partners either locally or regionally and would have the ability to serve either northern or southern regions in SLO County. The following bullets describe the decisions made that resulted in the five project alternatives that are included in Section 4.4 (Alternatives Under Consideration).

- Alternatives at S. SLO County WWTP area scored the highest. CWAT agreed that given the significant available hydraulic capacity of the ocean outfall, a large alternative would be sited at this area to serve southern regions of SLO County as well as potentially other areas for a regional alternative.
- Similarly, Morro Bay Area alternatives also scored within the top five, therefore it was agreed that a large alternative that served northern regions of SLO County would be sited in this area as a regional alternative with a preference for direct deliveries, not exchanges.
- The Cayucos/Estero Marine Terminal alternatives had relatively lower environmental impact and close vicinity to regional infrastructure. Additionally, this site had an alternative that scored in the top five in the unweighted criteria. CWAT agreed to include this site as a project alternative with a preference for direct deliveries, not exchanges.
- The Refinery site is popular due to being a brownfield industrial area with an existing ocean outfall pipeline. This alternative scored in the top five in the unweighted criteria. CWAT agreed to include this as a project alternative.
- The Avila Beach alternative did score in top five on both the unweighted and weighted criteria, but was considered a less than ideal location due to its geographic location not near any regional infrastructure, difficult access and alternatives 10 and 11 being nearby.
- CWAT agreed to include a local only alternative in the Cambria area since Cambria and San Simeon CSD both have an immediate need for additional water supply. This alternative would provide valuable insight by identifying project costs and implementation challenges for a small scale desalination facility in SLO County.

Table 4.7 Alternaitve Site Screening Evaluation Criteria

Evaluation Criteria	Weight	Favorable (Score = 5)	Moderate (Score = 3)	Unfavorable (Score = 1)	Undesirable (Score = 0)
Production Capacity.	15%	Significantly increases droughtproof supply (e.g. by >3,000 AFY).	Moderately increases droughtproof supply (e.g. by <3,000 AFY, but >1,500 AFY).	Insignificant increase in droughtproof supply (e.g. by <1,500 AFY).	Not Applicable.
Regional Benefit.	15%	Provides opportunity for exchanges across county for many partners (>5).	Provides opportunity for multiple partners or exchanges (>3).	Minimal partners or exchanges (<3).	No regional benefit, only 1 partner agency would obtain new desal supply.
Addressing Critical Need.	15%	Address known immediate shortfall in water supply and/or supplement GW over extraction.	Can be used to address future shortfalls during drought conditions.	Does not provide water to critical need areas.	Not Applicable.
Blending Water Available.	10%	Greater than equal to 50% of liquid discharged waste stream is wastewater/freshwater (not brine).	Less than equal to 50% of liquid discharged waste stream is wastewater/freshwater (not brine).	Less than equal to 25% of liquid discharged waste stream is wastewater/freshwater (not brine).	No blending water available or new outfall required.
Proximity to existing infrastructure and Risk.	5%	<15 mi of site, low risk site.	<1-5-10 mi of site, low to moderate risks/mitigatable.	> 10 mi of site moderate to high risks/ likely mitigatable.	High Risk/Not Mitigable.
Cultural Resources Impacts.	5%	No or limited impacts to known cultural resources.	Moderate Impacts, but able to mitigate.	Severe Impacts, limited ability to mitigate.	Severe Impacts without ability to mitigate.
Social/Neighbor Impacts (long term after construction).	5%	No or limited impacts expected for noise, visual traffic.	Moderate Impacts, able to mitigate.	Severe Impacts, limited ability to mitigate.	Severe Impacts without ability to mitigate.
Environmental/Biological Habitat Impacts (on land).	5%	▪ Minimal Impacts to sensitive habitat/species from proposed facilities. Able to mitigate. ▪ Minimal (completely avoid) impacts from land based environmental impacts.	▪ Moderate Impacts to sensitive habitat/species from proposed facilities. Able to mitigate. ▪ Moderate (adjacent to with potential) impacts from land based environmental impacts.	▪ Severe Impacts to sensitive habitat/species from proposed facilities. Limited ability to mitigate. ▪ Sever impacts from land based environmental impacts.	Protected Zone (Not permittable).
Environmental/Biological Habitat Impacts (Ocean).	5%	Minimal Impacts from proposed intake and outfall infrastructure. (Existing outfall with minimal modifications in a high value ocean habitat).	Moderate impacts from proposed intake and outfall infrastructure. (Using existing outfall with moderate modifications of high value ocean habitat).	Severe impacts from proposed intake and outfall infrastructure. (New outfall and intake in a high value ocean habitat.)	Protected zone, new outfall and intake in an MPA (Extremely difficult to permit).
Permitting Complexity.	15%	Able to readily meet all permit requirements.	Moderate complex - Some permit requirements may be difficult, require negotiation.	High complex -Multiple permits expected to be (very) difficult.	One or multiple aspects of the project expected to be not permittable (at this time).
Partners Agreement Complexity.	5%	Simple - Minimal inter-agency agreements required. No regional infrastructure exchange.	Moderate Complex - Several inter-agency agreements required.	High Complex - Multiple complicated agreements required for multi-regional infrastructure exchanges.	Not Applicable.

4.4 Alternatives Under Consideration

Following the alternative screening process, five alternatives were ultimately carried forward for future development and cost estimation. Considerations for selecting alternatives included having diverse geographies across SLO County, a range of volumes served, and a variety of alternatives that could be either local scale options or a large regional project that maximized use of outfall capacities. When considering the potential alternatives and range of demands that could be served from each location, the DESAL Partners expressed a preference for direct deliveries whenever possible. However, water exchanges can provide opportunities to deliver water at a lower cost and to more users. The screened alternatives carried forward include:

- Alternative A – Cambria Area.
- Alternative B – Cayucos/Estero Marine Terminal Area.
- Alternative C – Morro Bay Area.
- Alternative D – S. SLO County WWTP Area.
- Alternative E – Nipomo Mesa Area.

These five alternatives were refined based on feedback from the CWAT meeting and to maximize use of available outfall capacity. Table 4.8 on the next page lists project assumptions that are common across all alternatives. Total project costs include both construction direct cost and soft costs. Soft costs include estimated costs for planning, engineering and design, environmental permitting, administrative and legal, and construction management and are based on percentages of the direct construction costs subtotal. Construction costs have a 30 percent contingency applied on each line item and SLO County sales tax on an assumed 50 percent of the total direct costs. A 15 percent factor is used for construction general conditions (e.g., overhead, bonding, markup etc.) The total construction cost is shown for each of the major infrastructure components. Appendix E (cost estimate details) includes the details of the construction capital cost estimate.

In developing life cycle costs, each alternative is assumed to be financed through a federal or state low interest loan program (e.g., Drinking Water State Revolving Fund – SRF or Water Infrastructure Finance and Innovation Act - WIFIA) with a 30-year repayment period. The projected lifecycle of the alternatives was assumed to be the same for a total repayment period of 30 years. The annualized unit cost is based on a 30-year lifecycle from present day dollars. Appendix E (cost estimate details) includes the details of the operation and maintenance cost estimate as well as the life cycle calculations.

The following sections present additional details for each of the five alternatives under consideration, including:

- A description of each alternative and its components, including treated water pipelines, ocean water extraction infrastructure, desalination treatment facilities, and brine management systems.
- Desktop evaluation of the alternative with respect to environmental resources and identifying areas that spatially show having a lower impact.
- Total categorized water demand and avenues for exchanges.
- Total project costs, estimated annual operation and maintenance (O&M) costs and calculated annualized unit cost.

- All alternatives include an "Example Project Site" shown in their respective figures. This example project site does not represent the actual project site and is used for cost estimating purposes to route linear infrastructure to a central treatment location.

Table 4.8 Assumptions Used for All Alternatives

Assumption	Description
Soft Costs (all contingencies are a percent of the estimated total construction direct costs).	▪ Planning – 5 percent. ▪ Engineering and Design – 10 percent. ▪ Environmental Permitting and Mitigation 10 percent. ▪ Administrative and Legal – 5 percent. ▪ Engineering Services During Construction, Inspection, and Construction Management – 10 percent.
Economic Analysis.	▪ Inflation – 2.5 percent(1). ▪ Discount Rate – 3.25 percent(2). ▪ Interest Rate – 2.1 percent(3). ▪ Lifecycle Term – 30 years. ▪ Project Soft costs included in total overall project costs included in economic analysis.
Construction Contingencies (all contingencies are a percent of the estimated total construction direct costs).	▪ Construction Contingency – 30 percent. ▪ Sales Tax – 7.25 percent applied to 50 percent of construction costs + contingency. ▪ Contractor overhead, markup, and general conditions – 15 percent.
Treatment Technology.	Reverse osmosis treatment technology, see Section 4.2.4 Infrastructure and Treatment Technology.
Ocean Intake Technology.	Slant wells subsurface intake, see Section 4.2.4 Infrastructure and Treatment Technology.
Water Distribution Piping.	Typical linear water pipeline installed via open trench, see Section 4.2.4 Infrastructure and Treatment Technology.
ROC Brine Disposal.	Ocean floor outfall with diffuser section.

Notes:
ROC - reverse osmosis concentrate.
(1) 10-year projected inflation rate, Federal Reserve Bank of Cleavland
(2) Discount rate as of January 2026, USBR.
(3) Interest Rate for Drinking Water SRF as of January 2026.

4.4.1 Alternative A – Cambria Area

Alternative A is the smallest alternative, serving only the Cambria and San Simeon CSDs as its end users. Alternative A includes a new subsurface intake on the coastline north of San Simeon just east of San Simeon Point, a new outfall pipeline and diffuser, and treated water infrastructure to deliver directly to both end users. Alternative A routes the new ocean intake and outfall infrastructure outside of the Cambria State MPA. Figure 4.18 on the next page shows the layout of Alternative A.

Figure 4.18 Alternative A – Cambria Area Layout

4.4.1.1 Alternative Demands

Table 4.9 below lists the range of demands by end user included in Alternative A and delivery method (e.g., direct delivery, transfer, etc.). The total demand volume ranges from 330 to 580 AFY or approx. 0.29 to 0.52 mgd.

Table 4.9 Alternative A – Cambria Area Demand Volumes

End User	Volume (AFY)	Offset Category	Delivery Method
Cambria CSD.	250 – 500	Supplemental Supply.	Direct Delivery.
San Simeon CSD.	80	Supplemental Supply.	Direct Delivery.
Total	330 – 580 AFY (0.29 – 0.52 mgd)		

4.4.1.2 Treatment and Conveyance Infrastructure

Alternative A includes a new subsurface intake pipeline with a total length of approx. 5.6 miles that would span offshore and run along the Highway 1 corridor. The subsurface intake pipeline (green in Figure 4.8 above) extends north of San Simeon, near San Simeon Point, to be located outside of the nearby Cambria State Marine Conservation Area. All extracted ocean water from this intake pipeline would be conveyed to a centralized desalination facility using RO treatment technology. The facility could have a total plant footprint of up to 6 acres and a production capacity of 580 AFY (or 0.52 mgd) to meet potential future needs. Brine produced at the desalination facility would be discharged through a new outfall with a total length of approx. 4.5 miles (orange pipeline in Figure 4.18 above) and a new diffuser section to dilute brine within Ocean Plan requirements. Similar to the subsurface intake pipeline, this new discharge pipeline would be located outside of the nearby MPA and extend north of San Simeon.

A total of almost 5.1 miles of distribution piping (blue pipelines in Figure 4.18 above) would convey desalinated water to the alternative's end users listed in Table 4.9 above. A main transmission line of approx. 0.5 miles in length would transmit water from the desalination facility and branch off to distribute end users' demands. Almost 3.2 miles of pipeline would be routed north to deliver San Simeon CSD demands and approx. 1.4 miles of pipeline would be routed south to deliver Cambria CSD demands.

4.4.1.3 Environmental Impact Evaluation

Figure 4.19 on the next page shows the layout of Alternative A spatially overlain with aquatic-and land-based environmental constraints. Additionally, Figure 4.19 delineates several areas that show to have a relatively lower impact than others due to the vicinity of protected areas or lack thereof. As shown, the area surrounding the lower impact polygons are adjacent to nearby wetland habitats with protected species including, but not limited to, the California red-legged frog. A large portion of the land within the alternative vicinity is designated as protected land through conservation easements or preserves. Multiple inland areas are designated as sensitive resources areas and conservation easements for land conservancy and the Cambria Pine. The San Simeon Creek and its tributaries are adjacent to the 100-year Federal Emergency Management Agency (FEMA) Flood Zone which could present hazards to sites that are nearby.

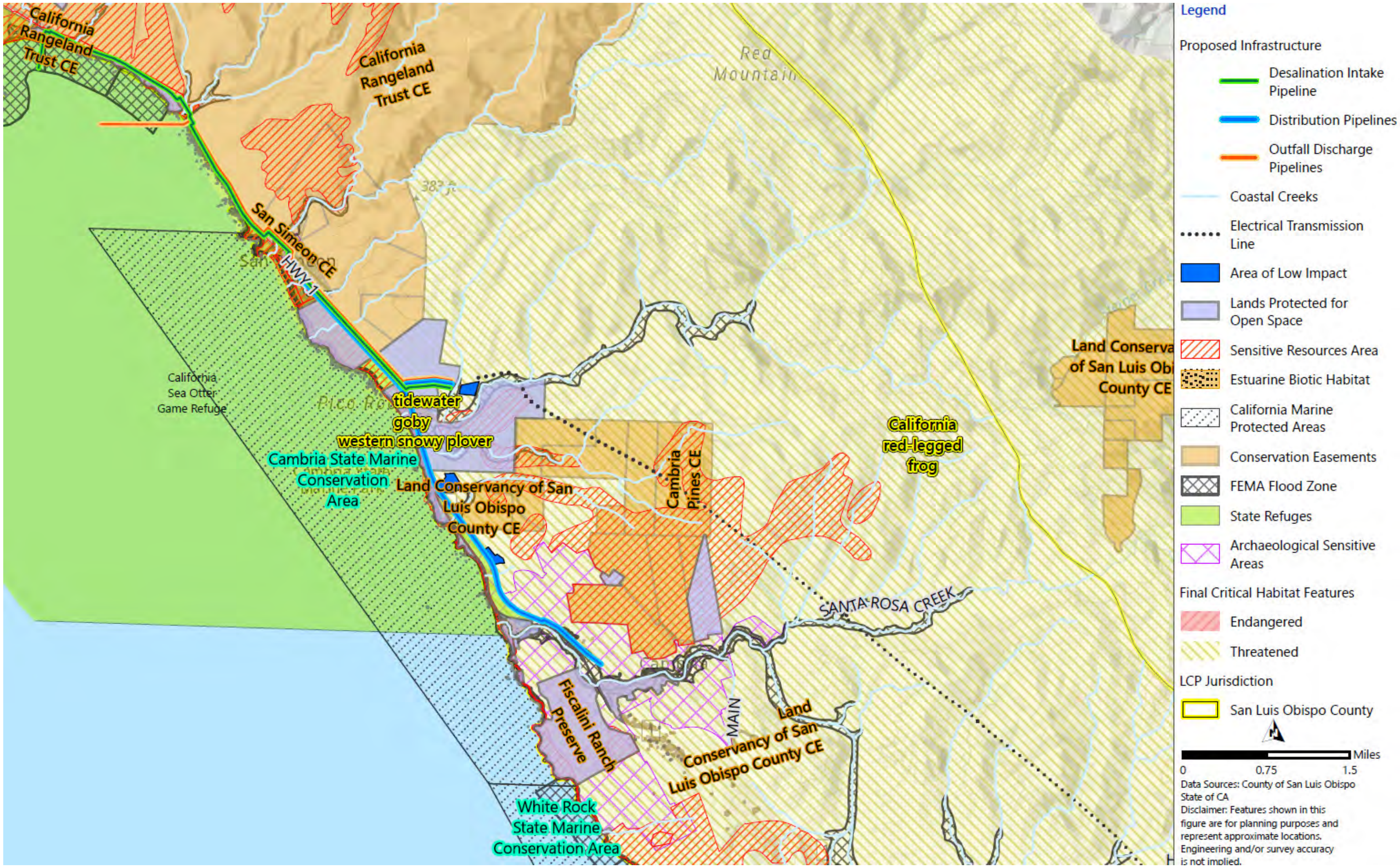


Figure 4.19 Alternative A – Cambria Area Environmental Constraints

Most of the area west of the site is within the coastal waters and the Cambria SMCA/State Marine Park (SMP), which is the state's only dual-designation MPA and are also part of the Monterey Bay National Marine Sanctuary. The new subsurface intake pipeline and outfall would be located outside of these protected areas, further north towards San Simeon. Additionally, the transmission lines for this alternative notably run along roadways through the Highway 1 scenic corridor where development is required to adhere to strict guidelines to not disturb scenic viewpoints and preserve the architectural style of the region. Environmental mitigation costs associated with the project are included in the soft cost factors.

4.4.1.4 Estimated Cost

Total capital costs for Alternative A are estimated at approx. $178.6 million with $127.5M direct construction cost and $51.0M for soft costs. The O&M costs for Alternative A are estimated at approx. $10.0million for both infrastructure and treatment facilities. The estimated planning level and annual costs for Alternative A are shown below in Table 4.10 and Table 4.11, respectively.

Table 4.10 Alternative A – Cambria Area Capital Costs

Project Component	Cost(1)(2)
New Ocean Outfall	$6,500,000
Ocean Water Extraction Conveyance	$13,811,000
Subsurface Extraction Wells	$22,507,000
Brine Discharge Conveyance	$13,827,000
Treated Water Transmission Piping	$10,762,000
Treated Water Pump Station	$9,877,000
Ocean Water Treatment Plant Costs	$50,269,000
Construction Subtotal	$127,553,000
Planning (5 percent)	$6,380,000
Engineering Design (10 percent)	$12,760,000
Environmental Permitting (10 percent)	$12,760,000
Administrative and Legal (5 percent)	$6,380,000
ESDC, Inspection, and Construction Management (10 percent)	$12,760,000
Soft Costs Subtotal	$51,040,000
Total Capital Costs	$178,593,000

Notes:
ESDC - engineering services during construction.
(1) All costs include: Rounded up to nearest $1,000, 30 percent construction contingency, SLO County sales tax of 7.25 percent applied to 50 percent of costs, and 15 percent contingency applied for contractor overhead, bonding, general conditions and markup.
(2) Costs are presented in January 2026 Dollars.

Table 4.11 Alternative A – Cambria Area Annual Costs

Component	Annual Cost ($ Million)
Treatment Annual O&M Cost	$6.9
Infrastructure Annual O&M Cost	$3.1
Estimated Annual O&M Cost Subtotal	$10.0
Estimated Total Project Annual Cost(1)	$18.0
Estimated Unit Cost(2)(3)	$23,875 $/AF

Notes:
(1) Total estimated project annual costs do not account for inflation over the life cycle of the project and account for present day annual costs at year one of the project life cycle.
(2) Finance terms include 2.5 percent inflation rate, 3.25 percent discount rate.
(3) Estimated Project Annualized Unit Cost based on estimated demand of 580 AFY.

4.4.2 Alternative B – Cayucos/Estero Marine Terminal Area

Alternative B is located within the area of the Cayucos/Estero Marine Terminal which is approx. one mile north of Morro Bay and one mile south of the community of Cayucos, just east of Highway 1. This alternative includes a new subsurface intake on the coastline just south of Cayucos and the use of the existing Estero Marine Terminal (EMT) ocean outfall that was retrofitted by the Cayucos CSD. Figure 4.20 on the next page shows the layout of Alternative B.

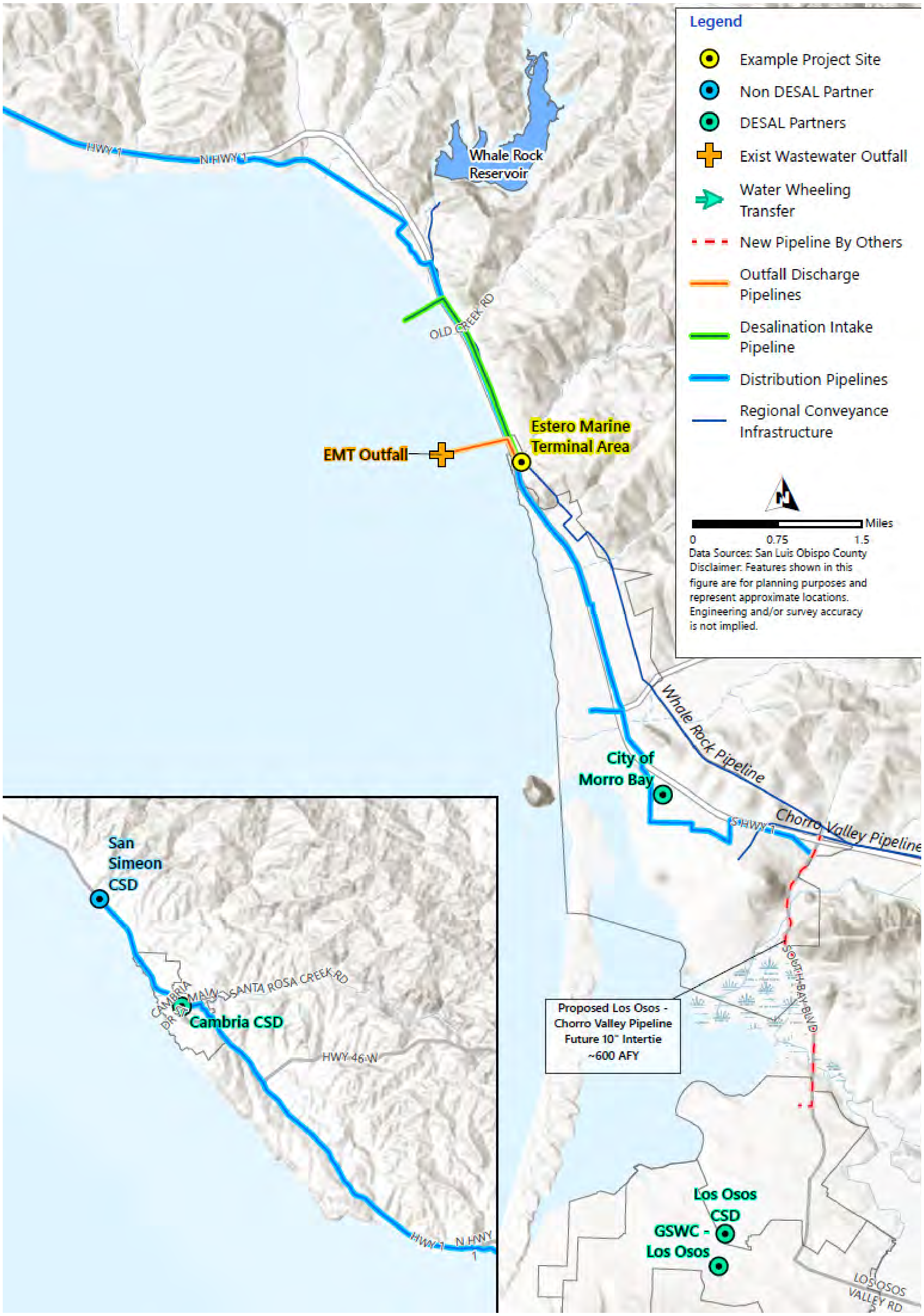


Figure 4.20 Alternative B – Cayucos/Estero Marine Terminal Area Layout

4.4.2.1 Alternative Demands

Table 4.12 below lists the range of demands by end user and delivery method for Alternative B. The lower range represents the direct request volume whereas the upper range represents direct request and offset of existing supplies. The total demand volume ranges from 930 to 1,055 AFY or approx. 0.83 to 0.94 mgd, which is capped by the estimated existing Estero Marine Terminal outfall pipeline capacity. Treated water would be provided through direct delivery to Los Osos CSD, Cambria CSD and San Simeon CSD. Optionally, the City of Morro Bay could receive treated water as another end user for this alternative through direct delivery for exchange with S. SLO County users connected to the SWP system or for use themselves.

Table 4.12 Alternative B – Cayucos/Estero Marine Terminal Area Demand Volumes

End User	Volume (AFY)	Offset Category	Delivery Method
Los Osos CSD	600	Supplemental Supply/Groundwater.	Direct Delivery & Los Osos New Chorro Pipeline Lateral.
Cambria CSD	250 – 375	Supplemental Supply/Groundwater.	Direct Delivery.
San Simeon CSD	80	Supplemental Supply.	Direct Delivery.
Morro Bay area (optional)	330	SWP.	Direct Delivery for Use or Exchange.
Total(1)	930 – 1,055 AFY (0.83 – 0.94 mgd)		

Notes:
(1) Existing hydraulic capacity available of Estero Marine Terminal outfall pipeline, if the Morro Bay area is not included as an end user, the other end users' delivery volumes can be increased.

4.4.2.2 Treatment and Conveyance Infrastructure

Alternative B includes a new subsurface intake pipeline with a total length of approx. 2 miles that would extend offshore, just south of Cayucos. The location of this intake was proposed to provide adequate spacing from the existing ocean outfall and to be located in favorable geology. All extracted ocean water from this intake pipeline would be conveyed to a centralized desalination facility using RO treatment technology. The facility could potentially have a total plant footprint up to 6 acres and a production capacity up to 1,055 AFY (or 0.94 mgd), limited by the capacity of the existing outfall pipeline, to meet potential future needs. Brine produced at the desalination facility would be discharged through the existing Estero Marine Terminal outfall pipeline. It is assumed that the outfall pipeline would need a new diffuser section to be installed to promote improved mixing.

A total of approx. 28 miles of distribution piping would convey treated water to the alternative's end users listed in Table 4.12. A main transmission line would transmit water from the desalination facility and branch off to distribute end users' demands. Almost 18 miles of pipeline would be routed north to deliver Cambria CSD demands with an additional 5 miles of pipeline being routed further north to deliver San Simeon CSD. South of the facility, 6 miles of pipeline would be routed to connect to the proposed Los Osos – Chorro Valley Pipeline 10-inch intertie that would ultimately deliver Los Osos demands. A lateral connection to the City of Morro Bay area could allow delivery off the 6 mile pipeline toward Los Osos.

4.4.2.3 Environmental Impact Evaluation

Figure 4.21 on the next page shows the layout of Alternative B spatially overlain with the aquatic and land-based environmental constraints present for the Cayucos/Estero Marine Terminal area. The proposed infrastructure for Alternative B runs along roadways through the Highway 1 scenic corridor in the Cambria, Cayucos, and Morro Bay regions. Development within this corridor will be subject to strict guidelines to not disturb scenic viewpoints and to preserve the architectural style of the region. The dark blue polygons show areas that have relatively low potential impact to the nearby environmental resources.

The San Luis Obispo County Parks and Recreation Department is currently in the process of planning Toro Creek Park, which is just east of Morro Bay. Areas included in this proposed park area have been avoided due to being potential future conservation easements as shown in Figure 4.21. The Toro Creek designated flood zone includes designated wetland zones along Toro Creek. Additionally, most of the region east of Highway 1 is a designated California Red-Legged Frog habitat which will require extensive biological surveys and likely require mitigation measures during the environmental permitting effort. Near the shoreline, there is risk of coastal erosion by 2100 that will require mitigation measures or avoidance of coastal erosion boundaries. Lastly this region is a known archaeological sensitive area. Chapter 7 (Environmental Considerations) describes the cultural resource considerations within the study area in more detail. Environmental mitigation costs associated with the project are included in the soft cost factors.

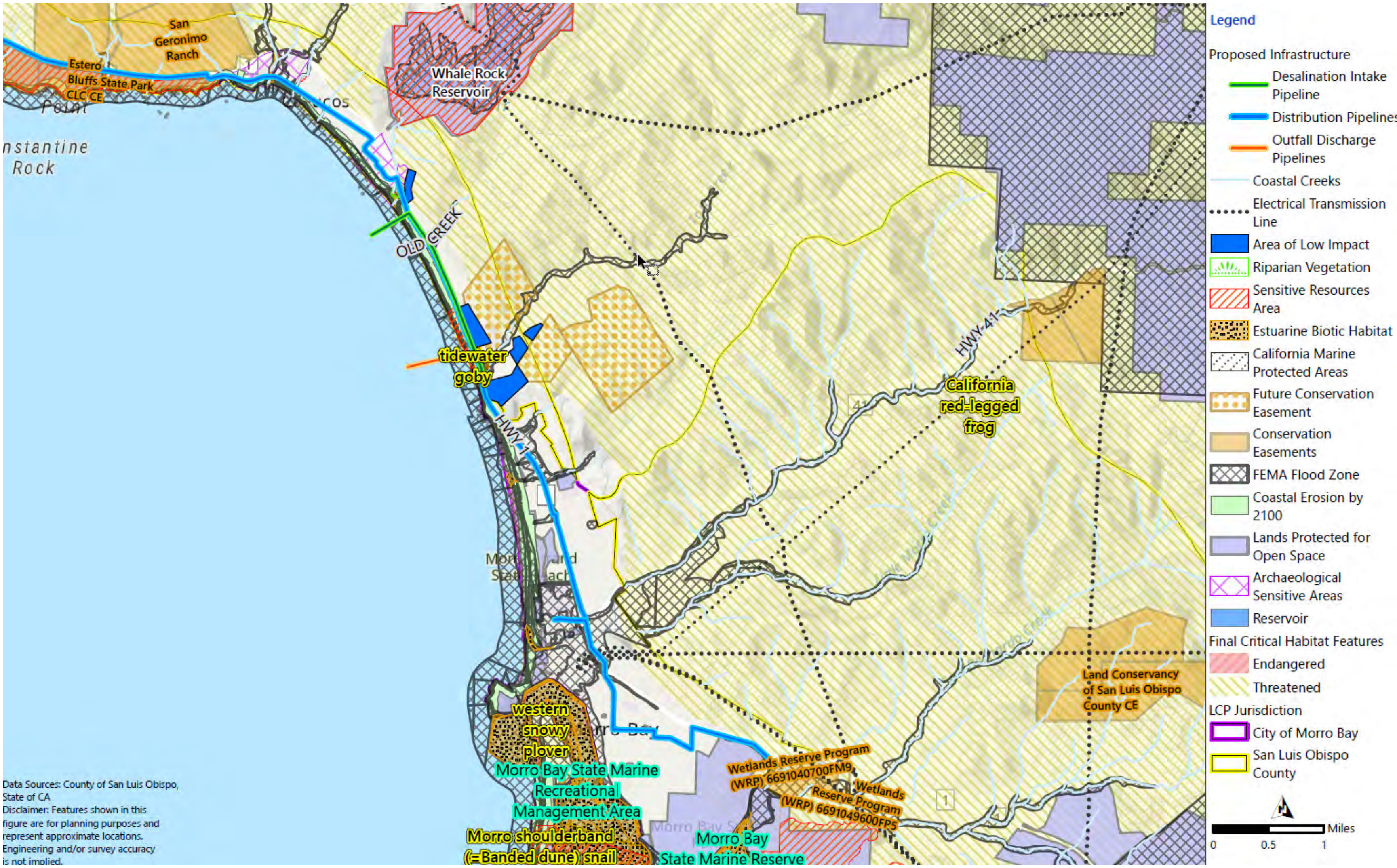


Figure 4.21 Alternative B – Cayucos/Estero Marine Terminal Area Site Environmental Constraints

4.4.2.4 Estimated Cost

Capital costs for Alternative B are estimated at approx. $261.0M with $186.5M for construction and $74.6M for soft costs. The O&M costs for this alternative are estimated at approx. $14.8M for both infrastructure and treatment facilities. The estimated planning level and annual costs for Alternative B are shown below in Table 4.13 and Table 4.14, respectively. The total construction cost is also shown for each major infrastructure component.

Table 4.13 Alternative B – Cayucos/Estero Marine Terminal Area Capital Costs

Project Component	Cost(1)(2)
Ocean Outfall Improvements	$1,500,000
Ocean Water Extraction Conveyance	$6,623,000
Subsurface Extraction Wells	$35,384,000
Brine Discharge Conveyance	$233,000
Treated Water Transmission Piping	$69,320,000
Treated Water Pump Stations	$10,458,000
Ocean Water Treatment Plant Costs	$62,937,000
Construction Subtotal	$186,455,000
Planning (5 percent)	$9,320,000
Engineering Design (10 percent)	$18,650,000
Environmental Permitting (10 percent)	$18,650,000
Administrative and Legal (5 percent)	$9,320,000
ESDC, Inspection, and Construction Management (10 percent)	$18,650,000
Soft Costs Subtotal	$74,590,000
Total Capital Costs	$261,045,000

Notes:
(1) All costs include: Round up to nearest $1,000, 30 percent construction contingency, SLO County sales tax of 7.25 percent applied to 50 percent of costs, and 15 percent contingency applied for contractor overhead, markup, and general contractor costs.
(2) Costs are presented in January 2026 Dollars.

Table 4.14 Alternative B – Cayucos/Estero Marine Terminal Area Annual Costs

Component	Annual Cost (million $)
Treatment Annual O&M Cost	$9.5
Infrastructure Annual O&M Cost	$5.3
Estimated Annual O&M Cost Subtotal	$14.8
Estimated Total Project Annual Cost(1)	$26.6
Estimated Unit Cost(2)(3)	$19,344 $/AF

Notes:
(1) Total estimated project annual costs do not account for inflation over the life cycle of the project and account for present day annual costs at year one of the project life cycle.
(2) Finance terms include 2.5 percent inflation rate, 3.25 percent discount rate.
(3) Estimated Project Annualized Unit Cost based on estimated demand of 1,055 AFY.

4.4.3 Alternative C – Morro Bay Area

Shown in Figure 4.22 on the next page, Alternative C includes a new subsurface intake near the Morro Bay area, a centralized treatment facility, and the use of the existing City of Morro Bay Water Resources Center outfall.

4.4.3.1 Alternative Demands

Table 4.15 below lists the range of demands by end user and delivery method for Alternative C. The alternative ranges comprise of either direct deliveries or direct deliveries plus additional demand scenarios as described in Section 4.2.3 – Demand Scenarios. The total demand volume ranges from 5,855 to 7,135 AFY or approx. 5.23 to 6.37 mgd. The City of Morro Bay's existing outfall capacity is limited at 7.3 mgd. Treated water would be delivered directly to Los Osos CSD, City of SLO, Cambria CSD, and San Simeon CSD. Treated water delivered to the City of San Luis Obispo could be exchanged to agencies in both North and S. SLO County as shown in Table 4.15 and Figure 4.22. California Polytechnic, University, SLO (Cal Poly) would receive their supply transferred through the City of SLO's existing water system interties. S. SLO County users would receive treated water through the City of San Luis Obispo and delivered via the SWP to offset a potential decrease in Lopez Lake availability. This would require a new intertie between the City of SLO and the SWP Coastal Branch pipeline as shown in Figure 4.22. Templeton CSD would be served through exchanges with the City of San Luis Obispo via the Nacimiento pipeline. San Luis Valley Groundwater Basin demands would be transferred via the SLO existing water system and a new pipeline to offset a portion of the basin's overextraction volume. Optionally, Santa Barbara County could be delivered water through the SWP connection, and the City of Morro Bay area could exchange a portion of their SWP allocation to S. SLO County users.

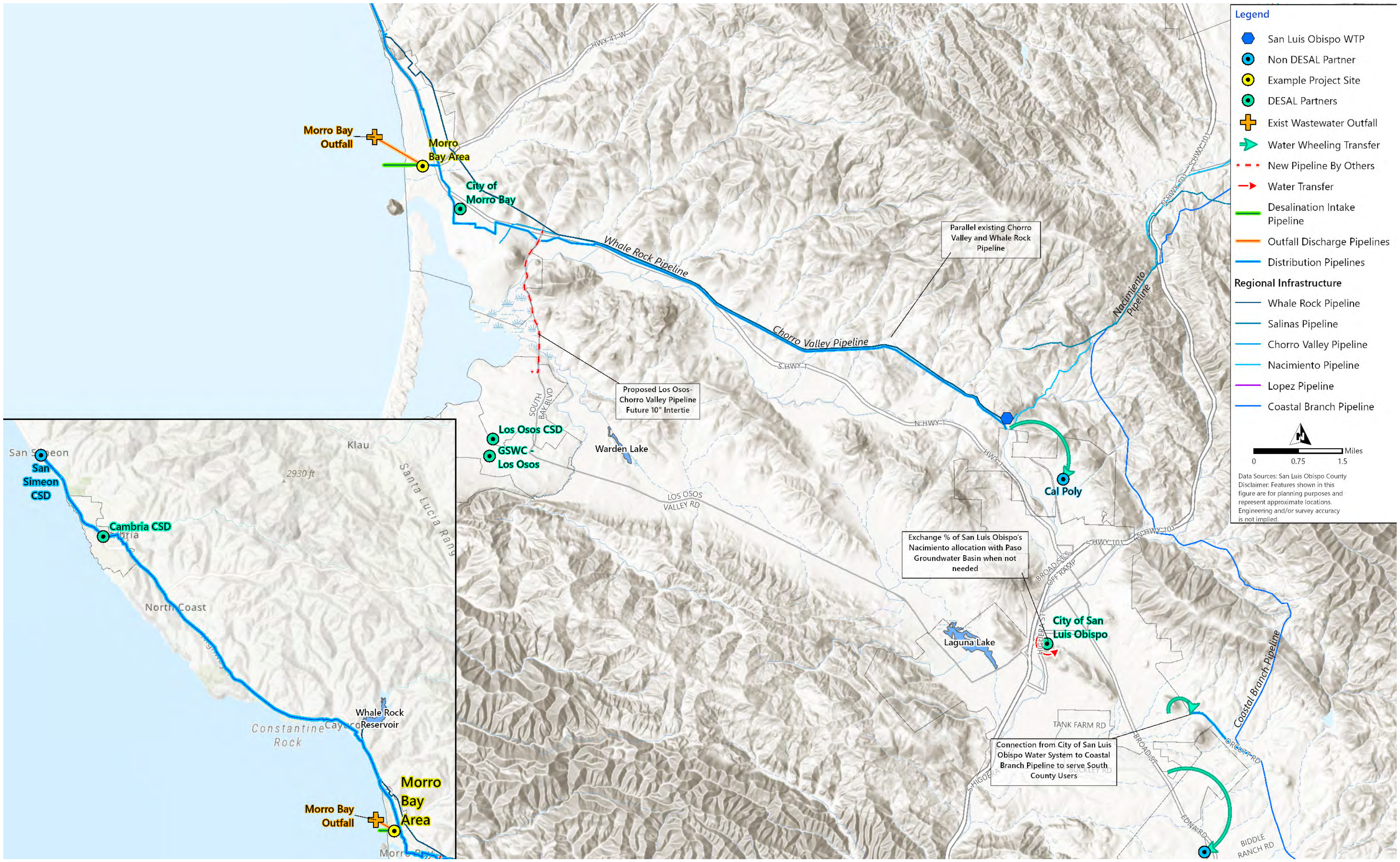


Figure 4.22 Alternative C - Morro Bay Area Layout

Table 4.15 Alternative C – Morro Bay Area Demand Volumes

End User	Volume (AFY)	Offset Category	Delivery Method
Cambria CSD.	500	Supplemental/Groundwater.	Direct Delivery.
San Simeon CSD.	80	Supplemental/Groundwater.	Direct Delivery.
Los Osos CSD.	600	Supplemental/Groundwater.	Direct Delivery.
City of San Luis Obispo.	2,600 – 3,300	Future Drought Supply.	Direct Delivery.
Cal Poly.	300	Supplemental.	Direct Delivery (wheeled via SLO).
Avila Beach CSD.	80	Supplemental/SWP Offset.	Transfer via SLO → SWP → Lopez Offset.
City of Arroyo Grande.	725	Supplemental/SWP Offset.	
City of Grover Beach.	850	Supplemental/SWP Offset.	
City of Pismo Beach.	400	SWP Offset.	
Oceano CSD.	100	SWP Offset.	
Templeton CSD.	100	Supplemental.	Transfer via SLO → Nacimiento.
San Luis Valley Groundwater Basin.	100	GW Overextraction.	Transfer via SLO → Direct.
Santa Barbara County (optional)(1).	750	SWP Offset.	Transfer via SLO → SWP.
City of Morro Bay (optional) (1).	250	SWP Offset.	Transfer via SLO → SWP.
Total	5,855 - 7,135 AFY Demands (5.23 - 6.37 mgd) with Optional = 8,135 AFY(1) (7.3 mgd)		

Notes:
(1) Existing hydraulic capacity available Morro Bay outfall pipeline, if the optional demands are not included as an end user, the other end users' delivery volumes can be increased.

4.4.3.2 Treatment and Conveyance Infrastructure

Alternative C includes a new subsurface intake pipeline with a total length of approx. 1 mile that would extend offshore, in the northern Morro Bay area. All extracted ocean water from this intake pipeline would be conveyed to a centralized desalination facility using RO treatment technology. The facility could potentially have a total plant footprint of up to 12 acres and a production capacity of 7,135 AFY (or 6.28 mgd) to meet the demands shown in Table 4.15. Brine produced at the desalination facility would be discharged through the existing Morro Bay outfall and require a connection to the existing Morro Bay outfall infrastructure. Additionally, it is assumed that the existing outfall pipeline would need to be rehabilitated and the diffuser would need port improvements.

A total of approx. 40 miles of distribution piping would convey desalinated water to the alternative's end users listed in Table 4.15 above. A main transmission line would transmit water from the desalination facility and branch off to distribute end users' demands. Almost 21 miles of pipeline would be routed north of the facility to deliver Cambria CSD demands with an additional 5 miles of pipeline being routed further north to San Simeon CSD. South of the facility, 3 miles of pipeline would be routed to connect to a proposed Los Osos – Chorro Valley Pipeline 10-inch intertie that would ultimately deliver Los Osos demands. An additional 9 miles of pipeline would extend further east, running parallel with the existing

Chorro Valley and Whale Rock Pipeline, to deliver additional demands to the City of SLO where it could be transferred to meet additional demands as described below:

- It is assumed the pipeline that parallels the Whale Rock/Chorro Valley pipelines would intertie with the City of SLO's surface water treatment plant's finished water pipeline for distribution.
- Cal Poly demands would be delivered via the City of SLO's existing water system that interties with Cal Poly.
- A new 1-mile connection from the City of SLO water system to the Coastal Branch Pipeline would be used to deliver S. SLO County demands via a transfer from City of SLO. These demands would then use the existing coastal branch pipeline and Lopez Pipeline for delivery to S. SLO County users.
- Treated water for the San Luis Valley Groundwater Basin would be delivered via a transfer from the City of SLO system to small distribution laterals as needed to offset groundwater use.
- Templeton CSD demands and/or demands with the Paso Robles Groundwater Basin would be transferred from the desalinated supplies provided to the City of SLO and delivered via the Nacimiento pipeline. City of SLO demands would have the ability to be exchanged for a percentage of the City of SLO's Nacimiento allocation with Paso Robles Groundwater Basin water when not needed via the Nacimiento pipeline.
- Optional demands to Santa Barbara County would be transferred through the City of SLO system and delivered via the aforementioned new connection to the Coastal Branch Pipeline. Similarly, Alternative C allows the City of Morro Bay SWP allocation to be transferred to other SWP or Lopez users under the same means. For example, Morro Bay could receive desalinated water and transfer SWP allocations to Lopez supply users or Santa Barbara County via the existing connection between the Lopez Pipeline and the SWP Coastal Branch pipeline.

4.4.3.3 Environmental Impact Evaluation

Figure 4.23 on the next page shows the Alternative C layout overlain with the aquatic-based and land-based environmental constraints present in the area. The Morro Bay Estuary is a sensitive estuarine habitat as well as a State Marine Recreational Area which limits proposed infrastructure development near the south end of the City requiring development north near residential areas. Additionally, riparian habitats exist near Morro Bay proper as well as along Morro Creek and protected species habitats for endangered species exist east of Highway 1, specifically the California Red Legged Frog and Morro Shoulderband snail. Several protected species exist within this area such as the Western Snowy Plover which tends to nest near the sandy dune landscapes. Furthermore, the Morro Bay FEMA designated flood plain, shown in Figure 4.23, is adjacent to Morro Creek and discharges into the low-lying bay causing flood hazards along the Coast near the old WWTP site. This low-lying area is prone to coastal hazards of both erosion and tsunami inundation. Lastly, this region has known archaeological sensitive areas. Chapter 7 (Environmental Considerations) describes the cultural resource considerations within the study area in more detail. Environmental mitigation costs associated with the project are included in the soft cost factors.

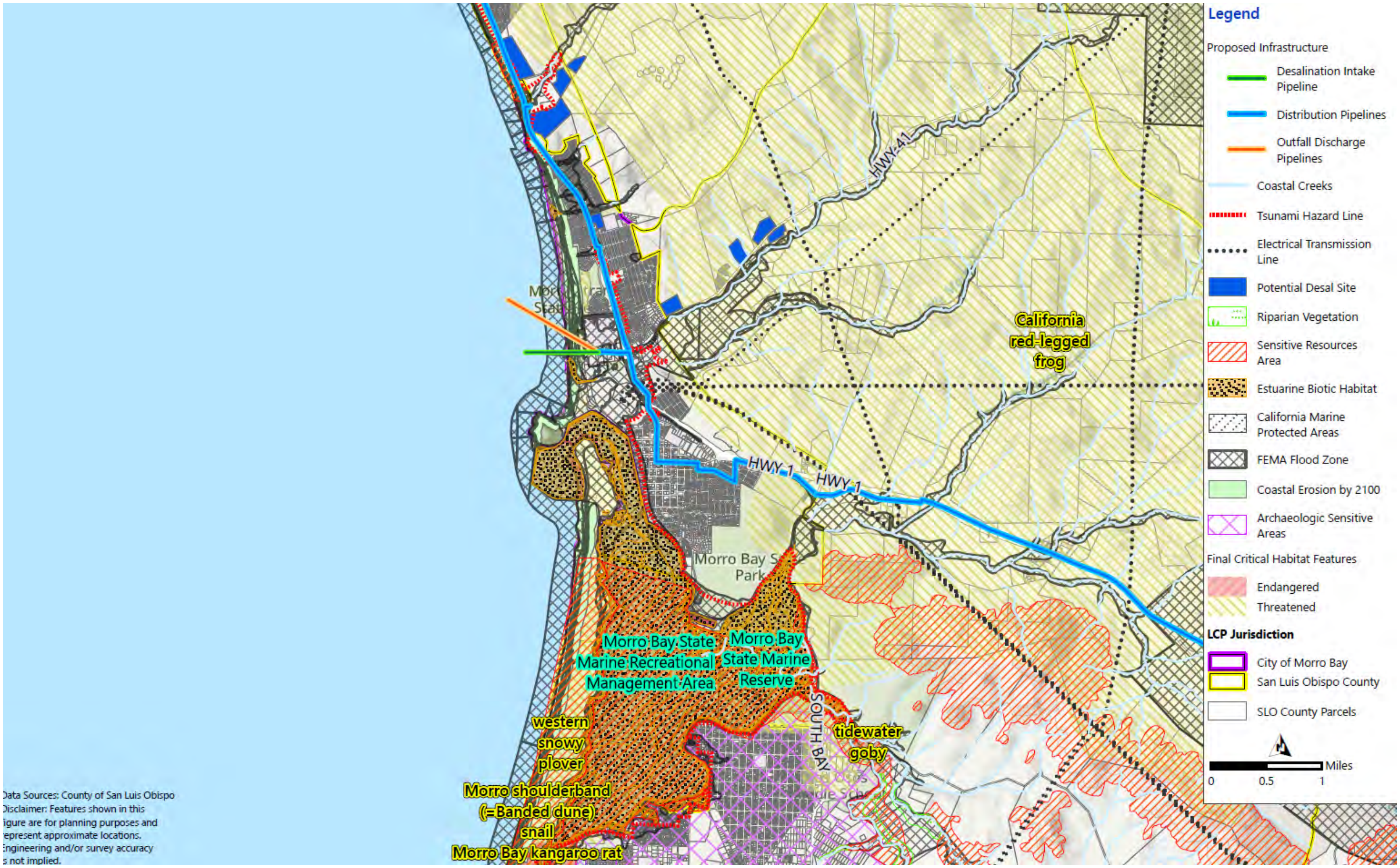


Figure 4.23 Alternative C – Morro Bay Area Environmental Constraints

4.4.3.4 Estimated Cost

Capital costs for Alternative C are estimated at approx. $544.6M with $389.0M from construction costs and $155.6M from soft costs. The O&M costs for the Morro Bay area alternative are estimated at approx. $63.8M for both infrastructure and treatment facilities. The estimated planning level and annual costs for Alternative C, are shown below in Table 4.16 and Table 4.17, respectively. The total project costs include both construction direct costs and soft costs.

Table 4.16 Alternative C – Morro Bay Area Capital Costs

Project Component	Cost(1)(2)
Ocean Outfall Improvements	$5,250,000
Ocean Water Extraction Conveyance	$3,490,000
Subsurface Extraction Wells	$120,332,000
Brine Discharge Conveyance	$465,000
Treated Water Transmission Piping	$118,698,000
Treated Water Pump Stations	$14,486,000
Ocean Water Treatment Plant Costs	$126,306,000
Construction Subtotal	$389,027,000
Planning (5 percent)	$19,450,000
Engineering Design (10 percent)	$38,900,000
Environmental Permitting (10 percent)	$38,900,000
Administrative and Legal (5 percent)	$19,450,000
ESDC, Inspection, and Construction Management (10 percent)	$38,900,000
Soft Costs Subtotal	$155,600,000
Total Capital Costs	$544,627,000

Notes:
(1) All costs include: Rounded up to nearest $1,000, 30 percent construction contingency, SLO County sales tax of 7.25 percent applied to 50 percent of costs, and 15 percent contingency applied for contractor overhead, markup, and general contractor costs.
(2) Costs are presented in January 2026 Dollars

Table 4.17 Alternative C – Morro Bay Area Annual Costs

Component	Annual Cost (Million $)
Treatment Annual O&M Cost	$43.3
Infrastructure Annual O&M Cost	$20.5
Estimated Annual O&M Cost Subtotal	$63.8
Estimated Total Project Annual Cost(1)	$88.5
Estimated Unit Cost(2)(3)	$10,020 $/AF

Notes:
(1) Total estimated project annual costs do not account for inflation over the life cycle of the project and account for present day annual costs at year one of the project life cycle.
(2) Finance terms include 2.5 percent inflation rate, 3.25 percent discount rate.
(3) Estimated Project Annualized Unit Cost based on estimated demand of 7,135 AFY.

4.4.4 Alternative D – South SLO County Wastewater Treatment Plant Area

Figure 4.24 on the next page shows Alternative D, which consists of new subsurface intakes, a new centralized treatment facility, and use of the existing S. SLO County Wastewater Treatment Plant outfall and diffuser.

4.4.4.1 Alternative Demands

Table 4.18 on the next page lists the range of demands by end user and delivery method for Alternative D. The total demand volume ranges from 5,070 to 6,825 AFY or approx. 4.53 to 6.09 mgd. Treated water would be provided through direct delivery to Nipomo CSD, the City of SLO, and the San Luis Valley Groundwater Basin. The Nipomo Mesa Management Area (NMMA) and Northern Cities Management Area (NCMA) would receive transfers through adjacent systems. The City of SLO would directly receive desalinated water which would free up existing supplies received from Lake Nacimiento. The City of SLO would be able to exchange a percentage of the City of SLO's Nacimiento allocation with Templeton and/or Paso Robles Groundwater Basin. Cal Poly and Los Osos CSD would receive their water transferred through the City of San Luis Obispo system and a new pipeline from the City of SLO would deliver water to Los Osos. S. SLO County users' treated water would be transferred via the Lopez pipeline to offset a potential 25 percent offset of Lopez Lake entitlement.

Table 4.18 Alternative D – S. SLO County WWTP Area Demand Volumes

End User	Volume (AFY)	Offset Category	Delivery Method
Avila Beach CSD.	80-90	Supplemental/SWP/Lopez Offset.	Transfer via Lopez.
City of Grover Beach.	200 - 850	SWP/Lopez Offset.	
City of Arroyo Grande.	525 - 725	SWP/Lopez Offset.	
Oceano CSD.	100- 385	SWP/Lopez Offset.	
City of Pismo Beach.	400	Lopez Offset.	
Northern Cities Management Area.	40	Groundwater Overextraction.	Transfer through Oceano and Grover Beach.
Nipomo CSD.	500 - 775	Supplemental/SWP Offset.	Direct Delivery.
Nipomo Mesa Management Area.	125	Groundwater Overextraction.	Direct Delivery (Transfer through Nipomo).
Los Osos CSD.	600	Supplemental.	Direct Delivery (Wheeled through SLO) ⟶ Direct Delivery/
City of San Luis Obispo.	2,600	Future Drought Supply.	Direct Delivery.
San Luis Obispo Valley Groundwater Basin.	100	Groundwater Overextraction.	Direct Delivery.
Cal Poly.	300	Supplemental.	Direct Delivery (wheeled through SLO).
Templeton CSD.	100	Supplemental.	Transfer via SLO ⟶ Nacimiento.
Total	5,070 – 6,825 AFY (4.53 – 6.09 mgd(1))		

Notes:
(1) Existing hydraulic capacity available S. SLO County WWTP outfall pipeline.

Figure 4.24 Alternative D – S. SLO County WWTP Area Layout

4.4.4.2 Treatment and Conveyance Infrastructure

Alternative D includes a new subsurface intake pipeline with a total length of approx. 1.5 miles that would extend offshore, near the S. SLO County WWTP. All extracted ocean water from this intake pipeline would be conveyed to a centralized desalination facility using RO treatment technology. The facility could potentially have a total plant footprint of up to 12 acres and a production capacity of 6,825 AFY (or 6.09 mgd) to meet potential future needs given the existing S. SLO County outfall capacity of approx. 6.1 mgd. ROC produced at the desalination facility would be discharged through the existing S. SLO County WWTP outfall and diffuser.

A total of approx. 28 miles of distribution piping would convey desalinated water to the alternative's end users listed in Table 4.18 above. A main transmission line would transmit water from the desalination facility and branch off to distribute end users' demands. Utilizing as much existing infrastructure as possible. The different infrastructure components included in Alternative D are listed below:

- Approx. 8 miles of new pipeline would be routed south of a treatment facility to Nipomo CSD, delivery demands for Nipomo CSD and transfer for Nipomo Mesa Management Area.
- A 4-mile pipeline would be routed north of the facility to connect to the Lopez pipeline, which would be used to deliver demands to S. SLO County agencies through the Lopez pipeline and demands to the Northern Cities Management Area would be transferred through Oceano and Grover Beach.
- Additional demands would be delivered further north of the Lopez pipeline connection, via an additional 9 miles routed towards City of San Luis Obispo, providing direct delivery of City of San Luis Obispo demands and others that would be transferred through the City.
- City of San Luis Obispo supply would have the ability to be exchanged for a percentage of San Luis Obispo's Nacimiento allocation with Paso Robles Groundwater Basin via the Nacimiento pipeline. Templeton CSD demands would be exchanged with the City of San Luis Obispo and delivered via the Nacimiento pipeline.
- As with previous alternatives, Cal Poly demands would be transferred through the City of San Luis Obispo's system and delivered through existing interties.
- Demands to Los Osos would be wheeled through the City of San Luis Obispo system and delivered via a 7-mile pipeline routed along Los Osos Valley Road.

4.4.4.3 Environmental Impact Evaluation

Figure 4.25 on the next page shows Alternative D overlain with the aquatic-based and land-based environmental constraints present. Areas near the existing S. SLO County WWTP are designated as riparian habitats, land protected for open space, archeologically sensitive areas to the west and the 100-year FEMA Flood Zone to the southeast along Arroyo Grande Creek. Further south lies Pismo State Beach, a sensitive resources area. The potential sites are not located on Pismo State Beach. Waters west of the Beach are a designated Chumash Heritage National Marine Sanctuary, which would require additional permitting efforts for the new subsurface intake pipeline for this alternative and any needed alterations to the existing S. SLO County WWTP outfall diffuser. Lastly, some of the relatively low impact areas are within existing neighborhoods, therefore land use zoning specific to this region would need to be considered for a future industrial treatment facility. Environmental mitigation costs associated with the project are included in the soft cost factors.

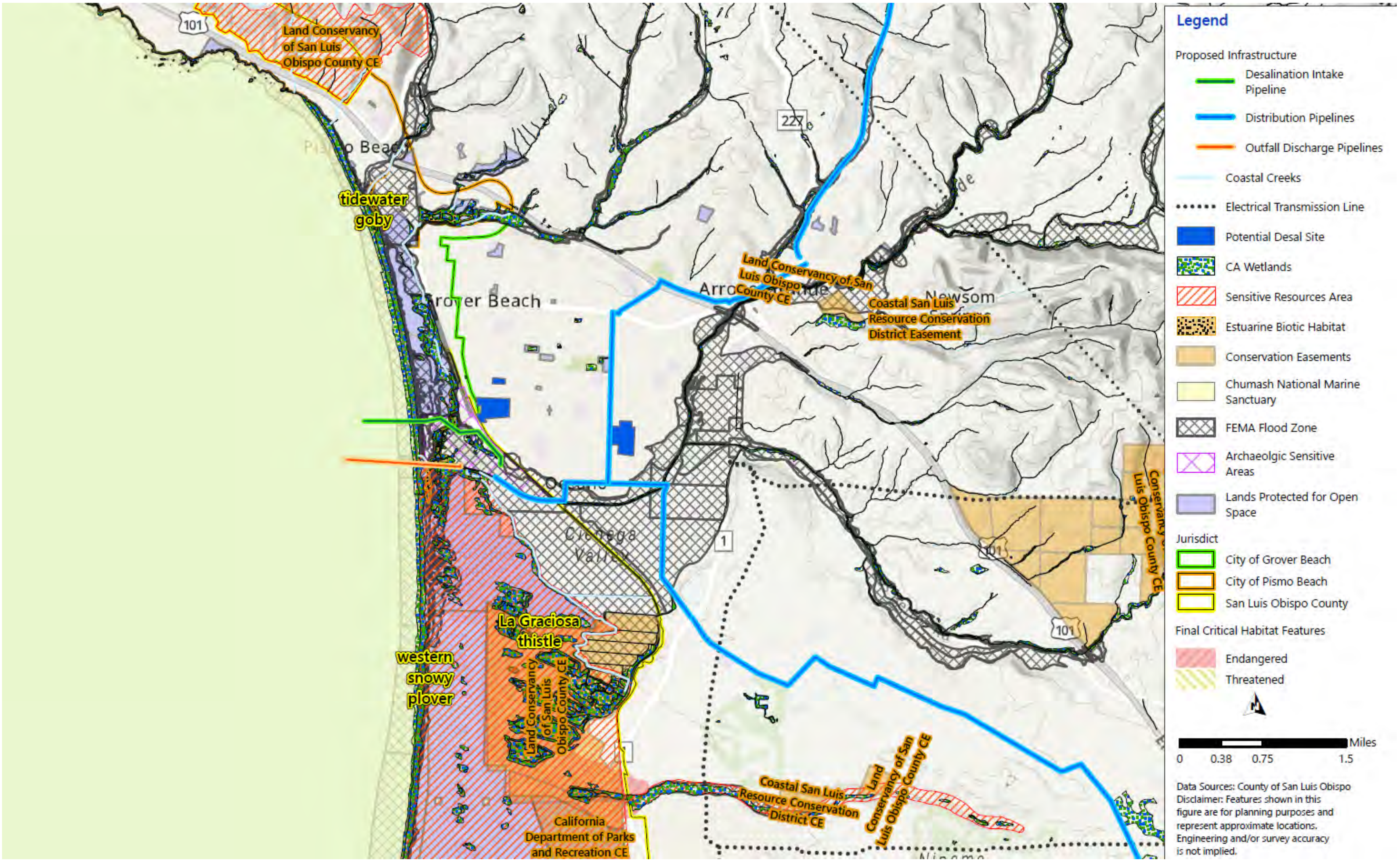


Figure 4.25 Alternative D – S. SLO County WWTP Area Environmental Constraints

4.4.4.4 Estimated Cost

Capital costs for Alternative D are estimated at approx. $482.6M which include $344.7M for construction and $137.9M for soft costs. The O&M costs for the S. SLO County WWTP alternative are estimated at approx. $55.5 million for both infrastructure and treatment facilities. The estimated planning level and annual O&M costs for Alternative D are shown below in Table 4.19 and Table 4.20, respectively. The total project costs include both construction direct cost and soft costs.

Table 4.19 Alternative D – S. SLO County WWTP Area Capital Costs

Project Component	Cost(1)(2)
Ocean Outfall Improvements	$5,250,000
Ocean Water Extraction Conveyance	$7,139,000
Subsurface Extraction Wells	$87,137,000
Brine Discharge Conveyance	$1,502,000
Treated Water Transmission Piping	$87,697,000
Treated Water Pump Station	$14,718,000
Ocean Water Treatment Plant Costs	$141,254,000
Construction Subtotal	$344,697,000
Planning (5 percent)	$17,230,000
Engineering Design (10 percent)	$34,470,000
Environmental Permitting (10 percent)	$34,470,000
Administrative and Legal (5 percent)	$17,230,000
ESDC, Inspection, and Construction Management (10 percent)	$34,470,000
Soft Costs Subtotal	$137,870,000
Total Capital Costs	$482,567,000

Notes:
(1) All costs include: 30 percent construction contingency, SLO County sales tax of 7.25 percent applied to 50 percent of costs, and 15 percent contingency applied for contractor overhead, markup, and general contractor costs.
(2) Costs are presented in January 2026 Dollars

Table 4.20 Alternative D – S. SLO County WWTP Area Annual Costs

Component	Annual Cost (Million $)
Treatment Annual O&M Cost	$38.2
Infrastructure Annual O&M Cost	$17.3
Estimated Annual O&M Cost Subtotal	$55.5
Estimated Total Project Annual Cost(1)	$77.3
Estimated Unit Cost(2)(3)	$9,150 $/AF

Notes:
(1) Total estimated project annual costs do not account for inflation over the life cycle of the project and account for present day annual costs at year one of the project life cycle.
(2) Finance terms include 2.5 percent inflation rate, 3.25 percent discount rate.
(3) Estimated Project Annualized Unit Cost based on estimated demand of 6,825 AFY.

4.4.5 Alternative E – Nipomo Mesa Area

Figure 4.26 on the next page shows Alternative E which includes a new subsurface intake, use of the Nipomo Mesa Refinery (Refinery) site, and the use of the existing Refinery ocean pipeline with a new diffuser for ROC discharge. The proposed treatment would be located at the closed Refinery site, which would be redeveloped.

Figure 4.26 Alternative E – Nipomo Mesa Area Layout

4.4.5.1 Alternative Demands

Table 4.21 below lists the range of demands by end user and delivery method for Alternative E. The total demand volume ranges from 1,805 to 1,905 AFY or approx. 1.6 to 1.7 mgd given the outfall capacity of approx. 1.7 mgd. Treated water would be provided through direct delivery to Nipomo CSD while S. SLO County users' treated water would be delivered and transferred via the Lopez Pipeline. Santa Barbara County could receive treated water transferred via the SWP.

Table 4.21 Alternative E – Nipomo Mesa Refinery Area Terminal Demand Volumes

End User	Volume (AFY)	Offset Category	Delivery Method
Nipomo CSD.	500	Supplemental.	Direct Delivery.
Avila Beach CSD.	80	Supplemental/Lopez Offset.	Transfer via Lopez.
City of Grover Beach.	200	Lopez Offset.	
City of Arroyo Grande.	525	Lopez Offset.	
City of Pismo Beach.	400	Lopez Offset.	
Oceano CSD.	100	Lopez Offset.	
Santa Barbara County.	100	Supplemental.	Transfer via New Pipeline → SWP.
Total	1,805 – 1,905 AFY(1) (1.6 -1.7 mgd)		

Notes:
(1) Existing hydraulic capacity available for Nipomo Mesa Refinery outfall pipeline, if the demands for Santa Barbara are omitted, the other end users' delivery volumes can be increased.

4.4.5.2 Treatment and Conveyance Infrastructure

Alterative E includes a new subsurface intake pipeline with a total length of approx. 2.9 miles that would extend offshore, near the existing Refinery. The proposed subsurface intake pipelines would need to be installed by a trenchless technology to limit impact to the protected plant habitat located directly west of the site, see Figure 4.27 (Alternative E – Nipomo Mesa Refinery Area Site Constraints). All extracted ocean water from this intake pipeline would be conveyed to a centralized desalination facility using RO treatment technology that is onsite at the refinery. The facility could potentially have a total plant footprint of 7 acres and a production capacity up to 1,905 AFY (or 1.7 mgd) which is limited by the hydraulic capacity of the existing outfall pipeline. ROC produced at the desalination facility would be discharged through the existing Santa Maria Refinery ocean pipeline with a new outfall diffuser installed.

A total of approx. 18 miles of distribution piping would convey treated, desalinated water to the alternative's end users listed in Table 4.21 above. A main transmission line of approx. 3 miles in length would transmit water from the desalination facility and branch off to distribute end users' demands. Approx. 9 miles of pipeline would be routed east of the facility to Nipomo, where the pipeline would branch off for another 1 miles, connecting to the Coastal Branch Pipeline, through which Santa Barbara County demands would be transferred and delivered from. The pipeline would then branch off another 0.5 miles to deliver demands to Nipomo CSD, utilizing as much existing infrastructure as possible. North of the facility, an approximate 5-mile long pipeline would connect near Arroyo Grande to the Lopez pipeline for S. SLO County users to be transferred and delivered demands from.

4.4.5.3 Environmental Impact Evaluation

Figure 4.27 on the next page shows the Alternative E layout overlain with the aquatic-based and land-based environmental constraints present. Alternative E would utilize the existing Nipomo Mesa Refinery site to limit environmental impact and take advantage of the brownfield site. The site is currently being decommissioned, and the County is currently overseeing the environmental process through decommissioning. Alternative E is located near the 100-year FEMA Flood Zone. Directly west of the site are wetland habitats, conservation easements, sensitive resources areas, and lands protected for open space (i.e., Oceano Dunes State Vehicular Recreation Area). The wetland habitats include protected species (i.e., Tidewater Goby) which will require extensive biological surveys during the permitting process. Furthermore, the conservation easement west of the site includes the protected plant species, La Graciosa Thistle, which will significantly limit disturbances during development and require installation of the subsurface intake piping to use a trenchless technology for construction (e.g., Horizontal Directional Drill). The waters west of the existing refinery site are designated as a Chumash Heritage National Marine Sanctuary and similar to Alternative D will require additional permitting efforts for the subsurface intake construction and improvements to the existing ocean pipeline and installation of a diffuser section. Environmental mitigation costs associated with the project are included in the soft cost factors.

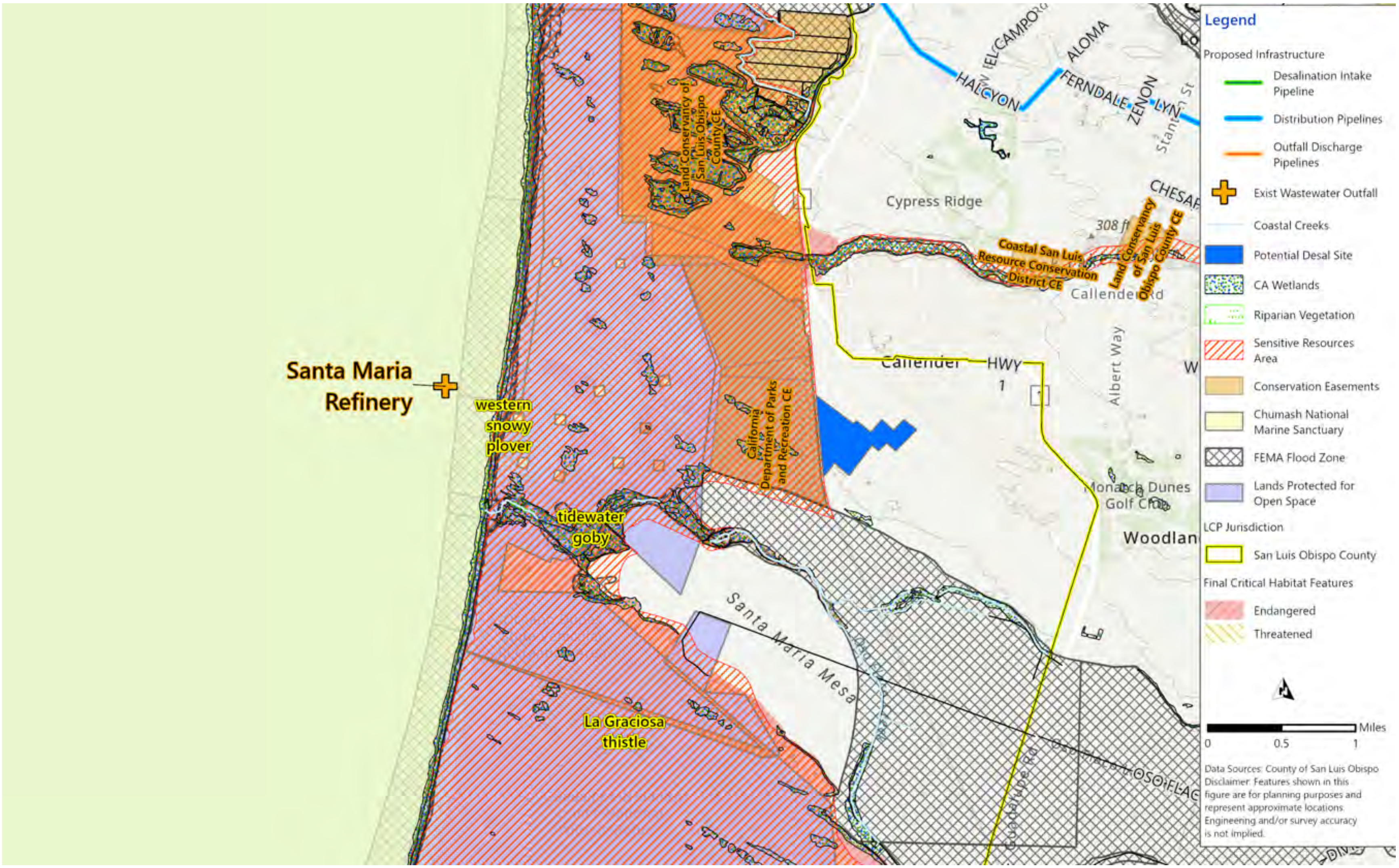


Figure 4.27 Alternative E – Nipomo Mesa Refinery Area Site Constraints

4.4.5.4 Estimated Cost

Capital costs for Alternative E are estimated at approx. $254.1M which includes $181.5M for construction and $72.6M for soft costs. The O&M costs for the Nipomo Mesa Area alternative are estimated at approx. $20.2M for both infrastructure and treatment facilities. The estimated planning level and O&M costs estimate of Alternative E are shown below in Table 4.22 and Table 4.23, respectively. The total project costs include both construction direct costs and soft costs.

Table 4.22 Alternative E – Nipomo Mesa Refinery Area Capital Costs

Project Component	Cost(1)(2)
Ocean Outfall Improvements	$6,250,000
Ocean Water Extraction Conveyance	$18,663,000
Subsurface Extraction Wells	$32,282,000
Brine Discharge Conveyance	$6,522,000
Treated Water Transmission Piping	$35,969,000
Treated Water Pump Stations	$10,458,000
Ocean Water Treatment Plant Costs	$71,350,000
Construction Subtotal	$181,494,000
Planning (5 percent)	$9,070,000
Engineering Design (10 percent)	$18,150,000
Environmental Permitting (10 percent)	$18,150,000
Administrative and Legal (5 percent)	$9,070,000
ESDC, Inspection, and Construction Management (10 percent)	$18,150,000
Soft Costs Subtotal	$72,590,000
Total Capital Costs	$254,084,000

Notes:
(1) All costs include: Rounded up to nearest $1,000, 30 percent construction contingency, SLO County sales tax of 7.25 percent applied to 50 percent of costs, and 15 percent contingency applied for contractor overhead, markup, and general contractor costs.
(2) Costs are presented in January 2026 Dollars.

Table 4.23 Alternative E – Nipomo Mesa Refinery Area Annual Costs

Component	Annual Cost (Million $)
Treatment Annual O&M Cost	$14.6
Infrastructure Annual O&M Cost	$5.7
Estimated Annual O&M Cost Subtotal	$20.2
Estimated Total Project Annual Cost(1)	$31.6
Estimated Unit Cost(2)(3)	$13,071 $/AF

Notes:
(1) Total estimated project annual costs do not account for inflation over the life cycle of the project and account for present day annual costs at year one of the project life cycle.
(2) Finance terms include 2.5 percent inflation rate, 3.25 percent discount rate.
(3) Estimated Project Annualized Unit Cost based on estimated demand of 1,905 AFY.

4.5 Alternatives Summary and Comparison

Table 4.24 below summarizes the Alternative A – E costs. Based on the cost estimates, the smallest producing alternatives have the lowest cost due to having the least amount of infrastructure and larger alternatives have the largest costs due to having the most infrastructure. The smallest alternative, Alternative A, has the highest annualized unit cost compared to the Alternative D having the lowest. This is due to economies of scale in the treatment costs as well as the length of infrastructure associated with each alternative. Comparing Alternative C and D, Alternative C has a comparable treatment facility cost even while producing approx. 300 AFY more, however Alternative D has a much lower treated water transmission main cost, ultimately lowering the total annualized unit cost.

Table 4.24 Summary of Alternatives Cost Estimates

Project Component	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E
Total Project Cost	$178,593,000	$261,045,000	$544,627,000	$482,567,000	$254,084,000
Annual O&M Costs	$10,049,000	$14,756,000	$63,818,000	$55,497,000	$20,244,000
Total Supply, AFY	580	1,055	7,135	6,825	1,905
Annualized Cost $/AFY	$23,875	$19,344	$10,020	$9,150	$13,071

Table 4.25 on the next page provides a detailed comparison between each alternative. Note in general, all project alternatives are within, nearby or adjacent to a land based environmental resources. The coastal region of SLO County includes a diverse array of sensitive habitats, rich cultural resources, and protected lands. Also all projects are either nearby or adjacent to a sensitive aquatic resource, whether that is adjacent to a marine protected area, a State marine recreational area, or a national marine sanctuary. Lastly, across all alternatives, project infrastructure includes the same treatment technology or installation method as described in Section 4.2.4 (Infrastructure and Treatment Technology). The larger Alternatives C and D include significantly more pipeline spanning a greater region of SLO County. The larger alternatives are also closer to regional infrastructure, expanding the alternatives' potential delivery capacity. Given these are ocean desalination projects in California, the size of the projects, and the sensitive nature of the region, all project alternatives will have a complex permitting effort from multiple regulating agencies. This is described in further detail in Chapter 7 (Environmental Considerations) and Chapter 8 (Legal and Institutional Requirements).

Table 4.25 Alternatives Comparison

	Alt. A – Cambria Area	Alt. B – Cayucos/Estero Marine Terminal Area	Alt. C – Morro Bay Area	Alt. D – S. SLO County WWTP Area	Alt. E – Nipomo Mesa Area
Production Volume.	▪ 330 – 580 AFY.	▪ 930 – 1,055 AFY.	▪ 5,855 – 7,135 AFY.	▪ 5,070 – 6825 AFY.	▪ 1,805 – 1,905 AFY.
DESAL Plan Partners or Potential End Users.	▪ Cambria CSD. ▪ San Simeon CSD.	▪ Los Osos CSD. ▪ Cambria CSD. ▪ San Simeon CSD. ▪ Morro Bay area (optional).	▪ Cambria CSD. ▪ San Simeon CSD. ▪ Los Osos CSD. ▪ City of San Luis Obispo. ▪ Cal Poly. ▪ Avila Beach CSD. ▪ City of Arroyo Grande. ▪ City of Grover Beach. ▪ City of Pismo Beach. ▪ Oceano CSD. ▪ Templeton CSD. ▪ San Luis Valley Groundwater Basin. ▪ Santa Barbara County (optional). ▪ City of Morro Bay (optional).	▪ Avila Beach CSD. ▪ City of Grover Beach. ▪ City of Arroyo Grande. ▪ Oceano CSD. ▪ City of Pismo Beach. ▪ Northern Cities Management Area. ▪ Nipomo CSD. ▪ Nipomo Mesa Management Area. ▪ Los Osos CSD. ▪ City of San Luis Obispo. ▪ San Luis Obispo Valley Groundwater Basin. ▪ Cal Poly. ▪ Templeton CSD.	▪ Nipomo CSD. ▪ Avila Beach CSD. ▪ City of Grover Beach. ▪ City of Arroyo Grande. ▪ City of Pismo Beach. ▪ Oceano CSD. ▪ Santa Barbara County (optional).
Addressing Critical Needs.	▪ Supplemental Supply. ▪ Direct deliveries to offset drought-stricken supplies. ▪ Water Supply portfolio diversification. ▪ Helps alleviate water supply connection moratorium.	▪ Supplemental Supply. ▪ Direct deliveries to offset drought-stricken supplies. ▪ Water Supply portfolio diversification for North Coast. ▪ Support seawater intrusion prevention by offsetting groundwater use at Los Osos. ▪ Potential for regional deliveries if Morro Bay included.	▪ Provides additional water supply to most of County. Using existing regional infrastructure to increase geographic footprint. ▪ Direct deliveries to offset vulnerable supplies. ▪ Ability to exchange with North SLO County users during normal periods to support sustainability goals. ▪ Exchange potential with Santa Barbara County.	▪ Provides additional water supply to most of County. Using existing regional infrastructure to increase geographic footprint. ▪ Direct deliveries to offset vulnerable supplies. ▪ Ability to exchange with North SLO County users during normal periods to support sustainability goals.	▪ Provides additional water supply to most of South County users. ▪ Direct Deliveries to offset vulnerable surface water supplies. ▪ Support seawater intrusion prevention by offsetting groundwater use in S. SLO County. ▪ Exchange potential with Santa Barbara County.
Blending Water Available with Existing Outfall.	▪ No dilution water available since a new outfall required. ▪ Requires new ocean outfall. Additional brine conveyance pipeline needed to avoid MPA (see figure 4.20 and 4.21).	▪ Existing outfall that has been recently retrofitted with a new diffuser section and pipeline available and nearby. ▪ Blend with treated wastewater currently discharged to promote dilution.	▪ Existing outfall with a high hydraulic capacity available. Likely new diffuser required. ▪ Blend with treated wastewater currently discharged to promote dilution.	▪ Existing outfall with a high hydraulic capacity available. Likely new diffuser required. ▪ Blend with treated wastewater currently discharged to promote dilution.	▪ Existing outfall with low hydraulic capacity available. Will require pipeline rehabilitation and diffuser installation. ▪ No dilution volume available.
Environmental Impact (Land Based).	▪ High concentration of protected lands and conservation easements. ▪ FEMA Flood zone nearby. ▪ Protected plant and animal habitats. ▪ Sensitive resources area due to historical significance. ▪ Moderate potential cultural resources impact. ▪ Steep terrain and designated scenic area. ▪ Existing power transmission close.	▪ High concentration of protected lands and conservation easements ▪ FEMA Flood zone nearby. ▪ Protected plant and animal habitats. ▪ High potential cultural resources impact ▪ Designated scenic area. ▪ Steep terrain. ▪ Existing power transmission nearby.	▪ Limited space due to existing development. ▪ Low impact areas are inland due to flood hazards. ▪ Known FEMA Flood zone nearby. ▪ Protected plant and animal habitats. ▪ Site specific habitats nearby (estuarine). ▪ High Potential cultural resources impact. ▪ Designated scenic area. ▪ Existing high power transmission close.	▪ Limited space due to existing development. ▪ Low concentration of protected lands and conservation easements. ▪ Known FEMA Flood zone nearby. ▪ Protected plant and animal habitats. ▪ Site specific habitats nearby (estuarine and wetlands). ▪ Moderate potential cultural resources impact.	▪ Brownfield site previous industrial facility. ▪ Some protected lands and conservation easements. ▪ Known FEMA Flood zone nearby. ▪ Very sensitive plant species directly adjacent. ▪ Protected plant and animal habitats. ▪ Site specific habitats nearby (estuarine and wetlands). ▪ Low potential cultural resources impact

	Alt. A – Cambria Area	Alt. B – Cayucos/Estero Marine Terminal Area	Alt. C – Morro Bay Area	Alt. D – S. SLO County WWTP Area	Alt. E – Nipomo Mesa Area
Environmental Impact (Aquatic Based).	▪ No infrastructure improvements are allowed in Cambria State Marine Protected area. ▪ California Sea Otter Game refuge. ▪ Kelp canopy and rocky reef habitats present. ▪ Low presence of costal hazards (tsunami inundation, erosion, or high tide flooding). ▪ Cliff beach access.	▪ Coastal hazards (tsunami inundation, erosion, high tide inundation). ▪ Low presence of reported kelp canopy and rocky reef habitats.	▪ Coastal hazards (tsunami inundation, erosion, high tide flooding). ▪ Morro Bay State Marine Reserve. ▪ Morro Bay State Marine Recreational Management Area. ▪ Low presence of reported kelp canopy and rocky reef habitats.	▪ Coastal hazards (tsunami inundation, erosion, high tide flooding). ▪ Chumash Heritage National Marine Sanctuary. ▪ Low presence of reported kelp canopy and rocky reef habitats.	▪ Coastal hazards (tsunami inundation, erosion, high tide flooding). ▪ Chumash Heritage National Marine Sanctuary. ▪ Low presence of reported kelp canopy and rocky reef habitats.
Operational Complexity.	▪ Simple operational complexity since there are no paper exchanges or utilization of existing regional infrastructure. ▪ Could possibly co-mingle San Simeon and Cambria CSD treated wastewater in a new outfall to promote dilution.	▪ Simple operational complexity if use of existing regional infrastructure. If not, contractual exchanges with Coastal Branch pipeline could be challenging.	▪ Very complex. Deliveries using multiple different regional infrastructure systems for direct deliveries and paper exchanges. See Table 4.12.	▪ Very complex. Deliveries using multiple different regional infrastructure systems for direct deliveries and paper exchanges. See Table 4.15. ▪ Potential co-location opportunity with S. SLO County WWTP.	▪ Moderately complex. Must tie into Lopez pipeline system to make deliveries to S. SLO County end users. ▪ Potential connection to Coastal Branch pipeline, however can rely on existing nexus with Lopez.
Other.	▪ Alternative technology could be considered given the size. ▪ Project could be a standalone satellite facility. ▪ Considerations for easy expansion or operational flexibility to increase capacity during severe droughts. ▪ Low volume poses low economy of scale.	▪ Difficult construction installing pipeline from Estero Marine Terminal Area to Cambria along Highway 1. ▪ Low cost to benefit for installing significant length of infrastructure for a relatively low delivery volume.	▪ Requires the most infrastructure to make deliveries. ▪ Most expensive alternative. ▪ Little community interest in siting a new treatment facility near Morro Bay Area.	▪ Requires significant length of infrastructure to make deliveries. ▪ Lowest unit cost, highest economy of scale. Able to deliver highest amount of water for lowest cost.	▪ High interest in utilizing existing refinery brownfield site. ▪ Requires trenchless installation of intake pipeline or requires much more intake pipeline. ▪ Requires moderate length of infrastructure to make any delivery (isolated area).

4.6 Description of Alternatives Technology

There has been recent development in alternative technologies in the ocean desalination industry. Companies such as Oneka, Waterise, Seawell, and OceanWell offer non-traditional ocean desalination technologies that could provide alternative means to producing drinking water from the ocean. All four companies' technologies claim to have decreased energy consumption, claim to be more environmentally friendly, and be less expensive than traditional desalination. While all of these alternative technologies are still in pilot phases, they could become commercialized in the future. None of them have any large scale commercial installations or operational histories.

All alternative technologies still require post treatment stabilization, disinfection, and conveyance infrastructure all onshore. Like conventional desalination, all alternative desalination technologies utilize a reverse osmosis process. While each supplier advertises use of no chemicals, they are referring only to use of chemical in maintaining the RO process. Each desalination technology is modular and scalable, having the potential for additional units to be added to increase total water production capacity. For comparison purposes, the smallest RO train included in project alternatives A through E was 0.5 mgd (500,000 gallons per day [gpd]) while the alternative technology single modular units ranged from 264 gpd to 1 mgd.

Each of the technologies would need to undergo a significant studies and CEQA evaluation to determine impacts related to the infrastructure located in the ocean including moorings, sea floor powerlines, and water lines to bring treated water onshore. A discussion of each technology is provided in the following sections based on equipment suppliers' literature on their websites and discussions held with each technology in 2025.

4.6.1 Oneka Technologies

Oneka Technologies (Oneka) uses wave energy to convert seawater into freshwater. Oneka claims sustainability features such as emitting zero carbon dioxide emissions, consuming zero electricity, and requiring zero land space to function and zero chemicals in its desalination process. Figure 4.28 on the next page shows an example of an Oneka buoy. Each buoy is required to be moored to the seafloor. The Oneka system is modular and scalable, the volume of water it produces can be altered by removing or adding units and are carried out by Oneka.

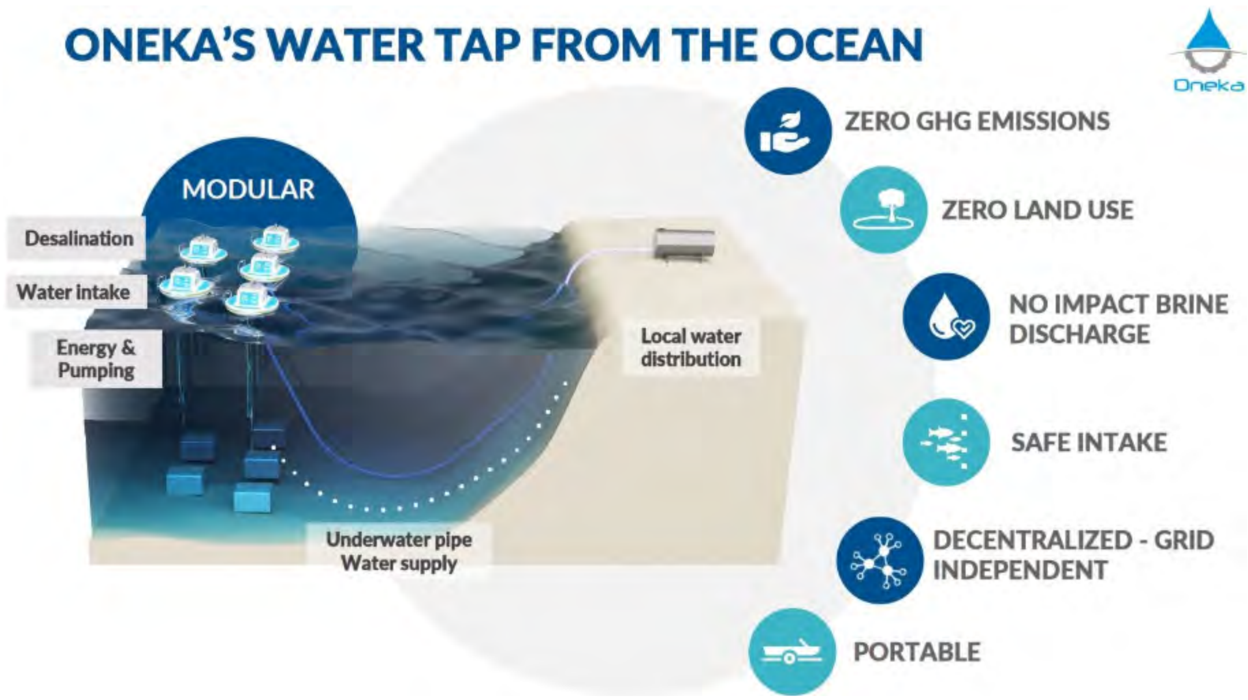


Figure 4.28 Oneka Technologies Bouy

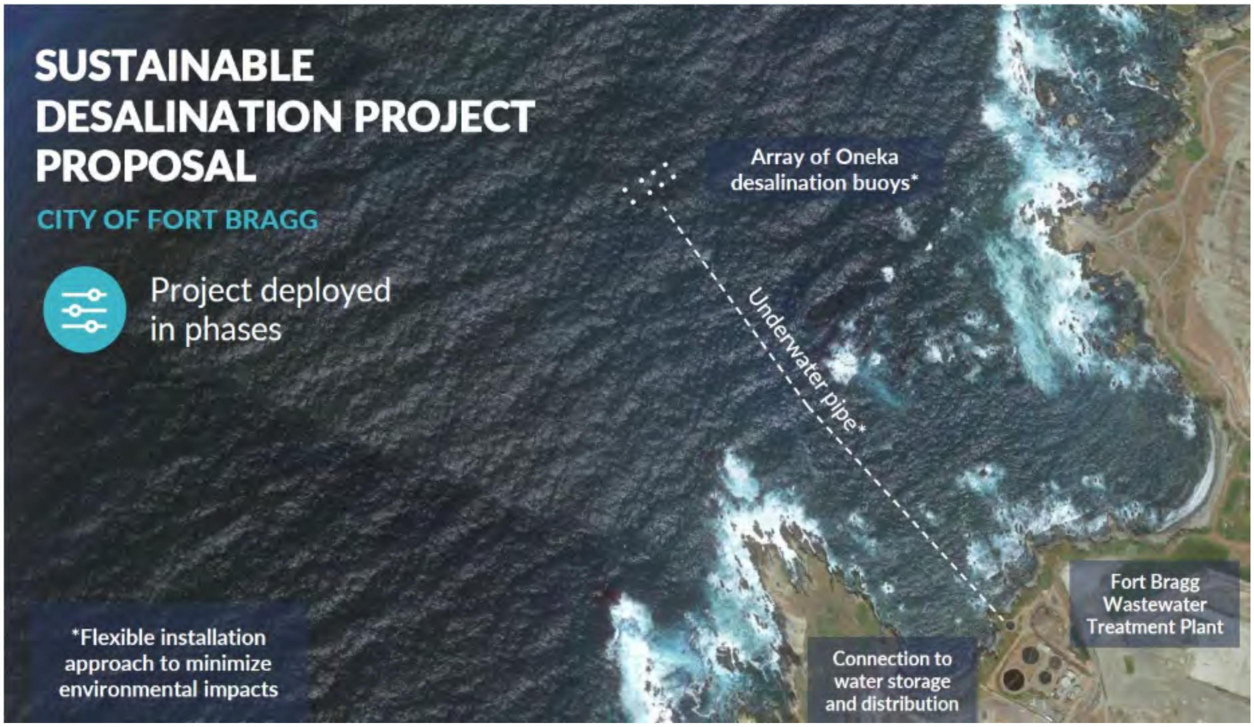
4.6.1.1 Description of Technology

Oneka uses reverse osmosis (RO) membranes to turn seawater into potable freshwater. Oneka produces brine that is approx. 30 percent to 50 percent higher than normal ocean salinity levels. Each Oneka buoy has an inlet for seawater and outlet for brine, which allows the brine to passively spread over a wide area and dilute rapidly being on the ocean water surface. The brine is discharged in low volumes near the ocean's surface which allows for the brine to mix as it falls through the water column. Within 50 feet of the discharge point, Oneka claims the brine has diluted to near-ambient salinity. Sufficient wave energy is needed to pressurize the seawater to force it through the RO membranes and convey it to the shoreline. The resulting permeate remains pressurized as it travels to shore.

Oneka offers various desalination units, the P-class unit, IceCube unit, and Iceberg unit. The P-class unit has been developed for deployment at pilot project demonstration sites. IceCube class buoys were developed to be rapidly deployed for humanitarian and disaster relief purposes. The IceCube class buoys have a capacity of 1 cubic meters (m^3) (approx. 264 gallons) per day per unit and the Iceberg units can produce up to 50 m^3 (approx. 13,200 gallons) per day.

4.6.1.2 Oneka Pilot Study

The City of Fort Bragg (Fort Bragg) is located along California's North Coast in Mendocino County. After experiencing water reliability concerns due to severe droughts in California, Fort Bragg partnered with Oneka to conduct a pilot study of their desalination technology. Figure 4.29 shows a schematic layout of the pilot. Fort Bragg was awarded a grant of $1.49M from the California Department of Water Resources for this pilot study. Fort Bragg plans to install Oneka's Iceberg class unit to treat brackish or saline waters at a diversion point approx. 4.5 miles upriver from the Noyo River mouth. The single Iceberg class unit will produce an average of 13,200 gpd or 0.013 mgd for 12 months. During this period, the environmental impact and operational parameters of the Iceberg unit's operation will be monitored to support permitting for a future array of units to provide a utility-scale water supply.



Source: City of Fort Bragg

Figure 4.29 Oneka Seawater Desalination Buoy Pilot Study

The Initial Study/Negative Declaration (IS/MND) for the Fort Bragg Desalination Buoy Pilot Project was approved by the City's Planning Commission on May 28, 2025. The State Lands Commission (SLC) approved the lease application on August 21, 2025. The California Coastal Commission (CCC) approved the Coastal Development Permit for the Fort Bragg-Oneka Wave Powered Desalination Buoy pilot study on December 11, 2025. Fort Bragg and Oneka pursued a two-tier permitting strategy, which was temporary permits for the pilot and traditional, for long term permits and a larger deployment of units. Agencies working on the permits include the Department of Fish and Wildlife, State Lands Commission, United States Army Corps of Engineers (USACE), CCC, and United States Coast Guard (USCG). Examples of required studies for permitting include an entrapment study, benthic habitat survey, subsurface intake feasibility, brine discharge technology empirical study, essential fish habitat assessment and a sensitive species survey. On April 30, 2026, Oneka announced that it had obtained all necessary permits from all regulatory agencies to move forward with the pilot project.

The ideal distance of the Iceberg unit from the shoreline is less than one mile. Fort Bragg decided to locate the Iceberg unit 0.5 miles offshore after considering pumping efficiency, ambient wave energy, water depth needed for brine dispersion, and minimization of visual impacts from land. This distance allows for freshwater to be delivered to shore without exceeding the system's pumping capacity or requiring additional pumping powered by non-wave powered energy. At this location, the water depth is optimal for the unit to be able to use wave energy without being in the dominant surf zone, where it could be damaged by the breaking waves. In addition to this, the site was selected so that the mooring system could be placed in an area dominated by soft-bottom habitats. For the pilot study, the Iceberg unit will be moored to a depth of 80 feet to provide enough water depth for the brine to mix and dilute before contacting the seafloor. Conveyance pipeline alignment along the ocean floor was planned to follow existing, previously disturbed habitat from the Fort Bragg Wastewater Treatment Plant's outfall. The pipeline will lead to a permeate receiving point at the Fort Bragg Wastewater Treatment Plant's fenceline and extend into the plant to an in-plant discharge point. The permeate will be routed back to the ocean through the plant's existing outfall. The pipeline will also contain valving which will allow for the permeate to be collected for testing and potential alternative, non-potable uses.

The Iceberg buoy is designed to operate continuously throughout the 12-month pilot test period and produce permeate constantly. Planned maintenance activities or extreme sea conditions, such as hurricanes, typhoons, and tsunamis, will result in a temporary removal of the device. Once maintenance has been completed or extreme sea conditions have subsided, the Iceberg buoy will be moved back to resume permeate production. The permeate that will be pumped to shore will not be used as potable water but may have other potential uses. Before any permeate can be used, it will be tested in accordance with California Division of Drinking Water standards. After testing, Fort Bragg will evaluate the results to determine if the water is suitable for non-potable uses and potentially replace the use of potable water in watering City-owned vegetation, washing down equipment and surfaces at the wastewater treatment plant, and other applications (Fort Bragg, 2026).

Fort Bragg contracted Oneka for technical support in the operation and maintenance of the Iceberg unit. The Iceberg unit uses a new technology that does not incorporate standard water plant operator criteria as certified under the Drinking Water Operator Certification Program. Oneka intends to maintain a project staff of three operations personnel on site in Fort Bragg to facilitate rapid responses to the Iceberg, if necessary. The team includes an operator/technician, field service engineer, and operations coordinator.

4.6.1.3 Requirements and Limitations

For Oneka's buoys to be deployed and function successfully a minimum daily water requirement of at least 500 m^3 (132,086 gallons) is necessary. The Oneka buoy network needs to be deployed 0.2 to 5 kilometers (km) (approx. 656 to 16,404 feet) from the coastline. Each unit needs to be separated by 20 to 50 meters (approx. 66 to 164 feet) in distance. The buoys need to be deployed at a depth of 13 to 30 meters (approx. 43 to 98 feet). The buoys require a minimum average wave height of 1.5 meters (approx. 5 feet). Given the production and the spacing, for the smallest to the largest project alternatives (A to C) would need an estimated 40 to 482 buoys, respectively (assuming the Iceberg unit) to meet the demands of the project alternatives under consideration at a footprint in the ocean of 22 to 250 acres as well.

4.6.1.4 Cost

Currently there is no cost information available for the Oneka system at a commercial scale, however through discussions with Oneka, they offer flexible operational and purchase agreements for potential end users to consider.

4.6.2 Waterise

Waterise uses subsea technology combined with membrane desalination to provide drinking water. The Waterise system utilizes features from the subsea gas and oil industry to utilize deep sea pressure and conditions to facilitate treatment.

4.6.2.1 Description of Technology

Waterise system combines existing RO technology using deep ocean conditions to facilitate treatment. Placing units deep in the ocean uses the natural hydrostatic pressure of water at 400 meters (approx. 1312 feet) to feed reverse osmosis membranes. Waterise's subsea modules have a production capacity of 50,000 m^3 (13,208,603 gallons) per day. Its systems are placed on the seabed approx. 400 meters (approx. 1312 feet) below sea level. The deployment of multiple modules at the same site can achieve larger water production capacities. The plant is connected by an "umbilical connection", which is a cable that provides electricity, communication to the facility and conveys filtered water back to land. The distance between the shoreline and the unit is dependent on when 400 meters (approx. 1312 feet) of depth can be achieved. A typical configuration of the Waterise system is shown in Figure 4.30 below.

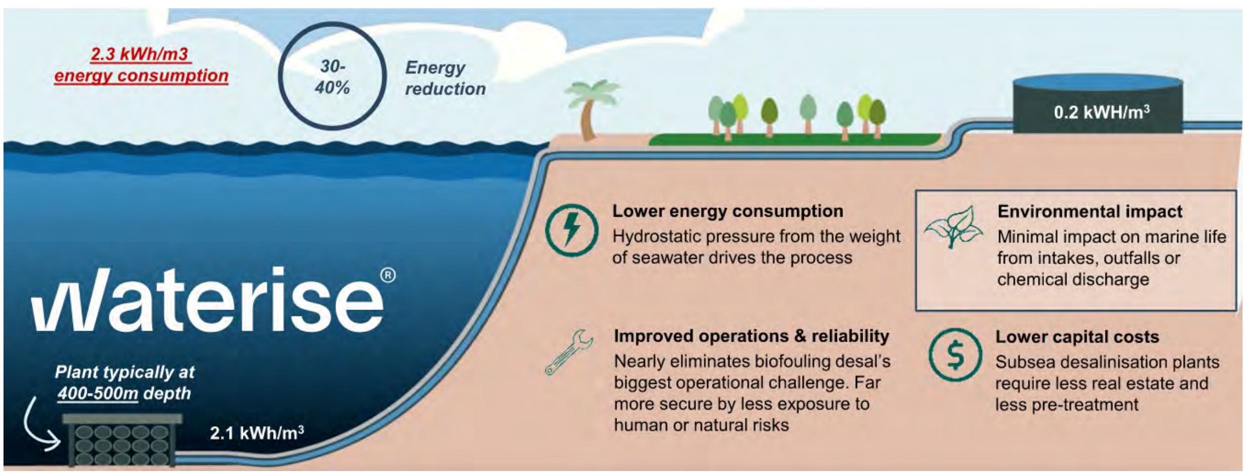


Figure 4.30 Typical Waterise Configuration

Waterise claims raw ocean water at this depth avoids algal blooms, jellyfish, or other contaminants, which can reduce land-based desalination plants water availability therefore annual downtime is very low and eliminates the need for chemical pre-treatment. Similar to other alternative desalination technologies, minimal land impact is claimed, however post treatment stabilization, disinfection and storage are still required and not included in the Waterise technology.

4.6.2.2 Requirements and Limitations

A challenge involved with utilizing Waterise's technology is locating an area for plant placement at 400 meters of depth while remaining close enough to the shoreline to maintain its energy efficiency. The Central Coast shoreline is shallow and gradually decreases, therefore, to achieve a depth of 400 meters below the ocean water surface would require 10 to 20 miles of umbilical conduits and piping. Furthermore, being at such a depth would require special diving equipment, personnel and monitoring to maintain.

4.6.2.3 Estimated Costs

Currently there is no cost information available for the Waterise system at commercial scale. Waterise offers a build-own-operate transfer model to potential end users.

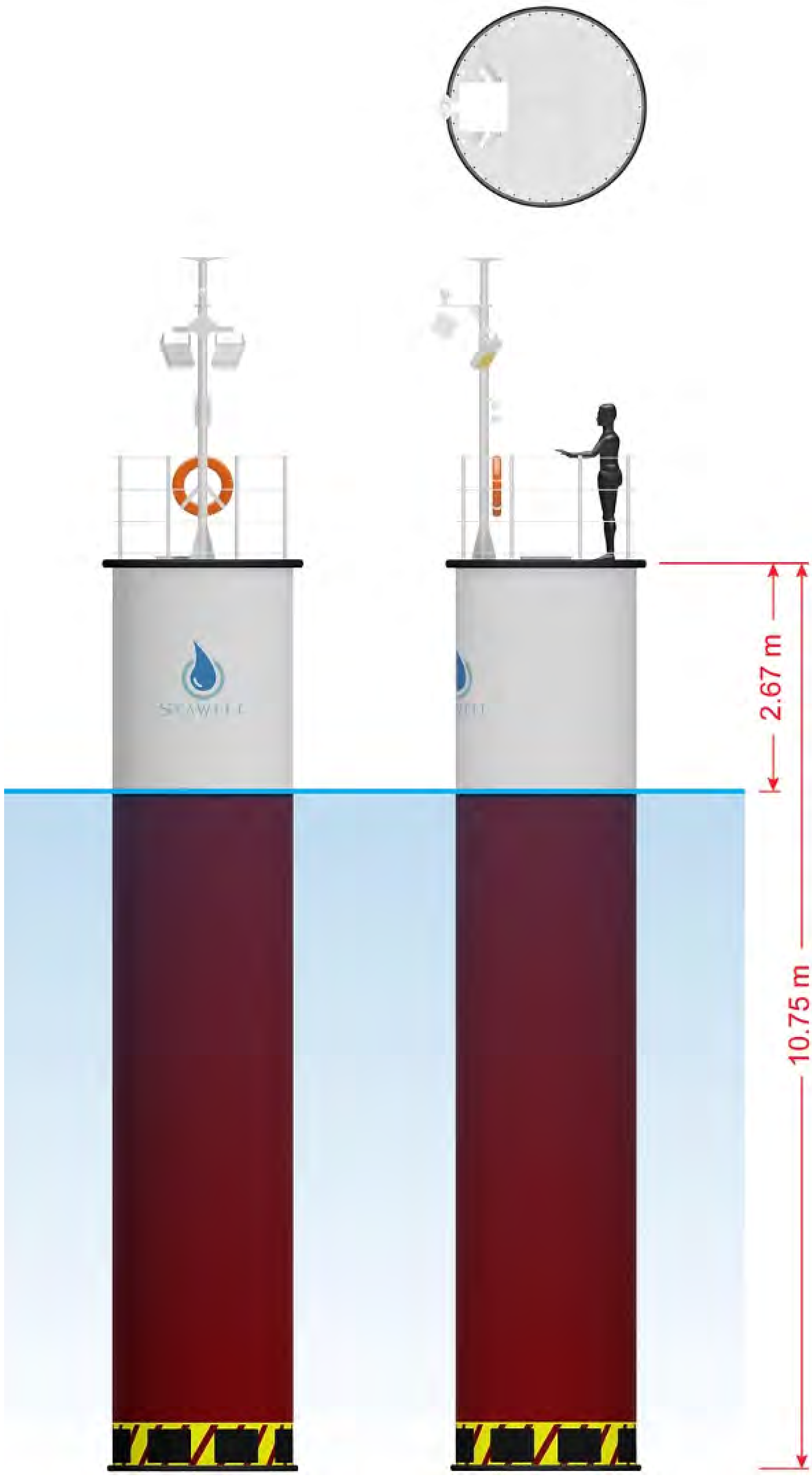
4.6.3 Seawell

Seawell offers a desalination system that can desalinate ocean water and transport the produced freshwater back to shoreline. Seawell is another buoy style alternative technology that resides close to the coast and sits both above and below the ocean water surface.

4.6.3.1 Description of Technology

Seawell's SW-15 buoys are moored offshore and can produce 15 m^3 of freshwater per hour or approx. 100,000 gpd. The SW-15 vessel has a vertical tubular buoy configuration, which allows it to maintain stable operation during extreme sea conditions with minimal motion, see Figure 4.31 on the next page. The SW-15 can also be moved if a change of location is needed. The buoy's offshore mooring reduces the need for extensive onshore development; however, post treatment stabilization, disinfection, and conveyance infrastructure are still needed on shore. The buoy can be deployed at a water depth of 15 meters (approx. 49 feet) or greater. The SW-15 buoys are modular, allowing for units to be added as needed to increase freshwater output.

The seawater intake is located at the bottom of the buoy. The intake has wedge wire screens with 1-millimeter openings to reduce the velocity of incoming water and limit the entrainment and impingement of marine life. The water passes through a series of filters before entering the RO membranes. Brine from the RO membranes is 43-54 percent saltier than seawater and is discharged near the water surface. Since the brine is released high in the water column where the highest current velocities are, the brine can mix naturally. This approach avoids the discharge of concentrated, high-density brine which can result in toxic sea floor pooling. Modeling performed by Seawell indicated that the brine does not descend a great distance before its salinity level comes close to ambient seawater salinity. Additionally, SW-15 buoys do not use or transport any chemicals in their desalination process. The system performs periodic backflushing to clean its filters and therefore does not require any chemicals for cleaning.



Source: Seawell

Figure 4.31 Diagram and Dimensions of the Seawell SW-15 Buoy

High-pressure pumps push the water through the RO membranes, and the produced freshwater is transported to shore through a small diameter pipe with gravity anchors. When this pipeline reaches the shore, it can connect to the treatment module that is configured to match the customer's water requirements. The unit's treated water is transported to Seawell's onshore facility, the "Water Station". The post-treatment module disinfects the water, adjusts the pH, and remineralizes the desalinated water to meet drinking water standards and ensure compatibility with the customer's distribution system. The SW-15 unit is designed to be adaptable to intermittent energy sources such as wind, solar, and marine renewable energy systems, see Figure 4.32 below.

Source: *Seawell*

Figure 4.32 Desalination Process of the Seawell SW-15 Buoy

4.6.3.2 Pilot Study

In 2024, Seawell planned to conduct a pilot project offshore of the Vandenberg Space Force Base in Santa Barbara. The goal of the project was for Seawell to provide drinking water to the US Space Force facility and create a dependable supply of water, which is critical to launch processes. In November 2023, Seawell began testing a smaller version of its buoy at the Deep Ocean Simulation Facility. This basic operational testing was to last three months but can potentially be extended by another six months. The Vandenberg Seawell project is expected to be located offshore of Vandenberg's first space launch complex from the 1950's, which is currently inactive. Its proximity to the shoreline is ideal for repurposing the launch pads for the Seawell project. Currently, as of July 2026, the status of this pilot project is unknown.

4.6.3.3 Requirements and Limitations

Like the other buoy style moorings, they are modular systems that can be grouped together to develop a treatment farm that can convey permeate to a land base post treatment processing and conveyance facility. Given the estimated capacity of 100,000 gpd (0.1 mgd), for the smallest to largest alternatives, approx. five to 15 systems would be needed, respectively. There is no information on the required spacing, therefore the required footprint for install is unknown.

4.6.3.4 Estimated Costs

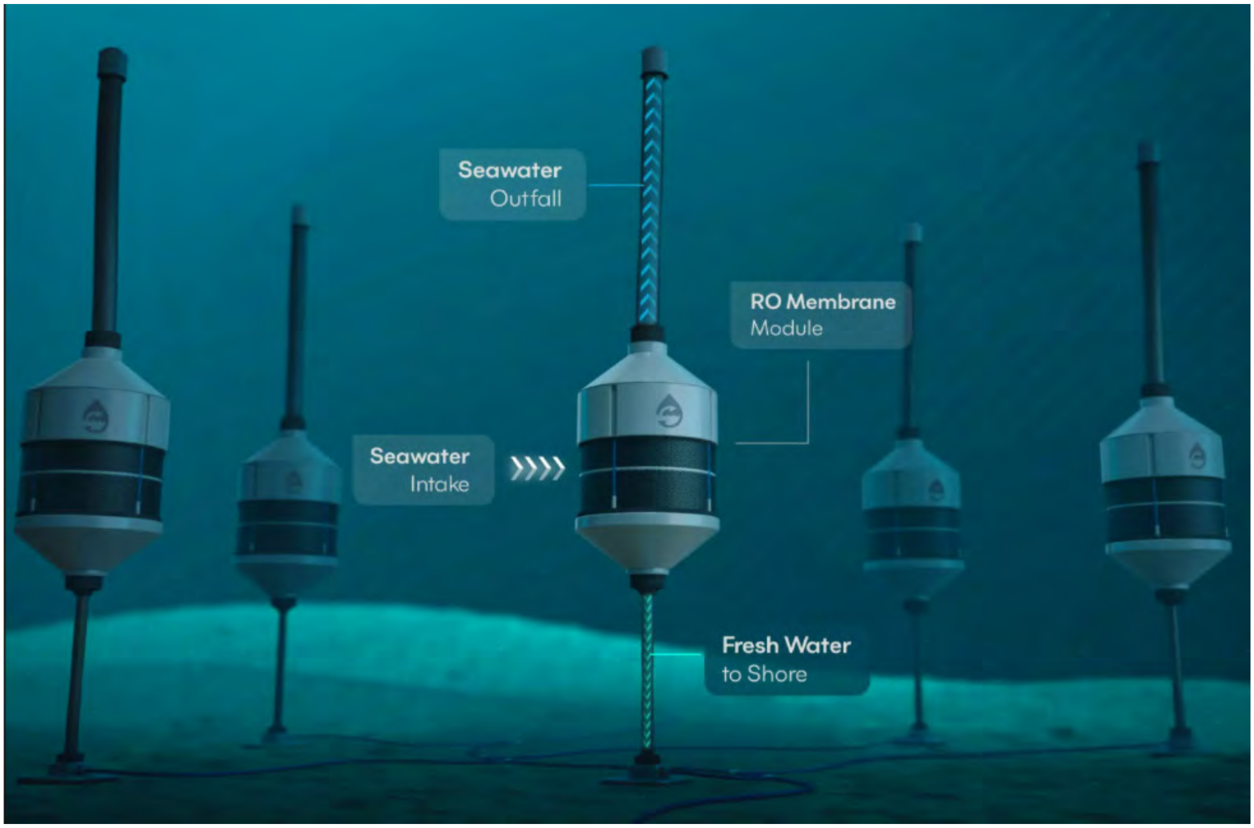
Currently there is no cost information available for the Seawell system at commercial scale, however Seawell does offer flexible agreements with potential end users such as, but not limited to, build-own operate transfer or power purchase agreements.

4.6.4 OceanWell

OceanWell's underwater desalination system consists of clusters of pods and is placed on the sea floor. Pods can work alone or in groups. OceanWell pods are designed to integrate water industry standard reverse osmosis membranes and are designed to remove salt, PFAS, pesticides, microplastics, bacteria, and viruses. Its desalination process does not use any chemicals or produce a strong brine concentration. OceanWell's desalination system claims to use 40 percent less energy than traditional desalination, due to utilizing natural pressure to drive its process similar to Waterise. OceanWell's water farm location on the sea floor protects it from adverse weather events, floods, and algae blooms, and allows it to reliably generate a high quality supply of freshwater.

4.6.4.1 Description of Technology

OceanWell's desalination system consists of subsea pods that use the natural hydrostatic pressure that is found at 400 meters (1,300 feet) below sea level to power the RO process and efficiently produce fresh water. Each OceanWell pod can produce at least 1 million gallons of freshwater per day. Since OceanWell operates by using pressures at 400 meters, its outfall brine is claimed to have a lower salinity being only 5 percent higher than ambient ocean water salinity levels. Additionally, the brine discharge is dispersed through risers on the pod which sends it to strong, deep-water currents. This causes the brine to rapidly mix and diffuse to ambient salinity. The size of the riser depends on the discharge point's distance to the local currents needed for brine diffusion. Each pod in a water farm pumps the freshwater it produces to a common manifold, from there, the freshwater is conveyed to shore in a single underwater pipeline. A typical OceanWell farm is shown on the next page in Figure 4.33.



Source: https://www.lvmwd.gov/lv-x-oceanwell

Figure 4.33 Conceptual Illustration of an OceanWell Water Farm

4.6.4.2 Pilot Program

Las Virgenes Municipal Water District (LVMWD) is a public water agency in Southern California that serves over 75,000 people in western Los Angeles County. LVMWD imports 100 percent of its drinking water through the SWP, which travels more than 400 miles from the Sierra Nevada Mountains to reach its customers. Thus, LVMWD is affected when droughts occur and aims to diversify their water supply by finding local, drought-proof sources of water that aren't dependent on snowpack, rainfall, or state allocations. LVMWD chose to partner with OceanWell to test its ocean desalination technology and investigate its produced freshwater as a potential future water source. Their partnership has three stages: a reservoir pilot, an open-ocean demonstration, and then a full commercial water supply. OceanWell received 11 million dollars in Series A funding for its reservoir pilot and open-ocean demonstration in partnership with LVMWD. The reservoir pilot was launched in March 2025 at Las Virgenes Reservoir in Westlake Village, California.

The reservoir pilot involves testing a prototype in Las Virgenes Reservoir to monitor its environmental performance in highly biologically active, shallow water conditions, which is more challenging than in the deep sea. Freshwater will be produced from a submerged prototype at shallow depth and data will be collected on fouling rates and fluid mechanics over time. This program enables OceanWell to test certain aspects of the system and fine tune them over an extended period. From the data received from this test, OceanWell will prepare for its ocean-based trials before full commercial deployment.

4.6.4.3 Comparison to Traditional Desalination

Given the estimated capacity of 1,000,000 gpd (1.0 mgd), for the smallest to largest alternatives, approx. one to eight systems would be needed, respectively. There is no information on the required spacing, therefore the required footprint for install is unknown. The Central Coast shoreline is shallow and gradually decreases; therefore, to achieve a depth of 400 meters below the ocean water surface would require 10 to 20 miles of umbilical conduits and piping. Furthermore, being at such a depth would require special diving equipment, personnel and monitoring to maintain.

4.6.4.4 Cost

Currently there is no cost information available for the OceanWell system at commercial scale, however OceanWell does offer build own operate transfer programs for potential end users to consider.

4.7 Similar Viable Alternatives

As discussed in Chapter 2 (Problem and Needs), a variety of water supplies already exist within SLO County and each has its own unique vulnerabilities. Local surface water supplies are not anticipated to be expanded in the future and are likely to decrease from varying hydrological conditions and operational changes. A combination of regulatory enforcement and climate change is expected to reduce both available groundwater and surface water supplies in the future. Imported water from the State Water Project is both vulnerable to climate change and natural disasters, which results in varying delivery capacity from year to year due to current and projected hydrologic conditions.

Several agencies within SLO County are currently producing recycled water to offset potable water use. For example, Morro Bay's Water Resources Center is anticipated to increase the City's potable water supply through indirect potable reuse with recycled water. The City of SLO's Water Resources and Recovery Facility offsets potable water use through recycled water used for landscape irrigation. The volume of recycled water that can be produced is limited by remaining volume of wastewater effluent available, which is not at a volume sufficient to satisfy the region's needs. Furthermore, these water supply projects have been proposed as local only and do not offer any regional benefits. Beyond these local recycled water projects, there is no regional water supply project currently under consideration.

The alternatives presented in this chapter vary in water production from about 580 to 7,000 AFY depending on who is served and which alternative is implemented. Given the limited ability to expand existing raw and recycled supplies and the vulnerability of imported State Water, there is no comparable or practical alternative to Alternatives A to E that meets a similar demand and provides drought resilience region wide without relying on desalination.

CHAPTER 5 ECONOMIC ANALYSIS

Chapter 5 provides economic analyses for project concept alternatives, compares their advantages and disadvantages, and addresses what would happen in absence of a desalination project. A single preferred alternative has not yet been selected. Therefore, this chapter presents high level analyses of the economic considerations for the five alternatives presented in Chapter 4 (Description of Alternatives). If the District and/or Desalination Executable Solution and Logistics Plan partners (DESAL Partners) decide to move one or more of the alternatives forward, additional economic analysis of benefits of the specific alternative would be needed for a selected project. This chapter includes the following sections and a crosswalk of relevant sections per United States Bureau of Reclamation (USBR) WTR11-01 and TRMR-128 is shown in Table 5.1 below.

- **Section 5.1: Economic Analysis With and Without the Project** – This section includes a description of the region's current economic activity, and projections of how the presence or absence of the proposed desalination project would positively or negatively impact the region's economic activity and ability to meet water demands in the future.
- **Section 5.2: Comparison of Alternatives** – This section provides a comparison of the project alternatives' cost, partners served, supply benefit provided, waste discharged, tradeoffs, and considerations, as well as summarizing other water supply projects that are under consideration in the region.
- **Section 5.3: Quantified and Monetized Benefits** – This section discusses the benefits gained and harmful consequences avoided if one of the project alternatives were implemented.
- **Section 5.4: Benefits and Cost Comparison –** This section summarizes the economic benefits of implementing desalination and compares it with the cost of implementing the proposed desalination project.
- **Section 5.5: Qualitative Benefits –** This section lists the qualitative benefits received from implementing the proposed desalination project.

Table 5.1 Chapter 5 Crosswalk

WTR 11-01 Section 5 and TRMR-128 Section 2 ECONOMIC ANALYSIS			
Reclamation Manual Outline	Abbreviated Directives and Standards Section Title	Corresponding Report Location	Reclamation Manual Guidelines
5a and TRMR 128 2a	Conditions that exist and projection of future without the project as well as contributions plan could make toward meeting future water demand	Section 5.1	A description of the conditions that exist in the area and projections of the future, with, and without, the project that emphasize alleviation of economic problems and meeting future water demand.

WTR 11-01 Section 5 and TRMR-128 Section 2 ECONOMIC ANALYSIS			
Reclamation Manual Outline	Abbreviated Directives and Standards Section Title	Corresponding Report Location	Reclamation Manual Guidelines
5b and TRMR 128 2b	All project-related costs for selected project and alternatives (planning, design, construction, O&M)	Section 4.3, Table 5.4	A cost comparison of alternatives that would satisfy the same demand as the proposed desalination project.
5c	Description of alternatives including benefits	Section 4.2, 4.4 and Table 5.2	A description of water supply alternatives considered to accomplish the objectives addressed by the proposed desalination project, including benefits, total project cost, life cycle cost, and cost of the water produced expressed in dollars per million gallons (MG) and/or dollars per acre-foot (AF).
5d	Cost of the alternative most likely to be implemented in absence of the proposed project	Table 5.4 and Section 5.2	A comparison of the benefits of the proposed desalination project measured in terms of the cost of the alternative most likely to be implemented in absence of the project.
TRMR 128 2c	Quantified and monetized benefits	Section 5.3, 5.4	(c) Identification, quantification, and monetization of benefits, both direct use benefits and indirect use benefits, for the selected project and the alternatives identified. Benefits may include, but are not limited to, benefits related to water supply, recreational benefits, ecosystem benefits, water quality, energy efficiency, public health and other social benefits, and/or avoided costs.
TRMR 128 2d	Comparison of benefits and costs at NPV with a resulting B/C ratio and discussion about the extent the selected project maximizes benefits	NA	(d) A comparison of the benefits and costs associated with the selected water reclamation or recycling project and the alternatives identified. The results of this comparison should be discounted to net present value. The alternative plan that reasonably maximizes net public benefits will be identified. (i) This comparison must result in a benefit cost ratio that is provided for the selected project and the alternatives. (ii) Discussion about the extent to which the selected project maximizes benefits must be included.
5e and TRMR 128 2e	Qualitative benefits	Section 5.5	Documentation and a qualitative description of the proposed desalination project benefits that are difficult to quantify.
TRMR 128 2f	Summary table of NPV of benefits, costs, and ranked qualitative benefits	NA	(f) A summary, in one table, of the net present value of monetized benefits and costs, and the listing and ranking of the benefits described qualitatively.

This chapter is not complete as a USBR Title XVI Feasibility Study. The economic analysis of a preferred project will be refined once an alternative project or projects are selected for further development.

5.1 Economic Analysis With and Without the Project

Without a new water supply project, San Luis Obispo County (SLO County) will continue to see dwindling water supplies due to cyclical droughts, more extreme weather (e.g. floods) that disrupt exiting vulnerable supplies, mandatory decreases to address legal and environmental issues, and limited ability to meet needs for the future residents. All of these factors would cause regional losses in tax revenue, jobs, tourism and overall gross regional production. Diversifying the regional supply by implementing a drought tolerant desalination project would bolster existing supplies by adding resiliency and reliability and increase overall supply availability in a region with few options for new supply.

SLO County is rich in natural beauty with a scenic coastline, the coastal mountains, and pastoral agricultural production. Its Mediterranean climate provides year-round recreational activities including visiting beaches, surfing, and fishing. The mild climate also supports the local agriculture including wineries. However, as with all central and southern California communities, SLO County has highly variable water reliability and is subject to droughts. In the eleven-year period from 2014 – 2024, the region experienced exceptional drought for three years (2014 – 2016), extreme drought for two years (2021 to 2022), severe drought one year (2018), and was abnormally dry one year in 2017. This totals 7 years of dry to drought conditions out of the 11 years, or nearly 64 percent of the time. Many of these dry and drought periods overlapped with similar climate conditions in northern California, impacting the availability of State Water Project (SWP) water and therefore impacting many communities in SLO County that rely on it as a key supply source. The California Water Plan projects that drought conditions are expected to be recurring, multi-year and persistent in the future.

The Federal Reserve Bank estimates that SLO County's gross regional product is $24.5 billion (B) (FRED, 2026). SLO County reports through the California Center for Jobs and the Economy that quarterly taxable sales are approximatley$1.8B and there are a total of 100,400 jobs (SLO County, 2026). Tourism accounts for over 10 percent of SLO County's gross domestic product, creating jobs and driving local economic prosperity. Per Visit SLO, an estimated $2.4B is spent on tourism and over 24,000 jobs are supported by the tourist industry. Tourism is heavily impacted when droughts or water supply shortages result in cutbacks.

As discussed in Chapters 2 (Problem and Need) and 3 (Opportunities for Desalination), the region's water purveyors and local farmers rely heavily on groundwater supplies, many of which are under a regulatory requirement to be managed sustainably, meaning they cannot be pumped faster than they refill or allowed to cause major problems like declining groundwater levels, degraded water quality, etc. Currently, several of the groundwater basins in SLO County are overdrafted or already adjudicated due to overuse. Agriculture, which relies almost entirely on groundwater for irrigation, supports an annual crop value of over $1 billion a year (SLO, 2024).

A total of 49 percent of potable water is sourced from surface water supplies (imported and local). These surface water supplies are vulnerable to drought reductions and have faced legal challenges related to environmental flow requirements that have reduced available supplies. As environmental restrictions and drought conditions require cutbacks of surface supplies, water providers typically begin to increase groundwater use, drawing down the water levels in the aquifers faster than usual. Stressed groundwater basins could result in rural residential wells going dry, requiring alternative means for getting water such as trucking it in, and/or a need for agriculture to reduce pumping, affecting crop production and economic output.

More housing is required within the region to accommodate state mandated housing quotas. The State's Regional Housing Needs Assessment (RHNA) allocations (2019-2028 cycle) identified the need for an additional 3,256 dwelling units in the County. These mandates from the State will continue to push growth. Individual cities must plan for population growth and housing in their service areas. For example, the City of SLO General Plan anticipates up to one percent population growth per year (City of SLO, 2015). City of Arroyo Grande projects a 0.4 percent per year (Plan Arroyo Grande, 2026) and City of Morro Bay projects a 1 percent a year (Plan Morro Bay, 2015) population growth. Countywide, total population is anticipated to increase by 8.6 percent by 2060 (SLO COG, 2026). Additionally, per the 2035 Campus Master Plan, Cal Poly State University plans to grow over the next decade to add housing for over 4,000 additional students and plans to increase enrollment by 200 new students a year.

These growth plans paired with current uncertainty and unreliability of existing water supplies mean that new water sources are needed for the region. Inadequate water supplies could impact the region's economic vitality as previous water shortages have been shown to result in reduced economic output, lost revenues for water utilities, administrative costs for utilities having to implement water use restrictions, and consumer benefit loss for customers who have to forgo water using amenities like landscape irrigation or recreation. Ocean desalination would provide a reliable, drought proof supply that could augment regional supplies and support the current and future needs of the region. Project concept alternatives ranging from 330 to 7,855 acre-feet per year (AFY) have been identified and described in Chapter 4 (Description of Alternatives). Each of these alternatives could help alleviate the impacts of droughts, supply cutbacks and supply interruptions for end users.

Moving forward, the region could consider one or several desalination projects to implement, with significant potential for supply augmentation. For example, if one of the larger projects like Alternative D - South SLO County Wastewater Treatment Plant (WWTP) Area was implemented along with Alternative A - Cambria Area, all participants would benefit and a combined total of 7,400 AFY of new supply could be made available, which would be over 20 percent of the current urban use (32,300 AFY) for the referenced beneficiaries.

5.2 Comparison of Alternatives

The five project alternatives (A to E) discussed in Chapter 4 (Description of Alternatives) are summarized in Table 5.2 below including partners served, supply benefit, waste discharged and tradeoffs/considerations for each of the alternatives. A summary of project alternatives costs is shown in Table 5.3 (Summary of Project Alternative Costs), while details are included in Appendix E - Cost Estimate Details. These costs are conceptual cost estimates and reflect Class 5 rough order of magnitude estimates with an accuracy range of -50 percent/+100 percent. As shown, the estimated total capital costs range from $164 million (M) to $530M, while the unit production costs range from $8,951/AFY (Alternative [Alt.] D) to $23,140/AFY (Alt. A). Due to economies of scale, the two alternatives with the largest desal plant production capacities (Alts C and D) have the lowest unit costs of all five alternatives. The wide range of costs is driven by the variability in size and needed infrastructure for each alternative. The high unit costs ($/AFY) are driven by the small sizes of the alternatives, with larger sizes having lower unit costs.

As discussed in Section 4.7 (Similar Viable Alternatives) there are few, if any, alternative water supply projects besides ocean desalination that could deliver a significant water supply to the region. Water supply projects implemented in the past include increasing non-potable reuse to offset potable water demands and regional conveyance interties. New and ongoing projects include potable reuse and repairs to Salinas Dam to increase surface water storage capacity as summarized in Table 5.4 (Summary of Other Supply Projects that Could Offset Demands for Each Alternative). However, none of these projects are regional nor can they supply all the demands geographically across SLO County due to their distributed nature. There also is not adequate wastewater generated and not already reused in SLO County. Some of the dischargers have obligations to maintain minimum flows or use their discharge to recharge the groundwater basin limiting opportunities for large new reuse projects to offset demands.

Table 5.2 Summary of Project Alternatives

Alternative	Partners Served	Supply Benefit	Brine Waste Discharge	Tradeoffs and Considerations
Alternative A – Cambria Area	Cambria Community Services District (CSD), San Simeon CSD	330-580 AFY	New Outfall 0.3-0.5 mgd	▪ Requires 15 miles of new pipeline. ▪ Serves small local users that currently face regular water shortfalls, seawater intrusion and water quality issues. ▪ Maintain groundwater resources along San Simeon Valley. ▪ No larger regional benefit other than providing a proof of concept if alternative technologies used.
Alternative B – Cayucos/Estero Marine Terminal (EMT) Area	Los Osos CSD Cambria CSD, San Simeon CSD, potential SWP exchange	930-1055 AFY	EMT Outfall 0.8-0.9 mgd	▪ Requires 32 miles of new pipeline. ▪ Serves small local users that currently face regular water shortfalls, seawater intrusion and water quality issues. ▪ No larger regional benefit other than providing a proof of concept if alternative technologies used. ▪ Cayucos Mutual Water Companies is not a DESAL Plan partner.
Alternative C – Morro Bay Area	Los Osos CSD, City of SLO, Cal Poly, all Lopez users, Templeton CSD, San Luis GSA, Cambria CSD, San Simeon CSD	5,855-7,855 AFY	Morro Bay Area Outfall 5.2-7 mgd	▪ Requires 41 miles of new pipeline. ▪ Largest potential for regional benefit due to largest outfall. Has potential to serve all interested partners. ▪ Offsets users of Lopez Lake that will be impacted by additional releases for Interim Downstream Release Schedule (IDRS). ▪ Some project fatigue expressed by local residents of Morro Bay area. ▪ Supports sustainable groundwater resources in North SLO County through exchanges via City of SLO and Nacimiento.
Alternative D – South SLO County WWTP Area	Los Osos CSD, City of SLO, Cal Poly, all Lopez users, Templeton CSD, San Luis GSA, NCMA, NMMA, Nipomo CSD	5,070-6,825 AFY	South SLO WWTP Outfall 4.5-6 mgd	▪ Requires 32 miles of new pipeline. ▪ Large regional project that can serve most interested partners. ▪ Need to consider hydrogeology to avoid impacts to adjudicated groundwater basin. ▪ Offsets users of Lopez Lake that will be impacted by additional releases for IDRS. ▪ Supports sustainable groundwater resources in North SLO County through exchanges via City of SLO and Nacimiento.

Alternative	Partners Served	Supply Benefit	Brine Waste Discharge	Tradeoffs and Considerations
Alternative E – Nipomo Mesa Area	All Lopez users, Nipomo CSD, Santa Barbara County (optional)	1805-1905 AFY	Nipomo Mesa Outfall 1.6-1.7 mgd	▪ Requires 22 miles of new pipeline. ▪ Provides regional benefit to South SLO County Partners faced with Lopez cutbacks. ▪ Redeveloped brownfield site. ▪ Adjacent sensitive habitat must be avoided/mitigated. ▪ Need to consider hydrogeology to avoid impacts to adjudicated groundwater basin. ▪ Offsets users of Lopez Lake that will be impacted by additional releases for IDRS.

Table 5.3 Summary of Project Alternative Costs

Project Component	Alternative A Cambria Area	Alternative B Cayucos/EMT Area	Alternative C Morro Bay Area	Alternative D South SLO County WWTP Area	Alternative E Nipomo Mesa Area
New Outfall/Outfall Improvements	$6,500,000	$1,500,000	$5,250,000	$5,250,000	$6,250,000
Ocean Water Extraction Conveyance	$13,811,000	$6,623,000	$3,490,000	$7,139,000	$18,663,000
Subsurface Extraction Wells	$22,507,000	$35,384,000	$120,332,000	$87,137,000	$32,282,000
Brine Discharge Conveyance	$13,827,000	$233,000	$465,000	$1,502,000	$6,522,000
Treated Water Transmission	$10,762,000	$69,320,000	$118,698,000	$87,697,000	$35,969,000
Treated Water Pump Station(s)	$9,877,000	$10,458,000	$14,486,000	$14,718,000	$10,458,000
Ocean Water Treatment Plant Costs	$50,269,000	$62,937,000	$126,306,000	$141,254,000	$71,350,000
Construction Subtotal	$127,553,000	$186,455,000	$389,027,000	$344,697,000	$181,494,000
Planning	$6,380,000	$9,320,000	$19,450,000	$17,230,000	$9,070,000
Engineering and Design	$12,760,000	$18,650,000	$38,900,000	$34,470,000	$18,150,000
Environmental Permitting	$12,760,000	$18,650,000	$38,900,000	$34,470,000	$18,150,000
Administrative and Legal	$6,380,000	$9,320,000	$19,450,000	$17,230,000	$9,070,000
ESDC, Inspection and Construction Management	$12,760,000	$18,650,000	$38,900,000	$34,470,000	$18,150,000
Soft Costs Subtotal(1)	$51,040,000	$74,590,000	$155,600,000	$137,870,000	$72,590,000
Total Capital Costs	$178,593,000	$261,045,000	$544,627,000	$482,567,000	$254,084,000
Treatment Annual O&M Costs	$6,940,000	$9,500,000	$43,323,000	$38,210,000	$14,590,000
Infrastructure Annual O&M Costs	$3,619,000	$5,256,000	$20,495,000	$17,287,000	$5,654,000
Annual O&M Costs ($/yr)	$10,559,000	$14,756,000	$63,818,000	$55,497,000	$20,244,000
Total Estimated Max Yield (AFY)	330 - 580 AFY	1,055 AFY	7,135 AFY	6,825 AFY	1,905 AFY
Annualized Unit Cost $/AFY using max supply(2)	$24,943	$19,344	$10,020	$9,150	$13,071

Notes:

(1) Soft costs are represented by a factor of Construction Subtotal costs. See Table 4.5 in Chapter 4. Planning 5%; Engineering and Design 10%; Environmental Permitting and Mitigation 10%; Administrative and Legal 5%; ESDC, Inspection, and CM 10%.

(2) All annualized unit costs include the following: 10 year projected inflation rate of 2.5 percent estimated by the Federal Reserve Bank of Cleveland; 3.25 percent discount rate provided by the USBR for Water Resources Projects as of January 2026; 2 percent interest rate assumed for low interest financing through the CA State Revolving Fund per the State Water Resources Control Board as of 2026; 30 year life cycle.

Table 5.4 Summary of Other Supply Projects that Could Offset Demands for Each Alternative

DESAL Alternative/ Capacity	Partners Served	Alternative Supply Projects	Cost to Secure Other Supplies in 2026 dollars
Alternative A – Cambria Area 330-580 AFY	Cambria CSD, San Simeon CSD	▪ The Cambria CSD is working on obtaining permits for an indirect potable reuse (IPR) project that would provide 30-250 AFY. The facility is already constructed but requires a regular Coastal Development Permit (CDP) permit for operation under non-emergency conditions. There are no other realistic supply options for this area of SLO County that is disconnected from all regional infrastructure, has a small groundwater basin and seasonal streamflow. This IPR supply is insufficient to supply these two users with an adequate amount of water during droughts when their existing supplies dwindle.	▪ Cambria area – $0.5 M permitting
Alternative B – Cayucos/EMT Area 930-1,055 AFY	Los Osos CSD and Golden State, Cambria CSD, San Simeon CSD, potential SWP exchange	▪ The Cambria CSD indirect potable reuse project is discussed above. ▪ Los Osos CSD is working on a project to build infrastructure to connect to the SWP pipeline. This would allow Los Osos to purchase water from other SWP contractors when excess water is available. However, during drought periods, SWP supplies are not reliable. ▪ Morro Bay Water Resources Center – IPR Project.	▪ Cambria area – $0.5 M permitting ▪ Los Osos – $8M ▪ Morro Bay area - $179M
Alternative C – Morro Bay Area 5,855-7,855 AFY	Los Osos, SLO, Cal Poly, all Lopez users, Templeton, San Luis GSA, Cambria CSD, San Simeon CSD	▪ Cambria CSD and Los Osos CSD projects are discussed above. ▪ Central Coast Blue, an IPR project, is being developed by Pismo Beach for 500 AFY. ▪ Salinas Dam repairs and expansion are being considered to help secure and improve the reliability of supplies for the City of SLO, and to potentially add 1,650 AFY of reservoir capacity that was part of the dam's original design, to serve the City of SLO and possibly other users. ▪ Morro Bay Water Resources Center – IPR Project.	▪ Cambria area – $0.5 M permitting ▪ Los Osos – $8M ▪ Central Coast Blue – $50-60M ▪ Salinas Dam - $38 to 63M ▪ Morro Bay area - $179M
Alternative D – South SLO County WWTP Area 5,070-6,825 AFY	Los Osos CSD and Golden State, City of SLO, Cal Poly, all Lopez users, Templeton CSD, San Luis GSA, NCMA, NMMA, Nipomo CSD	▪ Los Osos project is discussed above. ▪ Central Coast Blue is discussed above. ▪ Salinas Dam is discussed above.	▪ Los Osos – $8M ▪ Central Coast Blue – $50-60M ▪ Salinas Dam - $38 to 63M
Alternative E – Nipomo Mesa Area 1,805-1,905 AFY	All Lopez users, Nipomo CSD, Santa Barbara County (optional)	▪ Central Coast Blue is discussed above.	▪ Central Coast Blue – $50-60M

5.3 Quantified and Monetized Benefits

There are several key quantifiable benefits of having reliable water supplies including:

1. Avoided cost of developing new supplies.
2. Avoided direct cost of water shortages.
3. Avoided loss of consumer benefits.

Each of these are discussed in this section. Since no one alternative has been selected yet for implementation, this section considers the benefits of either several alternatives combined or one of the larger alternatives that provides regional benefits to most or all the partner agencies. As discussed above, project alternative(s) could provide up to 20 percent of the region's water supply needs, assuming new supplies in the range of 7,400 AFY to 7,800 AFY.

5.3.1 Avoided Cost of New Supply

As shown in Table 5.4 above, there is no single non-desalination project (other supply) that can offset the supplies provided by the desalination alternatives considered. A combination of other supply projects would be required to provide as much supply benefit as desalination and these other supply projects would not provide a regional benefit comparable to some of the proposed alternatives. There are several other supply projects that are in development, such as Central Coast Blue and Cambria CSD's IPR project, that would help individual DESAL Plan partners improve their water supply reliability, but they do not replace the need for increased regional supply availability and reliability. The one new supply project discussed in Table 5.4 (Summary of Other Supply Projects that Could Offset Demands for Each Alternative) that could potentially be avoided if a desalination project was constructed is the Salinas Dam and Reservoir expansion. Salinas Dam repairs and expansion are being considered to help secure and improve the reliability of supplies for the City of SLO, and to potentially add 1,650 AFY of reservoir capacity that was part of the dam's original design, to serve the City of SLO and possibly other users. All of the other projects highlighted in Table 5.4 are either already constructed or are already in design. The Salinas Dam repair project is estimated in 2021 SLO County Board packet at $30 – 50M. Escalating costs to 2026 dollars would equate to approximately $38 to 63M using 5 percent annual inflation. The expansion part of the project has not yet been determined and is being evaluated in a separate feasibility study, that is not yet complete. Costs and yields will need to be updated. The dam repair would be required prior to or as part of the expansion. For now, the cost of the dam repair ($38-63M) is used as a potential avoided cost of new supply with the understanding that this is not the full cost.

5.3.2 Avoided Direct Cost of Water Shortages

Water shortages are an ongoing concern for SLO County given the drought prone history and projected future, the reliance on groundwater basins that need pumping to be reduced to meet regulatory requirements, and the regulatory cutbacks and drought reductions seen in surface water supplies, including SWP imported supplies. For this evaluation, a 20 percent water supply shortage is considered, which aligns with the percent of total supply that could be provided by one of the larger desalination alternatives or a combination of alternatives (approximately 7,400 to 7,800 AFY). A 20 percent water shortage across SLO County is reasonable to consider given the historical droughts and water deficits described in Chapter 3 (Opportunities for Desalination). To evaluate water shortages that could be avoided by implementing a new water supply, information from economic studies completed for other utilities was used to estimate economic impacts in SLO County. These studies are for southern and central California area with similar coastal climates and areas with tourism.

A recent study in Orange County, California (Boarnet et al., 2022) details the relationship between water restrictions and economic activity within the "other businesses" sector. The business sectors include offices, government enterprises (public and institutional), schools, commercial/retail other than tourism-supported, and churches. Each of these businesses are expected to have similar impacts. The Boarnet study surveyed business owners in the Municipal Water District of Orange County about the impact of water reductions of 15 percent and 30 percent. The 15 percent and 30 percent reductions in water led to 0.8 percent and 4.6 percent reductions in economic output for retail and other services and 1.2 percent to 1.6 percent reductions in economic output for professional services, information, and administration.

An economic study for Ventura (Haddad et al. 2026) showed that a 20 percent water cutback would result in 510 percent reduction in tourism dollars. While Ventura has a smaller population than SLO County, it is a central coast tourist destination that also supports significant agriculture and is located approximately 100 miles south of SLO County so it has similar climate and land use characteristics.

Using these studies, estimates of the costs of a water shortage that requires a 20 percent water cutback or curtailment are:

- **Reduction in Tax revenue:** SLO County's gross regional product is $24.5 billion (B), generating approximately $1.6B in sales tax revenue at a 6.5 percent tax rate. Extrapolated from the Boarnet study, a 20 percent supply reduction could result in a 2 percent decrease in economic output countywide. Applying a 2 percent reduction to the $1.6B in sales tax revenue results in an estimated $32 M loss.
- **Reduction in tourism**: Tourism accounts for over 10 percent of SLO County's gross regional product, with estimated $2.4B spent on tourism each year. Based on Ventura's estimates from the Haddad study, a 20 percent water supply cutback could result in as much as a 10 percent decrease in tourism dollars. Applying a 10 percent reduction to the $2.4B tourism industry results in an estimated $240M loss in tourism revenue.
- **Job losses in tourism**: Per SLO County's Key Economic Indicators Report, over 24,000 jobs are supported by the tourist industry in the County. Jobs in tourism will be impacted due to loss of tourism dollars (previous bullet), so to estimate this we can assume a modest 5 percent reduction in jobs for lower hourly wage workers in the tourism industry. It is also likely that these types of workers are part-time or seasonal workers. Therefore, a partial year of employment of 20 weeks a year was assumed. The estimated impact of job losses in tourism, based on our assumptions of 5 percent job loss X 24,580 jobs X $20/hour X 40 hours/week X 20 weeks/year (assuming not full year work) the loss in income from jobs in tourism is $19.6M.
- **Added program costs to administer water reductions:** In addition to direct impacts to taxes and tourism, there is an impact on local utilities during water shortages for the added costs to administer strict conservation programs, mandatory watering restrictions, enforcement, fines and education that is needed to meet specific curtailment objectives. The City of Ventura documented a cost of $235,000 of additional administration costs to implement a 20 percent curtailment. Using this cost as representative of utility costs, and given that there are 16 DESAL Plan partner utilities, the additional

cost for administering water reductions of 20 percent is $0.24 million per utility (16 partners) for a total of $3.8M.

5.3.3 Avoided Cost of Consumer Losses

Based on the 2026 economic study for the City of Ventura (Haddad et al, 2026), water use restrictions result in a loss of wellbeing for potable water customers. For example, limiting water available for water related activities like flower and vegetable gardens, pools, and turf irrigation reduces the quality of those landscapes which in turn reduces the level of enjoyment household members derive from their properties. Losses in landscaping can also impact property values. This loss borne by residents from water use restrictions is distinct from (and in addition to) the economic impact of water use curtailments on local water-dependent businesses.

The economic benefit for Single Family Residential (SFR) households of avoided water use curtailments has been estimated for Southern California, using advanced statistical models (Buck et al., 2016). Estimates for curtailments of 10 percent, 20 percent, and 30 percent are provided on a per AF of shortage basis, shown in Table 5.5. Applying these $/AF values to a water shortage of 3,230 AFY as a 10 percent increment of water use (current potable use is approximately 32,300 AFY so 10 percent curtailment is 3,230 AFY), an estimate of the economic loss for each households can be estimated as shown in Table 5.4.

Table 5.5 Household Losses From Each Year Of Water Use Curtailments

Curtailment Level	$/AF loss for Each Stage	Loss by Stage ($M)	Total Loss ($M)
Water curtailment at 10 percent(1)	2,017	$6.5	$6.5
Water curtailment at 20 percent	2,932	$9.5	$16.0
Water curtailment at 30 percent	3,376	$10.9	$26.9

Notes:
(1) Based on 32,300 AFY total demands x 10 percent Cutback = 3,230 AF for each 10 percent increment.
(2) Based on Buck et al, 2016; all $ values updated from 2015 to 2026 levels based on CPI.

5.4 Benefits and Costs Comparison

Due to the geographic distribution of the DESAL Plan partners and potential end users, there is no one non-desalination supply project that could be implemented that would equal the benefits of one larger or a combination of several of the regional desalination alternatives identified in this study. There have been a number of smaller non-desalination supply projects considered over the years, but the most likely scenario is that existing supplies will continue to be used, and demand reductions would be required to address shortfalls in supplies in future years. As discussed above, there are significant costs associated with demand reductions affecting SLO County’s economy, local water utilities, and their customers.

In addition, if existing supplies are insufficient to meet the various demands, cutbacks to local agriculture may be necessary (with their groundwater supplies being diverted to potable users), affecting a $1B industry that provides strawberries, winegrapes, beef, avocados, broccoli, lettuce and vegetables. The benefit to agriculture of alleviating demands on local groundwater supplies has not been estimated as agriculture is not envisioned to be a direct customer of desalinated water.

5.4.1 Summary of Monetized Benefits

The summary of economic benefits of implementing desalination that avoids the impacts of supply shortfalls and required water curtailments (20 percent countywide) is estimated in Table 5.6 below.

Table 5.6 Summary of Monetized Benefits of Implementing Desalination to Avoid 20 Percent Water Shortage

Type of Benefit	Description	Level and Value	Beneficiaries
Avoided Cost of Salinas Dam (Capital Cost).	Avoided cost of repair of Salinas Dam. Costs for expansion for new 1650 AFY supply is unknown.	$38 to 63M Plus costs for expansion.	City of SLO and possibly other users.
Avoided economic impacts of water supply shortages.	Reduced/avoided loss of economic output, jobs, incomes, and tax revenues associated with a 20 percent curtailment.	Reduction in Tax revenue: $32 Million (M) Reduction in tourism: $240M Job losses in tourism: $19.6M	Local residents, businesses, employees of local businesses, and the local government.
Avoided expense of managing drought curtailment (Avoided utility expense of $0.24 million per year per utility and 16 utilities).	Cost of personnel and materials to establish, communicate, and enforce an effective curtailment program.	$3.8M	All households, businesses, and other customers served water
Household losses related to reduction of consumer surplus for 20 percent water curtailment.	Economic welfare individuals derive from water related activities.	$16.0M	All households
Total Benefit of avoiding one 20% water shortage		$349.4M – 374.4M	

As shown in Table 5.6 above, if one 20 percent water curtailment can be avoided, there could be an economic benefit of **$349.4M – 374.4M.** In other words, this is the benefit of added supply to avoid a 20 percent water curtailment.

Any additional water shortage events in the life of the project (more than one drought in the 30 year life of a desalination project) would create an additional $311.4 M benefit of avoided water supply (all costs, shown in Table 5.6, except the capital cost of the Salinas Dam repair which can only be avoided once). If there were two drought conditions of the magnitude to require a 20 percent curtailment during the life of the project that could be avoided, the benefits would exceed the costs of the largest alternative or even a combination of alternatives that could meet regional needs (given the accuracy of cost estimating and benefit calculations). This indicates that the prevention of two water shortage events requiring 20 percent cutbacks in water supply would "pay for the project." Given the past history of drought in the region, it is quite likely that there will be more than two drought events requiring water curtailment in the range of 20 percent over a 30-year time horizon.

5.5 Qualitative Benefits

Ocean desalination for urban and potable supply would provide numerous benefits to SLO County, including:

- Reliable water supply that is not dependent on rainfall.

- Reduced dependence on imported water that is not reliable during droughts and subject to greater infrastructure vulnerabilities.
- Reduced dependence on surface water supplies that face cutbacks due to environmental flow requirements and unreliability during droughts.
- Reduced dependence on groundwater supplies that are overdrafted and subject to cutbacks due to the Sustainable Groundwater Management Act requiring groundwater sustainability.
- Providing water supplies to meet current water demands, especially during droughts, as well as future water needs to meet future growth projections, including the housing mandates required by the State of California.
- Reducing potential impacts to, and conflicts between, urban and agricultural users over a dwindling supply of water.

CHAPTER 6 SELECTION OF PROPOSED PROJECT

The intent of Chapter 6 is to provide justification of selection of a proposed desalination alternative, to describe how the alternative meets the key goals of the Desalination Executable Solution and Logistics Plan (DESAL Plan) and how the alternative reduces demand from other water sources, including federal water supply facilities. This study is a high-level screening analysis to help identify the feasibility of a desalination project in San Luis Obispo County (SLO County) and, therefore, a preferred project site or alternative has not yet been selected. This chapter presents discussions about the desalination project concept alternatives in general and provides a comparison of benefits and tradeoffs. If the DESAL Plan partners (DESAL Partners) decide to move one or more of the alternatives forward, additional review would be needed for a selected project.

This chapter includes the following sections and a crosswalk of relevant sections per United States Bureau of Reclamation (USBR) WTR11-01 is shown in Table 6.1, below.

- **Section 6.1: Justification of Selected Project** – This section discusses why the desalination project alternatives are cost effective and meet the SLO County's objectives, water demands, needs, and more, as well as summarizing the benefits received from each project alternative.
- **Section 6.2: Reduction of Needed Supplies, Diversions, Demands** – This section details how the proposed desalination project alternatives can reduce development of new or expanded water supplies, the amount of diversions and withdrawals from water sources, the demand on existing Federal water supply facilities, and does not require new or expanded wastewater facilities.

Table 6.1 Chapter 6 Crosswalk

WTR 11-01 Section 6 SELECTION OF PROPOSED WATER RECLAMATION, RECYCLING OR DESALINATION PROJECT			
Reclamation Manual Outline	Abbreviated Directives and Standards Section Title	Corresponding Report Location	Reclamation Manual Guidelines
6a	Justification for the selected project	Section 6.1	Justification of why the proposed desalination project is the selected alternative to meet objectives, demands, needs, cost effectiveness, and other important criteria.
6b	6b(i-iv) Reduction, postponement, or elimination of new supplies, existing diversions, federal supplies, wastewater facilities	Section 6.2	See items 6b(i)-(iv) below.
6b(i)	Selected project's reduction, postponement, or elimination of development of new or expanded water supplies	Section 6.2.1	An analysis and affirmative statement of the proposed desalination project addressing reduction, postponement, or elimination of the development of new or expanded water supplies.
6b(ii)	Selected project's reduction or elimination of the use of existing diversions from natural watercourses, or withdrawals from aquifers	Section 6.1, 6.2.2	An analysis and affirmative statement of the proposed desalination project addressing reduction or elimination of the use of existing diversions from natural watercourses, or withdrawals from aquifers.

WTR 11-01 Section 6 SELECTION OF PROPOSED WATER RECLAMATION, RECYCLING OR DESALINATION PROJECT			
Reclamation Manual Outline	Abbreviated Directives and Standards Section Title	Corresponding Report Location	Reclamation Manual Guidelines
6b(iii)	Selected project's reduction of demand on existing Federal water supply facilities; and	Section 6.2.3	An analysis and affirmative statement of the proposed desalination project addressing reduction of demand on existing Federal water supply facilities.
6b(iv)	Selected project's reduction, postponement, or elimination of new or expanded wastewater facilities	Section 6.2.4	An analysis and affirmative statement of the proposed desalination project addressing reduction, postponement, or elimination of new or expanded wastewater facilities.

This chapter is not complete as a USBR Title XVI Feasibility Study. The project selection and justification of that selection will be refined once an alternative project or projects are selected for further development.

6.1 Justification of Selected Project

The San Luis Obispo County Flood Control and Water Conservation District (District) and the DESAL Partners have collaborated in developing this feasibility study with the objective of investigating the potential for ocean desalination to help augment water supplies to help meet existing and future needs. With future uncertainties, including but not limited to, those related to droughts, reduced imported water supply reliability, surface water reductions for environmental flows, and groundwater use reductions needed to meet Sustainable Groundwater Management Act (SGMA) objectives, ocean desalination could provide an important reliable and drought-proof new water supply for the region.

Due to the disperse nature of the communities in the SLO County and relatively low population, regional water supply projects for this region have relatively high per capita unit costs, including for the ocean desalination alternatives evaluated. The SLO County is exploring an “all of the above” approach to evaluating water supply projects and non-desalination projects are under consideration. However, the same challenges that current supplies have with reliability and uncertainty during drought would apply to other supply options being considered and the options considered are likely not sufficient for future needs. Therefore, ocean desalination may be needed in the future to continue to sustain the communities in the SLO County. At this point, no specific desalination project concept alternative has been selected. DESAL Partners will need to determine which, if any, of the alternatives to move forward into additional investigations.

In general, ocean desalination for any of the alternatives is not particularly cost effective when compared to existing water supply sources used in SLO County. However, these concept alternatives have been developed to utilize the most cost effective (and widely used) desalination technology on the market paired with the intake and outfall configurations that are least impactful and able to be permitted. These alternatives also meet the regional objectives to provide additional water supplies that are reliable and drought proof, often where there are no other options for new supplies.

The alternatives were developed to meet the demands for DESAL Partners depending on the location. Some alternatives are small and local, therefore not every demand in the SLO County is met Selection of one of the larger regional alternatives, or a combination of multiple alternatives, could be assembled to meet all the identified demands. As demonstrated in Chapter 5 (- Economic Analysis), the economic losses that would be sustained without new supplies would be extremely harmful to the region and the economic benefits that would be received from a desalination project greatly outweigh its costs.

There is a also potential to use ocean desalination to support sustainable groundwater management by providing an alternate supply to offset groundwater extractions, especially during drought years. Reducing groundwater withdrawals in stressed groundwater basins would also have impacts beyond utility-served potable water users and would benefit rural and agricultural users of the basins indirectly. In addition, several of the alternatives could deliver water to communities facing reduced water supply reliability due to drought-related impacts, environmental flow requirements, infrastructure damage, aging systems, and other factors. Some of the alternatives also have the ability to provide supply water to Santa Barbara County water users, if desired for a cross-county regional effort.

Additional reasons to select each alternative are highlighted in Table 6.2, on the next page.

Table 6.2 Summary of Alternative Benefits and Reasons for Selection

Alternative	Partners Served	Capacity Range	Benefits of Alternative/Reasons to Select
Alternative A – Cambria Area	Cambria CSD and San Simeon CSD	330-580 AFY (0.3-0.5 mgd)	▪ Provides critical water supply reliability to users who are not connected to regional systems, have limited supply diversification and lack of storage leaves them vulnerable, especially during drought. ▪ Partners have high number of low income (disadvantaged community) residents. ▪ Potential to co-locate with existing Cambria Community Services District (CSD) Water Reclamation Federation (WRF). ▪ End users are in close proximity which reduces length of water distribution piping.
Alternative B – Cayucos/Estero Marine Terminal Area	Los Osos CSD, Cambria CSD, San Simeon CSD, potential SWP exchange	930-1,055 AFY (0.8-0.9 mgd)	▪ Provides critical water supply reliability to users who are not connected to regional systems, have limited supply diversification and lack of storage leaves them vulnerable, especially during drought. ▪ Los Osos groundwater basin is already experiencing, and remains vulnerable to, seawater intrusion. ▪ Potential to deliver regionally without extensive piping through exchanges with City of Morro Bay. ▪ Partners have high number of low income (disadvantaged community) residents. ▪ Low number of environmental constraints present.
Alternative C – Morro Bay Area	Los Osos CSD, City of San Luis Obispo, Cal Poly, all Lopez users, Templeton CSD, San Luis Groundwater, Cambria CSD and San Simeon CSD	5,855-7,135 AFY (5.2-7 mgd)	▪ This larger, regional alternative provides new supply to all DESAL Partners, including those with vulnerable supplies, areas of future growth, and areas with surface water supply cutbacks expected due to environmental flow requirements. ▪ The development of infrastructure and agreements that encompass the entire SLO County allows for future potential exchanges during critical shortages that would significantly increase resiliency for the region. ▪ Supports SGMA by potentially providing water for overdrafted groundwater basins through exchanges. ▪ Potential to deliver water regionally without extensive piping through exchanges. ▪ Due to the economies of scale of the larger desal plant production capacity, this alternative has the second lowest unit cost of alternatives A-E.
Alternative D – South SLO County Wastewater Treatment Plant Area	Los Osos CSD, City of San Luis Obispo, Cal Poly, all Lopez users, Templeton, San Luis Groundwater, Northern Cities and Nipomo Mesa Management Areas, Nipomo CSD	5,070-6,825 AFY (4.5-6 mgd)	▪ This larger, regional alternative provides new supply to most of the DESAL Partners including some of those with vulnerable supplies, areas of future growth, and areas with surface water supply cutbacks expected due to environmental flow requirements. ▪ The development of infrastructure and agreements that encompass the entire SLO County allows for future potential exchanges during critical shortages that would significantly increase resilience for the region. Low number of environmental constraints. ▪ Supports SGMA by potentially providing water for overdrafted groundwater basins. ▪ Potential to serve some water to Santa Barbara County as well. ▪ Due to the economies of scale of the larger desal plant production capacity, this alternative has the lowest unit cost of alternatives A-E.
Alternative E – Nipomo Mesa Area	All Lopez users, Nipomo CSD, Santa Barbara County (optional)	1,805-1,905 AFY (1.6-1.7 mgd)	▪ Provides new supply to DESAL Partners in south SLO (S. SLO) County in areas with surface water supply cutbacks expected due to environmental flow requirements. ▪ Utilizes a brownfield site to limit new development. ▪ Potential to serve some water to Santa Barbara County. ▪ Supports local adjudicated basins by providing alternative water supply.

Notes:
AFY - acre-feet per year, CSD - Community Services District; WRF water reclamation facility.

6.2 Reduction of Needed Supplies, Diversions, Demands

6.2.1 Reduction, Postponement or Elimination of New Supplies

The SLO County has a wide variety of existing water supplies ranging from surface water reservoirs, groundwater extraction facilities, imported State Water Project (SWP) water, and recycled water. However, the options for new supplies are very limited. As described in Table 5.4 (Summary of Other Supply Projects that Could Offset Demands for Each Alternative), there are a number of potential new projects being considered including:

- **Central Coast Blue** – an indirect potable reuse project being developed by Pismo Beach.
- **Paso Robles Recycled Water** – deliveries of tertiary treated water to agricultural and urban customers.
- **Morro Bay Indirect Potable Reuse** – an indirect potable reuse project being developed by the City of Morro Bay.
- **Cambria Water Reclamation Facility** - an indirect potable reuse project applying for Coastal Development Permit by the Cambria Community Services District.
- **Salinas Dam Retrofit and Expansion** – improvements to dam and expansion to gain additional volume (up to 1,650 AFY).

An ocean desalination project would likely not eliminate any recycled water supply projects but instead would work in conjunction with them to extend and maximize existing local supplies. An ocean desalination project could lessen the need to expand reservoirs or build new surface water storage. Investment in a desalination project would reduce or postpone the need for other new water supply projects in the future.

6.2.2 Reduction or Elimination of Existing Diversions or Withdrawals

The implementation of one of the ocean desalination project concept alternatives identified in this study could reduce demands on existing supply sources by 330 to 7,135 AFY, depending on the alternative, as described in Chapter 4 (Description of Alternatives). Potable water supply gaps and demands that could be reduced include water from the following existing sources:

- Overdrafted or unsustainable groundwater supplies, such as those in the Paso Robles and San Luis Obispo Valley Groundwater Basins.
- Surface water reservoirs that are facing legal challenges related to environmental cutbacks and in-stream flow requirements such as Lopez Lake.
- Surface water reservoirs that have aging conveyance infrastructure and dams needing significant investment such as Salinas and Whale Rock Reservoirs.
- Surface water reservoirs that have experienced conveyance infrastructure failures such as Lake Nacimiento.
- Imported water that comes from the environmentally sensitive Sacramento-San Joaquin Delta (Delta) and traverses hundreds of miles including through a seismically active area.

Chapter 3 (- Opportunities for Desalination) and Chapter 4 (- Description of Alternatives) both discuss the existing use of these supplies and to the degree that they could be offset by a desalination project.

6.2.3 Reduction of Demands on Existing Federal Water Supplies

There are several water supplies that have a Federal nexus in SLO County.

The Salinas Reservoir or Santa Margarita Lake supplies the City of San Luis Obispo with surface water. The Salinas Dam was constructed by the US Army Corps of Engineers during World War II and is still owned by the federal government. A Feasibility Study is underway to evaluate the repairs needed to this facility to protect its continued use in the future. Use of ocean desalination water by the City could result in reduced reliance on water from Salinas Reservoir.

The SWP, while largely considered a State of California supply, has a federal nexus in that all State Water originates in the Delta, where the Central Valley Project (a federal water supply project) also originates. The Delta water supply has been tenuous and fraught with lawsuits and potential cutbacks. A new ocean desalination water supply would reduce demands on the Delta supply sources through reductions in SWP use. The District is contracted for conveyance of treated SWP water into SLO County of up to 4,830 AFY. However, the District holds another 14,463 AFY of SWP allocations that are used as drought buffer. These allocations could be made available to other parts of the state needing water if adequate reliable supplies were available in SLO County. Hence, the DESAL Partners could offset up to 4,830 AFY of SWP use, not counting the drought buffer.

There are a number of other water supply projects in the SLO County that have benefited from federal funding such as Morro Bay's WRF project and Cambria CSD's Emergency Water Reclamation Facility (WRF) project. An ocean desalination project would work in concert with these other supplies to provide more drought resilient supplies for local users in the SLO County.

6.2.4 Reduction or Elimination of New or Expanded Wastewater Treatment Plants

The addition of a new ocean desalination facility or multiple facilities on the SLO County coast will not reduce or eliminate the need for wastewater treatment expansions. With the need for a desalination facility to discharge its waste product or brine to the ocean, use of an existing wastewater outfall is preferred. Use of an existing outfall may require improvements to accommodate the additional discharges and to provide adequate mixing to meet dilution requirements.

CHAPTER 7 ENVIRONMENTAL CONSIDERATIONS

Chapter 7 provides information on the desalination project concept alternatives to allow United States Bureau of Reclamation (USBR) to assess the potential measures and costs that will be necessary to comply with the National Environmental Policy Act (NEPA), and any other applicable federal law. This chapter addresses potential effects and environmental impacts of a desalination project on the San Luis Obispo County (SLO County) coastline. This USBR Title XVI Feasibility Study (Study) is a high-level screening analysis to help identify the feasibility of a desalination project in SLO County and, therefore, a preferred project site or alternative has not yet been selected. Therefore, this chapter presents high level analyses of the environmental considerations for the five alternative sites presented in Chapter 4 - Description of Alternatives. If the Desalination Executable Solution and Logistics Plan (DESAL Plan) partners (DESAL Partners) decide to move one or more of the alternatives forward, additional review would be needed for each selected project. For the purposes of this chapter's analysis, "project" refers to a potential desalination project at one or more of the proposed alternative locations.

This chapter includes the following sections and a crosswalk of relevant sections per USBR WTR11-01 is shown in Table 7.1, below.

Section 7.1: Environmental Discussion of Alternatives – This section discusses how the project's construction and operation may potentially impact endangered and threatened species, public health and safety, natural resources, regulated waters, and cultural resources.

Section 7.2: NEPA Compliance for USBR Funding – This section states that if the USBR provides funding for the proposed desalination project, full NEPA compliance will be achieved prior to initiating construction.

Table 7.1 Chapter 7 Crosswalk

WTR 11-01 Section 7 ENVIRONMENTAL CONSIDERATIONS AND POTENTIAL EFFECTS			
Reclamation Manual Outline	Abbreviated Directives and Standards Section Title	Corresponding Report Location	Reclamation Manual Guidelines
7a	Environmental discussion on each alternative	Section 7.1	Information on the proposed desalination project that allows Reclamation to assess the potential measures and costs that will be necessary to comply with NEPA and other applicable Federal laws.
7a(i)	Discussion of potential impacts on endangered or threatened species, public health or safety, natural or cultural resources	Section 7.1.1-7.1.4	A discussion of the proposed desalination project's potential impacts on endangered or threatened species, public health or safety, natural resources, regulated waters of the United States, or cultural resources.
7a(ii)	Discussion of potential environmental effects, or undefined environmental risks.	Sec 7.1.5	A discussion of the proposed desalination project's potential environmental effects or risks.

WTR 11-01 Section 7 ENVIRONMENTAL CONSIDERATIONS AND POTENTIAL EFFECTS			
Reclamation Manual Outline	Abbreviated Directives and Standards Section Title	Corresponding Report Location	Reclamation Manual Guidelines
7a(iii)	Discussion of potential environmental compliance measures for the proposed water reclamation, recycling or desalination project, including copies of any documents that have been prepared, or results of any relevant studies.	Section 7.1.6	A description of the status of required federal, state, tribal, and/or local environmental compliance measures for the proposed desalination project.
7a(iv)	Discussion of any other information available for NEPA assessment	Section 7.1.7	Other information that assists with assessing the measures that will be necessary to comply with NEPA, and other applicable federal, state or local environmental laws.
7a(v)	Discussion of potential impacts to regional water supply and water quality	Section 7.1.8	Discussion of how the proposed desalination project will affect water supply and water quality from the perspective of a regional, watershed, aquifer, or river basin condition.
7a(vi)	Public involvement with study	Section 7.1.9, 11.3.3	Discussion of the extent to which the public was involved in the feasibility study, and a summary of comments received.
7a(vii)	Effect on historical properties	Section 7.1.10	Description of the potential effects the project will have on historic properties.
7b	If Reclamation funds construction, NEPA compliance prior to ground disturbing activities.	Section 7.2	If Reclamation provides funding, all appropriate NEPA and other environmental and cultural compliance must be completed prior to any ground disturbing activities beginning for the project to be eligible.

This chapter is not complete as a USBR Title XVI Feasibility Study. The environmental review of all the alternatives in this chapter are at a high level. Once an alternative project or projects are selected for further development this section should be reviewed and updated for specific project impacts.

7.1 Environmental Discussion of Alternatives

This section addresses the potential environmental effects associated with construction and operation of a desalination facility, which consists of the following components:

- Subsurface intake slant wells located offshore.
- Extraction conveyance pipelines and associated infrastructure.
- Desalting of extracted saltwater at a centralized treatment facility.
- Conveyance pipelines from treatment facility to end users.
- Ocean outfall for brine discharge.

As outlined in Chapter 4 (Description of Alternatives), five alternatives of varying scale were identified and evaluated as part of this study. The study evaluated SLO County's coastal zone for potential sites, which stretches from Ragged Point in the north to Nipomo in the south. Because of the infrastructure necessary for a desalination facility, only sites relatively close to the shoreline were determined to be economically feasible, and thus no inland sites outside the coastal zone were evaluated.

For the purpose of presenting the preliminary environmental considerations and effects (herein referred to as the preliminary environmental analysis), the study area includes the immediate areas surrounding each of the five site alternatives: Cambria Area, Cayucos/Estero Marine Terminal (EMT) Area, Morro Bay Area, South SLO County (S. SLO County) Wastewater Treatment Plant (WWTP) Area, and Nipomo Mesa Area. This preliminary environmental analysis offers high-level review of potential impacts but does not provide a site-specific analysis or evaluate the specific siting of extended potential infrastructure (roads, pipeline, transmission lines, etc.) or the potential impacts associated with them. High level review of presented pipelines (intake, outfall, and distribution) for each alternative is provided, which would follow existing roads to minimize disturbance of previously undisturbed area(s). The exception is the portion of the distribution pipeline along the Chorro Valley pipeline in Morro Bay Area alternative, which would involve new areas of disturbance outside existing infrastructure right of ways. Throughout this chapter the potential impacts are discussed about “the Project” or “alternative” which is construction and operation of a desalination alternative at any of the aforementioned general site locations.

This preliminary environmental analysis addresses the following environmental concerns:

- Endangered, Threatened, and Special-Status Species.
- Public Health and Safety.
- Natural Resources.
- Regulated Waters.
- Cultural Resources.

Additional detailed assessment of the potential effects of the alternatives and any proposed project as well as identification of avoidance, minimization, and mitigation measures where applicable will need to be provided in project-level environmental documents to be prepared in compliance with the NEPA and California Environmental Quality Act (CEQA) review.

This section provides a preliminary environmental analysis based on publicly available information including online databases, city and county planning documents, geographic information system (GIS) mapping, and environmental documents. Based on this qualitative assessment, **it is anticipated that adverse effects could be mitigated to less-than-significant levels with implementation of mitigation measures**. However, to quantitatively assess the full scope of the potential environmental impacts of a project and to identify necessary site-specific environmental protection measures, additional project-specific analyses would be required, including field studies and record searches.

7.1.1 Endangered or Threatened Species

California contains several “rare” plant and animal species. In this context, rare is defined as species known to have low populations or limited distributions. As the human population grows, urban expansion encroaches on the already-limited suitable habitat. This results in sensitive species becoming increasingly more vulnerable to extirpation (local extinction). State and federal regulations have provided the California Department of Fish and Wildlife (CDFW), the United States Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) with a mechanism for conserving and protecting the diversity of plant and animal species native to California. Numerous native plants and animals have been formally designated as "threatened" or "endangered" under state and federal endangered species legislation. Other formal designations include "candidate" for listing or "species of special concern" by CDFW. The California Native Plant Society (CNPS) has its list of native plants considered rare, threatened, or endangered. Collectively these plants and animals are referred to as "special status species."

The discussion in this section is based on information obtained from a high-level review of the CDFW California Natural Diversity Database (CNDDB); the CNPS Online Inventory of Rare and Endangered Vascular Plants of California; CalFlora's online database of California native plants; the Jepson Herbarium online database (Jepson eFlora); the USFWS Environmental Conservation Online System (ECOS) and Information for Planning and Consultation (IPaC); the NatureServe Explorer online database; the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Plants Database; CDFW's California Wildlife Habitat Relationships (CWHR) database; the California Herps online database; and various manuals, reports, and references related to plants and animals in the area. More precise reviews of specific locations may result in identification of additional resources.

The Project is located along the SLO County coastline, which encompasses a broad range of biological resources. The Project would likely be located within the Central Coast floristic province, or less likely the Outer South Coast Range floristic province. Construction activities could potentially damage biological resources or modify habitats that are crucial for sensitive plant and wildlife species. In these cases, development may be regulated by state or federal agencies, subjected to provisions of CEQA, and/or addressed by local regulatory agencies.

7.1.1.1 Plants

Based on the aforementioned database review, four plant species identified by CDFW and/or USFWS as candidate, sensitive, or special status in local or regional plans, policies, or regulations are shown to be in the vicinity of one or more project alternatives (see Table 7.2 below). One of those species is listed as threatened and/or endangered. The remaining five are species that hold a ranking under the CNPS rare plant inventory system. Depending on the specific project location, much of the land surrounding the evaluation sites is developed for agricultural, industrial, commercial, and residential land uses. However, there are several areas of natural habitat in proximity to some potential sites that could support special-status plant species. Construction of the project would be the primary source of impacts, whereas impacts due to operations and maintenance would likely only occur when wells or pipelines require repair or replacement. As part of future environmental review, site specific field surveys and a biological resources evaluation would be needed to determine species presence and/or absence within the project limits and provide mitigation measures to avoid and/or reduce impacts to less-than-significant under CEQA.

Table 7.2 Listed Plant Species with the Potential to Occur within the Project Area(s)

Species Name	Potential Site	Federal	State	CNPS[1]
Blochman's Leafy Daisy (*Erigeron blochmaniae*)	Morro Bay Area	None	None	1B.2
Coastal Goosefoot (*Chenopodium littoreum*)	South SLO WWTP Area	None	None	1B.2
Goldenbush (*Ericameria* or *Isocoma menziesii*)	Nipomo Mesa Area	None	None	1B.2
Kellogg's Horkelia (*Horkelia cuneata var. sericea*)	Cambria Area	None	None	1B.1
La Graciosa Thistle (*Cirsium scariosum var. loncholepis*)	South SLO WWTP Area, Nipomo Mesa Area	Endangered	Threatened	1B.1

Species Name	Potential Site	Federal	State	CNPS(1)
Monterey Pine (*Pinus radiata*)	Cambria Area	None	None	1B.1
Gambel's Watercress (*Nasturtium gambelii*)	South SLO WWTP Area	Endangered	Endangered	1B.1
California Seablite (*Suaeda californica*)	Cayucos/EMT Area	Endangered	None	1B.1
Nipomo Mesa Lupine *(Lupinus nipomensis)*	Nipomo Mesa Area	Endangered	Endangered	1B.1

Notes:
(1) CNPS rarity category (scale = 1A (presumed extinct) to 4 (watchlist)) [1B is rare, threatened. or endangered] with degree of risk in California specifically denoted by .# with .1 highest and .3 lowest (relative).

Alternative A - Cambria Area

Alternative A is in an area where the CNDDB has identified Kellogg's horkelia and Monterey pine as species of concern. Figure 4.19 (Alternative A Cambria Area Environmental Constraints) shows areas with potentially low impact on local environmental resources that could be considered for the project alternative site. They are mapped as Mixed Evergreen Forest and Non-Native Grassland according to County Vegetation data per CDFW. These areas are located next to a Freshwater Forested/Shrub Wetland according to the National Wetlands Inventory (NWI). While the actual plant siting would not be located in Hearst San Simeon State Park, most of the area west of the of anticipated project siting areas are and potential pipeline routes run through Hearst San Simeon State Park along existing roads. The coastal waters further to the west are in the Cambria State Marine Conservation Area (SMCA)/State Marine Park (SMP) which is the state’s only dual-designation marine protected area and are also part of the Monterey Bay National Marine Sanctuary. Plant siting and pipelines routes for this alternative have been designed to avoid the Cambria SMCA SMP.

Alternative B - Cayucos/EMT Area

Alternative B is not in an area where the CNDDB has identified any plant species of special concern. Figure 4.21 (Alternative B Cayucos/Estero Marine Terminal Environmental Constraints) shows areas with potentially low impact on environmental resources that could be considered for the project alternative site. These are located next to a potential future conservation area and Highway 1. Pipelines for this alternative follow existing established roads and intersect with Toro Coast Preserve, Estero Bluffs State Park and Morro Strand State Park within which additional protections may be afforded to localized vegetation species.

Alternative C - Morro Bay Area

Alternative C is in an area outside of any identified CNDDB or USFWS Complete Species Range and areas that could be considered for a site with low impact are located in urban/built up land according to the County Vegetation data. Figure 4.23 (Alternative C Morro Bay Area Environmental Constraints) shows areas that indicate potentially low impact with respect to local environmental resources. However, seaward of these areas the CNDDB has identified Blochman's leafy daisy to the north (Morro Bay State Beach) and the south (Morro Bay City Beach). West of the potential project site, the most seaward part of the beach is an Estuarine and Marine Wetland and waters within the Morro Bay State Marine Recreational Management Area (SMRMA). Pipelines for this alternative follow existing roads, with the exception of the pipeline following the Chorro Valley pipeline alignment to the City of SLO, see Figure 4.22 (Alternative B – Morro Bay Area Layout). Proposed pipeline alignments intersect with San Lusi Obispo Wildlife Area, Chorro Creek Ecological Preserve, Lower San Luis Obispo Creek Wetland Preserve, Estero Bluffs State Park, and Morro Strand State Park within which additional protections may be afforded to localized vegetation species.

Alternative D - South SLO County WWTP Area

Alternative D is in an area where the CNDDB has identified the Coastal goosefoot. Figure 4.25 (Alternative D South SLO County WWTP Area Environmental Constraints) shows areas that could be considered for a site that show low impact with respect to local environmental resources. USFWS Complete Species Range has not identified any species near areas that could be considered for project site, but there is la Graciosa thistle just south of the S. SLO County WWTP, which is located in freshwater forested/shrub wetland, according to NWI Wetlands. The S. SLO County WWTP is not located on Pismo State Beach, but the beach west of the plant is and waters further west are in the Chumash Heritage National Marine Sanctuary, which intake and outfall pipelines would intersect.

Alternative E - Nipomo Mesa Area

Alternative E is anticipated to be collocated at the decommissioned Nipomo Mesa Refinery Site. Figure 4.27 (Alternative E Nipomo Mesa Refinery Area Environmental Constraints) shows areas that could be considered for a site that show low impact with respect to local environmental resources. Alternative E is in an area where the CNDDB has identified the golden bush, which is a component of coastal scrub habitat, and Nipomo Mesa Lupine. The potential site is adjacent to a sensitive resource area, as well as the Oceano Dunes State Vehicle Recreation Area. The water west of the potential site is in the Chumash Heritage National Marine Sanctuary. Intake and outfall pipelines would intersect with the Oceano Dunes State Vehicle Recreation Area and Chumash Heritage National Marine Sanctuary.

7.1.1.2 Wildlife

Based on database review, the potential sites have the potential to impact ten animal species identified by CDFW, NMFS, and/or USFWS as candidate, sensitive, or special status in local or regional plans, policies, or regulations (Table 7.3, on the next page). Seven of the animal species are listed as threatened and/or endangered, and two are currently a candidate (or proposed) for threatened status. All ten are listed as species of special concern (SSC) or are on the California Watch List (WL).

As described above, much of the land surrounding the areas that indicate potentially low impact that could be considered for a project site are already developed for agricultural, industrial, commercial, and residential land uses. However, there are several areas of natural habitat near the potential sites that could support special-status species, including riparian and wetland areas, undeveloped lands with natural vegetation, marine protected areas such as Cambria SMCA/SMP, Morro Bay SMRMA, and Chumash Heritage National Marine Sanctuary, and beachfront areas such as Morro Strand State Beach, Morro Bay State Beach, and Pismo State Beach. Potentially significant impacts to special-status plants and animals could include death or injury of individuals, disruption of normal behaviors that could lead to reduced reproductive success, and loss of habitat. Construction of the alternatives would be the primary source of impacts, whereas impacts due to operations and maintenance would likely only occur when subsurface slant wells or pipelines require repair or replacement. As part of subsequent environmental review, site specific field surveys and a biological resources evaluation would be needed to determine species presence and/or absence within the sites where Project components are proposed and provide mitigation measures to avoid and/or reduce impacts (from construction as well as operation) to less-than-significant under CEQA.

Table 7.3 Wildlife Species Identified as Species of Special Concern with the Potential to Occur within the Project Area(s)

Species Name	Potential Site	Federal	State/CDFW
California red-legged frog (*Rana draytonii*)	Cambria Area, South SLO WWTP Area [and pipelines for Cayucos/EMT Area and Morro Bay Area]	Threatened	SSC
Mimic tryonia (California brackishwater snail) (*Tryonia imitator*)	South SLO WWTP Area	None	SSC
Monarch - California overwintering population (*Danaus plexippus* pop. 1)	South SLO WWTP Area, Nipomo Mesa Area, Cayucos/EMT Area, Cambria Area [and pipelines for Morro Bay Area]	Candidate	SSC
Morro Shoulderband Snail (*Helminthoglypta walkeriana*)	Morro Bay Area	Threatened	SSC
Sandy Beach Tiger Beetle (*Cicindela hirticollis gravida*)	Cayucos/EMT Area, Morro Bay Area	None	SSC
Steelhead - South Central California Coast DPS (*Oncorhynchus mykiss irideus* pop. 9)	Cambria Area, Morro Bay Area, Nipomo Mesa Area, South SLO WWTP Area	Threatened	SSC
Western snowy plover (*Charadrius nivosus nivosus*)	Morro Bay Area, South SLO WWTP Area [and pipelines for Cayucos/EMT Area and Nipomo Mesa Area]	Threatened	SSC
Southwestern Pond Turtle *(Actinemys pallida)*	Cambria Area, Cayucos/EMT Area	Candidate	SSC
Tidewater Goby *(Eucyclogobius newberryi)*	Cayucos/EMT Area, Cambria Area, South SLO WWTP Area [and pipelines for Morro Bay Area]	Endangered	SSC
California Least tern *(Sternula antillarum browni)*	Nipomo Mesa Area	Endangered	SSC

Alternative A - Cambria Area

Alternative A is in an area where the CNDDB has identified California red-legged frog and steelhead (south central California coast DPS) as species of concern. While the actual plant siting would not be located in Hearst San Simeon State Park, most of the area west of areas that could be a potential site are, and the coastal waters further to west are in the Cambria SMCA/State Marine SMP which is the state's only dual-designation marine protected area and are also part of the Monterey Bay National Marine Sanctuary. Additional species recorded nearby include the southwestern pond turtle and monarch butterfly.

Alternative B - Cayucos/EMT Area

Alternative B is in an area where the CNDDB has identified the sandy beach tiger beetle, specifically on Morro Strand State Beach. Additional species recorded nearby include the southwestern pond turtle, tidewater goby, and monarch butterfly. Pipelines (intake, outfall, and/or distribution) for this alternative intersect with areas for which recorded species also include the red legged frog.

Alternative C - Morro Bay Area

Alternative C is in an area outside of any identified CNDDB or USFWS Complete Species Range. However, seaward, the CNDDB has identified sandy beach tiger beetle and Morro shoulderband snail. Similarly, the beach seaward of areas that could be considered a potential site have been identified as an area for western snowy plover by USFWS Complete Species Range. West, the most seaward part of the beach is an Estuarine and Marine Wetland and waters within the Morro Bay SMRMA. Additional species recorded nearby include steelhead. Pipelines (intake, outfall, and/or distribution) for this alternative intersect with areas for which recorded species also include the red legged frog, monarch butterfly, and western snowy plover.

Alternative D - South SLO WWTP Area

Alternative D is in an area where the CNDDB has identified monarch - California overwintering population, CA red-legged frog, and mimic tryonia (California brackishwater snail). USFWS Complete Species Range has not identified any species near the South SLO County WWTP area, but there is western snowy plover seaward of the plant. Areas that could be considered a potential site are not located on Pismo State Beach, but the beach west and waters further west are in the Chumash Heritage National Marine Sanctuary. Additional species recorded nearby include steelhead, Gambel's watercress, and monarch butterfly.

Alternative E - Nipomo Mesa Area

Alternative E is in an area where the CNDDB has identified monarch - California overwintering population. The potential site is near San Luis Bay, a sensitive resource area. The waters west of the Nipomo Mesa Refinery site are in the Chumash Heritage National Marine Sanctuary. Additional species recorded nearby include California least tern and western snowy plover. Pipelines (intake, outfall, and/or distribution) for this alternative intersect with areas for which recorded species also include the western snowy plover.

7.1.2 Public Health

The following sections address the potential effects of the Project related to public health and safety, including air quality, geologic and seismic hazards, coastal erosion and sea level rise, hazards and hazardous materials, water quality, and noise.

7.1.2.1 Air Quality

The Project is located within the jurisdiction of the SLO County Air Pollution Control District (SLO County APCD), which regulates air quality in the South Central Coast Air Basin (SCCAB). Air quality in the planning area is not only affected by various emission sources (mobile, industry, etc.), but also by atmospheric conditions such as wind speed, wind direction, temperature, and rainfall.

Within SLO County, ambient air quality standards for ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (particulate matter less than 10 microns in size [PM_{10}] and particulate matter less than 2.5 microns in size [$PM_{2.5}$]), and lead have been set by both the State of

California and the federal government. The state has also set standards for sulfate and visibility. SLO County is currently designated as non-attainment for State O_3 and PM_{10} standards. Non-attainment status means thresholds for daily emissions are lower for those pollutants (O_3 and PM_{10}) than for other pollutants that the County is in attainment for.

During construction, short-term degradation of air quality may occur due to the release of particulate matter emissions (i.e., fugitive dust) generated by grading, hauling, and other activities. Emissions from construction equipment are also anticipated and would include CO, nitrogen oxide (NO_x), reactive organic gases (ROG), directly emitted particulate matter ($PM_{2.5}$ and PM_{10}), and toxic air contaminants such as diesel exhaust particulate matter.

For example, grading, site preparation, paving, and other construction activities would disturb soils and generate fugitive dust and particulate emissions, which would have the greatest construction-related effects on air quality. Vehicles leaving the site would deposit dirt and mud on local streets, which could be an additional source of airborne dust after it dries. PM_{10} emissions would vary from day to day, depending on the nature and magnitude of construction activity, local weather conditions, soil moisture, silt content of soil, and wind speed. Larger dust particles would settle near the source, while fine particles would be dispersed over greater distances from the construction site. Water or other soil stabilizers can be used to control dust, resulting in emission reductions of 50 percent or more.

In addition to dust-related PM_{10} emissions, heavy trucks and construction equipment powered by gasoline and diesel engines would generate CO, O_3, NO_2, SO_2, and some soot particulate ($PM_{2.5}$ and PM_{10}) in exhaust emissions. If construction activities were to increase traffic congestion in the area, CO and other emissions from traffic would increase slightly while those vehicles idle in traffic. These emissions would be temporary in nature and limited to the immediate area surrounding the construction site. However, there are numerous measures that can be implemented to reduce emissions during construction. Therefore, it is expected that implementation of standard control measures for fugitive dust emissions would minimize adverse to short-term air quality effects associated with Project construction.

Long-term air pollutant emission impacts during operation are typically associated with mobile sources (e.g., vehicle trips), energy sources (e.g., electricity and natural gas), and area sources (e.g., architectural coatings and the use of landscape maintenance equipment) related to a project. Operation of the Project would likely generate a small number of additional vehicular/truck traffic to operate and service the treatment facility and booster bumps. Because the alternative's primary operations consist of electrically powered pumps and treatment processes rather than combustion-based equipment, long-term operational emissions of criteria pollutants would be limited. Potential stationary emission sources, such as emergency backup generators or other permitted equipment, would be subject to applicable SLO County APCD permitting requirements. Overall, operational air pollutant emissions would be associated primarily with electricity consumption and limited maintenance activities. An air quality analysis will need to be completed to determine whether there will be an increase in any criteria pollutants. Air pollutant emissions associated with construction and operation of the Project will be estimated using the California Emissions Estimator Model (CalEEMod), which is a statewide land use emissions modeling tool developed by the California Air Pollution Control Officers Association in coordination with California Air Resources Board and regional air districts.

7.1.2.2 Geologic and Seismic Hazards

The Study area is located in a seismically active region subject to strong seismic ground shaking. Ground shaking is a general term referring to all aspects of motion of the earth's surface resulting from an earthquake and is normally the major cause of damage in seismic events. The extent of ground shaking is controlled by the magnitude and intensity of the earthquake, distance from the epicenter, and local geologic conditions. The magnitude of a seismic event is a measure of the energy released by an earthquake; it is assessed by seismographs that measure the amplitude of seismic waves. The intensity of an earthquake is a subjective measure of the perceptible effects of a seismic event at a given point. The Modified Mercalli Intensity scale is the most commonly used scale to measure the subjective effects of earthquake intensity. It uses values ranging from I to XII. According to spatial data gathered from the California Geologic Survey, the closest fault to the potential Project sites is the Rinconada Fault, located to the east. The SLO County General Plan identifies several regional faults that could potentially affect the potential Project sites, including the San Andreas, the Hosgri-San Simeon, and the Los Osos, in addition to at least 17 other faults that are considered potentially active or have uncertain fault activity in the County.

Although seismic ground shaking may occur within the Project limits, proposed improvements would be designed and constructed consistent with the most current version of the California Building Code (CBC), which includes specifications and design criteria to minimize damage from anticipated ground shaking. It is acknowledged that seismic hazards cannot be completely eliminated, even with site specific geotechnical investigation/design and advanced building practices. However, the seismic design standards of the CBC have been developed to mitigate seismic hazards and to prevent catastrophic building failure in the most severe earthquakes currently anticipated, thereby reducing the risk of collapse and the associated risks to human health and safety and private property.

Site specific geotechnical investigations would need to be conducted to determine the soil characteristics and seismic hazards at the site of each Project component (e.g., wells, pipelines, seawater desalination facility). These investigations would identify the specific soil conditions at the site and provide feasible site design and engineering recommendations to address potentially adverse soil conditions. Site specific geotechnical investigations would also provide structural engineers with the necessary information to design structures to withstand earthquake ground motion and associated adverse effects, such as liquefaction, expansion, ground failure, and landslides. Grading plans, foundation designs, and structural designs would be prepared based on the geotechnical recommendations presented in the site specific geotechnical investigation and other pertinent requirements of the CBC. Preparation and compliance with the recommendations in these site specific geotechnical studies would minimize adverse effects related to geological hazards that could pose a risk to public health and safety.

7.1.2.3 Flooding

According to the Federal Emergency Management Agency (FEMA) mapping, large portions of the coastal areas where Project components would potentially be installed are designated as Special Flood Hazard Areas. However, it is anticipated that alternative components will be designed to be resilient to and located outside of special flood hazard areas, to the greatest extent practicable.

7.1.2.4 Coastal Erosion and Sea Level Rise

Sea level rise in California is a slow-moving threat. It creates extreme hazards that cause significant harm to people, infrastructure, and the environment, depending on coastal topography and land use. Sea level rise can also threaten the operation of utilities in the long term.

While the potential alternatives would place infrastructure outside of the immediate coastline, their components would be proposed within the Coastal Zone boundary and near areas where sea level rise is anticipated. Sea level rise projections will need to be considered in locating the alternative components. Future environmental analyses will map sea level rise projections relative to alternative components to ensure that infrastructure is designed to be resilient to, and located outside of areas vulnerable to, inundation and flooding from sea level rise to the greatest extent practicable.

7.1.2.5 Hazards and Hazardous Materials

Project construction and operation would likely require the use of limited quantities of hazardous materials, such as fuels, oils, lubricants, and solvents. The small quantities of hazardous materials that would be transported, used, stored, or disposed of would be well below reportable quantities. The improper use, storage handling, transport, or disposal of hazardous materials during construction and/or operation could result in accidental release exposing construction workers, employees, the public, and the environment, including soil and/or ground or surface water to adverse effects. Construction and operational activities would be conducted in accordance with all applicable federal, state, and local hazardous materials laws and regulations, which would minimize the risk associated with the transport, use, storage, or disposal of hazardous materials.

According to the State Water Resources Control Board (SWRCB) GeoTracker website, several Cortese List sites or other hazardous material release sites (e.g., leaking underground storage tank [LUST] sites, cleanup program sites) are located in proximity to proposed facilities, particularly the alternatives in Cayucos/EMT area and Morro Bay area. All of these sites have been designated as "Completed—Case Closed." Therefore, no significant hazard to the public or environment would be associated with any of these listed as closed sites. A closed site indicates that regulatory requirements for response actions, such as site assessment and remediation, have either been completed or were not necessary, and therefore, potential migration of residual contaminants in groundwater beneath the sites where alternative components are proposed (if any) would not likely pose a risk to human health and the environment.

7.1.2.6 Noise

Project construction would result in short-term noise impacts on adjacent land uses. Maximum construction noise would be short-term, generally intermittent depending on the construction phase, and variable depending on the distance of the sensitive receptor from the active construction zone. Sensitive receptors are defined in the SLO County General Plan as residential developments, schools, health care facilities, nursing and personal care facilities, churches, public assembly and entertainment locations, libraries and museums, hotels and motels bed and breakfast facilities, outdoor sports and recreation facilities, and offices. The duration of noise impacts generally would be from one day to several days depending on the phase of construction. Most of the proposed facilities are not located in close proximity to sensitive receptors; however, some of the proposed pipeline alignments are located in developed areas with sensitive receptors that may be subject to short-term construction noise. Compliance with local construction noise level standards that limit construction activities to daytime hours and implementation of best management practices (e.g., mufflers for construction equipment) would minimize potential adverse construction noise for any nearby sensitive receptors.

Sources of noise associated with the operation of the Project would include pumps and other equipment near or at the actual desalination facility. As part of subsequent environmental review, site specific noise analyses would be prepared to evaluate the potential noise levels associated with project operation and its impact on sensitive receptors. It is expected that any operational noise associated with new facilities could be minimized through the design process (e.g., placement of equipment within structures). Proposed extraction and potable water conveyance pipelines would not generate operational noise.

Neither construction nor operation of the alternative components would permanently alter public roadways, nor would the project add significant vehicle trips (e.g., from employee traffic and maintenance activities) to the surrounding roadways. Therefore, the project would not result in a significant increase in the generation of vehicle trips that would result in a perceptible increase in traffic noise levels at sensitive receptors in the Project vicinity. Neither alternative construction nor operation would generate transportation-related noise levels that would exceed the applicable standards.

7.1.3 Natural Resources/Regulated Waters

7.1.3.1 Watershed

The potential alternative sites and associated infrastructure may be within the following hydrologic unit codes (HUC) as defined by the United States Geological Survey (USGS):

- San Simeon-Arroyo de la Cruz Area Watershed (HUC: 180600060404).
- Santa Rosa Creek Area Watershed (HUC: 180600060407).
- Cayucos Creek-Whale Rock Area Watershed (HUC: 180600060413).
- Morro Bay Watershed (HUC: 180600060503).
- Chorro Creek (HUC: 180600060502)
- Los Osos Creek (HUC: 180600060501)
- Arroyo Grande Creek Watershed (HUC: 180600060605).
- Santa Maria River Watershed (HUC: 180600060704).

Figure 7.1 on the next page shows these HUC's as well as major water systems within the study area. The major rivers draining into this stretch of coastal SLO County are (from north to south) Arroyo de la Cruz Creek, San Simeon Creek, Santa Rosa Creek, Villa Creek, Cayucos Creek, Old Creek, Toro Creek, Morro Creek, Chorro Creek, Los Osos Creek, Arroyo Grande Creek, and Santa Maria River.

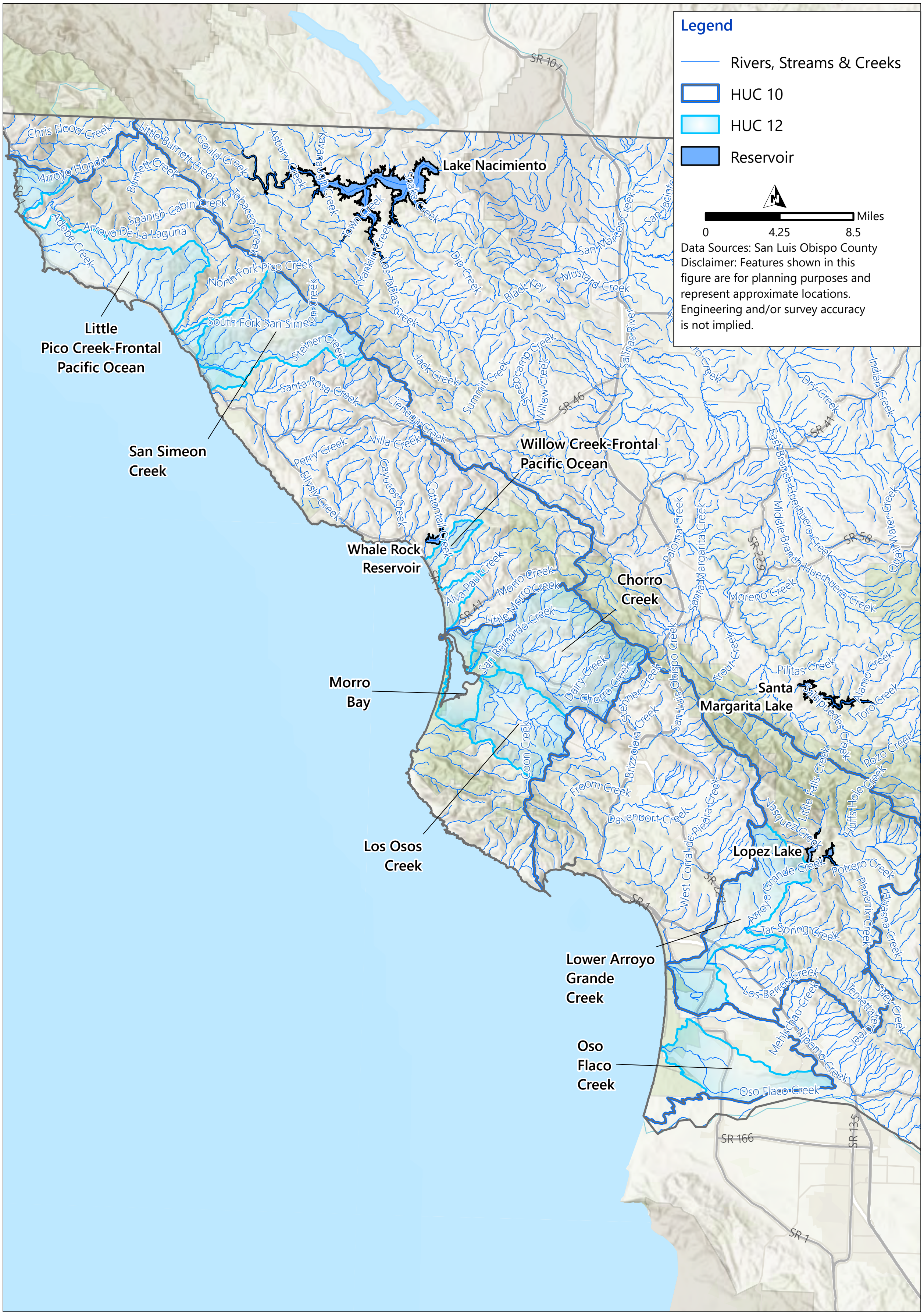


Figure 7.1 Hydrologic Features within Study Area

7.1.3.2 Surface Waters

The NWI uses a system of classification nomenclature that best describes a particular wetland habitat. The Cowardin system, employed by the USFWS for the NWI, classifies wetlands by landscape position, vegetation cover, and hydrologic regime. According to the NWI mapper, the potential alternative areas and pipelines (intake, outfall, and/or distribution) may impact several types of waters that could be considered waters of the United States (U.S.) and/or waters of the state. Potential aquatic habitats within or nearby the potential Project sites include Estuarine and Marine Wetland and Freshwater Forested/Shrub Wetland.

If the alternative's construction work would result in impacts to waters of the U.S. or waters of the State of California, the alternative proponent would be required to secure permits from the United States Army Corps of Engineers (USACE) and the Regional Water Quality Control Board (RWQCB). Waters within the Project limits, below the ordinary high-water mark, would most likely fall under the jurisdiction of USACE as water of the U.S. and construction activities in this area would be subject to USACE permit requirements pursuant to Section 404 of the Clean Water Act (CWA). Alternatives may be authorized under a Nationwide Permit but could require an individual permit if Nationwide Permit limits are exceeded[1]. In addition, if a USACE 404 permit is required, a Section 401 of the CWA Water Quality Certification from the RWQCB is also required and activities must meet state water quality standards. In situations where a water source is determined jurisdictional under state regulations, but is not jurisdictional under federal regulations, a SWRCB Waste Discharge Requirements (SWRCB WDR), would be issued in lieu of a 401 Certification. A WDR is designed to manage and regulate discharges to prevent pollution and protect water resources and allows a facility or activity to discharge waste into state waters while ensuring compliance with water quality standards. These permits and certifications are typically issued on the condition that the applicant agrees to provide mitigation that results in no net loss of wetland functions, jurisdictional waters or beneficial uses. Compliance with each permit requires avoidance, minimization, and mitigation measures to ensure that Project-related impacts to jurisdictional waters are less-than-significant in nature or are fully mitigated.

All of the potential desalination facility site areas are located within the Coastal Zone under the jurisdiction of SLO County, with the exception of the Alternative C - Morro Bay area which is under the jurisdiction of the City of Morro Bay and potentially parts of Alternative D – S. SLO County WWTP Area alternative which are under the jurisdiction of the City of Grover Beach and Pismo Beach. Figure 7.2 shows a map of the Coastal Zones within the study area. All potential alternatives would require approval of a Coastal Development Permit, which is the regulatory mechanism by which proposed developments in the coastal zone are brought into compliance with the policies of Chapter 3 of the Coastal Act. Local Coastal Programs (LCP) carry out policies of the California Coastal Act (CCA) at the local level by laying out a framework for development and coastal resource protection within a city or county's coastal zone area. They are prepared by the local jurisdiction and submitted to the California Coastal Commission (CCC) for certification. Each LCP includes a Land Use Plan, which contains policies, and an Implementation Plan (or zoning code), which includes accompanying measures to implement the plan. Both SLO County and the City of Morro Bay have certified LCPs, meaning they have authority to issue Coastal Development Permits

[1] The limits for nationwide permits are identified in each nationwide permit and are different depending on the individual nationwide permit number.

within their respective jurisdictions. Even in areas with a certified LCP, the CCC also retains permit jurisdiction over development proposed on any tidelands, submerged lands, or public trust lands. If the proposed alternative includes any development within CCC jurisdiction, they will require issuance of a chemical disinfection by-product permit in addition to the locally issued Coastal Development Permit.

Project activities with potential to alter natural waters including the bed, bank, floodplain, and associated riparian habitat, would also be within CDFW's jurisdiction, pursuant to Section 1602 of the California Fish and Game Code. The selected alternative proponent would be required to notify CDFW if the Project's activities have potential to impact rivers, streams, or the riparian corridor of any aquatic features onsite that may be beneficial to fish or wildlife resources. If CDFW determines that the alternative would potentially adversely affect fish and wildlife resources and/or riparian habitat, a Lake or Streambed Alteration Agreement (LSA Agreement) would be issued prior to construction. LSA Agreements are typically issued with mandatory avoidance and minimization measures, protective measures for special status species, and required compensatory mitigation for removal of riparian trees, shrubs, and herbaceous cover along the banks. Compliance with measures of the LSA Agreement would ensure that the Project's impacts to aquatic features and riparian habitat within CDFW's jurisdiction remain less-than-significant or are fully mitigated.

Installation of conveyance pipes could require crossing aquatic resources. Given that the majority of the infrastructure would be installed below grade, permanent loss of aquatic features is not expected or would be minimal. Temporary impacts during construction are expected and could include hydrological interruption and temporary filling ("fill" refers to the placement of material into waters of the United States that is intended to alter the natural hydrology, morphology, or function of those waters). As part of subsequent environmental review, an aquatic resources delineation would need to be prepared to identify potential jurisdictional areas and to determine what, if any, permits may be required and provide mitigation measures to avoid and/or reduce impacts to less-than-significant under CEQA.

Compliance with USACE, RWQCB, CCC, and CDFW permits, certifications, and agreements is a complex and lengthy process. However. full compliance would result in no direct or indirect effects to jurisdictional waters.

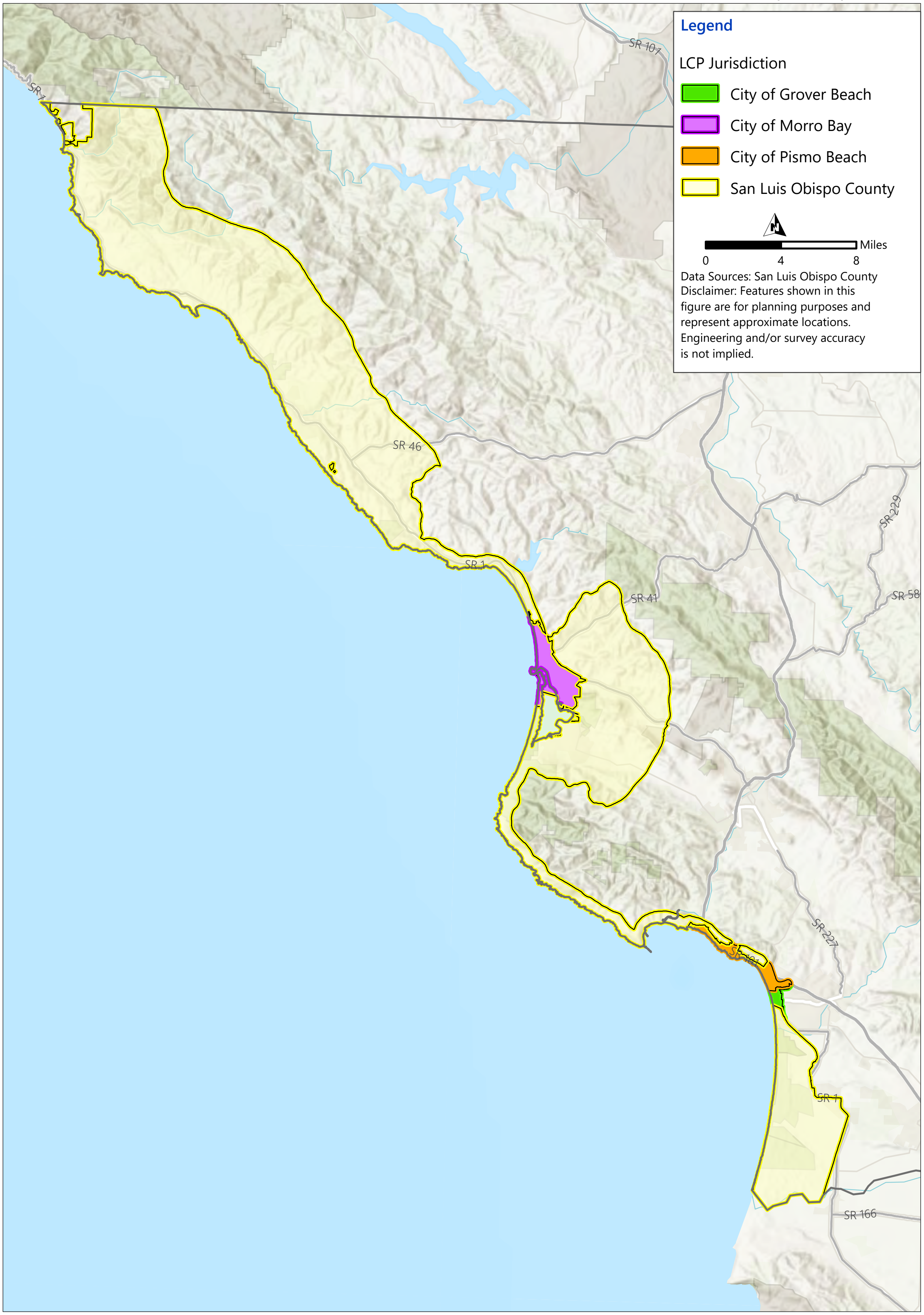


Figure 7.2 Coastal Zone Jurisdictions within Study Area

7.1.3.3 National Pollutant Discharge Elimination System

Since construction would involve ground disturbance over an area greater than 1 acre, the potential Project would also be required to obtain a Construction General Permit under the Construction Storm Water Program administered by the RWQCB. A prerequisite for this permit is the development of a Storm Water Pollution Prevention Plan (SWPPP) to ensure construction activities do not adversely affect water quality.

The ocean outfalls utilized for brine disposal would be required to update their National Pollutant Discharge Elimination System (NPDES) permits or secure new NPDES permits that include the discharge of brine. Chapter 8 - Legal and Institutional Requirements discusses some of these permitting requirements.

7.1.3.4 Groundwater

The potential alternative sites are located over four groundwater basins: San Simeon Valley, Toro Valley, Morro Valley, and Santa Maria River Valley. In September 2014, Governor Edmund G. Brown signed into law the Sustainable Groundwater Management Act (SGMA) to govern groundwater management in California. SGMA mandated the formation of Groundwater Sustainability Agency(ies) (GSA) to oversee local groundwater basins. GSAs are responsible for the development and implementation of a Groundwater Sustainability Plan (GSP), which aim to ensure groundwater sustainability over a 20-year implementation period. GSPs focus on creating and executing long-term groundwater sustainability programs, plans, and practices with a 50-year planning horizon.

In 2019, DWR ranked all four groundwater basins as very low priority for preparation of a GSP under SGMA. Additionally, the Santa Maria River Valley basin is an “adjudicated area” subject to litigation. Though it is exempt from SGMA requirements, the Santa Maria River Valley Basin, which is separated into the Northern Cities Management Area, Nipomo Mesa Management Area, and the Santa Maria Valley Management Area, is required to comply with the terms of the Stipulated Judgment.

As part of subsequent environmental review, site specific hydrogeological investigations and analyses would need to be completed to demonstrate that project construction and operations do not adversely impact groundwater users in the surrounding area. These investigations could include, but are not limited to the following:

- **Review of available subsurface information** – A desktop study to establish a database of available subsurface information, including identification of existing wells that could be incorporated into a project monitoring network. Available information could be assessed for completeness regarding aquifer characterization and establishment of baseline conditions. Data gaps identified in this step could be incorporated into a design of a dedicated project groundwater monitoring network.
- **Groundwater monitoring network** – The establishment of a dedicated groundwater monitoring network with completions in all aquifer zones – New monitoring wells could be completed in data gap areas identified in the desktop analysis. Data collected from the new wells could be used to improve the understanding of aquifer characterization (hydraulic conductivity, transmissivity, storativity) and in conjunction with any existing wells to establish baseline conditions (water level and water quality). The network could be used to monitor for any changes induced by operation of the project or pilot project.

- **Electromagnetic geophysics** – In conjunction with data acquired from the monitoring network, electromagnetic geophysics could be used to map the existing seawater/freshwater interface. These data could be used to inform a salinity profiling and mixing zone analysis.
- **Environmental & Permitting-Driven Studies** – Beneficial use characterization, cumulative impact assessments and antidegradation analysis of local aquifers is likely to be simplified and framed instead as a cumulative benefits analysis tied to baseline conditions.
- **Groundwater modeling** – Informed by data collected from the monitoring network and geophysics, groundwater modeling would be used to assess seawater capture vs capture of groundwater from inland freshwater aquifers for project design alternatives and to evaluate any potential adverse impacts to users of groundwater.
- **Pilot Project** – A pilot project may potentially be needed as part of the permitting process if slant well intakes or other novel technologies are used. If performed, results from the pilot project could be incorporated into the groundwater model to improve the accuracy of simulated outcomes for various project design alternatives.
- **Geologic Hazards Assessment** – Site specific studies for fault and seismic hazards, liquefaction potential, coastal erosion and sea level rise vulnerability would be required.

7.1.3.5 Wild and Scenic Rivers

There are no designated wild and scenic rivers within or nearby the potential alternative sites, with the closest being the Sisquoc River to the southeast; therefore, the Project would not result in direct impacts to wild and scenic rivers.

7.1.4 Cultural Resources

All alternative areas are generally considered sensitive for cultural resources, specifically Native American archaeological sites. This is due in large part to the close proximity to the Pacific Ocean and freshwater sources where dietary resources would have been abundant in the past. Many significant Native American archaeological sites have been documented along the SLO County coast, particularly in low lying areas where freshwater sources are present.

Construction of alternative components would require excavation and other ground disturbing activities that could affect cultural resources. An initial study, conducted by an archaeologist who meets the Secretary of Interior standards, will be necessary and include the following: establishment of the project Area of Potential Effects (APE), background research, Native American consultation, pedestrian survey (field survey conducted on foot), and reporting. The APE would be defined to include all potential project components inclusive of staging areas. Background research would include a records search of the APE and 1/4-mile radius at the Central Coast Information Center (CCoIC) in addition to an assessment of surface landform age and the potential for deeply/naturally buried archaeological sites. Native American consultation would begin with a search of the sacred lands files at the Native American Heritage Center and a request for a list of all interested Native American tribes. The County would then contact each interested tribal group (via letter, email, and/or phone call) to inquire if they would like to be consulted with during the development of the project. In addition, consultation with local Native American tribes will be required to comply with California Assembly Bill 52(AB 52) and Section 106 of the National Historic Preservation Act to avoid or mitigate any potential impacts or adverse effects to tribal cultural resources or traditional cultural properties. The pedestrian survey would include examination of the APE at close interval and any cultural resources identified would be recorded. This study would be documented in an Archaeological Survey Report that would include recommendations for additional identification efforts, such as subsurface presence/absence testing. If an archaeological resource(s) is identified within the APE that may be subject to project impacts, it will need to be evaluated for listing on the National Register of Historic Places and California Register of Historical Resources. If determined eligible and cannot be avoided through project redesign, mitigation of adverse effects to the resource will be necessary.

Archaeological and Native American construction monitoring may also be warranted in highly sensitive areas. If cultural materials are encountered during grading/construction activities, all work shall cease until the finding has been evaluated and mitigation or protection measures put in place.

There is the possibility of inadvertently uncovering human remains during construction. The potential inadvertent discovery or potential inadvertent damage or disturbance of human remains during construction, would result in an adverse environmental effect. If human remains are encountered at any time during Project implementation, State Health and Safety Code Section 7050.5 and *State CEQA Guidelines* Section 15064.5(e)(1) state that no further disturbance shall take place in the area of the find until the County Coroner has made a determination of origin and disposition of the human remains pursuant to Public Resources Code (PRC) Section 5097.98. The County Coroner must be notified of the find immediately and shall make a determination within two working days of being notified. If the remains are determined to be Native American, the County Coroner shall notify the Native American Heritage Commission (NAHC) by phone within 24 hours, and the NAHC shall then immediately determine and notify a most likely descendant (MLD). With the permission of the landowner or his/her authorized representative, the MLD may inspect the site of the discovery. The MLD shall complete the inspection and make recommendations or preferences for treatment of the remains within 48 hours of being granted access to the site. The MLD's recommendations may include scientific removal and nondestructive analysis of human remains and items associated with Native American burials, preservation of Native American human remains and associated items in place, relinquishment of Native American human remains and associated items to the descendants for treatment, or any other culturally appropriate treatment.

It is assumed that operation of the Project would have no impacts on cultural resources.

7.1.5 Environmental Effects or Undefined Risks

Based on a preliminary screening of potential environmental effects (from the previous sections) during both construction and operation, short-term and long-term impacts are expected from the alternative. It is anticipated that adverse environmental effects can be avoided, minimized or mitigated through implementation of best management practices and feasible mitigation measures. No unique or undefined environmental risks have been identified at this time. However, once specific alternatives or projects have been better defined, a more detailed analysis would be required to confirm this preliminary finding.

7.1.6 Environmental Compliance Measures

The anticipated environmental commitments, beyond standard project features and/or avoidance and minimization measures, have not been determined since a single desalination project concept alternative has not been selected. For any project to advance, further studies will be required to properly delineate the extent of impacts and the environmental commitments necessary to avoid and/or minimize effects to resources. With additional studies completed, a more thorough assessment of potential mitigation measures to be incorporated into a project can be conducted. The intent for this feasibility study is to evaluate the locations so the project can be designed to be as protective as possible. For example, in Chapter 4 (Description of Alternatives), measures such as subsurface intakes and use of existing outfalls with diffusers improved to meet dilution requirements have been included. Additionally, in developing these alternatives, areas with sensitive habitats were avoided as much as possible and additional avoidance and mitigation measures will be incorporated into the alternatives as needed as the projects are developed further. In addition, pipelines (intake, outfall, and/or distribution) for each alternative intersect with a variety of State Parks, State Beaches requiring permitting and coordination with California State Parks. In these areas pipelines would follow existing roads to minimize disturbance of previously undisturbed area. The exception is the portion of the distribution pipeline along the Chorro Valley pipeline in Morro Bay Area alternative, which in addition to State Parks and Beaches could intersect with the San Lusio Obispo Wildlife Area, Chorro Creek Ecological Preserve, and Lower San Luis Obispo Creek Wetland Preserve requiring additional coordination with and permitting from CDFW.

As part of the planning and environmental assessment process, the USBR and the CEQA lead agency will incorporate certain environmental commitments and best management practices into the alternative to avoid or minimize potential effects, including specific requirements identified by the applicable resource agencies. Specific actions to avoid, mitigate, and/or compensate for potential adverse environmental effects will be identified and addressed in the CEQA/NEPA document.

7.1.7 Other Environmental Information for CEQA/NEPA Assessments

For a Project to advance, as part of the subsequent CEQA and NEPA review, site specific studies and analyses will need to be prepared demonstrating that the Project is in compliance with federal, state and local environmental laws, which may include but is not limited to, the following:

- Archaeological & Historic Preservation Act.
- Assembly Bill 52 (Tribal consultation).
- Clean Air Act.
- Clean Water Act.
- Coastal Barriers Resources Act.
- Coastal Zone Management Act.
- Endangered Species Act.
- Environmental Justice Executive Order.
- Farmland Protection Policy Act.
- Fish & Wildlife Conservation Act.
- Flood Plain Management.
- Magnuson-Stevens Fishery Conservation & Management Act.
- Migratory Bird Treaty Act.
- National Historic Preservation Act (Section 106).
- Protection of Wetlands (Executive Order 11990).

- Rivers & Harbors Act.
- Safe Drinking Water Act, Sole Source Aquifer Protection.
- Wild & Scenic Rivers Act.
- California Coastal Act.
- California Clean Air Act.
- California Global Warming Solutions Act.
- California Endangered Species Act.
- California Fish and Game Code.
- Porter-Cologne Water Quality Control Act.
- California Public Resources Code.
- California Health and Safety Code.
- Surface Mining and Reclamation Act of 1975.
- Sustainable Groundwater Management Act.
- California Land Conservation Act of 1965 (Williamson Act).
- Local General Plans and Municipal Codes, including the County of San Luis Obispo Local Coastal Program and/or City of Morro Bay Local Coastal Program.

7.1.8 Impacts to Regional Water Supply and Water Quality

The main purpose of the alternatives is to intake and desalinate ocean saltwater to create a potable water source for local users. By providing a new alternative water supply, existing inland groundwater pumping could be reduced, which would help increase existing groundwater levels. Alternatively, surface water use could be reduced, leaving more water for potential in-stream flow or other benefits. Since a specific alternative has not yet been selected, the end uses of the desalinated water would need to be further defined for the selected alternative. Most likely the desalinated water would be used to directly augment potable supplies, which would not directly improve in situ groundwater or surface water quality but could have indirect benefits as use of groundwater and surface water would be offset. Additionally, it would provide a high-quality drinking water supply that would reduce salts and other constituents (such as nitrates, Per- and polyfluoroalkyl substances [PFAS] and disinfection by-products) in the supply, providing an overall supply water quality improvement for participating agencies.

Section 4.2.4 (Infrastructure and Treatment Technology) describes that the alternatives include subsurface ocean intakes and are assumed to use slant wells as shown in Figure 4.15. Chapter 10 (Research Needs) describes the various next steps that are required for a project to advance, one of which is conducting hydrogeological studies to identify the groundwater and soil characteristics to better inform a design for the subsurface intakes. Historically, seawater intrusion has been an issue within select regions (e.g. Morro Bay and Pismo Beach). The hydrogeological studies would identify the best location for the subsurface intakes and how they will be designed to avoid exacerbating existing, or causing new, seawater intrusion. Furthermore, performing pilot studies of the intake wells is also a common practice to gather data to determine the hydrogeological response from a slant well installation.

During construction activities, excavated soil would be exposed, and there would be an increased potential for soil erosion and sedimentation compared to existing conditions. In addition, chemicals, liquid products, petroleum products (such as paints, solvents, and fuels), and concrete-related waste may be spilled or leaked during construction. Any of these pollutants have the potential to be transported via storm water runoff into receiving waters. The Project would be subject to the SWRCB's NPDES General Permit for Storm Water Discharge Associated with Construction and Land Disturbance Activities (Order No. 2022-0057-DWQ, NPDES No. CAS000002) (Construction General Permit), which requires preparation of a SWPPP prior to any ground-disturbing activities. The SWPPP would provide the details of the erosion control measures to be applied on the project sites during the construction period, including Construction Best Management Practices (BMPs) for erosion control that are recognized by the RWQCB. BMPs would include, but not be limited to, erosion and sediment control, designed to minimize erosion and retain sediment on site, and good housekeeping practices to prevent spills, leaks, and discharge of construction debris and waste into receiving waters. Also, during construction, water would be used for soil compaction and dust control. However, the amount of water used would be minimal and would largely percolate into the ground; therefore, water use associated with construction is not anticipated to adversely affect groundwater quality or supply.

New facilities requiring foundations (e.g., well pads, pump stations, transmission poles, desalination plant, etc.) may be located in unpaved areas, which would result in new impervious surfaces. However, the increase in impervious surface areas would be small and/or undertaken in compliance with applicable NPDES permitting and would not cause a substantial increase in stormwater runoff that could lead to erosion or substantial amounts of polluted runoff that could affect the quality of surface waters. Complying with relevant NPDES permits, such as the Phase II Small Municipal Separate Storm Sewer System (MS4), and incorporating BMPs during operation would promote the Project to not substantially increase the volume of runoff or discharge substantial sources of polluted runoff. The Project would also not impact groundwater supply. The new facilities would be designed to direct runoff to adjacent unpaved areas to promote groundwater infiltration. Along pipeline routes, groundwater recharge characteristics would not change because the existing site surfaces would be restored to pre-construction conditions and there would be no increase in the quantity of impervious surfaces and no loss of groundwater recharge capability.

7.1.9 Public Involvement with This Study

This feasibility study has been led by the SLO County Flood Control and Water Conservation District (District) and has been discussed in numerous public meetings, including via the public meetings of the Water Resources Advisory Committee (WRAC). Below is a list of public meetings or engagement activities undertaken for the proposed Project as of the writing of this report:

- 4/5/2023: DESAL Plan Approach and Timeline Presented to WRAC.
- 2/5/2025: DESAL Plan Contract Presented to WRAC.
- 5/2/2025: Draft Stakeholder Engagement Plan for DESAL Plan Posted for Public Comment until 5/23/2025.
- 5/7/2025: DESAL Plan Update Presented to WRAC.
- 5/23/2025: Key Opinion Leaders - Interviews Summary was Posted.
- 6/2/2025: Final Stakeholder Engagement Plan for DESAL Plan Posted.

- 8/25/2025: DESAL Plan - Public Survey posted on County website until 9/22/2025.
- 9/15/2025: Kickoff Virtual Community Engagement Session to Inform the Public and Gather Input.
- 10/1/2025: DESAL Plan Update Presented to WRAC.
- 4/20-21/2026: In-Person Community Engagement Sessions (2).
- 5/6/2026: DESAL Plan Update Presented to WRAC.
- 6/10/2026 – 7/8/2026: DESAL Plan Public Survey posted on County website until July 8
- 7/22/2026 – 8/7/2026: Draft Feasibility Report posted on County website for public comment.
- 8/5/2026: Draft Feasibility Report presented to WRAC.
- 9/1/2026: Final Feasibility Report presented to County Board of Supervisors.

7.1.10 Effects on Historical Properties

The Project would involve installation of an intake and associated infrastructure, a saltwater desalination facility, an ocean outfall, and conveyance pipelines on existing undeveloped land or on vacant industrial sites. Therefore, no direct effects to any historic properties are anticipated with implementation of the Project. As described, future study will include an evaluation of any historic properties located in proximity to Project components that might be indirectly affected by the Project.

7.2 NEPA Compliance for USBR Funding

NEPA compliance is triggered by a discretionary federal action that is subject to USBR control and responsibility (40 Code of Federal Regulations [CFR]1508.18). The nature of the federal action may be construction of a project, granting a permit, providing federal funding, or any other action where a federal decision is required. If the USBR provides funds for construction of the Project, it is anticipated that an Environmental Assessment (EA) leading to a Finding of No Significant Impact will be the appropriate document to satisfy the requirements of NEPA as the Project does not appear to be categorically excluded under the USBR's environmental review procedures. Any selected project alternative would comply with NEPA and all other applicable local, state, and federal laws prior to beginning construction (before any ground disturbing activities begin).

CHAPTER 8 LEGAL AND INSTITUTIONAL REQUIREMENTS

Chapter 8 addresses the legal, regulatory and institutional requirements of a desalination project on the coast of San Luis Obispo County (SLO County). A preferred project has not yet been selected, therefore, this chapter presents high level analyses of the considerations for the five alternatives presented in Chapter 4 (Description of Alternatives). If Desalination Executable Solution and Logistics Plan (DESAL Plan) (DESAL Partners) decide to move one or more of the alternatives forward, additional review would be needed for a selected project. This chapter includes the following sections and a crosswalk of relevant sections per United States Bureau of Reclamation (USBR) WTR11-01 as shown in Table 8.1, below.

- **Section 8.1: Water Rights Analysis** – This section provides an overview of the water rights for use of ocean water in the study area, ways that the proposed desalination project may impact those water rights, and methods that will be implemented to avoid infringement of water rights.
- **Section 8.2: Legal and Institutional Requirements** – This section identifies the legal and institutional requirements for desalination projects.
- **Section 8.3: Need for Interagency Agreements** – This section describes the need for collaborative interagency agreements to streamline the implementation a desalination project, if approved.
- **Section 8.4: Permitting Procedures** – This section details the permits and/or approvals that will likely be needed for the implementation of a desalination project, the agencies that issue those, and methods for obtaining them.
- **Section 8.5: Unresolved Issues** – This section lists the unresolved issues and required action items to further advance the planning phase of a desalination project.
- **Section 8.6: Current and Projected Discharge Requirements** – This section describes the current discharge requirements per the Water Quality Control Plan for Ocean Waters of California (Ocean Plan) and states that no studies or dilution analyses have been performed to project discharge requirements for any desalination alternative.
- **Section 8.7: Rights to Wastewater Discharges** – This section states that no rights to wastewater discharges are required or will result from the proposed desalination project.

Table 8.1 Chapter 8 Crosswalk

WTR 11-01 Section 8 LEGAL AND INSTITUTIONAL REQUIREMENTS			
Reclamation Manual Outline	Abbreviated Directives and Standards Section Title	Corresponding Report Location	Reclamation Manual Guidelines
8a	Water rights analysis	Section 8.1	An analysis of any water rights issues potentially resulting from implementation of the proposed desalination project.
8b	Legal and institutional requirements	Section 8.2	Discussion of legal and institutional requirements, state, and/or local requirements with the potential to affect implementation of the project.

WTR 11-01 Section 8 LEGAL AND INSTITUTIONAL REQUIREMENTS			
Reclamation Manual Outline	Abbreviated Directives and Standards Section Title	Corresponding Report Location	Reclamation Manual Guidelines
8c	Need for interagency agreements	Section 8.3	Discussion of the need for multi-jurisdictional or interagency agreements, any coordination undertaken, and any planned coordination activities.
8d	Permitting procedures	Table 8.4	Discussion of permitting procedures required for the implementation of desalination projects in the study area, and any measures that the non-Federal project sponsor can implement that could speed up the permitting process.
8e	Unresolved issues	Section 8.5	Discussion of any unresolved issues associated with implementing the project, how and when those issues will be resolved, and how the project would be affected if the issues are not resolved.
8f	Current and projected wastewater discharge requirements	Section 8.6	Identification of current and projected wastewater discharge requirements resulting from the proposed desalination project.
8g	Rights to wastewater discharges	Sec 8.7	Description of rights to wastewater discharges resulting from implementation of the proposed desalination project.

This chapter is not complete as a USBR Title XVI Feasibility Study. The legal and institutional requirements should be refined based on further developing the selected alternative/project(s) in Chapter 6 (Selection of Proposed Project).

8.1 Water Rights Analysis

In California, water rights for use of ocean water are subject to the Public Trust Doctrine which says that the state owns the resource for the people of the state and no individual can 'own' ocean water. Article X, Section 2 of the California Constitution requires that all water use (including ocean water) be reasonable and put to a "beneficial use" (e.g., municipal supply, industrial use, or environmental protection) to prevent waste. The California Coastal Commission (CCC), which administers the California Coastal Act that also codifies the Public Trust Doctrine, identifies that the consumptive use of seawater for potable water is a shift from that common resource to a commodity (CCC, 2004).

The State Water Resources Control Board (SWRCB) has established objectives for the protection of marine water quality in the Ocean Plan and the Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California (Thermal Plan). The Ocean Plan, developed in 1972 and updated in 2019, governs the protection of ocean water quality. As a result, it regulates access to ocean water for use or extraction and controls discharge back to the ocean, including brine residual from desalination. The 1975 Thermal Plan focuses on discharge and corresponding temperature effects on coastal waters so does not directly impact rights or ability to extract ocean water. The 1972 Federal Clean Water Act (CWA) and California Water Code (CWC) govern protection of water resources (including ocean and navigable waters) from uses (including extraction) and discharges.

The type of intake used for a desalination project could impact the water rights if groundwater was drawn into the intake. The use of brackish groundwater for desalination is subject to water rights governed by the proportional use of all overlying landowners above the tapped groundwater aquifer. The goal of the alternatives is to use ocean water to avoid impacts to local groundwaters. Mixing brackish groundwater with ocean water through the subsurface extraction process is not desired or preferred in order to prevent exacerbating seawater intrusion within the region. All alternatives are assuming adequate well distances will be defined and used to extract ocean water, not brackish groundwater.

In August 2022, the Governor of California set out a Water Supply Strategy for the State (California Natural Resources Agency [CNRA], 2022), which provides four strategies including "*Make new water available for use by capturing stormwater and desalinating ocean water and salty water in groundwater basins, diversifying supplies and making the most of high flows during storm events*." The Strategy targets expanding desalination by 28,000-acre-feet per year (AFY) of desalination water in the state by 2030, and 84,000-AFY of desalination water in the state by 2040. The Strategy recognizes the changing water availability and demands in the state and the need to expand supply options; it does not assert or alter water rights.

8.2 Legal and Institutional Requirements

Contractual water supply obligations are defined within varying agreements between the District (and interested member agencies) service area(s) between suppliers and users. Water reclamation, recycling or desalination projects using USBR Reclamation project water must address contractual requirements as described in Reclamation Manual (RM) Directive and Standard (D&S), Reuse of USBR Project Water (PEC 05-09). There have not been any contractual agreements made yet for the DESAL Plan related to water deliveries or other activities other than agreements to participate in this feasibility study.

The SLO County Flood Control and Water Conservation District (District), established in 1945 by the California Legislature with the passage of the SLO Flood Control and Water Conservation Act Act, has statutory authority to manage water supply and is the lead agency for the region's Integrated Regional Water Management Plan (IRWMP). The IRWMP is developed and implemented by the Regional Water Management Group (RWMG) as defined in Water Code §10540 (IRWMPs).

Additionally, CWC §10632 (Urban Water Management Planning) requires that every urban water supplier that serves more than 3,000-acre feet per year or has more than 3,000 connections to prepare and adopt a standalone Water Shortage Contingency Plan (WSCP) as part of its Urban Water Management Plan (UWMP). Project partners develop their own UWMP. The District is also obligated to prepare its own UWMP as it acts as an urban wholesale water supplies, as defined in the CWC § 10608.12.

Power (electricity) would be provided by Pacific Gas and Electric (PG&E) or Central Coast Community Energy (3CE). Agreements may be required for purchase of power and provisions of transmission/distribution lines, including potential necessitating right of ways.

8.3 Need for Interagency Agreements

The site and location specific nature of project review and the involvement of different agencies support the establishment of a coordinated and cooperative interagency process for State and federal agencies involved in review, for purposes of consistency and efficiency. Although each agency has a unique, independent role and authority in reviewing and permitting desalination facilities, there are opportunities for the agencies to collaborate in developing the information needed to conduct their reviews. The District will continue to work collaboratively with local partners on the DESAL Plan to identify and, if feasible and supported, implement a local ocean desalination project. The DESAL Plan Phase 1 was Agreements with 16 partners engaged in review of desalination opportunities in the County. This feasibility study is central to Phase 2 of the DESAL Plan.

Interagency agreements are essential to facilitate effective coordination and information sharing throughout the desalination project lifecycle. These agreements streamline collaboration before and during determinations under CWC section 13142.5(b) (State Policy for Water Quality Control), as well as during permitting, leasing application reviews, and environmental assessments under California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA). CWC section 13142.5(b), (State Policy for Water Quality Control), states that for each new or expanded coastal powerplant or other industrial installation using seawater for cooling, heating, or industrial processing, the best available site, design, technology, and mitigation measures feasible shall be used to minimize the intake and mortality of all forms of marine life. Interagency agreements support the coordination of information needs and actions related to desalination planning, including process streamlining, technical, siting and mitigation issues, statewide water supply planning and integrated water resource management. Additionally, agreements help maintain confidentiality of communications and records and enable supplemental agency reviews for proposed changes to permitted facilities. Coordination may also involve negotiations to provide services, cost sharing, funding partnerships, and other items beyond regulatory approvals and encroachment permits.

As discussed in previous sections, a preferred project or alternative has not yet been selected. However, once an alternative is selected, there will be need for a number of agreements. A meeting was held with project partners to review potential governance models and agreements needed, as summarized in Appendix F – Governance Considerations and Institutional Structure.

8.4 Permitting Procedures

Implementation of a proposed desalination project will require compliance with a range of federal, state, and local permitting requirements, some of which were discussed in Chapter 7 (Environmental Considerations). Table 8.2, below, and the following sections outline the key permitting agencies and the permits and approvals typically needed for a desalination facility at any of the possible locations.

Table 8.2 Permits/Approvals Likely Required for a Desalination Facility

Agency	Permit or Approval
United States Army Corps of Engineers (USACE)	▪ Clean Water Act Section 404 Permit. ▪ Rivers and Harbors Act Section 10 Permit. ▪ Nationwide Permit No. 6 & Nationwide Permit No. 7.
United States Coast Guard (USCG)	Consultation with USACE.
United States Environmental Protection Agency (EPA)	Underground Injection Control Program (EPA, 2019)
National Marine Fisheries Service	Endangered Species Act Section 7 consultation. (USFWS, 2026)
United States Fish and Wildlife Service (USFWS)	Endangered Species Act Section 7 consultation. (USFWS, 2026)
Federal Emergency Management Agency (FEMA)	Conditional Letter of Map Revision. (FEMA, 2026)
National Marine Sanctuary (Monterey Bay or Chumash)	Authorization for leases and activities in the sanctuary.
Local or State Lead Agency	California Environmental Quality Act (CEQA).
Central Coast - Regional Water Quality Control Board (RWQCB)	▪ National Pollutant Discharge Elimination System (NPDES) permit. ▪ Clean Water Act Section 401 water quality certification.
California Coastal Commission (CCC)	Coastal Development Permit (CDP).
California State Lands Commission	State Lands Commission Lease. (CSLC, 2026)
California Department of Fish and Wildlife (CDFW)	Incidental Take Permits under California Endangered Species Act.
Tribes	Tribal consultation.
State Historic Preservation Office (SHPO)	Consultation with USACE under Section 106 of the National Historic Preservation Act.
State Water Resources Control Board (SWRCB) Division of Drinking Water (DDW)	Permit for operation of public water system and new water supply.
Caltrans	Encroachment permit for any portion of a state highway right of way.
Air Pollution Control District	Authority to construct permit and permit to operate.
County of SLO	Well construction permits, land use authority, noise ordinance permit, encroachment permit, grading permit, erosion control permit, Local Coastal Plan Coastal Development Permit??
Local Agency	▪ Encroachment and building permits. ▪ Local Coastal Plan Coastal Development Permit, if designated.

8.4.1 United States Army Corps of Engineers

The United States Army Corps of Engineers (USACE) issues Clean Water Act 404 permit for discharge or fill (as in sediments) into waters of the United States, including wetlands. A Section 404 permit would be required at any site where project activities would affect jurisdictional waters or wetlands. This may include impacts to riparian corridors, estuarine or marine wetlands, or other federally regulated waters located near the various site options, such as those in the Morro Bay, Cayucos/Estero, Cambria, South SLO (S. SLO), and Nipomo Mesa areas. The specific applicability of Section 404 permitting will depend on the site selected and the extent of ground disturbance, grading, or construction within these regulated aquatic resources.

USACE issues River and Harbor Section 10 permit for the construction of any structure in or over any navigable water of the United States, which includes the Pacific Ocean.

Under Nationwide Permit No. 6, Survey Activities, USACE issues permits for survey activities such as core sampling, seismic exploratory operations, soil surveys, sampling, and historic resources surveys. These types of surveys may be needed for progressing a project past this feasibility study.

Under Nationwide Permit No. 7, Outfall Structures and Associated Intake Structures, USACE issues permits related to the construction or modification of intake and outfall structures where the effluent is authorized by the NPDES System Program (Section 402 of the CWA).

Applications for Section 404, Section 10, or applicable Nationwide Permits must be prepared and submitted to the USACE District Office. USACE reviews for completeness, and review may include public notice before decision to deny or approve (with conditions) is made and a permit issued.

8.4.2 United States Coast Guard

The United States Coast Guard (USCG) provides consultation on the Coastal Commission CDP, and for the USACE Section 10 permit for structures placed in navigable waters. For desalination facilities, intake and outfall pipelines or any associated in-water infrastructure may require USCG approval to ensure they don’t adversely affect navigation. USCG may also require buoys or markers to be maintained over the structures. The applicant may also be required to submit information about the structures to include on nautical charts.

To obtain USCG approval, applicants must submit sufficient details about the proposed location and design to USCG for review. USCG evaluates whether the proposed in-water structures affect navigation and may require modifications or conditions before providing authorization.

8.4.3 National Marine Fisheries Service and United States Fish and Wildlife Service

National Marine Fisheries Service (NMFS) and United States Fish and Wildlife Service (USFWS) provide Endangered Species Act Section 7 consultations to address potential incidental take of federally listed species. Consultation would be required if there is potential for federally threatened/endangered species in the areas of the alternatives. Species with federally threatened/endangered status with potential to be present at some of the site areas include

California Red-Legged Frog, South-Central California Coast Steelhead, California Seablite, Tidewater Goby, Western Snowy Plover, Morro Shoulderband, Gambel's Watercress, Nipomo Mesa Lupine, California Least Tern, Southwestern Pond Turtle [proposed], and Monarch Butterfly [proposed].

Projects obtain approvals under Endangered Species Act Section 7 by consulting with the USFWS or NMFS to evaluate project impacts on listed species. If the USFWS or NMFS determine the project is not likely to adversely affect species or habitat, they issue written concurrence; otherwise, a formal consultation is completed, resulting in a biological opinion that authorizes the action. A biological opinion may include reasonable and prudent measures necessary or appropriate to minimize the impact of the incidental take on the species.

8.4.4 Federal Emergency Management Agency

A Conditional Letter of Map Revision (CLOMR) is a letter issued by the Federal Emergency Management Agency (FEMA) commenting on whether a proposed project, if built as proposed, or proposed hydrology changes would meet minimum National Flood Insurance Program standards. If the desalination facility site is located within a FEMA-designated 100-year floodplain, a CLOMR would be required to demonstrate how proposed site modifications would affect mapped floodplain boundaries.

To obtain a CLOMR, applicants must submit an application including hydrologic and hydraulic analyses and the resulting floodplain and regulatory floodway boundaries to FEMA. FEMA reviews the materials and issues a letter commenting on whether a proposed project, if built as proposed, or proposed hydrology changes would meet minimum National Flood Insurance Program standards.

8.4.5 California Environmental Quality Act

Environmental review under California Environmental Quality Act (CEQA) would be required prior to discretionary project approvals. CEQA compliance would evaluate the potential environmental impacts associated with project construction and operation, identify feasible mitigation measures, and consider a reasonable range of project alternatives. Given the scale, coastal location, and potential environmental effects of a desalination facility, CEQA compliance would require preparation of documentation. Options for documentation range from relatively small Exemptions, to modest Negative Declarations (ND) or Mitigated Negative Declarations, and up to rigorous Environmental Impact Report (EIR). Given the interest and array of potential consequences associated with a desalination facility, an EIR would be expected. CEQA environmental review would be mandatory to support any discretionary decision or approval from a local or state agency to comply with applicable state environmental documentation requirements.

CEQA requires preparation of environmental documentation (e.g., MND or EIR) that is circulated for public review and comment. Lead agencies must issue public notice of the draft document, consider comments received, respond to them in the final document, and make findings supporting approval before discretionary approvals can be issued.

8.4.6 Regional Water Quality Control Board

An NPDES permit regulates the discharge of pollutants into waters of the United States to meet compliance with the Clean Water Act. Desalinization facilities utilizing an existing outfall or proposing a new outfall will need a NPDES Permit issued by the SWRCB and the Regional Water Quality Control Board (RWQCB).

Clean Water Act Section 401 water quality certification is required when proposing to place fill in a water body, and is issued by the state in conjunction with a Section 404 permit from USACE. "Fill" includes intake or outfall pipelines, beach wells, transmission lines, or similar structures. Desalination facilities involving new intakes or outfalls are likely to require a Section 401 water quality certification.

8.4.7 California Coastal Commission

Development within the coastal zone generally may not commence until a CDP has been issued by either the California Coastal Commission (CCC) or a local government. The CCC issues CDPs within the Coastal Zone, excluding areas where local jurisdictions have approved Local Coastal Plans (LCP) in place. For the project alternatives being considered, SLO County's certified LCP would apply for all alternatives, except the Morro Bay Area alternative, where Morro Bay's LCP would apply. These local jurisdictions may issue CDPs consistent with their certified Local Coastal Program (Title 23). CDP applications to build structures within the coastal zone will need to include a lease from the local jurisdiction. In these areas, the local jurisdiction's lease decision may be subject to review and approval by the State Lands Commission.

8.4.8 California State Lands Commission

California State Lands Commission (SLC) manages most of the state's tidelands and lands lying under coastal waters. A SLC Lease would be required if intake or outfall structures cross state tidelands or submerged lands. Desalinization facilities proposing to place new intakes or outfalls on state tidelands will generally be required to obtain a lease from SLC. A SLC Lease application must be prepared and submitted to SLC. SLC reviews historic maps and documents to determine the land and resource interest and extent of State land and resources impacted by the proposed use; evaluates the potential for environmental impacts from the proposed activity or use, consistent with CEQA; and prepares a staff report for the Commission and recommends whether to approve or deny a proposed lease or permit. The Commission then considers the proposed application during a public meeting and decides whether to approve or deny the proposed lease or permit and under what terms and conditions.

8.4.9 California Department of Fish and Wildlife

CDFW issues Incidental Take Permits where a State-listed candidate, threatened or endangered species under California Endangered Species Act may be present at the project area. Consultation would be required if there is potential for federally threatened/endangered species at the site. Species with State-listed candidate, threatened or endangered status with potential to be present at some of the site options include Gambel's Watercress, Nipomo Mesa Lupine, California Least Tern, and La Graciosa Thistle.

8.4.10 Tribes

Consultation with Federally recognized Tribes is required as part of federal permitting including USACE approval/permits.

AB 52 requires lead agencies (project sponsors) to consult with tribes (including but not limited to federally recognized Tribes) during the CEQA process. Under AB 52, the lead agency must formally notify tribes early in the CEQA process. Consultation begins upon tribal request and continues until both parties agree that potential Tribal Cultural Resource impacts are avoided, minimized, or mitigated, after which the CEQA document incorporating agreed-upon measures can be finalized.

8.4.11 State Historic Preservation Office

Consultation with State Historic Preservation Office (SHPO) may be required during federal permit processing under Section 106 of the National Historic Preservation Act to evaluate potential effects on historic or archaeological resources, including submerged cultural sites. This consultation is triggered whenever the project involves a federal permit, approval, or funding and must be completed before the federal agency can issue its decision.

8.4.12 State Water Resources Control Board Division of Drinking Water

DDW has permitting authority over the operation of a public water system and provides oversight with respect to the quality of the product water produced at a proposed desalination facility as well as the installation of proposed treated water transmission pipes.

8.4.13 Caltrans

Caltrans has permitting authority over encroachments in, under, or over any portion of a state highway right-of-way. Caltrans approvals could impact the routing of infrastructure for project.

8.4.14 SLO County Air Pollution Control District

SLO County Air Pollution Control District (APCD) regulates air quality in the region. The APCD will issue permits to construct and permits to operate to address potential sources of air pollution. An authorization to construct permit is required for projects that propose to build, erect, alter, or replace any article, machine, equipment, or other contrivance that may emit air contaminants from a stationary source or may be used to eliminate, reduce, or control air containment emissions including gas-powered generators. Operating the diesel fuel-powered emergency generators, and any other articles, machines, equipment, or other contrivances that may emit air contaminants from a stationary source requires a permit to operate.

8.4.15 County of San Luis Obispo

The SLO County has land use authority and is the designated authority to issue Coastal Development Permits under the Local Coastal Plan for many sections of the coast. In addition, the County has authority to issue well construction permits, noise ordinance permits, encroachment permits, grading permits, and erosion control permits.

8.4.16 Local Agencies

Depending on where a project site is selected there may be a local agency that would have authority to issue encroachment and building permits. In addition, some of the local agencies have Local Coastal Plans and authority to issue Coastal Development Permits, as discussed in Chapter 7 (Environmental Considerations).

8.4.17 Other

Other permitting requirements that may be required based on the specific location of the desalination project include but are not limited to:

- California State Parks Right of Entry Permit, if any development is proposed in the State Marine Park (Cambria State Marine Conservation Area, Morro Strand State Beach, Cayucos State Beach).
- Lake or Streambed Alteration (LSA) Agreement, if sited near stream/creek/river (e.g., San Simeon Creek, Toro Creek), from the CDFW.
- CWA Section 401 Water Quality certification, if any activities may result in a discharge into waters of the United States, including but not limited to the discharge of dredged or fill material.

In addition, local requirements may be specific to the local agency jurisdiction(s) and any conservation area or other specific resource management considerations at or near that site. Necessary permitting for provision of power to the facility (distribution lines construction and right-of-way [ROW]) would also trigger permitting, which may extend to approvals and permits beyond those described such as encroachment permits from Caltrans.

8.4.18 Streamlining

The California Seawater Desalination Interagency Group developed a document in 2023 (Seawater Desalination Siting and Streamlining Report to Expedite Permitting) to provide recommendations and guidance for streamlining permitting for desalination projects. The guidance is summarized in this section.

To streamline agency review, prepared materials should generally consider all necessary permits as this helps maximize opportunities for multi-use and synergy, reducing duplication across permitting processes. Applicants may take the following actions to increase the likelihood that their project will be reviewed and approved in an efficient and timely manner:

- Request pre-application meetings with regulatory agencies to discuss proposed projects, which will allow agencies to identify particular information needs, key issue areas, etc., in advance of application submittals. Schedule multi-agency pre-application meetings whenever feasible.

- Submit applications for concurrent review by agencies when feasible.
- Verify that an identified need for seawater desalination is clearly demonstrated through an integrated water resources management approach.
- Conduct early, meaningful, and culturally appropriate engagement with underserved communities that may be impacted by the project.
- Clearly demonstrate that environmental justice impacts are avoided, minimized, or mitigated.
- Conduct meaningful tribal engagement early and throughout project development and implementation.
- Thoughtfully plan and site facilities for resilience to hazards.
- Use subsurface intake designs, and conveyance as necessary.
- Aim to be fully "net carbon neutral," minimize on-site energy use, maximize on-site renewable energy generation activities, and establish plans to optimize energy efficiency as new technologies and renewable sources become available.
- Minimize intake and mortality of all forms of marine life from construction and operation of intakes and discharges.
- Demonstrate that mitigation will be fully compensatory.

To streamline the planning and permitting process for desalination facilities, relevant permitting agencies may implement the following measures, including but not limited to:

- Considering amendments to the Ocean Plan to:
  - Provide guidance on the information needed to prepare a Water Supply and Demand Assessment.
  - Provide guidance on the application of existing policies and regulatory requirements relating to environmental justice, including siting projects with proactive community engagement and locally scoped environmental justice in mind at the onset of the permitting process.
  - Articulate criteria for studies necessary to demonstrate subsurface intake feasibility.
  - Specify a sequential order for assessing site, design, technology, and mitigation under the Water Code section 13142.5(b) determination process.
- Incorporating new language into the Desalination Interagency Memorandum of Agreement (MOA) to clearly define roles and responsibilities for joint/concurrent agency review.
- Revising the process for determining the identified need for seawater desalination projects to use an improved integrated regional water management approach, including updates to the Department of Water Resources' Guidebook for Urban Water Management Plans before the next publication (for the 2025 UWMPs).
- Establish definitions for terms such as "restoration", "creation", and "expansion" to improve clarity around mitigation planning expectations:
  - Clarify that "preservation" is not an acceptable means of mitigation under the Ocean Plan.
  - Align the desalination provisions with the Coastal Act requirements regarding energy consumption and Resolution No. 2017-0012, Comprehensive Response to Climate Change.
  - Align the desalination provisions with the human right to water and all applicable racial equity resolutions.

- Incorporating new language into the Desalination Interagency MOA to clearly define roles and responsibilities for joint/concurrent agency review.
- Providing additional direction on conducting a hazards analysis when siting a facility to consider appropriate hazards to promote long-term water supply resilience in line with California's Water Supply Strategy and Water Resilience Portfolio.
- Evaluating artificial reef efficacy and developing a statewide scientifically based artificial reef plan.
- Developing a Statewide Marine Restoration and Mitigation Policy to provide direction and guidance on a range of mitigation approaches in the marine environment.

8.5 Unresolved Issues

As outlined in this chapter and other chapters of this feasibility study, there are a number of unresolved issues, starting with selection of a specific site or alternative for further development. Now that the District and DESAL Plan partners have a high level evaluation of potential desalination project concept alternatives, the next step would be to decide on which project(s) to advance.

Once one or more projects are selected, there are numerous agreements to be made, as well as completion of necessary studies and documents to obtain various project approvals and permits for construction and operation of facilities for intake, desalination, discharge, and associated facilities and pilot studies may be warranted. CEQA/NEPA compliance requirements will also need to be satisfied prior to discretionary action(s) related to the project. All of the agreements, special studies, piloting and CEQA/NEPA analysis will take significant time and without these elements completed, a project cannot move forward.

8.6 Current and Projected Discharge Requirements

The brine or waste product generated from desalination will need to be discharged to an ocean outfall. Different outfalls are identified for each alternative as discussed in Chapter 4 (Description of Alternatives). Requirements for discharge will vary for each outfall based on its size, dilution and location, all which will be established in an NPDES permit. There have not been any specific studies or dilution analyses completed for any of the outfalls.

Generally, the Ocean Plan dictates the parameters for acceptable discharge of waters from desalination facilities as follows:

- Chapter III.M.2 (Water Code §13142.5(b) (State Policy for Water Quality Control)) multiple general considerations including location, co-siting, and use of best available technology to demonstrably avoid sensitive habitat and species of marine life, as well as minimize mortality of all forms of marine life.
- Chapter III.M.3 Receiving water limitation for salinity: (1) Shall not exceed a daily maximum of 2.0 parts per thousand (ppt) above natural background salinity measured no further than 100 meters (328 feet) horizontally from each discharge point/ there is no vertical limit to this zone. (2) In determining an effluent limit necessary to meet this receiving water limitation, permit writers shall use the formula in Chapter III.C.4 that has been modified for brine* discharges as follows: Ce= Co + Dm (2.0 ppt) or

- Ce (effluent concentration limit) **=** Co (salinity concentration to be met at the completion of initial dilution= 2.0 ppt + Cs (natural background salinity)) + Dm (2.0 ppt) (minimum probable initial dilution expressed as parts seawater per part brine discharge). [Also, as Ce=(2.0 ppt + Cs) + Dm (2.0ppt)]

References to co-siting and comingling refer to dual use of either facilities such as power stations already taking in seawater and discharging it back to the ocean, or wastewater treatment facilities with discharge infrastructure to the ocean and/or could dilute the salinity of brine from desalination discharges. Generally, the Ocean Plan encourages comingling and co-siting as part of avoiding and minimizing changes to ambient ocean conditions and potential for mortality of marine life.

Individual discharge facilities are subject to permit(s) and approval(s) through which site-specific parameters may be reflected as permit conditions. As well as specific permit or approval conditions further specifying parameters, Marine Protected Areas and newly created Chumash Heritage National Marine Sanctuary are generally more restrictive and consequences to those would be factored into any new or amended permits or approvals.

8.7 Rights to Wastewater Discharges

None of the project alternatives utilize wastewater as the source for new water supplies. Therefore, there is no right to wastewater discharges that would be needed.

CHAPTER 9 FINANCIAL CAPABILITY OF SPONSOR

Chapter 9 provides information regarding financial capability of the non-federal sponsor, the San Luis Obispo County Flood Control and Water Conservation District (District) for moving a preferred project into construction. A preferred project has not yet been selected; therefore, this chapter presents high level analyses of the funding opportunities and considerations for any of the five alternatives presented in Chapter 4 (Description of Alternatives). If the Desalination Executable Solution and Logistics Plan (DESAL Plan) partners (DESAL Partners) decide to move one or more of the alternatives forward, additional financial planning review would be needed for a selected project.

This chapter includes the following sections and a crosswalk of relevant sections per United States Bureau of Reclamation (USBR) WTR11-01 is shown in Table 9.1, below.

- **Section 9.1: San Luis Obispo County DESAL Plan** – This section describes the DESAL Plan phases and the goals associated with each phase.
- **Section 9.2: Schedule** – This section shows a preliminary schedule for the implementation of the DESAL plan.
- **Section 9.3: Willingness to Pay** – This section describes the District and DESAL Partners' methodology for financing the proposed desalination project.
- **Section 9.4: Funding Plan** – This section identifies some potential sources of funding, lists goals for funding, and states that the further development of a funding plan will take place once additional funding analysis, planning, and decision-making process is completed.
- **Section 9.5: Sources of Funding** – This section details potential funding opportunities and financing mechanisms for capital and operations costs estimated for the desalination project.

Table 9.1 Chapter 9 Crosswalk

WTR 11-01 Section 9 FINANCIAL CAPABILITY OF SPONSOR			
Reclamation Manual Outline	Abbreviated Directives and Standards Section Title	Corresponding Report Location	Reclamation Manual Guidelines
9a	Schedule	Section 9.1, 9.2	Proposed schedule for project implementation.
9b	Willingness to pay	Section 9.3	Discussion of the willingness of the non-Federal project sponsor to pay for its share of capital costs and the full operation, maintenance, and replacement costs.
9c	Funding Plan	Section 9.4	A plan for funding the proposed desalination project's construction, operation, maintenance, and replacement costs, including an analysis of how the non-Federal project sponsor will pay construction and annual operation, maintenance, and replacement costs.
9d	Sources of funding	Section 9.5	Description of all Federal and non-Federal sources of funding and any restrictions on such sources.

This chapter is not complete as a USBR Title XVI Feasibility Study. The project sponsor and the financial capability of that sponsor should be refined based on further developing the selected alternative/projects in Chapter 6 - Selection of Proposed Project.

9.1 San Luis Obispo County DESAL Plan

The District developed the DESAL Plan to identify and if feasible and supported, implement an ocean desalination project in San Luis Obispo County (SLO County). The DESAL Plan is a five-phase effort with specific objectives associated at each phase as it progresses. A potential timeline of the entire DESAL Plan is shown in Figure 9.1. The District and the DESAL Plan partners completed the first phase by formally agreeing to be considered in the DESAL Plan and by applying for a USBR grant to complete this USBR Title XVI Feasibility Study (Study). Now in phase two, which is split into two sub phases, 2a and 2b as shown in Figure 9.2 below and discussed in the following sections.

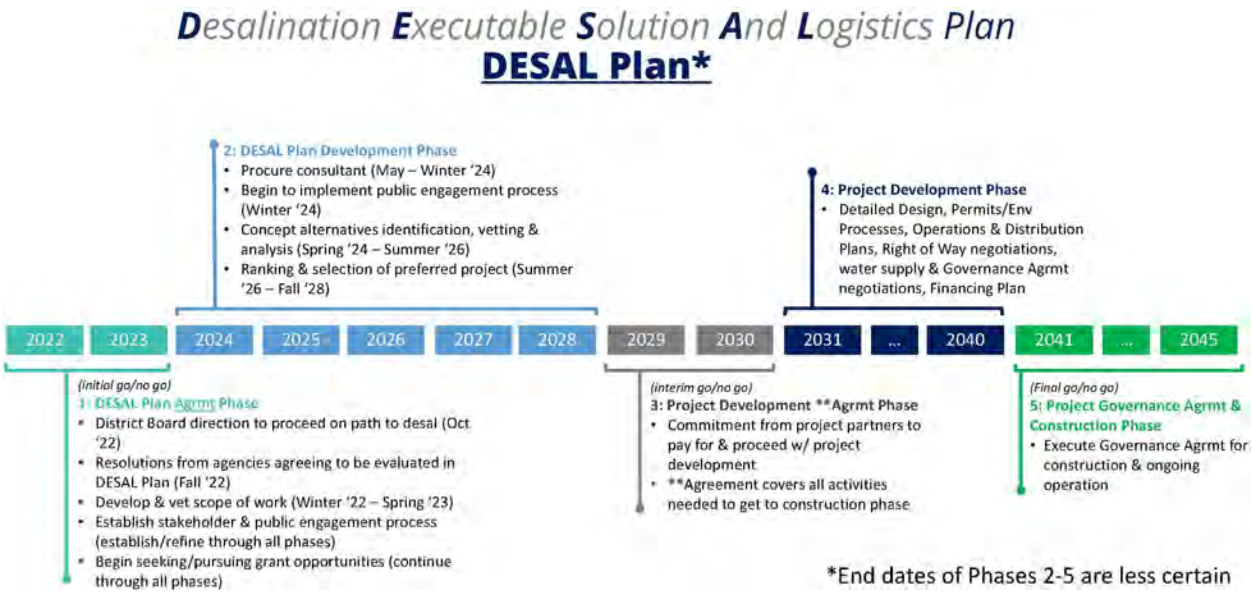


Figure 9.1 Potential DESAL Plan Timeline

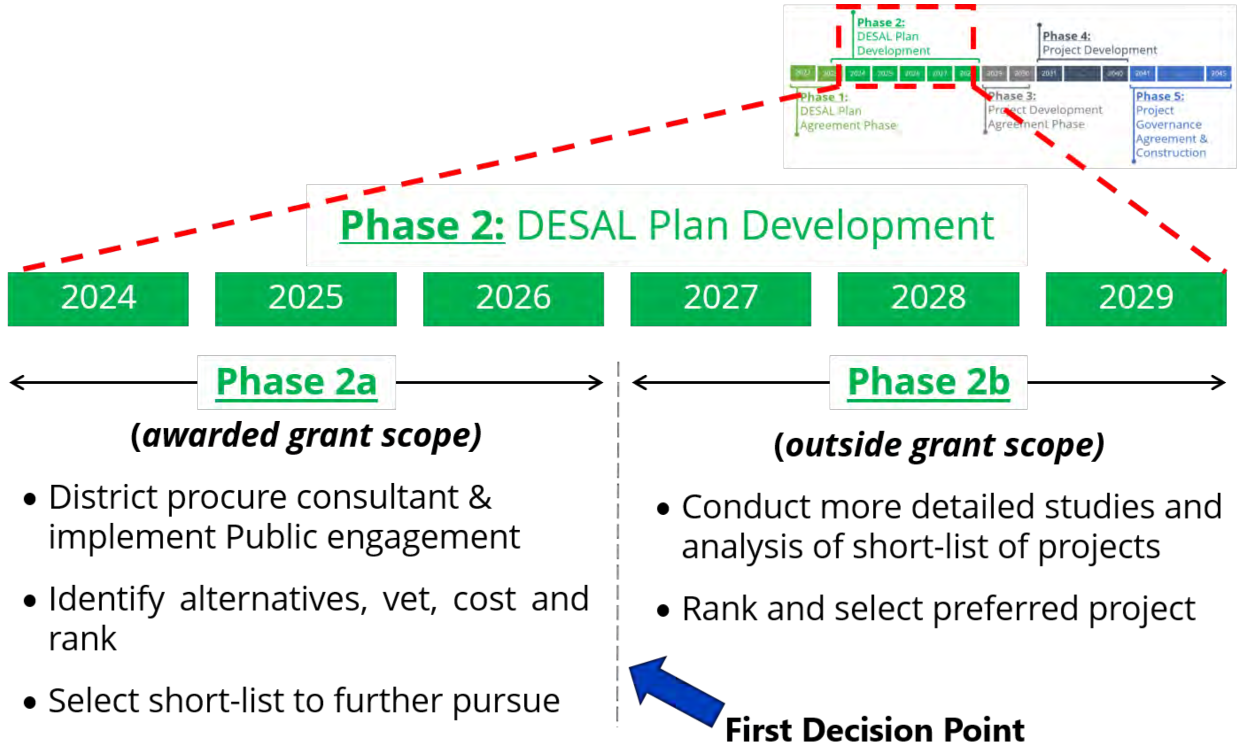


Figure 9.2 Phase 2a and 2b Scope Breakdown

9.1.1 Phase 2a

Phase 2a includes the development of this Study. The development of the alternatives started as concepts for consideration by the DESAL Partners, which were evaluated with respect to established criteria and compared to each other. Concept alternatives were developed to identify a preference of location, size, and potential environmental impact. A shortlist of five concept alternatives were then further detailed with costs and infrastructure to better define each alternative. Phase 2a also included public engagement sessions through online presentations, eblasts, website updates, public presentations and in-person meetings to inform the public throughout the alternative development. The five alternatives described in Chapter 4 - Description of Alternatives are to be further studied in Phase 2b.

Phase 2a does not select a preferred alternative nor does it select a project sponsor. Currently, the District is facilitating the implementation of the DESAL Plan until a project sponsor is determined.

9.1.2 Phase 2b

Phase 2b includes conducting more detailed studies and analysis on one or more of the short-listed five alternatives. Phase 2b includes selecting a preferred alternative or alternatives, which is the first major decision point of the DESAL Plan. From this selection of a preferred alternative, a project sponsor would need to be identified to progress implementation of detailed studies that are described in Chapter 10 - Research Needs.

9.2 Schedule

A potential implementation schedule for the DESAL Plan is presented in Table 9.2, below.

Table 9.2 Potential Schedule per DESAL Plan

Project Phase	Description	Timeline
1 – DESAL Plan Agreements	▪ District Board direction to proceed. ▪ Resolutions from participating agencies (DESAL Partners). ▪ Develop scope of work for Phase 2a. ▪ Establish stakeholder process. ▪ Seek and secure funding.	2022-2023 (completed)
2a – Initial Feasibility Study	▪ Grant agreement with USBR for draft feasibility study. ▪ Procure consultant. ▪ Implement stakeholder engagement. ▪ Feasibility study to identify and evaluate alternatives. ▪ Short-list of alternatives.	2024-2026 (this study)
2b - Planning and Piloting	▪ Additional studies to analyze project alternatives. ▪ Pilot testing. ▪ Community Outreach.	2027 - 2029
3 - Project Agreements	▪ Partner participation agreements. ▪ Governance models. ▪ Memorandums of Understanding. ▪ Financing and Funding.	2029 - 2030
4 - Development	▪ Site specific investigations. ▪ Permitting and CEQA: » Define need, demonstrate optimized water use. » Permitting discussions and required investigations. » Environmental Impact Report. » Permit applications. ▪ Design.	2031 -2040
5 - Construction	▪ Construction.	2041- 2045

9.3 Willingness to Pay

Adequate funding of capital costs and operations and maintenance (O&M) costs is a key constraint in implementing any desalination project. In general, it is anticipated that the project sponsor would utilize a combination of state, federal, and local funding sources to construct any proposed project. Similar to other large infrastructure projects, the priority would likely be to secure grants where available and then obtain debt financing in the form of loans, general obligation bonds, or revenue bonds to fund the remainder of the project. The project sponsor understands the need for adequate revenue generation to pay for both capital and ongoing operations and maintenance and, should a project advance, would be committed to developing a program that can support the project.

Payment capacity depends on existing charges, ability of water users to pay for new charges, and how the project costs are allocated. Cost allocation has not been established at this time. Approaches to cost allocation may include various methods, such as proportion to groundwater extractions, irrigated acres, domestic connections, and/or economic benefits. The financial analysis of the DESAL Plan Feasibility Study includes the capital cost, interest during construction, cost of issuance, annual O&M costs, and replacement costs.

9.4 Funding Plan

The District and the DESAL Plan partners are still investigating potential funding options. Likely funding sources for the DESAL Plan may include the USBR Desalination Construction Grant and loans from Clean Water State Revolving Fund (CWSRF) or Water Infrastructure Finance and Innovation Act (WIFIA). The funding plan for any project moving forward would likely be developed once the District and/or DESAL Partners have completed the alternative decision-making process, funding analysis and governance planning required for project implementation, and a project sponsor for implementing a preferred alternative is determined. The funding strategy for the DESAL Plan implementation of a preferred project (for any of the alternatives) will focus on the lowest-cost funding and financing options, which include grants, low-interest loans, and debt service restructuring. To increase the likelihood of securing grant funding, a variety of funding opportunities can be closely tracked to stay up to date on any changes to these programs. Rates may have to be developed to support the repayment of loans as well as the significant operations and maintenance costs associated with a potential project.

9.5 Sources of Funding

The adequate funding of capital costs is a primary constraint in implementing any construction project. This section describes potential funding opportunities and financing mechanisms for capital and operations costs, including an outline of current applicable grants and loan opportunities. The term "funding" refers to the method of collecting funds; the term "financing" refers to methods of addressing cash flow needs.

9.5.1 Types of Available Funding

The sections that follow outline the likely funding mechanisms that could be pursued, including:

- Pay-as-you-go financing or upfront collection of project costs from existing and new users for future capital improvement projects.
- Utility Fees and benefit assessments.
- Certificates of Participation.
- Debt financing or the acquisition of funds through borrowing mechanisms.
- Grants and loans or alternate sources of funds at no or minimal interest cost. Examples include federal, state, and local programs that provide funding at zero, low, or Treasury rate interest for projects that meet select criteria.
- Market based programs that refer to financing through funds obtained from tax credits, purchase agreements, voluntary programs, trading and offset programs.

- Public-private partnership agreements such as BOOT (Build-Own-Operate-Transfer), Water Purchase Agreements (WPAs), or availability payment models where the public agency pays the private operator based on the plant's *readiness* to produce water up to a certain standard, rather than just the volume consumed.

9.5.1.1 Pay-As-You-Go Financing

Pay-as-you-go financing involves periodic collection of capital charges or assessments from customers within a utility's jurisdiction for funding future capital improvements. These revenues are accumulated in a capital reserve fund and are used for capital projects in future years. Pay-as-you-go financing can be used to finance 100 percent or only a portion of a given project.

9.5.1.2 Utility Fees and Benefit Assessments

Utility fees or benefit assessments can be used to fund capital projects. With connection fees, as authorized under Government Code §66000, a utility may impose a capacity charge on new development to recover a proportionate share of providing regional conveyance and treatment facilities. A capacity charge is a one-time fee imposed on a new development or upsize in system requirements. Capacity charges are collected at the time of permitting for many agencies. Consequently, annual revenues from capacity charges depend solely on the rate of growth of the system. Because they are dependent on growth, funds may not be available to construct new facilities at the time funding is needed.

Revenue bonds are historically the principal method of incurring long-term debt. This method of debt obligation requires specific non-tax revenues such as user charges, facility income, and other funds, pledged to guarantee repayment. There is often no legal limitation on the amount of authorized revenue bonds that may be issued, but from a practical standpoint, the size of the issue must be limited to an amount where annual interest and principal payments are well within the revenues available for debt service on the bonds. Revenue bond covenants generally include coverage provisions, which require that revenue from fees minus operating expenses be greater than debt service costs.

Any revenue bonds obtained for a potential project would require proof of financial capacity to repay, using revenue sources that do not inequitably burden customers.

9.5.1.3 Certificates of Participation

Certificates of participation provide long-term financing through a lease agreement that does not require voter approval. The legislative body of the issuing agency is required to approve the lease arrangement by a formal resolution. The lessee is required to make payments, typically from revenues derived from the operation of the facilities. The amount financed may include reserves and capitalized interest for the period that facilities will be under construction. Within the State of California, most municipal water utility bonds are issued in the form of certificates of participation rather than traditional revenue bonds.

9.5.1.4 Grants and Loans

Federal, state, and local grant and low-interest loan sources are available for the planning, design, and construction of water, wastewater, stormwater, and other public infrastructure projects. These programs have become more competitive due to an overall increased interest in alternate funding options and federal/state budget constraints, coupled with a nationwide, consistent increase in construction costs.

Many programs have challenging qualification processes, specific timeframes in which funds can be used, and eligibility restrictions. Table 9.3 (Potential Funding Sources) contains a list of grants and low-interest loan programs that may help finance a potential project. There are many important factors that should be considered in the pursuit of external low-interest loans and grant funding, including:

- **Specific Project Priorities:** Most low-interest loan and grant programs target a specific type of project or have clear purposes, priorities, and goals for their funds to be awarded. Therefore, a project must be closely aligned with these criteria to be competitive.
- **Does Not Cover Full Project Cost:** Most grant programs do not cover the full cost of the project, requiring the sponsoring agency to provide a cost share typically ranging from 25 to 75 percent (in-kind donations are often applicable matches).
- **Demonstration of Ability to Pay for Ongoing Project Expenses:** Funding agencies typically require the proposed grant applicant to demonstrate the ability to operate and maintain the project without external funding.
- **Funding Restrictions:** Few programs allow for the retroactive funding of design and construction work, and some programs will only fund activities that are conducted post selection for award or even require entering into an agreement prior to starting work activities.
- **Application Timelines:** Application timing is critical for most grant and loan programs. Typically, grant programs release funding announcements once per year with a 45- to 60-day window to apply, and available funding varies from year to year pending Congressional appropriations. Low interest loan programs typically accept applications on a rolling basis (e.g., WIFIA, State Revolving Funds [SRF]); however, they may require submission of pre-application materials by a prescribed date.
- **Award Timing:** With the increased interest in external funding and limited funding agency staff availability, the review, selection, and execution of a funding agreement can take an average of 12 months (sometimes longer). In general, agencies should plan on submitting a loan application 6 to 12 months in advance of when funding will be needed, prior to construction start.
- **Project and Documentation Readiness:** Applications may require multiple documents (e.g., engineering, environmental, and financial) to show the readiness level of the project. Assessing project document readiness early on is important to ensure the appropriate level of documentation is available to support the funding application.
- **Grant Reimbursement:** Most grants are reimbursement-based, not upfront cash. This may require that a separate source of funding (i.e., bridge loan) be available as an entity awaits reimbursement of submitted payment receipts if they do not have the cash flow to support the project. Grant reimbursements are subject to annual budget and appropriations processes, and thus disbursement of grant funds on schedule is not guaranteed.
- **Federal Compliance Requirements:** Federal funding sources require compliance with federal requirements (also called crosscutters) These conditions may add to the project's overall cost, influence project schedules, and increase the administrative burden on the borrower.

Despite the competitive nature of grant funding, all available funding sources should be considered to minimize ratepayer impacts.

9.5.2 Available State and Federal Funding

Table 9.3 below lists the primary state and federal funding sources that may be applicable a potential project. This section continues with detailed discussion of each of these opportunities. The state and federal funding sources listed in Table 9.3 are applicable; however, some of these programs may change, be suspended, or not have funding available when the District and/or DESAL Partner(s) are ready to apply. The sections following provide additional details on the highest priority opportunities for this project.

Table 9.3 Potential Funding Sources

Program	Agency	Type	Program Website[1]
State Programs			
CWSRF	SWRCB	Grant/Loan	Clean Water State Revolving Fund | California State Water Resources Control Board
Watershed Resilience Program	California Department of Water Resources	Grant	Watershed Resilience Program
Water Desalination Grant Program	California Department of Water Resources	Grant	Water Desalination Grant Program
Sustainable Groundwater Management Grant Program	California Department of Water Resources	Grant	Sustainable Groundwater Management Grant Program
Federal Programs			
WIFIA	EPA	Loan	Water Infrastructure Finance and Innovation Act (WIFIA) | US EPA
Desalination Construction	USBR	Grant	Desalination | Bureau of Reclamation
WaterSMART Recycling and Desalination Planning	USBR	Grant	Desalination | Bureau of Reclamation
USBR WaterSMART Drought Response Program	USBR	Grant	Drought Response Program | Bureau of Reclamation
USBR Desalination and Water Purification Research Program	USBR	Grant	Desalination and Water Purification Research Program | Research and Development Office
Water & Waste Disposal Loan & Grant Program	USDA	Loan	Water & Waste Disposal Loan & Grant Program | Rural Development

Notes:
(1) All Program Website references included in the References Section of this Study.

9.5.2.1 SWRCB State Revolving Fund

State Water Resources Control Board (SWRCB) SRFs are available through both the Drinking Water SRF and the CWSRF programs. Based on discussions with the state, a proposed desalination project would likely best fit under the CWSRF program.

The CWSRF primarily provides low-interest loans for wastewater-related infrastructure projects, stormwater infrastructure projects, water recycling projects, and desalination projects. Principal forgiveness is available for borrowers that meet the state's definition of a disadvantaged community and other select projects. Priority is also given to projects that address public health problems. The program focuses on projects that remove nutrients from effluent, provide recycled water, protect a drinking water source, or addresses compliance with a water quality control plan/permit or improve conditions for an impaired water body.

9.5.2.2 DWR Watershed Resilience Program

The Department of Water Resources (DWR) Watershed Resilience Grants (formerly the Integrated Regional Water Management Program) are available for projects to improve water resilience and adaptation across California to help build stronger, more sustainable watersheds to better handle climate challenges. Applicants must apply on behalf of a collaborative group. Approximately $152 million will be available for two rounds of grants that will support both planning and implementation.

The application process and timeline are still being developed for the program. The draft guidelines should be released in the fall of 2026. The application is anticipated to open in early 2027 when the final guidelines are released. Awards should be finalized in late 2027 or early 2028.

9.5.2.3 DWR Water Desalination Grant Program

DWR provides grants to local agencies for the planning, design, and construction of projects to desalinate naturally occurring brackish water and ocean water for potable water supply, though the program is currently closed and application process is suspended. Under the program, when open, projects that produce a new potable water supply for state municipal use will be prioritized. Projects must have a completed Desalination Grant Program feasibility study. Some Proposition 4 funds have been allocated to DWR, which may result in additional funding for this program.

9.5.2.4 DWR Sustainable Groundwater Management Grant Program

The Sustainable Groundwater Management Grant Program plans to allocate one grant award per high or medium-priority groundwater basin. The program will focus on recharge/conjunctive use projects, subsidence BMP implementation actions, addressing DWR recommended corrective actions, agricultural land adaptation projects, conveyance projects, and other implementation projects.

The program will have approximately $320 million available for one round of grant awards. The application process and timeline are still being developed for the program. The draft guidelines should be released in the fall of 2026. The application is anticipated to open in early 2027 when the final guidelines are released. Awards should be finalized in late 2027 or early 2028.

9.5.2.5 EPA Water Infrastructure Finance and Innovation Act

United States Environmental Protection Agency's (EPA) Water Infrastructure Finance and Innovation Act (WIFIA) provides low-cost, flexible loans for water infrastructure projects and supports most aspects of project design, planning, construction, land and equipment acquisition, and more. The program provides loan funds for investments in water and wastewater infrastructure of national and regional significance by offering loans to creditworthy borrowers for up to 49 percent of eligible project costs.

Project eligibility is divided into two categories: small and large communities. A population of over 25,000 is considered a large community, and eligible projects are those that cost more than $20 million. Projects can be combined and submitted as a group of projects and funded under one loan if they serve a similar purpose and will be repaid from the same revenue stream.

9.5.2.6 USBR Desalination Construction Program

The Water Infrastructure Improvements for the Nation Act authorized USBR to develop a desalination construction program that will provide a path for ocean or brackish water desalination projects to receive federal funding. Eligible projects include water recycling and desalination feasibility, demonstration, and construction projects. The program provides grant funding for up to 25 percent of project costs. To meet eligibility requirements, a project must have a USBR approved feasibility study, comply with environmental regulations, and demonstrate the ability to pay the remainder of the construction costs.

9.5.2.7 USBR WaterSMART Recycling and Desalination Planning

The WaterSMART Water Recycling and Desalination Planning funding opportunity makes funding available for planning and pre-construction activities for water recycling and desalination projects to facilitate project development and to provide assistance with the preparation of feasibility studies under the Title XVI Water Reclamation and Reuse Program, the Desalination Construction Program, and the Large-Scale Water Recycling Program. This program is providing funding for the completion of this study.

Eligible project activities include development of new water recycling and desalination feasibility studies, preparation of preliminary project cost estimates, pre-final design activities, and environmental and cultural resource compliance activities. The program is not currently accepting applications.

9.5.2.8 USBR WaterSMART Drought Response Program

Financial assistance is provided on a 50/50 cost share basis for projects that conserve and use water more efficiently; increase the production of hydropower; mitigate conflict risk in areas at a high risk of future water conflict; and accomplish other benefits that contribute to water supply reliability in the west.

The applying entity does not need a drought contingency plan but must demonstrate that the proposed project is supported by an existing drought contingency plan (e.g., state, county, or municipal plan) related to the project location. Identifying a supporting plan will make the application more competitive. Reclamation can provide technical assistance after the award of the project, if their assistance has been accounted for in the proposed budget costs.

9.5.2.9 USBR Desalination and Water Purification Research Program

The Desalination and Water Purification Research Program works with USBR researchers and partners to develop more innovative, cost-effective, and technologically efficient ways to desalinate and treat water.

9.5.2.10 USDA Water & Waste Disposal Loan & Grant Program

United States Department of Agriculture (USDA) provides funding for very small, financially distressed rural communities to extend and improve water and waste treatment facilities that serve local households and businesses. The project must serve a rural area or town with a population of 10,000 people or less. Eligible projects include the acquisition, construction, or improvement of drinking water facilities, sewer collection facilities, stormwater collection facilities, and more.

CHAPTER 10 RESEARCH NEEDS

Chapter 10 lists the next steps and research needs required for the successful implementation of the Desalination Executable Solution and Logistics Plan (DESAL Plan). This chapter includes the following sections and a crosswalk of relevant sections per United States Bureau of Reclamation (USBR) WTR11-01 is shown in Table 10.1, below.

- **Section 10.1: Next Steps for DESAL Plan** – This section lists the next steps needed for this project in a near-term, mid-term, and long-term basis.
- **Section 10.2: Research Needs and Objectives** – This section identifies areas of research, and the objectives that each research strategy will accomplish, that need to be undertaken in the future.
- **Section 10.3: Basis for Reclamation Participation** – This section states the research areas that would greatly benefit from the USBR's participation.
- **Section 10.4: Parties Conducting Research** – This section states the parties who are foreseen to administer and conduct research for this project.
- **Section 10.5: Research Completion Timeline** – This section provides an estimated timeline of when planned research activities are expected to be completed.

Table 10.1 Chapter 10 Crosswalk

WTR 11-01 Section 10 RESEARCH NEEDS			
Reclamation Manual Outline	Abbreviated Directives and Standards Section Title	Corresponding Report Location	Reclamation Manual Guidelines
10a	Description of research needs and objectives to be accomplished	Section 10.1, 10.2	Description of research needs associated with the proposed desalination project, including the objectives to be accomplished through research.
10b	Basis for reclamation participation in research	Section 10.2, 10.3	Description of the basis for USBR participation in the identified research.
10c	Parties who will conduct necessary research	Section 10.4	Identification of the parties who will administer and conduct necessary research.
10d	Timeframe necessary to complete research	Section 10.5	Identification of the timeframe required for the completion of necessary research.

This chapter is not complete as a USBR Title XVI Feasibility Study. The recommended next steps and research needs should be refined based on further developing the selected alternative/project(s) in Chapter 6 (Selection of Proposed Project).

10.1 Next Steps for DESAL Plan

As discussed in earlier chapters, a preferred desalination project concept alternative has not yet been selected. The assumptions used in this study were that a conventional and proven desalination process would be used with a subsurface ocean intake, treatment facilities on land, and brine disposal in an outfall. However, other newer technologies, including offshore desalination, are being developed and could be considered in the future following additional research. There are a number of next steps that any ocean desalination project within San Luis Obispo County (SLO County) would require in the near, mid and long-term:

- **Near-term:**
  - Partner agreements and Memorandums of Understanding (MOUs).
  - Narrow down the alternatives – select specific areas for additional investigation and determine who will be participating.
  - Economic study to better define and quantify benefits of desalination within SLO County.
  - Additional Community Outreach and Education.
- **Mid-Term:**
  - Site specific investigations – soils, hydrogeology, marine studies, outfall dilution/condition, coastal risks/hazards, energy studies, treatment siting, existing infrastructure needs, pipeline corridors.
  - Pilot and demonstration projects.
  - Basis of Design Report or Preliminary Design to better define project, costs and potential impacts
  - Permitting and California Environmental Quality Act (CEQA):
    - Define need, demonstrate optimized water use.
    - Permitting discussions and required investigations.
    - Environmental Impact Report.
  - Governance, Financing/Funding Studies and Negotiations.
- **Long-Term:**
  - Final Design.
  - Construction.
  - Operation.

Included in this list and in addition to these next steps, there are several areas where research efforts would be beneficial as detailed in the following section.

10.2 Research Needs and Objectives

One area of additional research is the opportunity for offshore desalination techniques that have the potential for fewer environmental impacts and lower costs. As discussed in Chapter 4 – Description of Alternatives, Section 4.5 Description of Alternative Technology, a number of offshore technologies providers are working on developing demonstration and pilot projects to demonstrate to California regulators that their technology is equally permittable as conventional desalination processes like reverse osmosis on land with a subsurface intake and outfall. There is great local and regional interest in these new technologies, however, due to the lack of pilot or full-scale installations, they could not be assessed as part of this study. The region, as well as the water industry in general, would benefit from USBR supported research for these offshore technologies. The goal of the pilot studies and research would be to:

- Demonstrate performance of intakes to assess if they have less negative impact on marine life.
- Demonstrate performance of outfall or brine dispersion mechanisms to assess if they have less negative impact on marine life and can meet ocean plan objectives for dilution and salinity concentrations.

- Develop operating experience and data that would help identify design criteria, costs (capital and operation and maintenance [O&M]) and operational procedures necessary for successful implementation.

Other areas of research would be related to site-specific suitability for conventional desalination including:

- Geologic and hydrogeologic investigations on land and offshore to identify suitable locations for subsurface intakes, including bathymetry mapping and field studies.
- Groundwater studies to identify the distance from shore to reach brackish or ocean waters as opposed to fresh groundwater.
- Marine studies to investigate the suitability of locations for intakes and outfalls, including:
  - Sediment transport modeling to demonstrate intake and outfall structures will not adversely alter coastal processes, beaches, nearshore habitats or stability of the seabed over the life of the facility.
  - Marine biology study to establish the environmental baseline needed to evaluate environmental impacts from the intake, outfall, construction activities, and long-term operation of the facility.
  - Marine life habitat survey (e.g. Eelgrass, Kelp, or sensitive fish spawning grounds) to prepare a benthic habitat characterization and identify essential fish habitats to support environmental impact analysis for CEQA/National Environmental Policy Act (NEPA).
- Coastal hazards studies to identify the risk of coastal impacts from sea level rise, coastal flooding and tsunami.
- Outfall dilution models and condition assessments to determine improvements, including type and spacing of diffusers required, to outfalls to allow discharge of brine.
- Hydraulic capacity studies of existing regional infrastructure.
- Site specific pilot studies for subsurface intakes to determine capacity.
- Siting studies to identify suitable project locations.
- Power supply study, including an energy and greenhouse gas (GHG) emissions assessment.

10.3 Basis for Reclamation Participation

The participation of the USBR in the studies discussed above would be in support of a regional desalination project in SLO County. The research for site-specific studies would only be useful for this region's efforts.

USBR's participation in pilot studies for alternative offshore technologies would benefit all coastal regions in the United States by providing important research in alternative desalination technologies that may provide significant benefits in terms of less environmental impacts, lower energy usage and lower cost solutions.

Although no preliminary cost estimates have been performed for the above listed research needs, it is estimated that they will be costly. The funding that USBR can provide for this project would be greatly beneficial for completing the identified research needs.

The San Luis Obispo County Flood Control and Water Conservation District (District) and/or DESAL Plan partner (DESAL Partner) agencies (those conducting the research) would greatly benefit from USBR's expertise on planning research endeavors. Collaboration with USBR can guide the planning process for the listed research needs as they may have experience helping/overseeing other agencies with desalination testing prior to implementation. Their insight into the best methods for conducting the research and ways to prevent errors/noncompliance with laws during research studies would help to achieve research objectives and will contribute to the overall success of the project.

10.4 Parties Conducting Research

The parties conducting the research would be the District and/or Desal Partner agencies that decide to participate in additional studies. If alternative technologies are researched, participation from suppliers/vendors would be required.

10.5 Research Completion Timeline

Table 10.2 outlines a preliminary timeline for research activities. This schedule would be refined in the future as the project and research plan are more developed.

Table 10.2 Summary of Research Timelines

Research Need	Steps	Timeline
Offshore Technologies (sequential)	▪ Identify which technologies to test. ▪ Work with suppliers to develop test plan. ▪ Get permits for in-ocean test locations. ▪ Perform test.	▪ 6 months ▪ 6 months ▪ 1 year ▪ 1 year or more
Site Specific Studies (could be completed concurrently or sequentially)	▪ Geologic and hydrogeologic investigations. ▪ Groundwater studies. ▪ Marine studies. ▪ Coastal hazards studies. ▪ Outfall dilution models and condition assessments. ▪ Hydraulic capacity studies of regional infrastructure. ▪ Pilot studies for subsurface intakes. ▪ Regional infrastructure capacity. ▪ Site suitability. ▪ Power supply study.	▪ 1 year ▪ 6 months ▪ 1 year or more ▪ 1 year ▪ 6 months ▪ 6 months or more ▪ 6 months or more ▪ 6 months or more ▪ 1 year or more ▪ 6 months or more

CHAPTER 11 INDEPENDENT PEER REVIEW

The United States Bureau of Reclamation (USBR) Large Scale Water Recycling (LSWR) Program Feasibility Study, as detailed in WTR TRMR-128, requires an independent peer review. This includes a discussion of the reviewers and the process and details about comments received and how they were addressed. This chapter provides a summary of the different reviews and input received during the development of this study. This chapter includes the following sections and a crosswalk of relevant sections per USBR's TRMR-128 is shown in Table 11.1 below.

- **Section 11.1: Description of Independent Peer/Quality Reviews** – This section discusses the process for input and review by Desalination Executable Solution and Logistics Plan (DESAL Plan) partners (DESAL Partners), a regional water committee, quality assurance/quality control (QA/QC) reviewer and public.
- **Section 11.2: Identification of Reviewers** – This section identifies the reviewers' affiliations.
- **Section 11.3: Peer Review Process and Summary** – This section summarizes the review process and comments.

Table 11.1 Chapter 11 Crosswalk

TRMR-128 Section 3 INDEPENDENT PEER REVIEW			
Reclamation Manual Outline	Abbreviated Directives and Standards Section Title	Corresponding Report Location	Reclamation Manual Guidelines
TRMR 128 3a	Description of all independent peer review/quality assurance and/or control conducted on analyses presented in the study	Section 11.1	Description of all independent peer review and/or quality assurance/quality control conducted on the analyses presented in the study and the scope and charge to the reviewers.
TRMR 128 3b	Identification of the number of technical reviewers and their expertise and affiliation	Section 11.2	Identification of the number of technical reviewers and the technical expertise and affiliation of the independent reviewers.
TRMR 128 3c	Comment disposition summary of issues raised during peer review/quality assurance and/or control and how they were addressed	Section 11.3	Provide a comment disposition summary describing issues raised during peer review and/or quality assurance/quality control and how they were addressed.

This chapter is not complete as a USBR Title XVI Feasibility Study. The final peer review would be of the completed study once an alternative/project is selected.

11.1 Description of Independent Peer/Quality Reviews

As discussed in previous chapters, the objective of this study was to evaluate the feasibility of a regional seawater desalination project to provide reliable and resilient water supply to the region, San Luis Obispo County (SLO County). Stakeholder engagement was conducted throughout the feasibility study process. Stakeholder feedback and technical review helped to identify regional priorities, refine evaluation criteria, highlight opportunities and constraints, and inform evaluation of potential project alternatives.

Stakeholder engagement included meetings with DESAL Plan partner agencies and other potential beneficiaries, discussions with the Countywide Water Action Team (CWAT), presentations to the Water Resources Advisory Committee (WRAC), community engagement workshops, online surveys, and comments submitted through the project website.

The CWAT (which is largely comprised of DESAL Partners) provided a utility staff-level forum for local agencies to provide technical and operational input regarding regional water supply needs, infrastructure, implementation considerations, and potential implementation opportunities. The CWAT representatives are in general engineers, water resources planners, hydrogeologist and water systems operators/managers. Numerous meetings were held with the CWAT team, and they were provided the opportunity to review the administrative draft report for this study.

The WRAC--a committee that advises the County Board of Supervisors on water-related matters, with representatives from water agencies, agriculture, environmental interests, local government, institutions, businesses, and citizens--provided broader regional policy, resource management, and community perspectives. WRAC meetings are publicly noticed with agendas posted ahead of time and the meetings are open to the public. The draft report of this study was provided to WRAC and posted to the DESAL Plan website for public review and comment.

Interested community members were able to provide input through public workshops, surveys, WRAC meetings, and the DESAL Plan public comment portal to identify community priorities, concerns, and information needs related to future planning.

As part of this feasibility study effort, this report was reviewed by a QA/QC internal consultant team. These QA/QC reviewers checked for consistency with the USBR requirements and provided review of the report content and overall direction of the recommendations.

11.2 Identification of Reviewers

11.2.1 DESAL Plan Partners and Water Resources Advisory Committee Reviewers

The District and 16 local agencies initiated this study in order to explore ocean desalination as a viable water supply option within the SLO County region. Five CWAT meetings (held in March 2025, August 2025, November 2025, March 2026, June 2026), as well as independent review of documents and the draft study, were used to gather information and perspectives from these representatives. The DESAL Plan partners who participated in review of this project through attending presentations/meetings and report review are shown in Table 11.2 below.

Table 11.2 CWAT and DESAL Plan Partners Provided Opportunity to Review

Title/Role	Affiliation
▪ Subregional Unit Supervisor ▪ Water Resources Division Manager ▪ Deputy Director of Public Works ▪ Director of Public Works ▪ Director of Groundwater Sustainability	San Luis Obispo County Flood Control and Water Conservation District (District) and SLO County

Title/Role	Affiliation
▪ Utilities Manager (former) ▪ Assistant City Manager	City of Arroyo Grande
Utility Staff	Atascadero Mutual Water Co.
General Manager	Avila Beach Community Services District (CSD)
▪ Program Manager ▪ Utilities Department Manager	Cambria CSD
▪ General Manager, Coastal District ▪ Water Resources Manager, Chief Hydrogeologist	Golden State Water Company
City Engineer (former)	City of Grover Beach
General Manager (former)	Los Osos CSD
▪ Public Works Director (former) ▪ Interim Public Works Director	City of Morro Bay
General Manager	Nipomo CSD
General Manager (former)	Oceano CSD
Utility Staff	City of Paso Robles
Public Works Director	City of Pismo Beach
Utility Staff	San Miguel CSD
Water Agency Manager	Santa Barbara County
Assistant Director of Utilities	City of San Luis Obispo
District Engineer	Templeton CSD
Facilities Management Staff	California Polytechnic University – San Luis Obispo (Cal Poly)

The project team presented at four WRAC meetings (held in May 2025, October 2025, May 2026, August 2026) and gathered input from WRAC representatives as well as members of the public. Table 11.3 – WRAC Membership shows the WRAC membership during review of this project and report, their titles and affiliations.

Table 11.3 Water Resources Advisory Committee Membership

Individual	Title/Role	Affiliation
Brendan Clark	WRAC Secretary; Regional Unit Supervisor	SLO County and District
▪ Melanie Blankenship ▪ Elizabeth Covert	▪ Member ▪ Alternate	District 1
▪ Neal MacDougall	▪ Alternate	District 2
▪ Jim Marderosian ▪ Matthew Watkins	▪ Member ▪ Alternate	District 3
▪ Thomas Burhenn ▪ David Crater	▪ Member (Chair) ▪ Alternate	District 4
▪ Allen Duckworth	▪ Member	District 5

Individual	Title/Role	Affiliation
▪ Aileen Loe ▪ Jim Guthrie	▪ Member ▪ Alternate	City of Arroyo Grande
▪ Seth Peek ▪ Nick DeBar	▪ Member ▪ Alternate	City of Atascadero
▪ John Neil ▪ Jaime Hendrickson	▪ Member ▪ Alternate	Atascadero Mutual Water Co.
▪ Brad Hagemann	▪ Member	Avila Beach CSD
▪ Scott Buffaloe ▪ Mike Schwartz	▪ Member ▪ Alternate	California Men's Colony
▪ Jim Green ▪ Tristan Reaper	▪ Member ▪ Alternate	Cambria CSD
▪ Jubilee Satele	▪ Alternate	Camp SLO
▪ Dominic Roques ▪ Linda Chipping	▪ Member ▪ Alternate	Coastal San Luis Resource Conservation District (RCD)
▪ Steve Carter ▪ Paul Clark	▪ Member ▪ Alternate	County Farm Bureau
▪ Vacant	▪ N/A	Cuesta College
▪ Lee Nesbitt ▪ Hilary Graves	▪ Member ▪ Alternate	Estrella El Pomar Creston Water District
▪ Matt Cook ▪ Mark Zimmer	▪ Member ▪ Alternate	Golden State Water Company
▪ Jules Tuggle ▪ Robert Robert	▪ Member ▪ Alternate	City of Grover Beach
▪ Scott Duffield ▪ Doug Groshart	▪ Member ▪ Alternate	Heritage Ranch CSD
▪ Chuck Cesena ▪ Ron Munds	▪ Member ▪ Alternate	Los Osos CSD
▪ Zara Landrum ▪ Cyndee Edwards	▪ Member ▪ Alternate	City of Morro Bay
▪ Ed Eby ▪ Phil Henry	▪ Member ▪ Alternate	Nipomo CSD
▪ Allene Villa ▪ Peter Brown	▪ Member ▪ Alternate	Oceano CSD
▪ Christopher Alakel ▪ Kirk Gonzalez	▪ Member ▪ Alternate	City of Paso Robles
▪ Marcia Guthrie ▪ Stacy Inman	▪ Member ▪ Alternate	City of Pismo Beach
▪ Kelly Dodds ▪ Tamara Parent	▪ Member ▪ Alternate	San Miguel CSD
▪ Vacant	▪ N/A	San Simeon CSD

Individual	Title/Role	Affiliation
▪ Jan Marx ▪ Michael Boswell	▪ Member ▪ Alternate	City of SLO
▪ Stephen Sinton ▪ Ray Shady	▪ Member ▪ Alternate	Shandon-San Juan Water District
▪ Jeff Briltz ▪ Lori Azeem	▪ Member ▪ Alternate	Templeton CSD
▪ George Kendall ▪ Tom Mora	▪ Member ▪ Alternate	Upper Salinas Las Tablas RCD
▪ Jon Winstead ▪ Mary Van Ryn ▪ Patricia Wilmore ▪ Jason Yeager	▪ Member ▪ Member ▪ Alternate ▪ Alternate	Agriculture At-Large
▪ Eric Greening ▪ Christine Mulholland ▪ David Chipping ▪ Dolores ▪ Sara Gault	▪ Member ▪ Member (Vice Chair) ▪ Member ▪ Alternate ▪ Alternate	Environmental At-Large
▪ Tim Walters	▪ Alternate	Development At-Large

11.2.2 Quality Assurance / Quality Control Reviewers

A QA/QC review of this report was conducted by internal consultant team members. These QA/QC reviewers were not involved in the day-to-day work on this project and so were able to perform an independent review of the draft report and provide meaningful comments. Their qualifications are included below:

- Dan Heimel, PE. Daniel has 20 years of water industry experience including engineering, operations, and regulatory compliance services for water and wastewater utilities. Dan is a registered professional engineering with a masters' degree in civil and environmental engineering from California Polytechnic State University, San Luis Obispo.
- Inge Wiersema, PE. Inge is Carollo's Water Resources Practice Director with 30 years of experience in strategic utility master planning and water resources projects. She is nationally recognized for her contributions in integrated One Water planning and extensive stakeholder engagement programs.
- Elisa Garvey, PhD, P.E. Elisa is Carollo's Water Resources Operational Lead with 30 years of experience. Dr. Elisa Garvey is an experienced water resources professional specializing in water quality assessments, regulatory support, and master planning. She has contributed to a range of projects, including wastewater master plans and recycled water planning for clients throughout California and is currently leading the SLO County Master Water Report and Data Information Management Systems development.

11.3 Peer Review Process and Summary

11.3.1 DESAL Plan Partners and WRAC Reviews

The DESAL Plan partners (via CWAT) and WRAC reviews throughout the project were used to help form this study and the alternatives considered. Comments were generally made in the following areas:

- Partner agency supplies and demand clarifications.
- Thoughts on evaluation criteria and project siting screening.
- Questions and discussion related to evaluation of alternatives and emerging technologies.
- Discussions on use of regional infrastructure for deliveries or water exchanges, and operational feasibility.
- Discussions on regional need, water reliability and resilience.
- Considerations of potential pipeline alignments.
- Discussion on grouping of end users and sites into alternatives, and the screening of those alternatives.
- Questions and comments on approach to cost estimating, cost of alternatives, affordability and economic considerations.
- Considerations on environmental protection and permitting feasibility.
- Discussion of potential governance, partnerships, and regional implementation.
- Considerations for public engagement, transparency, and community perspectives gathered through various engagement methods.

11.3.2 Report Quality Assurance / Quality Control and Peer Review

The QA/QC and peer review effort largely resulted in comments in the following areas:

- Clarification and consistency of terminology and acronyms.
- Clarity in discussions and descriptions, including the options screening and evaluation process alternatives development process.
- Clarification of cost estimates.
- Meeting all requirements of USBR WTR 11-01 and Temporary Reclamation Manual Release (TRMR)-128.
- Recommendations for improved readability, understanding and organization.
- Recommendations on figures to add or modify to add clarity.

The peer review comments were all addressed in this report.

11.3.3 Community Stakeholder Review

This feasibility study was presented to and discussed with interested community members and stakeholders through a variety of engagement avenues throughout the study development, including three public workshops (held in September 2025 and April 2026), four WRAC meetings open to the public (held in May 2025, October 2025, May 2026, August 2026), two online surveys open to the public (held in

August/September 2025 and June/July 2026), and a public comment portal that was available for use at any time during the study (open May 2025 – August 2026). The DESAL Plan website is the central location for posting Project specific documentation, notifications, and other general information to all interested parties and the general public. The website provides information on this study as well as other relevant reports.

Interested stakeholders and community members were invited to engage throughout the project to help inform them about this study and the alternatives considered. Project modifications were also made throughout the project based on stakeholder input, such as refinement of evaluation criteria, review of siting assumptions, and more. Comments and questions were generally made in the following areas:

- Water reliability and long-term resilience.
- Cost and affordability as a primary consideration.
- Environmental protection and marine resource impacts.
- Facility siting, infrastructure, and feasibility.
- The need for desalination within a broader water resource and supply portfolio.
- Potential future governance, decision-making, and trust within and among communities when pursuing a multi-community water project.
- Regional benefit, growth considerations, and equity among participating communities, especially considering the host community of any potential treatment facility.

11.4 Review Comments and Resolutions

Table 11.4 summarizes the topics of comments related to the draft study report received by reviewers, and responses and resolutions.

Table 11.4 Draft Study Report Comments and Resolution

Comment Topic	Comment Details	Comment Resolution
Acronyms	Clearly define	Acronym page added to beginning of report
Documentation	Document sources of any claims	Added source information and reference section
Drought and Groundwater Basins	Clarify drought issues, storage issues and impacts on groundwater basins	Added more detail to expand discussion
Water rights/ allocations/entitlements	Be careful how describe as different water sources have different terminology	Revised descriptions and use of terminology
Participants for different water sources	Be clear on participants of different regional water supplies	Revised descriptions
Release requirements	Discuss release requirements from dams and minimum environmental flows from wastewater treatment plants.	Added additional detail
Salinas Dam	Clarify ongoing efforts to understand improvement needs, capacity and potential increase in capacity.	Added additional detail
Contaminants of concern	Clarify issues for water quality	Added additional detail
State Water Project	Clarification of amounts, use and terminology	Added additional detail

Comment Topic	Comment Details	Comment Resolution
Desalination	Clarify that Pacific Ocean is source water	Added clarification
Subsurface intakes	Was this the only intake type considered?	Added clarification that only subsurface intakes were considered to be consistent with guidance from the State of California
Assumptions used for demand scenarios	Be clear on how came up with demand scenarios	Added clarification
Screening and evaluation process	Provide more context as to how alternatives were developed and screened.	Added clarification and figures
Benefits	Be clear on what SLO County stands to lose by not implementing new supply alternatives.	Added clarification and additional detail
Housing goals	Clarify State of California housing mandates	Added clarification
Cost allocations to DESAL Plan partners	How will costs be allocated to partners?	This report does not allocate costs to individual DESAL Plan partners. That would be part of future phases of work.