

## Appendix B Watershed Plan

---

### Introduction

This document is a Watershed Plan supporting the Environmental Assessment (EA) prepared pursuant to the National Environmental Policy Act (NEPA) that analyzes and discloses the effects of the proposed implementation of the Salton Sea Management Program's (SSMP's) Phase 1: 10-Year Plan (SSMP 10-Year Plan). The SSMP 10-Year Plan proposed project is being planned to implement a total of 29,800 acres of aquatic habitat restoration and dust control projects around the perimeter of the Salton Sea. At least 50 percent of the acreage must be created as habitat for fish and wildlife that depend on the Salton Sea ecosystem and the remainder will be projects to suppress dust.

The California Natural Resources Agency (CNRA), California Department of Water Resources (DWR), and the California Department of Fish and Wildlife (CDFW)—together, the SSMP team—is responsible for implementing the SSMP 10-Year Plan. The Watershed Agreement is between the United States Department of Agriculture - Natural Resources Conservation Service (NRCS) and sponsoring local organization (SLO) CNRA. A draft of the Watershed Agreement is included in Attachment B.1.

Projects implemented under this Watershed Plan will be in accordance with the conservation practices described in the National Watershed Program Manual as required by NRCS to receive technical and financial assistance for project implementation through the Watershed Protection and Flood Prevention Act of 1954. The activities within the Planning Area eligible for funding upon the Watershed Plan approval are identified in the EA and would be developed to meet all of the requirements in the Watershed Program Manual. Prior to project implementation, the SLO will develop and provide all required documentation pursuant to the National Watershed Program Handbook (NRCS 2010)<sup>1</sup>.

The NRCS Conservation Practices are outlined in Sections 3.3.1.5 and 3.3.2.4 of the EA by project type (Tables 3-2 and Table 3-4).

### Background

The Salton Sea (Sea), located in southern Riverside and northern Imperial counties in Southern California, is California's largest lake. Although large seas have cyclically formed and dried in the basin throughout time due to natural flooding from the Colorado River, the current Sea was formed when Colorado River floodwater breached an irrigation canal that was being constructed in the Imperial Valley in 1905 and flowed into the Salton Sink. The hydrology to the Sea has since been maintained by irrigation runoff in the Imperial and Coachella valleys and local rivers. Because the Sea is a terminal lake, increasingly concentrated salts have resulted in salinity that is approximately twice that of the ocean.

---

<sup>1</sup> United States Department of Agriculture (USDA) and Natural Resources Conservation service (NRCS). 2010. National Watershed Program Handbook. January 2010. Available at: [https://www.nrcs.usda.gov/Internet/FSE\\_DOCUMENTS/nrcs143\\_010608.pdf](https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs143_010608.pdf).

In addition to functioning as a sump for agricultural runoff, the Sea is also an important wildlife area. Although it has only existed for about 100 years, the Sea has become a critical resource for many species of resident and migratory birds, including several species of special concern, due to the widespread loss of wetland habitat elsewhere in the United States and Mexico.

The Quantification Settlement Agreement (QSA)<sup>2</sup> is one of the factors contributing to declining inflows to the Sea. California historically used more than its normal year apportionment of Colorado River water, but that is unlikely to continue in the future. After prolonged negotiations between the federal government and the California water districts that have entitlements to Colorado River water, a series of agreements, collectively known as the QSA, were made among the federal government, State of California, Imperial Irrigation District (IID), Metropolitan Water District of Southern California, San Diego County Water Authority, and Coachella Valley Water District in October 2003. The QSA imposes water conservation measures within the IID service area to allow the transfer of this water elsewhere, reducing the volume of agricultural runoff that constitutes the Sea's chief source of water. The QSA required IID to provide conserved water to the Sea to mitigate the effects of the transfer on salinity until 2017, at which point the delivery of mitigation water ceased. Once mitigation water ceased, the State of California, through CNRA, was given the responsibility to undertake a restoration effort at the Sea that addresses the larger long-term environmental needs of the Sea. The purpose of the SSMP is to implement restoration projects to meet the State's obligation.

Fugitive dust emissions from the exposed lakebed will likely reduce air quality at the Sea and may impact surrounding communities. Dust, or particulate matter, is hazardous to human health. Declining inflows to the Sea have caused increased salinity that exceeds tolerance limits of most fish species and has resulted in a loss of the majority of the fishery, declines in bird populations from the loss of food, and wind erosion of recently exposed playa soils. Further loss of water in future years will continue the degradation of the Sea ecosystem due to increasing salinity and other water quality issues, including temperature extremes, eutrophication (increased nutrient loads), related anoxia (oxygen deficiency), and algal productivity. Reduction of river inflows to the Sea from other factors, such as water recycling and diversion to the Hardy River in Mexico, is also contributing to increases in salinity and a declining sea elevation.

## Preferred Alternative

The Preferred Alternative would be implemented primarily within the exposed lakebed areas surrounding the Salton Sea. Although the planning area for the SSMP 10-Year Plan is 63,008 acres generally between the 2003 and projected 2028 water surface elevation levels (Figure B-1), the planning area for the NRCS Watershed Plan is further refined based on land ownership and comprises 47,447 acres of the total SSMP 10-Year Plan planning area. The Watershed Plan area is a subset of the area analyzed in the EA. Figures B-2 and B-3 show the various land ownership types within the planning area which are eligible for projects funded by NRCS, and acreages are summarized in Table B-1. These include lands that are non-federally owned, including state-owned land, tribal lands, lands owned by IID and Coachella Valley Water District, and privately-owned land.

---

<sup>2</sup> The Quantification Settlement Agreement consists of more than 30 agreements executed concurrently among certain Southern California water agencies in 2003. The State of California, the federal government, and others signed some of the agreements. That set of agreements is commonly referred to as the QSA.

**Table B-1 Land Ownership within the NRCS Watershed Planning Area**

<b>Land Ownership Category</b>	<b>Responsible Agency or Department</b>	<b>Acres</b>
<b>Tribal Lands</b>	Tribal Lands	3,303
<b>State Lands</b>	State Lands	313
	State Lands - Undefined - Imperial Parcels	2
	State Lands - Undefined - Riverside Parcels	228
	State Park	195
<b>Local / Regional</b>	Imperial Irrigation District	39,031
	Coachella Valley Water District	1,372
<b>County / Private</b>	Imperial County - Individual, Commercial	2,402
	Riverside County - Individual, Commercial	602
<b>Unmapped</b>	Unmapped (Open Water)	<1
<b>Total Acres<sup>1</sup></b>		<b>47,447</b>

<sup>1</sup> May not sum due to independent rounding.

All project types analyzed in the EA for the SSMP 10-Year Plan are eligible for NRCS funding under this watershed plan and include aquatic habitat restoration and dust suppression restoration projects.

### **Aquatic Habitat Restoration Projects**

Aquatic habitat restoration opportunity areas are proposed around the perimeter of the Salton Sea, between the 2003 and projected 2028 surface elevation levels. Aquatic habitat restoration project types are provided in Section 3.3.1.2 of the EA. The aquatic habitat restoration projects would consist of one or more large, ponded units that may be subdivided into one or more smaller ponds created by internal subdivision berms. Depending on site characteristics, projects would be designed to consist of suitable shallow, mid-depth, and deep aquatic habitat to support fish and piscivorous birds. They would also be designed to provide connectivity between currently occupied desert pupfish habitat. The primary water supply for the ponds would be a combination of brackish river water and hypersaline water from the Sea, but other sources may be used as well. Aquatic habitat restoration projects could also include mudflats and permanent vegetated wetlands in conjunction with the ponds to support shorebird and marsh bird foraging and nesting.

Cumulatively, these projects would provide habitat for invertebrates, fish (including desert pupfish), and a variety of bird species. Development of pond habitat around the Sea would be designed to support robust fish populations, which would in turn provide food for piscivorous birds. Some of the projects would also provide habitat and connectivity for desert pupfish.

### **Dust Suppression and Restoration Projects**

Dust suppression and restoration opportunity areas would target the most emissive exposed lakebed areas as the Sea recedes where habitat and dust suppression projects could be located. Dust suppression and restoration project techniques are provided in Section 3.3.2.3 of

the EA. Dust suppression projects are intended to reduce the emission of airborne particulates from exposed lakebed areas using a variety of dust control treatments that are appropriate to a project site. A suite of potential dust suppression measures have been developed for consideration. Projects that include waterless techniques to suppress dust may be implemented as a temporary proactive measure to limit potential emissions from exposed lakebed areas.

## Rationale for Plan Preference

The Preferred Alternative is the National Economic Development (NED) plan and was selected to maximize net economic benefits as quantified and monetized at the national level. The SSMP 10-Year Plan is designed to reduce fugitive dust emissions and to mitigate adverse water quality effects relative to the No Action Alternative. An economic analysis was completed for the Watershed Plan, which identifies the costs and benefits associated with implementation of the SSMP 10-Year Plan relative to the No Action Alternative and is included as Attachment B.2 to this appendix and summarized below.

There are three potential social cost components associated with implementation of the SSMP 10-Year Plan. They are: (1) social costs associated with the use of resources to design, engineer, permit and construct habitat creation and dust suppression projects; (2) social costs associated with the use of resources to operate, maintain and adaptively manage habitat creation and dust suppression projects; and (3) social costs that could arise if land and water use under the SSMP 10-Year Plan conflict with other activities such as geothermal development or lithium extraction. There are four primary benefits streams associated with implementation of the of the SSMP 10-Year Plan. They are associated with: (1) a reduction in adverse human health effects; (2) an increase in wellbeing among area recreators; (3) an increase in the areas' agricultural productivity; and (4) a potential increase in non-use value. The expected net benefit is estimated to be approximately \$0.39 billion dollars (present value) with greater than 23 percent of the total benefit accruing among residents of rural populations (Attachment B.2). As described in Table 3 and Table 6 in Attachment B.2 the calculation of rural benefits is a conservative estimate and the true proportion may be materially higher. Table B.2 summarizes the social costs and benefits of the Preferred Alternative.

**Table B-2 Summary of Monetized Costs and Benefits of NED Plan**

	<b>NED Plan</b>	<b>No Action</b>	<b>Added Increment</b>
<b>Social Benefits (\$B)</b>	\$2.14 [\$0.82 to \$4.07] <sup>a</sup>	\$0	\$2.14 [\$0.82 to \$4.07] <sup>a</sup>
<b>Social Costs (\$B)</b>	\$1.74 [\$1.43 to \$2.38] <sup>a</sup>	\$0	\$1.74 [\$1.43 to \$2.38] <sup>a</sup>
<b>Net Social Benefits (B\$)</b>	\$0.39 [-\$1.03 to \$2.38] <sup>a</sup>	\$0	\$0.39 [-\$1.03 to \$2.38] <sup>a</sup>

<sup>a</sup> Results are reported as "expected value [5th percentile to 95th percentile]".

## Alternatives

A No Action Alternative was considered in addition to the Preferred Alternative. Under the No Action Alternative, the United States Army Corps of Engineers (Corps) would not issue a permit for the SSMP 10-Year Plan Project, no funding would be provided by NRCS, and no components of the Project would be constructed. The No Action Alternative is intended to reflect existing conditions (those present at the time the Notice of Preparation was issued) plus

changes that are reasonably expected to occur in the foreseeable future if none of the alternatives are implemented, based on current plans and consistent with available infrastructure and community services.

As part of the EA, an additional alternative, the No Federal Action Alternative was considered. A description is provided below, but this is not considered in the Watershed Plan, which only distinguishes between whether NRCS funding is provided or not. Under the No Federal Action Alternative, no projects would be built that require federal action (other than the Species Conservation Habitat Project, which is under construction). Under this alternative, the State of California would proceed with dust suppression and restoration projects that meet the following parameters for projects, access, and infrastructure:

- > Are not on federal or tribal lands,
- > Are not in wetlands or waters of the United States at the time of construction,
- > Would not impact federally listed species,
- > Would not have any federal funding, and
- > Do not require a diversion from waters of the United States (all water would be from wells).

## Measures to be Installed

A number of conservation practices may be installed under the Preferred Alternative to improve habitat for piscivorous birds, endangered species, and other wildlife and/ or to reduce the formation of airborne dust on the exposed lakebed. These measures are discussed in detail in Section 3.3.1 and 3.3.2 of the EA and include:

- > 378 CA CPS Pond 2016 (Ponds)
- > 402 CA CPS Dam 2018, 356 CA CPS Dike 2008 (Earthen berms)
- > 646 CA CPS Shallow Water Development and Management 2011 (Mudflats / shallow-water habitat)
- > 390 CA CPS Riparian Herbaceous Cover, 643 CA CPS Restoration of Rare or Declining Natural Communities 2012, 657 CA CPS Wetland Restoration 2011, 659 CA CPS Wetland Enhancement 2011(Permanent vegetated wetlands)
- > 644 CA CPS Wetland Wildlife Habitat Management 2011, 659 CA CPS Wetland Enhancement 2011 (Managed wetlands)
- > 582 CA CPS Open Channel 2015 (Flood control associated with North Lake Project)
- > 533 CA CPS Pumping Plant 2011 (Pumps)
- > 430 CA CPS Irrigation Pipeline 2011 (Pipelines, water conveyance)
- > 646 CA CPS Shallow Water Development and Management 2011 (Seasonal flooding)
- > 644 CA CPS Wetland Wildlife Habitat Management, 649 CA CPS Structures for Wildlife 2014 (Bird islands; floating islands)
- > 649 CA CPS Structures for Wildlife 2014 (Snags or other vertical structures)

- > 582 CA CPS Open Channel 2015, 412 CA CPS Grassed Waterway 2015, 658 CA CPS Wetland Creation 2011 (Swales or channels)
- > 638 CA CPS Water and Sediment Control Basin 2018, 587 CA CPS Structure for Water Control 2018 (Water conveyance and supply system: sedimentation/mixing basins)
- > 575 CA CPS Trails and Walkways 2014 (Public amenities, recreation access)
- > 353 CA CPS Monitoring Well 2015, 355 CA CPS Groundwater Testing 2015 (Monitoring wells)
- > 362 CA CPS Diversion 2017, 587 CA CPS Structure for Water Control 2018 (Weirs and other structures in waterways to divert water)
- > 609 CA CPS Surface Roughening 2015 (Temporary surface roughening)
- > 327 CA CPS Conservation Cover 2016, 342 CA CPS Critical Area Planting 2017, 589C CA CPS Cross Wind Trap Strips 2015, and 612 CA CPS Tree/Shrub Establishment 2017, 380 CA CPS Windbreak-Shelterbelt Establishment 2013 (Vegetation establishment)
- > 373 CA CPS Dust Control on Unpaved Roads and Surfaces 2019 (Dust suppressants or surface stabilizers)
- > 484 CA CPS Mulching 2020 (Gravel and other cover)
- > 646 CA CPS Shallow Water Development and Management 2011 (Shallow flooding)
- > 362 CA CPS Diversion 2017, 373 CA CPS Dust Control on Unpaved Roads and Surfaces 2019, 640 CA CPS Water spreading 2021 (Stormwater spreading)
- > 373 CA CPS Dust Control on Unpaved Roads and Surfaces 2019 (Enhancing soil crusts)

Under the Preferred Alternative, these measures may be used individually or combined to achieve project objectives.

## **Mitigation Features**

Chapter 5 of the EA includes a detailed assessment of the environmental impacts of the Preferred Alternative. The following resource areas were found to result in effects that were not major and long term:

- > Aesthetics and Visual Beauty,
- > Environmental Justice,
- > Socioeconomics,
- > Population and Housing,
- > Navigation,
- > Public Services,
- > Parks and Recreation,
- > Utilities,

- > Energy,
- > Geology,
- > Hydrology and Water Quality,
- > Groundwater Hydrology and Quality,
- > Water Supply and Conservation and Water Rights,
- > Floodplain Management and Flood Risk Management, and
- > Transportation and Traffic.

Other resource areas would experience effects exceeding minor or short-term levels. For agriculture, permanent removal of prime or important farmland would be possible. EA Section 5.2 addresses this impact by requiring projects avoid prime or important farmland. For air quality, construction would temporarily result in an increase of criteria pollutants and particulate matter, which would be minimized as described in EA Section 5.3 by implementing dust suppression activities during construction and diesel control measures.

For biology, the proposed project would cause temporary disturbance and/or permanent loss of riparian or sensitive habitat which would be offset as described in EA Section 5.4 and 5.16 through implementation of a Habitat Protection, Mitigation, and Restoration Program. Drain water that may be used for habitat projects could result in adverse effects wetland species due to selenium bio accumulation, which would be managed through a targeted selenium monitoring program. In addition, project construction could result in removal of special status plant species, habitat and/or individual of the federally listed desert pupfish, removal of snags for nesting or roosting birds. Mitigation measures include preparing a Pupfish Protection and Relocation Plan, implementing a nesting bird management plan and wildlife species survey plan, implementation of noise attenuation measures, measures to minimize alterations of water levels in adjacent marshes, clean equipment prior to delivery on site, and monitoring water quality in ponds.

For cultural resources, ground disturbing activities could result unauthorized collection of artifacts, but this impact would be mitigated as described in EA Section 5.7 by determining the potential for buried resources in project sites and preparing and implementing a Programmatic Cultural Resources Management Plan and Historic Properties Treatment Plan. For hazardous materials, a risk to release virus containing dust and/or increasing mosquito breeding could occur which would be managed as described in EA Section 5.7 by providing working training on virus containing dust and by preparing and implementing a mosquito control plan. For noise, noise could temporarily increase near construction areas and that would be managed as described in EA Section 5.11 by instituting controls on construction work and avoiding nighttime construction. For paleontology, construction could expose and damaged undiscovered paleontological resources which could be avoided and minimized as described in EA Section 5.14 by implementing a survey and monitoring plan, conducting working training, and preparing a data recovery plan.

Ground-disturbing activities could result in effects on Indian trust assets (ITAs). To ensure no effects on ITAs, individual project plans will be submitted to the Bureau of Indian Affairs (BIA) and appropriate tribes for their concurrence/approval prior to any activities being conducted on tribal lands. Any projects located on land held in trust by the BIA for the Torres Martinez Tribe would require right-of-way agreements and approval from the BIA and Torres Martinez Tribe.

## Permits and Compliance

The Watershed Plan is a component of the SSMP 10-Year Plan which is going through programmatic consultation for Endangered Species Act (ESA) Section 7 and National Historic Preservation Act (NHPA) Section 106. All projects will comply with federal and state permits. Additional information is provided in EA Section 8.0, Coordination.

## Costs

The SSMP 10-Year Plan is intended to increase the level of services provided by the Salton Sea ecosystem relative to the No Action Alternative. This will be accomplished by constructing projects that suppress dust and support fish and wildlife.

Attachment B.2 of this appendix is an economic analysis that identifies all significant costs and benefits associated with implementation of the SSMP 10-Year Plan. The underlying analyses were conducted in a manner consistent with the Guidance for Conducting Analyses under the Principles, Requirements, and Guidelines for Water and Land Related Resources Implementation Studies and Federal Water Resource Investments DM 9500-013. Throughout, it is assumed that planning, design, and construction would be completed by 2028 and that operations and maintenance would continue through 2077.

- > The Plan's total present value cost is estimated to be approximately \$1.74 billion (Table 7 of Attachment B.2). As authorized under the Watershed Protection and Flood Prevention Act of 1954, NRCS would fund up to 50 percent of the construction costs associated with individual measures implemented under the plan provided (a) those measures do not occur on Federal Land and (b) the Service's total funding of measures implemented under the SSMP 10-Year Plan does not exceed \$25,000,000.
- > The Plan's total present value benefit is likely to be approximately \$2.14 billion (Table 7 of Attachment B.2). These benefits are the result of Plan-related reductions in adverse impacts related to human health, recreation, agricultural productivity, and potential non-use benefits that may be associated with the creation and preservation of habitat relative to baseline conditions. More than 23 percent of benefits would accrue among individuals living in rural areas.

## Economic Tables

- > The costs and benefits of the proposed Project are summarized in the Economic and Structural Tables covered in Tables B-3 and B-4, per National Watershed Program Manual requirements (NWPM Part 506, Subpart B). Table formats follow the table examples in the National Watershed Program Manual, including table fields appropriate to the Project, and omitting items not applicable to the Project. All values are presented in 2021 U.S. dollars. The base year for discounting is 2021, and the discount rate is 1.625%.



- > Throughout the Economic Tables, costs are broken down among two ‘works of improvement’ that comprise the proposed Project: \$1,007 million<sup>3,4</sup> of initial capital costs in present value in total; of which 988.9 million for projects implemented primarily to establish or enhance aquatic habitat with secondary dust control and other benefits; and \$18 million of which for all other projects, assumed here to have a primary purpose of dust control, with potential for secondary values such as aquatic or upland habitat. To the extent possible, costs and benefits are shown individually for these two works of improvement.
- > Table B-3 summarizes the costs of the proposed Project, broken down between Public Law 83-566 Funds and partner contributions from other sources. The total funding for the Project is \$1,007 million, with an installation cost-share of \$30 million under PL 83-566. The remaining \$977 million of Project costs will be covered by other funding sources.
- > Table B-4 shows installation costs for the two works of improvement, with cost categories broken out for installation, engineering, real property rights, and Project administration. Notes to the table provide additional detail on the cost categories that have been aggregated to the quantities presented in the table. Note that the table does not include non-Project costs related to permit applications; these costs are allocated by another part of the program. These costs are not included in the Project totals.

---

<sup>3</sup> All point estimates of project costs and benefits are average results from Monte Carlo simulations that rely on a range of input values with distinct probability distributions.

<sup>4</sup> The capital cost figure of \$1,007 million value is the estimated present value calculated and subsequently used in the Economic Appendix. As described in Appendix B.2, it is calculated from the original \$919 million estimated cost in 2022 dollars (CDOF 2021 and Maisonneuve 2022). It is subsequently converted to 2021 dollars, discounted at a rate of 1 and 5/8 percent, and then adjusted probabilistically according to a factor from Flyvbjerg et al. (2002) to account for the frequency and magnitude of relative cost overruns and underruns from a survey of past public work projects.

California Department of Finance (CDOF), 2021. *Water Resilience and Drought Package*. Water Code 81023. Available at: [https://esd.dof.ca.gov/Documents/bcp/2122/FY2122\\_ORG3860\\_BCP4699.pdf](https://esd.dof.ca.gov/Documents/bcp/2122/FY2122_ORG3860_BCP4699.pdf)

Maisonneuve, Vivien. 2022. *Program Manager II, DWR*. Personal communication with Coralie Allen, Cardno on March 10.

Flyvbjerg, B., Skamris Holm, M., and S. Buhl. 2002. "Underestimating Costs in Public Works Projects: Error or Lie?" *Journal of the American Planning Association*, vol. 68, no. 3, pp. 279-295.

**Table B-3 Estimated Installation Cost<sup>a</sup>**

<i>Salton Sea Management Plan</i>  Works of Improvement	Numbers			Estimated Cost (2021 Dollars) Public Law 83-566 Funds			Estimated Cost (2021 Dollars) Other Funds			Estimated Cost (2021 Dollars)	
	Unit	Federal Land <sup>b</sup>	Non- federal land	Total	Federal Land <sup>b</sup>	Non-federal land	Total	Federal Land <sup>b</sup>	Non-federal land	Total	Total
Aquatic habitat focus	Lump Sum	0	1	1	0	\$29.5 million	\$29.5 million	\$556.5 million	\$402.9 million	\$959.4 million	\$988.9 million
Dust suppression focus	Lump Sum	0	1	1	0	\$0.5 million	\$0.5 million	\$10.2 million	\$7.4 million	\$17.6 million	\$18.1 million
<b>Total</b>		<b>0</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>\$30 million</b>	<b>\$30 million</b>	<b>\$566.7 million</b>	<b>\$410.3 million</b>	<b>\$977 million</b>	<b>\$1,007 million<sup>c</sup></b>

<sup>a</sup> Price Base: Estimated 2021 U.S. Dollars.

<sup>b</sup> Refers to lands not eligible for Small Watershed funds. Generally, or as a rule if the SLO decides to simplify administration, all non-federal, including tribal, lands are potentially eligible, federal lands are not.

<sup>c</sup> The capital cost figure of \$1,007 million value is the estimated present value calculated and subsequently used in the Economic Appendix. As described in Appendix B.2, it is calculated from the original \$919 million estimated cost in 2022 dollars (CDOF 2021 and Maisonneuve 2022). It is subsequently converted to 2021 dollars, discounted at a rate of 1 and 5/8 percent, and then adjusted probabilistically according to a factor from Flyvberg et al. (2002) to account for the frequency and magnitude of relative cost overruns and underruns from a survey of past public work projects.

**Table B-4 Estimated Cost Distribution<sup>a</sup>**

Works of Improvement	Installation Cost - Public Law 83-566							Installation Cost - Other Funds							Total
	Construction <sup>b</sup>	Planning <sup>c</sup>	Engineering <sup>d</sup>	Real Prop. Rights	Relocation Payments	Project admin	Total Public Law 566	Construction	Planning	Engineering	Real Prop. Rights	Relocation Payments	Project admin	Total Other Funds	
Aquatic habitat	\$24.5 million	\$0	\$5 million	\$0	\$0	\$0	\$29.5 million	\$519.4 million	\$98.9 million	\$192.8 million	\$49.4 million	\$0	\$98.9 million	\$959.4 million	\$988.9 million
Dust suppression	\$0.4 million	\$0	\$0.1 million	\$0	\$0	\$0	\$0.5 million	\$9.6 million	\$1.8 million	\$3.5 million	\$0.9 million	\$0	\$1.8 million	\$17.6 million	\$18.1 million
<b>Total</b>	\$24.9 million	\$0	\$5.1 million	\$0	\$0	\$0	\$30 million	\$529.0 million	\$100.7 million	\$196.3 million	\$50.4 million	\$0	\$100.7 million	\$977 million	\$1,007 million <sup>e</sup>

<sup>a</sup> Price Basis: 2021 U.S. Dollars.

<sup>b</sup> Federal Implementation Amount cannot exceed \$25M.

<sup>c</sup> Includes Final O&M Plan, NEPA Requirements and Approvals (Watershed Plan and Economic Analysis), management and acceptance of final bids for installation of practices.

<sup>d</sup> Includes Geotechnical Investigation; NRCS Technical Assistance/Engineering; Preliminary and Final Design Standards, Specifications, and Approvals; Final As Built drawings.

<sup>e</sup> The capital cost figure of \$1,007 million value is the estimated present value calculated and subsequently used in the Economic Appendix. As described in Appendix B.2, it is calculated from the original \$919 million estimated cost in 2022 dollars (CDOF 2021 and Maisonneuve 2022). It is subsequently converted to 2021 dollars, discounted at a rate of 1 and 5/8 percent, and then adjusted probabilistically according to a factor from Flyvberg et al. (2002) to account for the frequency and magnitude of relative cost overruns and underruns from a survey of past public work projects.

Table B-5 Average Annual Costs summarizes Project costs on an annualized basis, including both capital costs and estimates of annual operation, maintenance, and replacement costs. Installation costs are amortized over the 75-year useful life of the Project at a discount rate of 1.625%, based on Treasury Annual Interest Rate Certification, per Water Resources Development Act of 1974 and rates for federal water projects, provided by NRCS Economics<sup>5</sup>. Total annualized capital costs are estimated at \$23.75 million over the life of the Project, while annualized Operation and Maintenance (O&M) costs are estimated at \$16.67 million per year. Total annualized costs are estimated at \$40.42 million.

**Table B-5. Average Annualized Costs<sup>a</sup>**

<b>Works of Improvement</b>	<b>Project Outlays- Amortization of Installation Cost</b>	<b>Project Outlays- Operation, Maintenance and Replacement Cost</b>	<b>Other Direct Costs</b>	<b>Total</b>
Aquatic habitat	\$23,327,322	\$16,378,948	\$0	<b>\$39,706,269</b>
Dust control	\$419,631	\$294,638	\$0	<b>\$714,269</b>
<b>Total</b>	<b>\$23,746,952</b>	<b>\$16,673,586</b>	<b>\$0</b>	<b>\$40,420,538</b>

<sup>a</sup> Price base: 2021 amortized over 75 years useful life at a discount rate of 1.625%.

Prepared: 05/16/22

The annual benefits of the Project alternatives are based on estimating the reduction in damage or benefit of the preferred Project relative to the No-Action Alternative (future-without-project (FWOP) alternative).

The benefits were calculated individually for agricultural and rural communities and for non-agricultural-related areas of the Project. Agricultural and Rural Communities were identified based on the definition in the National Watershed Program Manual, Part 606, which defines them as “All territories of a state that are not within the outer boundary of any city or town that has a population of 50,000 or more according to the latest decennial census of the United States.” For the Project, this includes all areas not within the boundary of the cities of Indio, Cathedral City and Palm Desert, including areas of unincorporated Imperial and Riverside Counties inside the Salton Sea Air Basin.

Total benefits are estimated to total \$49.52 million, with \$11.74 million associated with individuals in agricultural and rural communities. The benefit to agricultural and rural communities comprises 23.7 percent of total Project benefits.

<sup>5</sup> [https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/econ/prices/?cid=nrcs143\\_009685](https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/econ/prices/?cid=nrcs143_009685)

**Table B-6. Estimated Average Annualized Benefits<sup>a</sup>**

Item	Without-Project		With Project		Damage reduction benefit	
	Agriculture-related <sup>b</sup>	Non-agriculture-related	Agriculture-related	Non-agriculture-related	Agriculture-related	Non-agriculture-related
PM 2.5 caused mortality reduction	\$0	\$0	\$10,566,696	\$31,700,089	\$10,566,696	\$31,700,089
PM 2.5 caused morbidity reduction	\$0	\$0	\$96,135	\$288,404	\$96,135	\$288,404
Recreational and related benefits	\$0	\$0	\$155,437	\$2,953,301	\$155,437	\$2,953,301
Agricultural yield benefits	\$	\$0	\$776,026	\$0	\$776,026	\$0
Non-use benefits	\$0	\$0	\$149,182	\$2,834,464	\$149,182	\$2,834,464
<b>Total</b>	<b>\$0</b>	<b>\$0</b>	<b>\$11,743,476</b>	<b>\$37,776,258</b>	<b>\$11,743,476</b>	<b>\$37,776,258</b>

<sup>a</sup> Price Base: 2021 U.S. Dollars

<sup>b</sup> Agriculture-related benefits include benefits to agricultural and rural communities.

Prepared: 05/16/22

Table B-7 Comparison of Benefits and Costs, shows a summary of total benefits and costs of the preferred Project. Total annual expected benefits from Table B-6 are shown for agriculture and non-agriculture-related communities, broken down total annualized costs from Table B-5. Based on these estimates, the Project's benefit-cost ratio is estimated to be 1.23, indicating that every dollar of Project costs is associated with \$1.23 in Project benefits. Note that Project benefits are associated with the entire Project as a whole.

**Table B-7. Comparison of Benefits and Costs<sup>a</sup>**

Works of Improvement	Agriculture-related Benefits	Non-agriculture-related Benefits	Average Annual Benefits	Annualized Costs <sup>b,c</sup>	Benefit-Cost Ratio
Aquatic habitat <sup>d</sup>	\$33,439,628	\$6,093,302	\$39,532,930	\$39,706,269	1.00
Dust reduction <sup>d</sup>	\$9,988,460	\$0	\$9,988,460	\$714,269	13.98
<b>Total</b>	<b>\$43,428,088</b>	<b>\$6,093,302</b>	<b>\$49,521,390</b>	<b>\$40,420,538</b>	<b>1.23</b>

<sup>a</sup> Price Base: 2021 U.S. Dollars

<sup>b</sup> From Table B-5.

<sup>c</sup> Project benefits are associated with the Project as a whole.

<sup>d</sup> Annualized costs are amortized values.

Prepared: 05/16/22

## **Installation and Financing**

### **Framework for Carrying Out the Plan**

The SSMP team will identify projects within the Watershed Planning Area that are ready to be financed and installed. The order of projects will depend on land access agreements being signed and sites being designed. A typical sequence of installation will be to identify the parcels, collect soil samples, drone flights, topographic surveys, wetland delineation and other site characteristics and conduct a site reconnaissance survey. Once information is collected, the site will be designed and funding secured.

### **Planned Sequence of Installation**

Control the dust on site, and then add vegetation, wetlands, or pond projects. Mitigation measures will be identified through the Letter of Permission (LOP) process. Mitigation measures are identified in Chapter 5 of the EA. The types of projects to be installed are identified in the activities list of the EA. Land access would be secured by the State through signed voluntary agreements with the landowner whenever possible. Costs and payments associated with land transactions will be paid as necessary to secure property rights. The SLO does not own any property within the Watershed Planning Area so all necessary property rights would need to be acquired. Department of Water Resources (DWR) also has the power of eminent domain that could be used to implement the project in the event that all other options have been exhausted. To date the SSMP has not needed to use this authority. In the majority of projects, the SSMP will be seeking long-term contracts to construct projects and not ownership of project sites. The SSMP schedule is in the 10-Year Plan and includes approximately 30,000 acres.

### **Responsibilities**

The SLO is responsible for identifying and designing projects eligible for NRCS funding. Upon NRCS approval, the SLO will comply with the requirements resulting from programmatic consultations under the ESA Section 7 and NHPA Section 106. The SLO will be responsible for any additional permitting including land access and water rights. Prior to project implementation, the SLO will develop an O&M plan, pursuant to the National Watershed Program Handbook. The SLO will be responsible for implementation and monitoring of required mitigation measures and ensuring that the Project meets the requirements of the Watershed Agreement and permit conditions imposed by participating regulatory agencies. The SLO will ensure that projects are constructed following the design specifications, funding requirements, and be responsible for maintenance and inspections as detailed in the O&M Plan.

### **Contracting**

This plan is a land treatment plan that does not require landownership to be implemented. The State will seek long-term contracts for access to project sites and for the cost-shared treatment. For projects that the SSMP will seek Watershed Plan funding for, the preferred means would be to develop a NRCS Sponsor Lead Agreement where the SSMP selects the location and completed the designs and installation. The NRCS will do quality assurance to ensure all land treatment follows the requirements in the EA, and the NRCS Conservation Standards/Specifications and complies with all regulations. Contracts would be developed for

each project with the SSMP following State contracting requirements. The process could be design bid build or a design build.

The State has many potential State contracting mechanisms for various types for design, and construction, consultants to meet the NRCS requirements.

### **Real Property and Relocations**

Prior to receiving any funding, the SLO will secure access or property rights for the life of the project. The project would not require any relocation.

### **Other Agencies**

Other agencies include the Cooperating agencies that are participating in development of the EA and the LOP procedures. Other State agencies that are not part of the SSMP team that will also have a permitting role are the State Water Resources Control Board, CDFW and the Colorado River Regional Water Quality Control Board. Local agencies that own land or regulate air quality include IID, Coachella Valley Water District, South Coast Air Quality Management District, and Imperial County Air Pollution Control District, as well as several Community Services Districts. The two counties that will participate in the SSMP are Riverside County and Imperial County and their associated departments.

### **Cultural Resources**

Cultural resources are discussed in Sections 4.7 and 5.7 of the EA.

### **Financing**

The Projects will be carried out under the umbrella of the SSMP. With the enactment of the 2021-2022 Budget Act, the State has now appropriated \$402.6 million in funding for Salton Sea-related activities since the execution of the QSA in 2003. Through fiscal year 2020-2021, California has committed over \$270 million in funding for a broad range of habitat, dust suppression, and water quality improvement projects at the Salton Sea. The 2021-2022 Budget Act committed another \$220 million in near-term General Funds, including \$40 million appropriated for the 2021-22 fiscal year. The remainder will be appropriated in 2022-23 (\$100 million) and 2023-24 (\$80 million) through the annual budget act. This money is currently being used for the construction of habitat and dust suppression projects.

The money is always authorized and approved by the State of California through its yearly budget cycle. The requested amount is determined by the Budget Concept Proposal (BCP) submitted by the public agencies that constitutes the SSMP, CNRA, the CDFW and the DWR. The State Legislature and the Governor can approve or decline the proposals. Historically, the BCPs have always been approved.

The projected future needs for the implementation of the current plan stand at around \$450 to \$500 million. The money will be asked for once new projects are identified. The SSMP partners ask for additional funds every two or three years.

Any funds provided by the Federal government will go towards the construction of projects identified as priorities under the SSMP Plan. The State funds are eligible to pay for all costs related to projects. Any project or parts of a project that are not eligible for Federal funding can be paid by the State.

The costs not eligible to receive NRCS funding will be paid in integrality by other means. The ineligible costs will be determined by the NRCS.

The State of California has not sought any loans and self-fund the project for the most part. The United States Bureau of Reclamation has provided around \$1.3 million to DWR to fund projects on their land.

The State is not planning on seeking an advance of Watershed Program funds for its SSMP projects.

## **Conditions for Providing Assistance**

### **Operation, Maintenance, and Replacement**

The SLO is committed to covering all aspects of O&M for the lifespan of the projects outlined in the NRCS Conservation Standards. The SLO intends to take responsibility including financing for O&M and replacement for any projects that are implemented as part of the Watershed Plan. Tables B-8 and B-9 identify the expected NRCS identified life expectancy. The SLO will develop a written O&M plan as required for all practices installed with NRCS assistance. The O&M Plan will include the O&M requirements for specific conservation practices found in Section IV of the Field Office Technical Guide<sup>5</sup>.

Based on State's commitments on the QSA and as analyzed in the EA, the State will perform annual maintenance on Watershed Plan Projects in compliance with NRCS conservation practice standards<sup>6</sup> through 2078.

Additional information is provided in EA Section 3.15, Operations and Maintenance.

## **Economic and Structural Tables**

This is addressed in Attachment B.2 to this Watershed Plan.

---

<sup>6</sup> NRCS Field Office Technical Guide (usda.gov) Available at: <https://efotg.sc.egov.usda.gov/#/>



**Table B-8 NRCS Conservation Practices and Operation and Maintenance Schedule  
Aquatic Habitat Types and Features**

<b>SSMP Aquatic Habitat Types and Features</b>	<b>NRCS Conservation Practices</b>	<b>Project Life Expectancy (Years)<sup>7</sup></b>
Ponds	378 CA CPS Pond 2016	15
Earthen berms	402 CA CPS Dam 2018; 356 CA CPS Dike 2008	15–20
Mudflats/shallow-water habitat	646 CA CPS Shallow Water Development and Management 2011	5
Permanent vegetated wetlands	390 CA CPS Riparian Herbaceous Cover 643 CA CPS Restoration of Rare or Declining Natural Communities 2012 657 CA CPS Wetland Restoration 2011 659 CA CPS Wetland Enhancement 2011	15
Managed wetlands	644 CA CPS Wetland Wildlife Habitat Management 2011 659 CA CPS Wetland Enhancement 2011	1
Flood control associated with North Lake Project	582 CA CPS Open Channel 2015	15
Pumps	533 CA CPS Pumping Plant 2011	15
Pipelines, water conveyance	430 CA CPS Irrigation Pipeline 2011	20
Seasonal flooding	646 CA CPS Shallow Water Development and Management 2011	5
Bird islands; floating islands	644 CA CPS Wetland Wildlife Habitat Management 649 CA CPS Structures for Wildlife 2014	1–5
Snags or other vertical structures	649 CA CPS Structures for Wildlife 2014	5
Bottom hard substrate and hard substrate on berms in ponds	N/A	15–20

<sup>7</sup> Based on Technical Guide Notice No. 148 / NHCP No.171 Index of Conservation Practices  
[https://efotg.sc.egov.usda.gov/api/CPSFile/27594/Section\\_IV\\_Practice\\_Index](https://efotg.sc.egov.usda.gov/api/CPSFile/27594/Section_IV_Practice_Index)

<b>SSMP Aquatic Habitat Types and Features</b>	<b>NRCS Conservation Practices</b>	<b>Project Life Expectancy (Years)<sup>7</sup></b>
Swales or channels	582 CA CPS Open Channel 2015; 412 CA CPS Grassed Waterway 2015; 658 CA CPS Wetland Creation 2011	10–15
Water conveyance and supply system: sedimentation/mixing basins	638 CA CPS Water and Sediment Control Basin 2018; 587 CA CPS Structure for Water Control 2018	10–20
Public amenities, recreation access	575 CA CPS Trails and Walkways 2014	10
Monitoring wells	353 CA CPS Monitoring Well 2015 355 CA CPS Groundwater Testing 2015	15
Weirs and other structures in waterways to divert water	362 CA CPS Diversion 2017; 587 CA CPS Structure for Water Control 2018	10–20
Staging areas	N/A	N/A
Boat ramps	N/A	N/A
Operational facilities	N/A	N/A

**Table B-9 NRCS Conservation Practices and Operation and Maintenance Schedule  
Dust Suppression Techniques**

SSMP Dust Suppression Techniques	NRCS Conservation Practices	Project Life Expectancy (Years) <sup>8</sup>
<b>Temporary Waterless Techniques</b>		
Temporary surface roughening	609 CA CPS Surface Roughening 2015	1
Dust suppressants or surface stabilizers	373 CA CPS Dust Control on Unpaved Roads and Surfaces 2019	1
Sand fencing	N/A	N/A
Engineered roughness	N/A	N/A
Gravel and other cover	484 CA CPS Mulching 2020	1
<b>Long-term Habitat Enhancement Techniques</b>		
Vegetation establishment	327 CA CPS Conservation Cover 2016; 342 CA CPS Critical Area Planting 2017; 589C CA CPS Cross Wind Trap Strips 2015; 612 CA CPS Tree/Shrub Establishment 2017; 380 CA CPS Windbreak-Shelterbelt Establishment 2013	5–15
Shallow flooding	646 CA CPS Shallow Water Development and Management 2011	5
Stormwater spreading	362 CA CPS Diversion 2017; 373 CA CPS Dust Control on Unpaved Roads and Surfaces 2019; 640 CA CPS Water spreading 2021	1–10
Enhancing soil crusts	373 CA CPS Dust Control on Unpaved Roads and Surfaces 2019	1

<sup>8</sup> Based on Technical Guide Notice No. 148 / NHCP No.171 Index of Conservation Practices  
[https://efotg.sc.egov.usda.gov/api/CPSFile/27594/Section\\_IV\\_Practice\\_Index](https://efotg.sc.egov.usda.gov/api/CPSFile/27594/Section_IV_Practice_Index)



Figure B-1 Proposed Watershed Plan Project Area

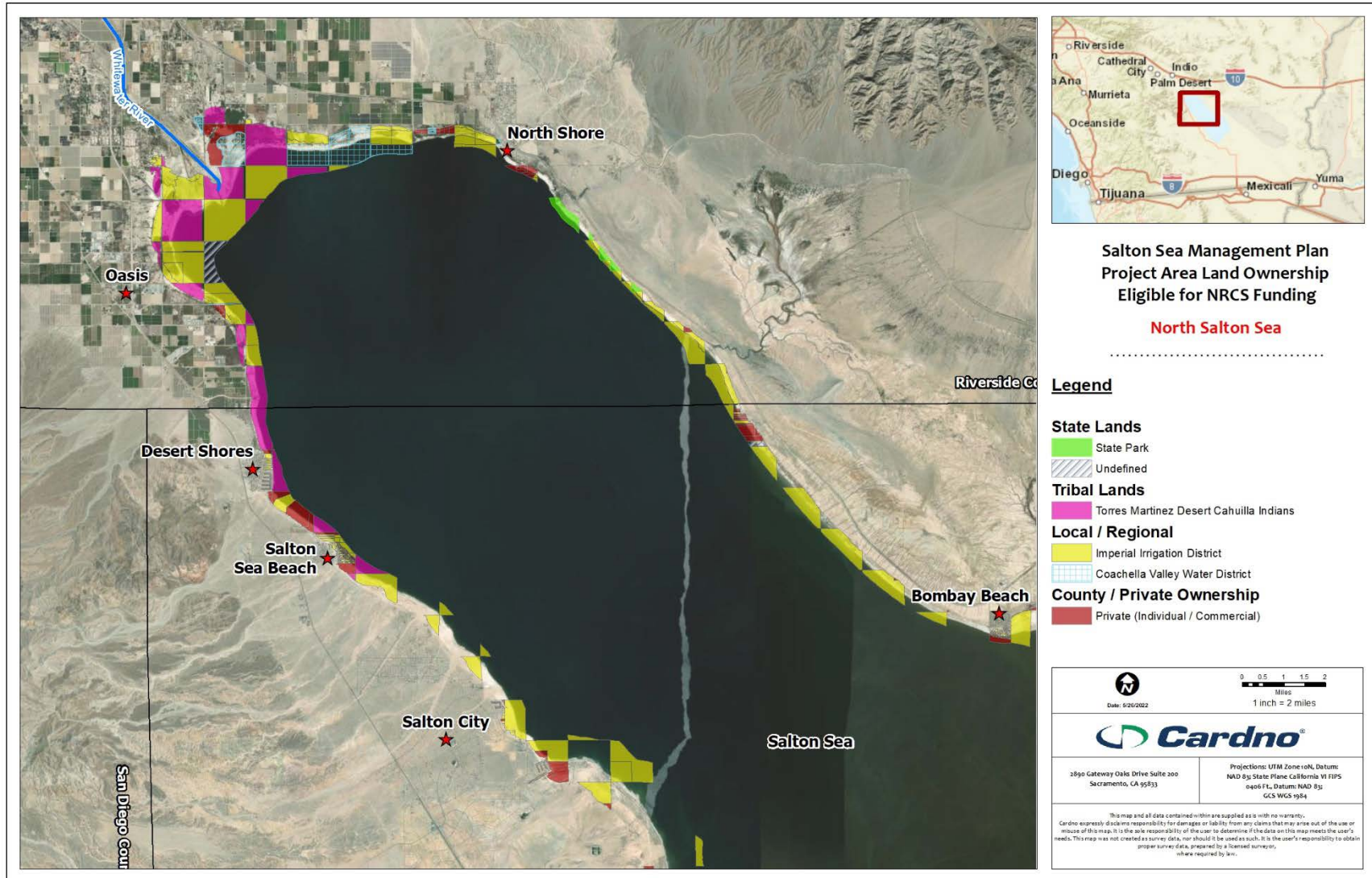


Figure B-2 Project Area Land Ownership Eligible for NRCS Funding (North)

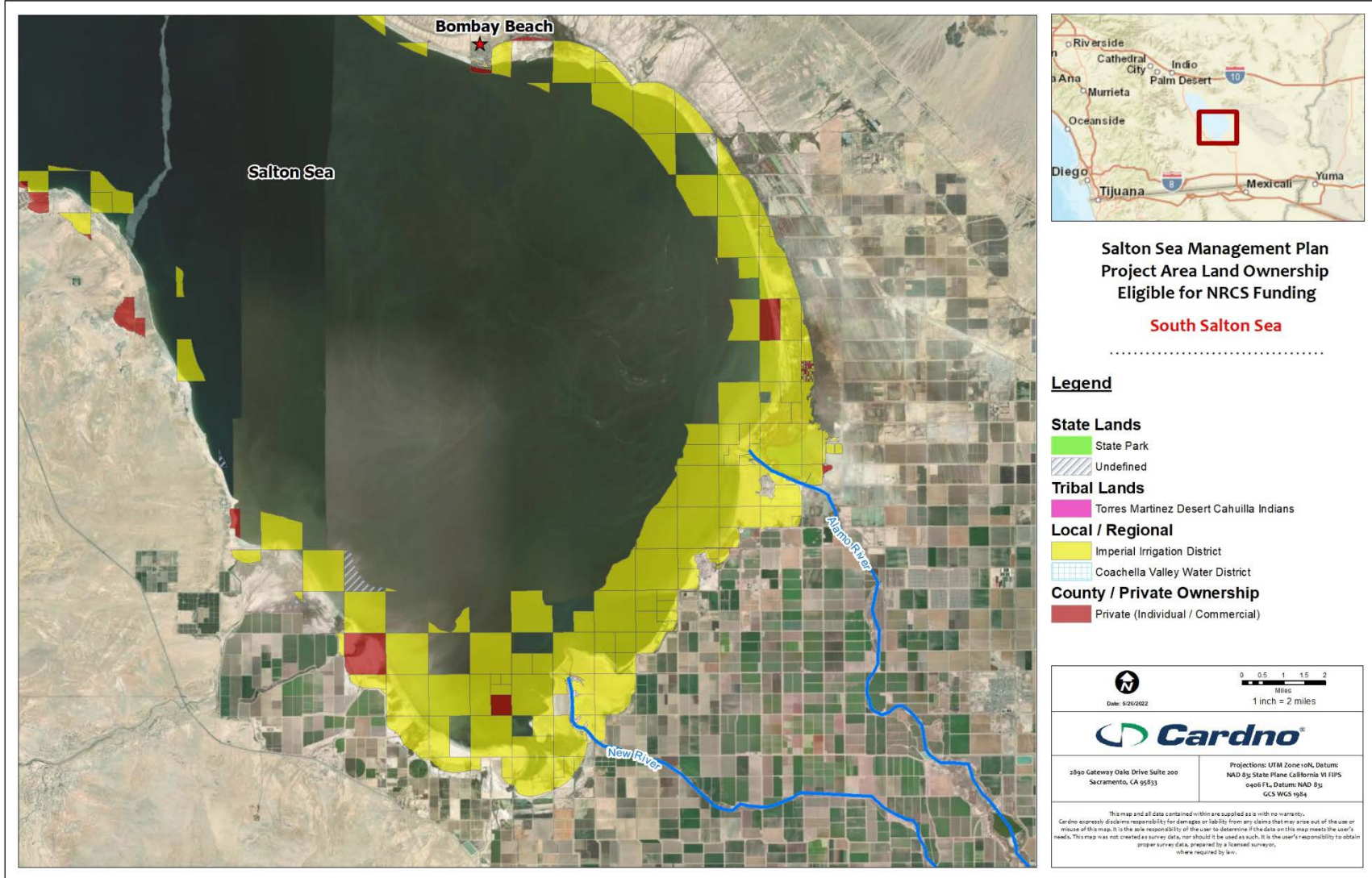


Figure B-3 Project Area Land Ownership Eligible for NRCS Funding (South)

Attachment B.1  
DRAFT WATERSHED PLAN AGREEMENT

# Draft Environmental Assessment SSMP Phase 1: 10-Year Plan Appendix B Watershed Plan, Attachment B.1:

## Draft Watershed Plan Agreement

between the  
California Natural Resources Agency  
(Referred to herein as Sponsors)

and the

UNITED STATES DEPARTMENT OF AGRICULTURE  
NATURAL RESOURCES CONSERVATION SERVICE  
(Referred to herein as NRCS)

**Whereas**, application has heretofore been made to the Secretary of Agriculture by the Sponsors for assistance in preparing a plan for works of improvement for the Salton Sea Watershed, State of California, under the authority of the Watershed Protection and Flood Prevention Act, as amended (16 U.S.C. Sections 1001 to 1008, 1010, and 1012); and

**Whereas**, the responsibility for administration of the Watershed Protection and Flood Prevention Act, has been assigned by the Secretary of Agriculture to NRCS; and

**Whereas**, there has been developed through the cooperative efforts of the Sponsors and NRCS a watershed project plan and environmental assessment for works of improvement for the Salton Sea Watershed, State of California, hereinafter referred to as the watershed project plan or plan, which plan is annexed to and made a part of this agreement;

**Now**, therefore, in view of the foregoing considerations, the Secretary of Agriculture, through NRCS, and the Sponsors hereby agree on this watershed project plan and that the works of improvement for this project will be installed, operated, and maintained in accordance with the terms, conditions, and stipulations provided for in this plan and including the following:

1. **Term.** The term of this agreement is for the installation period and evaluated life of the project (56 years) and does not commit NRCS to assistance of any kind beyond the end of the evaluated life.
2. **Costs.** The costs shown in this plan are preliminary estimates. Final costs to be borne by the parties hereto will be the actual costs incurred in the installation of works of improvement.
3. **Real property.** The sponsors will acquire such real property as will be needed in connection with the works of improvement. The amounts and percentages of the real property acquisition costs to be borne by the Sponsors and NRCS are as shown in the Cost-share table in item 5 hereof.

The sponsors agrees that all land acquired for measures, other than land treatment practices, with financial or credit assistance under this agreement will not be sold or otherwise disposed of for the evaluated life of the project except to a public agency which will continue to maintain and operate the development in accordance with the Operation and Maintenance Agreement

4. **Uniform Relocation Assistance and Real Property Acquisition Policies Act.** The sponsors hereby agrees to comply with all of the policies and procedures of the Uniform Relocation Assistance and Real Property Acquisition Policies Act (42 U.S.C. Section 4601 et seq. as further implemented through regulations in 49 CFR Part 24 and 7 CFR Part 21) when acquiring real property interests for this federally assisted project. If the sponsors are legally unable to comply with the real property acquisition requirements, it agrees that, before any Federal financial assistance is furnished, it will provide a statement to that effect, supported by an opinion of the chief legal officer of the state containing a full discussion of the facts and law involved. This statement may be accepted as constituting compliance.



5. **Cost-share for Watershed Work Plan.** The following table shows cost-share percentages and amounts for Watershed Work Plan implementation.

**Cost-share Table for Watershed Operation or Rehabilitation Projects**

<b>Works of Improvement:</b>	<b>NRCS</b>		<b>Sponsors</b>		<b>Total</b>
	Percent	Cost (In million dollars)	Percent	Cost (In million dollars)	Cost (In million dollars)
<b>Cost-Shareable Items</b> <i>List measures by purpose and rate of assistance <sup>1/</sup></i>					
Land Treatment Measure	4.5%	\$24.9	95.5%	\$529	\$553.9
Sponsors Engineering Costs	2.5%	\$5.1	97.5%	\$196.3	\$201.4
<b>Subtotal: Cost-Shareable Costs</b>	<b>N/A</b>	<b>\$30</b>	<b>N/A</b>	<b>\$725.3</b>	<b>\$755.3</b>
<b>Non-Cost-Shareable Items <sup>2/</sup></b>					
Project Administration <sup>3/</sup>	3%	\$3	97%	\$97.7	\$100.7
Real estate appraisal fees, legal fees, survey costs, flowage easements	3%	\$1.5	97%	\$48.9	\$50.4
Non-Project Costs	3%	\$3	97%	\$97.7	\$100.7
<b>Subtotal: Non-Cost-Share Costs</b>	<b>N/A</b>	<b>\$7.5</b>	<b>N/A</b>	<b>\$244.3</b>	<b>\$251.8</b>
<b>Total Cost-Shareable and Non-Cost Share Costs:</b>	<b>N/A</b>	<b>\$37.5</b>	<b>N/A</b>	<b>\$969.6</b>	<b>\$1007<sup>4/</sup></b>

1/ Installation costs explanatory notes:

- (a) List each multiple-purpose measure separately. Specific cost items and joint costs of multiple-purpose measures will be shown as separate line item entries. Single-purpose measures may be grouped by kind if the rate of assistance is the same for each measure or group.
- (b) For watershed protection enduring measures, the following footnote should be included: 1/ The cost-share rate is the percentage of the average cost of installing the practice in the selected plan for the evaluation unit. During project implementation, the actual cost-share rate must not exceed the rate of assistance for similar practices and measures under existing national programs.

2/ If actual non-cost-shareable item expenditures vary from these figures, the responsible party will bear the change.

3/ The sponsors and NRCS will each bear the costs of project administration that each incurs. Sponsor costs for project administration include relocation assistance advisory service.

4/ The capital cost figure of \$1,007 million value is the estimated present value calculated and subsequently used in the Economic Appendix. As described in Appendix B.2, it is calculated from the original \$919 million estimated cost in 2022 dollars (CDOF 2021 and Maisonneuve 2022). It is subsequently converted to 2021 dollars, discounted at a rate of 1 and 5/8 percent, and then adjusted probabilistically according to a factor from Flyvberg et al. (2002) to account for the frequency and magnitude of relative cost overruns and underruns from a survey of past public work projects.

6. **Land treatment agreements.** The sponsors will obtain agreements from owners of not less than 50 percent of the land above each multiple-purpose and floodwater-retarding structure. These agreements must provide that the owners will carry out farm or ranch conservation plans on their land. The sponsors will ensure that 50 percent of the land upstream of any retention reservoir site is adequately protected before construction of the dam. The sponsors will provide assistance to landowners and operators to ensure the installation of the land treatment measures shown in the watershed project plan. The sponsors will encourage landowners and operators to continue to operate and maintain the land treatment measures after the long-term contracts expire, for the protection and improvement of the watershed.
7. **Floodplain Management.** Before construction of any project for flood prevention, the sponsors must agree to participate in and comply with applicable Federal floodplain management and flood insurance programs. The sponsor is required to have development controls in place below low and significant hazard dams prior to NRCS or the sponsor entering into a construction contract.
8. **Water and mineral rights.** The sponsors will acquire or provide assurance that landowners or resource users have acquired such water, mineral, or other natural resources rights pursuant to State law as may be needed in the installation and operation of the works of improvement.
9. **Permits.** The sponsors will obtain and bear the cost for all necessary Federal, State, and local permits required by law, ordinance, or regulation for installation of the works of improvement.
10. **NRCS assistance.** This agreement is not a fund-obligating document. Financial and other assistance to be furnished by NRCS in carrying out the plan is contingent upon the fulfillment of applicable laws and regulations and the availability of appropriations for this purpose.
11. **Additional agreements.** A separate agreement will be entered into between NRCS and the sponsors before either party initiates work involving funds of the other party. Such agreements will set forth in detail the

financial and working arrangements and other conditions that are applicable to the specific works of improvement.

12. **Amendments.** This plan may be amended or revised only by mutual agreement of the parties hereto, except that NRCS may deauthorize or terminate funding at any time it determines that the sponsors have failed to comply with the conditions of this agreement or when the program funding or authority expires. In this case, NRCS must promptly notify the sponsors in writing of the determination and the reasons for the deauthorization of project funding, together with the effective date. Payments made to the sponsors or recoveries by NRCS must be in accordance with the legal rights and liabilities of the parties when project funding has been deauthorized. An amendment to incorporate changes affecting a specific measure may be made by mutual agreement between NRCS and the sponsors having specific responsibilities for the measure involved.
13. **Prohibitions.** No member of or delegate to Congress, or resident commissioner, may be admitted to any share or part of this plan, or to any benefit that may arise therefrom; but this provision may not be construed to extend to this agreement if made with a corporation for its general benefit.
14. **Operation and Maintenance (O&M).** The sponsors will be responsible for the operation, maintenance, and any needed replacement of the works of improvement by actually performing the work or arranging for such work, in accordance with an O&M Agreement. An O&M agreement will be entered into before Federal funds are obligated and will continue for the project life (56 years). Although the sponsors' responsibility to the Federal Government for O&M ends when the O&M agreement expires upon completion of the evaluated life of measures covered by the agreement, the sponsors acknowledge that continued liabilities and responsibilities associated with works of improvement may exist beyond the evaluated life.
15. **Emergency Action Plan.** Prior to construction, the sponsors must prepare an Emergency Action Plan (EAP) for each dam or similar structure where failure may cause loss of life or as required by state and local regulations. The EAP must meet the minimum content specified in the NRCS Title 180, National Operation and Maintenance Manual (NOMM), Part 500, Subpart F, Section 500.52, and meet applicable State agency dam safety requirements. The NRCS will determine that an EAP is prepared prior to the execution of fund obligating documents for construction of the structure. EAPs must be reviewed and updated by the sponsors annually.
16. **Nondiscrimination Provisions.** In accordance with Federal civil rights law and U.S. Department of Agriculture (USDA) civil rights regulations and policies, the USDA, its Agencies, offices, and employees, and institutions participating in or administering USDA programs are prohibited from discriminating based on race, color, national origin, religion, sex, gender identity (including gender expression), sexual orientation, disability, age, marital status, family/parental status, income derived from a public assistance program, political beliefs, or reprisal or retaliation for prior civil rights activity, in any program or activity conducted or funded by USDA (not all bases apply to all programs). Remedies and complaint filing deadlines vary by program or incident.

Persons with disabilities who require alternative means of communication for program information (e.g., Braille, large print, audiotape, American Sign Language, etc.) should contact the responsible Agency or USDA's TARGET Center at (202) 720-2600 (voice and TTY) or contact USDA through the Federal Relay Service at (800) 877-8339. Additionally, program information may be made available in languages other than English.

To file a program discrimination complaint, complete the USDA Program Discrimination Complaint Form, AD-3027, found online at [How to File a Program Discrimination Complaint](#) and at any USDA office or write a letter addressed to USDA and provide in the letter all of the information requested in the form. To request a copy of the complaint form, call (866) 632-9992. Submit your completed form or letter to USDA by: (1) mail: U.S. Department of Agriculture, Office of the Assistant Secretary for Civil Rights, 1400 Independence Avenue, SW, Washington, D.C. 20250-9410; (2) fax: (202) 690-7442; or (3) email: [program.intake@usda.gov](mailto:program.intake@usda.gov).

USDA is an equal opportunity provider, employer, and lender.

By signing this agreement the recipient assures the Department of Agriculture that the program or activities provided for under this agreement will be conducted in compliance with all applicable Federal civil rights laws, rules, regulations, and policies.

17. **Certification Regarding Drug-Free Workplace Requirements (7 CFR Part 3021).** By signing this Watershed Agreement, the sponsors are providing the certification set out below. If it is later determined that the sponsors knowingly rendered a false certification, or otherwise violated the requirements of the Drug-Free

Workplace Act, the NRCS, in addition to any other remedies available to the Federal Government, may take action authorized under the Drug-Free Workplace Act.

*Controlled substance* means a controlled substance in Schedules I through V of the Controlled Substances Act (21 U.S.C. Section 812) and as further defined by regulation (21 CFR Sections 1308.11 through 1308.15);

*Conviction* means a finding of guilt (including a plea of *nolo contendere*) or imposition of sentence, or both, by any judicial body charged with the responsibility to determine violations of the Federal or State criminal drug statutes;

*Criminal drug statute* means a Federal or non-Federal criminal statute involving the manufacturing, distribution, dispensing, use, or possession of any controlled substance;

*Employee* means the employee of a grantee directly engaged in the performance of work under a grant, including: (i) all direct charge employees; (ii) all indirect charge employees unless their impact or involvement is insignificant to the performance of the grant; and, (iii) temporary personnel and consultants who are directly engaged in the performance of work under the grant and who are on the grantee's payroll. This definition does not include workers not on the payroll of the grantee (e.g., volunteers, even if used to meet a matching requirement; consultants or independent contractors not on the grantees' payroll; or employees of subrecipients or subcontractors in covered workplaces).

**Certification:**

A. The sponsors certify that they will or will continue to provide a drug-free workplace by—

- (1) Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the grantee's workplace and specifying the actions that will be taken against employees for violation of such prohibition.
- (2) Establishing an ongoing drug-free awareness program to inform employees about—
  - (a) The danger of drug abuse in the workplace;
  - (b) The grantee's policy of maintaining a drug-free workplace;
  - (c) Any available drug counseling, rehabilitation, and employee assistance programs; and
  - (d) The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace
- (3) Making it a requirement that each employee to be engaged in the performance of the grant be given a copy of the statement required by paragraph (1).
- (4) Notifying the employee in the statement required by paragraph (1) that, as a condition of employment under the grant, the employee must—
  - (a) Abide by the terms of the statement; and
  - (b) Notify the employer in writing of his or her conviction for a violation of a criminal drug statute occurring in the workplace no later than five calendar days after such conviction.
- (5) Notifying the NRCS in writing, within 10 calendar days after receiving notice under paragraph (4)(b) from an employee or otherwise receiving actual notice of such conviction. Employers of convicted employees must provide notice, including position title, to every grant officer or other designee on whose grant activity the convicted employee was working, unless the Federal agency has designated a central point for the receipt of such notices. Notice must include the identification numbers of each affected grant.
- (6) Taking one of the following actions, within 30 calendar days of receiving notice under paragraph (4)(b), with respect to any employee who is so convicted—
  - (a) Taking appropriate personnel action against such an employee, up to and including termination, consistent with the requirements of the Rehabilitation Act of 1973, as amended; or
  - (b) Requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency.
- (7) Making a good faith effort to continue to maintain a drug-free workplace through implementation of paragraphs (1), (2), (3), (4), (5), and (6).

B. The sponsors may provide a list of the sites for the performance of work done in connection with a specific project or other agreement.

C. Agencies will keep the original of all disclosure reports in the official files of the agency.

**18. Certification Regarding Lobbying (7 CFR Part 3018) (for projects > \$100,000)**

A. The sponsors certify to the best of their knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the sponsors, to any person for influencing or attempting to influence an officer or employee of an agency, Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned must complete and submit Standard Form LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The sponsors must require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients must certify and disclose accordingly.

B. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by U.S. Code, Title 31, Section 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

**19. Certification Regarding Debarment, Suspension, and Other Responsibility Matters—Primary Covered Transactions (7 CFR Part 3017).**

A. The sponsors certify to the best of their knowledge and belief, that they and their principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;

(2) Have not within a 3-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State, or local) with commission of any of the offenses enumerated in paragraph A(2) of this certification; and

(4) (4) Have not within a 3-year period preceding this application/proposal had one or more public transactions (Federal, State, or local) terminated for cause or default.

B. Where the primary sponsors is unable to certify to any of the statements in this certification, such prospective participant must attach an explanation to this agreement.

**20. Clean Air and Water Certification.**

A. The project sponsoring organizations signatory to this agreement certify as follows:

(1) Any facility to be utilized in the performance of this proposed agreement is (\_\_\_\_), is not (X) listed on the Environmental Protection Agency List of Violating Facilities.

- (2) To promptly notify the NRCS-State administrative officer prior to the signing of this agreement by NRCS, of the receipt of any communication from the Director, Office of Federal Activities, U.S. Environmental Protection Agency, indicating that any facility which is proposed for use under this agreement is under consideration to be listed on the Environmental Protection Agency List of Violating Facilities.
- (3) To include substantially this certification, including this subparagraph, in every nonexempt sub-agreement.

B. The project sponsoring organizations signatory to this agreement agrees as follows:

- (1) To comply with all the requirements of section 114 of the Clean Air Act as amended (42 U.S.C. Section 7414) and section 308 of the Federal Water Pollution Control Act (33 U.S.C. Section 1318), respectively, relating to inspection, monitoring, entry, reports, and information, as well as other requirements specified in section 114 and section 308 of the Air Act and the Water Act, issued there under before the signing of this agreement by NRCS.
- (2) That no portion of the work required by this agreement will be performed in facilities listed on the EPA List of Violating Facilities on the date when this agreement was signed by NRCS unless and until the EPA eliminates the name of such facility or facilities from such listing.
- (3) To use their best efforts to comply with clean air standards and clean water standards at the facilities in which the agreement is being performed.
- (4) To insert the substance of the provisions of this clause in any nonexempt subagreement.

C. The terms used in this clause have the following meanings:

- (1) The term "Air Act" means the Clean Air Act, as amended (42 U.S.C. Section 7401 et seq.).
- (2) The term "Water Act" means Federal Water Pollution Control Act, as amended (33 U.S.C. Section 1251 et seq.).
- (3) The term "clean air standards" means any enforceable rules, regulations, guidelines, standards, limitations, orders, controls, prohibitions, or other requirements which are contained in, issued under, or otherwise adopted pursuant to the Air Act or Executive Order 11738, an applicable implementation plan as described in section 110 of the Air Act (42 U.S.C. Section 7414) or an approved implementation procedure under section 112 of the Air Act (42 U.S.C. Section 7412).
- (4) The term "clean water standards" means any enforceable limitation, control, condition, prohibition, standards, or other requirement which is promulgated pursuant to the Water Act or contained in a permit issued to a discharger by the Environmental Protection Agency or by a State under an approved program, as authorized by section 402 of the Water Act (33 U.S.C. Section 1342), or by a local government to assure compliance with pretreatment regulations as required by section 307 of the Water Act (33 U.S.C. Section 1317).
- (5) The term "facility" means any building, plant, installation, structure, mine, vessel, or other floating craft, location or site of operations, owned, leased, or supervised by a sponsor, to be utilized in the performance of an agreement or subagreement. Where a location or site of operations contains or includes more than one building, plant, installation, or structure, the entire location will be deemed to be a facility except where the Director, Office of Federal Activities, Environmental Protection Agency, determines that independent facilities are collocated in one geographical area.

**21. Assurances and Compliance.** As a condition of the grant or cooperative agreement, the sponsors assures and certifies that it is in compliance with and will comply in the course of the agreement with all applicable laws, regulations, Executive orders and other generally applicable requirements, including those set out below which are hereby incorporated in this agreement by reference, and such other statutory provisions as a specifically set forth herein.

State, Local, and Indian Tribal Governments: OMB Circular Nos. A-87, A-102, A-129, and A-133; and 7 CFR Parts 3015, 3016, 3017, 3018, 3021, and 3052.

Nonprofit Organizations, Hospitals, Institutions of Higher Learning: OMB Circular Nos. A-110, A-122, A-129, and A-133; and 7 CFR Parts 3015, 3017, 3018, 3019, 3021 and 3052.

**22. Examination of Records.** The sponsors must give the NRCS or the Comptroller General, through any authorized representative, access to and the right to examine all records, books, papers, or documents related to this agreement, and retain all records related to this agreement for a period of three years after completion of the terms of this agreement in accordance with the applicable OMB Circular.

**23. Signatures.**

**California Natural Resources Agency**

The signing of this plan by the California Natural Resources Agency

\_\_\_\_\_, 2022 at

California Natural Resources Agency  
715 P Street, 20<sup>th</sup> Floor  
Sacramento California 95814

By:

\_\_\_\_\_

Date: \_\_\_\_\_

Arturo Delgado  
Assistant Secretary for Salton Sea Policy

**USDA-NATURAL RESOURCES CONSERVATION SERVICE**

Approved by:

Date: \_\_\_\_\_

\_\_\_\_\_  
**Insert name**, State Conservationist  
Natural Resources Conservation Service  
**Insert Address**

## Attachment B.2

### WATERSHED PLAN: ECONOMIC APPENDIX

## Appendix B.2 Watershed Plan: Economic Appendix

---

The SSMP 10-Year Plan calls for the implementation of 29,800 acres of projects on lakebed areas that have been, or will be, exposed at the Salton Sea by 2028. At least half of the acreage will be dedicated to projects that not only suppress dust but also support fish and wildlife that are dependent on the Salton Sea ecosystem; the remainder will be dust suppression projects.

The SSMP 10-Year Plan is intended to address two issues.

1. The Salton Sea Air Basin met State and Federal particulate PM<sub>10</sub> air quality standards 36 percent of the days in 2018 (CARB 2019). If action is not taken, fugitive dust emissions from the increasingly exposed lakebed will likely further increase particulate matter concentrations in the area including both PM<sub>10</sub> and PM<sub>2.5</sub>. This air quality reduction would result in: (a) adverse lethal and sub-lethal human health effects; (b) a reduction in consumer surplus among area recreators; (c) a potential reduction in agricultural productivity; and (d) a potential decrease in well-being through a reduction in non-use values. The SSMP 10-Year Plan is designed to reduce fugitive dust emissions relative to the level that would exist under the No Action Alternative<sup>1</sup> and, in so doing, reduce the magnitude of these adverse outcomes.
2. Past declines in freshwater inflow have increased salinity such that Salton Sea water now exceeds most fish species' tolerance limits. This has resulted in fishery losses and declines in bird populations due to loss of food. Loss of water in future years will result in the continued degradation of the Salton Sea ecosystem due to increasing salinity and other water quality issues, including temperature extremes, eutrophication (increased nutrient loads), related anoxia (oxygen deficiency) and algal productivity. The SSMP 10-Year Plan is designed to mitigate these adverse water quality effects relative to the no action alternative. In so doing the plan would create and enhance fish and bird habitat.

This Appendix identifies the costs and benefits associated with implementation of the SSMP 10-Year Plan relative to the no action alternative. The underlying economic analyses are performed in a manner consistent with Guidance for Conducting Analyses under the Principles, Requirements, and Guidelines for Water and Land Related Resources Implementation Studies and Federal Water Resource Investments DM 9500-013 (hereafter DM 9500-013) which was prepared by the United States Department of Agriculture (USDA, 2017).

### Methodological Approach to Benefit Cost Analysis

The following text outlines the methodological approach taken to address four conceptual issues that arise when conducting a benefit and cost analysis of the SSMP 10-Year Plan.

---

<sup>1</sup> As described in Section 3.11, the No Action Alternative is intended to reflect existing conditions (those present at the time the Notice of Preparation was issued) plus changes that are reasonably expected to occur in the foreseeable future if none of the alternatives are implemented.



## Ongoing Design Optimization

Section 3 of this EA describes various alternative approaches to implementing the SSMP 10-Year Plan that are currently being considered as part of an optimization process. For example, Section 3.7 describes an approach where project implementation would consist primarily of open water habitat creation near the North Shore community. In contrast, Section 3.6 describes an approach where project implementation would include primarily wetland construction using natural inflow sources at drains and washes around the perimeter of the Sea. Section 3.10 describes a scenario that avoids all Federal lands and requires no Federal action.

The ongoing design optimization process poses a challenge as economic analyses are generally associated with specific plans. To address this challenge, the social costs and social benefits associated with the conceptual proposed project and alternative design considerations described in Draft EA (Chapter 3) are estimated. Further, it is assumed that, with the exception of the no Federal action alternative<sup>2</sup>, any deviation from the conceptual design detailed in the Draft EA represents a cost-effective improvement resulting from the ongoing effort to optimize project design as a function of water availability, soil suitability, landscape/habitat compatibility, and lakebed emissivity. Under this assumption, so long as the social benefit of the design exceeds its social cost, the social benefit of the SSMP 10-Year Plan as actually implemented will exceed its social cost. That is, the final configuration of the SSMP 10-Year Plan is considered to be economically justified so long as the social benefit of the design detailed in the Draft EA exceeds the social cost of the cost associated with its implementation. This is a conservative approach.

## Identification of Baseline Conditions

Baseline conditions (sometimes called counterfactual conditions) refer to the state of the world that would exist “but for” a project. The social costs and social benefits of a project are calculated relative to the baseline conditions.

For this economic analysis, baseline conditions correspond to the “No Action Alternative” described in Section 3.11.

- > Under baseline conditions society would not incur costs associated with an effort to create and maintain aquatic habitat and/or reduce fugitive dust emissions. However, society would receive only a limited level of ecosystem services<sup>3</sup> from the Salton Sea ecosystem.
- > If the SSMP 10-Year Plan is implemented, society will incur project-related costs associated with: (1) design, engineering and construction of habitat creation and dust suppression projects; (2) maintenance and adaptive management of habitat creation and dust suppression projects; and (3) costs arising from potential undesirable changes in land, water, air and/or biological resources associated with project implementation. In return, society would benefit from an increase, relative to baseline, in the level of certain ecosystem services provided by the Salton Sea ecosystem.

---

<sup>2</sup> As discussed in Section 3.1 of this EA, between 2018 and 2028 it is expected that 47,100 acres of Salton Sea lakebed will be exposed; much of this acreage is owned by a Federal entity and/or work on the acreage would require a Federal permit. Under the no Federal Action alternative, California would proceed with dust suppression and restoration projects in a manner that requires no Federal action. By definition, removing potential project sites from the choice set cannot result in an increase in the benefit to cost ratio.

<sup>3</sup> Ecosystem services refer to the benefits provided to humans by the natural environment. DM 9500-013 reports that ecosystem services are the critical link between ecological functioning and social well-being.

Herein we discuss, quantify in physical terms, and monetize (as practical) four social benefits likely to arise from the relative increase in the provision of ecosystem services due to implementation of the SSMP 10-Year Plan. These four benefit categories were identified through a literature search of the expected costs and benefits of potential public work projects in the Salton Sea basin<sup>4</sup>. While we do not exclude the possibility that other potential benefit categories may exist, benefit categories outside the four analyzed here are likely to be associated with benefits very small in magnitude and very high in uncertainty. The four quantified benefits are:

1. Benefits associated with a reduction in adverse human health effects likely to result from an increase in air quality relative to baseline conditions;
2. Benefits associated with an increase in consumer surplus among area recreators likely to result from a decrease in fugitive dust emissions and an increase in wildlife (fish and bird) habitat relative to baseline conditions;
3. Benefits associated with increased agricultural productivity that may result from a decrease in fugitive dust emissions relative to baseline conditions; and
4. Potential non-use benefits that may be associated with the creation and preservation of habitat relative to baseline conditions.

---

<sup>4</sup> Cohen (2014) for example identifies five benefit categories: human health, recreation, agricultural productivity, non-use and residential property values. However, changes to residential property values conceptually overlaps with the existing categories of changes in recreation, human health, and non-use values. Therefore, its inclusion would represent a double count of benefit streams, and would not be appropriate in a cost-benefit analysis as undertaken here. This leaves four remaining categories appropriate for a cost-benefit analysis.

Further detail on residential property values and double counting follows. Cohen (2014) employs hedonic pricing methods to estimate that the value of the existing housing stock near the Salton Sea had decreased by about \$400 million due to a negative stigma (disamenity) associated with proximity to the deteriorating Salton Sea. Importantly, in the context of this cost-benefit analysis, changes in property values are not themselves social costs nor social benefits. Instead, changes in property value are a measure of the social benefits or costs arising from factors such as, changes in air quality and changes in recreational opportunity. To see this, note that the value of a land parcel is indicative of the benefits the parcel is expected to provide its owner over time. For a residential parcel, value may be associated with, among other factors, access to quality recreational sites, an abundance of local employment, the safety of the location, and the aesthetics of the surrounding environment. Thus, if a partially restored Salton Sea ecosystem causes the value of nearby properties to increase, the increase is a measure of the value property owners place on the change in recreational opportunities, health and aesthetics. The increase in property value is not a social benefit component that would be added to the social benefit components identified in bullets 1 through 4 on this page.

## Treatment of Time

When calculating social costs and social benefits, values are denominated in 2021 dollars. The period of analysis extends 75 years<sup>5</sup> past the start of the Quantification Settlement Agreement<sup>6</sup>, which was 2003. Therefore, the analysis runs until the end of 2077. Both social costs and social benefits are calculated with an assumed discount rate of 1 and 5/8 percent<sup>7</sup>, and a base year for discounting of 2021.

## Treatment of Uncertainty

DM 9500-013 defines uncertainty as outcomes that cannot be described in objectively known probability distributions and notes that uncertainty arises from measurement errors and from the underlying variability of complex natural, social, and economic situations. To inform decision makers and the public, it is recommended that analysts document key assumptions, describe the degree of uncertainty surrounding those assumptions, and identify the ways in which conclusions could be affected by uncertainty.

Herein, we address uncertainty through the use of Monte Carlo simulation. Palisade (2021) describes the Monte Carlo simulation process this way. *Monte Carlo simulation performs risk analysis by building models of possible results by substituting a range of values—a probability distribution—for any factor that has inherent uncertainty. It then calculates results over and over, each time using a different set of random values from the probability functions. Depending upon the number of uncertainties and the ranges specified for them, a Monte Carlo simulation could involve thousands or tens of thousands of recalculations before it is complete. Monte Carlo simulation produces distributions of possible outcome values. By using probability distributions, variables can have different probabilities of different outcomes occurring. Probability distributions are a much more realistic way of describing uncertainty in variables of a risk analysis.*

In this benefit cost analysis, the net social benefit (i.e. social benefits minus social costs) is calculated for each randomly drawn set of values. The 100,000 net social benefit estimates associated with 100,000 sets of randomly selected values are used to create a distribution that characterizes the range of potential net social benefits and the probability associated with each value within that range.

## Social Cost Quantification

Social costs are defined as society's willingness to pay for changes, relative to baseline, brought about by a project or policy. These can include both private costs that appear in markets as well as external costs that are borne by individuals in society but outside of an explicit market setting.

---

<sup>5</sup> DM 9500-013 requires the period of analysis to be the time required for implementation of the investment (in this case 10 years) plus the lesser of (1) the period of time over which any alternative would have meaningful beneficial or adverse effects; or (2) a period not to exceed 100 years.

<sup>6</sup> The Quantification Settlement Agreement consists of more than 30 agreements executed concurrently among certain Southern California water agencies in 2003. The State of California, the federal government, and others signed some of the agreements. That set of agreements is commonly referred to as the 'QSA'. The QSA imposes water conservation measures within the IID service area to allow the transfer of this water elsewhere, reducing the volume of agricultural runoff that constitutes the Sea's chief source of water. The QSA required IID to provide conserved water to the Sea to mitigate the effects of the transfer on salinity until 2017, at which point the delivery of mitigation water ceased.

<sup>7</sup> As required under DM 9500-013, the discount rate of 1 and 5/8 percent for water resources investments is provided by the Bureau of the Public Debt found in Table 4 of the Annual Interest Rate Certification for the fiscal year (FY) in which the analysis is performed. According to DM 9500-013 "[This is the] interest rate based on average market yields during the preceding fiscal year on interest bearing marketable securities that have 15 years or more remaining to maturity."

## **Social Costs Associated with Implementing of the SSMP 10-Year Plan**

There are three potential social cost components associated with implementation of the SSMP 10-Year Plan. They are: (1) social costs associated with the use of resources to design, engineer, permit and construct habitat creation and dust suppression projects; (2) social costs associated with the use of resources to operate, maintain and adaptively manage habitat creation and dust suppression projects; and (3) social costs arising from potential undesirable changes in land, water, air and/or biological resources associated with project implementation (i.e. externalities).

### **Social Costs Associated with the Design, Engineering, Permitting and Construction of Projects**

A schedule of costs to design, engineer and construct the 29,800 acres of aquatic habitat restoration, vegetated habitat restoration and dust suppression projects is provided in Table B.2-1a and B.2-1b. Data in the tables were created from a projection of project acres implemented per year by habitat types as found in the 2020 Annual Report on the Salton Sea Management Program (CNRA 2022), as well as projections of implementation costs per acre by habitat type as provided via personal communication (CDOF, 2021 and Maisonneuve, 2022). These upfront implementation costs are also referred to as capital costs. Maisonneuve (2022) estimated the sum of capital costs as \$919 million in undiscounted 2022 dollars. To remain consistent with the framework of this economic analysis, the \$919 million in capital costs are first updated to 2021 dollars and then discounted at the rate of 1 and 5/8 percent following projected expenditures in capital cost by year as presented in Table B.2-1b. Updating the capital cost figure to 2021 dollars results in a capital cost estimate of approximately \$842.4 million. Discounting this capital cost per the schedule laid out in Table B.2-1b results in a capital cost estimate of \$788.6 million in present value.

The proportion of capital costs by major spending category is broken down as follows: Planning and permitting costs to implement the SSMP 10-Year Plan, 10 percent; Engineering which includes, design of projects and exploratory work such as Geotech and lidar, 20 percent; Administration which includes administering grants, contracts and construction management, 10 percent; Real estate which includes the costs to develop easements, rights-of-way, title reports and to adopt signed agreements, 5 percent; Construction, 55 percent.

Uncertainty associated with the costing of public sector projects is characterized by Flyvbjerg et al. (2002) who analyzed a sample of 258 public sector infrastructure projects. Flyvbjerg et al. (2002) found that frequent and substantial deviation existed between project cost as estimated and project cost as implemented. Summary findings of these deviations in are reproduced in Table B.2-2 in cost deviation increments of 10 percentage points. For example, Table B.2-2 shows that 12 percent of projects are implemented approximately 10% under budget, while 27 percent of projects are implemented approximately 30 percent over budget. This distribution is used to estimate the true cost of implementing the capital cost of the Project presented in Table B.2-1b in a realistic manner that captures uncertainty.

**Table B.2-1a Social costs associated with capital cost expenditure projections for implementing approximately 30,000 acres of aquatic habitat restoration and dust suppression projects through 2028**

Habitat Type	Acreage	Approximate Capital Cost per Acre (2022\$)	Total Capital Costs Projections (Undiscounted Millions, 2022\$)
Aquatic deep-water habitat	16,000	\$50,000	\$800
Wetland, shallow water and/or vegetated habitat	7,000	\$15,000	\$105
Dust suppression projects	7,000	\$2,000	\$14
<b>Results</b>			
Total Capital Cost (undiscounted, million 2022\$)			\$919.0
Total Capital Cost (undiscounted, million 2021\$)			\$842.4
Present Value of Total Capital Cost (million 2021\$) <sup>a</sup>			\$788.6

<sup>a</sup> Present value discounting is determined by the schedule of expenditures presented in Table B.2-1b based on projection of project acres implemented per year by habitat types as found in the 2020 Annual Report on the Salton Sea Management Program (CNRA 2022), as well as projections of implementation costs per acre by habitat type as provided via personal communication (CDOF, 2021 and Maisonneuve, 2022).

Source: Maisonneuve (2022), CNRA (2022) and CDOF (2021).

**Table B.2-1b Schedule of Project Acres Implemented by Year and Associated Discounted Capital Cost Projections**

Year	Acreage	Capital Cost Projections (Discounted 2021\$)
2020	755	\$1,378,995
2021	522	\$1,214,612
2022	1,500	\$2,739,726
2023	4,723	\$192,058,447
2024	6,900	\$197,800,000
2025	3,400	\$97,466,667
2026	4,000	\$114,666,667
2027	4,000	\$114,666,667
2028	4,200	\$120,400,000
Total	30,000	\$788,556,797

Source: CNRA (2022) and CDOF (2021)

**Table B.2-2 Probability Distribution Characterizing the Expected Deviation between As-Built Costs and Cost Estimates among Public Sector Projects.**

Percent Deviation from Cost Estimate	Probability
-70	1
-50	1
-30	2
-10	12
10	36
30	27
50	2
70	4
90	3
110	12

### **Social Costs Associated with Operation, Maintenance, and Adaptive Management**

The Draft EA reports that an adaptive monitoring program is under development that will include the identification of a fish stocking program, development of a monitoring and management program for existing avian and fishery habitat, and a water quality monitoring program. CNRA (2020) outlines the general intervals and requirements for operations and maintenance. The costs of operating, monitoring, and adaptively managing the SSMP 10-Year projects are projected to be approximately \$800/acre for \$24 million per year in 2022 dollars (Maisonneuve 2022).

### **Social Costs Associated with Externalities from Project Implementation and Operation**

As discussed in Chapter 5 of the EA Project implementation and operation may result in impacts on land, air, water, biological and built human systems. For example, project implementation may result in a minor increase in traffic on certain local roads during construction. Construction activities will utilize fuels and products that either directly or indirectly (through their manufacture and transportation) release combustion by-products like carbon dioxide and particulate matter that are known to have detrimental impacts on human health and climate stability. In addition, project construction may disturb soil releasing small amounts of dust and/or sediment in runoff water. These potential impacts can be associated with external costs. However, these impacts are all expected to be highly localized, minor, and short-term. Importantly, we anticipate the social costs imposed by these factors in aggregate to be extremely small in magnitude (relative to other cost and benefit components monetized herein), and therefore, these factors are omitted from a quantitative analysis. This approach is consistent with the United States Environmental Protection Agency's (USEPA) detailed economic guidance for conducting benefit-cost analyses for cooling water intake structures under the Clean Water Act's 316(b) existing facilities rule (USEPA 2014).

In addition to more common categories of externalities, the possibility for less common categories were considered. If implementation of the Project were to inhibit cost-effective industry from conducting efficient operations in future years, this could represent a social cost. As discussed in Section 3.13 of this EA, the primary potential land use conflict relates to potential future geothermal

and lithium extraction development in the Salton Sea area. Because of this, Plan proponents have committed to design habitat restoration and dust suppression projects in a manner compatible with existing facilities and to ensure that future aquatic habitat and dust suppression projects would be adapted, as needed, to accommodate facilities, well pads, and access roads. Thus, no social costs are reasonably foreseen in association with potential land use conflicts.

Furthermore, as described in Section 3.3.1 of the EA, some habitat creation and dust suppression projects will require water. The water conveyance and supply system embedded in the SSMP 10-Year Plan is designed to supply agricultural return flow<sup>8</sup> water to support project implementation. The use of a recycled water source in SSMP projects is unlikely to displace other water users and/or result in a material and adverse effect on ecosystem services provided elsewhere. In particular, this envisioned use of recycled water is not an influx of new water nor is it associated with a change in the physical/chemical attributes of the recycled water, but rather the use of existing recycled water in new locations. As such, no social costs are reasonably foreseen in association with potential water use conflicts.

### **Social Cost Summary**

For the purpose of the present analysis, social costs are the forgone value that would have resulted from the utilization of project resources had they been used at their next-best alternative. Social costs are defined as society's willingness to pay for changes, relative to baseline, brought about by a project or policy. The primary social costs associated with implementation of the SSMP 10-Year Plan are characterized as follows:

1. Design, engineering, permitting and construction are characterized by the current \$788,600,000 cost estimate (Table B.2-1a) and subsequently modified by a distribution that represents observed deviations from cost estimates across 258 public sector infrastructure projects (see Table B.2-1b).
2. Annual Operation, maintenance and adaptive management costs are estimated to be \$21,920,000 per year after completion of construction.
3. Future conflicts related land use may arise, the SSMP 10-Year Plan includes a commitment to implement and modify projects to accommodate reasonably foreseeable activities. Thus, the social cost associated with future land and/or water conflicts is estimated to be zero.
4. While various other externalities may be associated with project implementation, these are deemed immaterial in the context of the magnitudes of monetized costs and benefits in this analysis. Therefore, they are omitted from quantification. However, the concept of these unquantified possible external costs will be revisited in the *Benefit to Cost Comparison* section of this appendix to assess how large they would need to be in order to meaningfully modify the findings of this analysis.

---

<sup>8</sup> Agricultural return flows represent water that has been used for irrigation, was not absorbed by plants or evaporated, but instead entered ground or surface water systems.

## Social Benefits Quantification

Social benefits are defined as society's willingness to pay for changes, relative to baseline, brought about by a project or policy. Stated differently, social benefits are the total willingness to pay among all individuals in society in aggregate for the beneficial impacts of the Project.

The first step in estimating social benefits associated with the SSMP 10-Year Plan is to quantify the changes that will be brought about by Project implementation, relative to the baseline (no action) alternative, and identify a method for estimating societies willingness to pay for those changes. As discussed in the introduction to this appendix, the SSMP 10-Year Plan is designed to: (a) reduce fugitive dust emissions relative to the level that would exist under the no action alternative; and (b) mitigate adverse ecological effects relative to the no action alternative. These two changes are likely to generate 4 social benefit streams.

1. A reduction in fugitive dust emissions would likely bring about a reduction in adverse human health effects. These health effects are generalized into two distinct subcategories; lethal impacts (hereafter 'mortality') and sub-lethal impacts (e.g. sick days, hospitalization). Society's willingness to pay for the health benefits associated with a relative improvement in air quality is estimated by quantifying the annual number of avoided mortalities and reduced sub-lethal health outcomes by type. These improvements are monetized based on the value of a statistical life and society's willingness to pay for fewer and less severe sub-lethal health outcomes, respectively.
2. A reduction in fugitive dust emissions, coupled with a relative improvement in the Salton Sea ecosystem, is likely to bring about an increase in wellbeing among area recreators relative to baseline. Society's willingness to pay for the relative increase in recreational opportunity is estimated by quantifying the number of recreational trips likely to be affected and monetizing based on the expected increase in consumer surplus per recreational trip.
3. A reduction in fugitive dust emissions may bring about an increase in the area's agricultural productivity relative to baseline. Society's willingness to pay for a relative increase in agricultural productivity is estimated by quantifying the increase in agricultural output and monetizing based on the price of the agricultural commodities at issue.
4. Some members of the public may benefit from project implementation despite the fact that they will never use, either directly or indirectly, the Salton Sea ecosystem. This source of willingness to pay is referred to as non-use value and is estimated by reviewing the existing literature that describes the level of non-use values associated with ecological restoration.



The social benefits described above would flow to residents of both urban and rural communities depending on the category of benefit considered, as laid out in Table B.2-3. A justification for the rural proportion of benefits follows:

- > **Human Health:** The social benefits associated with human health (both reductions in mortality and reductions in sub-lethal impacts) will flow primarily to the 603,000 individuals residing in the Salton Sea Air Basin; 25 percent of whom are identified as residing in rural areas<sup>9</sup> (See Figure B-1 and Attachment A). However, the individuals most likely to benefit from the SSMP 10-Year Plan are those residing in closest proximity to the Salton Sea, because generally speaking, air quality changes will be most pronounced closer to the source of emissions. For example, Figure B-1 identifies the area most likely to experience project-related reductions in PM<sub>10</sub> concentrations. This area was identified based on predominant wind directions, PM<sub>10</sub> emissions data and annual emissions estimates. All of these individuals inside the identified area of largest PM<sub>10</sub> reductions are rural areas. While the area of largest PM<sub>10</sub> concentration reductions is not anticipated to overlap perfectly with the area of largest PM<sub>2.5</sub> reductions, these two areas are likely to show generally similar patterns with perhaps a somewhat larger area for PM<sub>2.5</sub> due to finer particulates tending to exhibit more mobility. Therefore, it is estimated that at least 25 percent of human health benefits will flow to rural communities.
- > **Recreational Opportunities:** The social benefits associated with enhanced recreational opportunities flow to individual recreators. Therefore, an understanding of the geographic origin of recreators determines the proportion of social benefits to rural communities. As a minimum estimate, it is noted that the majority of recreators are residents of California. California has the highest proportion of citizens living in an urban community (95 percent) compared to any other state in the nation (United States Census Bureau 2012). Therefore, it is estimated that, at a minimum, 5 percent of recreation related benefits flow to rural communities.

However, this 5 percent minimum underestimates the actual rural benefits for two reasons. First, recreators are unlikely to be accurately represented equally across the entire state. Frequent recreators are likely to live closer to the Salton Sea and may also come from out of state. Both of these geographical areas are associated with higher proportion of rural residents than the California state average. Second, some of the social benefits that flow to individual recreators may be captured by local rural communities if enhanced recreational opportunities result in increased spending patterns near the Salton Sea and result in elevated producer surplus among rural businesses. Therefore, a reasonable estimate is 25 percent of social benefits from recreation flow to rural communities.

- > **Agricultural Output:** The social benefits associated with increased agricultural output is a rural benefit in full (i.e., 100 percent). According to the Natural Resource Conservation Service (NRCS), the 20 percent rural community benefit requirement explicitly classifies agricultural benefits as rural in this framework (USDA, nd).
- > **Non-Use Values:** The social benefits associated with non-use values are distributed in a manner that do not readily lend themselves to identification of beneficiaries by geography. By their nature, benefits associated with non-use values may be highly diffuse across distant geographies and

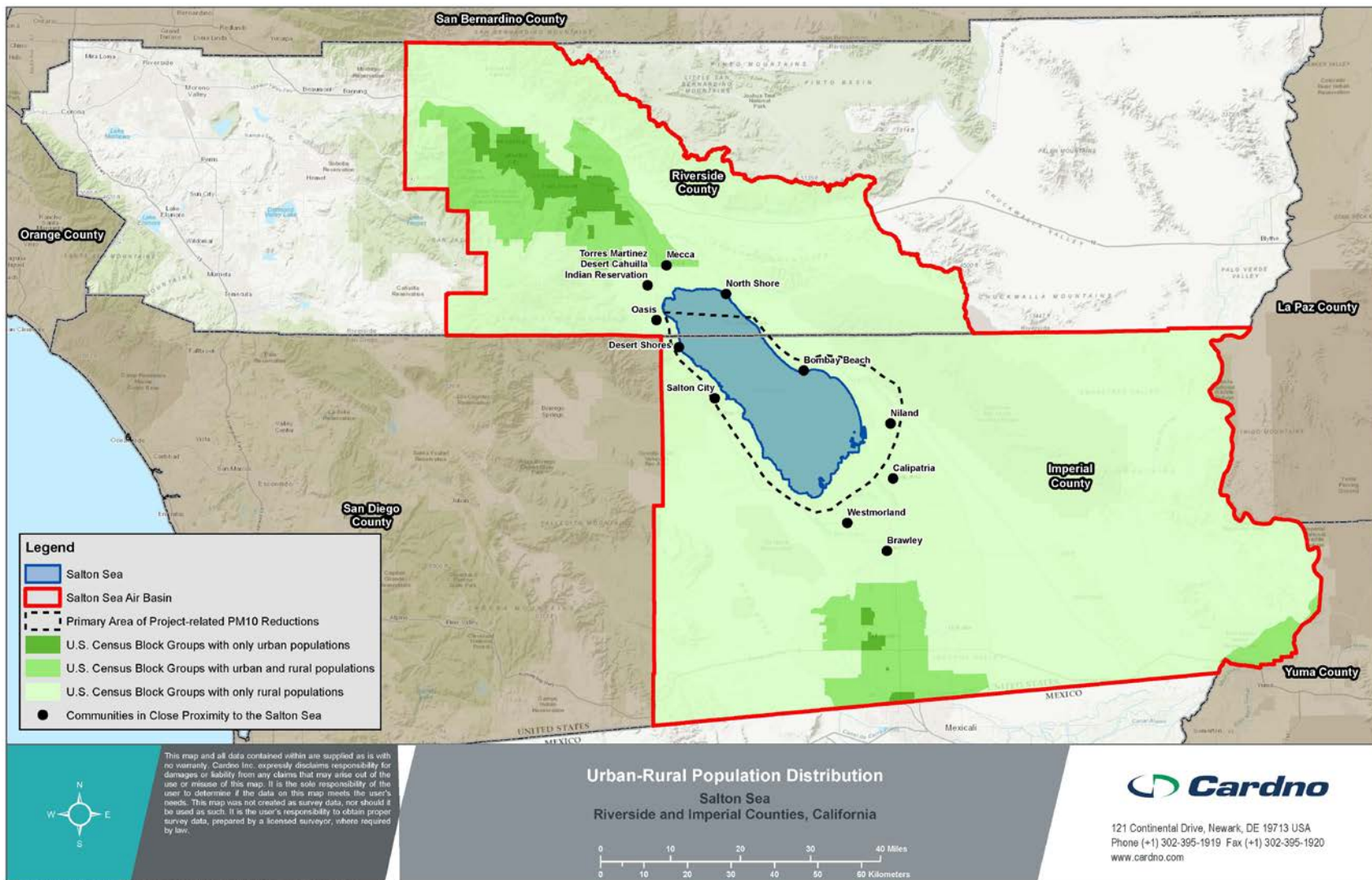
---

<sup>9</sup> Rural areas are defined as locations outside urban boundaries; rural areas will include some set of towns and villages below a chosen population threshold. That threshold can range from 2,500 to 50,000 people. For purposes of this study, rural is defined to include all territory outside any a densely settled core of census tracts in which 50,000 or more people reside (United States Census Bureau 2021).

leave no transactional data from which to estimate their distribution. Therefore, at a minimum, it is estimated that 5 percent of non-use benefits flow to rural communities (United States Census Bureau 2012). This proportion is consistent with an even distribution of non-use benefits across the populace of California, which has the lowest rural proportion of any state in the nation. However, a reasonable estimate of this value would be something higher than 5 percent as non-use benefits generally decrease with geographical distance from the resource in question. Because the area immediately surrounding the Salton Sea has a rural population closer to 25 percent, the 5 percent metric is likely an underestimate of the rural percentage.

**Table B.2-3 Percentage of Social Benefits Flowing to Rural Communities from Project Implementation**

Social Benefit Category	Rural Benefits (Percent)	
	Lower Estimate	Reasonable Estimate
1a) Human Health – Mortality	0.25	>0.25
1b) Human Health – Sub-lethal impacts	0.25	>0.25
2) Recreational Opportunities	0.05	0.25
3) Agricultural Output	1.00	1.00
4) Non-Use Values	0.05	>0.05



**Figure B.2-1 Distribution of Urban and Rural areas within the Salton Sea Air Basin and Geographic Relationship to Primary Area of Project related PM<sub>10</sub> Reductions**

## Air Quality and Human Health

Exposure to elevated levels of airborne particulate matter (dust) has been linked to cardiovascular mortality, asthma hospitalization, and decrease in pulmonary function among both adults and children<sup>10</sup>. Further, Johnston et al. (2019) report that “According to the statewide tool, CalEnviroScreen, the majority of the census tracts in this region [near the Salton Sea] are among some of the most vulnerable in the state to pollution, as measured by socioeconomic (education, housing, linguistic isolation, poverty and unemployment) and health indicators (asthma, cardiovascular disease and low birth weight)”.

The SSMP 10-Year Plan is designed to reduce fugitive dust emissions relative to the level that would exist under the No Action Alternative and, in so doing, reduce the number and severity of adverse health outcomes arising from exposure to airborne particulate matter. To estimate, in monetary terms, the social benefit associated with the expected reduction in mortality, exposure estimates and dose response relationships reported by Jones and Fleck (2020) are linked to research conducted by the USEPA summarizing the value of preserving a statistical life (USEPA 2010).

### Expected Changes in Human Health Outcomes - Mortality

Jones and Fleck (2020) evaluated the relationship between the area of exposed Salton Sea lakebed and average concentrations of particulate matter less than 2.5 microns in diameter (PM<sub>2.5</sub>) in Imperial and Riverside Counties. Jones and Fleck (2020) also estimated the relationship between a change in PM<sub>2.5</sub> concentrations and the rate of lower respiratory mortality among county residents.

They report the following:

1. Exposing 3500-acres of Salton Sea lakebed increases average county-wide PM<sub>2.5</sub> concentrations by between 0.25 and 0.39 micrograms per cubic meter with a most likely value of 0.32.
2. Increasing county-wide PM<sub>2.5</sub> concentrations by 1 microgram per cubic meter results in between 0.70 and 4.79 additional instances of lower respiratory mortality per 100,000 county residents exposed; the most likely value is 2.74.

These relationships, along with an estimate of the number of individuals exposed to Salton Sea-related PM<sub>2.5</sub> over the 75-year analysis period are used to estimate the number of lower respiratory mortalities that would be avoided if the SSMP 10-Year Plan were implemented.

To estimate the number of individuals that would be exposed to reduced PM<sub>2.5</sub> concentrations over the 75 years following construction, it is noted that the population in Riverside and Imperial counties is projected to grow from 2,752,000 in 2021 to 3,466,000 by year 2040 (Southern California Association of Governments 2016). Assuming the 0.8% growth rate projected for between 2035 and 2040 continues until 2077, the population in 2077 would be 4,744,000. The number of county residents in the year 2077 is used as a conservative (tending to understate) estimate of the number of individuals likely to be exposed over the 75 years following construction. The conservatism arises because the number of individuals who will reside in the two counties at some point in time over the next 75 years will, almost certainly, exceed the number of individuals residing in the two counties in the year 2077. While two counties do not overlap perfectly with the Salton Sea Air Basin (See Figure 1), it is

---

<sup>10</sup> For example, see: <https://ww2.arb.ca.gov/resources/inhalable-particulate-matter-and-health>

internally consistent (i.e. does not introduce bias) to apply data from Jones and Fleck (2020) to the two county population as done in the present analysis.<sup>11</sup>

As reported in Table B.2-4, these factors, combined with an assumption of highly effective dust suppression, suggest that habitat conversion and/or dust suppression on 29,800 acres of exposed lakebed would prevent between 70 and 752 statistical mortalities from the year 2028 through 2077.

**Table B.2-4 Factors used to Estimate Plan-related changes in Annual Statistical Mortalities in Imperial and Riverside Counties from changes in PM<sub>2.5</sub> Concentrations**

	Minimum	Most Likely	Maximum
Average Two County-Wide Reduction in PM <sub>2.5</sub> for a 29,800 Acre Plan (micrograms per cubic meter)	2.13	2.72	3.32
Statistical Mortalities Avoided per 100,000 County Residents	1.49	7.45	15.90
Conservative Estimate of the Number of Individuals Exposed by 2077	4,744,000	4,744,000	4,744,000
Total Statistical Mortalities Avoided in Imperial & Riverside Counties	70	352	752
Statistical Mortalities Avoided Allocated over 75 Years	0.93	4.69	10.03

**Social Benefit of Preventing the Loss of a Statistical Life**

USEPA (2010) reviews existing literature on the social benefit associated with preventing the loss of a statistical life<sup>12</sup>. This review finds estimates ranging between \$1,300,000 and \$25,200,000 with a median value of \$10,200,000 million.

<sup>11</sup> It is recognized that project benefits would flow primarily to individuals residing in the Salton Sea Air Basin which includes all of Imperial County but only part of Riverside County. In contrast, Jones and Fleck (2020), and by extension this benefit cost analysis, estimate human health impacts at the county level. Indeed, Jones and Fleck (2020) noted that their reliance on county data “mask[s] within-county heterogeneity in health, which may be significant for Riverside County, in particular. This is because the more populous western part of the county is separated from the eastern part by a large mountain range (the San Jacinto Mountains) and because the western part of the county lies in close proximity to Los Angeles (a significant source of PM<sub>2.5</sub> emissions). This means that fugitive dust emissions from the Salton Sea will likely have little or no impact on western Riverside County PM<sub>2.5</sub> levels, and hence, human health outcomes.” In addition, Jones and Fleck (2020) note that the reliance on county level data means that the PM<sub>2.5</sub> elevations and the health-related estimates they report “are likely conservative lower-bounds on actual effects.”

The preceding has three implications. First, by including all of Riverside County, Jones and Fleck (2020), and by extension this benefit cost assessment, overstate the number of individuals likely to be affected by changes in PM<sub>2.5</sub> arising from the Salton Sea. Second, Jones and Fleck, and by extension this benefit cost assessment, understate the increase in mortality rates among the subset of Imperial and Riverside County residents actually exposed to increases in Salton Sea-related PM<sub>2.5</sub>. Finally, when estimating the change in the number of mortalities brought about by a change in Salton Sea-related PM<sub>2.5</sub> concentrations, these factors offset one another. Thus, the mortality estimates presented by Jones and Fleck, and by extension the mortality estimates reported in this benefit cost analysis, are unbiased.

Stated differently, Jones and Fleck (2020) estimated the relationship between Salton Sea shoreline exposure and lower respiratory mortality using county level data. These county level data and relationships are used herein to estimate the SSMP 10-Year Plan-related change in lower respiratory mortalities. The majority of these health effects would accrue among individuals residing in the Salton Sea Air Basin.

<sup>12</sup> According to the US Department of Transportation (2016), “The benefit of preventing a fatality is measured by what is conventionally called the Value of a Statistical Life (VSL), defined as the additional cost that individuals would be willing to bear for improvements in safety (that is, reductions in risks) that, in the aggregate, reduce the expected number of fatalities by one”

## Expected Changes in Human Health Outcomes – Sub-lethal Impacts

Sub-lethal impacts are negative health changes that lead to outcomes other than death. Sub-lethal impacts that may arise from PM<sub>2.5</sub> pollution include a variety of ailments including acute myocardial infarction, stroke, asthma exacerbation, and a variety of negative upper and lower respiratory symptoms, among others. These ailments may or may not require hospitalization and may necessitate lost workdays either directly, or as a result of caring for another individual. Because the relationship between changes in PM<sub>2.5</sub> and changes in sub-lethal impacts is highly complex<sup>13</sup>, it was deemed outside the scope of the present analysis to attempt to quantify these impacts through the creation of custom fit-for purpose models.

Therefore, this analysis evaluates benefits arising from reduction in sub-lethal impacts by applying a proportional relationship found from existing literature. The proportional relationship that is utilized for this purpose relates cases of reduced mortality with monetized benefits from reduced sub-lethal impacts across a set population from a defined reduction in PM<sub>2.5</sub> concentrations. Ideally, an existing estimate is found in the available literature that performs the necessary complex environmental modeling to determine both reduced mortality and reduced sublethal impacts from a decrease in PM<sub>2.5</sub> concentration. Furthermore, the data would be applied to the current analysis with greatest confidence if the data were estimated over a qualitatively similar or overlapping population in a qualitatively similar or overlapping geography relative to this analysis.

In their Final Socioeconomic Report of the 2016 Air Quality Management Plan, the South Coast Air Quality Management District in California investigated social benefits from various air quality improvements including reductions in PM<sub>2.5</sub> (SCAQMD 2017). These data were estimated over an overlapping population and geographic area, composed of the following four counties in California: Los Angeles, Orange, Riverside and San Bernardino. Though the population in the four-county area is greater than that investigated for health impacts in the present analysis, the proportional approach adopted herein provides reliable estimates regardless of population size.

The analysis conducted by SCAQMD shows that in the year 2023, projected reductions in PM<sub>2.5</sub> result in 1,522 avoided mortality cases. The same modeling also found that sub-lethal impacts over the same population for the same reduction in PM<sub>2.5</sub> also resulted in avoided sublethal damages totaling \$155,500,000 in 2021 dollars<sup>14</sup>. In other words, SCAQMD found that reductions in PM<sub>2.5</sub> yielded \$102,200 in sub-lethal benefits for benefit in one mortality avoided. This analysis applies an additional benefits of \$102,200 for every case of reduced mortality in order to capture benefits from reduced sub-lethal impacts.

### **Human Health Summary**

In light of the preceding facts, the social benefit associated with changes in human mortality arising from implementation of the SSMP 10-Year Plan are characterized as follows:

---

<sup>13</sup> For example, each category of ailment yields complex dynamics in dose-response relationships that are sensitive to a variety of factors that are unique to the individual receptor (individual human) and dynamic environmental context. As a result, differential impacts on various classes of individuals are stratified by age, sex, genetic predisposition, and baseline health level among other factors.

<sup>14</sup> Types of sub-lethal benefits that are quantified and monetized individually in the 2017 SCAQMD analysis consist of the following non-overlapping categories: acute bronchitis, acute myocardial infarction, asthma exacerbation, asthma (new onset), hospital admission for cardiovascular (less myocardial infarction), hospital admission for ischemic stroke, hospital visit for asthma, lower respiratory symptoms, upper respiratory symptoms, minor restricted workdays and work loss day.

- > The range of statistical lives preserved annually from 2028 through 2077 is characterized as a PERT distribution<sup>15</sup> with a minimum value of 0.93, a most likely value of 4.69 and a maximum value of 10.03.
- > The social benefit associated with the preservation of a statistical life is specified as a PERT distribution with a minimum of \$1,300,000, a most likely of \$10,200,000 and a maximum of \$25,200,000.
- > The social benefit associated with reduced sub-lethal impacts is determined through a proportional relationship whereby the preservation of each statistical life is associated with an additional \$102,200 in benefits from reduced sub-lethal impacts.

Because variability in these parameters reflects true uncertainty as opposed annual variability, each Monte Carlo simulation relies on a single draw as the basis for selecting the number of statistical lives preserved annually<sup>16</sup>. Likewise, each Monte Carlo simulation relies on a single separate draw to identify the value of a statistical life.

## **Reductions in Fugitive Dust Emissions, Mitigation of Ecosystem Degradation and Recreation**

While Cohen (2014) reports that outdoor recreation at the Salton Sea has declined since its peak in the 1960s, the area currently supports an array of outdoor recreation activities including bird watching, camping, paddling, hiking, hunting, and others. Much of the recreation takes place at either the Salton Sea State Recreation Area<sup>17</sup>, the Sonny Bono National Wildlife Refuge complex, or the Imperial Wildlife Area Wister Unit<sup>18</sup>. According to a visitor survey at the Sonny Bono National Wildlife Refuge complex (Sexton et al, undated), the mean distance travelled to visit the refuge was about 300 miles. This is an unusually high travel distance suggesting that the Sea's concentration of migratory birds (in the past as many as 400 species of migratory birds have congregated during migration (California Parks and Recreation, 2021a), unique scenery, and geologic setting are highly valued by the recreators who do continue to travel to the site.

Under the No Action Alternative, recreators will encounter increased distances between recreational infrastructure and the shoreline itself, increased airborne dust, and a salinity-linked reduction in the diversity of birds. Implementation of the SSMP 10 Year Plan would, relative to the No Action Alternative, reduce airborne dust concentrations and, by supporting viable populations of forage fish, increase the diversity of birds using the area.

The social benefit associated with the Plan-related increase in recreational quality is quantified using a Monte Carlo simulation that relies on the following inputs:

---

<sup>15</sup> The Program Evaluation and Review Technique (PERT) distribution is a family of continuous probability distributions defined by the minimum (a), most likely (b) and maximum (c) values that a variable can take. The PERT distribution is often used in Monte Carlo simulation when the value of a parameter is based on subjective estimates.

<sup>16</sup> For example, in any one simulation, assume a random draw corresponding to the lower 25<sup>th</sup> percentile of the "statistical lives preserved" distribution is selected. In this case, the number of statistical lives preserved in all years (2028 through 2077) would correspond to the lower 25<sup>th</sup> percentile of the of the "statistical lives preserved" probability distribution.

<sup>17</sup> California Parks and Recreation (2021b) reports over 200,000 annual visitor-days at the Salton Sea State Recreation Area.

<sup>18</sup> Cohen (2014) reported 27,000 visitor-days to the Sonny Bono National Wildlife Refuge Complex and 15,000 visitor-days to the Imperial Wildlife Area Wister Unit at the time the Cohen report was drafted.

1. The current level of recreational activity is characterized as a uniform distribution between 242,000 and 300,000 visitor-days<sup>19</sup>.
2. The split between bird-related and other recreational activities is characterized as a uniform distribution where between 50 and 75 percent of total current recreational activity is bird related<sup>20</sup>.
3. It is assumed the number of visitor days is directly related to the number of people in the population all other factors remaining unchanged. Thus, the population trends for Imperial and Riverside counties, as reported in the Human Health section of this appendix, would increase the number of annual visitor days in future years if all other conditions remained constant.
4. Under the No Action Alternative, it is assumed that bird-related visitor days would decline to between 10 and 20 percent of current levels if there were no growth in the human population. Similarly, other recreational activity would decline to between 10 and 50 percent of its current level if there were no growth in the human population<sup>21</sup>.
5. If the SSMP 10 Year Plan is implemented, it is assumed that both bird-related and other recreational activity would decline to between 25 and 75 percent of their current level if there were no growth in the human population<sup>22</sup>.
6. The time it takes for the declines in recreational activity identified in the preceding bullets to be realized are specified as a uniform distribution between 5 and 15 years.
7. The Economic value per visitor-day is based on consumer surplus which is the difference between the enjoyment produced by a visitor-day (measured in dollars), and the cost of travelling to the site for a day. The value of a birding day is characterized as<sup>23</sup> a uniform distribution between \$31.78 and \$54.58. The value of other recreation is characterized as<sup>24</sup> a uniform distribution between \$25.00 and \$40.00.

## Reductions in Fugitive Dust Emissions and Agricultural Productivity

According to the most recent Census of Agriculture, over 785,000 acres of land were dedicated to agricultural production in Imperial and Riverside counties, combined (USDA 2019a; USDA 2019b).

---

<sup>19</sup> The lower bound is based on 200,000 visitor-days taken to the Salton Sea State Recreation Area with an additional 42,000 visitor-days to the Sonny Bono National Wildlife Refuge Complex the Imperial Wildlife Area Wister Unit. The upper end of the range allows for an additional 58,000 visitor days to locations for which attendance data are not available.

<sup>20</sup> Sexton et al. (undated), reported that about 90 percent of Refuge visitors pursue activities related to birds; the proportion is likely to be less for the State Recreation Area. The specified distribution is based on best professional judgement informed by these observations.

<sup>21</sup> Cohen (2014) reports that the 7,900-acre Imperial Wildlife Area has its own source of freshwater. Thus, the use of the area by piscivorous migratory birds (and associated bird watching activity) would not be driven to zero under the No Action Alternative. Similarly, while other recreational activities such as camping are expected to decline, the unique history, biology, and geology of the increasingly exposed lakebed would itself be a recreational draw for some individuals. Thus, other recreational activities are likely to persist albeit at a lower level.

<sup>22</sup> Under both the No Action Alternative and the SSMP 10 Year Plan, reductions in recreational activity are specified as uniform distributions.

<sup>23</sup> The range in birding-day-value is based on Loomis et al. (2018). The low value corresponds to the bottom of the range found in that study. The high value is the reported value for birding in a nationwide study.

<sup>24</sup> The per-day value for other recreational activities is based on a point estimate reported in Leggett et al. (2018) and a general knowledge of the outdoor recreation literature.



The gross value of that production exceeded \$3.1 billion in 2021 dollars. Key crops in these counties included Alfalfa, lettuce, broccoli, carrots, beets, and spinach (Agricultural Commissioner, 2019).

Several authors have evaluated the effects of dust on agricultural productivity. The general consensus, as summarized in Ontario (2021) is that particulate matter deposited on vegetation can inhibit the normal respiration and photosynthesis mechanisms within the leaf. In addition, dust coating may affect the normal action of pesticides and other agricultural chemicals applied as sprays to foliage. Finally, accumulation of alkaline dusts in the soil can increase soil pH to levels adverse to crop growth.

There are two approaches that can be used to quantify the expected effects of a Plan-related change in fugitive dust released from the Salton Sea: review of empirical evidence from the Imperial Valley and review of dose response relationship between dust and agricultural productivity.

### **Empirical Evidence from the Imperial Valley**

Morales (2021) studied the effects of the Quantification Settlement Agreement of 2003 on agricultural productivity in the Imperial Valley. This agreement decreased the volume of water being transported to the Imperial Valley (IV) from the Colorado River which in turn has contributed to declining inflows, increased exposure of the Salton Sea lakebed and increased dust emissions since 2003.

Morales (2021) evaluated data from 1995 through 2019 and found that water productivity (agricultural value per unit of irrigation) increased in response to the decreased water supply while the real value (i.e. after adjusting for inflation) of crops produced in the Imperial Valley increased materially from 2003 to 2019. In addition, the annual Agricultural Crop and Livestock Reports for Imperial County report per-acre-yield for various Imperial Valley crops over this time frame. These measures show no consistent downward trend which would be expected if increased lakebed exposure and the resulting increase in fugitive dust had a large and material effect on the regions per acre yields.

To be clear, these data do not preclude the possibility that increased dust could be having an adverse effect on agricultural productivity. It is possible that improved agricultural methods as well as the adaptability of farmers are simply masking any adverse dust effect. However, it is clear that relative to other factors affecting agricultural productivity, the effect of increases in fugitive dust after 2003 are not material enough to result in an obvious trend in Imperial County agricultural productivity.

### **Dose Response Relationships between Dust and Agricultural Productivity**

Sett (2017) cited Treshow (2002) in reporting that daily exposure to dust in excess of 1.0 gram per square meter can cause a decrease in a plant's rate of carbon dioxide exchange, carbon assimilation, transpiration, and net photosynthesis. Lobell and Burney (2021) reviewed air quality and crop yield data from 1999 through 2019 from maize and soybean. They found that a 34 percent decrease in ambient PM<sub>10</sub> concentrations, would bring about a 0.25 to 1 percent increase in yield.

Parajulia and Zender (2018) estimated that, over a large rectangular area that extends from Cathedral City in the northwest to San Louis Rio, Colorado in the southeast (an area that includes nearly all of Imperial County), the exposure of approximately 93,000 acres of lakebed would increase average PM<sub>10</sub> concentrations by about 8 percent.

A three-step process was used to estimate annual willingness to pay for a project-related increase in agricultural productivity based on these data.

1. The change in PM<sub>10</sub> concentrations likely to arise from 28,900 acres of habitat creation and dust suppression was estimated as  $\frac{28,900 \text{ acres of planned dust suppression}}{93,000 \text{ acre of assumed playa exposure}} \times 8 \text{ percent} = 2.5 \text{ percent}$ .
2. The resulting change in yield was estimated as  $\frac{2.5 \text{ percent change in PM}_{10}}{34 \text{ percent change in PM}_{10} \text{ for each 1 percent change in yield}} = 0.07 \text{ percent increase in yield}$ .
3. Annual willingness to pay for a 0.07 percent increase in yield was estimated to be \$2,170,000 which is 0.07 percent of the \$3,100,000,000 annual agricultural yield of Imperial and Riverside counties.

### **Agricultural Productivity Summary**

Data describing the agricultural productivity of Imperial Valley acreage through time do not reveal a clear and obvious adverse effect linked to dust exposure. However, confounding factors likely to affect these data could easily mask a small or even modest effect. In contrast, laboratory and field-based studies indicate that dust adversely affects plants and a recent large-scale study of air quality and agricultural yield (Lobell and Burney 2021) provides evidence suggesting a small (in percentage terms) increase in county-wide yield may well be associated with implementation of the SSMP 10-Year Plan.

In light of the preceding facts, the social benefit associated with a potential increase in agricultural productivity is specified as a uniform distribution between 0 and \$67,080,000. Note that the maximum is the present value of a \$2,170,000 annual benefit from 2028 through 2077 discounted at 1 and 5/8 percent annually.

### **Non-Use Values Potentially Associated with Project Implementation**

The idea that there may be a willingness-to-pay for natural resources outside of any active use of a natural resource (i.e., the idea of non-use value) was first put forth by Krutilla (1967) who wrote, “when the existence of a grand scenic wonder or a unique and fragile ecosystem is involved, its preservation and continued availability are a significant part of the real income of many individuals.” The existence of such non-use values has since been widely adopted by natural resource economists (Kling et al. 2012).

However, non-use values may not necessarily exist for all resources or all circumstances. For example, Krutilla focuses on the continued availability of “grand” and “unique” resources. Specifically, at the margin, willingness-to-pay for common goods and/or goods with many similar substitutes is likely to be zero or very small. This notion was captured by Freeman (1993) when he wrote, “...resources such as ordinary streams and lakes or a subpopulation of a widely dispersed wildlife species are not likely to generate significant non-use values because of the availability of close substitutes.” Following this line of reasoning, where the species benefiting from the SSMP 10-Year Project are common, biological changes are modest, and population viabilities are not materially altered, non-use values are, for the purpose of comparing social costs and social benefits, best characterized as de minimis.

To begin an assessment of potential non-use values associated with the SSMP 10 Year Plan, two factors are noted:

1. “In 2007, the Salton Sea ecosystem support[ed] some of the highest avian biological diversity in North America as well as the world. The more than 400 bird species that have been reported within the Salton Sea ecosystem comprise approximately 70 percent of all the bird species

recorded in California. In addition, several species listed under the Federal Endangered Species Act use habitat resources associated with the Salton Sea. This combination of avian biodiversity and importance as breeding habitat is unsurpassed by any limited geographic area within the contiguous 48 states and Latin America” (USDOl, 2007). These facts suggest that the public likely derives non-use value from the existence of the Salton Sea ecosystem as a whole.

2. Any potential non-use value the public may associate with the SSMP 10-Year Plan would be only some fraction of the non-use value the public attaches to the existence of the Salton Sea ecosystem. This is because the SSMP 10-Year Plan is intended to reduce the rate at which ecosystem services provided by the Salton Sea decline. The SSMP 10-Year Plan is not intended to preserve the level of ecosystem services that have been provided in the recent past. Instead, it is intended to offset some of the losses that would otherwise be associated with salinity increases and lakebed exposure occurring between 2018 and 2028. Similarly, noting that California’s 7,900-acre Imperial Wildlife Area has its own dedicated water supply and so reportedly would not be directly affected by declining Salton Sea elevations (Cohen 2014). Thus, the SSMP 10-Year Plan can be described as enhancing the quality of the area that has, and will for the foreseeable future, be a migratory bird stopover site.

Given the preceding bullets, this analysis relies on the notion that there may be a direct relationship between changes in the direct use value of a natural resource and changes in non-use value associated with that resource<sup>25</sup>. The USEPA has, at times, identified as a ‘credible rule of thumb’, the work of Fisher and Raucher (1984) which suggested that non-use values associated with natural resource changes might be about half as large as the use value. This idea was expanded in the current analysis by identifying meta-analyses describing potential non-use values associated with natural resources. Together, these meta-analyses incorporate information from 109 unique survey-based studies that either report a non-use to use ratio for a change in a natural resource or evaluated use and non-use values for natural resources in a manner that supported calculation of such a ratio.

While the meta-analysis results are based on responses to surveys and thus embody a variety of survey-related issues (see McFadden and Train 2017), the maximum non-use to use ratio identified after reviewing the literature in Table B.2-5 was 1.92<sup>26</sup>.

---

<sup>25</sup> This idea was discussed as early as the 1970’s (see Abel et al. 1975). Indeed, two of the three factors thought to motivate changes in non-use values, vicarious values and passively received values, are directly related to use values.

<sup>26</sup> If a positive non-use value is associated with implementation of the SSMP 10 Year plan, it is not clear that it should be included in a benefit to cost comparison. To see this, note that if non-use value is included as a social benefit, social cost estimates should be updated to include the amount of non-use value the public could have received had the monies expended on design, engineering, permitting, construction, operations, and maintenance been expended on some other project(s). See Nelson (1997) for a discussion. Nonetheless, following past evaluation of Salton Sea restoration, non-use value is included as a source of potential social benefit without making a parallel adjustment to reflect the opportunity cost associated with the non-use value that could have been generated had Plan-related inputs been applied to their next best alternative.

**Table B.2-5 Meta-analyses Used to Derive a Non-use to Use Ratio**

Study	Scope	Ratio Reported in Paper?	Number of Studies	Number of Observations	Date Range
Fisher and Raucher (1984)	Water Quality Improvements	No	9	9	1974-1983
Brown (1993)	Impact to Environment	Yes	31	51	1981-1993
Loomis and White (1996)	Rare and Endangered Species	No	20	38	1983-1994
Brouwer et al. (1999)	Impacts to Wetland Ecosystems	No	30	103	1981-1998
Johnston et al. (2003)	Water Quality Improvements	Yes	20	29	1978-2000
Johnston et al. (2005)	Aquatic Resource Improvements	No	34	81	1981-2001
Van Houtven et al. (2007)	Water Quality Improvements	Yes	21	131	1977-2003
Richardson and Loomis (2009)	Impacts to Rare and Endangered Species	Yes	31	67	1983-2003
Johnston and Thomassin (2010)	Water Quality Improvements	No	36	97	1981-2003

In light of the preceding facts, the annual social benefit associated with potential non-use values is specified as a uniform distribution between 0 and 1.92 times the estimated direct active use value<sup>27</sup>. These benefits would accrue among residents of both rural and urban communities.

### Social Benefits Summary

Social benefits are defined as society's willingness to pay for changes (both private and external) relative to baseline, brought about by a project or policy:

- > No social benefits would be provided under the baseline (no action) alternative.
- > The primary social benefits associated with implementation of the SSMP 10-Year Plan are:
  3. A reduction in fugitive dust emissions would likely bring about a reduction in adverse human health effects:
    - a. Mortality: A reduction in fugitive dust emissions would likely bring about a reduction in human mortality. This social benefit was estimated in two stages. First, the number of statistical mortalities prevented each year was specified as a PERT distribution with a minimum value of 0.93, a most likely value of 4.69 and a maximum value of 10.03. Second, the social benefit associated with the preservation of a statistical life is specified as a PERT distribution with a minimum of \$1,300,000, a most likely of \$10,200,000 and a maximum of \$25,200,000.

<sup>27</sup> Herein direct active use value is the social benefit arising from increased recreation opportunity.

- b. Sub-lethal Impacts: A reduction in fugitive dust emissions would likely bring about a reduction in adverse sub-lethal human health impacts. Monetized benefits are estimated through a proportional approach as informed by a recent socioeconomic report published by SCAQMD (2017) relating mortality benefits to sub-lethal benefits. Each singular reduction in mortality generates an additional benefit of approximately \$102,200 in reduced sub-lethal impacts.
4. A reduction in fugitive dust emissions, coupled with a relative improvement in the Salton Sea ecosystem, is likely to bring about an increase in wellbeing among area recreators relative to baseline. This social benefit, in present value terms, was specified by fitting a distribution to a Monte Carlo simulation that estimated the social benefit associated with a Plan-related increase in recreational opportunity<sup>28</sup>.
  5. A reduction in fugitive dust emissions may bring about an increase in agricultural productivity relative to baseline. This potential social benefit over the life of the project, in present value terms, was specified as a uniform distribution between zero dollars and \$32,459,000.
  6. Some members of the public may be willing to pay for project implementation even though they will never use, either directly or indirectly, the Salton Sea. This potential social benefit was specified as a uniform distribution between 0 and 1.92 times the total direct active use value.

The monetized social benefits associated with each benefit category are presented in Table B.2-6. The category associated with the largest share of monetized benefit is human health (approximately 86 percent of the total). Furthermore, Table B.2-6 provides monetized social benefits estimated to flow to rural communities for each benefit category and an overall share of total benefits that flow to rural communities in aggregate. The share of social benefits that flow to rural communities is at least 23.7 percent. Of note, the share of social benefits that are rural benefits is a conservative measure as presented in Table B.2-3 and described in text preceding Table B.2-3.

**Table B.2-6 Summary of Monetized Social Benefits from Project Implementation and Percent of Benefits Flowing to Rural Communities**

<b>Benefit Category</b>	<b>Expected Present Value of Benefits (in million dollars)</b>	<b>Lower Estimate of Benefits to Rural Communities (Percent)<sup>a</sup></b>	<b>Lower Expected Present Value of Rural Benefits (in million dollars)</b>
1a) Human Health – Mortality	1,824.6	25	456.1
1b) Human Health – Sub-lethal Impacts	16.6	25	4.2
2) Recreational Opportunities	134.2	5	6.7
3) Agricultural Output	33.5	100	33.5
4) Non-Use Values	128.8	5	6.4
<b>Total Social Benefits<sup>b</sup></b>	2,137.8	N/A	507.0

<sup>28</sup> The @Risk distribution fitting function found the best fit to be a general beta distribution, denominated in millions of dollars, with shape parameters of 3.41 and 4.91, a minimum of -10.86, and a maximum of 342.87. This distribution has mean present valued benefits of \$134,204,000, with a 5th percentile of \$45,010,000 and a 95% percentile of \$232,520,000.

Benefit Category	Expected Present Value of Benefits (in million dollars)	Lower Estimate of Benefits to Rural Communities (Percent) <sup>a</sup>	Lower Expected Present Value of Rural Benefits (in million dollars)
<b>Percent of Benefits to Rural Communities (Lower Estimate)</b>	<b>23.7</b>		

<sup>a</sup> The percentages reflected in this column represent the minimum values from Table B.2-3.

<sup>b</sup> May not sum due to independent rounding.

### Benefit to Cost Comparison

Figure B-2 illustrates the net social benefit estimates associated with 100,000 sets of randomly selected values. This distribution characterizes the range of potential net social benefits and the probability associated with each value within that range.

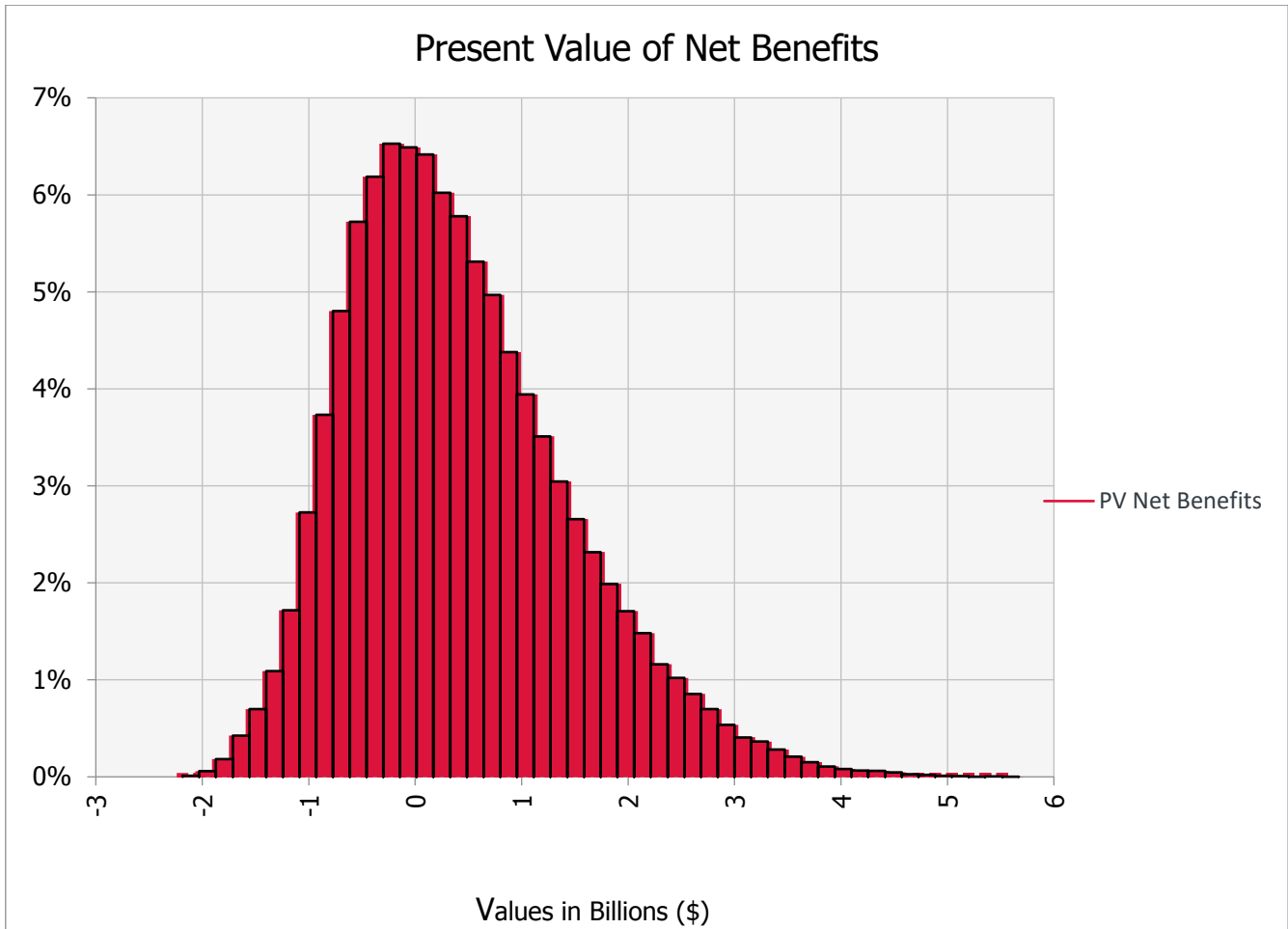
Figure B-22 indicates that, given the uncertainty associated with the benefits and costs as specified in this assessment, there is a 60.1 percent probability that implementation of the SSMP 10-Year Plan will provide a net benefit to society. The expected net social benefit<sup>29</sup> is approximately \$393,000,000, while the median<sup>30</sup> net social benefit is \$255,000,000. As discussed in the Section named *Air Quality on Human Health*, this is likely to be a conservative (i.e., tending to underestimate) estimate.

Based on the preceding analyses and results, implementation of the SSMP 10-Year Plan under any optimization scheme that includes Federal action is economically justified from the perspective of a cost-benefit analysis.

---

<sup>29</sup> The expected net social benefit is calculated as the average of the 100,000 unique social benefit estimates generated during the Monte Carlo simulation process.

<sup>30</sup> When all 100,000 unique social benefit estimates generated during the Monte Carlo process are put in order from least to greatest, the median is calculated as the average of estimates number 50,000 and 50,001. That is, the median is the value that represents the center of the probability distribution.



**Figure B.2-2 Probability Distribution for Net Social Benefits Associated with Implementation of the SSMP 10 Year Plan.**

**Environmental Justice**

DM 9500-013 calls for an evaluation of environmental justice consistent with Executive Order 12898 of February 11, 1994 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations) and, in this case, USDA DR 5600-002 (Environmental Justice).

As discussed in Section 5.5 of this EA, construction-related air emissions would have a short term, adverse, unavoidable impact on communities in the immediate vicinity of the Salton Sea; these communities are primarily minority and low-income. Once construction is complete, the effect of the project on these, and other communities in the Salton Sea Air Basin, would be a decrease in adverse human health outcomes, increased recreational opportunities, and potentially increased employment opportunities in the agricultural sector. That is, on net, the project is likely to benefit low income and minority populations.

**Summary Tables Required and/or Recommended Under DM 9500-013**

DM 9500-013 calls for the creation of two tables to summarize economic assessments: (1) a summary of project alternatives and associated ecosystem services; and (2) an evaluation of relevant alternatives’ consistency with Principles, Requirements and Guidelines (PR&G) Guiding Principles. These are included as Tables B.2-7 and B.2-8.

**Table B.2-7 Summary of Project Alternatives and Associated Ecosystem Services**

	<b>No Action Alternative</b>	<b>SSMP 10 Year Plan</b>	<b>No Federal Action</b>
<b>Overview</b>	No project components would be constructed. Exposed lakebed would emit fugitive dust, the absence of water with suitable salinity would result in the extirpation of fish populations and a continued decline in the use of the area by migratory birds.	A total of 29,800 acres of recently exposed lakebed are treated. The location of specific projects would be optimized over 47,100 acres resulting in a reduction in fugitive dust emissions and water with salinity that supports fish populations to the benefit of migratory birds.	California would implement the project in a manner that avoided Federal lands and the need for Federal permits. The reduction in dust emission and the quality of the fish and bird habitat created would be diminished relative to the SSMP 10 Year Plan.
<b>Social Cost Range (Present Value Billions)</b>	\$0	\$1.74 [\$1.43 to \$2.38] <sup>a</sup>	≥ SSMP 10 Year Plan
<b>Social Benefit Range (Present Value Billions)</b>	\$0	\$2.14 [\$0.82 to \$4.05] <sup>a</sup>	≤ SSMP 10 Year Plan
<b>Expected Net Benefit (Present Value Billions)</b>	\$0	\$0.39 [-\$1.03 to \$2.38] <sup>a</sup>	≤ SSMP 10 Year Plan
<b>Benefits Flowing to Rural Population</b>	0 percent	More than 23 percent <sup>b</sup>	More than 23 percent <sup>b</sup>
<b>Economic Assumptions</b>	Social costs and benefits are denominated in 2021 dollars. The period of analysis extends to 2077 (75 years after the start of the Quantification Settlement Agreement), the assumed discount rate is 1 and 5/8 percent and the base year for discounting is 2021.		
<b>Effects on Ecosystem Services</b>			
	<b>No Action Alternative</b>	<b>SSMP 10 Year Plan</b>	<b>No Federal Action</b>
<b>Soil Stabilization</b>	Exposed lakebed releases dust into the air resulting in adverse human health outcomes, reduced recreational opportunities, and decreased agricultural productivity	A total of 29,800 acres of recently exposed lakebed are treated to reduce dust emissions relative to the no action alternative. Adverse impacts related to human health, recreation, and agriculture decrease relative to the no action alternative.	Implementation avoids Federal lands. There is likely less benefit and/or higher costs relative to the SSMP 10 Year Plan because there are fewer locations from which to choose project locations.



	<b>No Action Alternative</b>	<b>SSMP 10 Year Plan</b>	<b>No Federal Action</b>
<b>Water Quality</b>	As Salton Sea salinity increases past most fish species' tolerances, there are limited areas with substitute sources of suitable water. This results in the extirpation of fish populations and a continued decline in the use of the area by migratory birds.	Despite an increase in Salton Sea salinity, substitute sources of suitable water are available. Forage fish reductions, relative to the No Action Alternative are partially mitigated as are reductions in migratory bird and recreational use.	Implementation avoids Federal lands. There is likely less benefit and/or higher costs relative to the SSMP 10 Year Plan because there are fewer locations from which to choose project locations.

<sup>a</sup> Results are reported as “expected value [5<sup>th</sup> percentile to 95<sup>th</sup> percentile]”.

<sup>b</sup> It is estimated that at least 23.7 percent of benefits will flow to rural communities. See Table B.2-6.

**Table B.2-8 Consistency with PR&G Guiding Principles**

<b>PR&amp;G Guiding Principle</b>	<b>No Action Alternative</b>	<b>SSMP 10 Year Plan</b>	<b>No Federal Action</b>
Healthy and Resilient Ecosystems	-	++	+
Sustainability	-	++	+
Floodplains	+	+	+
Public Safety	-	++	+
Environmental Justice	-	++	+
Watershed Approach	+	+	+

Notes:

- poorly aligned with guiding principle
- + moderately aligned with guiding principles
- ++ highly aligned with guiding principles

## References

- Abel, F.H., D. Tihansky, and R. Walsh. 1975. National benefits of water pollution control. US Environmental Protection Agency. Washington, DC.
- Agricultural Commissioner of Imperial County. 2019. Imperial County Agricultural Crop and Livestock Report. Available at: <https://agcom.imperialcounty.org/wp-content/uploads/2020/12/2019-Crop-Report.pdf>
- Brouwer, R., I.H. Langford, I.J. Bateman, and R.K. Turner. 1999. A meta-analysis of wetland contingent valuation studies. *Regional Environmental Change*, 1(1), pp.47-57.
- Brown, T.C. 1993. Measuring nonuse value: a comparison of recent contingent valuation studies. Bergstrom, JC, comp. W-133: benefits and costs transfer in natural resource planning. Athens: University of Georgia, pp.163-203.
- California Air Resources Board. 2019. Table with daily PM10 measurements in 2018. Available at: [https://www.arb.ca.gov/aqmis2/display.php?year=2018&param=PM10\\_L&units=001&statistic=DAVG&county\\_name=--COUNTY--&basin=SS-Salton+Sea&latitude=--PART+OF+STATE--&std15=&o3switch=new&hours=all&ptype=aqd&mon=&day=&report=AREA1YR&order=&btnsubmit=Update+Display](https://www.arb.ca.gov/aqmis2/display.php?year=2018&param=PM10_L&units=001&statistic=DAVG&county_name=--COUNTY--&basin=SS-Salton+Sea&latitude=--PART+OF+STATE--&std15=&o3switch=new&hours=all&ptype=aqd&mon=&day=&report=AREA1YR&order=&btnsubmit=Update+Display).
- California Department of Finance (CDOF), 2021. Water Resilience and Drought Package. Water Code 81023. Available at: [https://esd.dof.ca.gov/Documents/bcp/2122/FY2122\\_ORG3860\\_BCP4699.pdf](https://esd.dof.ca.gov/Documents/bcp/2122/FY2122_ORG3860_BCP4699.pdf)
- California Department of Parks and Recreation. 2021a. Visiting the Park. Available at: [https://www.parks.ca.gov/?page\\_id=21261](https://www.parks.ca.gov/?page_id=21261)
- California Department of Parks and Recreation. 2021b. Current Park Restrictions. Available at: [https://www.parks.ca.gov/?page\\_id=639](https://www.parks.ca.gov/?page_id=639)
- California Natural Resources Agency (CNRA), California Department of Water Resources (DWR), and California Department of Fish and Wildlife (CDFW). 2018. Salton Sea Management Program, Phase 1: 10-Year Plan. August.
- California Natural Resources Agency (CNRA). 2020. Salton Sea Management Program: Dust Suppression Action Plan.
- California Natural Resources Agency. 2022. Annual Report on the Salton Sea Management Program. February. Available at: [https://saltonsea.ca.gov/wp-content/uploads/2022/02/2022-Annual-Report-English-Feb-24-2022-Final.pdf?utm\\_medium=email&utm\\_source=govdelivery](https://saltonsea.ca.gov/wp-content/uploads/2022/02/2022-Annual-Report-English-Feb-24-2022-Final.pdf?utm_medium=email&utm_source=govdelivery). Accessed 5/26/2022.
- Center for Economic Development. 2018. Imperial County: Economic and Demographic Profile. Available at: [https://www.rcrcnet.org/sites/default/files/useruploads/Documents/Advocacy/Economic\\_Development/County\\_Profiles/2018%20Imperial%20Economic%20&%20Demographic%20Profile.pdf](https://www.rcrcnet.org/sites/default/files/useruploads/Documents/Advocacy/Economic_Development/County_Profiles/2018%20Imperial%20Economic%20&%20Demographic%20Profile.pdf)
- Cohen, M.J. 2014. Hazard's Toll The Costs of Inaction at the Salton Sea. Available at: [https://pacinst.org/wp-content/uploads/2014/09/PacInst\\_HazardsToll-1.pdf](https://pacinst.org/wp-content/uploads/2014/09/PacInst_HazardsToll-1.pdf)
- De Groot, R.S., Blignaut, J.N., Van Der Ploeg, S., Aronson, J., Elmqvist, T., and J. Farley. 2013. Benefits of Investing in Ecosystem Restoration. *Conservation Biology*. 27:1286–1293.

- Fisher, A. and R. Raucher. 1984. Intrinsic benefits of improved water quality: conceptual and empirical perspectives. *Advances in Applied Micro-Economics*, 3, pp.37-66.
- Flyvbjerg, B., Skamris Holm, M., and S. Buhl. 2002. "Underestimating Costs in Public Works Projects: Error or Lie?" *Journal of the American Planning Association*, vol. 68, no. 3, pp. 279-295.
- Freeman, A. M. 1993. *The Measurement of Environmental and Resource Values: Theory and Methods*. Washington, DC: Resources for the Future, Inc.
- Johnston, J. E., Razafy, M., Lugo, H., Olmedo, L., & Farzan, S. F. 2019. The disappearing Salton Sea: A critical reflection on the emerging environmental threat of disappearing saline lakes and potential impacts on children's health. *The Science of the total environment*, 663, 804–817.
- Johnston, R.J. and P.J. Thomassin. 2010. Willingness to pay for water quality improvements in the United States and Canada: Considering possibilities for international meta-analysis and benefit transfer. *Agricultural and Resource Economics Review*, 39(1), pp.114-131.
- Johnston, R.J., E.Y. Besedin, and R.F. Wardwell. 2003. Modeling relationships between use and nonuse values for surface water quality: A meta-analysis. *Water Resources Research*, 39(12).
- Johnston, R.J., E.Y. Besedin, R. Iovanna, C.J. Miller, R.F. Wardwell, and M.H. Ranson. 2005. Systematic variation in willingness to pay for aquatic resource improvements and implications for benefit transfer: A meta-analysis. *Canadian Journal of Agricultural Economics/Revue canadienne d'agroeconomie*, 53(2-3), pp.221-248.
- Jones, B.A. and J. Fleck. 2020. Shrinking lakes, air pollution, and human health: Evidence from California's Salton Sea. *Science of the Total Environment* 712.
- Kling, C., Phaneuf, D., and J. Zhao. 2012. From Exxon to BP: Has Some Number Become Better Than No Number? *Journal of Economic Perspectives*. 26(4), pp. 3-26.
- Krutilla, J.V. 1967. "Conservation Reconsidered." *American Economic Review* 57(4):777–786.
- Leggett, C., E. Horsch, and M. Curry. "Recreational Camping Damages due to the Refugio Beach Oil Spill". 2018. Available at: <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=178504&inline>
- Lobell D.B. and J.A. Burney. 2021. Cleaner air has contributed one-fifth of US maize and soybean yield gains since 1999. *Environmental Research Letters*. 16.
- Loomis, J.B. and D.S. White. 1996. Economic benefits of rare and endangered species: summary and meta-analysis. *Ecological Economics*, 18(3), pp.197-206.
- Loomis, J., M. Haefele, J. Dubovsky, A.M. Lien, W.E. Thogmartin, J. Diffendorfer, D. Humburg, B.J. Mattsson, K. Bagstad, D. Semmens, L. Lopez-Hoffman, and R. Meredith. 2018. "Do economic values and expenditures for viewing waterfowl in the U.S. differ among species?" *Human Dimensions of Wildlife* 23(6), pp. 587-596.
- Maisonneuve, Vivien. 2022. Program Manager II, DWR. Personal communication with Coralie Allen, Cardno on March 10.
- McFadden, D. and K. Train, K. 2017. *Contingent Valuation of Environmental Goods: A Comprehensive Critique*. Edward Elgar Publishing.
- Morales, G. 2021. *Agricultural and Hydrologic Responses to Changing Water Supplies in Imperial Valley, California*. Available at: <https://www.calstate.edu/impact-of-the->

[csu/research/wrpi/Documents/conference/2021/agricultural-and-hydrologic-responses-to-changing-water-supplies-in-imperial-valley-california.pdf](https://www.csu/research/wrpi/Documents/conference/2021/agricultural-and-hydrologic-responses-to-changing-water-supplies-in-imperial-valley-california.pdf)

- Nelson, R.H. 1997. Does “Existence Value” Exist? Environmental Economics Encroaches on Religion. Independent Review. Volume I, No.4, Spring 1997, ISSN 1086-1653.
- Ontario Ministry of Agriculture, Food and Rural Affairs. 2021. Effects of Air Pollution on Agricultural Crops. Available at: <http://www.omafra.gov.on.ca/english/crops/facts/01-015.htm#particulate>
- Palisade. 2021. Monte Carlo Simulation. Available at: [https://www.palisade.com/risk/monte\\_carlo\\_simulation.asp](https://www.palisade.com/risk/monte_carlo_simulation.asp)
- Parajulia, S.P. and C.S. Zender. 2018. Projected changes in dust emissions and regional air quality due to the shrinking Salton Sea. Aeolian Research 33: 82-92.
- Richardson, L. and J. Loomis. 2009. The total economic value of threatened, endangered and rare species: an updated meta-analysis. Ecological Economics, 68(5), pp.1535-1548.
- Riverside County Center for Demographics. 2021. Population Projections. Available at: <https://rivcoeda.org/Portals/0/demographicReports/Projections.pdf?ver=2017-05-17-121208-827>
- Statistical Atlas. 2018. Population of Riverside County, California. Available at: <https://statisticalatlas.com/county/California/Riverside-County/Population>
- Southern California Association of Governments. 2016. 2016-2040 RTP/SCS Final Growth Forecast by Jurisdiction. Available at: [https://scag.ca.gov/sites/main/files/file-attachments/2016\\_2040rtpscs\\_finalgrowthforecastbyjurisdiction.pdf?1605576071](https://scag.ca.gov/sites/main/files/file-attachments/2016_2040rtpscs_finalgrowthforecastbyjurisdiction.pdf?1605576071)
- Sett R. 2017. Responses in plants exposed to dust pollution. Horticultural International Journal 1(2):53-56.
- Sexton, N.R., Dietsch, A.M., Don Carlos, A.W., Koontz, L., Solomon A.N., and H.M. Miller. No Date. National Wildlife Refuge Visitor Survey 2010/2011: Individual Refuge Results for Sonny Bono Salton Sea National Wildlife Refuge. Available at: [https://pubs.usgs.gov/ds/643/California%20and%20Nevada%20Region%20\(R8\)/Sonny%20Bono%20Salton%20Sea%20NWR%20-%20NWR%20visitor%20survey%202010\\_2011.pdf](https://pubs.usgs.gov/ds/643/California%20and%20Nevada%20Region%20(R8)/Sonny%20Bono%20Salton%20Sea%20NWR%20-%20NWR%20visitor%20survey%202010_2011.pdf)
- South Coast Air Quality Management District (SCAQMD). 2017. Final Socioeconomic Report- 2016 Air Quality Management Plan. Available at: [http://www.aqmd.gov/docs/default-source/clean-air-plans/socioeconomic-analysis/final/sociofinal\\_030817.pdf](http://www.aqmd.gov/docs/default-source/clean-air-plans/socioeconomic-analysis/final/sociofinal_030817.pdf). Accessed 5/26/2022.
- Treshow M. 2002. Terrestrial plants and plant communities. In: Bell JNB, editor. Air Pollution and plant life. Wiley Publishers, USA. p. 223–236
- United States Census Bureau. 2012. Growth in Urban Population Outpaces Rest of Nation, Census Bureau Reports. Available at: [https://www.census.gov/newsroom/releases/archives/2010\\_census/cb12-50.html](https://www.census.gov/newsroom/releases/archives/2010_census/cb12-50.html)
- United States Census Bureau. 2021. 2010 Census: Urban and Rural Classification and Urban Area Criteria. Available at: <https://www.census.gov/programs-surveys/geography/guidance/geo-areas/urban-rural/2010-urban-rural.html>. Accessed 05/26/2022.

- United States Department of Agriculture (USDA). nd. Watershed and Flood Prevention Operations Program. Available at: [https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/landscape/wfpo/?cid=nrcs143\\_008271](https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/landscape/wfpo/?cid=nrcs143_008271)
- United States Department of Agriculture (USDA). 2017. Guidance for Conducting Analyses Under the Principles, Requirements, and Guidelines for Water and Land Related Resources Implementation Studies and Federal Water Resource Investments DM 9500-013. Available at: [https://www.ocio.usda.gov/sites/default/files/docs/2012/DM9500-013\\_final.pdf](https://www.ocio.usda.gov/sites/default/files/docs/2012/DM9500-013_final.pdf).
- US Department of Agriculture (USDA). 2019. County Profile – Imperial County CA. Available at: [https://www.nass.usda.gov/Publications/AgCensus/2017/Online\\_Resources/County\\_Profiles/California/cp06025.pdf](https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/California/cp06025.pdf)
- US Department of Agriculture (USDA). 2019. County Profile – Riverside County CA. Available at: [https://www.nass.usda.gov/Publications/AgCensus/2017/Online\\_Resources/County\\_Profiles/California/cp06065.pdf](https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/California/cp06065.pdf)
- United States Department of the Interior Bureau of Reclamation Lower Colorado Region. 2007. Restoration of the Salton Sea: Summary Report. Available at <https://www.usbr.gov/lc/region/saltsea/FinalSummaryRpt.pdf>
- United States Department of Transportation. 2016. Treatment of the Value of Preventing Fatalities and Injuries in Preparing Economic Analyses. Available at: <https://www.transportation.gov/sites/dot.gov/files/docs/2016%20Revised%20Value%20of%20a%20Statistical%20Life%20Guidance.pdf>
- United States Environmental Protection Agency (USEPA). 2010. Guidelines for Preparing an Economic Analyses. Appendix B: Mortality Risk Valuation Estimates. Available at: <https://www.epa.gov/sites/default/files/2017-09/documents/ee-0568-22.pdf>
- United States Environmental Protection Agency (USEPA). 2014. Benefits Analysis for the Final Section 316 (b) Phase II Existing Facilities Rule, p. D1–5 (EPA–821–R–04–005, Feb. 2004). Available at: [https://www.epa.gov/sites/default/files/2015-05/documents/cooling-water\\_phase-4\\_economics\\_2014.pdf](https://www.epa.gov/sites/default/files/2015-05/documents/cooling-water_phase-4_economics_2014.pdf)
- Van Houtven, G., J. Powers, and S.K. Pattanayak. 2007. Valuing water quality improvements in the United States using meta-analysis: Is the glass half-full or half-empty for national policy analysis? *Resource and Energy Economics*, 29(3), pp.206-228.
- Yirdaw, E., Tigabu, M., and A. Monge. 2017. Rehabilitation of degraded dryland ecosystems—Review. *Silva Fennica*. 51: 1–32.

**Attachment A****Rural and urban populations among census block groups in the Salton Sea Air Basin.**

<b>County</b>	<b>Tract</b>	<b>Block Group</b>	<b>Community in Close Proximity to the Salton Sea Shoreline</b>	<b>Urban Population</b>	<b>Rural Population</b>	<b>Total</b>
Imperial County	10101	1	Niland	0	4,601	<b>4,601</b>
Imperial County	10102	1	Niland	0	1,466	<b>1,466</b>
Imperial County	10102	2	Calipatria	0	1,244	<b>1,244</b>
Imperial County	10102	3	Calipatria	0	1,437	<b>1,437</b>
Imperial County	10102	4	Calipatria	0	860	<b>860</b>
Imperial County	10200	1	Westmorland	0	983	<b>983</b>
Imperial County	10200	2	Westmorland	0	1,657	<b>1,657</b>
Imperial County	10300	1	Brawley	0	933	<b>933</b>
Imperial County	10400	1	Brawley	0	1,292	<b>1,292</b>
Imperial County	10400	2	Brawley	0	961	<b>961</b>
Imperial County	10400	3	Brawley	0	625	<b>625</b>
Imperial County	10400	4	Brawley	0	1,975	<b>1,975</b>
Imperial County	10400	5	Brawley	0	2,309	<b>2,309</b>
Imperial County	10500	1	Brawley	0	3,362	<b>3,362</b>
Imperial County	10500	2	Brawley	0	1,087	<b>1,087</b>
Imperial County	10500	3	Brawley	0	831	<b>831</b>
Imperial County	10500	4	Brawley	0	1,313	<b>1,313</b>
Imperial County	10600	1	Brawley	0	1,343	<b>1,343</b>
Imperial County	10600	2	Brawley	0	1,091	<b>1,091</b>
Imperial County	10600	3	Brawley	0	969	<b>969</b>
Imperial County	10600	4	Brawley	0	3,595	<b>3,595</b>
Imperial County	10700	1	Brawley	0	1,412	<b>1,412</b>
Imperial County	10700	2	Brawley	0	1,362	<b>1,362</b>
Imperial County	10700	3	Brawley	0	1,548	<b>1,548</b>
Imperial County	10800	1	Not a Shoreline Community	0	545	<b>545</b>
Imperial County	10800	2	Not a Shoreline Community	0	823	<b>823</b>
Imperial County	10900	1	Not a Shoreline Community	0	2,009	<b>2,009</b>
Imperial County	10900	2	Not a Shoreline Community	0	1,293	<b>1,293</b>
Imperial County	10900	3	Not a Shoreline Community	0	1,080	<b>1,080</b>
Imperial County	10900	4	Not a Shoreline Community	0	1,025	<b>1,025</b>
Imperial County	10900	5	Not a Shoreline Community	0	688	<b>688</b>

<b>County</b>	<b>Tract</b>	<b>Block Group</b>	<b>Community in Close Proximity to the Salton Sea Shoreline</b>	<b>Urban Population</b>	<b>Rural Population</b>	<b>Total</b>
Imperial County	10900	6	Not a Shoreline Community	0	660	<b>660</b>
Imperial County	11000	1	Not a Shoreline Community	859	0	<b>859</b>
Imperial County	11000	2	Not a Shoreline Community	721	0	<b>721</b>
Imperial County	11000	3	Not a Shoreline Community	918	0	<b>918</b>
Imperial County	11000	4	Not a Shoreline Community	943	0	<b>943</b>
Imperial County	11000	5	Not a Shoreline Community	3,456	0	<b>3,456</b>
Imperial County	11000	6	Not a Shoreline Community	4,485	665	<b>5,150</b>
Imperial County	11100	1	Not a Shoreline Community	0	690	<b>690</b>
Imperial County	11100	2	Not a Shoreline Community	293	988	<b>1,281</b>
Imperial County	11100	3	Not a Shoreline Community	0	1,714	<b>1,714</b>
Imperial County	11201	1	Not a Shoreline Community	3,823	7	<b>3,830</b>
Imperial County	11201	2	Not a Shoreline Community	2,070	143	<b>2,213</b>
Imperial County	11202	1	Not a Shoreline Community	2,534	0	<b>2,534</b>
Imperial County	11202	2	Not a Shoreline Community	1,969	0	<b>1,969</b>
Imperial County	11202	3	Not a Shoreline Community	941	0	<b>941</b>
Imperial County	11300	1	Not a Shoreline Community	3,859	668	<b>4,527</b>
Imperial County	11300	2	Not a Shoreline Community	1,546	112	<b>1,658</b>
Imperial County	11300	3	Not a Shoreline Community	2,470	0	<b>2,470</b>
Imperial County	11300	4	Not a Shoreline Community	1,800	5	<b>1,805</b>
Imperial County	11400	1	Not a Shoreline Community	1,352	0	<b>1,352</b>
Imperial County	11400	2	Not a Shoreline Community	741	0	<b>741</b>
Imperial County	11400	3	Not a Shoreline Community	2,487	0	<b>2,487</b>
Imperial County	11500	1	Not a Shoreline Community	1,443	0	<b>1,443</b>
Imperial County	11500	2	Not a Shoreline Community	1,234	0	<b>1,234</b>
Imperial County	11500	3	Not a Shoreline Community	1,368	0	<b>1,368</b>
Imperial County	11500	4	Not a Shoreline Community	2,187	0	<b>2,187</b>
Imperial County	11600	1	Not a Shoreline Community	1,635	0	<b>1,635</b>
Imperial County	11600	2	Not a Shoreline Community	2,404	0	<b>2,404</b>
Imperial County	11600	3	Not a Shoreline Community	752	0	<b>752</b>
Imperial County	11600	4	Not a Shoreline Community	1,519	0	<b>1,519</b>
Imperial County	11700	1	Not a Shoreline Community	2,388	0	<b>2,388</b>
Imperial County	11700	2	Not a Shoreline Community	973	0	<b>973</b>
Imperial County	11700	3	Not a Shoreline Community	1,436	0	<b>1,436</b>

<b>County</b>	<b>Tract</b>	<b>Block Group</b>	<b>Community in Close Proximity to the Salton Sea Shoreline</b>	<b>Urban Population</b>	<b>Rural Population</b>	<b>Total</b>
Imperial County	11801	1	Not a Shoreline Community	1,752	0	<b>1,752</b>
Imperial County	11801	2	Not a Shoreline Community	2,069	0	<b>2,069</b>
Imperial County	11802	1	Not a Shoreline Community	1,521	0	<b>1,521</b>
Imperial County	11802	2	Not a Shoreline Community	774	0	<b>774</b>
Imperial County	11802	3	Not a Shoreline Community	1,670	0	<b>1,670</b>
Imperial County	11802	4	Not a Shoreline Community	905	0	<b>905</b>
Imperial County	11803	1	Not a Shoreline Community	5,844	93	<b>5,937</b>
Imperial County	11900	1	Not a Shoreline Community	13	341	<b>354</b>
Imperial County	11900	2	Not a Shoreline Community	8,439	265	<b>8,704</b>
Imperial County	11900	3	Not a Shoreline Community	1,829	79	<b>1,908</b>
Imperial County	12001	1	Not a Shoreline Community	2,696	0	<b>2,696</b>
Imperial County	12001	2	Not a Shoreline Community	1,135	0	<b>1,135</b>
Imperial County	12002	1	Not a Shoreline Community	5,916	0	<b>5,916</b>
Imperial County	12002	2	Not a Shoreline Community	3,762	0	<b>3,762</b>
Imperial County	12100	1	Not a Shoreline Community	1,029	0	<b>1,029</b>
Imperial County	12100	2	Not a Shoreline Community	1,868	0	<b>1,868</b>
Imperial County	12100	3	Not a Shoreline Community	1,452	0	<b>1,452</b>
Imperial County	12100	4	Not a Shoreline Community	2,588	0	<b>2,588</b>
Imperial County	12200	1	Not a Shoreline Community	3,052	0	<b>3,052</b>
Imperial County	12200	2	Not a Shoreline Community	1,588	0	<b>1,588</b>
Imperial County	12200	3	Not a Shoreline Community	1,418	0	<b>1,418</b>
Imperial County	12200	4	Not a Shoreline Community	1,746	0	<b>1,746</b>
Imperial County	12301	1	Not a Shoreline Community	0	5,369	<b>5,369</b>
Imperial County	12301	2	Not a Shoreline Community	0	264	<b>264</b>
Imperial County	12302	1	Desert Shores	0	1,104	<b>1,104</b>
Imperial County	12302	2	Salton City	0	2,388	<b>2,388</b>
Imperial County	12302	3	Salton City	0	1,264	<b>1,264</b>
Imperial County	12400	1	Bombay Beach	0	815	<b>815</b>
Imperial County	12400	2	Not a Shoreline Community	0	451	<b>451</b>
Imperial County	940000	1	Not a Shoreline Community	278	1,044	<b>1,322</b>
Imperial County	940000	2	Not a Shoreline Community	208	736	<b>944</b>
Imperial County	940000	3	Not a Shoreline Community	525	261	<b>786</b>
Riverside County	44402	4	Not a Shoreline Community	0	919	<b>919</b>



<b>County</b>	<b>Tract</b>	<b>Block Group</b>	<b>Community in Close Proximity to the Salton Sea Shoreline</b>	<b>Urban Population</b>	<b>Rural Population</b>	<b>Total</b>
Riverside County	44403	3	Not a Shoreline Community	0	2,495	<b>2,495</b>
Riverside County	44405	2	Not a Shoreline Community	0	1,392	<b>1,392</b>
Riverside County	44505	1	Not a Shoreline Community	3,905	310	<b>4,215</b>
Riverside County	44505	2	Not a Shoreline Community	2,228	36	<b>2,264</b>
Riverside County	44507	1	Not a Shoreline Community	0	2,818	<b>2,818</b>
Riverside County	44507	2	Not a Shoreline Community	0	3,747	<b>3,747</b>
Riverside County	44509	1	Not a Shoreline Community	0	3,939	<b>3,939</b>
Riverside County	44510	1	Not a Shoreline Community	0	3,094	<b>3,094</b>
Riverside County	44510	2	Not a Shoreline Community	0	2,714	<b>2,714</b>
Riverside County	44515	1	Not a Shoreline Community	0	3,618	<b>3,618</b>
Riverside County	44516	1	Not a Shoreline Community	0	2,406	<b>2,406</b>
Riverside County	44516	2	Not a Shoreline Community	0	4,200	<b>4,200</b>
Riverside County	44517	1	Not a Shoreline Community	0	2,377	<b>2,377</b>
Riverside County	44518	1	Not a Shoreline Community	0	1,572	<b>1,572</b>
Riverside County	44518	2	Not a Shoreline Community	0	3,660	<b>3,660</b>
Riverside County	44520	1	Not a Shoreline Community	8	828	<b>836</b>
Riverside County	44520	2	Not a Shoreline Community	0	868	<b>868</b>
Riverside County	44521	1	Not a Shoreline Community	0	1,196	<b>1,196</b>
Riverside County	44522	1	Not a Shoreline Community	0	4,876	<b>4,876</b>
Riverside County	44602	1	Not a Shoreline Community	753	0	<b>753</b>
Riverside County	44602	2	Not a Shoreline Community	991	0	<b>991</b>
Riverside County	44602	3	Not a Shoreline Community	1,163	0	<b>1,163</b>
Riverside County	44604	1	Not a Shoreline Community	2,276	0	<b>2,276</b>
Riverside County	44604	2	Not a Shoreline Community	2,044	0	<b>2,044</b>
Riverside County	44605	1	Not a Shoreline Community	1,906	0	<b>1,906</b>
Riverside County	44605	2	Not a Shoreline Community	2,897	0	<b>2,897</b>
Riverside County	44606	1	Not a Shoreline Community	1,189	0	<b>1,189</b>
Riverside County	44606	2	Not a Shoreline Community	838	825	<b>1,663</b>
Riverside County	44701	1	Not a Shoreline Community	1,901	0	<b>1,901</b>
Riverside County	44701	2	Not a Shoreline Community	1,654	0	<b>1,654</b>
Riverside County	44702	1	Not a Shoreline Community	2,295	0	<b>2,295</b>
Riverside County	44804	1	Not a Shoreline Community	2,850	0	<b>2,850</b>
Riverside County	44805	1	Not a Shoreline Community	1,701	0	<b>1,701</b>

<b>County</b>	<b>Tract</b>	<b>Block Group</b>	<b>Community in Close Proximity to the Salton Sea Shoreline</b>	<b>Urban Population</b>	<b>Rural Population</b>	<b>Total</b>
Riverside County	44806	1	Not a Shoreline Community	1,982	0	<b>1,982</b>
Riverside County	44807	1	Not a Shoreline Community	1,097	184	<b>1,281</b>
Riverside County	44904	1	Not a Shoreline Community	4,540	3	<b>4,543</b>
Riverside County	44907	1	Not a Shoreline Community	1,709	0	<b>1,709</b>
Riverside County	44907	2	Not a Shoreline Community	1,460	0	<b>1,460</b>
Riverside County	44907	3	Not a Shoreline Community	1,820	0	<b>1,820</b>
Riverside County	44911	1	Not a Shoreline Community	2,623	0	<b>2,623</b>
Riverside County	44911	2	Not a Shoreline Community	1,994	0	<b>1,994</b>
Riverside County	44915	1	Not a Shoreline Community	3,640	0	<b>3,640</b>
Riverside County	44915	2	Not a Shoreline Community	2,849	0	<b>2,849</b>
Riverside County	44916	1	Not a Shoreline Community	1,635	0	<b>1,635</b>
Riverside County	44916	2	Not a Shoreline Community	1,310	0	<b>1,310</b>
Riverside County	44916	3	Not a Shoreline Community	1,705	0	<b>1,705</b>
Riverside County	44917	1	Not a Shoreline Community	2,295	0	<b>2,295</b>
Riverside County	44917	2	Not a Shoreline Community	1,616	0	<b>1,616</b>
Riverside County	44918	1	Not a Shoreline Community	2,103	0	<b>2,103</b>
Riverside County	44918	2	Not a Shoreline Community	927	0	<b>927</b>
Riverside County	44919	1	Not a Shoreline Community	1,106	0	<b>1,106</b>
Riverside County	44919	2	Not a Shoreline Community	1,050	0	<b>1,050</b>
Riverside County	44919	3	Not a Shoreline Community	1,860	0	<b>1,860</b>
Riverside County	44919	4	Not a Shoreline Community	227	0	<b>227</b>
Riverside County	44921	1	Not a Shoreline Community	2,355	0	<b>2,355</b>
Riverside County	44922	1	Not a Shoreline Community	3,457	37	<b>3,494</b>
Riverside County	44923	1	Not a Shoreline Community	2,165	0	<b>2,165</b>
Riverside County	44923	2	Not a Shoreline Community	1,450	0	<b>1,450</b>
Riverside County	44924	1	Not a Shoreline Community	2,205	0	<b>2,205</b>
Riverside County	44924	2	Not a Shoreline Community	1,779	0	<b>1,779</b>
Riverside County	44925	1	Not a Shoreline Community	871	0	<b>871</b>
Riverside County	44925	2	Not a Shoreline Community	2,606	0	<b>2,606</b>
Riverside County	44926	1	Not a Shoreline Community	3,644	0	<b>3,644</b>
Riverside County	44926	2	Not a Shoreline Community	1,021	0	<b>1,021</b>
Riverside County	44927	1	Not a Shoreline Community	2,753	0	<b>2,753</b>
Riverside County	44927	2	Not a Shoreline Community	1,048	0	<b>1,048</b>

<b>County</b>	<b>Tract</b>	<b>Block Group</b>	<b>Community in Close Proximity to the Salton Sea Shoreline</b>	<b>Urban Population</b>	<b>Rural Population</b>	<b>Total</b>
Riverside County	44928	1	Not a Shoreline Community	1,226	0	<b>1,226</b>
Riverside County	44928	2	Not a Shoreline Community	2,217	0	<b>2,217</b>
Riverside County	44929	1	Not a Shoreline Community	1,779	0	<b>1,779</b>
Riverside County	44929	2	Not a Shoreline Community	2,129	0	<b>2,129</b>
Riverside County	44930	1	Not a Shoreline Community	3,213	0	<b>3,213</b>
Riverside County	44931	1	Not a Shoreline Community	2,327	0	<b>2,327</b>
Riverside County	44932	1	Not a Shoreline Community	3,067	0	<b>3,067</b>
Riverside County	45000	1	Not a Shoreline Community	1,030	0	<b>1,030</b>
Riverside County	45000	2	Not a Shoreline Community	1,306	0	<b>1,306</b>
Riverside County	45000	3	Not a Shoreline Community	1,088	0	<b>1,088</b>
Riverside County	45103	1	Not a Shoreline Community	1,096	0	<b>1,096</b>
Riverside County	45103	2	Not a Shoreline Community	699	115	<b>814</b>
Riverside County	45103	3	Not a Shoreline Community	817	0	<b>817</b>
Riverside County	45103	4	Not a Shoreline Community	896	0	<b>896</b>
Riverside County	45108	1	Not a Shoreline Community	1,979	0	<b>1,979</b>
Riverside County	45108	2	Not a Shoreline Community	1,837	0	<b>1,837</b>
Riverside County	45108	3	Not a Shoreline Community	1,910	0	<b>1,910</b>
Riverside County	45109	1	Not a Shoreline Community	1,706	0	<b>1,706</b>
Riverside County	45109	2	Not a Shoreline Community	2,125	0	<b>2,125</b>
Riverside County	45110	1	Not a Shoreline Community	3,664	0	<b>3,664</b>
Riverside County	45110	2	Not a Shoreline Community	1,737	0	<b>1,737</b>
Riverside County	45114	1	Not a Shoreline Community	968	0	<b>968</b>
Riverside County	45114	2	Not a Shoreline Community	971	0	<b>971</b>
Riverside County	45115	1	Not a Shoreline Community	2,026	0	<b>2,026</b>
Riverside County	45116	1	Not a Shoreline Community	1,492	0	<b>1,492</b>
Riverside County	45117	1	Not a Shoreline Community	1,696	0	<b>1,696</b>
Riverside County	45117	2	Not a Shoreline Community	2,273	0	<b>2,273</b>
Riverside County	45118	1	Not a Shoreline Community	2,762	0	<b>2,762</b>
Riverside County	45119	1	Not a Shoreline Community	1,978	0	<b>1,978</b>
Riverside County	45119	2	Not a Shoreline Community	833	0	<b>833</b>
Riverside County	45120	1	Not a Shoreline Community	474	0	<b>474</b>
Riverside County	45120	2	Not a Shoreline Community	2,464	0	<b>2,464</b>
Riverside County	45120	3	Not a Shoreline Community	1,642	0	<b>1,642</b>

<b>County</b>	<b>Tract</b>	<b>Block Group</b>	<b>Community in Close Proximity to the Salton Sea Shoreline</b>	<b>Urban Population</b>	<b>Rural Population</b>	<b>Total</b>
Riverside County	45121	1	Not a Shoreline Community	1,510	0	<b>1,510</b>
Riverside County	45121	2	Not a Shoreline Community	1,701	0	<b>1,701</b>
Riverside County	45121	3	Not a Shoreline Community	2,246	0	<b>2,246</b>
Riverside County	45122	1	Not a Shoreline Community	1,427	0	<b>1,427</b>
Riverside County	45123	1	Not a Shoreline Community	933	0	<b>933</b>
Riverside County	45123	2	Not a Shoreline Community	1,423	0	<b>1,423</b>
Riverside County	45124	1	Not a Shoreline Community	1,140	365	<b>1,505</b>
Riverside County	45125	1	Not a Shoreline Community	2,020	997	<b>3,017</b>
Riverside County	45207	1	Not a Shoreline Community	2,479	0	<b>2,479</b>
Riverside County	45207	2	Not a Shoreline Community	2,535	0	<b>2,535</b>
Riverside County	45209	1	Not a Shoreline Community	2,465	0	<b>2,465</b>
Riverside County	45209	2	Not a Shoreline Community	2,976	0	<b>2,976</b>
Riverside County	45212	1	Not a Shoreline Community	1,411	0	<b>1,411</b>
Riverside County	45212	2	Not a Shoreline Community	882	0	<b>882</b>
Riverside County	45213	1	Not a Shoreline Community	4,467	0	<b>4,467</b>
Riverside County	45213	2	Not a Shoreline Community	749	0	<b>749</b>
Riverside County	45214	1	Not a Shoreline Community	2,881	0	<b>2,881</b>
Riverside County	45214	2	Not a Shoreline Community	2,767	0	<b>2,767</b>
Riverside County	45215	1	Not a Shoreline Community	2,604	0	<b>2,604</b>
Riverside County	45215	2	Not a Shoreline Community	537	0	<b>537</b>
Riverside County	45215	3	Not a Shoreline Community	3,053	0	<b>3,053</b>
Riverside County	45215	4	Not a Shoreline Community	2,321	0	<b>2,321</b>
Riverside County	45216	1	Not a Shoreline Community	1,804	0	<b>1,804</b>
Riverside County	45217	1	Not a Shoreline Community	3,566	0	<b>3,566</b>
Riverside County	45217	2	Not a Shoreline Community	2,659	0	<b>2,659</b>
Riverside County	45222	1	Not a Shoreline Community	27	40	<b>67</b>
Riverside County	45222	2	Not a Shoreline Community	900	0	<b>900</b>
Riverside County	45222	3	Not a Shoreline Community	625	3	<b>628</b>
Riverside County	45224	1	Not a Shoreline Community	2,929	0	<b>2,929</b>
Riverside County	45224	2	Not a Shoreline Community	2,542	0	<b>2,542</b>
Riverside County	45226	1	Not a Shoreline Community	3,982	0	<b>3,982</b>
Riverside County	45226	2	Not a Shoreline Community	2,828	0	<b>2,828</b>
Riverside County	45228	1	Not a Shoreline Community	641	1,066	<b>1,707</b>

<b>County</b>	<b>Tract</b>	<b>Block Group</b>	<b>Community in Close Proximity to the Salton Sea Shoreline</b>	<b>Urban Population</b>	<b>Rural Population</b>	<b>Total</b>
Riverside County	45228	2	Not a Shoreline Community	2,229	0	<b>2,229</b>
Riverside County	45233	1	Not a Shoreline Community	2,903	0	<b>2,903</b>
Riverside County	45233	2	Not a Shoreline Community	1,341	0	<b>1,341</b>
Riverside County	45302	1	Not a Shoreline Community	2,318	0	<b>2,318</b>
Riverside County	45302	2	Not a Shoreline Community	954	0	<b>954</b>
Riverside County	45302	3	Not a Shoreline Community	1,187	0	<b>1,187</b>
Riverside County	45303	1	Not a Shoreline Community	3,035	0	<b>3,035</b>
Riverside County	45304	1	Not a Shoreline Community	1,830	0	<b>1,830</b>
Riverside County	45304	2	Not a Shoreline Community	3,886	0	<b>3,886</b>
Riverside County	45304	3	Not a Shoreline Community	2,959	0	<b>2,959</b>
Riverside County	45501	1	Not a Shoreline Community	2,157	0	<b>2,157</b>
Riverside County	45501	2	Not a Shoreline Community	3,361	0	<b>3,361</b>
Riverside County	45502	1	Not a Shoreline Community	1,751	0	<b>1,751</b>
Riverside County	45502	2	Not a Shoreline Community	1,993	0	<b>1,993</b>
Riverside County	45604	1	Mecca	0	2,672	<b>2,672</b>
Riverside County	45604	2	Mecca	504	1,192	<b>1,696</b>
Riverside County	45604	3	North Shore	0	5,054	<b>5,054</b>
Riverside County	45604	4	Mecca	0	4,272	<b>4,272</b>
Riverside County	45605	1	Not a Shoreline Community	0	2,618	<b>2,618</b>
Riverside County	45605	2	Torres Martinez Desert Cahuilla Indian Reservation	0	1,029	<b>1,029</b>
Riverside County	45605	3	Torres Martinez Desert Cahuilla Indian Reservation	0	2,713	<b>2,713</b>
Riverside County	45605	4	Not a Shoreline Community	1,258	1,429	<b>2,687</b>
Riverside County	45605	5	Oasis	0	1,496	<b>1,496</b>
Riverside County	45606	1	Not a Shoreline Community	8	379	<b>387</b>
Riverside County	45606	2	Not a Shoreline Community	2,147	146	<b>2,293</b>
Riverside County	45608	1	Not a Shoreline Community	1,148	0	<b>1,148</b>
Riverside County	45608	2	Not a Shoreline Community	1,611	119	<b>1,730</b>
Riverside County	45609	1	Not a Shoreline Community	1,122	799	<b>1,921</b>
Riverside County	45609	2	Not a Shoreline Community	1,079	940	<b>2,019</b>
Riverside County	45609	3	Not a Shoreline Community	1,722	218	<b>1,940</b>
Riverside County	45703	1	Not a Shoreline Community	3,202	0	<b>3,202</b>
Riverside County	45703	2	Not a Shoreline Community	2,506	0	<b>2,506</b>

<b>County</b>	<b>Tract</b>	<b>Block Group</b>	<b>Community in Close Proximity to the Salton Sea Shoreline</b>	<b>Urban Population</b>	<b>Rural Population</b>	<b>Total</b>
Riverside County	45704	1	Not a Shoreline Community	2,804	0	<b>2,804</b>
Riverside County	45705	1	Not a Shoreline Community	7,522	0	<b>7,522</b>
Riverside County	45706	1	Not a Shoreline Community	3,556	0	<b>3,556</b>
Riverside County	45706	2	Not a Shoreline Community	1,265	0	<b>1,265</b>
Riverside County	45707	1	Not a Shoreline Community	1,624	0	<b>1,624</b>
Riverside County	45707	2	Not a Shoreline Community	1,676	0	<b>1,676</b>
Riverside County	45707	3	Not a Shoreline Community	3,097	0	<b>3,097</b>
Riverside County	46900	1	Not a Shoreline Community	0	2,043	<b>2,043</b>
Riverside County	47201	1	Not a Shoreline Community	0	1,958	<b>1,958</b>
Riverside County	47202	1	Not a Shoreline Community	0	1,929	<b>1,929</b>
Riverside County	49100	1	Not a Shoreline Community	1,946	0	<b>1,946</b>
Riverside County	49100	2	Not a Shoreline Community	2,262	0	<b>2,262</b>
Riverside County	49100	3	Not a Shoreline Community	1,056	0	<b>1,056</b>
Riverside County	49400	1	Not a Shoreline Community	1,249	102	<b>1,351</b>
Riverside County	49400	2	Not a Shoreline Community	1,627	0	<b>1,627</b>
Riverside County	49500	1	Not a Shoreline Community	4,217	0	<b>4,217</b>
Riverside County	49500	2	Not a Shoreline Community	4,204	0	<b>4,204</b>
Riverside County	51400	1	Not a Shoreline Community	2,233	0	<b>2,233</b>
Riverside County	51400	2	Not a Shoreline Community	1,788	0	<b>1,788</b>
Riverside County	51400	3	Not a Shoreline Community	2,935	0	<b>2,935</b>
Riverside County	940400	1	Not a Shoreline Community	5,636	0	<b>5,636</b>
Riverside County	940400	2	Not a Shoreline Community	861	7	<b>868</b>
Riverside County	940500	1	Not a Shoreline Community	460	678	<b>1,138</b>
Riverside County	940500	2	Not a Shoreline Community	693	377	<b>1,070</b>
Riverside County	940600	1	Not a Shoreline Community	1,585	0	<b>1,585</b>
Riverside County	940600	2	Not a Shoreline Community	1,441	0	<b>1,441</b>
Riverside County	940700	1	Not a Shoreline Community	1,105	0	<b>1,105</b>
Riverside County	940700	2	Not a Shoreline Community	1,508	0	<b>1,508</b>
Riverside County	940800	1	Not a Shoreline Community	1,354	0	<b>1,354</b>
Riverside County	940800	2	Not a Shoreline Community	1,259	0	<b>1,259</b>
Riverside County	940900	1	Not a Shoreline Community	1,229	0	<b>1,229</b>
Riverside County	940900	2	Not a Shoreline Community	687	0	<b>687</b>
Riverside County	941000	1	Not a Shoreline Community	984	0	<b>984</b>

<b>County</b>	<b>Tract</b>	<b>Block Group</b>	<b>Community in Close Proximity to the Salton Sea Shoreline</b>	<b>Urban Population</b>	<b>Rural Population</b>	<b>Total</b>
Riverside County	941000	2	Not a Shoreline Community	695	0	<b>695</b>
Riverside County	941000	3	Not a Shoreline Community	1,220	0	<b>1,220</b>
Riverside County	941000	4	Not a Shoreline Community	913	0	<b>913</b>
Riverside County	941100	1	Not a Shoreline Community	652	0	<b>652</b>
Riverside County	941100	2	Not a Shoreline Community	1,399	0	<b>1,399</b>
Riverside County	941200	1	Not a Shoreline Community	520	15	<b>535</b>
Riverside County	941200	2	Not a Shoreline Community	986	0	<b>986</b>
Riverside County	941200	3	Not a Shoreline Community	684	0	<b>684</b>
Riverside County	941300	1	Not a Shoreline Community	1,683	0	<b>1,683</b>
Riverside County	941300	2	Not a Shoreline Community	1,617	0	<b>1,617</b>
Riverside County	941400	1	Not a Shoreline Community	735	0	<b>735</b>
Riverside County	941400	2	Not a Shoreline Community	1,398	0	<b>1,398</b>
Riverside County	941400	3	Not a Shoreline Community	1,046	0	<b>1,046</b>
			<b>Total</b>	<b>454,263</b>	<b>148,730</b>	<b>602,993</b>
<b>Proportion of Salton Sea Air Basin Population that is Rural</b>						<b>25%</b>