BUREAU OF RECLAMATION

IID 2024-2026 Temporary Colorado River System Water Conservation Project

Draft Environmental Assessment
LC-24-07
Lower Colorado Basin

U.S. Department of the Interior **June 2024**

Mission Statements

The Department of the Interior (DOI) conserves and manages the Nation's natural resources and cultural heritage for the benefit and enjoyment of the American people, provides scientific and other information about natural resources and natural hazards to address societal challenges and create opportunities for the American people, and honors the Nation's trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated island communities to help them prosper.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

IID 2024-2026 Temporary Colorado River System Water Conservation Project

Draft Environmental Assessment
LC-24-07
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prepared for

United States Department of the Interior
Bureau of Reclamation
Lower Colorado Basin Region
Boulder City, Nevada

prepared by

Imperial Irrigation District
333 East Barioni Boulevard
Imperial, California 92251

prepared with assistance from

Environmental Science Associates

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1.0 Introduction

1.1 Proposed Federal Action

The United States Bureau of Reclamation (Reclamation) is considering approval of a System Conservation Implementation Agreement (SCIA) with Imperial Irrigation District (IID) to participate in the Lower Colorado River Basin System Conservation and Efficiency Program (LC Conservation Program). The approval of the SCIA pursuant to the LC Conservation Program is the "Proposed Action."

This Environmental Assessment (EA) was prepared in compliance with the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321 et seq.) and the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA (40 CFR 1500-1508), the United States Department of the Interior Implementation of NEPA regulations (43 CFR Part 46), and Reclamation NEPA Handbook (Reclamation 2012). Reclamation is the lead Federal agency pursuant to NEPA. If a proposed action is not likely to have significant effects, an EA provides an appropriate level of review under NEPA. (40 CFR, §§ 1501.3(a)(2), 1501.5(a).) An EA is a "concise public document" intended to "support [an agency's] determination of whether to prepare an environmental impact statement or a finding of no significant impact [FONSI]…" (40 CFR, § 1508.1(h).) A FONSI is a document that briefly presents the reasons why an action "will not have a significant effect on the human environment and for which an environmental impact statement therefore will not be prepared." (*Id.* at (l).)

Reclamation is the federal lead agency for this EA pursuant to NEPA. (40 CFR, § 1501.7.) Reclamation has authority for the Proposed Action pursuant to the Reclamation Act approved by Congress on June 17, 1902 (32 Stat. 388), and acts amendatory thereof or supplementary thereto, the Boulder Canyon Project Act of December 21, 1928 (45 Stat. 1057), the Colorado River Basin Project Act of September 30, 1968 (82 Stat. 885), the Colorado River Drought Contingency Plan Authorization Act dated April 16, 2019, Public Law 116-14, and the Inflation Reduction Act of 2022, Public Law 117-169.

The U.S. Fish and Wildlife Service is a cooperating agency with jurisdiction over the Proposed Action under Section 7 of the federal Endangered Species Act of 1973, 16 U.S.C.A. §1531, et seq. (FESA). (40 CFR, § 1501.8.) IID would be responsible for obtaining all required State and local permits, approvals, and/or authorizations for the Proposed Action. The California Department of Fish and Wildlife is expected to review this EA for the resources under their jurisdiction.

1.2 Reclamation Authority, Policy, and Resource Management

The Colorado River Basin is experiencing the driest 23-year period in the historical record. Prolonged drought and low runoff conditions accelerated by climate change have led to historically low water levels in Lakes Powell and Mead. Over the last two decades, the United States Department of the Interior (Department) has engaged with Colorado River Basin partners on various drought response operations. On April 16, 2019, the Colorado River Drought Contingency

Plan Authorization Act (Public Law 116-14) was signed into law. This Act directed the Secretary to execute specific agreements referred to as the "DCP Agreements," and the DCP Agreements were subsequently executed on May 20, 2019.

However, given that water levels in Lake Powell and Lake Mead have continued to decline, additional actions are necessary to protect the Colorado River system. In June 2022, Reclamation Commissioner Camille Calimlim Touton testified before the U.S. Senate Committee on Energy and Natural Resources and called on water users across the Colorado River Basin to take actions to reduce demands or conserve water in the range of 2 to 4 million acre-feet per year for four years (2023 through 2026) to stabilize reservoir elevations at Lake Powell and Lake Mead. These actions were also needed to prevent the reservoirs from falling to critically low elevations that would threaten water deliveries and power production.

On August 16, 2022, the Department made a commitment to address the drought crisis within the Colorado River Basin with prompt and responsive actions and investments. Additionally, the Inflation Reduction Act of 2022 included $4 billion in funding specifically for water management and conservation efforts in the Colorado River Basin and other areas experiencing similar levels of drought. (Public Law 117-169.)

On August 17, 2022, the August 2022 24-Month Study was released by Reclamation pursuant to the *Record of Decision Colorado River Interim Guidelines for Lower Basin Shortages and the Coordinated Operations for Lake Powell and Lake Mead*, dated December 2007 (2007 Interim Guidelines). (USDOI 2007a.) Given the 23-year ongoing historic drought and low runoff conditions in the Colorado River Basin, downstream releases from Glen Canyon Dam and Hoover Dam, which created Lake Powell and Lake Mead, respectively, were determined to be reduced again in 2023 due to declining reservoir elevations. In the Lower Basin, calendar year 2023 was the second year in which a shortage condition was declared by the Secretary of the Department of the Interior (Secretary), demonstrating the severity of the drought and critically low reservoir conditions. The August 2022 24-Month Study reflected two key determinations. First, Lake Powell would operate in the Lower Elevation Balancing Tier in water year 2023 (October 1, 2022 through September 30, 2023), pursuant to the 2007 Interim Guidelines and the DCP Agreements. (USDOI 2007a, 2007b and Public Law 116-14.) Second, Lake Mead would operate in its first-ever Level 2a Shortage Condition in calendar year 2023 (January 1, 2023 through December 31, 2023), also pursuant to the 2007 Interim Guidelines and the DCP Agreements. (*Id.*) Each determination triggered certain requirements and operational actions, including shortage reductions in the Lower Basin for Nevada, Arizona, and Mexico.

On September 22, 2022, the Department announced that it was taking additional steps to address drought in the Colorado River Basin. The Department, through Reclamation, created the Lower Colorado River Basin System Conservation and Efficiency Program (LC Conservation Program). The LC Conservation Program is intended to provide new opportunities to fund system conservation and efficiencies in the Lower Colorado River Basin that lead to additional conservation and bridge the immediate need while moving toward improved system efficiency and more durable long-term solutions for the Colorado River System. Lower Colorado River water delivery contract or entitlement holders and Central Arizona Project water delivery contract or sub-contract holders are eligible to participate in the LC Conservation Program.

On October 12, 2022, Reclamation sent a letter to interested parties having a Colorado River water delivery contract or entitlement holders and Central Arizona Project water delivery contract or sub-contract holders, announcing the funding opportunities for voluntary participation in the new LC Conservation Program (October 2022 Letter).

The October 2022 Letter identified the three funding components of the LC Conservation Program:

1.a.) Reclamation requested proposals for system conservation resulting in additional volumes of water remaining in Lake Mead at a set price of:
- One-year agreement: $330 per acre-foot
- Two-year agreement: $365 per acre-foot
- Three-year agreement: $400 per acre-foot

1.b.) Additionally, Reclamation requested proposals describing Lower Colorado River Basin water conservation plans that can be implemented to reduce consumptive use of lower Colorado River water. The proposals include a price per acre-foot; economic justification for the price; plan description; proposed conservation amount; verification methodologies; approximate time frame for startup and the plan duration.

2) Additionally, in early 2023, Reclamation announced an opportunity for entities to submit proposals for long-term system efficiency improvements that will result in additional system conservation. Prior to approving an agreement under this program, Reclamation will evaluate the amount and timing of water conserved in Lake Mead; the duration of the conservation, and previous participation in existing conservation programs and/or the LC Conservation Program described in 1.a. and 1.b. above with emphasis placed on participation in 1.a. conservation.

The October 2022 Letter included an enclosure entitled, "*Enclosure 1 - Requirements for Lower Basin System Conservation and Efficiency Project Proposals*" (Enclosure 1) that described the proposal and selection requirements under set fixed prices (Program 1.a. in the letter) and under an agreed upon price (Program 1.b. in the letter).

In response to the October 2022 Letter, IID submitted to Reclamation a four-year LC Conservation Program 1.b proposal dated November 21, 2022, to cover calendar years 2023 through 2026. Reclamation evaluated IID's four-year proposal pursuant to the proposal and selection requirements shown in Enclosure 1 to Reclamation's October 12, 2022 letter and selected IID's four-year proposal for inclusion in the LC Conservation Program. This program will require a System Conservation Implementation Agreement with Reclamation similar to previous system conservation efforts in the Lower Colorado River Basin. IID and Reclamation agreed to separate IID's proposal into two parts, one SCIA for calendar year 2023 and one SCIA for calendar years 2024 through 2026. The Proposed Action includes only the calendar years 2024 through 2026 SCIA.

1.3 Purpose and Need

Under NEPA, an EA "shall briefly specify the underlying purpose and need to which the agency is responding" with the Proposed Action (40 CFR 1502.13). Reclamation's (2012) NEPA Handbook states that the purpose and need "shall present a brief statement explaining why the action is being

considered." (Reclamation 2012.) Taken together, the purpose and need for a Proposed Action establish the basic parameters for identifying the range of alternatives to be considered in an EA prepared in accordance with NEPA.

Prolonged drought in the Colorado River Basin and low runoff conditions accelerated by climate change have led to historically low water levels in Lakes Powell and Mead. Over the last two decades, Department leaders have engaged with Colorado River Basin partners on various drought response operations. While hydrology has improved in the Colorado River Basin, reservoir elevations are projected to continue to decline. Therefore, additional action is warranted to protect the Colorado River System and lower the risk of the reservoirs falling to critically low elevations threatening water deliveries and power production. As a result, Reclamation is using the best available science and actively collaborating with water users across the Basin to determine the best ways to meet this increased conservation need.

The historic funding levels committed by the Biden-Harris Administration in the Inflation Reduction Act (Public Law 117-169) provide the financial resources for the LC Conservation Program efforts in the Basin. The LC Conservation Program will incentivize temporary voluntary conservation by funding conserved water on a per acre foot basis. Participation in the LC Conservation Program fulfills the following objectives for IID:

- Promotes voluntary participation of Imperial Valley agricultural water users, including landowners and tenants, so that on-farm efficiency conservation measures can be implemented.
- Implements voluntary water conservation programs to benefit the Colorado River system, Imperial Valley's sole water supply, without impairing or affecting IID's historic senior-priority water rights, in a manner consistent with state and federal law.
- Maintains economic viability and vitality of Imperial Valley's agricultural economy and the surrounding community.

1.4 Background

1.4.1 Institutional Framework of the Lower Colorado River

The Secretary is vested with the responsibility of managing the mainstream waters of the lower Colorado River from Lee Ferry, Arizona in the northern part of the Lower Colorado River Basin to the Southerly International Boundary between the United States and Mexico. The Secretary's responsibilities are performed pursuant to a body of documents referred to as the "Law of the River." The Law of the River comprises operating criteria, regulations, administrative decisions, federal statutes, interstate compacts, court decisions and decrees, an international treaty, and contracts with the Secretary.

1.4.2 Reclamation Lower Colorado Basin Region Responsibilities

On behalf of the Secretary, the Lower Colorado Basin Regional Office performs the Secretary's water master responsibilities for oversight and management of the Lower Colorado River including major dams, reservoirs, diversion works, and other works. The Regional Director, Lower Colorado Basin, represents the Secretary as the water master and performs the oversight, administrative, and operational functions of the water master obligation.

1.4.3 Proposed Action Area

The Proposed Action will involve the conservation of Colorado River water by IID pursuant to the SCIA. The water conservation will occur within the IID Contract Service Area, which is also the "Proposed Action Area," located in Imperial County, California. The extent of the IID Contract Service Area is shown in **Figure 1-1, IID Contract Service Area/Proposed Action Area**.

1.4.4 Overview of IID

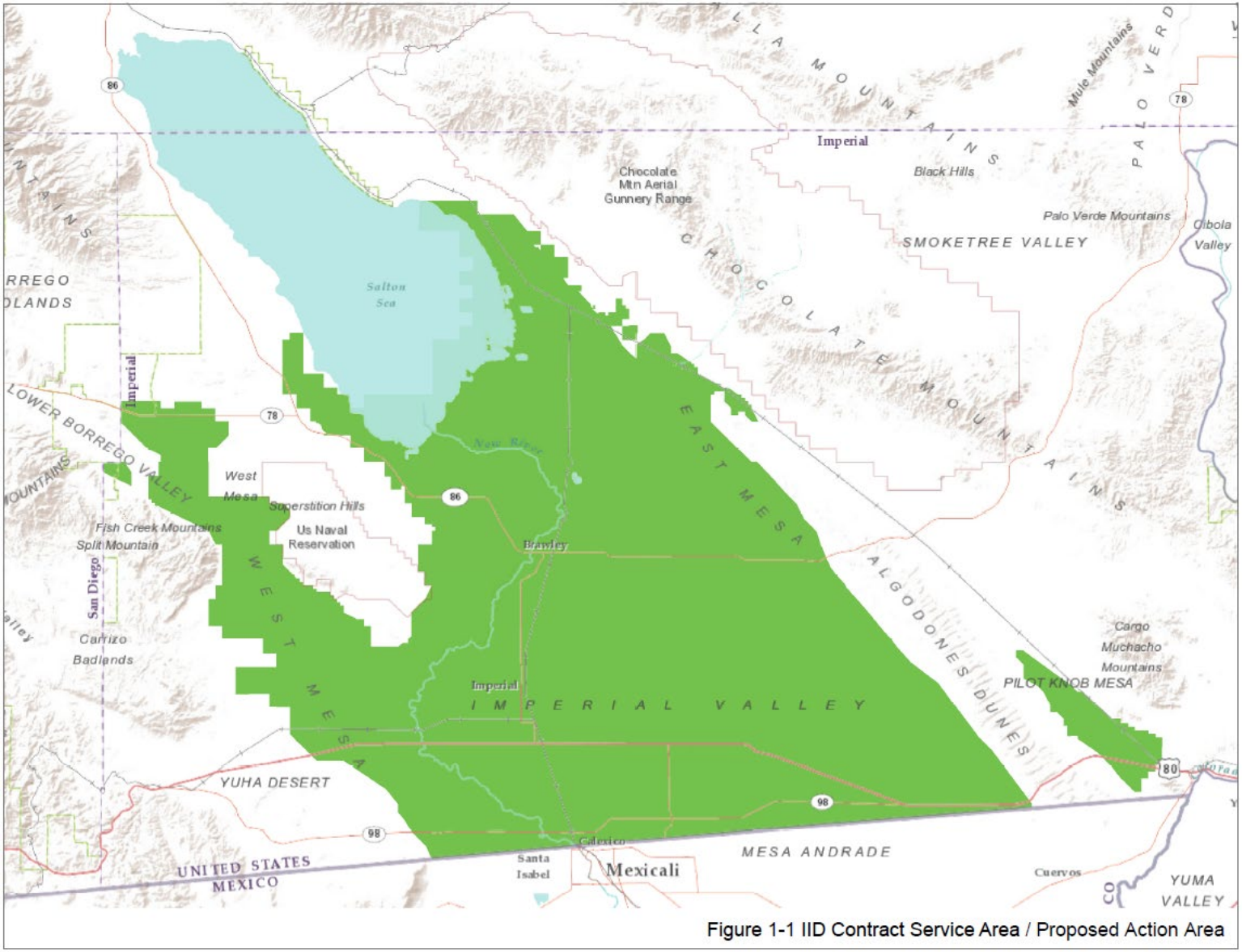
IID is an irrigation district, a limited-purpose public agency, formed under the laws of the State of California. IID holds rights to divert water from the Colorado River and deliver it to its water users, including farmers, tenants, landowners, cities, unincorporated areas, and special districts within a portion of Imperial County. IID was formed by a vote of the people pursuant to the California Irrigation District Law (formerly the "California Irrigation District Act") in 1911. Shortly thereafter, IID acquired 13 mutual water companies in the Imperial Valley which had developed and operated water distribution canals. (IID 2011.)

The Colorado River and its tributaries are a vital source of water for 40 million people today, and 80 percent of U.S. winter crops are irrigated primarily with Colorado River water. Pursuant to the Boulder Canyon Project Act of 1928, California's apportionment of Colorado River water is 4.4 million acre-feet per year (MAFY). The IID service area where it is authorized to deliver Colorado River water (Contract Service Area) is located within Imperial County in the Colorado Desert region of southern California. IID shares California priorities 3a and 6a to Colorado River water in accordance with Contract No. Ilr-747 dated December 1, 1932, as amended and supplemented, as modified by the Agreement of Compromise, dated February 14, 1934, between the Imperial Irrigation District and Coachella Valley County Water District, and as modified (and quantified at 3.1 MAFY) by the terms of the Colorado River Water Delivery Agreement, dated October 10, 2003, all of which includes IID's present perfected rights decreed by the U.S. Supreme Court in *Arizona v. California* (Consolidated Decree, 2006, 126 S. Ct. 1543, pg. 1559-1560).

Irrigated agriculture is the primary economic enterprise within IID's Contract Service Area. Agricultural water users conduct on-farm operations, which include crop irrigation (i.e., applying water to fields) and maintaining on-farm drainage systems. IID supplies Colorado River water to several hundred thousand acres within its Contract Service Area via the All-American Canal (AAC), an 80-mile gravity-fed canal, stretching from the Colorado River at the Imperial Dam to the Imperial Valley. (IID 2011, IID 2023.) The AAC and Imperial Dam are owned by Reclamation and operated and maintained by IID through Contract No. Ilr-747, as amended and supplemented.

In calendar year 2022, IID delivered an estimated 2.4 million acre-feet (MAF) of Colorado River water via its approximately 1,668-mile canal system (described in detail in Section 1.3.4 IID Colorado River Water Delivery Facilities), serving water to 5,150 farm accounts and approximately 471,570 irrigable acres. (IID 2023.) IID also manages approximately 1,456 miles of drains that convey drain water from the agricultural fields into drains that directly connect to the Salton Sea or drain to the Salton Sea via the Alamo River or New River. (IID 2023.) Approximately 96 to 97 percent of Colorado River water deliveries is used for agriculture purposes and less than 4 percent is delivered to non-agricultural water users, including seven cities, two special districts and a private water company that treat the water to safe drinking water standards prior to providing it to their customers, which comprises a total population of approximately 180,000. (IID 2023, USCB 2020.)

Figure 1-1 IID Contract Service Area/Proposed Action Area



1.4.5 IID Colorado River Water Delivery Facilities

IID's operational activities are associated with irrigation (i.e., the diversion, measurement, conveyance, and delivery of Colorado River water via the AAC to customers within the IID Contract Service Area through its canal system) and drainage (i.e., the collection, removal, measurement, and transport of drainage waters to the Salton Sea[1] through its drain system). The major features of these canal and drain systems within the IID Contract Service Area are illustrated in **Figures 1-2a, IID Canal System, and 1-2b, IID Drain System**.

Irrigation

To deliver Colorado River Water to its Contract Service Area, IID orders Colorado River water that is stored in and released from Lake Mead and diverts the water at Imperial Dam. Diverted Colorado River water is desilted and conveyed by gravity through the approximately 80-mile AAC to three primary main canals. (IID 2011, IID 2023.) These primary main canals (East Highline, Central Main, and Westside Main) branch off the AAC as it moves across the southern portion of the Imperial Valley. The main canals supply Colorado River water to numerous lateral canals throughout IID. The lateral canals carry water from the main canals to farm fields; turnouts are used on the lateral canals to deliver water to individual farm fields. All three main canals and all of the lateral canals are owned and operated by IID. In total, IID operates, maintains and repairs a canal system consisting of approximately 1,668 miles of canals, 1,175 miles of which are concrete-lined or pipelined (approximately 1,125 miles of concrete-lined canals, 23 miles of the AAC concrete-lining, and approximately 27 miles of pipe), with unlined earthen channels comprising the remaining miles. (IID 2023.)

IID's conveyance system includes regulating reservoirs and lateral interceptors with mid-lateral reservoirs shown in **Figures 1-3a, 1-3b, and 1-3c, IID Regulating and Interceptor Reservoirs**. To improve system efficiencies, IID uses eight regulating reservoirs to level out the variability in water supply and demand within its canal system. (IID 2023, IID 2024e.) IID's supply of Colorado River water must be ordered from Lake Mead one week in advance; the quantity is based on the estimated demand. (IID 2024d.) Actual demand is affected by weather conditions, business operations, and other factors that may affect an individual's or entity's water use. Lateral interceptors capture spillage (i.e., operational discharge) for reuse within IID's irrigation system. Each of the four lateral interceptors discharges to a temporary storage reservoir (mid-lateral reservoirs). (IID 2023.) The captured discharge is used for water regulation and delivery purposes. Regulating reservoirs and lateral interceptors with mid-lateral reservoirs conserve water and provide improved service to farmers.

Drainage

IID's drainage operations include collection, conveyance, measurement, and discharge of drainage water through IID's drain system to the Salton Sea via the New and Alamo Rivers and directly to the Sea or its shoreline. IID provides drainage within its Contract Service Area. To do so, IID operates a complex drainage system consisting of approximately 1,456 miles of open channel and closed (pipeline) drains and 750 surface and subsurface drainage pumps. (IID 2023, IID 2021.)

[1] Because the Salton Sea has receded since implementation of the QSA, IID drains that historically connected to the Salton Sea no longer connect directly to the Sea, but instead drain onto the exposed shoreline. (IID 2003, IID 2016, IID 2023a.)

Within fields, there are also thousands of miles of subsurface drains (or tile drains), and associated collection pipelines and water recovery systems that feed into IID's drain system. (IID 2021.)

IID's drain system collects tailwater and tilewater from fields within its Contract Service Area, as well as operational discharge water from IID's canal system. Tailwater is irrigation water that runs off the lower ends of fields and is discharged into drains or is collected in sumps from which it is pumped to the nearest drain, river, or directly to the Salton Sea or its shoreline. Locations where tailwater is collected in sumps and pumped directly to the Salton Sea or its shoreline are shown in **Figure 1-4, Salton Sea Pump Locations**. Tilewater is subsurface drainage water from irrigation water that percolates through the soil during farming operations collected by the subsurface tile drains and discharged into the nearest drain, river, or to a sump that pumps the water directly to the Salton Sea or its shoreline (the pump locations are those shown in Figure 1-4, Salton Sea Pump Locations). Currently, approximately 32,000 miles of subsurface tile drains have been installed within the Imperial Valley. (IID 2021.) Drainage outlets for subsurface tile drains are laid out to provide a drainage outlet for each governmental subdivision of approximately 160 acres, generally at intervals of 0.25 to 0.50 miles or less depending on site-specific conditions and needs. (*Id.*) Operational discharge is water resulting from the operation of IID's canal system, including lateral fluctuations, carriage water, and delivery changes in water orders. Operational discharges enter IID's drain system and then flow to the Salton Sea via the New and Alamo Rivers and directly to the Sea or its shoreline. (*Id.*)

1.4.6 Water Conservation Programs

In 2003, IID entered into a series of multi-party agreements collectively referred to as the "Quantification Settlement Agreement" (or QSA). The QSA provides for conserved water created within IID's Contract Service Area to be transferred to the San Diego County Water Authority (SDCWA) and the Coachella Valley Water District, and extended an existing transfer of conserved water to The Metropolitan Water District of Southern California. Under the terms of the QSA, IID annually transfers approximately 500,000 acre-feet (AF), or 16 percent of its entitlement of Colorado River water.

To meet the terms of the QSA, IID has implemented district-wide irrigation system modifications and on-farm water conservation programs. District-wide irrigation system modifications include canal lining and pipelining, the regulating reservoirs and lateral interceptors with mid-lateral reservoirs, canal and lateral interties, canal seepage recovery projects, and an operational discharge reduction program (e.g. SCADA installation and monitoring, automation of lateral headings, computer data collection). (IID 2024g.) IID also conducts the On-Farm Efficiency Conservation Program (OFECP) for participation by agricultural water users to implement conservation measures during crop seasons to create on-farm conserved water and simultaneously promote water use efficiency. Details of the OFECP are provided in Section 2.2.1 On-Farm Efficiency Conservation Program and Simplified OFECP.

Figures 1-2a and 1-2b IID Canal and Drain Systems

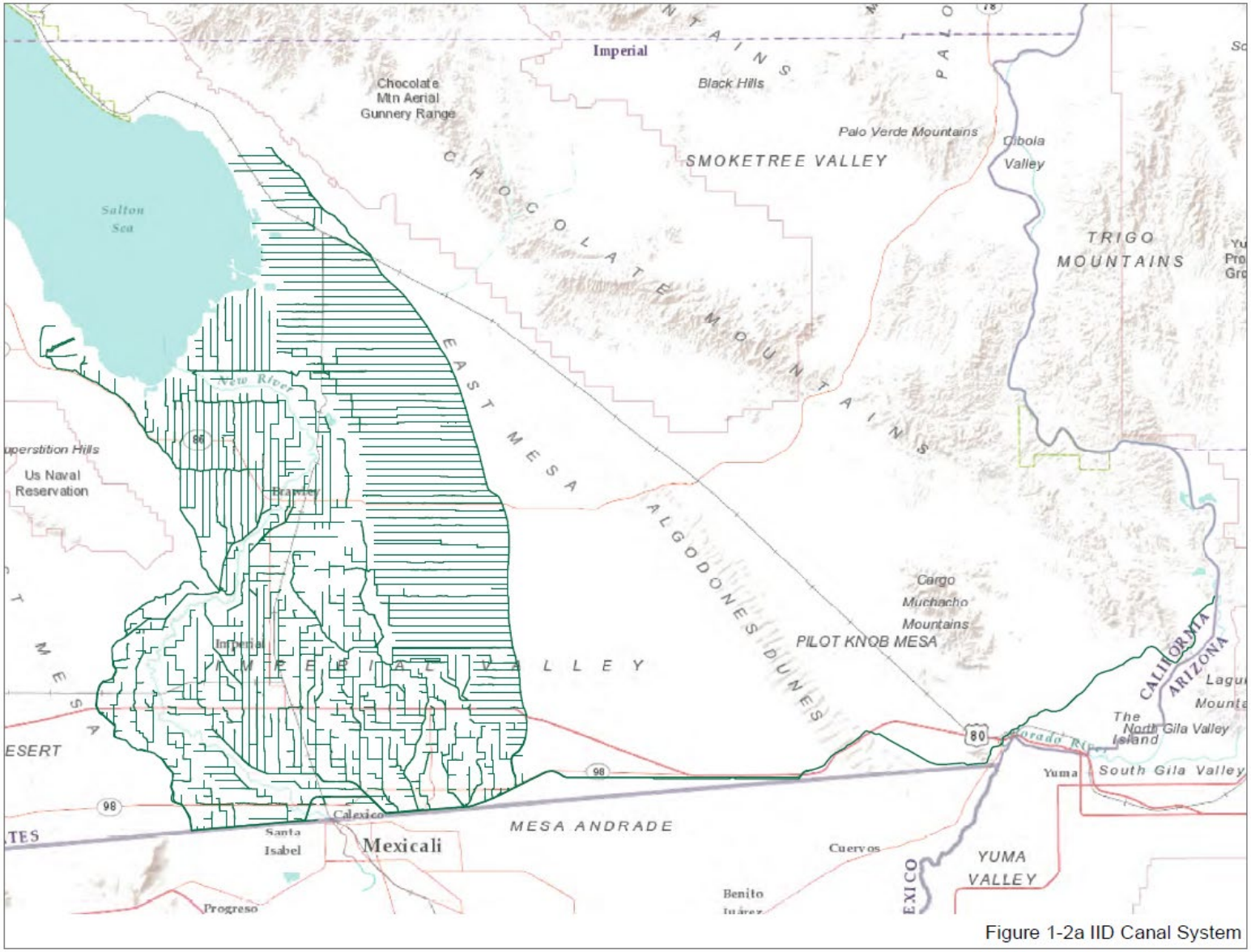


Figure 1-2a IID Canal System

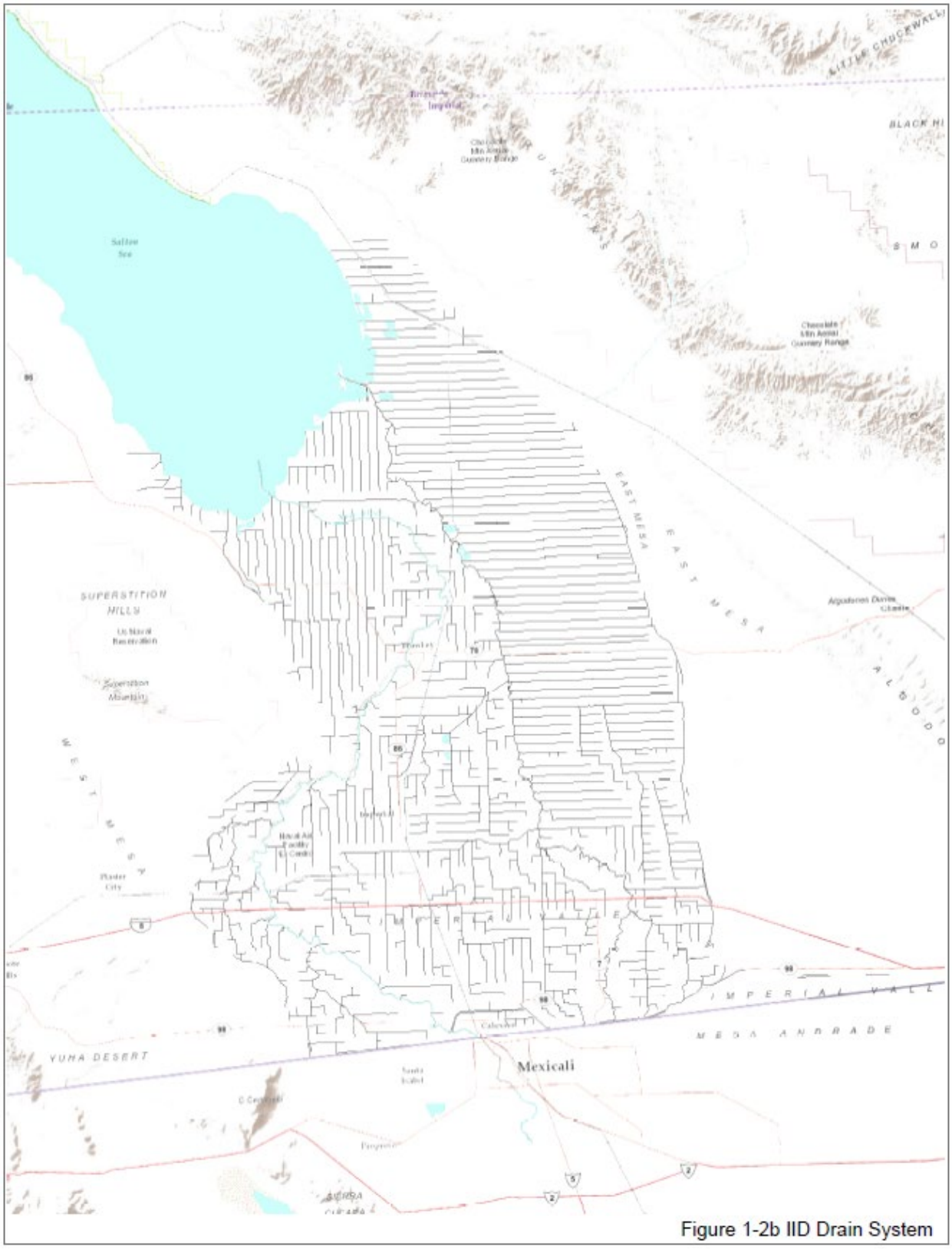


Figure 1-2b IID Drain System

Figures 1-3a, 1-3b, and 1-3c IID Regulating and Interceptor Reservoirs

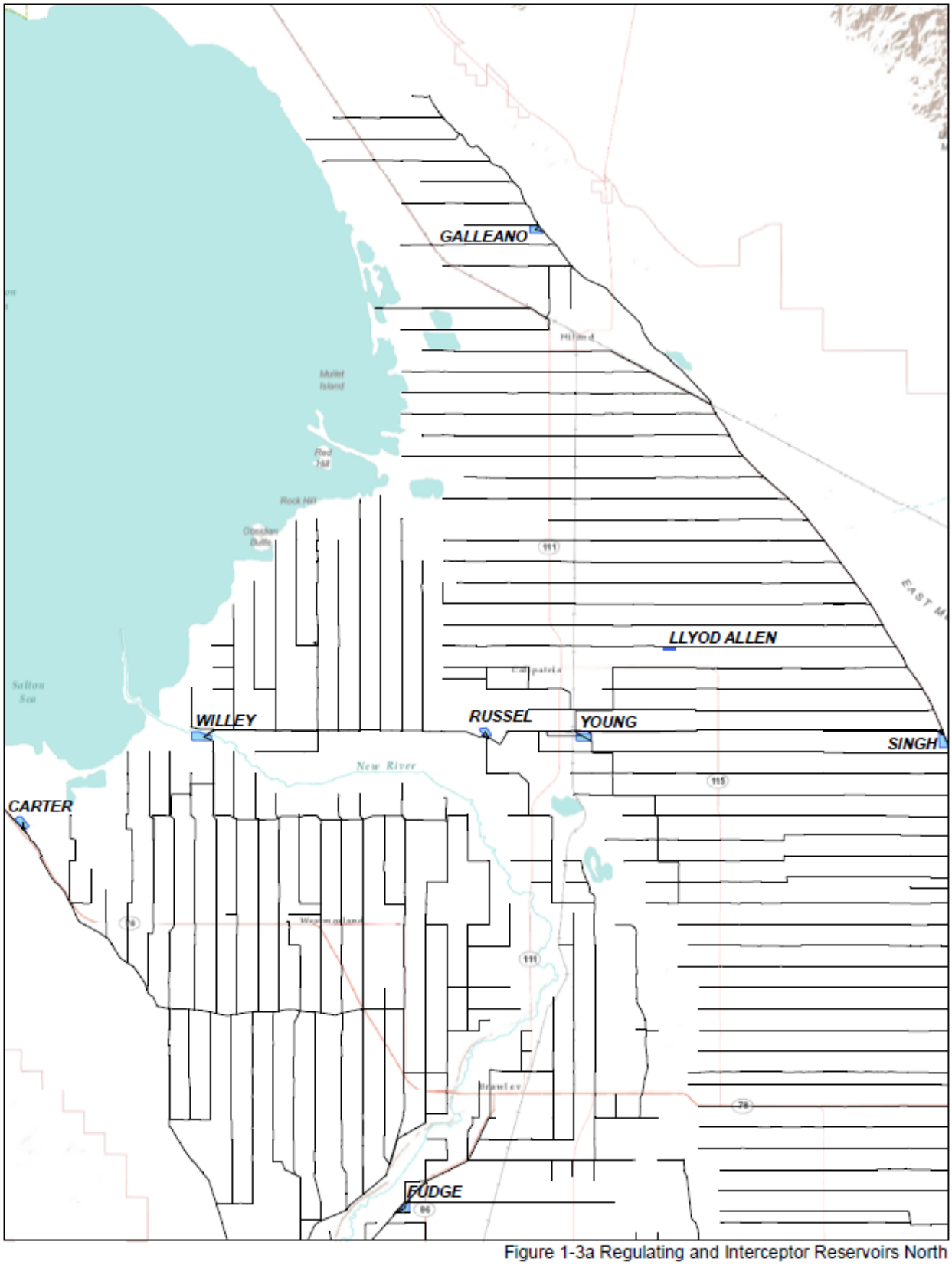


Figure 1-3a Regulating and Interceptor Reservoirs North

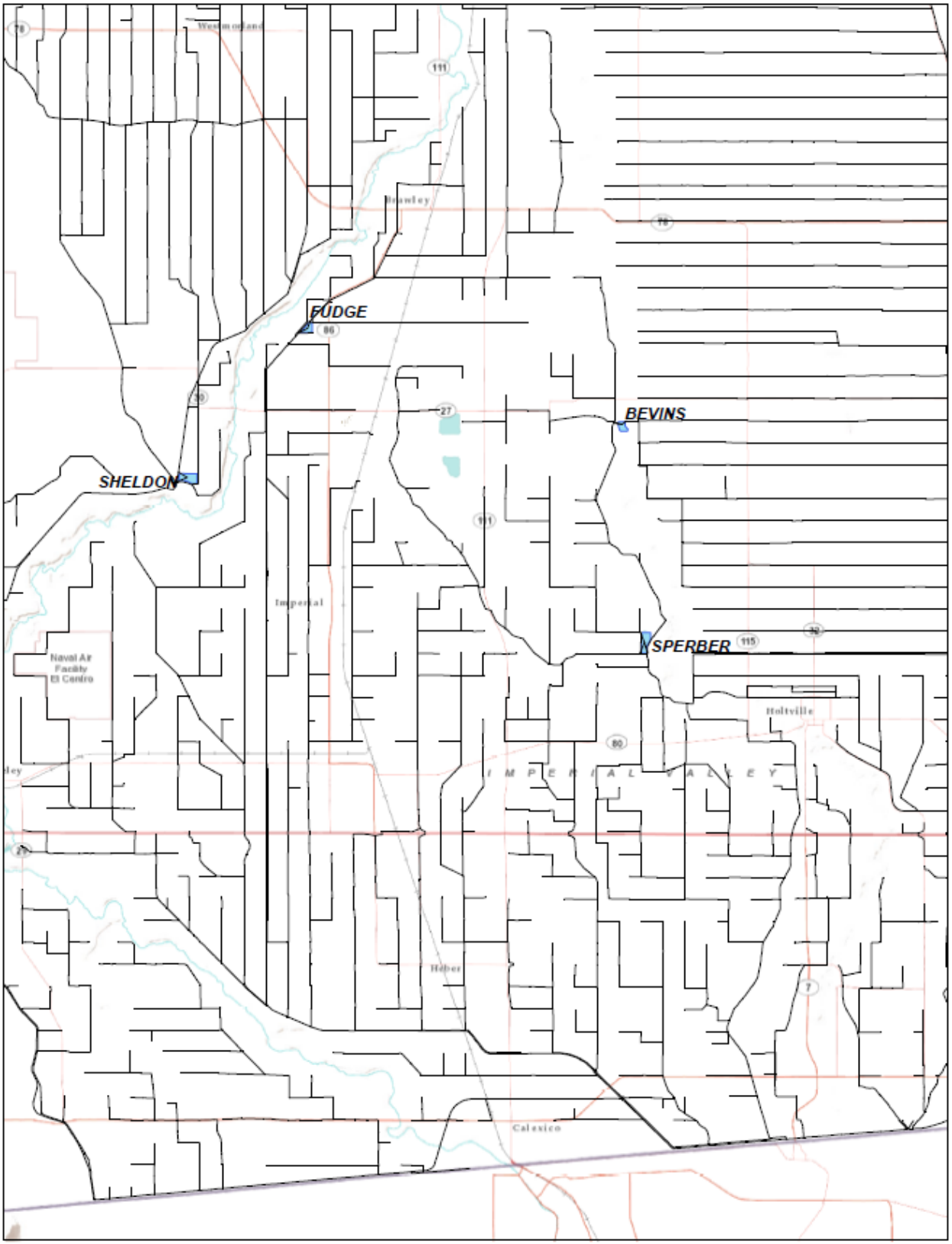


Figure 1-3b Regulating and Interceptor Reservoirs South

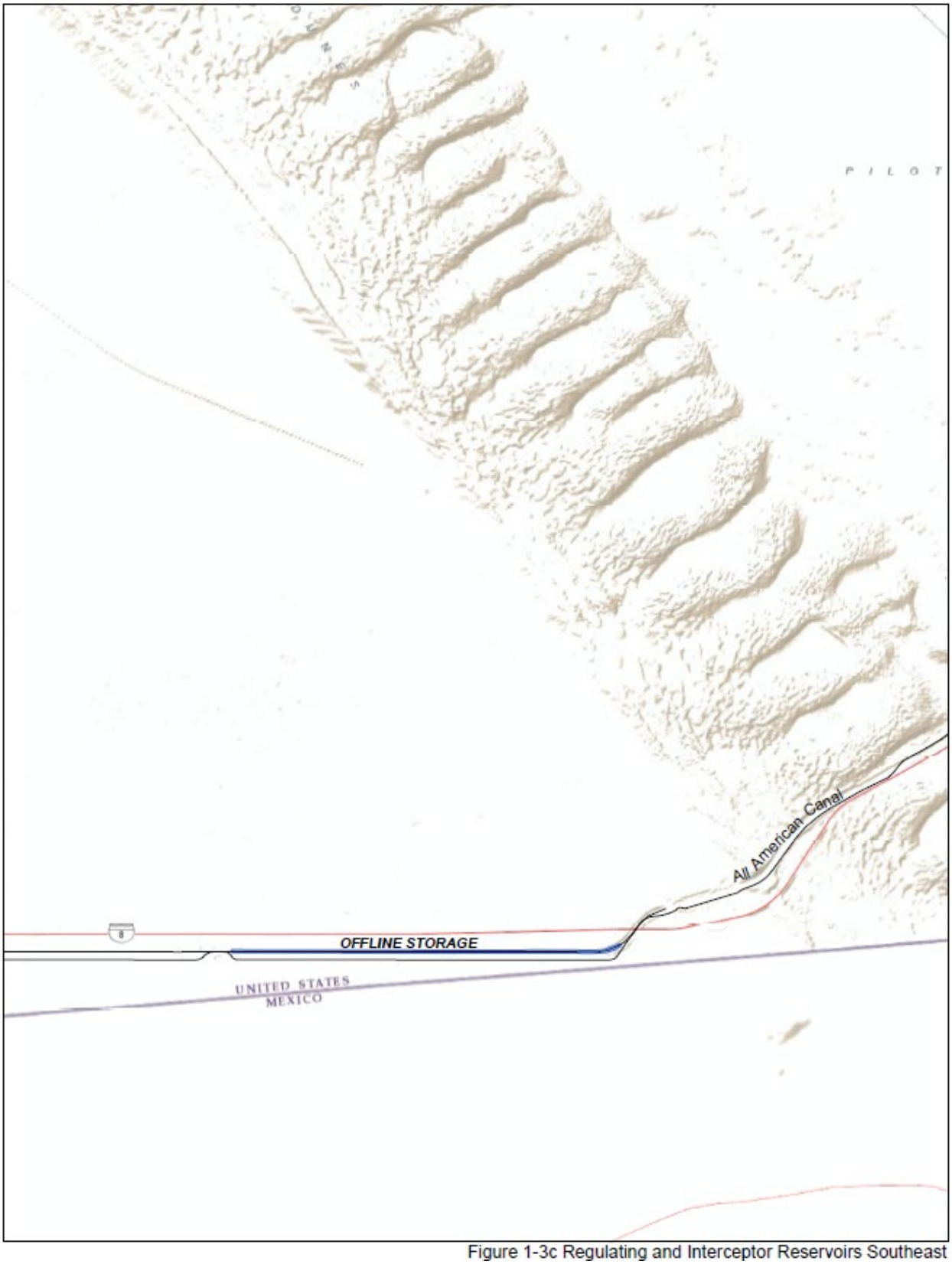


Figure 1-3c Regulating and Interceptor Reservoirs Southeast

Figure 1-4 Salton Sea Pump Locations

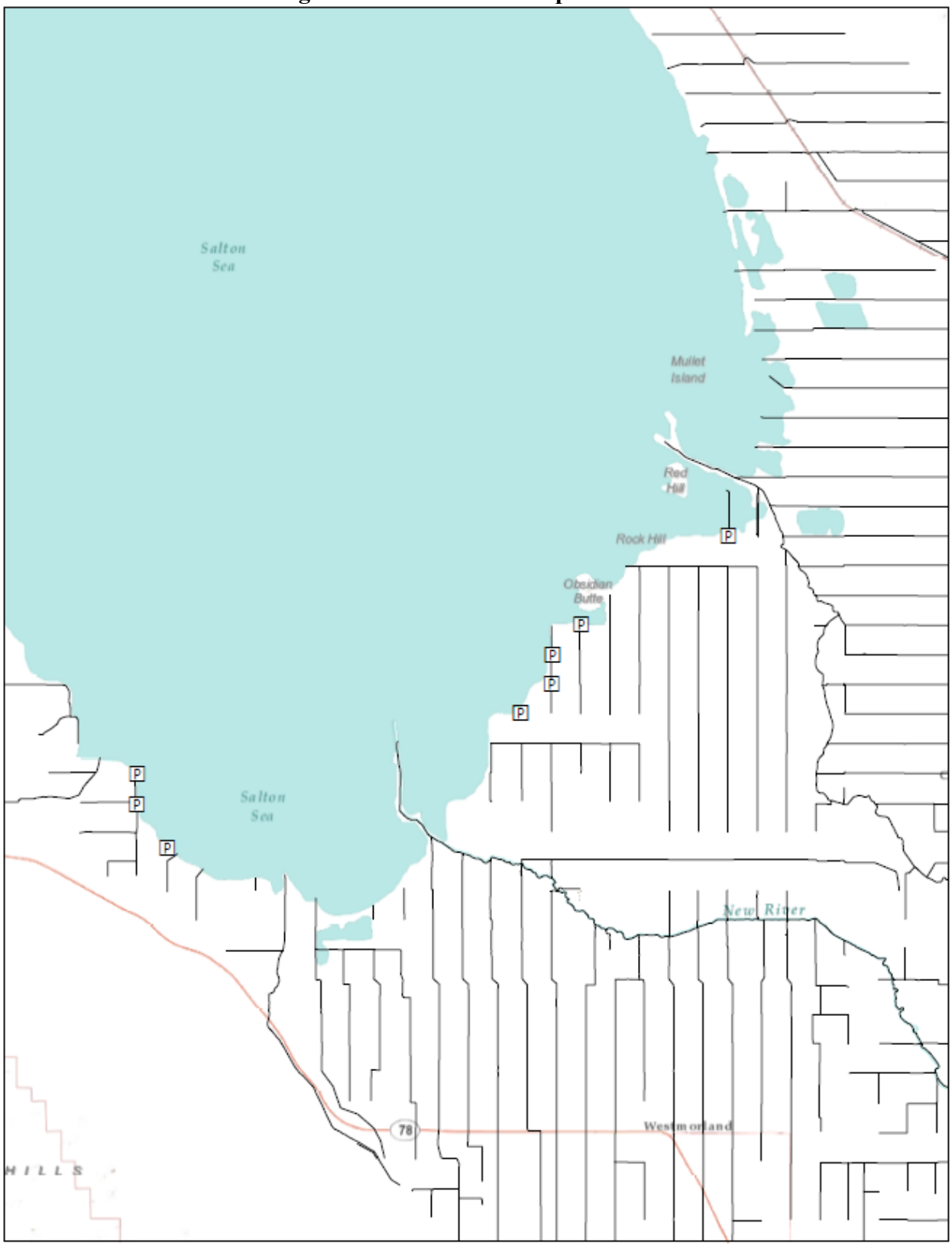


Figure 1-4 Salton Sea Pumps

1.5 Prior Environmental Analysis

In 2002, as the federal lead agency under NEPA, Reclamation certified a Final Environmental Impact Report (EIR)/Environmental Impact Statement (EIS) evaluating the IID Water Conservation and Transfer Project and Habitat Conservation Plan (2002 EIR/EIS). IID was the state lead agency in compliance with the California Environmental Quality Act, California Public Resources Code Sections 21000, et seq. (CEQA). The 2002 EIR/EIS evaluated, among other things, the conservation and transfer of up to 300,000 AFY of Colorado River water to the SDCWA for a designated period of up to 75 years. IID adopted an Addendum to the 2002 EIR/EIS in 2003 that, among other things, modified certain mitigation measures referred to as "the Salton Sea Habitat Conservation Strategies," including the temporary use of mitigation water, modifications to the terms of the water transfer, and modifications to the Endangered Species Act consultation strategies, allowing the water transfers to occur through a Section 7 consultation rather than with a Section 10 process, which would result in a Habitat Conservation Plan. The 2002 EIR/EIS and the 2003 Addendum are hereafter collectively referred to as the "QSA EIR/EIS." This EA incorporates the QSA EIR/EIS by reference for purposes of demonstrating consistency with the analysis of past water conservation efforts, and incorporating information and analysis from the QSA EIR/EIS where appropriate (43 CFR Sec. 46.135).

Simultaneously with the development of this EA, Reclamation prepared a Near-Term Colorado River Operations Final Supplemental Environmental Impact Statement, March 2024, for the 2007 Interim Guidelines (SEIS). The SEIS analyzed recent trends in hydrology relevant to the operation of critical elevation tiers in Lake Powell and Lake Mead. Because the SEIS considers effects of potential reduced flows in the Lower Colorado River Basin resulting from system conservation agreements, this EA does not specifically analyze the potential effects on the mainstem of the Colorado River.

1.6 Cumulative Projects List

Cumulative effects are potential impacts on the environment that result from the incremental impacts of an action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7). A list of relevant past, present, and reasonably foreseeable projects that involve the potential for water conservation and reduced water flow to the Salton Sea is provided in **Table 1-1, Cumulative Projects List**.

Table 1-1 Cumulative Projects List

Name	Applicant	Summary	Status
Salton Sea Management Program (SSMP), Phase 1: 10-Year Plan; Species Conservation Habitat Project	DWR	Aquatic habitat and dust control projects	Partially in Planning and Partially in Construction

Name	Applicant	Summary	Status
Lithium Valley Specific Plan	Imperial County	Specific Plan	In Planning
Quantification Settlement Agreement (QSA) Water Conservation and Transfer Project and Habitat Conservation Plan	IID	Water conservation and transfer to CVWD, MWD, and SDCWA	Ongoing (Partially in Planning, Construction and Completed)
All American Canal Lining	IID	Lining of the canal	Completed
Salton Sea Air Quality Mitigation Program	IID	Dust suppression projects	Ongoing (Partially in Planning, Construction and Completed)
Managed Marsh Complex	IID	Aquatic habitat creation and management	Completed
Colorado River Conservation Agreement between IID and BOR 2023	IID	Colorado River Conservation for 2023	Completed
Coachella Canal Lining	CVWD	Lining of the canal	Completed
WRP No. 4 Recycled Water Program	CVWD	Enhancing wastewater treatment and diverting discharges to irrigation	In Planning
Colorado River Conservation Agreements between CVWD and BOR	CVWD	Groundwater recharge reduction and fallowing	Completed
Atlis Plant Energy Source Minerals LLC	Imperial County	Lithium zinc and manganese mining	In Planning
Hell's Kitchen PowerCo1 and LithiumCo 1 Project	Hell's Kitchen Geothermal, LLC	49.9 MW geothermal plant and lithium extraction and processing facilities	In Planning
Morton Bay Geothermal Project	Morton Bay Geothermal, LLC	50 MW geothermal plant and related facilities	In Planning
Black Rock Geothermal	Black Rock Geothermal, LLC	77 MW geothermal plant and related facilities	In Planning
Elmore North Geothermal	Elmore North Geothermal, LLC	140 MW geothermal plant and related facilities	In Planning
New River Improvement Project	City of Calexico	River water treatment infrastructure	In Construction

2.0 Description of Alternatives

2.1 No Action Alternative

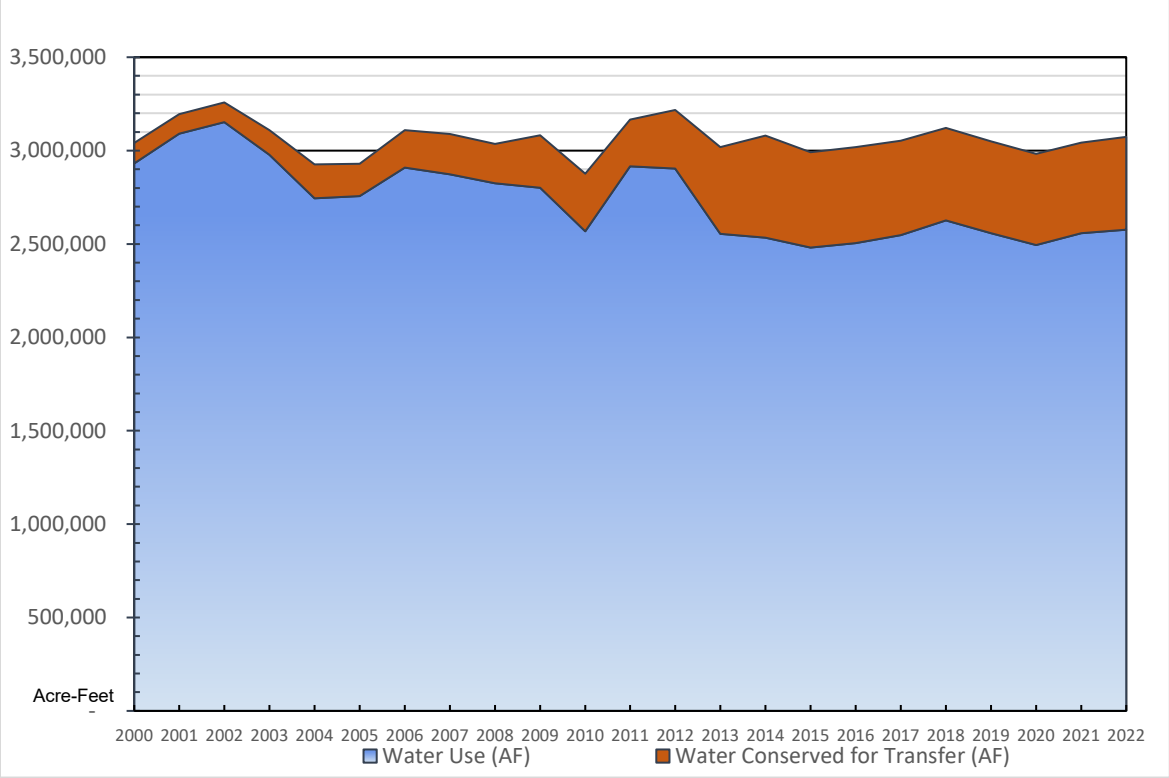
Under the No Action Alternative, IID would not participate in the LC Conservation Program. There would be no volume of conserved water created within IID's Contract Service Area under the LC Conservation Program. No changes to IID's Colorado River water deliveries or on-farm practices would occur.

2.2 Proposed Action Alternative

Pursuant to the Proposed Action, IID would agree to conserve a target volume of 250,000 AF, up to a maximum of 300,000 AF, of Colorado River water each year from 2024 through 2026, targeting a cumulative total of 800,000 AF, but no more than a cumulative maximum total of 900,000 AF, of water between 2024 and 2026, which will remain in Lake Mead to benefit the Colorado River System. The terms and conditions of the Colorado River System water conservation and funding are set forth in the SCIA with Reclamation.

IID has received delivery of approximately 2.5 MAFY from the Colorado River during the period from 2019 through 2022 as shown in **Figure 2-1, IID Colorado River Water Use 2000-2022**. (IID 2023.)

Figure 2-1 IID Colorado River Water Use 2000-2022



This volume is down from the approximately 3 MAFY volumes experienced prior to the implementation of water conservation programs initiated under the QSA beginning in 2003. (IID 2003, IID 2023.) Annual Colorado River water deliveries to IID vary annually primarily based on cumulative agricultural demands in the IID Contract Service Area that are affected by several factors, including economic and climatic conditions. The water conservation programs implemented pursuant to the Proposed Action would temporarily further reduce IID deliveries to approximately 2.2 MAFY for three years from 2024 through 2026. Colorado River water deliveries to IID would return to pre-Proposed Action volumes beginning in 2027 upon the expiration of the SCIA and conclusion of the water conservation programs provided for by the SCIA.

The Proposed Action will provide the funding for IID's implementation of water conservation programs under which agricultural water users conserve water, thereby reducing water diversions from the Colorado River at Imperial Dam. The potential conservation programs include the following:

- On-Farm Efficiency Conservation Program (OFECP) or Simplified OFECP,
- Deficit Irrigation Program (DIP), and
- Farm Unit Fallowing Program (FUFP).

These water conservation programs are described in further detail below. One or a combination of two or more of these water conservation programs will be implemented from 2024 through 2026, to achieve the annual 250,000 AF water conservation volume target and the cumulative 800,000 AF water conservation volume target under the Proposed Action. All water conservation programs are voluntary and offered to all agricultural water users for all irrigable agricultural acreage (or fields) within IID's Contract Service Area. While the implementation of the programs will overlap in time, agricultural water users will only be able to have one field participate in one conservation program at a time. This is largely because on-farm efficiency conservation and fallowing are mutually exclusive. In other words, the OFECP or simplified OFECP requires active farming activities and irrigation on a field and the DIP and FUFP require no irrigation or farming activities on a field. Therefore, participation in the OFECP or simplified OFECP and the DIP or FUFP cannot be done simultaneously. Additionally, the DIP and FUFP would have overlapping conservation periods and the requirements for each program are separate and unique to the program. Consequently, a field could only be in one program at a time.

The fallowing programs involve halting the application of irrigation water to fields for various periods of time. The FUFP is for a 6-month to one-year period during which no crop is actively farmed on a field and no irrigation water is applied to the field. The DIP is a 45- to 60-day period in the summer during which no irrigation water is applied to alfalfa, bermuda grass, or klein grass crops, or seed crops of any of those three crops. The efficiency-based programs involve the implementation of one or more conservation measures on a crop and field to reduce the consumptive use of the crop and/or reduce delivery of irrigation water to the field while simultaneously maintaining crop production. IID intends to prioritize the OFECP and DIP water conservation programs.

2.2.1 On-Farm Efficiency Conservation Program (OFECP) and Simplified OFECP

Under the Proposed Action, IID may implement the existing OFECP or a simplified OFECP. The maximum acreage potentially participating in the OFECP or the simplified OFECP is 65,000 acres per year resulting in up to a maximum of 50,000 acre-feet per year of efficiency-based conserved water. However, IID does not anticipate that the maximum acreage and acre-feet would be reached with implementation of the DIP and/or FUFP because there is a finite amount of farmable agricultural acreage within IID's Contract Service Area and, as a result, there is an inverse dynamic relationship between the OFECP and the implementation of the DIP and/or FUFP. As described above, the same farmable agricultural acreage cannot simultaneously be in the OFECP and another conservation program. Therefore, participation of fields in the DIP or FUFP would reduce the acreage participating in the OFECP.

The OFECP results in no change in cropping patterns but reduces the amount of water consumptively used by a specific crop on a specific field through the use of field-level conservation measures that result in increased agricultural water use efficiencies. The conservation measures are selected by the agricultural water user and include, but are not limited to, the use of drip and sprinkler irrigation systems, tailwater return systems, field reconfiguration measures, and land-leveling. Some of the conservation measures require ground disturbance; these will be restricted to areas of existing and historical surface and vertical disturbance. The OFECP uses an algorithm to calculate a consumptive water use reduction associated with a specific crop on a specific field participating through implementation of one or more conservation measures for the crop season, which is a calendar year if it is a perennial crop. The algorithm uses field-specific water use histories by crop (or district-wide averages if there is no water use history for that crop on that field). Participating crops and fields that result in a consumptive water use reduction are paid for the water conservation volume on a per acre-foot basis.

The simplified OFECP is generally the same program as the OFECP, but modifies the water conservation calculation methodology. Rather than calculating the consumptive water use reduction volume associated with a specific crop on a specific field, the simplified OFECP would use an average consumptive water use reduction volume, using the historic IID-wide OFECP data set, associated with each specific combination of crop type, conservation measure(s), and soil type. The average conservation volumes would be recalculated each year based on updated data from the field-level OFECP consumptive water use reduction calculations. Participating crops and fields that implement one or more conservation measures resulting in a consumptive water use reduction would be paid for the IID-wide average water conservation volume on a per acre-foot basis.

2.2.2 Deficit Irrigation Program (DIP)

Under the Proposed Action, IID may implement the DIP for agricultural water users on fields anywhere in the IID Contract Service Area that are owned or leased for agricultural use and cultivating alfalfa, bermuda grass, or klein grass, or seeds for one of these three crops. Participating fields would be allowed to choose between a 45-day to 60-day time period within the months of June, July, August, and September during which time the field would not be irrigated. The maximum acreage potentially participating in the DIP is 180,000 acres per year resulting in up to a maximum of 226,000 acre-feet of conserved water per year. Participating fields would be paid for the water conservation volume attributable to the fallowed 45-day to 60-day time period on a per acre-foot basis.

2.2.3 Farm Unit Fallowing Program (FUFP)

Under the Proposed Action, IID may implement the FUFP. Farm units are an aggregation of fields managed by an agricultural water user. Participating farm units will forego delivery of irrigation water on certain fields within the farm unit for the term of 6 months to one year. The FUFP would be for a 6-month to one-year fallowing period beginning July 1st of one year up to June 30th of the following year consistent with typical agricultural lease terms. To implement the FUFP, IID will determine the total volume of conserved water required for the FUFP based on participation in the OFECP and/or DIP and the remaining conserved water volume needed to meet IID's conservation targets. Each farm unit would be offered a pro-rata share of the total FUFP conserved water volume. The agricultural water user would be allowed to accept the volume offered and identify which field(s) in a farm unit to be fallowed.

The maximum acreage potentially participating in the FUFP is 34,450 acres resulting in up to a maximum of 172,250 acre-feet of conserved water for a one-year period. However, due to the term of the FUFP, IID would only be able to implement one one-year program by the end of 2026, from July 1, 2025 through June 30, 2026. Under this one-year program, for the 6 months in 2025 (July 1 through December 31) the maximum acreage potentially participating in the FUFP is 34,450 acres resulting in a water conservation volume of up to a maximum of 86,250 acre-feet. Similarly, for the 6 months in 2026 (January 1 through June 30), the maximum acreage potentially participating in the FUFP is 34,450 acres resulting in a water conservation volume up to a maximum of up to 86,250 acre-feet. If IID implements a 6-month program before or after the one-year program, any 6-month period would be the same maximum acreage potentially participating in the FUFP and the same maximum water conservation volume resulting from that acreage as set forth above. Participating farm units would be paid for the water conservation volume attributable to the fallowed fields for the 6-months to one-year term on a per acre-foot basis.

To minimize the potential for dust emissions from fallowed lands, participants in the FUFP would be required to implement best management practices (BMPs) recommended by the U.S. Department of Agriculture Natural Resources Conservation Service, including the following:

1) Plan ahead to start with plenty of vegetation residue and maintain as much residue on fallowed fields as possible.
2) Avoid any tillage.
3) Avoid any traffic on the field or tillage when fields are extremely dry to avoid pulverization.
4) If residues are not adequate, either small grain can be seeded around the first of the year to take advantage of winter rains, or soil stabilization chemicals may be applied to fallowed lands.

2.2.4 IID Drain and Salton Sea Vegetation Monitoring and Reporting Plan

To ensure that the Proposed Action will not result in adverse effects to listed species within the IID Contract Service Area, specifically the desert pupfish and the Yuma Ridgway's rail, IID will implement this IID Drain and Salton Sea Vegetation Monitoring and Reporting Plan (Monitoring Plan) for the three years of the Proposed Action, calendar years 2024 through 2026. This Monitoring Plan includes three monitoring components. Section 2.2.4.2 Drain Monitoring and Section 2.2.4.3 Vegetation Monitoring identify ongoing drain and vegetation monitoring to be conducted by IID throughout the short-term period of the Proposed Action. This ongoing monitoring is to provide

context and information regarding the general conditions of the IID drains and adjacent vegetation along the southern shoreline of the Salton Sea during the implementation of the conservation programs under the Proposed Action. Section 2.2.4.4 Action Triggers establishes triggers that would require action to be taken by IID. Vigilant drain and vegetation monitoring will be conducted to identify if or when those triggers occur. Section 2.2.4.5 Impact Avoidance Measures sets forth the specific actions to be taken by IID, when an action trigger occurs, to ensure that there are no adverse effects to listed species under the Proposed Action. This Monitoring Plan will be conducted in coordination with USFWS, Reclamation, and CDFW to confirm that the Proposed Action will not adversely affect listed species within the IID Contract Service Area.

2.2.4.1 Establish Monitoring Plan Area

The Proposed Action will result in water conservation within the IID Contract Service Area, which will reduce the volume of water flowing into IID's drains for the temporary short-term period of three years. Desert pupfish and Yuma Ridgway's rails have been recorded within the terminus of certain IID drains that flow directly to the Salton Sea and within the vegetation occurring along the southern shoreline of the Salton Sea adjacent to the drains. This Monitoring Plan will be applicable to the IID drains that flow directly to the Salton Sea and the vegetated areas along the southern shoreline of the Sea receiving water from those IID drains.

2.2.4.2 Drain Monitoring

Flow Monitoring

During the short-term period of the Proposed Action, drain flow data will be collected from IID drains that flow directly to the Salton Sea on an ongoing basis using one of the two following methods:

1. Automatic sensors installed within the drain that collect data at one-hour intervals; or
2. Hand-held water current meters manually used by IID staff that collect data at weekly intervals.

Automatic sensors can be installed in drains where weir structures are located such that the physical conditions of the weir, drain banks and terrain of the drain terminus are sufficiently stable to allow for the installation and maintenance of the sensor and the reliable operation of the sensor to collect the data. Below are pictures of the automatic sensors used by IID.[2] The automatic sensors are ultrasonic water level sensors that are located above the water level of the drain and measures the distance between the sensor and the water surface using sound waves. The data is transmitted through IID's supervisory control and data acquisition (SCADA) computer system, which is a system of software and hardware elements that allow IID to transmit and receive electronic data. The water level data collected from the automatic sensors are converted to a flow rate calculated at that cross section of the drain per unit of time, or cubic feet per second (cfs) in this instance, using a

[2] The specifications for the automatic sensors are the following: ToughSonic 14 ultrasonic sensor/Senix. Long range — small housing, Rugged construction, IP68 rated, Indoor or outdoor uses, Straight or tapered thread options, Two outputs plus serial data, Serial data-only models. Temperature compensation options, Push-button or PC configurable, Open channel flow – flumes, weirs.

hydrometric calculation of the weir length (width of the weir structure at the grade boards) and the water height (equal to the water level minus the weir elevation).

Automatic sensor (2 views)

An automatic sensor cannot be installed and properly operated within certain drains due to the physical conditions and terrain around and within the terminus of those drains. In those instances, the only feasible method of drain flow measurement will be hand-held water current meters. Below are pictures of the hand-held water current meters used by IID.[3] The hand-held water current meters collect water velocity data through the probe that is placed in the water. The water velocity data is then transmitted from the probe through the probe cable into the hand-held controller that stores the data until it is exported from the controller into IID's computer system. Again, the water velocity data collected from the hand-held current meter at differing depths across a single cross section of the drain that are then converted to a flow rate calculated per unit of time, or cubic feet per second (cfs) in this instance, using a hydrometric calculation of the area of water at the cross section and the average velocity of the water at that cross section.

Hand-held water current meter (2 views)

[3] The specifications for the hand-held water current meters are the following: FlowTracker Handheld-ADV® (Acoustic Doppler Velocimeter) measures 2D or 3D currents, attaches easily to wading rods, and features an automatic discharge computation using a variety of international methods, including ISO and USGS standards. The FlowTracker also features SonTek's exclusive "SmartQC" which involves a series of built-in data quality checks, Unmatched performance in shallow water and low flows.

The majority of the IID drains that flow directly to the Salton Sea have automatic sensors installed for the drain flow data collection as shown in **Table 2-1, IID Drain List** below. Table 2-1, IID Drain List includes the IID drain locations where desert pupfish have been recorded.

Table 2-1 IID Drain List

Drain Location[4]	**Flow Data Collection Method**
Niland Drain 1	Automatic Sensors
Niland Drain 2	Automatic Sensors
Niland Drain 3	Automatic Sensors
Niland Drain 4	Automatic Sensors
O Drain	Automatic Sensors
P Drain	Automatic Sensors
Poe Drain	Hand-held Current Metering
Pumice Drain	Hand-held Current Metering
Q Drain	Automatic Sensors
R Drain	Automatic Sensors
S Drain	Automatic Sensors
San Felipe Wash Drain	Automatic Sensors
T Drain	Automatic Sensors
Trifolium Drain No. 1	Automatic Sensors
Trifolium 12 Drain	Automatic Sensors
Trifolium 13 Drain	Hand-held Current Metering
Trifolium 14A Drain	Hand-held Current Metering
Trifolium 18 Drain	Hand-held Current Metering
Trifolium 19 Drain	Hand-held Current Metering
Trifolium 20 Drain	Hand-held Current Metering
Trifolium 20A Drain	Automatic Sensors
Trifolium 22 Drain	Automatic Sensors
Trifolium 23 Drain	Automatic Sensors
Trifolium Storm Drain	Hand-held Current Metering
U Drain	Automatic Sensors
Vail 5 Drain	Hand-held Current Metering
Vail Lateral 6	Automatic Sensors
W + Y Drain	Automatic Sensors
Vail Cutoff Drain	Hand-held Current Metering
Z Drain	Automatic Sensors

[4] This list does not include the Niland 5 Drain, which has no record of pupfish being located within it, or the Trifolium 21 Drain, which is a pipeline. Vegetation monitoring set forth in this Monitoring Plan will address the volume of drain water from all IID drains that flow directly to the Salton Sea to ensure there are no adverse effects to Yuma Ridgway's Rails. Therefore, there is no purpose in monitoring drains in which pupfish have not been recorded, which includes only the Niland 5 Drain and the Trifolium 21 Drain.

The drain flow data will be collected by the automatic sensors and hand-held current meters at the general location points shown on **Figures 2-2a, 2-2b, and 2-2c, Drain Flow Monitoring Locations**. It is anticipated that the exact locations where IID staff will be able to use the hand-held current meter will need to be coordinated with USFWS, Reclamation, and CDFW. Consideration will need to be given to IID staff safety to traverse through dense vegetation located within the terminus of each drain (downstream of the last structure) to collect the drain flow data. The drain flow data will be compiled to be available for review during the quarterly meetings with USFWS, Reclamation and CDFW and to be included in the annual reports submitted to USFWS, Reclamation and CDFW.

Visual Monitoring

IID staff will conduct weekly drain habitat monitoring by photographic documentation for each drain identified in Table 2-1, IID Drain List. The visual drain habitat monitoring will be conducted by IID staff at the general location points shown on **Figures 2-3a, 2-3b, and 2-3c, Drain Habitat Monitoring Locations**. These locations have been identified by IID staff as feasibly accessible for the visual monitoring to be safely conducted by IID staff near each drain terminus (downstream of the last structure) and to allow sufficient visual access to adequately document the conditions of the terminus of each drain. The drain habitat photographic documentation will be compiled to be available for review during the quarterly meetings with USFWS, Reclamation and CDFW and to be included in the annual reports submitted to USFWS, Reclamation and CDFW.

Farmland Mapping

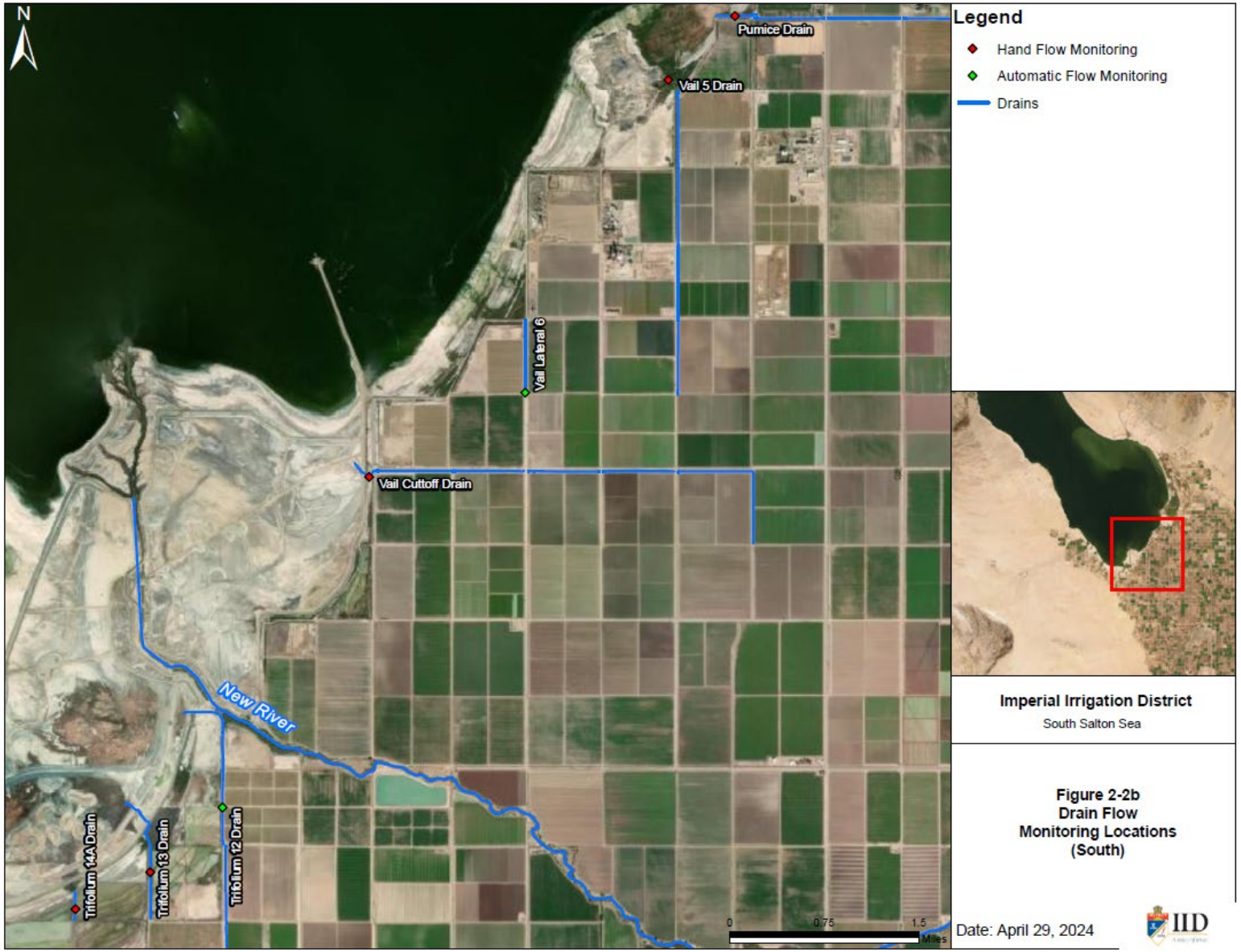
IID will develop maps showing drain-sheds for the drains that flow directly to the Salton Sea. To document existing conditions, IID will develop a map showing the 5-year (2019-2023) historical field participation in the existing OFECP. The drain-shed map and the historical OFECP map will be provided to the USFWS, Reclamation, and CDFW upon completion. IID will also develop maps showing fields participating in the IID conservation programs under the Proposed Action. These maps will be updated each quarter and available for review during the quarterly meetings with USFWS, Reclamation and CDFW. These maps will also be included in the annual reports submitted to USFWS, BOR, and CDFW.

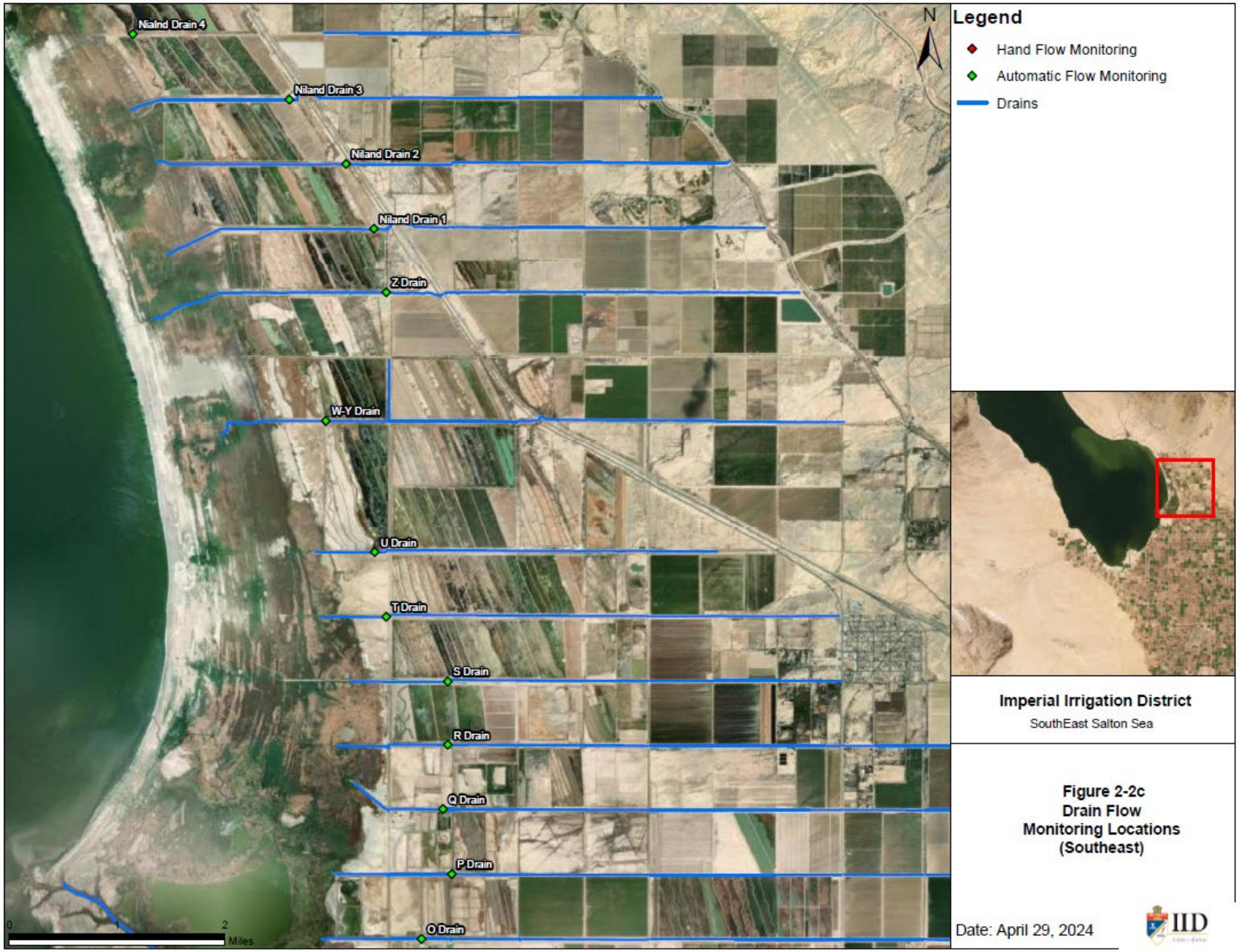
2.2.4.3 Vegetation Monitoring

Satellite Imagery and Mapping

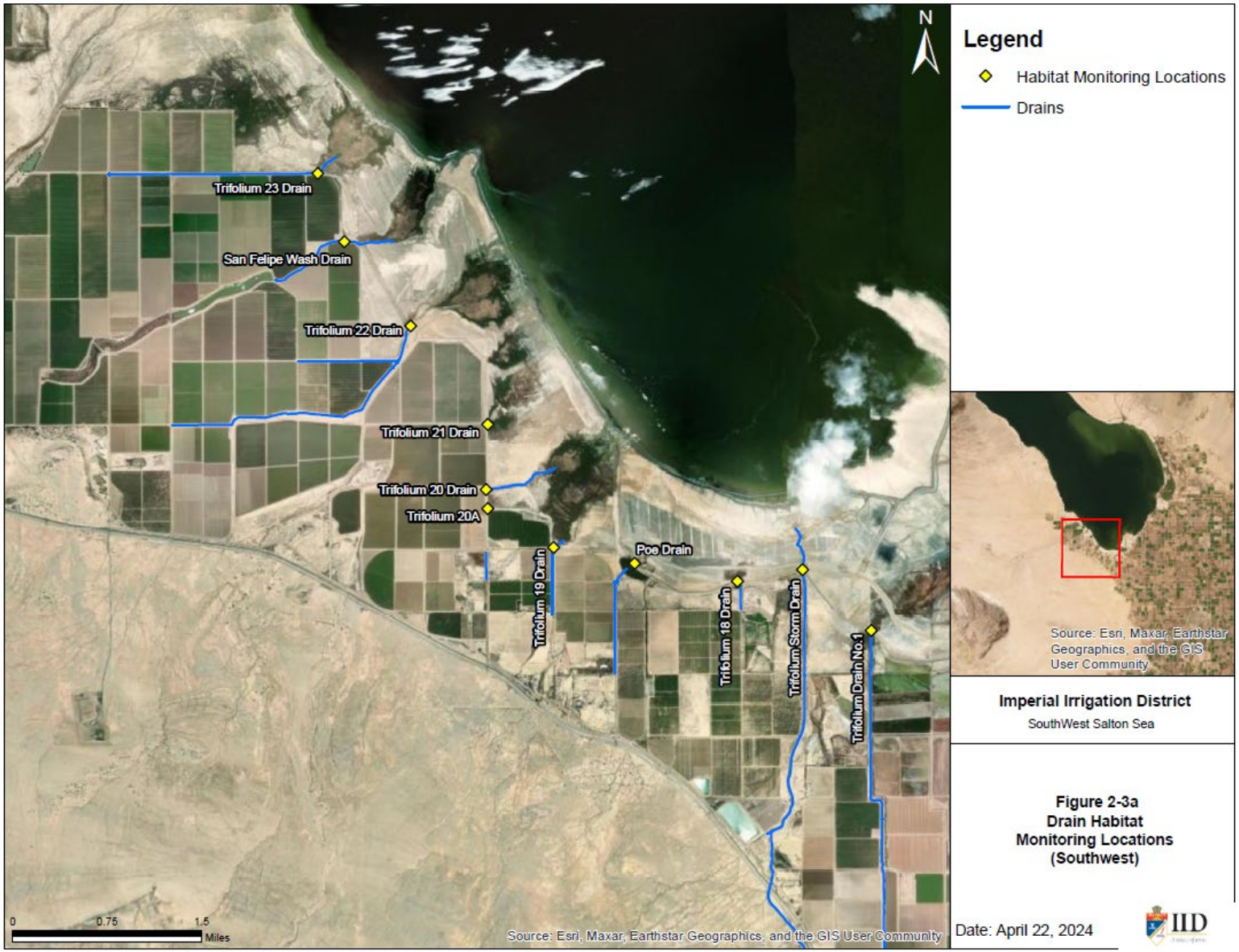
IID will map existing vegetation communities adjacent to the termini of IID drains along the southern shoreline of the Salton Sea within the three Vegetation Monitoring Areas shown on **Figures 2-4a, 2-4b, and 2-4c**, **Vegetation Monitoring Areas**, which will be provided to the USFWS, Reclamation, and CDFW upon completion. The Vegetation Monitoring Areas do not include vegetation within the CNRA's Salton Sea Species Conservation Habitat Project area because that area is under construction and subject to CNRA's obligations relating to the vegetation within that site.

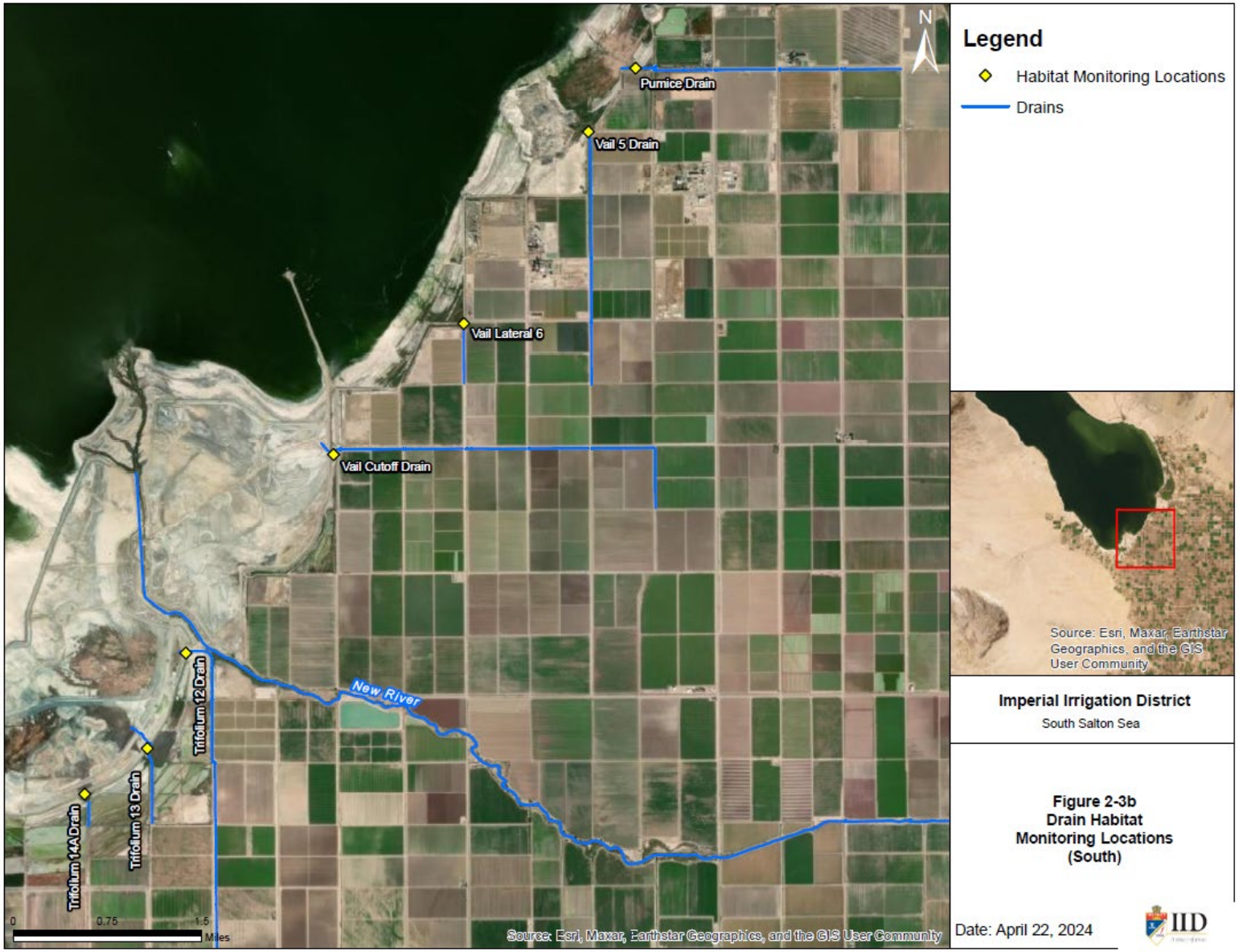
Figures 2-2a, 2-2b, and 2-2c Drain Flow Monitoring Locations

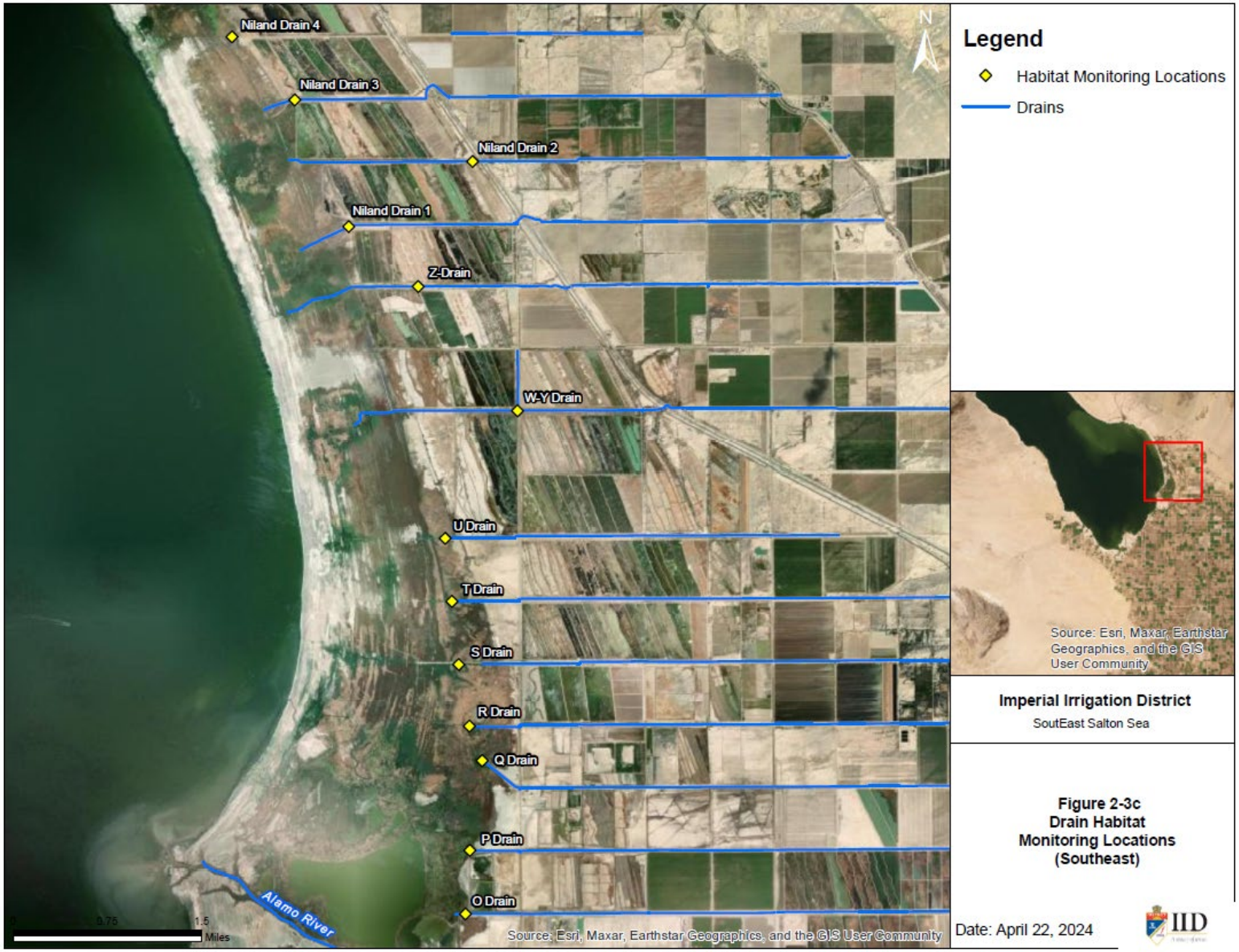

N
Pumice Drain
Vail 5 Drain
Vail Lateral 6
Vail Cuttoff Drain
New River
Trifolium 14A Drain
Trifolium 13 Drain
Trifolium 12 Drain
0
0.75
1.5
Miles
Legend
Hand Flow Monitoring
Automatic Flow Monitoring
Drains
Imperial Irrigation District
South Salton Sea
Figure 2-2b
Drain Flow
Monitoring Locations
(South)
Date: April 29, 2024
IID


Nialnd Drain 4
Niland Drain 3
Niland Drain 2
Niland Drain 1
Z Drain
W-Y Drain
U Drain
T Drain
S Drain
R Drain
Q Drain
P Drain
O Drain
N
0
1
2
Miles
Legend
Hand Flow Monitoring
Automatic Flow Monitoring
Drains
Imperial Irrigation District
SouthEast Salton Sea
Figure 2-2c
Drain Flow
Monitoring Locations
(Southeast)
Date: April 29, 2024
IID

Figures 2-3a, 2-3b, and 2-3c Drain Habitat Monitoring Locations




N
Legend
Habitat Monitoring Locations
Drains
Pumice Drain
Vail 5 Drain
Vail Lateral 6
Vail Cutoff Drain
New River
Trifolium 12 Drain
Trifolium 13 Drain
Trifolium 14A Drain
0
0.75
1.5
Miles
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community
Imperial Irrigation District
South Salton Sea
Figure 2-3b
Drain Habitat
Monitoring Locations
(South)
Date: April 22, 2024
IID


Niland Drain 4
Niland Drain 3
Niland Drain 2
Niland Drain 1
Z-Drain
W-Y Drain
U Drain
T Drain
S Drain
R Drain
Q Drain
P Drain
O Drain
Alamo River
0 0.75 1.5
Miles
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community
N
Legend
Habitat Monitoring Locations
Drains
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community
Imperial Irrigation District
SoutEast Salton Sea
Figure 2-3c
Drain Habitat
Monitoring Locations
(Southeast)
Date: April 22, 2024
IID

Figures 2-4a, 2-4b, and 2-4c Vegetation Monitoring Areas


Legend
Vegetation Monitoring Area
Vegetation (2019-2023)
0 0.5 1 Miles
0 4 8 Miles
N
Imperial Irrigation District
Salton Sea
Figure 2-4b
Vegetation Monitoring Area 2
DATE: APR 29, 2024
FORMATION ENVIRONMENTAL


Legend
Vegetation Monitoring Area
Vegetation (2019-2023)
0 0.5 1 Miles
0 4 8 Miles
N
Imperial Irrigation District
Salton Sea
Figure 2-4c
Vegetation Monitoring Area 3
DATE: APR 29, 2024
FORMATION ENVIRONMENTAL

Mapping will be completed using a combination of high resolution multi-spectral satellite imagery and object-based image analysis techniques informed by field survey observations. Satellite imagery with ultra-high and high resolution will be acquired. The resolution specifications will be provided with any imagery submitted. Field surveys will be completed within 4 to 6 weeks of satellite imagery acquisition along the periphery of the vegetated areas within the Vegetation Monitoring Areas where accessible. Unmanned Aerial Vehicle (UAV) video transacts will also be collected for interior portions of the vegetated areas inaccessible on foot. The satellite imagery and field survey data will be processed and analyzed to develop vegetation community maps. Processing the satellite imagery and field survey data involves 3 steps: 1) conversion to reflectance and calculation of vegetation indices, 2) classification, and 3) accuracy assessment.

Conversion to reflectance and calculation of vegetation indices. Reflectance of light spectra from plants/leaves changes with plant type, water content within tissues, and other intrinsic factors. The reflectance from vegetation to the electromagnetic spectrum allows for the mapping of vegetation using raw satellite imagery. The raw satellite imagery values are in Digital Number (DN). Vendor specified protocols will be used to convert DN values to reflectance values. Reflectance values are generally recommended for use in vegetation index calculations as it provides a more accurate representation and can be used analytically in a canopy reflectance model.

Classification. Satellite imagery will be analyzed using the Object Based Imagery Analysis (OBIA) technique. Specifically, imagery will be segmented to derive hierarchical objects that clearly delineate relevant plant communities at a fine scale. OBIA allows for incorporating meaningful non-spectral features (i.e. texture, size, shape, etc.) for class separation and classification and accounts for landscape hierarchy of vegetation ecosystem organization and structure. The field surveys will be used to classify a subset of objects as ground-truth and training data for the machine learning algorithm. A trained ecologist using photo-interpretive techniques and ground truth video transects will review the machine learning classification results.

Accuracy assessment. A subset of field survey points will be held out of the classification and used for an independent validation and accuracy assessment. Map accuracy will be reported for all classes using a fusion matrix approach. This will provide information on accuracy and misclassification within and between classes.

2.2.4.4 Action Triggers

Drains

Because each drain exhibits variable flow rates under existing conditions, recognizing that approximately 70% of fields within IID's contract service area are participating in existing conservation programs implemented under the QSA, this Monitoring Plan must consider that drain flow variability could occur due to factors unrelated to the Proposed Action. Therefore, these action triggers will focus on low flows at each drain where a majority of fields within the drain-shed are enrolled in the DIP or FUFP or were not participating in the OFECP within the last 5 years (2019-2023) prior to 2024 and become enrolled in the OFECP (or the simplified OFECP) during the three-year period of the Proposed Action. Because participation in the conservation programs will vary throughout the year, IID will provide USFWS, Reclamation, and CDFW the list of drains that will be subject to these action triggers and the impact avoidance measures on a quarterly basis.

For the drains on the list provided to USFWS, Reclamation, and CDFW, the following action triggers will apply:[5]

1) **Automatic Sensors.** For the drains with automatic sensors installed, the automatic sensors have the capability of triggering a signal when flows reach a zero-flow level. That signal can be directed to designated IID staff when that occurs. To account for existing conditions, IID staff will calculate for each drain on the list the average number of consecutive days[6] in a week (7-day period) that the flows reach a zero-flow level during the most recent 5-year period (2019-2023). On the next consecutive day following the average number of consecutive days for that drain to have a zero-flow signal, IID will follow the impact avoidance measures listed in Section 2.2.1.5 Impact Avoidance Measures. For example, if a drain is calculated to have an average of two consecutive days in a week of a zero-flow level during the most recent 5-year period (2019-2023), on the third consecutive day that IID receives a zero-flow signal, IID staff will follow the impact avoidance measures listed in Section 2.2.1.5 Impact Avoidance Measures. If a drain is calculated to have an average of no days in a week of a zero-flow level during the most recent 5-year period (2019-2023), on the day that IID receives a zero-flow signal, IID staff will follow the impact avoidance measures listed in Section 2.2.1.5 Impact Avoidance Measures.

2) **Hand-Held Current Meters.** For the drains measured with the hand-held current meters once a week, there is no historical data of the drain flows. However, an indication of drain flows are the irrigation delivery schedules of the fields that drain into that specific drain. To account for existing conditions, IID staff will calculate for each drain on the list the average number of consecutive days in a week (7-day period) that there are no deliveries to the fields that drain into that specific drain and no operational water discharges in that drain (if the drain receives operational water discharges) during the most recent 5-year period (2019-2023). On the next consecutive day following the average number of consecutive days for that drain to have no deliveries and no operational water discharges, IID will follow the impact avoidance measures listed in Section 2.2.1.5 Impact Avoidance Measures. For example, if a drain is calculated to have an average of two consecutive days in a week of no deliveries and no operational water discharges during the most recent 5-year period (2019-2023), on the third consecutive day that IID receives the irrigation delivery schedule showing no deliveries that day, IID staff will follow the impact avoidance measures listed in Section 2.2.1.5 Impact Avoidance Measures. If a drain is calculated to have an average of no days in a week of no deliveries and no operational water discharges during the most recent 5-year period (2019-2023), on the day that IID receives the irrigation delivery schedule showing no deliveries that day, IID staff will follow the impact avoidance measures listed in Section 2.2.1.5 Impact Avoidance Measures

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5 Action triggers will not apply if repair or maintenance work on a drain or canal lateral cause the action triggers set forth in this section (the zero-flow signal or no deliveries and no operational water discharges). Such repair or maintenance work occurs under existing conditions and not as a result of the Proposed Action.

6 "Days" shall mean a 24-hour period, but this Monitoring Plan expects monitoring, action triggers, and impact avoidance measures to occur during daytime hours to the maximum extent possible. The signal or data will be sent to or accessed by IID staff each morning.

Vegetation

IID will develop an early warning system focused on monitoring potential changes in the biophysical conditions of the mapped vegetation communities in the Vegetation Monitoring Areas (See Figures 2-4a, 2-4b, and 2-4c, Vegetation Monitoring Areas). The early warning system will involve the monitoring of the mapped vegetation communities using satellite-based indices representative of surface water stress and vegetation productivity/vigor. Specifically, this includes the use of the Normalized Difference Water Index (NDWI) for water stress and Leaf Area Index (LAI) for vegetation productivity/vigor. NDWI is a measure of surface water stress using a satellite-derived index from the Near-Infrared (NIR) and Short-Wave Infrared (SWIR) channels. NIR reflects leaf internal structure and leaf dry matter. SWIR reflects changes in both the vegetation water content and the spongy mesophyll structure in vegetation canopies. LAI is a plant-specific biophysical parameter that can be monitored *in situ* or remotely to quantify changes in vegetation productivity. LAI can be estimated using remote sensing techniques from satellite optical data based on the inversion of a physical canopy reflectance model.

The early warning system will include an analysis of the most recent 5-year historical conditions and changes to the mapped vegetation communities recognizing that the vegetation communities within the Vegetation Monitoring Areas change throughout any year due to seasonal and temperature changes, among other factors under existing conditions. Historical satellite imagery of the vegetation communities within the Vegetation Monitoring Areas from 2019 to 2023 will be analyzed to understand the recent past seasonal and inter-annual variability. Historical information is critical for developing statistics from which early warning thresholds of meaningful change can be developed. Past variability of vegetation attributes will be analyzed to identify, at an appropriate scale, thresholds for meaningful change in the mapped vegetation communities. If these thresholds of meaningful change are triggered, IID will follow the impact avoidance measures listed in Section 2.2.1.5 Impact Avoidance Measures.

2.2.4.5 Impact Avoidance Measures

Drains

When an action trigger set forth in Section 2.2.1.4 Action Triggers is reached for any of the drains, with or without automatic sensors, IID will implement the following impact avoidance measures:

1) IID staff responsible for monitoring the drains for the action triggers will notify operational and/or field staff to conduct a site visual check of the drain during that same day;
2) During the site visual check, IID staff will take photographic documentation of the conditions within the drain at or near the habitat monitoring locations shown on Figures 2-3a, 2-3b and 2-3c, Drain Habitat Monitoring Locations;
3) If there is no ponded water within or at the terminus of the drain that can be seen from the habitat monitoring location, within no more than 18 hours following the site visual check, IID staff will deliver water to the affected drain via water truck at a location that can be safely accessed by the water truck downstream of the last structure on the drain; and
4) IID will deliver water to the affected drain via water truck each following day until the automatic sensor indicates flows have returned to the affected drain or irrigation deliveries have resumed to fields draining into the affected drain.

Additionally, IID will analyze which fields respond to the DIP solicitation and corresponding drain-sheds. IID will coordinate with USFWS, Reclamation, and CDFW to determine whether participation in the DIP must be limited within certain drain-sheds to avoid adverse effects to listed species. If IID excludes all fields within a drain-shed from participating in the DIP, those drains will not be subject to the action triggers set forth in Section 2.2.1.4 Action Triggers, or the impact avoidance measures set forth above.

These drain impact avoidance measures will be conducted in coordination with USFWS, Reclamation, and CDFW to ensure maintenance of suitable habitat during low flow periods caused by the Proposed Action.

Vegetation

If an early warning threshold of meaningful change is triggered for the vegetation within the Vegetation Monitoring Areas shown on Figures 2-4a, 2-4b, and 2-4c, Vegetation Monitoring Areas, additional vegetation monitoring and analysis actions will be implemented to determine the cause of a meaningful change in the mapped vegetation communities. Within 15 days of the action trigger, IID will submit a set of actions to USFWS, Reclamation, and CDFW, which may include the additional collection and analysis of UAV imagery/video, ground-truth data, and high-resolution satellite imagery to determine whether there is a reduction in NDWI and LAI, the area of reduction, and whether the reduction is isolated to specific drain-sheds or part of a broader Salton Sea-wide phenomenon. If IID determines that the change is linked to a specific drain-shed affected by the conservation programs implemented under the Proposed Action, IID will take immediate action to deliver water to the affected vegetation via the drain or drains flowing water to the vegetation via water truck each following day until IID is able to limit participation in the conservation programs for the fields within that drain-shed. These impact avoidance measures will be conducted in coordination with USFWS, Reclamation, and CDFW to ensure maintenance of suitable habitat during this period of time.

2.2.4.6 Coordination and Reporting

IID will meet with USFWS, Reclamation, and CDFW staff on a quarterly basis during the short-term period of the Proposed Action to review the collected drain flow monitoring data and vegetation monitoring data for the prior quarter. During these meetings, IID will also report on the implementation of action triggers and impact avoidance measures for the prior quarter. IID will also prepare an annual report for submittal to USFWS, Reclamation, and CDFW by March 31 of each year under the Proposed Action. The annual report will include compiled drain and vegetation monitoring data for the year and information regarding the implementation of action triggers and impact avoidance measures during that year.

2.3 Alternatives Considered but Not Evaluated in Detail

A number of alternatives were considered that would result in lower volumes of water conserved within IID's Contract Service Area under the LC Conservation Program. The SCIA would indicate a potential maximum total of water conservation and would be less than or equal to the total volume analyzed within this EA. Lower water conservation volumes would therefore be included in the overall analysis of this EA and are not being evaluated separately.

3.0 Affected Environment and Environmental Consequences

The following section presents a description of the existing condition for the selected resource areas being reviewed as well as an analysis of the direct, indirect, and cumulative impacts of the Proposed Action on those resources.

3.1 Resources Not Discussed in Detail

The Proposed Action includes only conservation of water within the IID Contract Service Area, reducing water diversions from the Colorado River in the form of voluntary water conservation and efficiency programs for agricultural water users, and no construction would occur. Therefore, the following resources were considered and are either considered under other resource sections or not further addressed in this document because they would not be impacted by the Proposed Action.

Table 3-1 Resources and Issues Eliminated from Detailed Comparative Analysis

Resource	Discussion and Rationale
Agriculture/Forestry Resources	The Proposed Action would result in temporary modifications to farming practices, but would not alter land use or result in the loss of important farmland. No further assessment is necessary.
Energy	The Proposed Action involves water conservation programs and would not alter energy use or result in wasteful energy practices. Temporary reduction in farming activities would reduce energy uses slightly. No further assessment is necessary.
Floodplains and Wetlands	The Proposed Action would not alter floodplains. The analysis related to Wetlands is included under Section 3.4, Biological Resources.
Geology/Soils	The Proposed Action involves water conservation programs and would not include excavation or soil disturbance beyond normal farming activities on existing active farmland. No further assessment is necessary.
Greenhouse Gas Emissions	The Proposed Action involves water conservation programs and would not contribute to greenhouse gas emissions. No further assessment is necessary.
Hazards & Hazardous Materials	The Proposed Action involves water conservation programs and would not include activities that could use, transport, store or dispose of hazardous materials. No further assessment is necessary.
Land Use	The Proposed Action involves water conservation programs and would not change zoning or land uses. No further assessment is necessary.
Mineral Resources	The Proposed Action involves water conservation programs and would not include excavation or soil disturbance. Mineral

Resource	Discussion and Rationale
	resources or access to mineral resources would not be affected. No further assessment is necessary.
Noise	The Proposed Action involves water conservation programs and would not include any construction or new operational conditions that would increase noise levels. No further assessment is necessary.
Populations/Housing	The Proposed Action involves water conservation programs and would not include impacts to residential areas or existing housing. The Proposed Action would not induce growth or alter land use planning. No further assessment is necessary.
Public Services	The Proposed Action involves water conservation programs and would not require additional public services. No further assessment is necessary.
Recreation	The Proposed Action involves water conservation programs and would not impact recreational facilities. No further assessment is necessary.
Transportation	The Proposed Action involves water conservation programs and would not affect roadways, public transportation, parking or traffic patterns. No further assessment is necessary.
Utilities/Service Systems	The Proposed Action involves water conservation programs and would not require additional utilities and service systems or impact existing utilities or service systems. No further assessment is necessary.
Wildfire	The Proposed Action involves water conservation programs and would not increase the risk of wildlife in the area. No further assessment is necessary.
Indian Trust Assets (ITA)	The analysis related to Indian Trust Assets is included under Section 3.5, Cultural Resources.
Indian Sacred Sites	The analysis related to Indian Sacred Sites is included under Section 3.5, Cultural Resources.

3.2 Resources Discussed in Detail

The following resource areas are discussed below.

- Air Quality
- Biological Resources
- Cultural Resources
- Environmental Justice
- Human Health
- Hydrology / Water Quality
- Visual Resources

3.3 Air Quality

3.3.1 Affected Environment

Air quality in an area is determined by its topography, meteorology, and existing air pollutant sources. This section identifies the principal regulations applicable to the Proposed Action and the existing conditions within the IID Contract Service Area.

3.3.1.1 Clean Air Act

The Clean Air Act (CAA), passed by Congress in 1963 and last amended in 1990, is the federal legislation within the United States primarily designed to enhance air quality and safeguard public health by regulating the release of air pollutant emissions. The CAA requires the United States Environmental Protection Agency (USEPA) to establish National Ambient Air Quality Standards (NAAQS), to protect public health and public welfare and to regulate emissions of hazardous air pollutants. California has adopted state air quality standards, known as the California Ambient Air Quality Standards (CAAQS), which are established by the California Air Resources Board (CARB). The NAAQS and CAAQS are provided in **Appendix AQ-1, Air Quality Regulatory Framework**.

Exposure to elevated outdoor levels of PM10 and PM2.5 is associated with lung- and heart-related respiratory illness, including asthma (Johnston et al. 2019; Farzan et al. 2019). PM10 and PM2.5 are particulate matter with an aerodynamic diameter of 10 microns or less (PM10) and 2.5 microns or less (PM2.5), respectively. The populations most likely to experience adverse health effects with exposure to PM10 and PM2.5 include older adults with chronic heart or lung disease, children, and asthmatics (CARB 2021). PM2.5 is a significant portion of PM10 only in urban areas where mechanically generated and windblown dust are not significant source contributors.

The USEPA requires areas that do not meet a NAAQS to develop and submit a State Implementation Plan (SIP), which demonstrates how the area will meet the standard. Under California state law, CARB is responsible for submission of SIPs to EPA for approval. Local air districts and other agencies prepare SIP elements and submit them to CARB for review and approval. Air districts in California monitor air pollutant concentrations to determine whether the NAAQS are met in the air basin, and if not, what strategies will be employed to meet the standards. An air basin is classified as an attainment area (designated attainment and/or unclassifiable) or nonattainment area for a pollutant depending on whether the air quality standards are met or exceeded. In some cases, the USEPA is not able to determine an area's status after evaluating the available information and those areas are designated unclassifiable. If an area has been designated as nonattainment for a pollutant and later comes into attainment of the NAAQS, the area must maintain compliance with the NAAQS for a period of at least 10 years before being designated as attainment. These areas are commonly referred to as "maintenance areas."

3.3.1.2 Salton Sea Air Basin

The Proposed Action is located within the Salton Sea Air Basin (SSAB), which spans Imperial County and Riverside County. The SSAB is generally an arid desert region, with a significant portion located below sea level. A semi-permanent high-pressure cell blocks mid-latitude storms and causes sunny skies most of the time. The high-pressure zone tends to be weaker in the winter. The coastal mountains on the west side of the basin prevent the intrusion of cool, damp air from the Pacific coast. Due to the barrier and weakened storms, the SSAB experiences clear skies, extremely hot

summers, mild winters, and little rainfall. The Imperial County Air Pollution Control District (ICAPCD) oversees air quality planning and regulation for the Imperial County portion of the SSAB. The South Coast Air Quality Management District (SCAQMD) oversees air quality planning and regulation for the Riverside County portion of the SSAB.

Federal Air Quality Designations

The USEPA has designated the SSAB as nonattainment for the 8-hour ozone NAAQS. The Riverside County portion is designated as a severe nonattainment area for the 2015 8-hour ozone standard and an extreme nonattainment area for the 2008 and 1997 8-hour ozone standards. The Imperial County portion of the SSAB is designated as a marginal nonattainment area for the 2015 8-hour ozone standard and a moderate nonattainment area for the 2008 and 1997 8-hour ozone standards. The USEPA has designated the Riverside County portion of the SSAB as a serious nonattainment for the standard for PM10 and the Imperial County portion of the SSAB as a maintenance area for PM10. The USEPA has designated the portion of the SSAB within Imperial County south of the Salton Sea that includes the cities of Brawley, Calexico, El Centro, Holtville, Imperial, and Westmorland, as well as census-designated places of Heber and Seeley, as a moderate nonattainment area for the standard for PM2.5.

Regional Air Quality

The air quality at any site is dependent on the regional air quality and local pollutant sources. The air quality at any location within the SSAB is determined by the release of pollutants throughout the SSAB as well as from air pollutants that travel from the coastal areas and Mexico to the SSAB. The pollutants of greatest concern in the SSAB are ozone (O3) and ozone-precursors nitrogen oxides (NOx) and reactive organic gases (ROG) also called volatile organic compounds (VOCs), and particulate matter (PM10 and PM2.5). NOx, and VOCs are largely emitted from fuel systems and combustion in motor vehicles and equipment, PM2.5 from fuel combustion, and PM10 from wind erosion in the form of fugitive dust. The Proposed Action would not contribute O3, NOx, ROG, or VOCs. Therefore, these pollutants are not discussed further.

Regulatory air quality monitoring stations in the vicinity of the Salton Sea are operated by the SCAQMD in Riverside County to the north of the Salton Sea, and by the ICAPCD to the south of the Salton Sea. The air districts operate monitoring stations to support the management of air quality in their districts. Monitoring stations in these networks are sited and operated consistent with stringent guidelines developed by the USEPA. ICAPCD operates and maintains air quality monitoring stations in Brawley, Calexico (3), El Centro, Niland, Westmorland, and Winterhaven. SCAQMD operates and maintains air quality monitoring stations in the Coachella Valley in Indio and Palm Springs. Air quality monitoring data available from these monitoring stations are summarized in **Table 3-2, Air Quality Data**. As shown in Table 3-2, Ambient Air Quality Data, exceedance of O3, PM10 and PM2.5 CAAQS and NAAQS occur in the SSAB, although air quality is generally improving.

Table 3-2 Air Quality Data

Pollutant/Standard [a]	CAAQS [c]	NAAQS [c]	Riverside County/ Coachella Valley			Imperial County [d]		
			2019	2020	2021	2019	2020	2021
O_3 (1-hour)								
Maximum Concentration (ppm)	0.09	-	0.103	0.119	0.110	0.106	0.119	0.122
Samples > CAAQS			4	9	10	16	14	10
O_3 (8-hour)								
Maximum Concentration (ppm)	0.070	0.070	0.087	0.094	0.092	0.089	0.094	0.094
Samples > CAAQS			43	49	35	63	69	49
Samples > NAAQS			43	49	38	59	66	43
NO_2 (1-hour)								
Maximum Concentration (ppm)	0.18	0.1	0.0414	0.0474	0.0356	0.118	0.110	0.113
NO_2 (Annual)[h]								
Annual Arithmetic Mean (ppm)	0.030	0.053	0.0073	0.0066	0.0068	0.010	0.010	0.010
O (1-hour)								
Maximum Concentration (ppm)	20	35	1.3	0.8	0.8	Currently not monitored in Imperial County [g]		
CO (8-hour)								
Maximum Concentration (ppm)	9.0	9.0	0.7	0.5	0.4			
SO_2 (1-hour) [b]	0.25	0.075	0.0018	0.0022	0.0021	Currently not monitored in Imperial County [g]		
Maximum Concentration (ppm)								
PM_{10} (24-hour) [e]								
Maximum Concentration (µg/m³)	50	150	154	259	147	150	189	153
Days > CAAQS			44	69	69	142	206	189
Days > NAAQS [i]			0	1	0	0	1	1
PM_{10} (Annual Average)[h]								
Annual Arithmetic Mean (µg/m³)	20	-	33.3	38.0	39.1	36.5	42.4	43.7
$PM_{2.5}$ (24-hour)								
Maximum Concentration (µg/m³)	-	35	15.5	25.6	13.5	53.1	46.2	60.9
Days > NAAQS			0	0	0	1	7	3
$PM_{2.5}$ (Annual)[h]								
Annual Arithmetic Mean (µg/m³)	12	12	6.05	8.41	6.2	10.7	11.35	10.3
Lead [b]								
Maximum 30-day average (µg/m³)	1.5	-	0.008	0.016	0.008	Currently not monitored in Imperial County [g]		

NOTES:
[a] ppm = parts per million; µg/m³ = micrograms per cubic meter
[b] The Coachella Valley monitoring station most representative of the Salton Sea Air Basin for SO_2 and lead is the Metropolitan Riverside County 1 monitoring station.
[c] California Ambient Air Quality Standards and National Ambient Air Quality Standards: https://ww2.arb.ca.gov/sites/default/files/2020-07/aaqs2.pdf
[d] California Air Resources Board Imperial County Daily Averages by year: High wind events are excluded: https://www.arb.ca.gov/aqmis2/aqdselect.php
[e] High concentrations of PM10 which exceed the National Ambient Air Quality Standard which occur on days when sustained hourly wind speeds are 25 mph or higher are flagged as exceptional events. Concentrations measured on these days are not used to determine compliance with the PM_{10} NAAQS.
[f] https://www.arb.ca.gov/aqmis2/aqdselect.phpg Current air monitors in Imperial County: https://ww2.arb.ca.gov/applications/air-monitoring-sites-interactive-map
[g] Current air monitors in Imperial County: https://ww2.arb.ca.gov/applications/air-monitoring-sites-interactive-map
[h] Imperial County values are based on the EPA Air Data Air Quality Monitors: https://www.epa.gov/outdoor-air-quality-data/interactive-map-air-quality-monitors
[i] Data which has been flagged in accordance with the Exceptional Events Rule is not included.
SOURCE: SCAQMD, Historical Data by Year, www.aqmd.gov/home/air-quality/air-quality-data-studies/historical-data-by-year; CARB, IADAM: Air Quality Data Statistics, https://www.arb.ca.gov/adam. Accessed October 2023.

Particulate Matter

According to the Emission Inventories published by the ICAPCD in the 2018 Redesignation Request and Maintenance Plan, the major sources of PM_{10} emissions in Imperial County are attributed to fugitive windblown dust from area-wide dust sources (ICAPCD 2018). The 24-hour PM10 NAAQS is exceeded in Imperial County only under high wind conditions where fugitive dust from the outlying desert and mountain areas becomes entrained (*Id.*). These exceedance events are primarily caused by gusty westerly winds brought on by low pressure systems, with a smaller fraction resulting from monsoonal fronts passing through the region. From 2014 through 2016, 58 days with PM10 concentrations over the NAAQS were submitted and accepted by the USEPA as exceptional events (*Id.*). IID's Annual Emission Monitoring Program has documented similar conditions, noting that the natural desert surfaces west of the Salton Sea produce (on average) over 28,000 tons of PM10 per year, with the majority of those emissions occurring in ~10 days per year (IID 2024f).[7] Other significant sources of PM10 emissions in the ICAPCD emission inventory include emissions from Mexico, unpaved roads, farming operations, mineral processing, and construction and demolition (ICAPCD 2018).

The Salton Sea Air Quality Mitigation Program (SS AQMP) was developed by IID, in collaboration with ICAPCD, to provide a comprehensive, science-based, adaptive approach to address air quality mitigation requirements associated with the Quantification Settlement Agreement (QSA) and the water conservation and transfer under the QSA. The objective of the SS AQMP is to proactively detect, locate, assess and identify options to mitigate dust emissions from exposed Salton Sea playa as it occurs. Each component of the program is used to identify, prioritize, and guide implementation of dust control measures on exposed Salton Sea playa. The main components of the SS AQMP include 1) an annual Emissions Monitoring Program to estimate emissions and to identify areas of exposed playa for proactive dust control, 2) an annual Proactive Dust Control Plan with recommendations and design for site-specific dust control measures, and 3) implementation of dust control measures to prevent PM10 dust source areas from becoming significant sources of dust emissions, and also scaling and adapting dust control measures to efficiently achieve control at a larger scale. The annual Emissions Monitoring Program is designed to work with the development of the annual Proactive Dust Control Plan and subsequent implementation of dust control measures. Sites for dust control measures are identified by IID on an annual basis in the Proactive Dust Control Plan. This approach allows effective use of resources to help protect the public health of communities near and around the Salton Sea. (IID 2016.)

In addition to IID's SS AQMP, the Salton Sea Management Program (SSMP) Dust Suppression Action Plan (DSAP) was developed by the California Natural Resources Agency (CNRA) to fulfill its obligations under the California State Water Resources Control Board Order WR 2017-0134, Condition #24. Dust suppression project sites are identified in the SSMP DSAP, including those close to residential populations (North Shore and Bombay Beach) to benefit communities (CNRA 2020) and cover playa that is identified by IID as priority for dust control implementation. Under the SSMP DSAP, other factors related to the feasibility of implementation of dust suppression

[7] These emissions estimates are not approved by ICAPCD, CARB, or the U.S. Environmental Protection Agency as emissions inventories for the Salton Sea playa or Salton Sea Air Basin. They are not intended to be the actual inventory numbers for regulatory purposes. Rather, the estimates are intended to prioritize dust source areas for mitigation.

projects were also considered: permitting, access authorization, and water supply for certain suppression methods (CNRA 2020).

Hydrogen Sulfide

Hydrogen sulfide (H2S), a colorless gas that smells like rotten eggs, is formed by anaerobic organic decay at the bottom of the Salton Sea. Upwelling or mixing of the Sea by regional winds can bring H2S to the surface (Hurlbert et al. 2007) and into nearby communities, causing foul odors that can affect residents in the Coachella Valley and beyond (SCAQMD 2021, 2022a, 2022b). These events are more prevalent during the hot summer months, especially when the southeasterly "monsoonal" flow events occur, but they sometimes occur at other times of the year. Elevated H2S concentrations are typically measured near the Salton Sea during wind shifts that bring flows from the south or east. In this area, these shifts occur most often in the early morning or the late afternoon/early evening hours. The Salton Sea's receding shoreline and shallower waters may affect the number or severity of these odor events in the future.

The pollutant is detectable at only a few parts per billion (ppb). California has set a nuisance odor standard for H2S at 30 ppb (0.3 part per million [ppm]); there is no federal standard (SCAQMD 2022a). Exposure to ambient concentrations exceeding the standard may result in an objectionable odor and symptoms such as headaches, nausea, dizziness, nasal irritation, cough, and shortness of breath (SCAQMD 2022a). Since 2013, SCAQMD has operated H2S monitors at two locations in the eastern Coachella Valley: at the SCAQMD Mecca air monitoring station (Saul Martinez Elementary School) and at the station operated by IID (Salton Sea Near Shore, Lincoln Avenue and 73rd Avenue, Mecca) (SCAQMD 2020).

Hazardous Air Pollutants

The SSAB's air quality is also affected by Hazardous Air Pollutants (HAPs), which are also referred to as Toxic Air Contaminants (TACs) or air toxics. These are air pollutants which may cause or contribute to an increase in mortality or illness, or which may pose a present or potential hazard to human health. Due to the large number of different HAP/TAC pollutants and their generally low concentrations, it has not been possible to set air quality standards for these pollutants or to monitor for their presence as a group. HAP emissions in the SSAB are discussed below.

In the SSAB, TACs or HAPs are generated as a result of various processes, including fuel combustion, windblown dust, mining, farming, pesticide use, and industrial processes. Sensitive receptors are located throughout the air basin. The most recent National Emission Inventory provides criteria air pollutant and HAP emission estimates for the Imperial County and Riverside County portions of the SSAB (USEPA 2023). These estimates provide an indication of potential criteria air pollutant and HAP emissions throughout the basin. As shown in **Table 3-3, Hazardous Air Pollutants Reported in Imperial County and Riverside County National Emissions Inventory**, criteria air pollutants and HAPs reported in the Imperial County and Riverside County National Emissions Inventory data are emitted by biogenics, stationary sources, mobile and fire sources.

Table 3-3 Hazardous Air Pollutants Reported in Imperial County and Riverside County National Emissions Inventory

Source	Representative Hazardous Air Pollutants	Representative Criteria Air Pollutants
Imperial County		
Biogenics (naturally occurring emissions from soils and vegetation sources)	Methanol, formaldehyde, acetaldehyde	Volatile organic compounds, carbon monoxide, nitrogen oxides
Stationary Sources	Methanol, o-cresol, xylenes, naphthalene, n, n-dimethylaniline, methylene chloride, methyl methacrylate, methyl isobutyl ketone, methyl chloroform, methyl chloride, methyl bromide, acetaldehyde, ethylene glycol,	PM10, volatile organic compounds, carbon monoxide, ammonia, PM2.5, nitrogen oxides, sulfur dioxide
Mobile Sources	Xylenes, toluene, styrene, naphthalene, phenanthrene, propionaldehyde, formaldehyde, fluorene, fluoranthene, ethyl benzene, acetaldehyde, acrolein, 2,2,4-trimethylpentane, 1,3-butadiene,	Carbon monoxide, nitrogen oxides, volatile organic compounds, PM10, PM2.5, sulfur dioxide
Fire Sources	Acetaldehyde, formaldehyde, toluene, styrene, naphthalene, propionaldehyde, hexane, methanol, benzene,	Carbon monoxide, volatile organic compounds, PM10, PM2.5, nitrogen oxide
Riverside County		
Biogenics (naturally occurring emissions from soils and vegetation sources)	Methanol, formaldehyde, acetaldehyde	Volatile organic compounds, carbon monoxide, nitrogen oxides
Stationary Sources	Methanol, toluene, o-cresol, hexane, glycol ethers, ethylene glycol, acetaldehyde, styrene, phenol, methyl isobutyl ketone, methyl chloroform, methylene chloride, methyl isobutyl ketone	PM10, ammonia, volatile organic compounds, PM2.5, nitrogen oxides, sulfur dioxide
Mobile Sources	Toluene, xylenes, m-xylene, methanol, hexane, formaldehyde, ethyl benzene, benzene, acetaldehyde, 2,2,4-trimethylpentane,	Carbon monoxide, nitrogen oxides, volatile organic compounds, PM10, PM2.5, sulfur dioxide
Fire Sources	Formaldehyde, xylenes, toluene, methanol, methyl chloride, formaldehyde, acrolein, acetonitrile, acetaldehyde	Carbon monoxide, volatile organic compounds, PM10, PM2.5, nitrogen oxide

SOURCE: USEPA, EAP's 2020 National Emissions Inventory and Trends Report, July 31, 2023. https://storymaps.arcgis.com/stories/d7d730f974c6474190b142a49ae8d3bd. Accessed October 2023.

One of the primary health risks of concern due to exposure to TACs is the risk of contracting cancer. The carcinogenic potential of TACs is a particular public health concern because it is currently believed by many scientists that there is no "safe" level of exposure to carcinogens, that is, any exposure to a carcinogen poses some risk of causing cancer. Health statistics show that one in four people, or 250,000 in a million, will contract cancer over their lifetime from all causes, including diet, genetic factors, and lifestyle choices.

Unlike carcinogens, for most noncarcinogens it is believed that there is a threshold level of exposure to the compound below which it will not pose a health risk. The California Environmental Protection Agency (CalEPA) and its Office of Environmental Health Hazard Assessment (OEHHA) have developed reference exposure levels (RELs) for noncarcinogenic TACs that are health-conservative estimates of the levels of exposure at or below which health effects are not expected. The noncancerous health risk due to exposure to a TAC is assessed by comparing the estimated level of exposure to the REL. The comparison is expressed as the ratio of the estimated exposure level to the REL, called the hazard index (HI).

Odors

The presence of odors at the Salton Sea currently affects both visitor and resident populations in the area. Factors contributing to odors at the Salton Sea include water quality, high nutrient levels, and biological factors such as fish, algal, and bird die-offs. Water quality at the Salton Sea is affected by a high concentration of sulfates and other compounds present in the saline Salton Sea, as well as inputs of agricultural drainage. Nutrient-rich runoff entering the Salton Sea produces eutrophic conditions that result in phytoplankton blooms. These microscopic organisms float close to the Salton Sea's surface, and offensive odors are created when large numbers of organisms die and decompose. Odors resulting from algal bloom die-offs are most prevalent during the summer months, when inputs of freshwater to the Salton Sea are low and temperatures are high (SSA and Reclamation 2000).

Fish and bird die-offs at the Salton Sea also contribute to the odor problem. Several large die-offs in the past two decades have produced unpleasant odors as fish and birds decompose along the shoreline (SSA and Reclamation 2000).

Odors produced by decaying algal blooms, and fish and bird die-offs occur predominantly in the southern and eastern portions of the Salton Sea, although all areas of the Salton Sea are subject to these occurrences. The most prevalent odors exist during the summer months when temperatures are high and winds from the southeast are predominant. High winds in the Salton Sea area are most frequent during the months of April and May (SSA and Reclamation 2000).

3.3.1.3 General Conformity Rule

Section 176(c)(1) of the CAA (42 USC Section 7506(c)) is known as the General Conformity Rule and prohibits departments and agencies of the Federal Government from engaging in, supporting in any way or providing financial assistance for, licensing or permitting, or approving, any activity which does not conform to a SIP that has been approved by the USEPA. (USEPA 1994.) The General Conformity regulations incorporate a stepwise process, beginning with an applicability analysis. According to USEPA guidance (40 CFR Part 93), before any approval is given for a federal action to go forward, the regulating federal agency must apply the applicability requirements found at Title 40 Code of Federal Regulations (CFR) Section 93.153(b) to the federal action to evaluate whether, on a pollutant-by-pollutant basis, a determination of General Conformity is required. A General Conformity evaluation is only required for nonattainment areas and only required for the specific pollutants for which the area has been designated nonattainment. If the regulating federal agency determines that the General Conformity regulations do not apply to the federal action, no further analysis or documentation is required. In certain circumstances, the activity may be exempt (40 CFR 93.153, subdivisions (c), (d), and (e)). If the General Conformity regulations do apply to the

federal action and the action is not exempt, the regulating federal agency must conduct a conformity evaluation.

A conformity determination is required for each criteria pollutant or precursor where the total of direct emissions of the criteria pollutant or precursor in a federal non-attainment or maintenance area would equal or exceed specified annual emission rates, referred to as "de minimis" thresholds. These de minimis thresholds are provided in 40 CFR 93.153(b)(1) and (2). For ozone precursor emissions, the de minimis thresholds depend on the severity of the non-attainment classification.

The de minimis thresholds for both VOCs and NOx are 10 tons per year each in extreme nonattainment areas, 25 tons per year each in severe nonattainment areas, 50 tons per year each in serious nonattainment areas, and 100 tons per year for other ozone nonattainment areas. The de minimis thresholds for both PM10 and PM2.5 are 70 tons per year each in serious nonattainment areas and 100 tons per year each in moderate nonattainment areas.

3.3.2 Environmental Consequences

3.3.2.1 No Action Alternative

Implementation of the No Action Alternative would involve no additional reductions in water diversions by IID from the Colorado River at Imperial Dam pursuant to the LC Conservation Program and would therefore not achieve conservation objectives. As a result, the implementation of conservation programs would not occur, eliminating effects from water conservation, including efficiency conservation and fallowing. The IID would continue to implement the SS AQMP as provided in the Mitigation, Monitoring and Reporting Program (MMRP) of the QSA EIR/EIS (see Section 3.3.2.4 for a discussion of the SS AQMP). Therefore, the No Action Alternative would not result in new additional adverse effects on air quality.

3.3.2.2 Proposed Action Alternative

The Proposed Action involves the conservation of water within the IID Contract Service Area, reducing water diversions from the Colorado River. The conservation of water would occur through the implementation of on-farm conservation programs, meaning all participation will be within existing agricultural fields. Agricultural fields are intermittently disturbed (e.g. tillage, planting, or harvesting activities) on the surface. In fields with tile drains, small portions of the field may be temporarily disturbed down to three to six feet in narrow linear (~one- to two-foot wide) strips where tile drains are placed. The Proposed Action would not involve ground-disturbing or construction activities outside of normal agricultural practices and existing disturbed agricultural land.

The Proposed Action includes the implementation of conservation programs by IID within its Contract Service Area for a temporary, short-term three-year period of time. Participation in the conservation programs would be voluntary and incentivized by payment for the conserved water created by the programs. IID would implement a combination of conservation programs under the Proposed Action. By the structure and nature of each conservation program, fields cannot participate in more than one conservation program at a time. IID will prioritize the OFECP and DIP water conservation programs.

Under the Proposed Action, the combination of conservation programs may include the implementation of the fallowing-based conservation programs. If both the FUFP and the DIP were to be implemented, the maximum potential acreage for either program would not be reached. Therefore, either the maximum participation of the DIP during the four-month period (June through September) or the maximum participation of the FUFP would occur during the temporary, short-term three-year period, but neither program would be at maximum participation if both programs are implemented. Agricultural land cannot participate in both programs at the same time. Therefore, if one field is in one program, it cannot simultaneously be in the other program, thereby bringing down the maximum level of participation possible for that other program. The maximum level of participation for either fallowing-based conservation program will be even lower if there are fields participating in the OFECP and will then also not be eligible for participation in a fallowing-based conservation program.

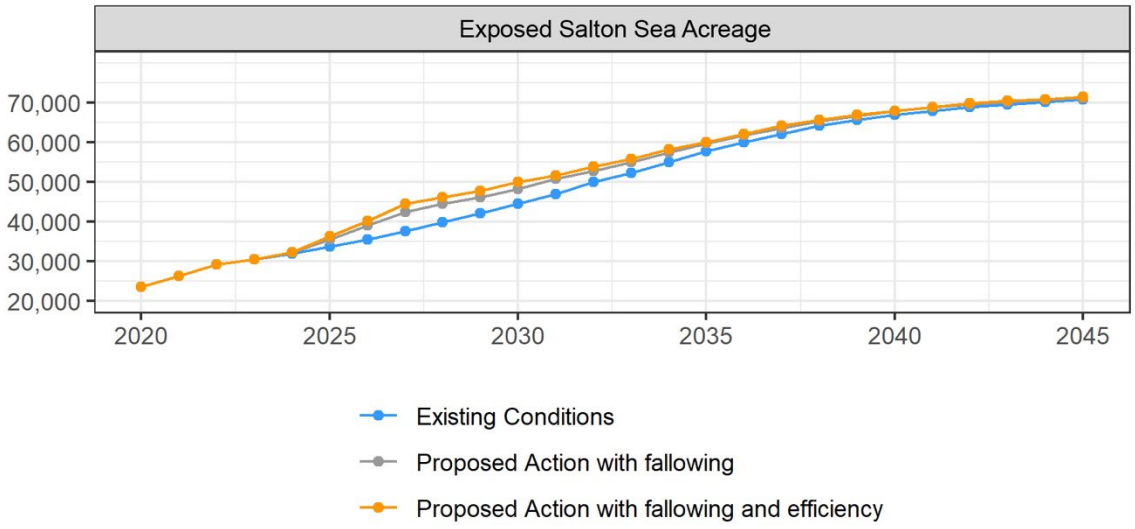
If maximum participation were to occur in the DIP, up to 180,000 acres of agricultural land could stop being irrigated for a 45- to 60-day period between the months of June through September for each of the three years of 2024, 2025 and 2026. Fields participating in the DIP will be in active agricultural production. The crop will cease receiving water for 45 to 60 days, but then the agricultural activities will resume on the field following that period of time. Therefore, despite the DIP being a fallowing-based conservation program, the crop remains on the field (providing cover and protection from wind erosion) and the agricultural activities on a field are only interrupted for a short period of time and only during the temporary, short-term span of three years. Further, participation in the DIP would include requirements for the implementation of Best Management Practices (BMPs) to ensure that potential dust emissions are controlled on participating fields. Consequently, along with the OFECP (or simplified OFECP), the implementation of the DIP would not substantially increase the potential for dust emissions from the participating fields or the surrounding area compared to the No Action Alternative.

If maximum participation were to occur in the FUFP as a result of the Proposed Action, up to a maximum of 34,450 acres throughout the IID Contract Service Area could participate in the FUFP that would result in an increase in frequency of fields that will not be irrigated for 6 months to one year during the two years of 2025 and 2026. The implementation of the FUFP would result in more fields lying fallow without the application of water than under existing conditions during the next three years. However, the agricultural activities will resume on the field following that period of time. If a field is allowed to participate in the FUFP for consecutive years, it would be no longer than the temporary, short-term period of three years. Similar to the QSA, a three-year maximum allowed participation can be implemented and still maintain the integrity of the soils for resumed agricultural production. Nevertheless, crop cycling is common throughout the IID service area and unpredictable. Under current conditions, fields may be fallowed, idled or unplanted for long periods of time (ranging from a few months to over a year) due to economic or other reasons. The Proposed Action could increase the frequency of dry fields or fields with vegetative cover, but only up to the maximum acreage for participation in the FUFP, which is 34,450 acres within over 400,000 acres of agricultural land being actively farmed within IID's Contract Service Area and only over the temporary short-term period of three years. Although the Proposed Action could result in additional fallowed acreage above the current amount, it would be distributed through the service area based on the voluntary basis of the programs and a given landowner's individual decision to fallow a given field and therefore would not disproportionately impact any one area. Further, the FUFP would

include requirements for the implementation of Best Management Practices (BMPs) to ensure that potential dust emissions are controlled on participating fields.

Implementation of the Proposed Action would also result in the acceleration of the Salton Sea elevation lowering from its current elevation due to the QSA and other factors (See Hydrology/Water Quality Section 3.8, subsection 3.8.2.3 Proposed Action Alternative). While the Proposed Action would accelerate the exposure of areas of shoreline that are currently inundated, the acceleration would taper off to baseline projection levels by the year 2045. Because the Proposed Action would accelerate the exposure of playa at the Salton Sea, there would be an increase of the potential for fugitive dust emissions and related HAP emissions and exposure to communities surrounding the Salton Sea earlier than would otherwise occur. The acceleration of the reduction of the Salton Sea may also cause an earlier increase of anaerobic organic decay with increasing concentration of sulfates and other compounds present in the saline Sea, which would lead to an earlier increase in H2S emissions. Odors could also occur earlier from increasing concentrations of nutrient levels and fish, algal, bird and plant, algae and phytoplankton die-offs. As shown in **Figure 3-1, Exposed Salton Sea Acreage**, hydrologic models developed by the Department of Water Resources (DWR) estimate that the Proposed Action would accelerate the exposure of the playa by approximately 5 to 10 years. The temporary acceleration of the lowering of the Salton Sea level would taper off to projected future baseline levels by the year 2045.

Figure 3-1 Exposed Salton Sea Acreage



The QSA involves implementation of long-term (up to 75 years) water conservation programs to conserve up to 300,000 acre-feet per year of Colorado River water and the transfer of this conserved water by IID to the San Diego County Water Authority, Coachella Valley Water District, and/or Metropolitan Water District of Southern California. As part of the Mitigation, Monitoring and Reporting Program (MMRP) of the QSA EIR/EIS, IID implemented Mitigation Measure AQ-7 parts 1, 2 and 4a which read as follows (IID 2003):

- Mitigation Measure AQ-7: (1) **Restrict Access.** Public access, especially off-highway vehicle access, will be limited, to the extent legally and practically feasible, to minimize disturbance of natural crusts and soils surfaces.
- Mitigation Measure AQ-7: (2) **Research and Monitoring.** A research and monitoring program would be implemented incrementally as the Salton Sea recedes. The research phase would focus on development of information to help define the potential for problems to occur in the future as the Salton Sea elevation is reduced slowly over time.
- Mitigation Measure AQ-7: (4a) **Direct Emissions Reductions at the Salton Sea.** Implementing feasible dust mitigation measures.

To comply with the MMRP, and as part of the QSA, IID developed the SS AQMP which provides air quality mitigation for impacts from the QSA water conservation and transfer. The objective of the SSA QMP is to proactively detect, locate, assess, and identify options to mitigate potential dust emissions from exposed Salton Sea playa. This approach allows effective use of resources to help mitigate impacts to the public health of communities near and around the Salton Sea. The SS AQMP consists of (IID 2016):

- An annual emissions monitoring program to estimate emissions and to identify areas of exposed playa for proactive dust control.
- An annual Proactive Dust Control Plan (PDCP) which recommends and designs specific dust control measures.
- Implementation of dust control measures to prevent PM10 dust source areas from becoming significant sources of dust emissions, and also scaling and adapting dust control measures to efficiently achieve control at a larger scale.

The SS AQMP includes a network of special purpose air quality monitoring stations for the purpose of monitoring and characterizing windblown dust from the upwind desert surface as well as Salton Sea Playa. Playa and desert surfaces are characterized annually to better understand the type, location, and extent of surfaces vulnerable to erosion. Weather variables, such as wind speed and direction, are modeled to determine the emissions potential of the exposed playa and desert surfaces. Finally, emissions estimates for the playa and the desert are modeled and a dust control plan is developed for priority playa areas with increased emission potential. The dust control plan provides recommendations on where and what type of dust control measures to use for these priority playa areas on the Salton Sea. The primary dust control measures are surface roughening and vegetation.

The IID would continue to implement its SS AQMP, including the implementation of dust control measures pursuant to the annual PDCP, as required in the Mitigation, Monitoring and Reporting Program (MMRP) of the QSA EIR/EIS for the IID Water Conservation and Transfer Project (see Section 3.3.2.4 for a discussion of the SS AQMP). The SS AQMP would continue to be implemented, in the same manner as under existing conditions. Therefore, because the Proposed Action would not increase overall acreage of exposed playa compared with future baseline projections, it also would not result in disproportionately high and adverse effects on air quality.

The fallowing programs would be subject to best management practices (BMPs) outlined in the MMRP including following the US Department of Agriculture Natural Resources Conservation Service recommendations that include the following:

1) Plan ahead to start with plenty of vegetation residue and maintain as much residue on fallowed fields as possible.
2) Avoid any tillage.
3) Avoid any traffic on the field or tillage when fields are extremely dry to avoid pulverization.
4) If residues are not adequate, either small grain can be seeded around the first of the year to take advantage of winter rains, or soil stabilization chemicals may be applied to fallowed lands.

In addition, ICAPCD Rule 806 (conservation management practices) may apply to some agricultural water users participating in the fallowing programs. However, the BMPs listed above are consistent with Rule 806, ensuring that potential dust emissions are controlled on participating fields.

3.3.2.3 Cumulative Impacts

The Proposed Action would accelerate the lowering elevation of the Salton Sea, thereby accelerating the exposure of the shoreline. This acceleration in turn would result in the earlier potential for increasing fugitive dust emissions and related HAP emissions and exposure to communities surrounding the Salton Sea. The reduction of the Salton Sea may also result in an earlier increase of anaerobic organic decay with increasing concentration of sulfates and other compounds present in the saline Salton Sea, which would lead to increasing H2S emissions. Odors could also occur earlier from increasing concentrations of nutrient levels and fish, algal, bird and plant, algae and phytoplankton die-offs. However, while it is possible that these events may occur earlier, they will still occur without the Proposed Action.

A list of relevant past, present, and reasonably foreseeable projects that involve the potential for water conservation and/or reduced water flow to the Salton Sea is provided in Table 1-1, Cumulative Project List above. As indicated, these projects are either completed or already in planning. The Proposed Action involves the temporary, short-term conservation of water during three years and would accelerate the lowering elevation of the Salton Sea and overall water surface area; however, the temporary impacts associated with the Proposed Action would taper off to projected future baseline levels by the year 2045 as shown in Figure 3-1, Salton Sea Acreage. (See **Appendix HYDRO-3, SSAM**.) Thus, the Proposed Action, when considered with relevant past, present, and reasonably foreseeable projects that involve the potential for water conservation and reduced water flow to the Salton Sea, would not increase overall emissions when considered with other projects in the Action Area.

3.4 Biological Resources

3.4.1 Affected Environment

Biological resources include the species of plants and animals which are regulated by Federal, state or local regulations. This section identifies the principal regulations applicable to the biological resources and the existing conditions within the IID Contract Service Area.

3.4.1.1 Methodology

Literature and Database Review

ESA reviewed existing environmental documentation for the IID Contract Service Area and conducted queries of available resource inventory databases to analyze the potential for sensitive resources to be affected by the Proposed Action. The literature and database review included the following sources:

- California Department of Fish and Wildlife (CDFW). 2023a. *California Natural Diversity Data Base*.
- CDFW. 2023b. *California Sensitive Natural Communities*. June 1, 2023.
- California Natural Resource Agency (CNRA). 2015. *Salton Sea Species Conservation Habitat Monitoring and Adaptive Management Plan*. May 2015.
- Environmental Science Associates (ESA). 2017. *Salton Sea Species Conservation Habitat, Desert Pupfish Adaptive Management and Monitoring Plan*.
- Environmental Science Associates (ESA). 2022. *Salton Sea Monitoring Implementation Plan*. November 2022.
- Imperial Irrigation District (IID). 2001. *Habitat Conservation Plan IID Water Conservation and Transfer Project.* December 2001. Prepared by CH2MHill.
- IID. 2003. *Imperial Irrigation District Water Conservation and Transfer Project, Habitat Conservation Plan, Final Environmental Impact Report/Environmental Impact Statement*, State Clearinghouse Number 99091142, June 2002. Prepared by CH2MHill; *Amended and Restated Addendum to Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the Imperial Irrigation District (IID) Water Conservation and Transfer Project*, September 2003.
- Lower Colorado River Multi-Species Conservation Program (LCR MSCP). 2004. *Lower Colorado River Multi-Species Conservation Program, Volume II: Habitat Conservation Plan.* Final. December 17, 2004. (J&S 00450.00) Sacramento, CA.
- United States Army Corps of Engineers (USACE). 2022. *Salton Sea Management Program, Phase 1: 10-Year Plan, Imperial and Riverside Counties, California, Draft Environmental Assessment*. June 2022.
- U.S. Bureau of Reclamation. 2024. *Near-term Colorado River Operations, Final Supplemental Environmental Impact Statement*. March 2024.
- U.S. Fish and Wildlife Service (USFWS). 2023c. *Information for Planning and Consultation* (IPaC).
- U.S. Fish and Wildlife Service (USFWS). 2023d. *Environmental Conservation Online System* (ECOS).

Field Mapping Effort and Desktop Analysis

Existing conditions within the IID Contract Service Area were determined through a combination of the review of existing documentation referenced above and a field mapping effort completed along the southern shoreline of the Salton Sea adjacent to the termini of IID's drains as shown in **Figure 3-2, Salton Sea Vegetation Study Area**. The field mapping effort was conducted by ESA biologists Brenda McMillan and Dillon Travis on October 10-13, 2023. The survey was completed

by driving to locations within the Salton Sea Vegetation Study Area accessible by vehicle and using binoculars to characterize and map existing vegetation between the terminus of IID drains, and the southern shoreline of the Salton Sea. Whenever feasible, biologists approached vegetation on foot to obtain greater detail regarding species dominance and/or physical characteristics. Aerial imagery uploaded onto field note pads was used to estimate species dominance and vegetation community and to draw vegetation community polygons in areas not visible from each access location. These estimates of vegetation community type and spatial extent were based on best estimate made by biologists in the field through a comparative analysis of what is seen on the ground as compared to discernable shapes and species in the aerial imagery.

Most descriptions were characterized in the field in accordance with *A Manual of California Vegetation* (MCV) (Sawyer et al. 2009); however, those which were not adequately described in the MCV were instead characterized based on consideration of species dominance or other notable descriptors. All natural communities and land cover types characterized and mapped within the Salton Sea Vegetation Study Area were digitized on aerial maps using Geographic Information System software (i.e., ArcGIS).

3.4.1.2 Regulatory Requirements

A summary of the federal, state, and local environmental regulations that govern the biological resources applicable to the Action Area are presented in **Appendix BIO-1, Biological Resources Regulatory Framework**.

3.4.1.3 Existing Conditions

Natural Communities and Land Cover Types

The analysis below describes the ecological conditions within the IID Contract Service Area, including any changes observed since certification of the QSA EIR/EIS. The analysis is based on a review of the sources listed above, field visits and vegetation mapping, and a review of agricultural drain flow data. These conditions, including the current Salton Sea elevation, are materially similar to conditions predicted in the QSA EIR/EIS for the present timeframe.

IID Contract Service Area (Excluding the Southern Shoreline of the Salton Sea)

Canals and drains traverse the IID Contract Service Area as shown on Figure 1-2a, IID Canal System and Figure 1-2b, IID Drain System. Natural communities and land cover types within IID Contract Service Area (excluding the southern shoreline of the Salton Sea), as described in the QSA EIR/EIS (IID 2003), are paraphrased below.

Drains – IID operates and maintains approximately 1,456 miles of agricultural drains in its Contract Service Area. (IID 2023.) These drains typically consist of unlined dirt channels; however, approximately 134 miles of this network have been buried in pipes. (IID 2021.) Drain channel banks are generally constructed at 45-degree slopes between 6 and 15 feet in depth. Drain channel depths are constructed and maintained at elevations needed to properly drain the subsurface tile drainage water in addition to the surface drainage water. As a result, typical drainage water levels within drain channels are generally at significantly lower depths than the height of the drain channel banks. Vegetation within the drains is typically dominated by 1 or more of the following species: saltbush (*Atriplex* sp.), Bermuda grass (*Cynodon dactylon*), saltgrass (*Distichlis spicata*), common reed (*Phragmites australis*) and tamarisk (*Tamarix* sp.); interspersed with various other upland and emergent vegetation

such as buckwheat (*Eriogonum* sp.), alkali heliotrope (*Heliotropium curassavicum*), rush (*Juncus* sp.), bulrush (*Scirpus* sp.), Russian thistle (*Salsola* tragus) and cattail (*Typha* sp.). Emergent vegetation tends to occur in isolated portions of the drain system, whereas more extensive stands occur at the mouths of drains where they empty into the Alamo and New Rivers and Salton Sea. Two surveys of various drains were completed within the IID Contract Service Area in 1994 by IID and again in 1997 by Hurlbert. The 1994 survey included approximately 506 miles of drain and indicated that vegetation within the surveyed area consisted primarily of Bermuda grass, common reed, mallow (*Malvella leprosa*), saltbush and saltgrass. The 1997 survey included 10 drains and approximately 78 miles. This survey revealed that common reed was the most prevalent species, while emergent vegetation (e.g., bulrush, rush and cattail) was the least common, only occurring in isolated stands. (IID 2003.)

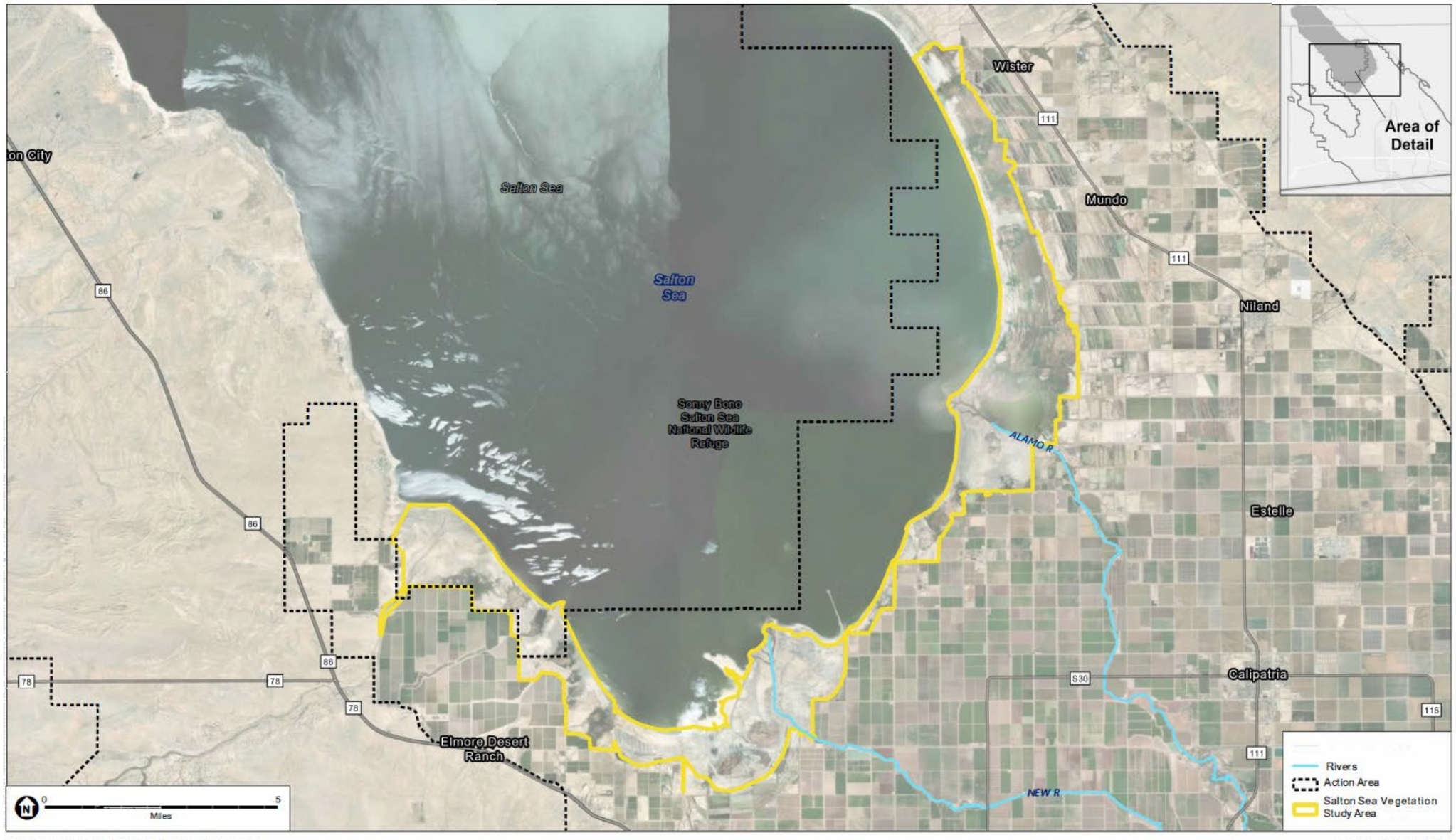
Canals – Canals that convey water from the Lower Colorado River to and throughout the IID water contract service area generally support little vegetation; approximately 70 percent of the approximately 1,668 miles of canals within the IID Contract Service Area are lined with concrete or contained in pipes. (IID 2023.) The remaining canals of approximately 30 percent are earthen (IID 2023) and support various forms of vegetation, generally dominated by common reed, bermuda grass, salt grass and tamarisk. In addition, the East Highline Canal supports adjacent phreatophytic vegetation resulting from seepage. Vegetation observed within these seepage communities is typically dominated by arrow weed, common reed and/or tamarisk and is interspersed with small, isolated patches of cattail, cottonwood and mesquite (*Prosopis* sp.) throughout. (IID 2003.)

All-American Canal – Channel vegetation along earthen portions the All-American Canal is overwhelmingly dominated by common reed. However, seepage along the canal allowed for the development of phreatophytic vegetation. Approximately 1,422 acres of phreatophytic vegetation occurs between Drops 3 and 4, which consists of approximately 111 acres of emergent vegetation (e.g., cattail), approximately 755 acres of tamarisk, approximately 233 acres of arrow weed, approximately 251 acres of mesquite and approximately 39 acres of cottonwood/willow. A total of between approximately 200 and 250 acres of un-characterized phreatophytic vegetation occurs between Drop 4 and the East Highline Canal and in proximity to Mission Wash. (IID 2003.)

Southern Shoreline of the Salton Sea

The IID Contract Service Area includes the southern shoreline of the Salton Sea. (See Figure 1-1, IID Contract Service Area/Proposed Action Area.) The natural communities and land cover types along the southern shoreline of the Salton Sea are depicted in **Figures 3-3a, 3-3b, 3-3c, and 3-3d, Vegetation and Land Cover Types**. These natural communities and land cover types were characterized during the field mapping effort by ESA on October 10-13, 2023.

Figure 3-2 Salton Sea Vegetation Study Area



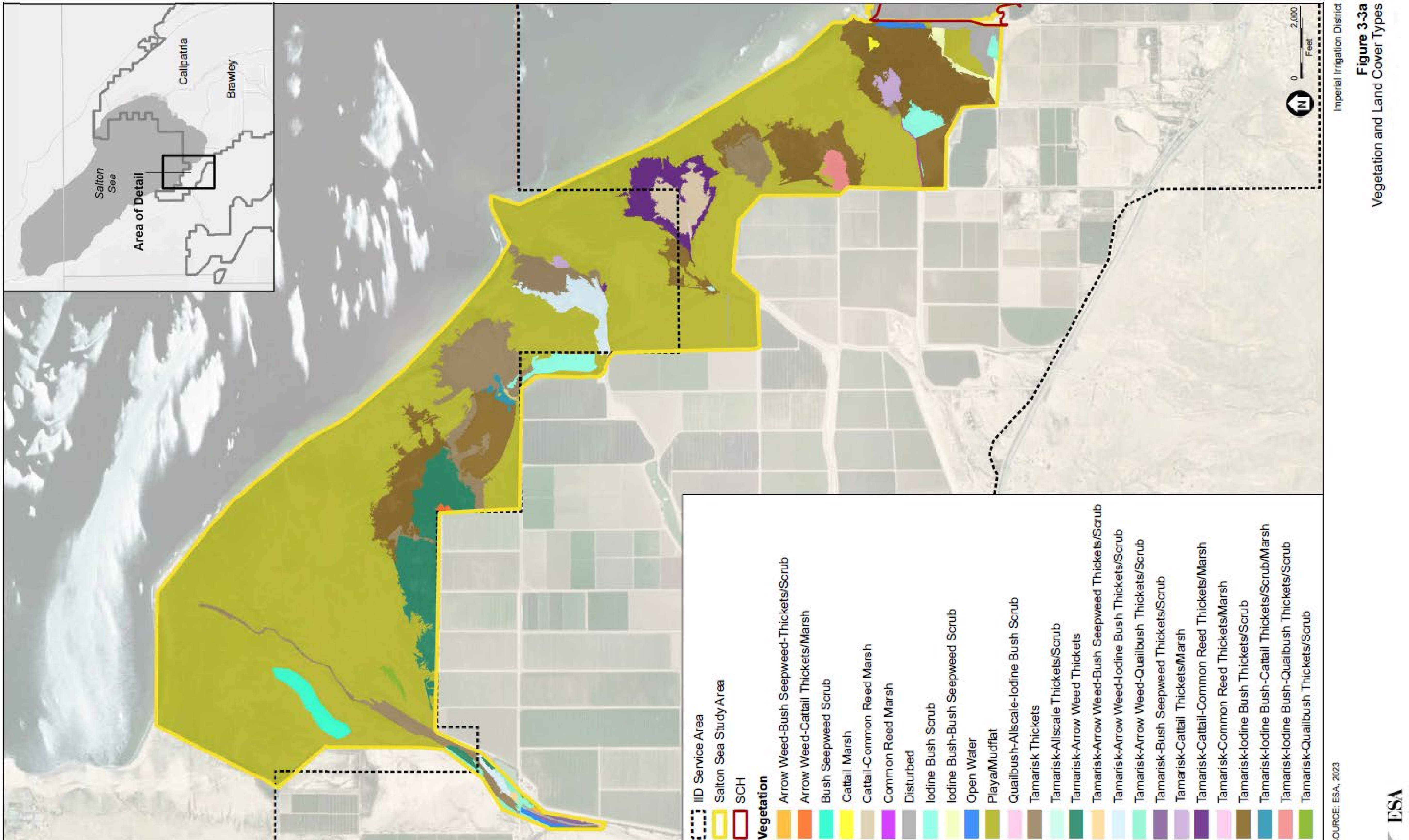
SOURCE: ID, 2023; CDFW, 2023; USFWS, 2023; ESA, 2023

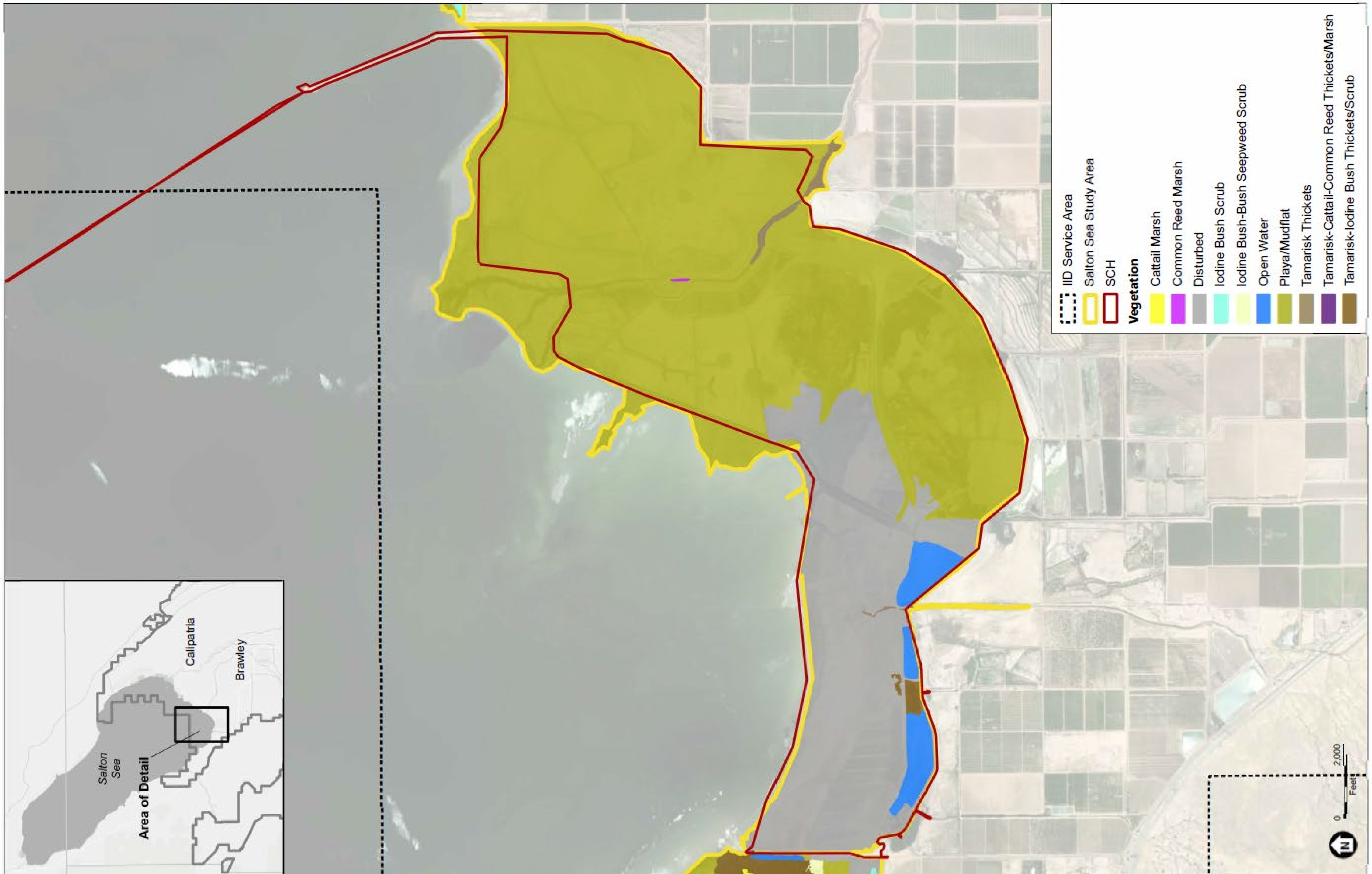
Imperial Irrigation District
2024-2026 Temporary Colorado river System Water Conservation Project

Figure 3-2
Salton Sea Vegetation Study Area

ESA

Figures 3-3a, 3-3b, 3-3c, and 3-3d Vegetations and Land Cover Types

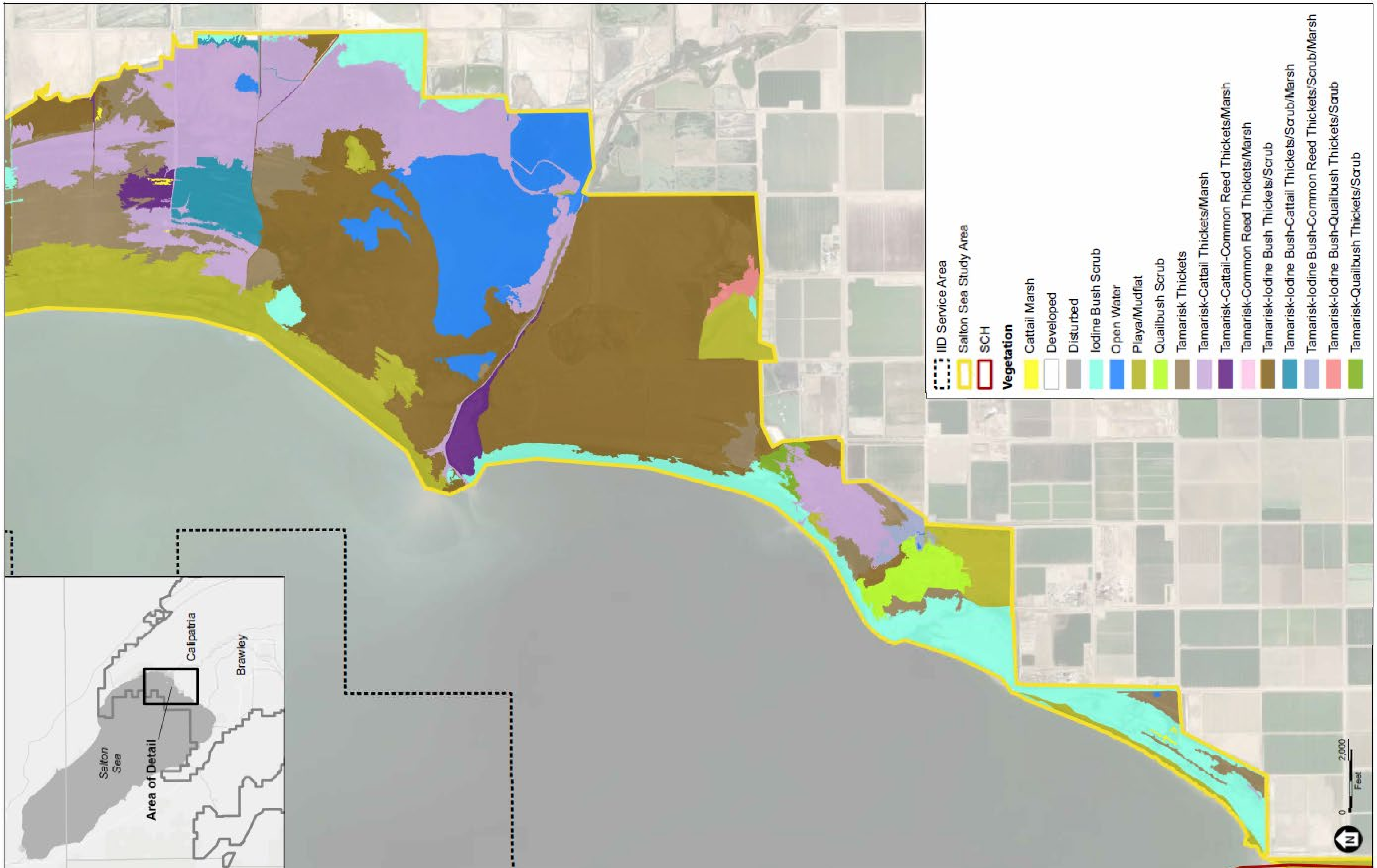




SOURCE: ESA, 2023

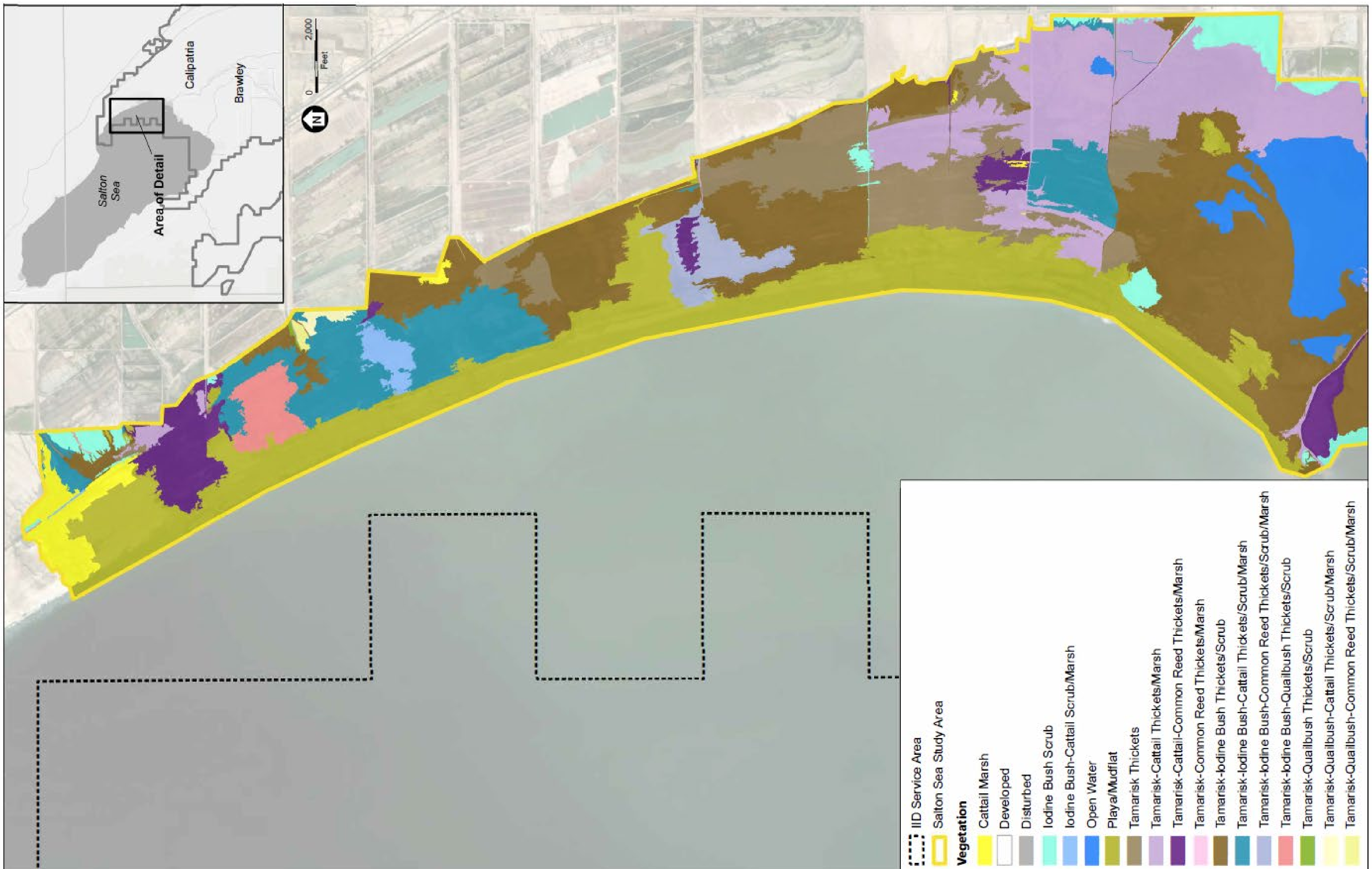
Imperial Irrigation District

Figure 3-3b
Vegetation and Land Cover Types



SOURCE: ESA, 2023

Imperial Irrigation District
Figure 3-3c
Vegetation and Land Cover Types



SOURCE: ESA, 2023

Imperial Irrigation District

Figure 3-3d
Vegetation and Land Cover Types

ESA

The southern shoreline of the Salton Sea includes approximately 19,000 acres of shoreline and exposed playa adjacent to the Sea as set forth in **Table 3-4, Natural Communities and Land Cover Types Along the Salton Sea**. Prior to certification of the QSA EIR/EIS, most of the southern shoreline of the Salton Sea was inundated by water. After 2003, when irrigation drain water flows were reduced and the Salton Sea started receding, playa around the Salton Sea became exposed and drains no longer reached the Sea, which resulted in the creation of discrete patches of vegetation (approximately 8,677 acres total). The field mapping effort within the Salton Sea Vegetation Study Area identified 31 distinct natural communities and land cover types within this portion of the IID Contract Service Area. As described in Section 3.4.1.1 Methodology, natural communities and land cover types were characterized based on species dominance or other relevant descriptor (such as disturbed, developed, barren, mudflat, etc.) and are presented below.

Table 3-4 Natural Communities and Land Cover Types Along the Salton Sea

Natural Community/Land Cover Type	Acres
Arrow Weed-Bush Seepweed Thickets/Scrub	0.92
Arrow Weed-Cattail Thickets/Marsh	2.49
Bush Seepweed Scrub	36.53
Cattail Marsh	154.04
Cattail-Common Reed Marsh	58.77
Common Reed Marsh	1.55
Iodine Bush Scrub	782.02
Iodine Bush-Bush Seepweed Scrub	17.12
Iodine Bush-Cattail Scrub/Marsh	52.10
Quailbush Scrub	96.01
Quailbush-Allscale-Iodine Bush Scrub	1.32
Tamarisk Thickets	1,152.28
Tamarisk-Allscale Thickets/Scrub	0.72
Tamarisk-Arrow Weed Thickets	183.48
Tamarisk-Arrow Weed-Bush Seepweed Thickets/Scrub	5.16
Tamarisk-Arrow Weed-Iodine Bush Thickets/Scrub	59.40
Tamarisk-Arrow Weed-Quailbush Thickets/Scrub	20.33
Tamarisk-Bush Seepweed Thickets/Scrub	6.89
Tamarisk-Cattail Thickets/Marsh	1,216.50
Tamarisk-Cattail-Common Reed Thickets/Marsh	360.62
Tamarisk-Common Reed Thickets/Marsh	2.40
Tamarisk-Iodine Bush Thickets/Scrub	3,527.25
Tamarisk-Iodine Bush-Cattail Thickets/Scrub/Marsh	597.34
Tamarisk-Iodine Bush-Common Reed Thickets/Scrub/Marsh	151.66

Natural Community/Land Cover Type	Acres
Tamarisk-Iodine Bush-Quailbush Thickets/Scrub	137.45
Tamarisk-Quailbush Thickets/Scrub	31.50
Tamarisk-Quailbush-Cattail Thickets/Scrub/Marsh	15.63
Tamarisk-Quailbush-Common Reed Thickets/Scrub/Marsh	6.27
Subtotal of Vegetation (above)	***8,677.75***
Open Water	620.80
Playa/Mudflat	4,869.73
Developed	2.15
Disturbed	4,411.20
Total	**18,581.63**

SOURCE: ESA, October 2023.

Sensitive Natural Communities

"Sensitive" natural communities and habitats are defined by CDFW as those natural communities that have a reduced range and/or are imperiled because of various forms of development and other anthropogenic stressors, including residential and commercial expansion, various forms of agriculture, energy production, mining, etc. These communities are evaluated using NatureServe's Heritage Methodology (NatureServe 2023), which is based on the knowledge of range and distribution of a specific vegetation type and the proportion of occurrences that are of good ecological integrity. Evaluation is done at both a global (natural range within and outside of California [G]) and subnational (State level for California [S]) level, each ranked from 1 ("critically imperiled" or very rare and threatened) to 5 (demonstrably secure). A community or habitat with a State rank of S1 through S3 is considered "sensitive" natural community and may require review when evaluating environmental impacts (CDFW 2024b). For the purposes of this EA, if a natural community supports a co-dominance of a species that is typically associated with "sensitive" community (e.g., state rank S1-3), it is presumed "sensitive."

Several sensitive natural community types have been documented within the IID Contract Service Area, sixteen along the southern shoreline of the Salton Sea and two within the remaining area of the IID Contract Service Area. Each natural community, its presumed State Rank and approximate acreage within each area of the Proposed Action Area is presented below in **Table 3-5, Sensitive Natural Communities and Land Cover Types**.

Table 3-5 Sensitive Natural Communities and Land Cover Types

Natural Community/Land Cover Type	State Rank	Acres
IID Contract Service Area (Excluding Southern Shoreline of the Salton Sea)		
Cottonwood and mesquite-dominated communities	S3	Unknown*
Southern Shoreline of the Salton Sea		
Arrow Weed-Bush Seepweed Thickets/Scrub	S3	0.92
Arrow Weed-Cattail Thickets/Marsh	S3	2.49
Bush Seepweed Scrub	S3	36.53
Iodine Bush Scrub	S3	782.09
Iodine Bush-Bush Seepweed Scrub	S3	17.12
Iodine Bush-Cattail Scrub/Marsh	S3	52.11
Quailbush-Allscale-Iodine Bush Scrub	S3	1.32
Tamarisk-Arrow Weed Thickets	S3	183.50
Tamarisk-Arrow Weed-Bush Seepweed Thickets/Scrub	S3	5.16
Tamarisk-Arrow Weed-Iodine Bush Thickets/Scrub	S3	59.40
Tamarisk-Arrow Weed-Quailbush Thickets/Scrub	S3	20.33
Tamarisk-Bush Seepweed Thickets/Scrub	S3	6.89
Tamarisk-Iodine Bush Thickets/Scrub	S3	3,527.55
Tamarisk-Iodine Bush-Cattail Thickets/Scrub/Marsh	S3	597.39
Tamarisk-Iodine Bush-Common Reed Thickets/Scrub/Marsh	S3	151.68
Tamarisk-Iodine Bush-Quailbush Thickets/Scrub	S3	137.46
Total		33,210

SOURCE: ESA, IID

*The quantity of cottonwood and mesquite-dominated communities within the IID Contract Service Area, excluding the southern shoreline of the Salton Sea, has not been quantified for this analysis.

Habitat Management and Restoration Lands

Managed lands are located within the IID Contract Service Area. Managed lands include those that have been recognized for their biological value, or those that have been created either as mitigation for impacts incurred from implementation of the QSA or as restoration projects implemented by the State of California (pursuant to the Salton Sea Restoration Act, California Fish and Game Code Sections 2930 et al. and the Salton Sea Management Program). **Table 3-6, Managed Habitat Mitigation and Restoration Lands**, presents the managed lands, managing entity and acreage.

Table 3-6 Managed Habitat Mitigation and Restoration Lands

Land	Managing Entity	Acres
Imperial Irrigation District Managed Marsh Complex	IID	969
Imperial Wildlife Area	CDFW	7,900
Sonny Bono Salton Sea National Wildlife Refuge	USFWS	3,000
Chanan Remington Memorial Wetland	CDFW	44
Species Conservation Habitat Project*	DWR	4,110

SOURCE: ESA 2022; IID
*SCH project is currently under construction

Imperial Irrigation District Managed Marsh Complex

The IID Managed Marsh Complex is situated between Highway 111 and English Road and was constructed to mitigate for impacts associated with implementation of the QSA per the QSA EIR/EIS. Phase I of the complex was completed in October of 2008 and is comprised of three habitat types, desert riparian, emergent wetland and scrub-shrub bosque, that total 375 acres. Phase II of the complex was completed in December 2014 and is comprised of two habitat types, desert riparian and emergent wetland that total 360 acres. Phase III of the complex was completed in 2020 and is comprised of two habitat types, desert riparian and emergent wetlands that total approximately 350 acres. The IID Managed Marsh Complex is intended to provide habitat for common and sensitive bird species, particularly those specific to marsh and shoreline habitats. (IID 2024a, 2024c.)

Imperial Wildlife Area

The Imperial Wildlife Area is intended to provide habitat for wildlife, as well as provide opportunities for recreation, including wildlife viewing, fishing and hunting. It is comprised of three units that include Wister, Hazard and Finney-Ramer. The Wister unit is located southeast of the Salton Sea and west of the town of Niland extending to the north. The Hazard unit is also located southeast of the Salton Sea and northwest of the town of Calipatria. The Finney-Ramer unit is located along the Alamo River south of Calipatria. These units support various habitat types, including fresh and saline wetland and desert scrub. (CDFW 2024a.)

Sonny Bono National Wildlife Refuge

The Sonny Bono Salton Sea National Wildlife Refuge, approximately 3,000 acres, is located adjacent to the southern and southeastern shorelines of the Salton Sea. This refuge is comprised of two separate units, approximately 18 miles apart, both bordered by the Salton Sea to the north or northwest and agriculture in all other directions. The refuge manages land intended for the maintenance of wildlife habitat, both to reduce crop damage to surrounding agricultural land and protect migratory birds and other special-status species. (USFWS 2023b.)

Chanan Remington Memorial Wetland

The Chanan Remington Memorial Wetland, approximately 44 acres, is located adjacent to the All-American Canal between Drops 3 and 4 as mitigation for the loss of seepage wetlands due to the All-American Canal Lining Project. Lining of the canal reduced percolation of the surface water to

adjacent seepage wetlands. The expanded and enhanced wetland acreage includes honey mesquite and/or cottonwood willow, and marsh vegetation. (IID 2024b.)

Species Conservation Habitat Project

The Salton Sea Species Conservation Habitat Project (SCH Project), approximately 4,100 acres, is located along the receded shoreline of the Salton Sea on the east and west sides of the New River. The goal of the SCH Project is to utilize areas of exposed playa to create habitat for fish and wildlife species that are dependent on the Salton Sea. The SCH Project objectives are as follows:

1. Provide habitat for piscivorous birds;
2. Develop physical structure and microhabitat elements for piscivorous bird species;
3. Support a sustainable, productive aquatic community;
4. Provide suitable water quality for fish;
5. Minimize adverse effects on desert pupfish;
6. Minimize risk of selenium toxicity; and
7. Minimize risk of disease/toxicity impacts. (CNRA 2015.)

Special-Status Species

Special-status plants and wildlife occur within the IID Contract Service Area and are defined as those that, because of their recognized rarity or vulnerability to various causes of habitat loss or population decline, are recognized by federal, state, or other agencies as imperiled in some way. Some of these species receive specific protection that is defined by federal or state endangered species legislation while others have been designated as special-status based on adopted policies (e.g., counties and cities) and/or the expertise of state resource agencies or non-profit organizations (e.g., CNDDB or CNPS). For purposes of this report, special-status plant and wildlife species are defined as follows:

- Plants that are listed or proposed for listing as threatened or endangered or are candidates for possible future listing as threatened or endangered, under the FESA or the California Endangered Species Act (CESA) (California Fish and Game Code Sections 2050, et seq.).
- Plants that meet the definitions of rare or endangered under State CEQA Guidelines Section 15380.
- Plants considered by the CNPS to be rare, threatened, or endangered (Rank 1A, 1B, 2A and 2B plants) in California.
- Plants listed as rare under the California Native Plant Protection Act (Fish and Game Code Sections 1900, et seq.).
- Wildlife listed or proposed for listing as threatened or endangered or are candidates for possible future listing as threatened or endangered, under the FESA or the CESA.
- Wildlife that meets the definitions of rare or endangered under State CEQA Guidelines Section 15380.
- Wildlife designated by CDFW as species of special concern, CDFW Watch List species, or have a state rank of S1-S3 on CDFW's Special Animals List (CDFW 2023a).
- Wildlife "fully protected" in California (FGC Sections 3511, 4700, and 5050).
- Bird species protected by the MBTA.
- Bat species considered priority by the Western Bat Working Group (WBWG).

A review of the CNDDB (CDFW 2023a) and existing documentation revealed that many special-status plant and wildlife species have been reported within the vicinity of the IID Contract Service Area. **Figures 3-4a and 3-4b, Special-Status Plant and Wildlife Species** depict the location of recorded occurrences of those special-status plant and wildlife species within the IID Contract Service Area. The potential for special-status species to occur is based on existing vegetation and habitat quality, topography, elevation, soils, surrounding land uses, habitat preferences and geographic ranges, and known occurrences within the IID Contract Service Area.

This has been analyzed based on the criteria provided below and is included in **Appendix BIO-2, Special Status Species with Potential to Occur**:

- **Not Expected:** The Action Area does not support habitat for a particular species or is outside of its known range.
- **Low Potential:** The Action Area supports limited habitat for a particular species. For example, the appropriate vegetation assemblage may be present while the substrate preferred by the species may be absent, or the preferred habitat may be present, but has undergone substantial disturbance, such that the species is not expected to occur.
- **Moderate Potential:** The Action Area supports marginal habitat for a particular species. For example, the available habitat may be somewhat disturbed, however, still supports important components, such as a particular soil or community type.
- **High Potential:** The Action Area provides suitable habitat conditions for a particular species and/or known populations occur in the immediate vicinity.
- **Present:** The species has been observed within a particular portion of the Action Area.

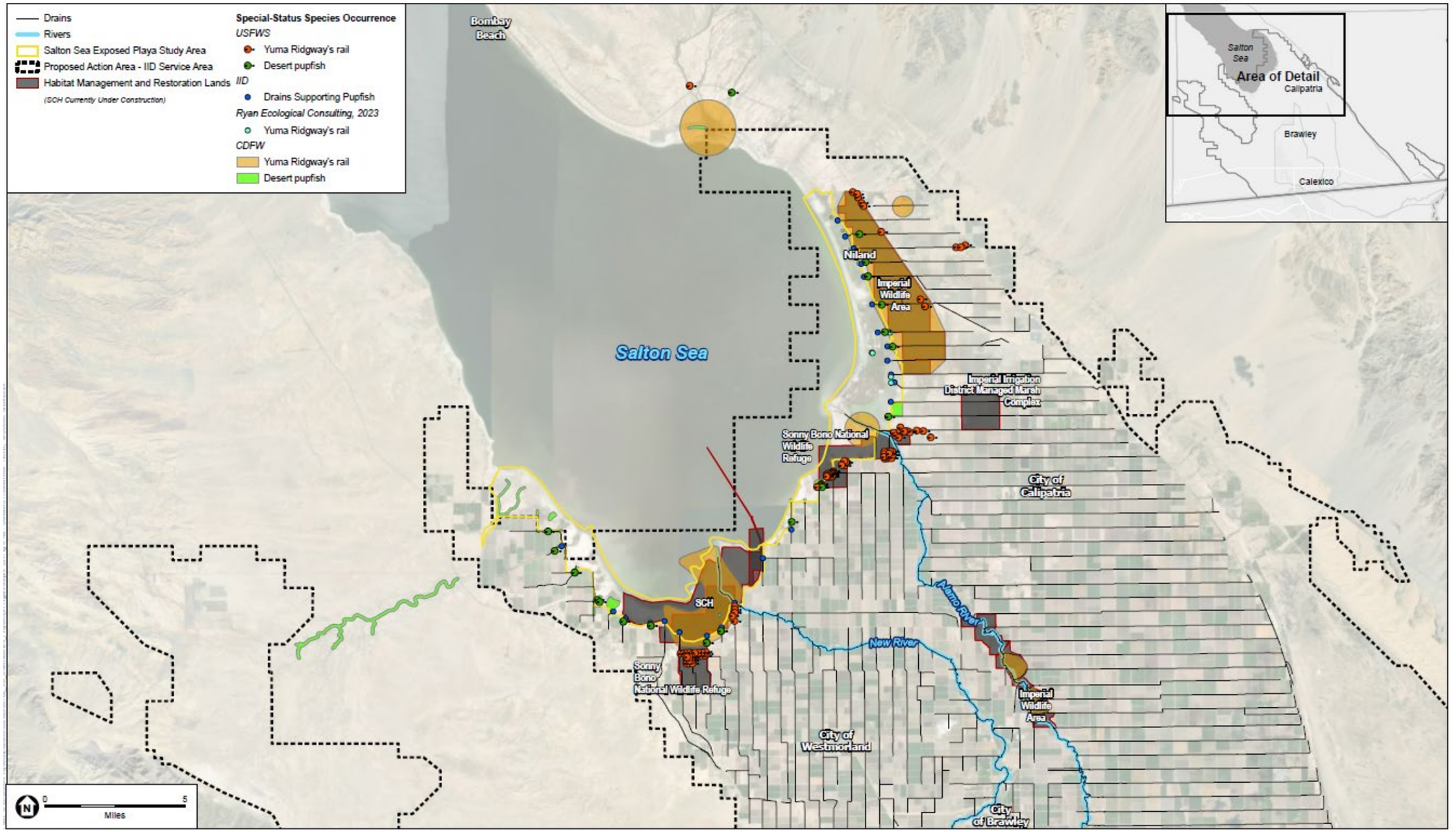
A total of six plant and forty-five wildlife species have a moderate to high potential to occur or have been observed within the IID Contract Service Area and have been put into two groups, those that depend on upland habitats and those that depend on fresh aquatic, riparian and marsh habitats.

Upland plant and wildlife species

A total of 16 species occur within and depend primarily upon upland desert scrub and dune habitat types dominated by plant species such as creosote bush (*Larrea tridentata*) and quailbush (*Atriplex lentiformis*). These include Peirson's milk-vetch (*Astragalus magdalenae* var. peirsonii), ferruginous hawk (*Buteo regalis*), mountain plover (*Charadrius montanus*), Wiggin's croton (*Croton wigginsii*), desert tortoise (*Gopherus agassizii*), merlin (*Falco columbarius*), Algodones Dunes sunflower (*Helianthus niveus spp. Tephrodes*), banded Gila monster (*Heloderma suspectum* ssp. *cinctum*), cave myotis (*Myotis velifer*), big free-tailed bat (*Nyctinomops macrotis)*, cheeseweed moth lacewing (*Oliarces clara*), flat-tailed horned lizard (*Phrynosoma mcallii*), Andrew's dune scarab beetle (*Pseudocotalpa andrewsi*), Couch's spadefoot toad (*Scaphiopus couchii*), crissal thrasher (*Toxostoma crissale*) and Le Conte's thrasher (*Toxostoma lecontei*). Upland habitats primarily depend on seasonal precipitation and are not reliant on perennial sources of water, natural or supplemental. The 16 species listed above will not be affected by the Proposed Action and will not be discussed further in this section.

In addition, the burrowing owl (*Athene cunicularia*) is known to occur in a variety of upland and wetland habitats throughout much of the IID Contract Service Area. This owl principally uses upland habitats and agricultural edits to forage and breed; however, it preys on invertebrates that depend on aquatic, riparian and marsh habitats, as well as active farmland.

Figures 3-4a and 3-4b Special-Status Plant and Wildlife Species

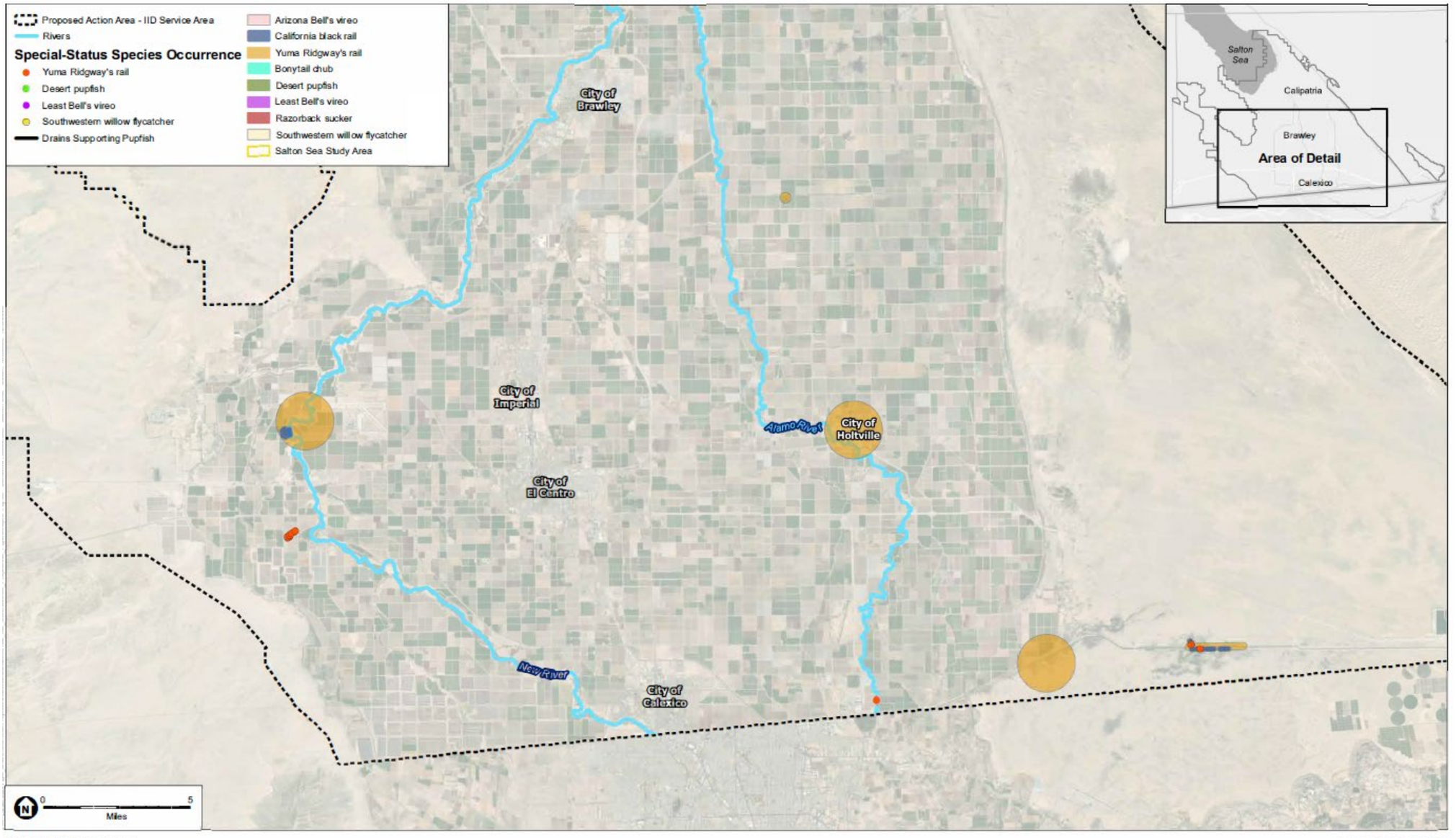


SOURCE: IID, 2023; CDFW, 2023; USFWS, 2023; Ryan Ecological Consulting, 2023; ESA, 2023

Imperial Irrigation District
2024-2026 Temporary Colorado river System Water Conservation Project

Figure 3-4a
Special-Status Plant and Wildlife Species
IID Contract Service Area
(Northern Portion)

ESA



SOURCE: IID, 2023; ESA, 2023

Imperial Irrigation District
2024-2026 Temporary Colorado river System Water Conservation Project

Figure 3-4b
Special-Status Plant and Wildlife Species
IID Contract Service Area
(Southern Portion)

Aquatic, riparian, and marsh wildlife species

A total of 32 species occur within and depend primarily upon aquatic, riparian and marsh habitats, which consist of open water/backwater along rivers and other waterways, and/or vegetation communities that are dominated by plant species such as cattail, cottonwood, willow, etc. These include Cooper's hawk (*Accipiter cooperii*), short-eared owl (*Asio flammeus*), long-eared owl (*Asio otus*), Aleutian Canada goose (*Branta canadensis* ssp. *leucopareia*), western snowy plover (*Charadrius nivosus* ssp. *alexandrinus*), black tern (*Chlidonias niger*), gilded flicker (*Colaptes chrysoides*), desert pupfish (*Cyprinodon macularius*), southwestern willow flycatcher (*Empidonax traillii* ssp. *extimus*), bonytail chub (*Gila elegans*), bald eagle (*Haliaeetus leucocephalus*), yellow-breasted chat (*Icteria* virens), least bittern (*Ixobrychus exilis*), Sonoran mud turtle (*Kinosternon sonoriense*), Yuma Ridgway's rail (*Rallus obsoletus yumanensis*), California black rail (*Laterallus jamaicensis* ssp. *coturniculus*), lowland leopard frog (*Lithobates yavapaiensis*), California leaf-nosed bat (*Macrotus californicus*), Gila woodpecker (*Melanerpes uropygialis*), elf owl (*Micrathene whitneyi*), brown-crested flycatcher (*Myiarchus tyrannulus*), cave myotis (*Myotis velifer*), American white pelican (*Pelecanus erythrorhynchos*), brown pelican (*Pelicanus occidentalis* ssp. *californicus*), summer tanager (*Piranga rubra*), white-faced ibis (*Plegadis chihi*), vermillion flycatcher (*Pyrocephalus rubinus*), bank swallows (*Riparia riparia*), black skimmer (*Rynchops niger*), yellow warbler (*Setophaga petechia*), Yuma hispid cotton rat (*Sigmodon hispidus* ssp. *eremicus*) and razorback sucker (*Xyrauchen texanus*).

One fish species and four bird species are discussed below in further detail, based on their known presence in the IID Contract Service Area. Known occurrences for these species documented by the CDFW (2023a) and the USFWS (2023b) are depicted in Figures 3-4a and 3-4b, Special-Status Plant and Wildlife Species.

Desert Pupfish

The desert pupfish is state and federally endangered. This species is a resident of small streams and the shallow margins of larger bodies of water, and in California is known to occur within the Salton Sink (San Felipe/San Sebastian Marsh, Salt Creek and the Salton Sea). They prefer areas with soft substrate, clear water and an abundance of aquatic vegetation and aquatic invertebrates (USFWS 1993, 2010). This species is tolerant of high temperatures and salinities and low dissolved oxygen concentrations and is far more tolerant to abrupt changes in salinity than virtually all other native fish that share their habitat (USFWS 2023a). Quantitative habitat metrics preferred/required for the species are listed below:

- shallow water, ranging between 0.5 inch and ~3 feet
- water less than 36 degrees C; upper lethal tolerance of 42.4 degrees C
- water greater than 0 degrees C
- water salinity of less than 68 ppt
- less than 100 percent cover of emergent vegetation
- surface water velocity of 1.0 foot per second or greater (ESA 2017)

Desert pupfish are known to occur along the shoreline of the Salton Sea and in irrigation drains. They have been documented within the Sonny Bono National Wildlife Refuge and the Imperial Wildlife Areas (CDFW 2023a).

California Black Rail

The California black rail is state threatened. This species is a resident in saline, brackish and fresh emergent wetlands in the San Francisco Bay area, Sacramento-San Joaquin Delta, coastal southern California, and the Salton Sea. Suitable habitat along the Salton Sea consists of freshwater emergent marsh dominated by bulrush, cattail and saltgrass, with either moist substrate or shallow water (i.e., up to 1.2 inches deep). They typically do not occur in low wetland areas with considerable annual and/or daily fluctuations in water levels and instead are found in the high wetland zones near the upper limit of tidal flooding. They are carnivorous, gleaning isopods, insects and other arthropods within suitable habitat. This species is known to breed between March and June (CDFW 1999). It typically nests at the base of tall vegetation, in moist substrate, but may place material in up to 1-inch deep of water (Cornell Lab of Ornithology 2019).

The California black rail has been documented in the Imperial Wildlife Area and within the IID Contract Service Area. Further within the IID Contract Service Area, the California black rail has been observed along the New River and the southwestern border of the Chocolate Mountains (CDFW 2023a).

Least and Arizona Bell's Vireo

Least Bell's Vireo is state and federally endangered, and the Arizona Bell's Vireo is state endangered. Both insectivorous subspecies breed within dense riparian and shrub vegetation associated with aquatic habitats in Southern California (including the Lower Colorado River) and Baja California. They are both commonly associated with habitats that include willow and mulefat (*Baccharis salicifolia*) and are known to breed between March and August (USFWS 2023e). Least Bell's Vireo have been documented in the IID Contract Service Area within the Imperial Irrigation District Managed Marsh Complex (CDFW 2023a).

Southwestern Willow Flycatcher

The Southwestern willow flycatcher is state and federally endangered. This insectivorous species breeds within dense riparian and shrub vegetation associated with aquatic habitats in southwestern North America, near or adjacent to surface water. This species is commonly associated with habitats that include willow and mulefat (*Baccharis salicifolia*). This species is known to breed between May and August (USFWS 2002). Southwestern willow flycatcher has been documented along the Lower Colorado River near the Palo Verde Diversion Dam, Imperial National Wildlife Refuge and south towards the Laguna Mountains (CDFW 2023a).

Yuma Ridgway's Rail

The Yuma Ridgway's rail is state threatened and fully protected and federally endangered. Yuma Ridgway's rails construct nests on stable substrates (e.g., at bases of emergent vegetation or in mats of dead vegetation) in shallow water along the shoreline of marsh habitat or over deeper water. Often, male birds will build multiple nests, to which they can physically move eggs in the event of predators or unexpected increases in water level (USFWS 1983). Water depths within proximity of active nests have been documented ranging between 5 centimeters and 1 meter (USFWS, 2023c).

The Yuma Ridgway's rail has been documented in the Salton Sea emergent vegetation, the Sonny Bono National Wildlife Refuge, within the IID Contract Service Area along drains and canals, along the Alamo River and within the Imperial Wildlife Area (CDFW 2023a).

3.4.2 Environmental Consequences

3.4.2.1 No Action Alternative

Implementation of the No Action Alternative would involve no additional reductions in water diversions by IID from the Colorado River at the Imperial Dam and would therefore not achieve conservation objectives. As a result, the water conservation would not occur, eliminating effects from the water conservation programs, including efficiency conservation and fallowing. There would be no additional reductions of water flows to the Salton Sea.

3.4.2.2 Proposed Action Alternative

The Proposed Action involves the conservation of water within the IID Contract Service Area, reducing water diversions from the Colorado River. The analysis of the Proposed Action follows an approach similar to that used in the QSA EIR/EIS to identify impacts for biological resources due to reduced flows. The QSA EIR/EIS assessed the following water conservation measures for their potential to effect biological resources: (1) IID system efficiencies (e.g., 12-hour delivery and seepage recovery programs), (2) on-farm irrigation system improvements (e.g., tailwater return systems and drip irrigation) and (3) temporary fallowing farmland and select Salton Sea mitigation sites (IID 2003).

Appendix BIO-3, QSA EIR/EIS Comparison Impact Table provides a comparison of the impacts identified in the QSA EIR/EIS with those associated with implementation of the Proposed Action. The Proposed Action will be limited to water conservation and will not involve the construction of projects; therefore, seven impacts involving construction of projects under the QSA (i.e., BR-14-16, BR-18, BR-25, BR-28 and BR-30) were omitted from this analysis. Additionally, the draft Habitat Conservation Plan (HCP) (IID 2001) prepared in tandem with the QSA EIR/EIS (IID 2003) included proposed beneficial impacts associated with the creation of managed marsh and native tree habitat and the implementation of avoidance measures for sensitive species (i.e., burrowing owl and razorback suckers). Some of these measures have been implemented by IID since certification of the QSA EIR/EIS to varying degrees; however, the 13 HCP-specific QSA impacts (i.e., HCP-BR-32-40 and HCP1-BR-52-55) were also omitted from this analysis (see Appendix BIO-3).

The remaining 34 impacts included in the QSA EIR/EIS (BR-1-13, BR-17, BR-19-24, BR-26, BR-27, BR-29, BR-31 and BR-41-51) were considered when assessing the effect on biological resources as a result of the Proposed Action.

IID Contract Service Area

The QSA EIR/EIS identified 13 impacts (BR-10-13, BR-17, BR-19-24, BR-26, BR-27) to biological resources (see Appendix BIO-3) within the IID Contract Service Area resulting from water conservation of up to 300,000 AFY. Some of these impacts (BR-10, BR-13, BR-17, BR-20-23, BR-28, BR-29, BR-30 and BR-31) were identified as either less than significant or as having no impact to biological resources; these included effects to drain and river (Alamo and New) vegetation, fallowing of agricultural fields, effects to fish habitat due to decreases in water depths and a reduction in availability of insects to burrowing owls. QSA impacts requiring mitigation included increases in

salinity, selenium and pesticide concentrations in the drains, and reduced habitat availability (i.e., emergent vegetation) for the Yuma Ridgway's rail and desert pupfish (i.e., aquatic habitat) due to decreases in water level.

IID maintains flow data for drains within the IID Contract Service Area, including for the New and Alamo Rivers. The drainage flow data presented and discussed in Section 3.8, Hydrology/Water Quality includes many of the drains that flow to the Salton Sea, but not all. Some drains that flow to the Sea have not been actively monitored for the collection of drain flow data. However, the dataset provides a robust representation of the water that moves through IID's drain system and discharges into the Salton Sea.

The Proposed Action is expected to result in an average annual reduction in drain flows of 11.9 percent during three years, calendar years 2024 through 2026 (See Section 3.8, Hydrology/Water Quality, Table 3-11, Existing Conditions Monthly Evapotranspiration, Mean Monthly Drain Flows, Water Balance for Natural Communities). To assess the effects of these drain flow reductions, an analysis of existing flow variability was conducted. Existing drain flow conditions are highly variable both seasonally and daily corresponding to agronomic practices and existing water conservation activities. Drain flows are generally higher during the hotter months of the year. The drain flow data was analyzed to determine mean on an annual and monthly timestep for the years 2019 to 2023 to reflect recent hydrology. The standard deviation of drain flow was calculated for existing conditions for each drain. The average annual flow reduction resulting from the Proposed Action (11.9 percent) would be well within the existing standard deviation of mean monthly flows at every drain (See Section 3.8, Hydrology/Water Quality, Table 3-11, Existing Conditions Monthly Evapotranspiration, Mean Monthly Drain Flows, Water Balance for Natural Communities, and Table 3-12, Proposed Action Monthly Evapotranspiration, Mean Monthly Drain Flows, and Water Balance for Natural Communities). That is to say, flow variability within each month in each drain under existing conditions is greater than the increment of flow reduction caused by the temporary conservation under the Proposed Action, assuming flow reductions are applied evenly spatially and temporally.

To further analyze the potential effects of the Proposed Action to drain flows to the Salton Sea, drain flow data for the most recent 5 years (2019-2023) was compiled for 20 of the drains that flow directly to the Sea. Hydrographs were prepared to illustrate the monthly median flow from January to December as well as the recorded highs and lows for each drain. The hydrographs shown on **Figure 3-5, Drain Flow Hydrographs**, demonstrate the annual flow variability in each of the drains and the reduction of the annual average drain flows by 11.9 percent are generally within the recorded variability. The hydrographs also show the brief periods that drain flows may occur lower than the 5-year historical lows if the DIP were to be implemented at maximum participation during the summer months of June through September. Only in this scenario is there an indication from the data that drain flows may be reduced to lower than the 5-year historical lows. However, in those instances, the drain flows are generally at higher levels during these months and the reduction in flows only represents a reduction to that volume, but does not result in no flows in those drains.

Figure 3-5 Drain Flow Hydrographs

It is anticipated that drains will continue to show variable flows corresponding to agronomic practices and existing water conservation programs. The Proposed Action is expected to reduce annual average drain flows by 11.9 percent. This reduction when added to the lowest drain flows on record for each month may result in brief periods of drain flows that are lower than the most recent 5-year historical lows. However, this condition would be temporary, and would recover within the month as demonstrated in the historic flow data.

Nevertheless, the Proposed Action includes the Monitoring Plan, which provides for the ongoing monitoring of the drain flows during the short-term period of the Proposed Action. Implementation of the Monitoring Plan would ensure that any drain flow reductions under the Proposed Action, that do not already occur under existing conditions, would be addressed immediately. The Monitoring Plan requires certain actions to be taken to ensure that there would not be adverse effects to listed species or their habitat resulting from the Proposed Action.

Aquatic, Riparian, and Marsh Habitat and Species

While the Proposed Action would result in an annual average reduction in drain flows of approximately 11.9 percent for the three-year period of calendar years 2024 through 2026, the Alamo River and New River, the San Felipe Wash and drains within IID's Contract Service Area would continue to convey the remaining flows, with the primary impact being a minor reduction in water depth. Characteristic drain morphology within the IID Contract Service Area typically consists of channels between 6 and 15 feet deep with 45-degree banks (IID 2003). The reduction in flow is expected to reduce water depth by less than 1 foot of surface elevation. Flow variability under existing conditions results in greater depth fluctuations.

Temporary reductions in water levels in drains are not expected to increase salinity or selenium concentrations that could affect desert pupfish by reducing water quality and available foraging/breeding opportunities. The flow reductions would represent a small percentage of the overall flows and occur only over the three-year period of calendar years 2024 through 2026. Projected increases in salinity would be accelerated by 3 to 4 years when compared to baseline future projections (2045), based on the trajectory predicted by hydrologic models developed by DWR. However, the temporary impacts associated with the Proposed Action would taper off to projected future baseline levels by the year 2045. (See Appendix HYDRO-3.)

Sensitive fish species, namely desert pupfish, are found in open water and drains that currently have sufficient flow to reliably maintain suitable habitat, even under the existing substantial flow variability. The IID drains in which the presence of desert pupfish have been recorded are identified in Table 2-1, IID Drain List. The flow reductions caused by the Proposed Action may reduce moisture or ponding in some of the marsh vegetation responding to flow variability. The spatial and temporal extent of flow reductions remains unknown and will depend on agronomic practices and the locations and timing of participating fields in the conservation programs implemented under the Proposed Action.

While adverse effects to desert pupfish would be unlikely during the short-term period of the Proposed Action, to ensure that drain flows are sustained spatially and temporally and to ensure that there are no adverse effects to listed species, the Proposed Action includes the implementation of the Monitoring Plan. The Monitoring Plan requires certain actions to be taken to ensure that there would not be adverse effects to the desert pupfish or its habitat resulting from the Proposed Action. Therefore, implementation of the Monitoring Plan would ensure that any drain flow reductions under the Proposed Action, that do not already occur under existing conditions, would be addressed immediately.

CDFW Sensitive Natural Communities

Based on review of the QSA EIR/EIS, two types of CDFW sensitive natural communities have been documented within the IID Contract Service Area, those dominated by cottonwood and mesquite-dominated communities. (See Table 3-5, Sensitive Natural Communities and Land Cover Types). As stated above, the average annual percent reduction in drain flows of 11.9 percent is expected to have a minimal effect on these vegetation types, which would be temporary and would return to baseline conditions following completion of the Proposed Action. And as noted above, the month-to-month flow variability under existing conditions is greater than the monthly effect of reduced flows under the Proposed Action, assuming flow reductions are applied evenly spatially and temporally, which suggests that stress to sensitive natural communities resulting from reduced water availability under the Proposed Action is within the current flow variability. As noted above, implementation of the Monitoring Plan would ensure that any drain flow reductions under the Proposed Action, that do not already occur under existing conditions, would be addressed immediately.

Sensitive Wildlife Utilizing Active Farmland

As noted in the QSA EIR/EIS (Impact BR-29), special-status species frequenting agricultural fields for foraging include mountain plover, sandhill cranes, black terns, and white-faced ibis. Implementation of the Proposed Action would not substantially reduce the availability of agricultural lands in the IID Contract Service Area. Any sensitive species utilizing a particular location affected by temporary fallowing would be able to move and utilize adjacent farmland in proximity.

Southern Shoreline of the Salton Sea

The QSA EIR/EIS identified 11 impacts (BR-41-51) to biological resources (see Appendix BIO-3) along the Salton Sea. Some of these impacts (BR-41-45 and BR-47-51) were identified as less than significant or as having no impact to biological resources. These include effects to adjacent wetland vegetation resulting from reduced rain flow and Salton Sea elevation, increased salinity and selenium concentrations, a reduction in invertebrate resources for shorebirds, effects to colonial nest/roost sites, a reduction in available mudflat and shallow water habitat, and an increase in avian disease outbreaks. QSA impacts requiring mitigation included effects to piscivorous birds due to reduced fish abundance and the isolation of desert pupfish populations from increased salinity.

Aquatic, Riparian, and Marsh Habitat and Species

Approximately 8,677 acres of wetlands have emerged on the playa along the southern shoreline of the Salton Sea (see Table 3-4, Natural Communities and Land Cover Types Along the Salton Sea). As the Salton Sea has receded (IID 2024a, 2024c), river and drain water no longer directly reaches the Sea in most locations, creating vegetation as the water disperses on the playa before reaching the Sea. The Proposed Action would reduce flows from the IID drains. If the flow reductions were sufficient to reduce the quantity or quality of the vegetative habitats along the southern shore of the Salton Sea, aquatic, riparian and marsh species including desert pupfish and Yuma Ridgeway's rails could be affected.

To determine the current water demand of the vegetative habitats, an analysis was conducted to estimate evapotranspiration (ET) rates of the natural communities mapped within the Salton Sea Vegetation Study Area in 2023 (See Section 3.8 Hydrology/Water Quality). Species dominance within each natural community was used to create representative ET values. ET demands were calculated for several representative areas of the Salton Sea Vegetation Study Area where drain data was available. A comparison of monthly drain flow and ET demands was conducted under existing conditions and under Proposed Action conditions.

The ET analysis presented in Section 3.8, Hydrology/Water Quality suggests that the annual ET demand of the existing vegetation within the Salton Sea Vegetation Study Area would be met in all locations under the Proposed Action during a normal (mean flow) year. The ET analysis shows that for normal years under existing conditions, some areas experience a water deficit compared with ET demand during summer months. The Proposed Action would potentially add to the existing monthly deficits during these months. However, the incremental increase in monthly deficits in certain areas is limited when compared to existing conditions, and the flow interruptions would be temporary, would occur within existing daily flow variability, and would recover as quickly as a few days, but no more than a few months. Due to the short duration of the minor flow deficits, vegetation is not expected to recede due to water stress such that species habitat would be adversely affected either temporarily or permanently.

To evaluate whether the reduced drain flows could adversely affect species, such as desert pupfish or Yuma Ridgway's rail, an analysis was conducted of the flow consistency within each drain (Section 3.8 Hydrology/Water Quality) to establish the existing drain flow conditions. As described in Section 3.8 Hydrology/Water Quality, existing drain flow conditions are highly variable both seasonally and daily corresponding to agronomic practices and existing water conservation activities. The Proposed Action is expected to reduce annual average drain flows by 11.9 percent. This reduction when added to the lowest flows on record for each month may result in brief periods of drain flows that are lower than the most recent 5-year historical lows. However, under existing conditions, vegetated areas that support nesting for sensitive rails and other avian species are subject to flow variability during nesting season.

To further analyze the potential effects to drainages that discharge to the Salton Sea, drain flow data were compiled for 20 of the drains that flow directly to the shoreline of the Sea (See Section 3.8, Hydrology/Water Quality). The agricultural drain hydrographs show the monthly median flow from

January to December as well as the recorded highs and lows for each drain (See Figure 3-5, Drain Flow Hydrographs). The hydrographs show annual flow variability, and the reduction of the annual average drain flows by 11.9 percent is generally within the recorded variability. The hydrographs also show the brief periods that drain flows may occur lower than the 5-year historical lows if the DIP were to be implemented at maximum participation during the summer months of June through September. Only in this scenario is there an indication from the data that drain flows may be reduced to lower than the 5-year historical lows. However, in those instances, the drain flows are generally at higher levels during these months and the reduction in flows only represents a reduction to that volume, but does not result in no flows in those drains.

Under the Proposed Action flow variability in each drain will remain high. The spatial and temporal extent of flow reductions remains unknown and will depend on farming practices and the locations and timing of participating fields in the conservation programs implemented under the Proposed Action. The effects to vegetation and nesting habitat would be minimal because the ecosystem is accustomed to the existing high flow variability. Further, desert pupfish utilize open water within drains that currently exhibit substantial flow variability. The proposed reduction in flows may create drier conditions temporarily in certain areas, but would not permanently eliminate habitat.

The expected deficit in drain flows during certain months of the Proposed Action may add to those observed under existing conditions. However, because drain flows within the IID Contract Service Area are highest each year March through September, drain flows will remain substantial during this period. Reductions in flow will be proportionally less during the avian nesting season (March through September) than during months with lower drain flows, which would reduce effects to Yuma Ridgway's rail breeding activities. Additionally, large areas of nesting habitat are available to nesting birds within the Salton Sea Vegetation Study Area allowing movement during these months. Given the Proposed Action is for a limited, short period of time of three years, areas affected by periods of lower flow will recover when flows resume to existing conditions.

While adverse effects to aquatic, riparian and marsh species, such as desert pupfish and Yuma Ridgway's rail, would be unlikely during the three-year period of the Proposed Action, to ensure that drain flows are sustained spatially and temporally within the Proposed Action Area and to ensure that take is avoided and there are no adverse effects to these listed species, the Proposed Action includes the implementation of the Monitoring Plan. In addition to the extensive drain flow and vegetation monitoring requirements and responsive actions to be taken to avoid any adverse effects to these species resulting from the Proposed Action, at several points throughout the implementation of the Monitoring Plan IID must also coordinate with and report to USFWS, Reclamation and CDFW. This is an integral part of the Monitoring Plan to ensure that IID is implementing the Monitoring Plan and providing ample communication and information to USFWS, Reclamation and CDFW throughout the three years of the Proposed Action. With the incorporation of the Monitoring Plan, the Proposed Action is not likely to adversely affect these species, particularly the desert pupfish and Yuma Ridgway's rail.

Shorebirds and Waterbirds

The Proposed Action may result in a temporary acceleration in exposure of Salton Sea acreage by 3 to 4 years based on the trajectory predicted by hydrologic models developed by DWR (See Figure 3-1, Exposed Salton Sea Acreage; Appendix HYDRO-3); however, drain water from the IID Contract Service Area would continue to flow to the Sea. Shorebirds and waterfowl utilizing the Salton Sea, adjacent vegetated areas, and drains would continue to do so under the Proposed Action.

CDFW Sensitive Natural Communities

A total of 16 CDFW sensitive natural communities have been documented within the Salton Sea Vegetation Study Area, as presented in Table 3-5, Sensitive Natural Communities and Land Cover Types. As stated above, the ET analysis suggests that water-dependent vegetation along the Salton Sea would not be adversely affected. Moreover, the Proposed Action includes extensive drain flow and vegetation monitoring requirements and responsive actions to be taken to avoid any adverse effects to sensitive species resulting from the Proposed Action.

3.4.2.3 Cumulative Impacts

A list of relevant past, present, and reasonably foreseeable projects that involve the potential for water conservation and reduced water flow to the Salton Sea is provided in Table 1-1, Cumulative Projects List, above. These projects are either completed or already in planning.

The projects included in Table 1-1 may alter flows in the water delivery and drainage system, but would not reduce overall flows in IID's canal system. Therefore, these projects are not expected to contribute to cumulative flow reductions occurring under the Proposed Action. The Proposed Action would accelerate the lowering elevation of the Salton Sea, thereby accelerating the exposure of the shoreline, but the acceleration would taper off to baseline projection levels by 2045 based on the trajectory predicted by hydrologic models developed by DWR. Many of the projects in Table 1-1 are assumed in the analysis prepared in the SSAM model (see Section 3.8 Hydrology/Water Quality; Appendix HYDRO-3). Thus, the Proposed Action, when considered with relevant past, present, and reasonably foreseeable projects that involve the potential for water conservation and reduced water flows to the Salton Sea, would not increase overall potential effects to biological resources.

3.5 Cultural Resources

3.5.1 Affected Environment

This section addresses the cultural resources in the IID Contract Service Area and potential impacts to cultural resources associated with the implementation of the Proposed Action. Effects considered under NEPA include cultural and historic (40 CFR 1508.1[g][4]). Cultural resources include buildings, sites, structures, or objects, each of which may be considered sacred or have historical, architectural, archaeological, cultural, and/or scientific importance. Historic properties, a subset of cultural resources, consist of "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register [of Historic Places]" (36 CFR Part 800.16[*l*][1]).

The principal federal law addressing historic properties is the National Historic Preservation Act (NHPA), as amended (United States Code Title 54, Sections 300101 et seq. [54 USC 300101 et seq.]), and its implementing regulations (Code of Federal Regulations Title 36, Part 800 [36 CFR Part 800]). Section 106 of the NHPA (54 USC 306108) requires a federal agency with jurisdiction over a proposed federal action (referred to as an "undertaking" under the NHPA) to consider the effects of the undertaking on historic properties, and to provide the Advisory Council on Historic Preservation (ACHP) an opportunity to comment on the undertaking. The implementing regulations (36 CFR Part 800) describe the process for identifying and evaluating historic properties; for assessing the potential adverse effects of federal undertakings on historic properties; and for seeking to develop measures to avoid, minimize, or mitigate adverse effects. Reclamation has determined that the proposed action meets the definition of undertaking (36 CFR 800.16[y]) but does not have the potential to cause effects as defined at 36 CFR 800.3(a)(1).

Whereas Reclamation has determined that the proposed action does not have the potential to affect historic properties, if present, pursuant to 54 USC 306108, it must consult with stakeholders, including Native American Tribes, with an interest in the area of the proposed action and/or the cultural resources that may be impacted by the proposed action (40 CFR 1508.1[g][4]). Consultation with Native American Tribes regarding issues related to Section 106 and other authorities, such as NEPA and Executive Order 13007, must recognize the government-to-government relationship between the federal government and Native American Tribes, as set forth in Executive Order 13175, "Consultation and Coordination with Indian Tribal Governments" (November 6, 2000; *Federal Register* Title 65, Pages 67249–67252, November 9, 2000), and the Presidential Memorandum of November 5, 2009.

3.5.1.1 Physical Setting

The Colorado Desert is located in the Salton Trough, which is a massive graben (geologic depression) formed by the interface of parts of the North American and Pacific plates. The trough formed by the ongoing movement of these faults and the general subduction of the basement formations has been filled by immense quantities of colluvial and alluvial sediments that in places are up to 20,000 feet deep (Morton 1977). Ancient river meandering reworked these sediments. Where the Colorado River empties into the Gulf of Mexico, finer sediments are released onto a vast and

growing delta while coarser materials fall out along the bed and nearby floodplains of the River. The trough is being constantly filled with sediments as it deepens while portions of the Imperial Valley remain well below sea level (IID 2003).

Before dams controlled the flows of the Colorado River, deposited sediment in the lower channels of the delta encouraged local flooding that dropped even more sediments on the fan. Gradual silt accumulation raised the delta and lowered stream-channel margins above the average grade of the main Colorado River channel to the north, resulting in an impoundment. This happened frequently after large flood events when the receding waters of the Colorado were unable to find a route back through the newly reworked delta. Then, rapid filling of the trough by the Colorado resulted in the formation of a vast freshwater lake. The filling generally continued until the impounding delta was breached (often after many decades or centuries) (IID 2003).

The most dominant lacustrine feature was Lake Cahuilla, a large, extensive freshwater lake that filled the northern part of the Salton Trough for several thousand years. Lake Cahuilla, too, attracted prehistoric occupation and use for long time periods. The ancient shoreline of Lake Cahuilla nearly surrounds the Salton Trough. On the surface, the Salton Trough province exhibits ancient lakebed sediments, alluvial channels, and dune sands. The central portion (Imperial and Coachella Valleys, Salton Sink) is covered by clay and silt deposits from the prehistoric lakestands. Shoreline deposits circumscribe the central lakebed deposits and consist mostly of unconsolidated sand and gravel, grading into silts and clays. During the Late Prehistoric period, Lake Cahuilla stretched from north of Indio to south of Mexicali. The Colorado River fed it, and, when full, it spilled southward to the Colorado delta and the Gulf of California (Laylander 1995).

The most recent flooding occurred between 1904 and 1907, when the Colorado entered the irrigation system leading to the Sink. In the winter of 1904-05, floodwaters from the Colorado and Gila Rivers combined, producing an abnormally high discharge, which flowed through an unprotected headgate and down the steeper grade of the canal. The canal and tributary channels began to cut and enlarge. By 1905, almost the entire Colorado discharge was flowing into the Salton Trough. The Colorado was finally returned to its channel in early 1907, but not before the Salton Sea was formed (Sykes 1914).

3.5.1.2 Ethnographic Context and Historic Setting

The traditional territories of two modern Native American groups—Cahuilla and Kumeyaay—encompass the Salton Sea, with possible ethnohistoric use by the Quechan and Halchidhoma. The traditional tribal lands of the Kumeyaay primarily encompass the southern half of the Sea. It has been speculated that the Quechan and Halchidhoma may have occupied the region, at least seasonally, in the past. The Quechan have been described by Kroeber (1920) and Forde (1931); the Kamia (or eastern Kumeyaay) by Gifford (1931), Knack (1981), and Spier (1923); and the Cahuilla by Barrows (1900), Bean (1972), Bean and Saubel (1972), Curtis (1926), Drucker (1937), Heizer (1974), Hooper (1920), Kroeber (1908), and Strong (1929).

Quechan. The Quechan are a Yuman-speaking group living upriver from the Colorado River Delta with linguistic and cultural ties to the Cochimi, Cocopah, Halyikwamai, Kohuana, Kumeyaay, Kiliwa, Walapai, Havasupai, Yavapai, Halchidhomal Maricopa, and Mohave (Forde 1931, Kroeber 1920). Traditionally friendly with the Kumeyaay, Yavapai, Papago and Mohave, they were typically enemies of the Cocopah and Maricopa and got along poorly with the Cahuilla. Between 1780 and 1850, the Quechan experienced lengthy hostilities with the Halchidhoma, resulting in the displacement of the Halchidhoma from the Colorado River to the middle Gila River (IID 2003). The Quechan's traditional economy was a mix of floodplain horticulture, fishing, and hunting-gathering, as detailed by Castetter and Bell (1951).

The Quechan lived in dispersed settlements along the Colorado River and lower Gila River and today, the 33,000-acre Fort Yuma Indian Reservation remains the center of cultural and political life for the 3,000-plus members of the Quechan Nation (Bee 1981, 1983, 1989). Pilot Knob, located near the beginning of the AAC, is the Quechan sacred site, *Avikwalal*. Pilot Knob was the first stop in a four-day ceremonial journey up the Colorado River to the creation site at *Avikwame*, near the City of Needles (Raven and Raven 1986; Ezzo and Altschul 1993; Altsschul and Ezzo 1994).

Kumeyaay/Kamia. The indigenous people who occupied the southern Imperial Valley area at Spanish Contact were the Tipai and Ipai (Kroeber 1925; Luomala 1978; Spier 1923), who largely prefer the term Kumeyaay. Until the 1960s, ethnographers used the term Diegueno for these peoples. South of the Salton Sea was home to the easternmost *Tipais*, the Kamia, who lived along sloughs such as the New River, and in the adjoining desert (Luomala 1978). The Kamia, or Imperial Valley, or Valley Tipai, were culturally related to the River Yumans, including the Quechan, to the east. Their territory extended southward to the Colorado delta below the International Line in Baja California, westward to the Coast, and eastward to the Sand Hills near the eastern shore of the Salton Sea. It included the New and Alamo Rivers, and innumerable temporary sloughs and shallow lakes (Van Camp 1979).

The Kumeyaay were seasonal hunters and gatherers (and occasional agriculturists) who used all major ecological zones at various times of the year, including the coast and its maritime resources, the mountain oaks and piñon, and the desert foothill agave and mesquite. Most groups had a mountain home base that provided acorns, greens, fruits, and abundant game. Each group operated out of its home base for most of the year. Seasonal campsites were scattered throughout their territory and used as needed, but their central villages were larger and permanently situated (see Schaefer 1998 for Kumeyaay settlement patterns and Luomala 1978 and Spier 1923 for traditional Kumeyaay mountain dwellings).

Although the Kumeyaay have been depicted as hunter/gatherers in ethnographic documents, some groups practiced agriculture in the Imperial Valley (Gifford 1931). Shipek (1989) suggested that horticultural practices among the Kumeyaay were widespread and intensive, involving transplantation and cultivation of several native plant species. The Salton Sea and the Laguna Salada area were desert oases during some portions of the year. They grew beans, corn, and squash whenever the floodwaters of the Colorado River backed up into the area through various overflow channels, such as the New and Alamo Rivers. Lands along New River belonged to individuals and/or families who cleared and leveled them, built dams and levees, and maintained canals. Any

Kumeyaay from any band (coastal, foothill, or mountain), could acquire New River floodplain land by clearing additional land, helping to build dams, and extending the levee and canal system to the newly cleared land (Shipek 1982).

By the late 19th and early 20th centuries, Kamia society had nearly collapsed from disease, assimilation, and warfare. The remaining bands and once-autonomous tribelets were combined by the American government to form larger groups that were assigned reservations established throughout San Diego County following the Mexican-American War (IID 2003).

Cahuilla. The Cahuilla are a Takic-speaking group that occupied areas in the northwestern portion of Imperial County and most of the western portion of Riverside County. The northern part of the Salton Sea was, at contact, home to the Desert Cahuilla (Strong 1929; James 1969) who practiced some agriculture (Bean and Saubel 1972). Shipek (1982) puts their southern border at San Felipe Creek while Strong (1929) puts the border between the Cahuilla and Kumeyaay around the Riverside/Imperial County line.

Cahuilla society was set up with a dozen or more land-holding clans, each with territory that ranged from desert or valley floor to mountain areas within which several biotic zones could be exploited. Each clan included several lineages, each with an independent community area it owned within a larger clan area. Each lineage had ownership rights to various hunting and gathering areas. Cahuilla clans varied in size but some numbered up to several thousand people. Clans were arranged so each lineage/community had access to water and food resources. Within each community, houses and structures were placed at some distance from each other; often a community would be spread over a mile or two, with each nuclear and extended family having houses and associated structures for storage of food, and shaded work places to manufacture tools and process food (Schaefer 1998). Hilly, rocky areas, cave sites, or walled cave sites were used for temporary camping, food storage, hunting blinds, and as fasting places for shamans (IID 2003).

By 1823, the Cahuilla had adopted elements of Hispanic lifeways. At that time, Mexicans were running livestock through the San Gorgonio Pass as far as Palm Springs. The 1823 Romero expedition reported that the Cahuilla at Toro were growing corn and melons and were already familiar with the use of horses and cattle (Schaefer 1998). In 1851, the Cahuilla and Luiseño leaders signed a treaty that was never ratified by Congress. In the 1860s, epidemic disease virtually wiped out the Cahuilla and survivors of decimated lineages and clans joined villages to maintain their ceremonial, cultural, and economic institutions (Schaefer 1998).

There are two Cahuilla reservations in close proximity to the Salton Sea today – the Torres Martinez Desert Cahuilla Indians reservation located in the northwestern portion of the Sea spanning Imperial and Riverside Counties and the Cabazon Band of Cahuilla Indians reservation located north of the Sea in Riverside County. In 1876, the Torres and Martinez reservations were created by an Executive Order. In 1891, under the Relief of Mission Indians Act, the Torres and Martinez reservations were combined. In 1903, another 640 acres of state lands were added to the reservation. In 1991, the area under trust was about 14,000 acres, with 192 people living on the reservation and 57 were living adjacent to the reservation at that time (Schaefer 1998). The Cabazon Reservation was

established near Indio by an Executive Order in 1876. In 1895, the area was increased by an Act passed in 1891. Around 1923, 60 to 70 acres of the reservation were under irrigated cultivation. By 1991, the reservation totaled 1,382 acres. At that time, the BIA had listed the Cabazon population as 17 within the reservation and 8 adjacent (Schaefer 1998).

3.5.1.3 Known Cultural Resources

The current distribution and availability of cultural resources are the consequences of several environmental and historical factors, including the periodic flooding of ancient Lake Cahuilla and the New and Alamo Rivers. Pre-contact settlement, resource exploitation, and horticulture focused on their shorelines and riverbanks, but seasonally available resources were distributed across the Imperial Valley. Intensive use of the Imperial Valley for irrigation agriculture since the beginning of the 20th Century, however, has disturbed most archaeological resources that might have existed on land that is now farmland or under the Salton Sea.

Schaefer's (1994b) review of archaeological research in the Colorado Desert addresses the difficulty inherent in site detection in the Imperial Valley vicinity. Schaefer (1994a) observed that many sites relating to the reoccupation of the Salton Trough (after the desiccation of Lake Cahuilla) along the New and Alamo Rivers were destroyed in the great flood of 1905-1906, or by later agricultural activities. When sites are discovered on or near the banks of New River, they usually consist of scatters of broken pottery. While pottery was not essential for these groups, it conferred considerable advantages and may have enabled them to be more sedentary, leading to larger populations and the establishment of more permanent residences. It is also possible that use of more reliable storage containers and a greater dependence on stored plant foods might have facilitated the introduction of horticulture (Van Camp 1979). Pottery is the most visible indicator (along with isolated lithic debitage) of prehistoric occupation in the IID Contract Service Area because fired ceramics survive well, and perishable basketry does not.

In contrast to the Imperial Valley bottom land, archaeological sites along the ancient shorelines of the Salton Trough often include a number of distinctive features, such as house rings with associated artifacts, sandstone slab hearths, cremations, artifacts sometimes covered with travertine, abundant obsidian and quartzite lithic debris, shell (abalone, *Olivella*, cardium, limpet, and mussel), fishbone, bird bones, and mammal bones. Many sites along the ancient shorelines consist of elaborately constructed stone fish-traps located below the maximum shoreline. Examination of fish-trap sites has recently shed greater light on the importance of fishing by peoples ancestral to the historic Cahuilla and Kamia, and to reconstructing the nature and timing of Lake Cahuilla infillings and recessions (Schaefer 1998).

Von Werlhoff (1974) evaluated the archaeological potential of the Imperial Valley from the perspective of modern geomorphological changes that occurred in the early 20th century. His main finding is that early 20th Century settlers had seen artifacts (portable mortars and pestles, metates and manos, projectile points, knives, scrapers, and hearthstones) at an undetermined number of temporary campsites along the old wash prior to the 1906 flood. The flood destroyed such evidence as the wash became the New River, and collectors obliterated what other evidence of Indian habitats that might have existed nearby. The lack of depth to aboriginal sites in the valley, coupled with

extensive land developments in historic times, render dim the prospects of discovering archaeological sites in this large region. Nonetheless, a possibility exists, regardless of how remote, that some sites escaped damage or destruction (IID 2003).

According to von Werlhoff, about 800 historic sites (including trash dumps) have been recorded in Imperial County (Heuberger [no date]). Important resources date back to 1540, when Hernando de Alarcón was the first European to visit, at the Colorado River delta, what would later be called Alta California (California Historical Landmark [CHL] No. 568). In 1774, Juan Bautista de Anza passed through the area, reaching Monterey before returning to Tubac. De Anza's subsequent, and larger expedition, of 1775-1776 is commemorated by the Anza Trail, itself, is a significant cultural resource, and a National Historic Trail, as is the later Sonoran/Southern Emigrant Trail that served as a major route to and from coastal California, from 1825 to 1865. Significant resources from the Spanish period (1769-1821) include the La Purisima Conception Mission site (CHL No. 350) and the San Pedro y San Pablo de Bicuner Mission site (CHL No. 921). The former was built in 1780 at the request of the local Indians; the latter was built in January, 1781, as a strategic settlement for those crossing the Colorado River. Both were attacked and destroyed in July, 1781, by the Quechan during the Yuma Revolt (IID 2003), effectively closing the route de Anza had found for the Spanish and eliminating further incursion by the Spanish into the Imperial Valley and necessitating the use of sea routes.

One of the few known Mexican-period (1821-1848) sites is Fort Romualdo Pacheco (CHL No. 944). Located about 7 miles west of the City of Imperial, near the New River, it was the only Mexican fort in Alta California, and was built to help maintain the Sonoran Trail. It was constructed in 1825 and attacked by the Kamia on April 26, 1826, resulting in the deaths of three soldiers and its abandonment. Low, adobe mounds remained in 1968, but were leveled for agricultural purposes shortly thereafter. Imperial Valley College excavated this site in 1978. Few early American-period (1848–early 1900s) sites remain (except for the Southern Pacific Railroad) because little settlement or other use occurred until irrigation water became available in 1901 (IID 2003).

Most sites have been disturbed by agricultural activities and town construction. One site has received a historical monument designation for being the location where the first irrigation water entered the county–a few feet from the U.S. Mexican border on Barbara Worth Road, between Calexico and the Alamo River. Another significant site is Plank Road near I-8 along the Algodones Sand Dunes, which was used from 1914 to 1927 (CHL No. 845). Sites of local importance are documented in Imperial Valley Historical Markers (Little 1982). Plat maps from the early 1900s indicate numerous structures throughout Imperial Valley. While many of these structures are no longer standing, the potential exists for subsurface features, such as house foundations, privies, and trash deposits (IID 2003).

The Boulder Canyon Project Act of 1928 began one of the most monumental public reclamation projects ever undertaken in the western U.S. The Act authorized construction of Boulder Dam (Hoover Dam), Imperial Dam, the AAC, and the Coachella Branch of the AAC (Schaefer and O'Neill 1998). Boulder Dam was dedicated in 1935. Some 300 miles downstream, Imperial Dam was constructed between 1935 and 1938. This was the diversion point for the AAC, where three

enormous desilting basins cleansed the muddy Colorado River waters. The AAC was excavated between 1934 and 1940 to carry water 82 miles to the Imperial Valley; the last element to be completed was the 123.5-mile Coachella Branch, which began in 1934 but did not open until 1949 because of a construction hiatus during World War II. The original Coachella Canal supplied water to the Coachella Valley until 1982, when portions of it were replaced by a concrete-lined canal designed to greatly reduce seepage. The AAC is a historic property (CA-IMP-7130-H) and has been assigned the National Register Status Code 3D (appearing to be eligible for listing in the National Register of Historic Places, as a contributing property of a district) (Reclamation 1994). The Old Coachella Canal is also a historic property (CA-IMP-7658) that has been evaluated by Schaefer and O'Neill (1998) as eligible for listing in the NRHP, under Criteria A.

3.5.2 Environmental Consequences

Prior to the formation of the Salton Sea, in the early years of the 20th Century, prehistoric and historic archaeological sites were present in what is now the Salton Sea. Creation of the Salton Sea flooded prehistoric and historic sites that were present. In the later part of the 20th Century through present day, the Salton Sea received drain water flows from the Imperial Valley.

3.5.2.1 No Action Alternative

Implementation of the No Action Alternative would involve no additional reductions in water diversions by IID from the Colorado River at the Imperial Dam under the LC Conservation Program and would therefore not achieve conservation objectives. No additional water conservation would be created. Therefore, the anticipated exposure of Salton Sea acreage would not be accelerated. There would be no impact to cultural resources other than what would already occur under existing conditions.

3.5.2.2 Proposed Action Alternative

The Proposed Action would consist of normal agricultural practices and restrict ground-disturbing activities to areas of disturbed agricultural land. These practices are unlikely to encounter known or unknown archaeological, historic, paleontological resources. It is, likewise, unlikely that the Proposed Action would impact Tribal Cultural Resources, as defined in CEQA. The conservation programs are on-farm programs; all participation will be within existing agricultural fields. Agricultural fields are disturbed on the surface down to at least the tile drains – most commonly placed 3 to 6 feet below the surface. As a result, the Proposed Action would not be expected to encounter previously unknown cultural resources. Impacts of the Proposed Action would be similar to the No Action Alternative.

On November 9 and 13, 2023, Reclamation delivered, via email and certified mail, digital and hardcopy versions of the Proposed Action's announcement and consultation invitation letter to 27 identified Tribes. Reclamation has since received responses from several Tribes. Reclamation has been informed of the presence of specific traditional cultural resources; these are, however, located outside of the area of the Proposed Action and will not be affected. Information regarding prior ground disturbance in the area of the Proposed Action and clarification of the nature and scope of the ground-disturbing activities funded by the Proposed Action was gathered by Reclamation from IID and disseminated, via email and telephone to Tribes requesting that information. A decision has

not been made and consultation continues. Reclamation continues to seek input from its participating Tribal partners regarding the potential for effects to places of significance for them and/or Tribal Cultural Resources, as defined in CEQA. For reasons previously stated, however, the Proposed Action is not expected to encounter previously unidentified places of significance for Tribes or other cultural resources and impacts of the Proposed Action Alternative would be similar to the No Action Alternative.

The presently submerged playa will be exposed as the elevation of the Salton Sea lowers as a result of the QSA water conservation and transfers and other factors regardless of the Proposed Action. (IID 2003, 2024a, 2024c.) (See Hydrology/Water Quality Section 3.8, subsection 3.8.2.3 Proposed Action Alternative.) The Proposed Action will, however, accelerate that exposure. (See Appendix HYDRO-3.) As the elevation lowers, submerged sites, if present, will be exposed. These archaeological sites would, due to their exposure, be at risk to vandalism, but would be protected by public law, subject to the mitigation measures of the QSA, and no more at risk than sites that are presently exposed. Exposed sites would, however, likely be obscured by the sediment accumulated through years of inflow deposits, mitigating the risk of detection and destruction. The Proposed Action would accelerate the anticipated exposure of the playa, but would return to projected conditions by 2045. (See Figure 3-1, Exposed Salton Sea Acreage; Appendix HYDRO-3.) Accelerated exposure is not anticipated to affect cultural resources and would be similar to the No Action Alternative.

3.5.2.3 Cumulative Impacts

The implementation of water conservation programs under the Proposed Action would not contribute to cumulative impacts to cultural resources in the Proposed Action Area. The Proposed Action would not involve land-disturbing activities beyond the present boundaries of existing fields with a recent demonstrated history of water usage and will not exceed the depth of the drain tiles or other prior disturbance – areas where extensive, historical, ground disturbance has already occurred. The intent of the Proposed Action is the conservation of water. As less water will leave the fields, the near-term (between implementation of the Proposed Action and 2045) shoreline recession of the Salton Sea would accelerate. By 2045 the Sea would, however, be at projected conditions and not lower based on the trajectory predicted by hydrologic models developed by DWR. Many of the projects in Table 1-1 are assumed in the analysis prepared in the SSAM model (see Section 3.8 Hydrology/Water Quality; Appendix HYDRO-3). Thus, the Proposed Action, when considered with relevant past, present, and reasonably foreseeable projects and the near-term accelerated lowering of the Salton Sea is not anticipated to effect cultural resources compared with the No Action Alternative.

3.6 Environmental Justice

3.6.1 Affected Environment

Executive Order (EO) 12898 requires federal agencies to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the U.S. Minority populations include persons identified by the Census of Population and Housing to be of Hispanic or Latino Origin, as well as, non-Hispanic persons who are African American, American Indian and Alaska Native, Native Hawaiian, or other Pacific Islander.

Low-income populations are those that fall within the annual statistical poverty thresholds from the U.S. Census Bureau for the 2020 Census. The definition of poverty is dependent upon the size of the family. The 2023 poverty threshold for a family of three is $24,860, and for a family of six is $40,280 (CDPH 2023a). According to the 2020 Census, Imperial County has a total population of 179,702, of which more than 86 percent of the population classified as Hispanic or Latino, over 3 percent Black or African American, 2 percent American Indian or Alaskan Native, 2 percent Asian, 0.2 percent Native Hawaiian/Other Pacific Islander and 1.7 percent of two or more races (**Table 3.6-1**). More than 17 percent of Imperial County residents have incomes that fall below the poverty level threshold. (USCB 2020.)

Executive Order 14008 directed the Council on Environmental Quality (CEQ) to develop the Climate and Economic Justice Screening Tool, an interactive map that uses datasets that are indicators of burdens in eight categories: climate change, energy, health, housing, legacy pollution, transportation, water and wastewater, and workforce development. The tool uses information to identify communities that are experiencing burdens and are disadvantaged because they are overburdened and underserved. According to the Climate and Economic Justice Screening Tool, the majority of census tracts within the IID Contract Service Area, with the exception of two within the City of El Centro, are considered disadvantaged because they meet one or more burden threshold and the associated socioeconomic threshold.

The Proposed Action would occur within the IID Contract Service Area. The Cities of Brawley, Calexico, Calipatria, El Centro, Holtville, Imperial, and Westmorland and census-designated places (CDP) of Heber, Niland, and Seeley are located within the IID Contract Service Area. These cities and CDPs range in population from approximately 39,000 to 775 residents. There is a large representation of both minority and low-income populations within the broad vicinity of the IID Contract Service Area. As shown on **Table 3-7, U.S. Census Bureau Data on Race, Income, and Housing**, approximately 73 to 99 percent of the population of each city and CDP within the IID Contract Service Area is identified as Hispanic or Latino. This is compared to an approximately 40 percent Hispanic/Latino population for California. Households below the poverty level within the IID Contract Service Area range between approximately 9 to 61 percent of their respective populations as shown on Table 3-7, U.S. Census Bureau Data on Race, Income, and Housing. Approximately 16 percent of Imperial County residents, and 12 percent of California residents as a whole fall below the poverty level. (USCB 2020.)

Table 3-7 U.S. Census Bureau Data on Race, Income, and Housing

	Imperial County	Brawley	Calexico	Calipatria	El Centro	Heber	Holtville	Imperial	Niland	Seeley	Westmorland	California	United States
Population, Census April 2020	179,702	26,416	38,633	6,515	44,322	6,896	5,605	20,263	756	1,729	2,014	39,538,223	331,449,281
Race and Hispanic Origin													
White	90.20%	63.40%	56.10%	33.40%	31.90%	50%	46.70%	60.80%	30.60%	24%	32%	70.70%	75.50%
Black or African American	3.20%	0.80%	0.30%	16.90%	3.00%	0%	1.60%	1.90%	33.20%	3.70%	1.10%	6.50%	13.60%
American Indian or Alaska Native	2.60%	1.60%	0.90%	1.60%	0.80%	1.60%	0.20%	0.10%	2.10%	1.80%	1.40%	1.70%	1.30%
Asian	2.10%	0.70%	1%	0.80%	1.50%	0.90%	0.70%	3.70%	3.60%	1.60%	0.54%	16.30%	6.30%
Native Hawaiian and other Pacific Islander	0.20%	0.30%	0%	0.60%	0%	0%	0%	0%	0%	0%	0%	0.50%	0.30%
Two or more Races	1.70%	12.60%	14.90%	12.40%	15.50%	23.20%	11.30%	17.50%	4.71%	27%	31%	4.30%	3%
Hispanic or Latino	86.10%	83.60%	97.80%	73.40%	88.60%	99%	82.80%	80.20%	74.00%	88.00%	89%	40.30%	19.10%
White alone, not Hispanic or Latino	9.10%	13.60%	1%	6.70%	31.90%	0.40%	14%	14%	17.60%	70%	0%	0.98%	58.90%
Income and Poverty													
Median Household Income, 2017-2021	$49,078	$50,964	$47,390	$39,217	$49,244	$54,668	$45,759	$81,657	($2,500)	$43,500	$33,444	$84,097	$69,021
Person in Poverty	17.3%	25.8%	21%	29.2%	23.7%	13.4%	22.1%	9.2%	61.1%	25.9%	40.8%	12.2%	11.5%

	Imperial County	Brawley	Calexico	Calipatria	El Centro	Heber	Holtville	Imperial	Niland	Seeley	Westmorland	California	United States
Housing													
Housing Units (V2022)	57,666	N/A	N/A	N/A	N/A	N/A	N/A	N/A	330	539	655	4,627,460	143,786,655
Owner-occupied housing unit rate (2017-2021)	58.0%	53.6%	52.5%	68.3%	48.7%	69.9%	50%	65%	0%	9.5%	5.7%	55.5%	64.6%
Median value of owner-occupied housing units (2017-2021)	$219,800	$225,300	$233,100	$148,800	$221,500	$220,200	$220,200	$261,700	N/A	N/A	N/A	$573,200	$244,900
Median gross rent (2017-2021)	$892	$851	$998	$791	$868	$860	$628	$1,173	$1,870	$813	$818	$1,698	$1,163

SOURCE: United States Census Bureau (U.S. Census Bureau QuickFacts: Imperial County, California)

3.6.2 Environmental Consequences

3.6.2.1 No Action Alternative

Implementation of the No Action Alternative would involve no additional reductions in water diversions by IID from the Colorado River at the Imperial Dam under the LC Conservation Program and would therefore not achieve conservation objectives. As a result, the additional water conservation would not occur. There would be no changes to existing conditions. Therefore, there would be no adverse effects on the environment of minority or low-income populations other than what would already occur under existing conditions.

3.6.2.2 Proposed Action Alternative

The Proposed Action includes the conservation of water within the IID Contract Service Area, reducing water diversions from the Colorado River. The conservation of water would occur through the implementation of on-farm conservation programs, meaning all participation will be within existing agricultural fields. Agricultural fields are disturbed on the surface down to at least the tile drains, which are most commonly placed 3 to 6 feet below the surface. The Proposed Action would not involve ground-disturbing or construction activities outside of normal agricultural practices and existing disturbed agricultural land.

IID would implement a combination of conservation programs under the Proposed Action. By the structure and nature of each conservation program, fields cannot participate in more than one conservation program at a time. IID intends to prioritize the OFECP and DIP water conservation programs. The implementation of the OFECP (or simplified OFECP) would result in no changes to or adverse effects on the environment of minority or low-income populations. The agricultural land would remain in production to the same extent it would otherwise be in production. The implementation of conservation measures under either the OFECP or the simplified OFECP would result in conserved water from existing agricultural land.

Under the Proposed Action, the combination of conservation programs may include the implementation of the fallowing-based conservation programs. If both the FUFP and the DIP were to be implemented, the maximum potential acreage for either program would not be reached. Agricultural land cannot participate in both programs at the same time. Therefore, if one field is in one program, it cannot simultaneously be in the other program, thereby bringing down the maximum level of participation possible for that other program. The maximum level of participation for either fallowing-based conservation program will be even lower if there are fields participating in the OFECP and will then also not be eligible for participation in a fallowing-based conservation program.

If maximum participation were to occur in the DIP, up to 180,000 acres of agricultural land could stop being irrigated for a 45- to 60-day period between the months of June through September for each of the three years of 2024, 2025, and 2026. Fields participating in the DIP will be in active agricultural production. The crop will cease receiving water for 45 to 60 days, but then the agricultural activities will resume on the field following that period of time. Therefore, despite the DIP being a fallowing-based conservation program, the agricultural activities on a field are only interrupted for a short period of time and only during the temporary, short-term span of three years. Consequently, there would be negligible direct or indirect impacts to the businesses within the

agricultural industry and no adverse effects on the environment of minority or low-income populations.

If maximum participation were to occur in the FUFP, up to 34,450 acres of agricultural land could be fallowed for 6 months to one year during the two years of 2025 and 2026. Fields participating in the FUFP will be in active agricultural production prior to participation in the program. The field will be fallowed for 6 to 12 months during which time all agricultural activities on the field will cease. However, the agricultural activities will resume on the field following that period of time. If a field is allowed to participate in the FUFP for consecutive years, it would be no longer than the temporary, short-term period of two years. Similar to the QSA, a two-year maximum allowed participation in the FUFP can be implemented and still maintain the integrity of the soils for resumed agricultural production. Although some businesses may be directly affected by the reduced farming activity, economic impacts of the FUFP implemented under the Proposed Action would be negligible given the longest possible period of fallowing would be a temporary, short-term period of two years.

Therefore, although the IID Contract Service Area includes a higher rate of Hispanic/Latino populations and higher rate of residents below the poverty level when compared to the overall State of California, the Proposed Action would not disproportionately affect the minority and low-income populations in the area because the Proposed Action is not expected to significantly affect local socioeconomic conditions due to the short duration of the reduced farming activities.

3.6.2.3 Cumulative Impacts

The Proposed Action would temporarily reduce water deliveries to agricultural operations within the IID Contract Service Area for three years. The temporary, short-term water delivery reductions combined with other delivery reductions would not contribute to permanent reductions in agricultural practices of the region supporting the local economy, which includes a high rate of minority and low-income population households. The Proposed Action involves the implementation of temporary water conservation programs and would not disproportionately impact disadvantaged communities. Thus, the Proposed Action, when considered with relevant past, present, and reasonably foreseeable projects would not contribute to cumulative impacts related to environmental justice issues in the IID Contract Service Area.

3.7 Human Health

3.7.1 Affected Environment

3.7.1.1 CalEnviroScreen 4.0

The California Environmental Protection Agency developed CalEnviroScreen which is a mapping tool that helps identify California communities that are most affected by many sources of pollution. It uses environment, health, and socioeconomic indicators to produce scores for every census tract in the state. The indicators help to present a broad picture of the vulnerabilities that communities may face from pollution across the state. The scores are mapped so that different communities can be compared to other census tracts in the state. An area with a high score is one that experiences a much higher pollution burden than areas with low scores. **Figure 3-6, CalEnviroScreen Recorded Pollution Levels in the IID Contract Service Area**, is an image from the CalEnviroScreen of the IID Contract Service Area. Values were given to each color-coded section to compare the different scores among indicators. As shown in Figure 3-6, CalEnviroScreen Recorded Pollution Levels in the IID Contract Service Area, large areas of the IID Contract Service Area exhibit high pollution levels compared with other parts of California.

3.7.1.2 Chronic Disease and Respiratory Illness

Poor air quality is related to adverse public health outcomes such as chronic disease and respiratory illness. Asthma is an indicator of public health related to air quality, with the caveat that many factors besides dust emissions are possible contributors.

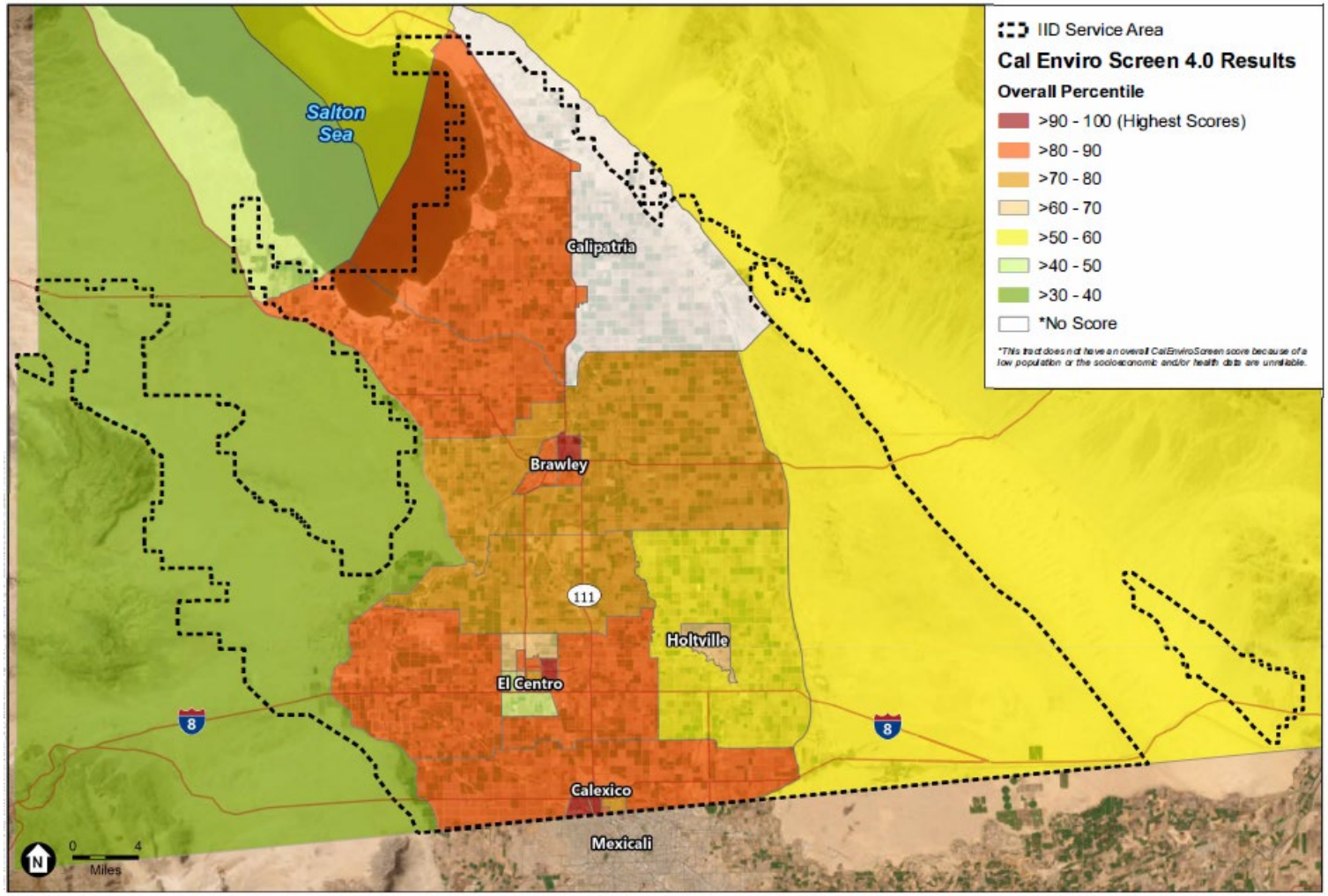
Imperial County has an overall asthma prevalence of approximately 10.6 percent as compared to California at 8.7 percent (CDPH 2023a). Hospitalizations and emergency room visits caused by asthma in Imperial County are higher than statewide averages. In Imperial County, hospitalizations attributable to asthma were 6.0 per 10,000 individuals and emergency room visits were 60.2 per 10,000 individuals in 2019, while in California the totals were 4.5 per 10,000 individuals and 42.6 per 10,000 individuals in 2019 (CDPH 2023a).

Studies have also shown a high incidence of childhood asthma in the Imperial Valley. Based on parent-reported survey information, an overall asthma prevalence of 22.4 percent was observed in school-aged children in Imperial County, which is significantly higher than the state average of 14.5 percent in children ages 0–17 (Farzan et al. 2019). Additional respiratory symptoms such as wheezing, allergies, bronchitic symptoms, and persistent dry cough were prevalent in both asthmatic and non-asthmatic children, further suggesting that childhood asthma rates in Imperial County may be underdiagnosed (*Id.*). To date, the factors contributing to the high rates of adverse adult and childhood respiratory health conditions in Imperial Valley have not been studied (*Id.*).

3.7.1.3 Air and Dust-Borne Diseases

Two airborne diseases and public health risks potentially exist within the IID Contract Service Area: Valley fever (or coccidiomycosis) and Hantavirus Pulmonary Syndrome (HCPS). Valley fever is an infection caused by Coccidioides spp. fungi. It can cause fever, chest pain and coughing, among other signs and symptoms. Coccidioides spp. that cause valley fever are commonly found in the soil in certain areas. Coccidioides fungal spores can grow under environmental extremes of temperature,

Figure 3-6 CalEnviroScreen Recorded Pollution Levels in the IID Contract Service Area



SOURCE: CalEnviroScreen 4.0; IID; ESA, 2023

Imperial Irrigation District

Figure 3-6
Cal Enviro Screen 4.0 Results

ESA

salinity, and alkaline conditions. These fungi can be stirred into the air by anything that disrupts the soil, such as farming, construction, and wind. Airborne spores can be inhaled into the lungs, where they multiply and grow. Most people who breathe the spores (about 60 percent) develop no symptoms at all. The rest develop flu-like symptoms. Without treatment, valley fever can lead to severe pneumonia, meningitis, and even death. However, when properly treated at the first sign of symptoms, most people will recover without problems. Once infected, the body usually establishes lifetime immunity against future infections. The disease is not contagious; it cannot spread from one person to another. Imperial County experienced one case of Valley Fever in 2021 and 5 cases in 2020 (CDPH 2023b).

HCPS is a rare, but often fatal, disease of the lungs. HCPS was first recognized in 1993 in the southwestern United States. HCPS infections are associated with domestic, occupational, or recreational activities that bring humans into contact with rodents (in California, specifically deer mice) and their excreta, usually in rural settings in poorly ventilated buildings. High risk areas and activities are vacant structures and rodent handling. According to the California Department of Public Health there have been no reported cases of HCPS in Imperial County from 2012 to 2020 (CDPH 2023b).

3.7.2 Environmental Consequences

3.7.2.1 No Action Alternative

Implementation of the No Action Alternative would involve no additional reductions in water diversions by IID from the Colorado River at the Imperial Dam under the LC Conservation Program and would therefore not achieve conservation objectives. As a result, the water conservation would not occur. There would be no changes to existing conditions. The health conditions of children and adults would be unaffected. Therefore, there would be no new adverse effects to human health other than what would already occur under existing conditions

3.7.2.2 Proposed Action Alternative

As shown on Table 3-6, CalEnviroScreen Recorded Pollution Levels in the IID Contract Service Area, the indicators with the highest-ranking percentiles within the IID Contract Service Area include impaired waters, unemployment, asthma, cardiovascular disease, and linguistic isolation. As shown on Figure 3-6, the CalEnviroScreen results show that the majority of the IID Contract Service Area that is developed has an overall percentile score of greater than 60-70 percent.

The Proposed Action involves the conservation of water within the IID Contract Service Area, reducing water diversions from the Colorado River. Implementation of the Proposed Action would result in the acceleration of the lowering of elevation of the Salton Sea when compared to the No Action Alternative. As shown in Figure 3-1, Exposed Salton Sea Acreage, the Proposed Action would accelerate the anticipated exposure of the playa, but the acceleration would taper off to baseline projection levels by 2045 based on the trajectory predicted by hydrologic models developed by DWR. (See Appendix HYDRO-3.) As provided in Section 3.3 Air Quality, no net increase in the exposure of the playa results in no increase of overall potential dust emissions through 2045. The exposed Salton Sea acreage is anticipated to occur as a result of the QSA and would be addressed by the IID's SS AQMP. During the three-year period of the Proposed Action, the acceleration of the exposed playa may increase the potential for dust emissions. However, the implementation of the SS AQMP would address the potential dust emissions because implementation of the SS AQMP would

be required for those same acres absent the Proposed Action. Further, given the many factors affecting respiratory conditions in children and adults, there is no data to indicate that the acceleration of the exposed playa could exacerbate those conditions. Data shows that dust emissions are occurring from other sources within and adjacent to Imperial County, including the desert region to the west of the IID Contract Service Area and Mexico to the south (see Section 3.3 Air Quality). Emissions inventories, assessments, dust control measures, and other activities under the SS AQMP would continue to be implemented, in the same manner as under existing conditions (see Section 3.3 Air Quality). Therefore, the Proposed Action would not increase adverse effects to human health.

3.7.2.3 Cumulative Impacts

The Proposed Action would not contribute to the cumulative reduction of the Salton Sea elevation. The Proposed Action would accelerate the anticipated effects of cumulative flow reductions, but over time, by the year 2045, the conditions at the Salton Sea would be the same as baseline projected conditions. (See Figure 3-1, Exposed Salton Sea Acreage; Appendix HYDRO-3.) Because the Proposed Action accelerates the exposure of playa that will already occur under existing conditions and does not result in greater exposed playa over the long term, and therefore will be addressed by IID's SS AQMP and the implementation of dust control measures as determined to be necessary (See Section 3.3 Air Quality), it would not contribute to cumulative human health impacts within the IID Contract Service Area.

A list of relevant past, present, and reasonably foreseeable projects that involve the potential for water conservation and/or reduced water flow to the Salton Sea is provided in Table 1-1, Cumulative Project List above. As indicated, these projects are either completed or already in planning. Among these projects is the California Natural Resources Agency developed the Salton Sea Management Program (SSMP). Under the SSMP, CNRA, DWR and CDFW prepared the Phase I: 10-Year Plan published in August 2018 and CNRA developed the Draft Salton Sea Long-Range Plan published in December 2022. The 10-year plan aims to construct 30,000 acres of habitat and dust suppression projects around the Sea. Implementation of the SSMP will address potential dust emissions that could adversely affect human health. The dust suppression projects include increased vegetation and scarification projects that minimize saltation (the process of dust becoming airborne) from exposed playa. The Proposed Action would be consistent with the SSMP and Long-Range Plan. Thus, the Proposed Action, when considered with relevant past, present, and reasonably foreseeable projects would not contribute to cumulative impacts related to human health issues in the IID Contract Service Area.

3.8 Hydrology/Water Quality

3.8.1 Affected Environment

The Proposed Action involves the conservation of surface water, specifically Colorado River water, within the IID Contract Service Area. Groundwater is not relied upon as a water supply within IID's Contract Service Area and requires treatment to be used for domestic and irrigation purposes. Although IID's canal and drain systems contribute some seepage to the perched groundwater, groundwater levels and quality would not be significantly affected by the temporary conservation programs, and as a result, are not evaluated further in this document.

The Imperial Valley has the driest climate in California. The winters are mild, and summers are hot. Temperatures range from below freezing to over 120 degrees Fahrenheit. Typical mean seasonal precipitation is 3.2 inches at the City of El Centro. Precipitation over the entire Imperial Valley occurs mostly from November through April, and August through September, but its distribution and intensity are often sporadic. Local thunderstorms may contribute to all the average seasonal precipitation at one time or only a trace of precipitation may be recorded at any locale for the entire season.

3.8.1.1 IID Contract Service Area

The water supply within the IID Contract Service Area comes solely from the Colorado River. Agriculture within IID's Contract Service Area is entirely dependent on Colorado River water diverted at Imperial Dam and conveyed through the AAC and into IID's canal system. The AAC is mostly lined, conserving what would otherwise be seepage losses, though some segments remain unlined. The AAC conveys Colorado River water to IID's Contract Service Area where it branches off to three main canals: East Highline, Central Main, and Westside Main. These three main canals serve as the main arteries of the canal system consisting of approximately 1,668 miles of main canals and lateral canals that distribute irrigation water to individual farm fields within the IID Contract Service Area. In 2022, IID delivered approximately 2.4 MAF of water from the Colorado River. (IID 2023.) IID's water system delivers water to 5,150 farm accounts and approximately 471,570 irrigable acres. (IID 2023.) IID maintains approximately 1,456 miles of drains that convey approximately 830,000 AF/year of water to the Salton Sea (CNRA 2022).

Drain water is conveyed to the Alamo River, the New River, or the Salton Sea. Collectively, tilewater and tailwater drainage accounts for roughly 67 percent of all of the drainage discharged either directly to the Salton Sea or via the New and Alamo Rivers. The Alamo and New River drainage water and the surface drains that discharge directly to the Salton Sea or its southern shoreline represent significantly different water regimes and affected by different segments of the IID Contract Service Area. The Alamo River receives approximately 61 percent of the discharge from the drainage system, and the New River receives roughly 29 percent of the drainage. The remaining 10 percent is discharged to surface drains that flow directly to the Salton Sea or its shoreline. (IID 2003.) **Table 3-8, Summary of IID Agricultural Operations for the Years 2021 and 2022,** summarizes the IID agricultural operations for calendar years 2021 and 2022.

Table 3-8 Summary of IID Agricultural Operations for the Years 2021 and 2022

2021 & 2022 Water Overview	2021	2022
Total Customers (Farm Accounts)	5,015	5,020
Owner Operated	2,091 (40%)	2,180 (42%)
Tenant Operated	2,924 (58%)	2,970 (58%)
District Gross Area	1,062,216 AC	1,062,216 AC
Farmable Area	471,364 AC	471,570 AC
Net Irrigated Area	446,670 AC	446,147 AC
Water Received for IID Use (Station 60 + Brock Reservoir)	2,557,242 AF	2,557,164 AF
Miles of Canals (AAC, Mains, Laterals)	1,668	1,668
Miles of Drains (AAC, Divisions, Drainage)	1,456	1,456

SOURCE: IID 2022 WATER & QSA IMPLEMENTATION REPORT

3.8.1.2 Salton Sea

The Salton Sea is a terminal lake located approximately 35 miles north of the United States and Mexico border and 90 miles east of San Diego. The Salton Sea watershed encompasses an area of approximately 8,000 square miles from San Bernardino County in the north to the Mexicali Valley in the Republic of Mexico to the south. At one time, the Salton Sea represented the northernmost tip of the Gulf of California. Historically, the Colorado River occasionally flowed into the Salton Sea Basin, forming a prehistoric water body known as Lake Cahuilla. During the 1800s, shallow ephemeral lakes periodically formed in the Salton Sea Basin as the Colorado River rose and fell prior to its damming. Reported episodes of inundation occurred in 1828, 1840, 1849, 1852, 1859, 1862, 1867, and 1897 (Littlefield 1966). On October 11, 1905, a dike failed, and nearly the entire flow of the Colorado River ran uncontrolled into the Salton Sea Basin for the next 18 months. When the breach was finally repaired in 1907, the elevation of the Salton Sea had reached -195 feet msl and had a surface area of 520 square miles. The Sea has existed continuously from that 1905 event to the present.

The water level in the Salton Sea fell to almost 250 feet below msl during the decade following the 1905 flood, and then rose slowly through the mid-1980s. The water surface elevation was fairly constant prior to 2000, ranging from -228.7 feet msl to -226.6 feet msl. However, the Salton Sea elevation has been declining since 2000, and the rate of decline has accelerated since 2018 following the cessation of the delivery of mitigation water to the Salton Sea at the end of 2017. (IID 2024a, 2024c.) The Salton Sea receives approximately 921,000 AFY from IID's drainage system, which accounts for approximately 30 percent of the total volume of water diverted at Imperial Dam. Approximately 830,000 AFY of this drainage reaches the Salton Sea via the New and Alamo Rivers (Appendix HYDRO-3).

The Colorado River Basin Plan identifies the Salton Sea's beneficial uses as the following:

- Contact and non-contact water recreation;
- Aquaculture;
- Warm freshwater habitat;
- Wildlife habitat; and
- Protection of threatened and endangered species.

More detailed information on the Salton Sea can be found in the QSA EIR/EIS (IID 2003).

Water quality in the IID Contract Service Area is affected by Colorado River water quality, inflows from Mexico via the New River, and from irrigation practices. As noted in the QSA EIR/EIS, the following constituents of concern apply to the rivers and drainage water flowing to the Salton Sea:

- Salinity (also referred to as TDS);
- Selenium;
- Total suspended solids (also referred to as TSS);
- Nitrogen and phosphorus;
- Organochlorine insecticides (DDT and its metabolites DDE and DDD, and toxaphlene);
- Organophosphorus insecticides (diazinon and chlorpyrifos (Lorsban, Dursban)
- Organochlorine herbicides (Dacthal); and
- Boron.

3.8.2 Environmental Consequences

3.8.2.1 Methodology

Literature and Database Review. Existing documentation was reviewed for the IID Contract Service Area including CNRA's December 2022 Salton Sea Management Program (SSMP) Draft Salton Sea Long-Range Plan, and the USBR March 2024 SEIS. In addition, the QSA EIR/EIS was incorporated into the regional characterization and impact analysis.

Salton Sea Accounting Model (SSAM). DWR's most current SSAM hydrologic model was used to assess impacts of reduced inflow into the Salton Sea, providing an assessment of impacts to sea elevation, salinity concentrations within the Sea, and acreage of exposed playa.

Assessment of Metered Drainage Flows. An analysis of available flow data collected by IID for drainages that flow to the Salton Sea was conducted. The flow data were used to evaluate existing conditions and flow variability.

Assessment of Evapotranspiration Demand of the Vegetation Along the Shoreline. An assessment of water demands of the vegetation on the exposed playa under existing conditions and with the Proposed Action was conducted to evaluate whether the Proposed Action would result in a significant deficit of flow needed to support vegetation located on the southern shoreline of the Sea.

3.8.2.2 No Action Alternative

Implementation of the No Action Alternative would involve no additional reductions in water diversions by IID from the Colorado River at the Imperial Dam under the LC Conservation Program. No additional Colorado River water would be conserved compared to current conditions under the QSA. Colorado River water deliveries to IID would not change and would be approximately the most recent average volume. As a result, water levels and storage in Lake Mead would not benefit from additional conservation. Flows within the AAC and IID canals would be subject to deliveries ordered by farmers primarily based on agricultural practices and economic conditions, among other factors. The anticipated variability of average monthly flows in the rivers and drains reaching the Salton Sea would be unchanged. There would be no changes to existing conditions. Conditions at the Salton Sea would be expected to evolve as described in the QSA EIR/EIS, resulting in lowering Sea elevations.

3.8.2.3 Proposed Action Alternative

Under the Proposed Action, IID will reduce its diversions by a target volume of 250,000 AF/year, up to a maximum of 300,000 AF/year, from the Colorado River for a period of three years resulting in a target cumulative volume of 800,000 AF, with a maximum cumulative volume of 900,000 AF, of conserved water between 2024 and 2026. The effect of the Proposed Action within the IID Contract Service Area was evaluated as an average flow reduction, evenly applied both spatially and temporally. Existing conservation programs implemented pursuant to the QSA comprise approximately 70 percent of agricultural fields within IID's Contract Service Area. The Proposed Action will likely increase the acreage of fields participating in a conservation program. All existing conservation programs and new conservation programs implemented pursuant to the Proposed Action are voluntary and participation cannot be reasonably predicted. Monthly variability in discharge to the Salton Sea from the IID drainage system under existing conditions was analyzed and compared to the Proposed Action.

IID Contract Service Area

IID's diversions from the Lower Colorado River have been declining since the implementation of the QSA in 2003. The updated Reclamation Salton Sea Spreadsheet Model (SSAM) utilized for the analysis of this EA modeled IID annual diversions derived from a run of the Reclamation Colorado River Simulation System (CRSS) model during the period 2022–2060. Based on the CRSS modeling, an annual diversion by IID for 2022 was estimated to be 2.535 MAF. For this analysis, the same baseflow of 2.535 MAF was assumed to apply for 2023 to 2025. To characterize the relative magnitude of monthly diversions by IID, mean monthly diversion volumes in AF were calculated for the last twenty-two years (2000 through 2022) based on values reported in Reclamation's Colorado River Accounting and Water Use Reports for Arizona, California, and Nevada. The assumed diversion volume of 2.535 MAF is 92 percent of the twenty-two-year average, so the monthly averages were reduced by 92 percent to estimate mean monthly diversion volumes for the existing conditions. The mean monthly volumes were then converted to the mean daily diversion rate in cubic feet per second (cfs) for existing conditions. Estimated mean daily diversion rates under the Proposed Action for each month were calculated by subtracting 414 cfs from the existing conditions mean daily diversion rate. The results are summarized in **Table 3-9, Summary of**

Estimated Mean Daily Diversion (CFS) Monthly Volume (AF) by Month for IID Diversions from the Colorado River for Existing and Proposed Action Conditions. Diversion volumes in AF for existing conditions and Proposed Action are also reported in Table 3-9, Summary of Estimated Mean Daily Diversion (CFS) Monthly Volume (AF) by Month for IID Diversions from the Colorado River for Existing and Proposed Action Conditions.

Table 3-9 Summary of Estimated Mean Daily Diversion (CFS) Monthly Volume (AF) by Month for IID Diversions from the Colorado River for Existing and Proposed Action Conditions

Month	Mean Daily Diversion (cfs) – Existing Conditions	Mean Daily Diversion (cfs) – Proposed Action	Mean Monthly Volume (AF) – Existing Conditions	Mean Monthly Volume (AF) – Proposed Action	Percent Reduction
January	1,857.9	1,443.5	114,236	88,757	22.3%
February	2,485.3	2,070.9	138,028	115,014	16.7%
March	3,792.7	3,378.3	233,201	207,722	10.9%
April	4,667.3	4,252.9	277,724	253,066	8.9%
May	4,755.6	4,341.2	292,409	266,929	8.7%
June	4,613.2	4,198.8	274,505	249,847	9.0%
July	4,562.7	4,148.3	280,549	255,070	9.1%
August	4,015.7	3,601.3	246,914	221,434	10.3%
September	3,539.8	3,125.4	210,633	185,975	11.7%
October	3,304.0	2,889.6	203,157	177,677	12.5%
November	2,523.0	2,108.6	150,130	125,473	16.4%
December	1,782.1	1,367.7	109,578	84,099	23.3%
				Weighted Mean	*11.9%*

SOURCE: analysis of Reclamation's Colorado River Accounting and Water Use Reports for Arizona, California, and Nevada 2000 to 2022

The annual diversion rate reduction from the Proposed Action is 11.9 percent. This percent reduction may be applied across the IID canals and drains to assess average monthly flow impacts of the Proposed Action. However, flow reductions are not anticipated to be applied evenly, either spatially or temporally, across the geographic extent of the IID Contract Service Area. Actual flow reductions will occur with variability depending on participation of individual agricultural water users. Moreover, each of the conservation programs described as the Proposed Action would result in varying volumes of water reaching the drains, rivers, and ultimately the Salton Sea. Under existing conditions, fields are generally irrigated to support cropping patterns in accordance with agricultural economic trends. As a result, under existing conditions flow variability within the canals and drains varies both spatially and temporally.

To characterize typical flow variability within the IID drains that directly discharge to the Salton Sea, the standard deviation of monthly drain flow in AF was calculated for the last five years (2019 through 2023). In this way, the relative magnitude of drain flow variability under existing conditions was compared to the magnitude of the effect of drain flow reductions under the Proposed Action. The average monthly flow variability is presented for each drain in **Table 3-10, Summary of Mean Monthly IID Drain Flow for Existing Conditions, The Standard Deviation of the Mean Monthly IID Drain Flow and the Proposed Action Mean Monthly Flow Reduction**.

Table 3-10 Summary of Mean Monthly IID Drain Flow for Existing Conditions, The Standard Deviation of the Mean Monthly IID Drain Flow and the Proposed Action Mean Monthly Flow Reduction

Drain	Existing Mean Monthly Volume (AF)	Existing Mean Monthly SD (AF)	Proposed Mean Reduction (AF)
Niland Drain 1	36.5	25.7	4.3
Niland Drain 2	96.6	43.1	11.5
Niland Drain 3	30.9	25.3	3.7
Niland Drain 4	28.5	28.5	3.4
O Drain	556.9	205.1	66.1
P Drain	345.6	105.2	41.0
Pumice Drain	609.4	816.1	72.3
Q Drain	204.9	93.5	24.3
R Drain	259.6	109.3	30.8
S Drain	145.7	64.5	17.3
San Felipe Wash Drain	113.6	75.6	13.5
T Drain	203.5	90.5	24.1
Trifolium 22 Drain	285.2	96.5	33.8
Trifolium 23 Drain	282.8	120.9	33.6
U Drain	122.4	77.6	14.5
W+Y Drain	177.8	146.7	21.1
Z Drain	344.5	190.3	40.9

SOURCE: ESA 2024, Analysis of IID Monthly Drain Flow Records

The Proposed Action would reduce drain flows by approximately 11.9 percent, assuming flow reductions are applied evenly spatially and temporally across the geographic extent of the IID Contract Service Area. This percent average monthly flow reduction would be well within the existing standard deviation of historic (last five years) monthly drainage flows for every drain. That is to say, impacts of the flow reduction would not substantively alter the pattern of flow variability for

every drain, assuming flow reductions are applied evenly spatially and temporally across the geographic extent of the IID Contract Service Area. During any month of the year under existing conditions, drain flows vary significantly more than the 11.9 percent increment estimated to be the effect of the Proposed Action assuming flow reductions are applied evenly spatially and temporally. Moreover, the Proposed Action is for the temporary short-term period of three years, at which time any flow reduction would cease and the existing flow variability would resume.

A uniform reduction in flows was applied to each monthly drain volume and the relative effect of the Proposed Action is highest in those months with the least flow. For instance, the effect of flow reduction in the IID drainage system is lower in months with high drainage volumes (April through September) and highest in months with lower drainage volumes (October through March). Tabular monthly summaries for each drain are available in **Appendix HYDRO-1, Flow Statistics Tables**.

Month-to-month variability under existing conditions is always higher than the monthly effect of the Proposed Action (Table 3-10, Summary of Mean Monthly IID Drain Flow for Existing Conditions, The Standard Deviation of the Mean Monthly IID Drain Flow and the Proposed Action Mean Monthly Flow Reduction). As a result, although total flows to the Salton Sea would be reduced by 11.9 percent, the effect of the Proposed Action on monthly drain flow rates at individual drains would be within the existing standard deviation of flows at every drain.

To further analyze the potential effects of the Proposed Action to drain flows to the Salton Sea, drain flow data for the most recent 5 years (2019-2023) was compiled for 20 of the drains that flow directly to the Sea. Hydrographs were prepared to illustrate the monthly median flow from January to December as well as the recorded highs and lows for each drain. The hydrographs shown on Figure 3-5, Drain Flow Hydrographs, demonstrate the annual flow variability in each of the drains and the reduction of the annual average drain flows by 11.9 percent are generally within the recorded variability. The hydrographs also show the brief periods that drain flows may occur lower than the 5-year historical lows if the DIP were to be implemented at maximum participation during the summer months of June through September. Only in this scenario is there an indication from the data that drain flows may be reduced to lower than the 5-year historical lows. However, in those instances, the drain flows are generally at higher levels during these months and the reduction in flows only represents a reduction to that volume, but does not result in no flows in those drains.

Nevertheless, the Proposed Action includes the Monitoring Plan, which provides for the ongoing monitoring of the drain flows during the short-term period of the Proposed Action. Implementation of the Monitoring Plan would ensure that any drain flow reductions under the Proposed Action, that do not already occur under existing conditions, would be addressed immediately.

Salton Sea and Shoreline Vegetation

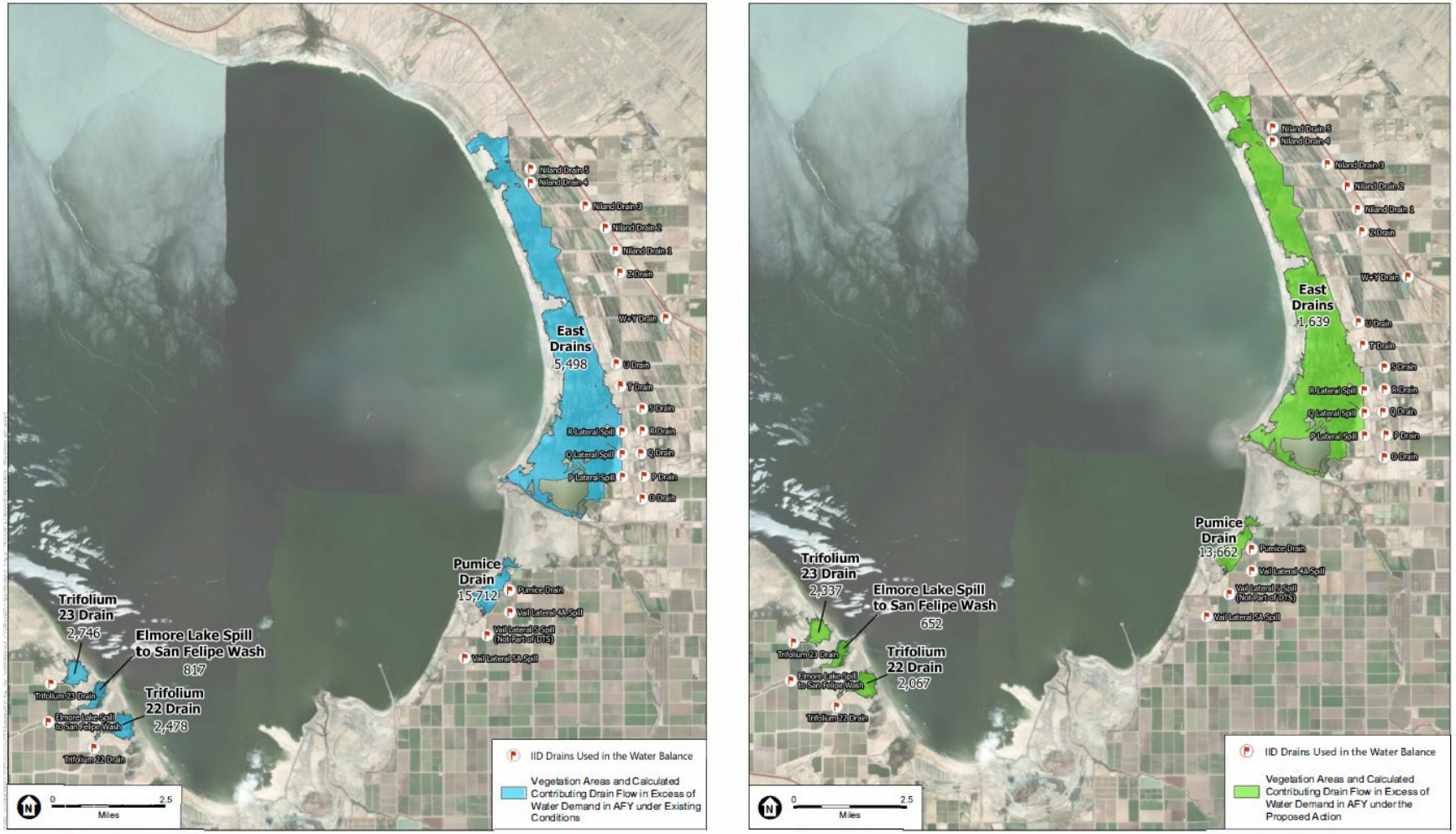
An analysis was conducted to estimate evapotranspiration (ET) rates of the natural communities mapped along the southern shoreline of the Salton Sea, within the Salton Sea Vegetation Study Area (see Figure 3-2, Salton Sea Vegetation Study Area). The ET analysis suggests that the annual ET demand of the existing vegetation within the Salton Sea Vegetation Study Area would be met in all locations under the Proposed Action during a normal (mean flow) year.

Species dominance within each natural community was used to create representative ET values (see **Appendix HYDRO-2, Playa Evaporation Assessment** for detailed methods and results). ET demands in AF were calculated for several representative areas of the exposed playa where drain data was available. Drain data consisted of mean monthly flows in AF (Table 3-10, Summary of Mean Monthly IID Drain Flow for Existing Conditions, The Standard Deviation of the Mean Monthly IID Drain Flow and the Proposed Action Mean Monthly Flow Reduction; see also Appendix HYDRO-1). Five aggregated natural community polygons were created (groups): three locations on the west shore where spatially adjacent natural communities were clearly supplied drain water from a single source were each aggregated, and two locations on the east shore where spatially adjacent natural communities were fed by multiple drains. In the latter case, monthly drain data were also aggregated for the analysis. **Figure 3-7, Annual Evapotranspiration-Drain Flow Water Balance** shows the existing annual drain flow surplus in blue for each drain group when ET demand is subtracted and the equivalent demand surplus under the Proposed Action condition in green.

The analysis compares estimated ET demands of the existing mapped vegetation with the volume of flows from the drains, attempting to compare water demand with water availability. The analysis assumes that ET values are evenly distributed within each vegetation polygon. Actual conditions show this to be a conservative assumption because most polygons show a heterogenous mix of healthy and stressed vegetation. Similarly, the analysis assumes that the flow application is evenly distributed within the vegetation polygon. This is a conservative assumption because aerial images show that flows in channels meander and change over time, conveying some flow directly to the Sea.

Monthly and annual ET demand and drain flow volumes were compared under existing conditions and the Proposed Action conditions (**Table 3-11, Existing Conditions Monthly Evapotranspiration, Mean Monthly Drain Flows, Water Balance for Natural Communities**, and **Table 3-12, Proposed Action Monthly Evapotranspiration, Mean Monthly Drain Flows, and Water Balance for Natural Communities**). The ET analysis shows that for normal years under existing conditions, annual inflows to the vegetated areas of the exposed playa are greater than estimated demands. Similarly, under the Proposed Action, annual inflows to the exposed playa would be sufficient to meet estimated annual ET demands in all locations during a normal (mean flow) year. The ET analysis shows that for normal years under existing conditions, some areas experience a water deficit compared with ET demand during summer months (values shown in orange in Table 3-11). The Proposed Action would potentially add to the existing monthly deficits during these months (values shown in orange in Table 3-12). However, the incremental increase in monthly deficits in certain areas is limited when compared to existing conditions, and the flow interruptions would be temporary, would occur within existing daily flow variability, and would recover as quickly as a few days, but no more than a few months. Due to the short duration of the minor flow deficits, vegetation is not expected to recede due to water stress. Moreover, the Proposed Action is for the temporary short-term period of three years, at which time any flow reductions would cease and the existing conditions would resume. Nevertheless, the Proposed Action includes the Monitoring Plan, which provides for the ongoing monitoring of the vegetation and drain flows during the short-term period of the Proposed Action. IID's implementation of the Monitoring Plan would bring the monthly drain flow deficits to existing conditions.

Figure 3-7 Annual Evapotranspiration-Drain Flow Water Balance



SOURCE: FMMP; IID; ESA, 2023

Imperial Irrigation District 2024-2026 Temporary Colorado River System Water Conservation Project

Figure 3-7
Annual Evapotranspiration-Drain Flow Water Balance

Table 3-11 Existing Conditions Monthly Evapotranspiration, Mean Monthly Drain Flows, Water Balance for Natural Communities

Vegetation Drain Group	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Monthly ET (AF)													
East Drains	767	961	1,492	2,265	3,124	3,796	4,017	3,687	2,848	2,178	1,146	737	27,018
San Felipe Wash	18	22	30	42	63	77	84	77	64	48	24	18	567
Pumice Drain	42	54	88	137	184	223	233	214	161	123	66	41	1,566
Trifolium 22 Drain	25	33	56	90	117	142	146	134	97	75	41	24	981
Trifolium 23 Drain	22	27	37	52	78	95	104	95	79	60	30	22	700
Mean Monthly Drain Flows (AF)													
East Drains	1,999	2,070	2,676	2,825	3,261	3,405	3,495	3,256	2,852	2,415	2,251	2,011	32,515
San Felipe Wash	168	108	107	58	38	54	90	114	120	144	176	209	1,384
Pumice Drain	1,005	910	1,300	1,588	1,418	1,596	1,644	1,269	1,387	1,994	1,760	1,409	17,279
Trifolium 22 Drain	240	264	652	507	206	162	227	248	179	256	258	261	3,459
Trifolium 23 Drain	228	246	340	314	248	240	347	257	309	364	302	250	3,446
Existing Monthly Flows minus ET Demand Balance (AF)													
East Drains	1,231	1,109	1,184	561	138	(391)	(522)	(431)	4	237	1,105	1,274	5,498
San Felipe Wash	150	86	77	16	(25)	(22)	6	37	55	95	151	191	817
Pumice Drain	963	856	1,212	1,451	1,235	1,372	1,411	1,055	1,226	1,870	1,694	1,368	15,712
Trifolium 22 Drain	215	232	595	417	89	20	80	114	82	181	217	237	2,478
Trifolium 23 Drain	206	219	303	262	170	145	244	162	230	304	272	229	2,746

SOURCE: ESA 2024

Table 3-12 Proposed Action Monthly Evapotranspiration, Mean Monthly Drain Flows, and Water Balance for Natural Communities

Vegetation Drain Group	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Monthly ET (AF)													
East Drains	767	961	1,492	2,265	3,124	3,796	4,017	3,687	2,848	2,178	1,146	737	27,018
San Felipe Wash	18	22	30	42	63	77	84	77	64	48	24	18	567
Pumice Drain	42	54	88	137	184	223	233	214	161	123	66	41	1,566
Trifolium 22 Drain	25	33	56	90	117	142	146	134	97	75	41	24	981
Trifolium 23 Drain	22	27	37	52	78	95	104	95	79	60	30	22	700
Mean Monthly Drain Flows (AF)													
East Drains	1,671	1,774	2,349	2,508	2,933	3,087	3,168	2,928	2,535	2,087	1,933	1,683	28,657
San Felipe Wash	154	95	93	44	24	41	76	100	106	130	162	195	1,220
Pumice Drain	831	753	1,126	1,419	1,244	1,427	1,470	1,095	1,218	1,820	1,592	1,235	15,228
Trifolium 22 Drain	205	233	617	473	171	128	192	214	145	221	224	226	3,048
Trifolium 23 Drain	194	215	305	281	213	206	313	222	275	329	269	216	3,037
Proposed Monthly Flows minus ET Demand Balance (AF)													
East Drains	903.5	813.2	856.1	243.4	(190.1)	(708.2)	(849.7)	(759.1)	(312.8)	(91.0)	787.9	946.0	1,639.2
San Felipe Wash	135.7	73.4	63.2	2.3	(39.2)	(36.0)	(7.7)	22.6	41.8	81.3	137.8	177.1	652.4
Pumice Drain	788.4	698.5	1,037.4	1,282.2	1,060.5	1,203.8	1,236.9	880.7	1,057.5	1,696.3	1,525.8	1,194.1	13,662.0
Trifolium 22 Drain	180.2	200.2	560.3	382.8	53.8	(14.1)	45.4	79.2	48.3	145.9	183.1	202.1	2,067.3
Trifolium 23 Drain	171.2	187.7	268.4	228.4	135.0	111.7	208.8	127.2	196.1	269.7	238.8	194.0	2,336.9

SOURCE: ESA 2024

The ET analysis and drain flow hydrology analysis both indicate that on an annual average, flow reductions under the Proposed Action could temporarily lower flows in drains flowing directly to the playa. The spatial and temporal extent of flow reductions remains unknown and will depend on farming practices and the locations and timing of participating fields in the conservation programs implemented under the Proposed Action. The expected deficit in drain flow during certain months of the Proposed Action may add to those observed under existing conditions; however, any deficit in drain flows is not expected to be substantial and vegetative habitat is not expected to decline. This impact is described in more detail in Section 3.4 Biological Resources. To ensure that flows are sustained spatially and temporally in each of the drains sufficient to avoid adverse effects to listed species, the Monitoring Plan (Section 2.2.4) would be implemented to monitor drain flow and vegetation, take responsive actions, and coordinate with and report to USFWS, Reclamation, and CDFW. Once the Proposed Action has completed, flows would return to pre-Proposed Action conditions.

Salton Sea Accounting Model

To account for the projected reduction in surface water reaching the Salton Sea in the future, DWR has prepared a model that estimates the impacts of cumulative inflow reductions to the Salton Sea. The Salton Sea Accounting Model (SSAM) estimates the anticipated surface water elevation decline at the Sea, salinity concentration trends, and acreages of exposed playa that will result from the declining Sea elevation. SSAM provides a tool to estimate future conditions in support of the Salton Sea Management Program Long-Range Plan (CNRA 2022).

SSAM was used to evaluate the potential impacts of the Proposed Action on the Salton Sea elevation, salinity concentrations, and exposed lakebed acreage. The model provides a baseline future projection compared with and without the Proposed Action. Two modeling scenarios were calculated: one assuming conservation programs would be conducted with 100 percent fallowing-based conservation programs that include the FUFP and the DIP, and one with a combination of fallowing-based conservation programs and the OFECP (or the simplified OFECP) (see Section 2.1, Proposed Action Alternative). The two different SSAM scenarios account for potential variability of Proposed Action inflow impacts that will depend on which combination of the three conservation programs are implemented by IID and the participation of agricultural water users and their fields in the conservation programs. The model assumes that the OFECP would result in less flow to the Sea than if all conservation was achieved with the fallowing-based conservation programs (FUFP and DIP) alone because the OFECP utilizes more efficient farming practices that result in less drainage water.

Figure 3-8 Comparison of Baseline Trends with Proposed Action Increment of Effect, presents the results of the SSAM model for net inflow and salinity of the Salton Sea. Appendix HYDRO-3 includes a Technical Memorandum explaining the model outputs. As shown in the model outputs, the Proposed Action under either scenario would accelerate the effects of the decline in Sea elevation, increased salinity, and increased acreage of exposed playa. However, given the temporary short-term period of three years, the Proposed Action would not increase these anticipated effects over the long-term. Each of the parameters evaluated would be similar to future

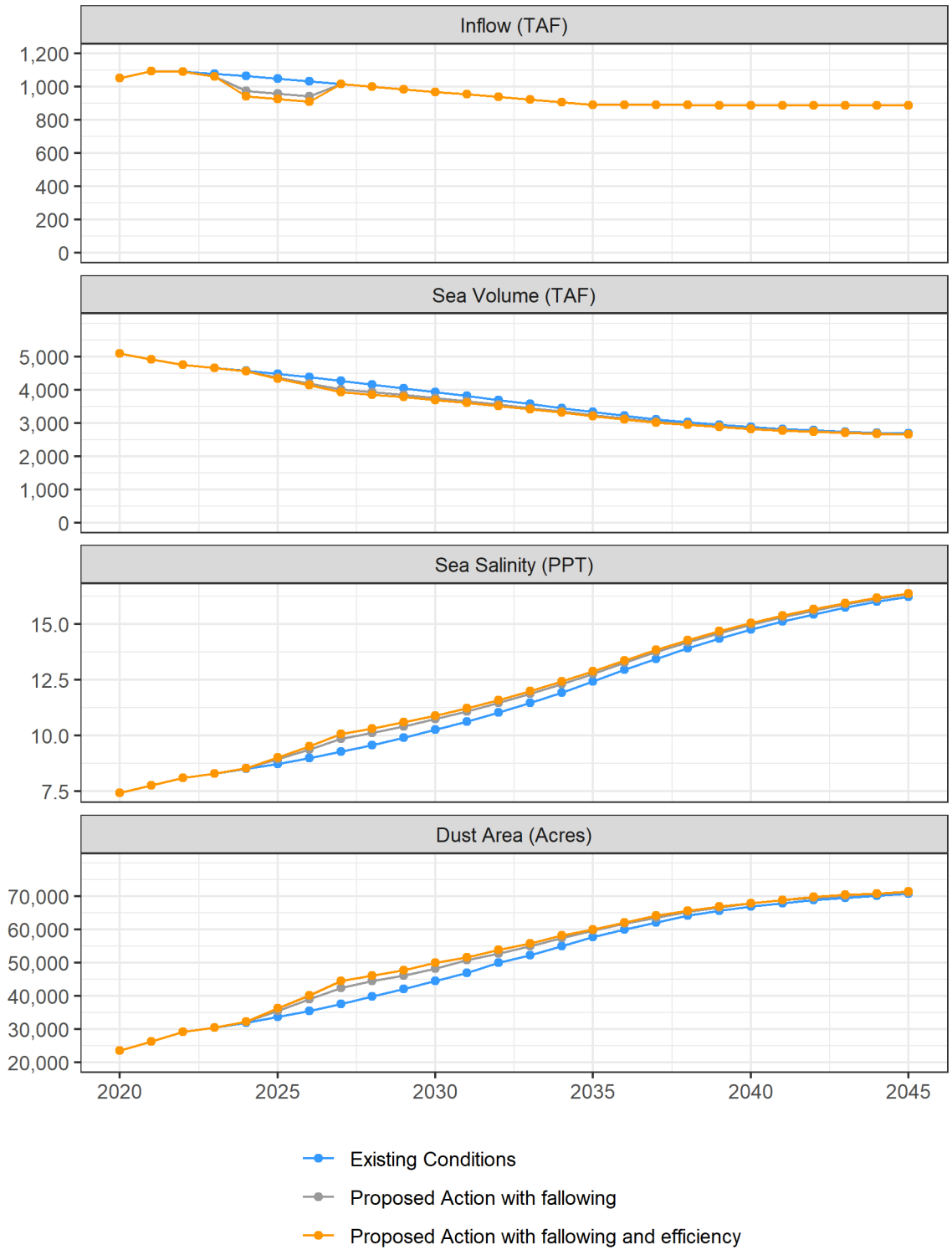
baseline conditions in the year 2045. The Proposed Action would accelerate the anticipated effects by an increment of 3 or 4 years compared with the No Action Alternative.

Water Quality

The QSA EIR/EIS provides a detailed assessment of potential water quality impacts that could result from reduced inflows into the Salton Sea. Salinity and increased concentrations of metals such as selenium are evaluated as potential concerns. The Proposed Action would reduce the inflow of freshwater with relatively low TDS concentrations into the Salton Sea. As noted in the QSA EIR/EIS, the Salton Sea is a terminal inland lake that is continually increasing in salinity over time due to evaporation. The Salton Sea will continue to increase in salinity with or without the cumulative reduction in freshwater inflows. The QSA EIR/EIS identified measures to minimize effects to ecological resources from increased salinity and from potentially hazardous concentrations of certain metals such as selenium. Because the effects of the Proposed Action are acceleration of effects identified in the QSA EIR/EIS, the Proposed Action is within the scope of analysis of the QSA EIR/EIS and confirms that the Proposed Action does not cause any new or unstudied potentially adverse effects. The existing mitigation measures under the QSA EIR/EIS will address the accelerated effects and, therefore, new mitigation measures are not necessary. (See discussion Section 3.1 Hydrology and Water Quality in the QSA EIR/EIS for the applicable mitigation measures.)

The SSAM model was used to estimate the impacts to salinity that may occur due to the Proposed Action. As shown in **Figure 3-8, Comparison of Baseline Trends with Proposed Action Increment of Effect** the Proposed Action may accelerate the salinity increase in the Sea for a period of 3 to 4 years. An accelerated increase in salinity over a period of 3 to 4 years would be within the bounds of what was anticipated and what is to be mitigated pursuant to the QSA EIR/EIS. Because of the temporary short-term period of three years for the Proposed Action, there is no effect over the long-term. Existing conditions resume upon the conclusion of the Proposed Action. Therefore, the Proposed Action would not increase overall salinity of the Sea. In addition, the Proposed Action would reduce loading of salts and metals into the Sea compared with existing conditions. Due to the temporary short-term nature of the proposed reductions, selenium concentrations would not increase substantially from the projected future baseline condition that could result in accumulated increases of selenium concentrations or increase the potential for hazardous conditions to ecosystems and the public.

Figure 3-8 Comparison of Baseline Trends with Proposed Action Increment of Effect



Source: DWR 2023

3.8.2.4 Cumulative Impacts

Table 1-1, Cumulative Projects List, provides a list of past, on-going, and future planned projects that could reduce flows to the Salton Sea. These projects include CNRA's SSMP Long-Range Plan which provides a road map for future management actions that will help to minimize impacts of cumulative inflow reductions. The Long-Range Plan utilizes SSAM to estimate cumulative future conditions. As shown in Figures 3-8, Comparison of Baseline Trends with Proposed Action Increment of Effect, the Proposed Action would accelerate the anticipated effects of cumulative flow reductions, but over time, by the year 2045, the conditions at the Salton Sea would be the same as baseline projected conditions. (See Appendix HYDRO-3.) Due to the temporary short-term nature of the Proposed Action, and lack of long-term effects demonstrated by SSAM, the Proposed Action, when considered with relevant past, present, and reasonably foreseeable projects, would not contribute significantly to cumulative hydrology impacts to the IID Contract Service Area.

3.9 Visual Resources

3.9.1 Affected Environment

3.9.1.1 IID Contract Service Area

The IID Contract Service Area is characterized visually by substantial agricultural production. Approximately 20 percent (534,328 acres) of the nearly 3 million acres of Imperial County land is irrigated for agricultural purposes (County of Imperial 2015). Along the 80-mile stretch of the AAC are desert lands and sand dunes before reaching and traveling the southern edge of the IID Contract Service Area just north of the U.S.-Mexico border. Beyond the IID Contract Service Area to the east and west, deserts, sand dunes, and mountains characterize the visual resources. Various mountains and foothills within the region add to the visual scenery in the Imperial Valley. The eastern foothills of the Peninsular Range, including the Jacumba, Coyote, Fish Creek, and Santa Rosa Mountains, are located to the west of the IID Contract Service Area. To the northeast, the Chocolate Mountains rise to an elevation of approximately 2,700 feet in a northwest to southeast direction and can be viewed from locations throughout the Imperial Valley. And to the north of the IID Contract Service Area is the Salton Sea.

3.9.1.2 Salton Sea

Visual resources in and around the Salton Sea include various landforms, vegetation, man-made structures, and the Sea itself, which covers approximately 211,840 acres (330 square miles) and is immediately surrounded by a sparsely vegetated desert landscape, which gives way to rocky, sandy hills (County of Imperial 2015).

Surrounding the Salton Sea, the visual baseline conditions are as follows:

- North Shore: The area bordering the Salton Sea's north shore is a gently sloping alluvial plain dominated by agricultural plots containing crops such as date palms and vineyards. The three highways approaching from the north—State Route (SR)-86, SR-195, and SR-111—provide the primary public views of the Sea in this area. No recreation facilities are located at the North Shore.
- West Shore: The west shore area includes the shoreline from south of Salton City to north of Desert Shores. The area includes most of the residential development around the Sea. Topography of this portion of the shore is a gradually sloping alluvial fan between the Sea and the boundary to Anza-Borrego State Park. Views of the Chocolate Mountains across the Sea and the Santa Rosa Mountains to the west provide a dramatic landscape backdrop. Primary views of the Salton Sea are provided from SR-86 and SR-78.
- South Shore: The area south of the Salton Sea is a northward-sloping, wide-open valley supporting large fields of intensive commercial agriculture. Large tracts of farmland are bordered by irrigation and drainage ditches. Two rivers terminate in the Sea: the Alamo River and the New River. Along the southwest corner of the Sea, SR-86 provides distant views to the Sea, views of Imperial Valley agricultural fields to the southwest, and the Vallecito and Santa Rosa Mountains to the northwest. Public access and recreation are provided via the Sonny Bono Salton Sea National Wildlife Refuge located in the southeast portion of the lake. The refuge provides wetland and grassland habitat for migratory birds

along the Pacific flyway. Access is provided seasonally to the refuge and trails, an observation tower, kiosks, and a visitor center are available (USFWS 2023b).

- East Shore: The east shore area includes small communities, mostly notably Bombay Beach. The terrain consists of the lower alluvial plains of the Mecca Hills and the Orocopia and Chocolate Mountains. California low desert scrub vegetation is the predominant cover for this area, with introduced palms and exotics at some of the public use areas. The Salton Sea State Recreation Area is located along SR-111 between the Salton Sea and the Chocolate Mountains. Spread out over almost 20 miles of shoreline are five campgrounds and a facility headquarters, which includes a visitor center and day-use area.

Two public highways in the vicinity of the Action Area have been selected as eligible for state scenic highway designation: SR-78 which terminates near the southwestern corner of the Sea and SR-111 on the eastern shore of the Sea (Caltrans 2023). Views afforded by sections of these potentially eligible roadways include rock and boulder scenery and plant life variations, the Chocolate Mountains, and the Salton Sea.

The elevation of the Salton Sea has varied historically since its creation in 1905 from a high of -195 ft msl in 1907 to its current elevation of -240.65, NGVD 1929 (USGS 2023). This elevation is projected to continue to decrease without the Proposed Action. In addition to the historic variation, the water level of the Salton Sea also varies by up to 1.5 feet on an annual cycle, according to seasonal runoff and evaporation rates. As a result of these water level changes, the surface area of the Sea and shoreline locations have historically varied both in long- and short-term periods.

3.9.2 Environmental Consequences

3.9.2.1 No Action Alternative

Implementation of the No Action Alternative would involve no additional reductions in water diversions by IID from the Colorado River at the Imperial Dam resulting from the LC Conservation Program and would therefore not achieve conservation objectives. As a result, the water conservation would not occur, eliminating effects from the LC Conservation programs, including efficiency conservation and fallowing. As a result, there would be no impact to visual resources other than what would already occur under existing conditions.

3.9.2.2 Proposed Action Alternative

The Proposed Action would occur within the IID Contract Service Area and would not alter the aesthetic character of surrounding desert areas, sand dunes, and mountains located outside the IID Contract Service Area.

Any equipment used to implement the Proposed Action would be typical agricultural equipment often used for agricultural production on fields and, therefore, would not contribute to any changes in the visual character of the area.

The Proposed Action includes the implementation of conservation programs by IID within its Contract Service Area for a temporary, short-term three-year period of time. Participation in the conservation programs would be voluntary and incentivized by payment for the conserved water created by the programs. IID would implement a combination of conservation programs under the Proposed Action. By the structure and nature of each conservation program, fields cannot

participate in more than one conservation program at a time. IID intends to prioritize the OFECP and DIP water conservation programs. The implementation of the OFECP (or simplified OFECP) would result in no changes to the visual character of the area because the agricultural land would remain in agricultural production to the same extent it would otherwise be in production. Moreover, the temporary increase in the use and implementation of conservation measures would be throughout the IID Contract Service Area and would not introduce unusual visual features to the landscape or result in significant impacts to visual resources, scenic views, or views from designated scenic highways.

Under the Proposed Action, the combination of conservation programs may include the implementation of the fallowing-based conservation programs. If both the FUFP and the DIP were to be implemented, the maximum potential acreage for either program would not be reached. Agricultural land cannot participate in both programs at the same time. Therefore, if one field is in one program, it cannot simultaneously be in the other program, thereby bringing down the maximum level of participation possible for that other program. The maximum level of participation for either fallowing-based conservation program will be even lower if there are fields participating in the OFECP and will then also not be eligible for participation in a fallowing-based conservation program.

If maximum participation were to occur in the DIP, up to 180,000 acres of agricultural land could stop being irrigated for a 45- to 60-day period between the months of June through September for each of the three years of 2024, 2025, and 2026. Fields participating in the DIP will be in active agricultural production. The crop will cease receiving water for 45 to 60 days, but then the agricultural activities will resume on the field following that period of time. Therefore, despite the DIP being a fallowing-based conservation program, the crop remains on the field and the agricultural activities on a field are only interrupted for a short period of time and only during the temporary, short-term span of three years. Consequently, along with the OFECP (or simplified OFECP), the implementation of the DIP would result in no change in the visual character of the participating fields or the surrounding area.

If maximum participation were to occur in the FUFP as a result of the Proposed Action, a maximum of up to 34,450 acres throughout the IID Contract Service Area could participate in the FUFP that would result in an increase in frequency of fields that will not be irrigated for 6 months to one year during the two years of 2025 and 2026. The visual impact of the FUFP participating fields would result in more fields lying fallow without the application of water than under existing conditions during the next three years. However, the agricultural activities will resume on the field following that period of time. If a field is allowed to participate in the FUFP for consecutive years, it would be no longer than the temporary, short-term period of two years. Similar to the QSA, a three-year maximum allowed participation can be implemented and still maintain the integrity of the soils for resumed agricultural production. Nevertheless, crop cycling is common throughout the IID Contract Service Area and unpredictable. Under current conditions, fields may be fallowed, idled or unplanted for long periods of time (ranging from a few months to over a year) due to economic or other reasons. The Proposed Action could increase the frequency of dry fields or fields with vegetative cover, but only up to the maximum acreage for participation in the FUFP, which is 34,450 acres within over 400,000 acres of agricultural land being actively farmed within IID's Contract Service Area and only over the temporary short-term period of three years.

Implementation of the Proposed Action would result in the acceleration of the Salton Sea elevation lowering from its current elevation due to the QSA and other factors (See Hydrology/Water Quality Section 3.8, subsection 3.8.2.3 Proposed Action Alternative). While the Proposed Action would accelerate the exposure of the Salton Sea playa currently inundated, the acceleration would taper off to baseline projection levels by the year 2045. (Figure 3-1, Exposed Salton Sea Acreage; Appendix HYDRO-3.) Until that time, the Proposed Action would have a limited impact to views of the Salton Sea landscape as seen from shoreline areas. The exposed playa will occur 3 to 4 years earlier than would otherwise occur, but that temporary impact would be no more than a nominal volume of what will already occur by 2045 under the No Action Alternative. Given the size and distance of the Salton Sea, the acceleration of playa exposure at the Sea will be less visible, if at all visible, from distant public roadways, including SR-86 and SR-78. The specific visual effects and their severity would vary according to the affected viewer's location and activity. In general, it is anticipated that views most affected by the Proposed Action would be at public recreation locations situated near the existing shoreline. Nevertheless, the receding shoreline of the Salton Sea has been part of the visual landscape for several decades. As the Sea continues to recede, the character of the shoreline has changed, including increased vegetation in some areas visible to the public. The Proposed Action would not change this condition substantially.

3.9.2.3 Cumulative Impacts

Table 1-1, Cumulative Projects List, provides a list of past, on-going, and future planned projects within and adjacent to the IID Contract Service Area. The Proposed Action would result in minor changes to the visual landscape within the primarily irrigated areas of IID's Contract Service Area and along the southern shoreline of the Salton Sea. The Proposed Action would accelerate impacts of the QSA, but not contribute to the cumulative effect of the lowering elevation of the Salton Sea. Hydrologic modeling conducted by DWR estimate that with implementation of the cumulative projects, the Salton Sea elevation will plateau in 2045. (See Figure 3-1 Exposed Salton Sea Acreage; Appendix HYDRO-3.) Although the Proposed Action would accelerate the near-term shoreline recession, over the long term, by 2045, the Sea elevation would be similar to the No Action Alternative. Therefore, the Proposed Action, when considered with relevant past, present, and reasonably foreseeable projects, would not contribute significantly to cumulative visual resource impacts within the IID Contract Service Area.

4.0 Coordination, Consultation and List of Preparers

4.1 Persons/Agencies Consulted

Reclamation and IID have consulted with various agencies and interested parties to identify potential issues or concerns prior to the initiation of formal consultation. Specifically, Reclamation and IID have met with the US Fish and Wildlife Service (USFWS), the California Natural Resources Agency (CNRA), and the California Department of Fish and Wildlife (CDFW) on several occasions to discuss the Proposed Action. Reclamation has commenced the consultation process pursuant to Section 7 of the Endangered Species Act with USFWS.

On November 9 and 13, 2023, Reclamation delivered, via email and certified mail, digital and hardcopy versions of the Proposed Action's announcement and consultation invitation letter to 27 identified Tribes. Reclamation has since received responses from and discussed the Proposed Action with several Tribes. Reclamation has been informed of the presence of specific traditional cultural resources; these are, however, located outside of the area of the Proposed Action and will not be affected. Reclamation's Tribal partners have also requested additional information regarding the nature and scope of prior ground disturbance in the area of the Proposed Action and voiced concerns regarding the effects of ground-disturbing programs funded by the Proposed Action. Information regarding prior ground disturbance in the Proposed Action and clarification of the nature and scope of the ground-disturbing activities funded by the Proposed Action was gathered by Reclamation from IID and disseminated to the requesting Tribes via email and telephone. Reclamation continues to maintain dialogue with those Tribal partners that have chosen to respond to the initial invitation, in accordance with their initial statements and requests, and welcomes consultation with those Tribes that choose to respond to this document.

4.2 Distribution List

An electronic copy of this EA has been posted for public viewing on Reclamation's Lower Colorado Basin Regional Office website at https://www.usbr.gov/lc/region/g2000/envdocs.html. Copies of this EA were also distributed to the following entities:

- USFWS, Palm Springs Office
- CDFW, Inland Deserts Region
- IID
- CNRA
- Agua Caliente Band of Cahuilla Indians
- Campo Kumeyaay Nation
- Cocopah Indian Tribe
- Fort Yuma-Quechan Indian Tribe
- Kwaaymii Laguna Band of Mission Indians
- Torres-Martinez Desert Cahuilla Indians

4.3 List of Preparers

Reclamation
Shonna Dooman, Resource Management Office Chief
Michael Boyles, Environmental Compliance Group Manager

IID
Joanna Smith Hoff, Deputy General Counsel
Jessica Humes, Senior Environmental Project Manager

Environmental Science Associates
Tom Barnes, Principal Environmental Scientist
Nicolle Lanelli Steiner, Managing Associate
Robert Sweet, Senior Associate Biologist

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Appendix AQ-1
Air Quality Regulatory Framework

AIR QUALITY
Regulatory Framework

Regulatory programs have been established at the national, state, and local levels to address air quality. These programs are intended to protect air quality in areas of attainment and to improve air quality in areas where pollutant concentrations exceed health-based criteria. Air quality regulatory programs characterize the concentration of pollutants within their area of jurisdiction, and implement emissions limitations for stationary sources and other mitigation measures necessary to achieve or maintain healthy air quality.

Federal

Clean Air Act

National Ambient Air Quality Standards

The federal Clea Air Act (CAA) was enacted in 1955 and has been amended numerous times in subsequent years, with the most recent amendments occurring in 1990.[1] The CAA is the comprehensive federal law that regulates air emissions in order to protect public health and welfare.[2] The United States Environmental Protection Agency (USEPA) is responsible for the implementation and enforcement of the CAA, which establishes federal National Ambient Air Quality Standards (NAAQS), specifies future dates for achieving compliance, and requires USEPA to designate areas as attainment, nonattainment, or maintenance. The CAA also mandates that each state submit and implement a State Implementation Plan (SIP) for each criteria pollutant for which the state has not achieved the applicable NAAQS. The SIP includes pollution control measures that demonstrate how the standards for those pollutants will be met. The sections of the CAA most applicable to the proposed project include Title I (Nonattainment Provisions) and Title II (Mobile Source Provisions).[3,4]

Title I requirements are implemented for the purpose of attaining NAAQS for criteria air pollutants. The NAAQS were amended in July 1997 to include an 8-hour standard for ozone and

1 42 United States Code §7401 et seq. (1970).

2 USEPA, Summary of the Clean Air Act, last updated September 6, 2023. https://www.epa.gov/laws-regulations/summary-clean-air-act. Accessed October 2023.

3 USEPA, Clean Air Act Overview, Clean Air Act Table of Contents by Title, last updated May 2, 2023. https://www.epa.gov/clean-air-act-overview/clean-air-act-text. Accessed October 2023. As shown therein, Title I addresses nonattainment areas and Title II addresses mobile sources.

4 Mobile sources include on-road vehicles (e.g. cars, buses, motorcycles) and non-road vehicles e.g. aircraft, trains, construction equipment). Stationary sources are comprised of both point and area sources. Point sources are stationary facilities that emit large amount of pollutants (e.g. municipal waste incinerators, power plants). Area sources are smaller stationary sources that alone are not large emitters, but combined can account for large amounts of pollutants (e.g. consumer products, residential heating, dry cleaners).

to adopt a NAAQS for PM2.5. The NAAQS were also amended in September 2006 to include an established methodology for calculating PM2.5, as well as to revoke the annual PM10 threshold. **Table 1**, *Ambient Air Quality Standards*, shows the NAAQS currently in effect for each criteria pollutant. The NAAQS and the California Ambient Air Quality Standards (CAAQS) for the California criteria air pollutants (discussed below) have been set at levels considered safe to protect public health, including the health of sensitive populations such as asthmatics, children, and the elderly with a margin of safety; and to protect public welfare, including against decreased visibility and damage to animals, crops, vegetation, and buildings.[5]

The six criteria pollutants are ground-level ozone (O_3); particulate matter, including coarse particulate matter (PM10) and fine particulate matter (PM2.5); nitrogen dioxide (NO_2); carbon monoxide (CO); sulfur dioxide (SO_2); and lead (Pb). O_3 is not directly emitted into the air but rather forms in the atmosphere through chemical and photochemical reactions of reactive organic gases (ROG) and nitrogen oxides (NOx). Therefore, O_3 is indirectly controlled through limits on emissions of ROG and NOx.

Certain air pollutants have been recognized to cause notable health problems and consequential damage to the environment either directly or in reaction with other pollutants, due to their presence in elevated concentrations in the atmosphere. The six criteria pollutants are ground-level ozone (O_3); particulate matter, including coarse particulate matter (PM10) and fine particulate matter (PM2.5); nitrogen dioxide (NO_2); carbon monoxide (CO); sulfur dioxide (SO_2); and lead (Pb). O_3 is not directly emitted into the air but rather forms in the atmosphere through chemical and photochemical reactions of reactive organic gases (ROG), also known as volatile organic compounds (VOCs), and nitrogen oxides (NOx). Therefore, O_3 is indirectly controlled through limits on emissions of ROG/VOCs and NOx. A brief description of the health effects of these criteria air pollutants are provided below.

Ozone (O_3): Ozone is a secondary pollutant formed by the chemical reaction of VOCs and nitrogen oxides (NO_X) in the presence of sunlight under favorable meteorological conditions, such as high temperature and stagnation episodes. Ozone concentrations are generally highest during the summer months when direct sunlight, light wind, and warm temperature conditions are favorable. According to the USEPA, ozone can cause the muscles in the airways to constrict potentially leading to wheezing and shortness of breath.[6] Ozone can make it more difficult to breathe deeply and vigorously; cause shortness of breath and pain when taking a deep breath; cause coughing and sore or scratchy throat; inflame and damage the airways; aggravate lung diseases such as asthma, emphysema and chronic bronchitis; increase the frequency of asthma attacks; make the lungs more susceptible to infection; continue to damage the lungs even when

5 USEPA, NAAQS Table, https://www.epa.gov/criteria-air-pollutants/naaqs-table, last updated March 15, 2023. Accessed September 2023.

6 United States Environmental Protection Agency (USEPA), Health Effects of Ozone Pollution, https://www.epa.gov/ground-level-ozone-pollution/health-effects-ozone-pollution, last updated May 24, 2023. Accessed September 2023.

TABLE 1
AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	Federal Primary Standard	California Standard
Ozone (O_3)	8-hour	0.070 ppm[(1)]	0.070 ppm
	1-hour	--	0.09 ppm
Nitrogen Dioxide (NO_2)	1-hour	100 ppb (0.100 ppm)	0.18 ppm
	Annual Mean	53 ppb[(2)] (0.053 ppm)	0.030 ppm
Carbon Monoxide (CO)	8-hour	9 ppm	9 ppm
	1-hour	35 ppm	20 ppm
Sulfur Dioxide (SO_2)	3-hour (secondary)	0.5 ppm	
	1-hour (primary)	75 ppb[(3)] (0.75 ppm)	0.25 ppm
	Annual Mean	30 ppb (0.030 ppm)	--
PM10	24-hour	150 µg/m^3	50 µg/m^3
	Annual Mean	--	20 µg/m^3
PM2.5	24-hour	35 µg/m^3	--
	Annual Mean	12 µg/m^3	12 µg/m^3
Lead	30-day average	==	1.5 µg/m^3
	3-month average	0.15 µg/m^3 [(4)]	--
Visibility Reducing Particles	8-hour	No Federal Standards	Extinction coefficient of 0.23 per kilometer — visibility of 10 miles or more (0.07 — 30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent.
Sulfates (SO_4)	24-hour		25 µg/m^3
Hydrogen Sulfide (H_2S)	1-hour		0.03 ppm
Vinyl Chloride	24-hour		0.01 ppm

NOTES:

-- No Standard

[(1)] Final rule was signed October 1, 2015, and effective December 28, 2015. The previous (2008) O_3 standards are not revoked and remain in effect for designated areas. Additionally, some areas may have certain continuing implementation obligations under the prior revoked 1-hour (1979) and 8-hour (1997) O_3 standards.

[(2)] The level of the annual NO_2 standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.

[(3)] The previous SO_2 standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (2)any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which is designated nonattainment under the previous SO_2 standards or is not meeting the requirements of a SIP call under the previous SO_2 standards (40 CFR 50.4(3)). A SIP call is an EPA action requiring a state to resubmit all or part of its State Implementation Plan to demonstrate attainment of the required NAAQS.

[(4)] In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 µg/m3 as a calendar quarter average) also remain in effect.

SOURCE: USEPA, NAAQS Table, last updated March 15, 2023. https://www.epa.gov/criteria-air-pollutants/naaqs-table#1. Accessed October 2023. CARB, California Ambient Air Quality Standards. https://ww2.arb.ca.gov/resources/california-ambient-air-quality-standards. Accessed October 2023.

the symptoms have disappeared; and cause chronic obstructive pulmonary disease.[7] Long-term exposure to ozone is linked to aggravation of asthma, and is likely to be one of many causes of asthma development and long-term exposures to higher concentrations of ozone may also be linked to permanent lung damage, such as abnormal lung development in children.[8] According to the California Air Resource Board (CARB), inhalation of ozone causes inflammation and irritation of the tissues lining human airways, causing and worsening a variety of symptoms and exposure to ozone can reduce the volume of air that the lungs breathe in and cause shortness of breath.[9] The USEPA states that people most at risk from breathing air containing ozone include people with asthma, children, older adults, and people who are active outdoors, especially outdoor workers.[10] Children are at greatest risk from exposure to ozone because their lungs are still developing and they are more likely to be active outdoors when ozone levels are high, which increases their exposure.[11] According to CARB, studies show that children are no more or less likely to suffer harmful effects than adults; however, children and teens may be more susceptible to ozone and other pollutants because they spend nearly twice as much time outdoors and engaged in vigorous activities compared to adults.[12] Children breathe more rapidly than adults and inhale more pollution per pound of their body weight than adults and are less likely than adults to notice their own symptoms and avoid harmful exposures.[13] Further research may be able to better distinguish between health effects in children and adults.[14]

Volatile Organic Compounds (VOCs): VOCs are organic chemical compounds of carbon and are not "criteria" pollutants themselves; however, they contribute with NO_X to form ozone, and are regulated to prevent the formation of ozone.[15] According to CARB, some VOCs are highly reactive and play a critical role in the formation of ozone, other VOCs have adverse health effects, and in some cases, VOCs can be both highly reactive and have adverse health effects.[16] VOCs are typically formed from combustion of fuels and/or released through evaporation of organic liquids, internal combustion associated with motor vehicle usage, and consumer products (e.g., architectural coatings, etc.).[17]

Nitrogen Dioxide (NO_2) and Nitrogen Oxides (NO_X): NO_X is a term that refers to a group of compounds containing nitrogen and oxygen. The primary compounds of air quality concern include NO_2 and nitric oxide (NO). Ambient air quality standards have been promulgated for

7 USEPA, Health Effects of Ozone Pollution.

8 USEPA, Health Effects of Ozone Pollution.

9 California Air Resources Board (CARB), Ozone & Health, Health Effects of Ozone, https://ww2.arb.ca.gov/resources/ozone-and-health. Accessed September 2023.

10 USEPA, Health Effects of Ozone Pollution.

11 USEPA, Health Effects of Ozone Pollution.

12 CARB, Ozone & Health, Health Effects of Ozone.

13 CARB, Ozone & Health, Health Effects of Ozone.

14 CARB, Ozone & Health, Health Effects of Ozone.

15 USEPA, Technical Overview of Volatile Organic Compounds, https://www.epa.gov/indoor-air-quality-iaq/technical-overview-volatile-organic-compounds, last updated March 14, 2023. Accessed September 2023.

16 CARB, Review of the California Ambient Air Quality Standard for Ozone Volume II of IV Chapters 3-8, Staff Report Initial Statement of Reasons for Proposed Rulemaking, March 11. 2005. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://ww2.arb.ca.gov/sites/default/files/barcu/regact/ozone05/isorv2.pdf. Accessed September 2023.

17 USEPA, What are volatile organic compounds (VOCs)?, last updated March 15, 2023. https://www.epa.gov/indoor-air-quality-iaq/what-are-volatile-organic-compounds-vocs. Accessed September 2023.

NO_2, which is a reddish-brown, reactive gas.[18] The principle form of NO_X produced by combustion is NO, but NO reacts quickly in the atmosphere to form NO_2, creating the mixture of NO and NO_2 referred to as NO_X.[19] Major sources of NO_X include emissions from cars, trucks and buses, power plants, and off-road equipment.[20] The terms NO_X and NO_2 are sometimes used interchangeably. However, the term NO_X is typically used when discussing emissions, usually from combustion-related activities, and the term NO_2 is typically used when discussing ambient air quality standards. Where NO_X emissions are discussed in the context of the thresholds of significance or impact analyses, the discussions are based on the conservative assumption that all NO_X emissions would oxidize in the atmosphere to form NO_2. According to the USEPA, short-term exposures to NO_2 can potentially aggravate respiratory diseases, particularly asthma, leading to respiratory symptoms (such as coughing, wheezing or difficulty breathing), hospital admissions and visits to emergency rooms while longer exposures to elevated concentrations of NO_2 may contribute to the development of asthma and potentially increase susceptibility to respiratory infections.[21] According to CARB, controlled human exposure studies that show that NO_2 exposure can intensify responses to allergens in allergic asthmatics.[22] In addition, a number of epidemiological studies have demonstrated associations between NO_2 exposure and premature death, cardiopulmonary effects, decreased lung function growth in children, respiratory symptoms, emergency room visits for asthma, and intensified allergic responses.[23] Infants and children are particularly at risk from exposure to NO_2 because they have disproportionately higher exposure to NO_2 than adults due to their greater breathing rate for their body weight and their typically greater outdoor exposure duration while in adults, the greatest risk is to people who have chronic respiratory diseases, such as asthma and chronic obstructive pulmonary disease.[24] CARB states that much of the information on distribution in air, human exposure and dose, and health effects is specifically for NO_2 and there is only limited information for NO and NO_X, as well as large uncertainty in relating health effects to NO or NO_X exposure.[25]

Carbon Monoxide (CO): CO is primarily emitted from combustion processes and motor vehicles due to the incomplete combustion of fuel, such as natural gas, gasoline, or wood, with the majority of outdoor CO emissions from mobile sources.[26] According to the USEPA, breathing air with a high concentration of CO reduces the amount of oxygen that can be transported in the blood stream to critical organs like the heart and brain and at very high levels, which are possible indoors or in other enclosed environments, CO can cause dizziness, confusion, unconsciousness and death.[27] Very high levels of CO are not likely to occur outdoors; however,

18 CARB, Nitrogen Dioxide & Health, https://ww2.arb.ca.gov/resources/nitrogen-dioxide-and-health. Accessed September 2023.

19 CARB, Nitrogen Dioxide & Health.

20 USEPA, Nitrogen Dioxide (NO_2) Pollution, https://www.epa.gov/no2-pollution/basic-information-about-no2, last updated July 25, 2023. Accessed September 2023.

21 USEPA, Nitrogen Dioxide (NO_2) Pollution.

22 CARB, Nitrogen Dioxide & Health.

23 CARB, Nitrogen Dioxide & Health.

24 CARB, Nitrogen Dioxide & Health.

25 CARB, Nitrogen Dioxide & Health.

26 CARB, Carbon Monoxide & Health, https://ww2.arb.ca.gov/resources/carbon-monoxide-and-health. Accessed September 2023.

27 USEPA, Carbon Monoxide (CO) Pollution in Outdoor Air, https://www.epa.gov/co-pollution/basic-information-about-carbon-monoxide-co-outdoor-air-pollution, last updated July 13, 2023. Accessed September 2023.

when CO levels are elevated outdoors, they can be of particular concern for people with some types of heart disease since these people already have a reduced ability for getting oxygenated blood to their hearts and are especially vulnerable to the effects of CO when exercising or under increased stress.[28] In these situations, short-term exposure to elevated CO may result in reduced oxygen to the heart accompanied by chest pain also known as angina.[29] According to CARB, the most common effects of CO exposure are fatigue, headaches, confusion, and dizziness due to inadequate oxygen delivery to the brain.[30] For people with cardiovascular disease, short-term CO exposure can further reduce their body's already compromised ability to respond to the increased oxygen demands of exercise, exertion, or stress; inadequate oxygen delivery to the heart muscle leads to chest pain and decreased exercise tolerance.[31] Unborn babies, infants, elderly people, and people with anemia or with a history of heart or respiratory disease are most likely to experience health effects with exposure to elevated levels of CO.[32]

Sulfur Dioxide (SO_2): According to the USEPA, the largest source of SO_2 emissions in the atmosphere is the burning of fossil fuels by power plants and other industrial facilities while smaller sources of SO_2 emissions include industrial processes such as extracting metal from ore; natural sources such as volcanoes; and locomotives, ships and other vehicles and heavy equipment that burn fuel with a high sulfur content.[33] In 2006, California phased-in the ultra-low-sulfur diesel regulation limiting vehicle diesel fuel to a sulfur content not exceeding 15 parts per million, down from the previous requirement of 500 parts per million, substantially reducing emissions of sulfur from diesel combustion.[34] According to the USEPA, short-term exposures to SO_2 can harm the human respiratory system and make breathing difficult.[35] According to CARB, health effects at levels near the State one-hour standard are those of asthma exacerbation, including bronchoconstriction accompanied by symptoms of respiratory irritation such as wheezing, shortness of breath and chest tightness, especially during exercise or physical activity and exposure at elevated levels of SO_2 (above 1 part per million (ppm)) results in increased incidence of pulmonary symptoms and disease, decreased pulmonary function, and increased risk of mortality.[36] Children, the elderly, and those with asthma, cardiovascular disease, or chronic lung disease (such as bronchitis or emphysema) are most likely to experience the adverse effects of SO_2.[37,38]

28 USEPA, Carbon Monoxide (CO) Pollution in Outdoor Air.

29 USEPA, Carbon Monoxide (CO) Pollution in Outdoor Air.

30 CARB, Carbon Monoxide & Health.

31 CARB, Carbon Monoxide & Health.

32 CARB, Carbon Monoxide & Health.

33 USEPA, Sulfur Dioxide (SO_2) Pollution, https://www.epa.gov/so2-pollution/sulfur-dioxide-basics, last updated February 16, 2023. Accessed September 2023.

34 CARB, Final Regulation Order, Amendments to the California Diesel Fuel Regulations, Amend Section 2281, Title 13, California Code of Regulations, https://www.arb.ca.gov/regact/ulsd2003/fro2.pdf, approved July 15, 2004. Accessed September 2023.

35 USEPA, Sulfur Dioxide (SO_2) Pollution.

36 CARB, Sulfur Dioxide & Health, https://ww2.arb.ca.gov/resources/sulfur-dioxide-and-health. Accessed September 2023

37 CARB, Sulfur Dioxide & Health.

38 USEPA, Sulfur Dioxide (SO_2) Pollution.

Particulate Matter (PM10 and PM2.5): Particulate matter air pollution is a mixture of solid particles and liquid droplets found in the air.[39] Some particles, such as dust, dirt, soot, or smoke, are large or dark enough to be seen with the naked eye while other particles are so small they can only be detected using an electron microscope.[40] Particles are defined by their diameter for air quality regulatory purposes: inhalable particles with diameters that are generally 10 micrometers and smaller (PM10); and fine inhalable particles with diameters that are generally 2.5 micrometers and smaller (PM2.5).[41] Thus, PM2.5 comprises a portion or a subset of PM10. Sources of PM10 emissions include dust from construction sites, landfills and agriculture, wildfires and brush/waste burning, industrial sources, and wind-blown dust from open lands.[42] Sources of PM2.5 emissions include combustion of gasoline, oil, diesel fuel, or wood.[43] PM10 and PM2.5 may be either directly emitted from sources (primary particles) or formed in the atmosphere through chemical reactions of gases (secondary particles) such as SO_2, NO_X, and certain organic compounds.[44] According to CARB, both PM10 and PM2.5 can be inhaled, with some depositing throughout the airways; PM10 is more likely to deposit on the surfaces of the larger airways of the upper region of the lung while PM2.5 is more likely to travel into and deposit on the surface of the deeper parts of the lung, which can induce tissue damage, and lung inflammation.[45] Short-term (up to 24 hours duration) exposure to PM10 has been associated primarily with worsening of respiratory diseases, including asthma and chronic obstructive pulmonary disease, leading to hospitalization and emergency department visits.[46] The effects of long-term (months or years) exposure to PM10 are less clear, although studies suggest a link between long-term PM10 exposure and respiratory mortality. The International Agency for Research on Cancer published a review in 2015 that concluded that particulate matter in outdoor air pollution causes lung cancer.[47] Short-term exposure to PM2.5 has been associated with premature mortality, increased hospital admissions for heart or lung causes, acute and chronic bronchitis, asthma attacks, emergency room visits, respiratory symptoms, and restricted activity days and long-term exposure to PM2.5 has been linked to premature death, particularly in people who have chronic heart or lung diseases, and reduced lung function growth in children.[48] According to CARB, populations most likely to experience adverse health effects with exposure to PM10 and PM2.5 include older adults with chronic heart or lung disease, children, and asthmatics and children and infants are more susceptible to harm from inhaling pollutants such as PM10 and PM2.5 compared to healthy adults because they inhale more air per pound of body weight than do adults, spend more time outdoors, and have developing immune systems.[49]

39 USEPA, Particulate Matter (PM) Pollution, https://www.epa.gov/pm-pollution/particulate-matter-pm-basics, last updated July 11, 2023. Accessed September 2023.

40 USEPA, Particulate Matter (PM) Pollution.

41 USEPA, Particulate Matter (PM) Pollution.

42 CARB, Inhalable Particulate Matter and Health (PM2.5 and PM10), https://www.arb.ca.gov/research/aaqs/common-pollutants/pm/pm.htm. Accessed September 2023.

43 CARB, Inhalable Particulate Matter and Health (PM2.5 and PM10).

44 CARB, Inhalable Particulate Matter and Health (PM2.5 and PM10).

45 CARB, Inhalable Particulate Matter and Health (PM2.5 and PM10).

46 CARB, Inhalable Particulate Matter and Health (PM2.5 and PM10).

47 CARB, Inhalable Particulate Matter and Health (PM2.5 and PM10).

48 CARB, Inhalable Particulate Matter and Health (PM2.5 and PM10).

49 CARB, Inhalable Particulate Matter and Health (PM2.5 and PM10).

Lead (Pb): Major sources of lead emissions include ore and metals processing, piston-engine aircraft operating on leaded aviation fuel, waste incinerators, utilities, and lead-acid battery manufacturers.[50] In the past, leaded gasoline was a major source of lead emissions; however, the removal of lead from gasoline has resulted in a decrease of lead in the air by 98 percent between 1980 and 2014.[51] Lead can adversely affect the nervous system, kidney function, immune system, reproductive and developmental systems and the cardiovascular system, and affects the oxygen carrying capacity of blood.[52] The lead effects most commonly encountered in current populations are neurological effects in children, such as behavioral problems and reduced intelligence, anemia, and liver or kidney damage.[53] Excessive lead exposure in adults can cause reproductive problems in men and women, high blood pressure, kidney disease, digestive problems, nerve disorders, memory and concentration problems, and muscle and joint pain.[54]

Air Quality Designations

The Salton Sea Air Basin (SSAB) includes all of Imperial County and a portion of central Riverside County. Air quality conditions in the Imperial County portion of the SSAB are under the jurisdiction of the Imperial County Air Pollution Control District (ICAPCD). The remainder of the SSAB is managed by the South Coast Air Quality Management District (SCAQMD). The ICAPCD and SCAQMD are required to monitor air pollutant levels to ensure that air quality standards are met and, if they are not met, to develop strategies to meet the standards. Depending on whether the standards are met or exceeded, the local air basin is classified as being in "attainment" or "non-attainment." **Table 2**, *Attainment Status – Imperial Valley Portion of the Salton Sea Air Basin*, shows the attainment status of the Imperial Valley portion of the SSAB for each criteria pollutant. The Imperial Valley portion of the SSAB is currently a marginal nonattainment area for ozone, and a moderate nonattainment area for PM2.5. **Table 3**, *Attainment Status – Riverside County/Coachella Valley Portion of the Salton Sea Air Basin*, shows the attainment status of the Riverside County/Coachella Valley portion of the SSAB for each criteria pollutant. The Riverside County/Coachella Valley portion is currently a severe-15 nonattainment area for ozone and serious nonattainment area for PM10.

USEPA Exceptional Event Rule

Because of its extremely dry climate and vast areas of undeveloped desert land, PM10 concentrations in Imperial County and the Coachella Valley are dominated by fugitive dust emissions. The primary sources of high PM10 concentrations in Imperial County are: (1) soil disturbance caused by wind and human activity, (2) transport of high PM10 concentrations from Mexicali, Mexico, and (3) occasionally, wildfires. High PM10 concentrations caused by uncontrollable natural events such as high winds and wildfires may qualify as "Exceptional Events"

50 USEPA, Lead Air Pollution, https://www.epa.gov/lead-air-pollution/basic-information-about-lead-air-pollution, last updated July 5, 2023. Accessed September 2023.
51 USEPA, Lead Air Pollution.
52 USEPA, Lead Air Pollution.
53 CARB, Lead & Health, https://ww2.arb.ca.gov/resources/lead-and-health. Accessed September 2023.
54 CARB, Lead & Health.

TABLE 2
ATTAINMENT STATUS – IMPERIAL VALLEY PORTON OF THE SALTON SEA AIR BASIN

Pollutant	National Standards (NAAQS)	California Standards (CAAQS)
O_3 (1-hour standard)	N/A [a]	Nonattainment
O_3 (8-hour standard)	Nonattainment – Marginal	Nonattainment
CO	Unclassified/Attainment	Attainment
NO_2	Attainment	Attainment
SO_2	Attainment	Attainment
PM10	Attainment	Nonattainment
PM2.5	Non-attainment – Moderate	Attainment
Lead (Pb)	Unclassified/Attainment	Attainment
Visibility Reducing Particles	N/A	Unclassified
Sulfates	N/A	Attainment
Hydrogen Sulfide	N/A	Unclassified
Vinyl Chloride [b]	N/A	N/A

NOTES:
N/A = not applicable

[a] The NAAQS for 1-hour ozone was revoked on June 15, 2005, for all areas except Early Action Compact areas.

[b] In 1990, the California Air Resources Board identified vinyl chloride as a toxic air contaminant and determined that it does not have an identifiable threshold. Therefore, the California Air Resources Board does not monitor or make status designations for this pollutant.

SOURCE: USEPA, The Green Book Non-Attainment Areas for Criteria Pollutants, https://www.epa.gov/green-book; CARB, Area Designations Maps/State and National, https://ww2.arb.ca.gov/resources/documents/maps-state-and-federal-area-designations. Accessed October 2023.

TABLE 3
ATTAINMENT STATUS – RIVERSIDE COUNTY/COACHELLA VALLEY PORTON OF THE SALTON SEA AIR BASIN

Pollutant	National Standards (NAAQS)	California Standards (CAAQS)
O_3 (1-hour standard)	N/A [a]	Nonattainment
O_3 (8-hour standard)	Nonattainment – Severe-15	Nonattainment
CO	Unclassified/Attainment	Attainment
NO_2	Attainment	Attainment
SO_2	Unclassified/Attainment	Attainment
PM10	Nonattainment – Serious	Nonattainment
PM2.5	Unclassified/Attainment	Nonattainment
Lead (Pb)	Unclassified/Attainment	Attainment
Visibility Reducing Particles	N/A	Unclassified
Sulfates	N/A	Attainment
Hydrogen Sulfide	N/A	Unclassified
Vinyl Chloride [b]	N/A	N/A

NOTES:
N/A = not applicable

[a] The NAAQS for 1-hour ozone was revoked on June 15, 2005, for all areas except Early Action Compact areas. Coachella Valley achieved attainment on 12/31/2013.

[b] In 1990, the California Air Resources Board identified vinyl chloride as a toxic air contaminant and determined that it does not have an identifiable threshold. Therefore, the California Air Resources Board does not monitor or make status designations for this pollutant.

SOURCE: USEPA, The Green Book Non-Attainment Areas for Criteria Pollutants, https://www.epa.gov/green-book; CARB, Area Designations Maps/State and National, https://ww2.arb.ca.gov/resources/documents/maps-state-and-federal-area-designations. Accessed October 2023.

under current EPA rules and therefore may be excluded from compliance calculations. These events must be properly documented according to the USEPA's Exceptional Event Rule guidelines. The ICAPCD and local agencies commit resources and work together to 1) identify and document potential exceptional events that may have been influenced by Salton Sea exposed playa and/or open areas in the surrounding area and 2) apply to USEPA for concurrence on the documentation in order to exclude these data in future attainment determinations.

Hazardous Air Pollutants/Toxic Air Contaminants

In addition to criteria pollutants, Title I also includes air toxics provisions which require USEPA to develop and enforce regulations to protect the public from exposure to airborne contaminants that are known to be hazardous to human health. In accordance with Section 112, USEPA establishes National Emission Standards for Hazardous Air Pollutants. Hazardous Air Pollutants (HAPs), also referred to as Toxic Air Contaminants (TACs) or air toxics, are air pollutants which may cause or contribute to an increase in mortality or an increase in serious illness, or which may pose a present or potential hazard to human health. Due to the large number of different HAP/TAC pollutants and their generally low concentrations, it has not been possible to set air quality standards for these pollutants or to monitor their presence as a group.

Class I Federal Lands

Class 1 federal lands include areas such as national parks, national wilderness areas, and national monuments. These areas are granted special air quality protection under Section 162(a) of the CAA. The project area is not within a Class 1 area. Joshua National Park is the closest Class I Area to the Salton Sea. Agua Tibia Wilderness Area, is another Class 1 Area, located in the Cleveland National Forest about 50 miles west of the north end of the Salton Sea. Both sites are located outside of the Salton Sea Air Basin, although the Joshua Tree site is close to the Basin's northern boundary.

Title II

Title II requirements pertain to mobile sources, such as cars, trucks, buses, and planes. Reformulated gasoline, automobile pollution control devices, and vapor recovery nozzles on gas pumps are a few of the mechanisms the USEPA uses to regulate mobile air emission sources. The provisions of Title II have resulted in tailpipe emission standards for vehicles, which have been strengthened in recent years to improve air quality. For example, the standards for NO_X emissions have been lowered substantially, and the specification requirements for cleaner burning gasoline are more stringent.

Federal General Conformity Requirements

Section 176(c)(1) of the CAA (42 USC section 7506(c)) is known as the General Conformity Rule. It prohibits the federal government from engaging in, supporting, providing financial assistance, licensing, permitting, or SIP which has been approved by the USEPA. The Conformity Rule is designed to ensure that federal actions do not impede local efforts to control air pollution and requires federal agencies to demonstrate that their actions do not undermine the approved SIP for the subject geographic area. The first step in determining whether conformity

review is required is to assess whether the activity would take place in a federal nonattainment or maintenance area, i.e., an area that does not meet the NAAQS. If the action was to occur in such an area, then it is necessary to determine whether the action would result in the emission of an air pollutant that is regulated due to the nonattainment or maintenance status of the region. In certain circumstances, the activity may be exempt.[55] If the action is not exempt, a determination must be made as to whether the emissions from the activity would exceed the *de minimis* threshold levels. If the *de minimis* threshold levels were to be met or exceeded, then a conformity review is required (40 CFR section 93.153(b)).

Prevention of Significant Deterioration/New Source Performance Standards

The CAA and amendments also include regulations intended to "prevent significant deterioration" (PSD) of air quality and to establish emissions performance standards for new stationary sources or New Source Performance Standards (NSPSs). Federal PSD and NSPS regulations generally apply to major (very large) stationary sources of emissions and would not apply to the Proposed Project or alternatives.

State

California Clean Air Act

California Ambient Air Quality Standards

The California Clean Air Act (CCAA), signed into law in 1988, requires all areas of California to achieve and maintain the CAAQS by the earliest possible date. CARB is responsible for the coordination and administration of both federal and state air pollution control programs within California including setting the CAAQS. CARB has primary responsibility for the development of California's SIP, for which it works closely with the federal government and the local air districts. The SIP is required for the state to take over implementation of the CAA from USEPA.

The CAAQS are established to protect the health of the most sensitive groups and apply to the same criteria pollutants as the CAA and also includes State-identified criteria pollutants, which are sulfates, visibility-reducing particles, hydrogen sulfide, and vinyl chloride.[56] CARB has primary responsibility for ensuring the implementation of the CCAA,[57] responding to the CAA planning requirements applicable to the state, and regulating emissions from motor vehicles and consumer products within the state.

Other Criteria Pollutants (California Only)

The CAAQS regulate the same criteria pollutants as the NAAQS but in addition, regulate State-identified criteria pollutants, including sulfates, hydrogen sulfide, visibility-reducing particles,

[55] The exemptions are set out in 40 CFR Section 93.153, subdivisions (c) and (d) and include activities that would result in no emissions increase or an increase in emissions that is clearly de minimis.

[56] CARB, California Ambient Air Quality Standards (CAAQS). https://ww2.arb.ca.gov/resources/california-ambient-air-quality-standards. Accessed October 2023.

[57] Chapter 1568 of the Statutes of 1988 (California Clean Air Act).

and vinyl chloride.[58] According to CARB, California law continues to mandate CAAQS, although attainment of the NAAQS has precedence over attainment of the CAAQS due to federal penalties for failure to meet federal attainment deadlines.[59] California law does not require that CAAQS be met by specified dates as is the case with NAAQS. Rather, it requires incremental progress toward attainment.[60]

With respect to the State-identified criteria pollutants (i.e., sulfates, hydrogen sulfide, visibility reducing particles, and vinyl chloride), the proposed project would either not emit them (i.e., hydrogen sulfide and vinyl chloride), or they would be accounted for as part of the pollutants estimated in this analysis (i.e., sulfates and visibility reducing particles). For example, visibility reducing particles are associated with particulate matter emissions and sulfates are associated with SO_X emissions. Both particulate matter and SO_X are included in the emissions estimates for the proposed project. A description of the health effects of the State-identified criteria air pollutants is provided below.

Sulfates (SO_4^{2-}): Sulfates in the environment occur as a result of SO_2 (sulfur dioxide) being converted to SO_4^{2-} compounds in the atmosphere where sulfur is first oxidized to SO_2 during the combustion process of sulfur containing, petroleum-derived fuels (e.g., gasoline and diesel fuel).[61] Exposure to SO_4^{2-}, which are part of PM2.5, results in health effects similar to those from exposure to PM2.5 including reduced lung function, aggravated asthmatic symptoms, and increased risk of emergency department visits, hospitalizations, and death in people who have chronic heart or lung diseases.[62] Population groups with higher risks of experiencing adverse health effects with exposure to SO_4^{2-} include children, asthmatics, and older adults who have chronic heart or lung diseases.[63]

Hydrogen Sulfide (H_2S): H_2S is a colorless gas with a strong odor of rotten eggs. The most common sources of H_2S emissions are oil and natural gas extraction and processing, and natural emissions from geothermal fields. Industrial sources of H_2S include petrochemical plants and kraft paper mills. H_2S is also formed during bacterial decomposition of human and animal wastes, and is present in emissions from sewage treatment facilities and landfills.[64] Exposure to H_2S can induce tearing of the eyes and symptoms related to overstimulation of the sense of smell, including headache, nausea, or vomiting; additional health effects of eye irritation have only been reported with exposures greater than 50 ppm, which is considerably higher than the odor threshold.[65] H_2S is regulated as a nuisance based on its odor detection level; if the standard were based on adverse health effects, it would be set at a much higher level.[66] According to CARB,

58 CARB, California Ambient Air Quality Standards, https://ww2.arb.ca.gov/resources/california-ambient-air-quality-standards. Accessed September 2023.

59 CARB, California Ambient Air Quality Standards.

60 CARB, California Ambient Air Quality Standards.

61 CARB, Sulfate & Health, https://ww2.arb.ca.gov/resources/sulfate-and-health. Accessed September 2023.

62 CARB, Sulfate & Health.

63 CARB, Sulfate & Health.

64 CARB, Hydrogen Sulfide & Health, https://ww2.arb.ca.gov/resources/hydrogen-sulfide-and-health. Accessed September 2023.

65 CARB, Hydrogen Sulfide & Health.

66 CARB, Hydrogen Sulfide & Health.

there are insufficient data available to determine whether or not some groups are at greater risk than others.[67]

Visibility-Reducing Particles: Visibility-reducing particles come from a variety of natural and manmade sources and can vary greatly in shape, size and chemical composition. Visibility reduction is caused by the absorption and scattering of light by the particles in the atmosphere before it reaches the observer. Certain visibility-reducing particles are directly emitted to the air such as windblown dust and soot, while others are formed in the atmosphere through chemical transformations of gaseous pollutants (e.g., sulfates, nitrates, organic carbon particles) which are the major constituents of particulate matter. As the number of visibility reducing particles increases, more light is absorbed and scattered, resulting in less clarity, color, and visual range.[68] Exposure to some haze-causing pollutants have been linked to adverse health impacts similar to PM10 and PM2.5 as discussed above.[69]

Vinyl Chloride: Vinyl chloride is a colorless gas with a mild, sweet odor. Most vinyl chloride is used to make polyvinyl chloride (PVC) plastic and vinyl products and are generally emitted from industrial processes and other major sources of vinyl chloride have been detected near landfills, sewage plants, and hazardous waste sites, due to microbial breakdown of chlorinated solvents.[70] Short-term health of effects of exposure to high levels of vinyl chloride in the air include central nervous system effects, such as dizziness, drowsiness, and headaches while long-term exposure to vinyl chloride through inhalation and oral exposure causes liver damage and has been shown to increase the risk of angiosarcoma, a rare form of liver cancer in humans.[71] Most health data on vinyl chloride relate to carcinogenicity; thus, the people most at risk are those who have long-term exposure to elevated levels, which is more likely to occur in occupational or industrial settings; however, control methodologies applied to industrial facilities generally prevent emissions to the ambient air.[72]

Attainment Status

Health and Safety Code Section 39607(e) requires CARB to establish and periodically review area designation criteria. **Tables 2 and 3**, above, provide a summary of the attainment status of the Salton Sea Air Basin Imperial Valley and Riverside County/Coachella Valley portions with respect to the state standards, respectively. The SSAB is designated as attainment for the California standards for sulfates and unclassified for hydrogen sulfide and visibility-reducing particles. The SSAB is currently in nonattainment for ozone, PM10, and PM2.5 under the CAAQS. Since vinyl chloride is a carcinogenic toxic air contaminant, CARB does not classify attainment status for this pollutant.

67 CARB, Hydrogen Sulfide & Health.

68 CARB, Visibility-Reducing Particles and Health. https://www.arb.ca.gov/research/aaqs/common-pollutants/vrp/vrp.htm. Accessed September 2023.

69 CARB, Visibility-Reducing Particles and Health.

70 CARB, Vinyl Chloride & Health, https://ww2.arb.ca.gov/resources/vinyl-chloride-and-health. Accessed September 2023.

71 CARB, Vinyl Chloride & Health.

72 CARB, Vinyl Chloride & Health.

California Air Toxics Program

The California Air Toxics Program was established in 1983, when the California Legislature adopted Assembly Bill (AB) 1807 to establish a two-step process of risk identification and risk management to address potential health effects from exposure to toxic substances in the air. Under this program, facilities are required to report their air toxics emissions, assess health risks, and notify nearby residents and workers of significant risks if present. In 1992, the AB 2588 program was amended by Senate Bill (SB) 1731 to require facilities that pose a significant health risk to the community to reduce their risk through implementation of a risk management plan. In 1993, the California Legislature amended the program to identify the 189 federal HAPs as TACs.

Local

South Coast Air Quality Management District

Air Quality Management Plans

To meet the NAAQS and CAAQS, the SCAQMD has adopted a series of Air Quality Management Plans (AQMPs), which serve as a regional blueprint to develop and implement an emission reduction strategy that will bring the Air Basin into attainment with the standards in a timely manner. The Coachella Valley is a nonattainment area for both the ozone and the PM10 NAAQS. The most current AQMP is the *2022 Air Quality Management Plan*[73], which was adopted on December 2, 2022. The goal of the 2022 AQMP is to provide a regional roadmap to help the South Coast Air Basin and Coachella Valley achieve the USEPA's NAAQS 2015 8-hour ozone standard (70 parts per billion). The SIP also requests that the Coachella Valley be classified as extreme nonattainment for the 70 ppb 8-hour ozone standard as modelling shows that it will not meet the standard by its 2032 deadline. The extreme designation will give it a deadline of 2038 and modeling demonstrates attainment in 2037.[74]

On January 26, 2023, CARB adopted Resolution 23-4, which directs the CARB Executive Officer to submit the 2022 AQMP to the USEPA for inclusion in the California SIP to be effective, for purposes of federal law, after notice and public hearing as required by Section 110(l) of the Clean Air Act and 40 Code of Federal Regulations Section 51.102 and approval by the USEPA. USEPA approval has not yet occurred.

The 2022 AQMP builds upon measures already in place from previous AQMPs. It also includes a variety of additional strategies such as regulation, accelerated deployment of available cleaner technologies (e.g., zero emissions technologies, when cost-effective and feasible, and low NOx technologies in other applications), best management practices, co-benefits from existing programs (e.g., climate and energy efficiency), incentives, and other CAA measures to achieve the 2015 8-hour ozone standard. The 2022 AQMP incorporates the transportation strategy and transportation control measures from the Southern California Association of Governments

[73] SCAQMD, 2022 Air Quality Management Plan, December 2, 2022. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/final-2022-aqmp/final-2022-aqmp.pdf?sfvrsn=16. Accessed October 2023.

[74] SCAQMD, 2022 Air Quality Management Plan, December 2, 2022.

(SCAG) Connect SoCal 2020 (2020-2045 *Regional Transportation Plan/Sustainable Communities Strategy* [2020-2045 RTP/SCS]).[75] SCAG is the regional planning agency for Los Angeles, Orange, Ventura, Riverside, San Bernardino, and Imperial Counties, and addresses regional issues relating to transportation, the economy, community development and the environment. SCAG coordinates with various air quality and transportation stakeholders in Southern California to ensure compliance with the federal and state air quality requirements. Pursuant to California Health and Safety Code Section 40460, SCAG has the responsibility of preparing and approving the portions of the AQMP relating to the regional demographic projections and integrated regional land use, housing, employment, and transportation programs, measures, and strategies. SCAG is required by law to ensure that transportation activities "conform" to, and are supportive of, the goals of regional and state air quality plans to attain the NAAQS. The RTP/SCS includes transportation programs, measures, and strategies generally designed to reduce vehicle miles traveled (VMT), which are contained in the AQMP. The 2022 AQMP forecasts future emissions inventories with growth based on SCAG's 2020-2045 RTP/SCS. Despite regional growth in the past, air quality has improved substantially over the years, primarily due to the effects of air quality control programs at the local, state and federal levels.[76]

The SCAQMD submitted the Final PM10 Redesignation Request and Maintenance Plan for the Coachella Valley in December 2009[77]. The Coachella Valley had not violated the federal 24-hour PM10 standard (150 µg/m^3) during the period including 1998 through 2007 and was eligible for redesignation as attainment due to the annual average PM10 concentrations meeting the revoked federal standard. On February 25, 2010, CARB approved the Coachella Valley PM10 Redesignation Request and Maintenance Plan from serious non-attainment to attainment for the PM10 NAAQS under CAA Section 107. However, the Coachella Valley began exceeding threshold for PM10 shortly after the redesignation request and continues to exceed threshold today. As of October 3, 2023, the USEPA has not redesignated the PM10 classification for Coachella Valley. However, PM10 concentrations in the Coachella Valley are continually evaluated and the influence of high-wind exceptional events are routinely assessed; a redesignation to attainment of the PM10 NAAQS could be possible in the near future.[78]

Rules and Regulations

The SCAQMD has adopted many rules and regulations to regulate sources of air pollution in the SSAB and to help achieve air quality standards. The proposed project may be subject to the following SCAQMD rules and regulations:

> **Regulation IV – Prohibitions:** This regulation sets forth the restrictions for visible emissions, odor nuisance, fugitive dust, various air emissions, fuel contaminants, start-

75 SCAG, Final 2020-2045 RTP/SCS, Connect SoCal, adopted on September 3, 2020. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://scag.ca.gov/sites/main/files/file-attachments/0903fconnectsocal-plan_0.pdf?1606001176. Accessed September 2023.

76 SCAQMD, 2022 Air Quality Management Plan, Table 3-3, 2022.

77 SCAQMD, Final PM10 Redesignation Request and Maintenance Plan for the Coachella Valley, December 2009. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://ww2.arb.ca.gov/sites/default/files/classic/planning/sip/planarea/scabsip/cvmaintplan2009.pdf. Accessed October 2023.

78 SCAQMD, 2022 Air Quality Management Plan, December 2, 2022.

up/shutdown exemptions and breakdown events. The following is a list of rules which apply to the proposed project:

Rule 401 – Visible Emissions: This rule states that a person shall not discharge into the atmosphere from any single source of emission whatsoever any air contaminant for a period or periods aggregating more than three minutes in any one hour which is as dark or darker in shade as that designated No. 1 on the Ringlemann Chart or of such opacity as to obscure an observer's view.

Rule 402 – Nuisance: This rule states that a person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property.

Rule 403 – Fugitive Dust: This rule requires projects to prevent, reduce or mitigate fugitive dust emissions from a site. Rule 403 restricts visible fugitive dust to the project property line, restricts the net PM10 emissions to less than 50 micrograms per cubic meter ($\mu g/m^3$) and restricts the tracking out of bulk materials onto public roads. Additionally, projects must utilize one or more of the best available control measures (identified in the tables within the rule). Control measures may include adding freeboard to haul vehicles, covering loose material on haul vehicles, watering or using non-toxic chemical stabilizers to prevent the generation of visible dust plumes, limiting vehicle speeds to 15 miles per hour on unpaved surfaces, and/or ceasing all activities. Finally, a contingency plan may be required if so determined by USEPA.

Rule 403.1 **– Coachella Valley Fugitive Dust Control Plans:** This rule is a supplemental rule to Rule 403 and is applicable to man-made sources of fugitive dust in Coachella Valley. The purpose of this rule is to reduce fugitive dust and resulting PM10 emissions from man-made sources in the Coachella Valley. Rule 403.1 requires a Fugitive Dust Control Plan approved by SC AQMD or an authorized local government agency prior to initiating any construction/earth-moving activity. These requirements are only applicable to construction projects with 5,000 or more square feet of surface area disturbance.

Imperial County Air Pollution Control District

Air Quality Plans

To meet NAAQS and CAAQS, the ICAPCD has adopted a series of air quality Plans which serve as a regional blueprint to develop and implement an emission reduction strategy that will bring the Air Basin into attainment with the standards in a timely manner. The Imperial Valley is a nonattainment area for ozone and PM2.5.

The USEPA approved[79], effective October 19, 2020, the 2018 Imperial County PM10 Maintenance Plan and Redesignation Request State Implementation Plan[80] which demonstrates implementation of best available control measures and a maintenance plan that includes an emissions inventory consistent with attainment, a maintenance demonstration, contingency provisions, and motor vehicle emissions budgets for use in transportation conformity determinations. The Imperial Valley Planning Area was redesignated attainment from serious nonattainment.

The 2018 State Implementation Plan for the 12 µg/m3 PM2.5 Annual Standard[81] address the annual 12.0 micrograms per cubic meter (µg/m^3) annual PM2.5 standard for the Imperial County PM2.5 nonattainment area. The nonattainment area represents a portion of Imperial County that includes the most populated area of the county, including the cities of Brawley, El Centro, and Calexico. In establishing the PM2.5 nonattainment area for Imperial County, the USEPA recognized the unique features and characteristics of the area and determined the boundaries based on multiple factors including air quality, emissions data, population, local meteorology, and geography/topography. The Calexico monitor, located next to the border with Mexico is impacted with PM2.5 emissions daily, primarily from Mexico. The 2018 PM2.5 Plan relies on a special provision in the CAA that enables states to prepare a SIP when transport of international pollution inhibits the ability to demonstrate attainment of the PM2.5 standard. The 2018 PM2.5 Plan includes a comprehensive technical analysis of these cross-border impacts, and a demonstration that the Calexico monitor would have attained the 12.0 µg/m^3 annual PM2.5 standard in 2021, absent these international emissions from Mexicali. The 2018 PM2.5 Plan also addresses Act requirements to demonstrate that appropriate local actions have been taken to reduce emissions and provide ongoing public health protection.

The 2017 State Implementation Plan for the 75 ppb 8-hour Ozone Standard[82] was adopted by CARB on October 26, 2017. In response to court decisions, some elements included in the Imperial County 2017 State Implementation Plan for the 2008 8-hour Ozone Standard required updates by CARB staff. The Updated 2018 SIP[83] was adopted on October 25, 2018. The Updated 2018 SIP demonstrates how ICAPCD will attain the 75 ppb 8-hour ozone standard absent the impact of emissions from Mexico. The 2018 SIP Update includes an updated

79 Federal Register, 85 FR 58294, PM10 Maintenance Plan and Redesignation Request; Imperial Valley Planning Area; California, September 18, 2020. https://www.federalregister.gov/documents/2020/09/18/2020-18427/pm10-maintenance-plan-and-redesignation-request-imperial-valley-planning-area-california. Accessed October 2023.

80 Imperial County Air Pollution Control District (ICAPCD), 2018 PM10 Redesignation Request and Maintenance Plan, October 23, 2018. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://apcd.imperialcounty.org/wp-content/uploads/2020/01/2018PM10PlanBoardPacket.pdf. Accessed October 2023.

81 CARB, Staff Report 2018 State Implementation Plan for the Imperial County 12 µg/m3 PM2.5 Annual Standard, May 25, 2018. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://ww2.arb.ca.gov/sites/default/files/classic/planning/sip/planarea/imperial/staffreport.pdf. Accessed October 2023.

82 ICAPCD, Imperial County 2017 State Implementation Plan for the 2008 8-hour Ozone Standard, September 2017. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://apcd.imperialcounty.org/wp-content/uploads/2020/01/OzoneSIP.pdf. Accessed October 2023.

83 CARB, 2018 Updates to the California State Implementation Plan, adopted October 25, 2018. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://ww2.arb.ca.gov/sites/default/files/classic/planning/sip/2018sipupdate/2018update.pdf?_ga=2.240075459.1366959660.1696286403-1819775784.1695756119. Accessed October 2023.

reasonable further progress demonstration for Imperial County that uses a 2011 baseline year and demonstrates that Imperial County will make regional further progress attainment in 2017.

Rules and Regulations

The ICAPCD has adopted many rules and regulations to regulate sources of air pollution in the SSAB and to help achieve air quality standards. The proposed project may be subject to the following ICAPCD rules and regulations:

Regulation IV – Prohibitions: This regulation sets forth the restrictions for visible emissions, odor nuisance, fugitive dust, various air emissions, fuel contaminants, start-up/shutdown exemptions and breakdown events. The following is a list of rules which apply to the proposed project:

Rule 401 – Opacity of Emissions: This rule states that no person shall release or discharge into the atmosphere from any single source of emissions whatsoever, any air contaminant, other than uncombined water vapor, for a period or periods aggregating more than three (3) minutes in any hour which is: (B.1) as dark or darker in shade as that designated as No. 1 on the Ringelmann Chart, (B.2) of such opacity as to obscure an observer's view to a degree equal to or greater than does smoke, and (B.3) the shade or equivalent opacity shall not exceed Ringelmann No. 2.

Rule 407 – Nuisance: This rule states that a person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property.

Regulation VIII – Fugitive Dust Rules: This regulation sets forth the restrictions for fugitive dust emissions. The Rules contained within this Regulation have been developed pursuant to USEPA guidance for Serious PM2.5 nonattainment areas. The following is a list of rules which apply to the proposed project:

Rule 800 – General Requirements for Control of Fine Particulate Matter: Rule 800 contains the definitions, exemptions, general requirements, administrative requirements and test methods that are applicable to all Regulation VIII rules. Section C of Rule 800 contains the definitions that are essential to understanding each specific rule. Section F contains the general requirements that establish basic guidelines for dust control material(s), specifies requirements that the dust control material(s) must meet ICAPCD, SWRCB, CARB and EPA regulations, and contains guidelines for development of Bureau of Land Management (BLM) and Border Patrol dust control plans. Section G contains administrative requirements for test methods. Appendices A and B contain the test methods for visual determination of opacity and determination of surface stabilization, respectively. The latter contains methods for determining; visible crust strength (ball drop test), threshold friction velocity (sieve measurements to assign soil texture), surface protection from flat and standing vegetation and surface stabilization from rock armoring using the rock test method. Rule 800 requires recreational off-highway vehicle (OHV) areas to apply BACM to mitigate fugitive dust emissions. On each day of an off-road event and/or competition during which 50 average vehicle daily trips per day will occur on an unpaved road segment, the owner or operator shall limit Visible Dust Emissions (VDE) to 20 percent opacity and comply with the requirements of a stabilized unpaved road by application, reapplication, or maintenance of at least one

of the following control measures: watering; applying uniform layer of washed gravel; paving; restricting access; restricting speed below 15 mph; applying chemical or organic dust suppressants; applying "road mix;" or using any other method that can be demonstrated to effectively limit VDE to 20 percent opacity and meets the conditions of a stabilized unpaved road surface.

Rule 804 – Open Areas: Rule 804 applies within rural areas to any open area of 3 acres or more that contains at least 1000 square feet of disturbed surface area. This rule pertains to the Salton Sea because exposed playa around the Sea qualifies as open areas under this rule. Section D of the rule contains exemptions for agricultural operation sites subject to Rule 806 and recreational OHV Use Areas on public lands subject to Rule 800. Section E contains requirements to apply BACM to limit VDE to 20 percent opacity and meet conditions for stabilized surface, and to install barriers to prevent unauthorized vehicle access to stabilized areas. Section F sets forth the permissible BACM for open areas. BACM for open areas includes: (1) applying water or chemical dust suppressants to all unvegetated areas, (2) establishing vegetation on previously disturbed areas, (3) paving, applying and maintaining gravel, or applying and maintaining chemical dust suppressants and (4) implementing alternative BACM that has gone through the approval process set forth in section G.

Rule 806 – Conservation Management Practices: Rule 806 applies to all agricultural operation sites of 40 or more acres in size. This rule pertains to the Salton Sea because some exposed playa could be reclaimed for agricultural use (this occurred during previous dry periods). Section C of the rule contains definitions that are essential to understand the main terms and Conservation Management Practices (CMPs) in this rule. Section D contains requirements for agricultural operation sites to implement at least one CMP for land preparation and cultivation, harvest activities, unpaved roads and unpaved traffic areas. This section also contains guidelines for operators to develop alternative CMPs. In addition, this section requires the owner/operator to prepare a CMP plan and make it available upon request. Section E contains CMPs for land preparation and cultivation, harvesting, unpaved roads and unpaved traffic areas. Section F contains guidelines to develop a CMP plan.

Appendix BIO-1
Biological Resources Regulatory Framework

REGULATORY FRAMEWORK

Biological Resources

Federal Endangered Species Act

The United States Congress passed the Federal Endangered Species Act (FESA) in 1973 to protect those species that are endangered or threatened with extinction. FESA is intended to operate in conjunction with the National Environmental Policy Act to help protect the ecosystems upon which endangered and threatened species depend. FESA prohibits the "take" of endangered or threatened wildlife species. "Take" is defined to include harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting wildlife species or any attempt to engage in such conduct (FESA Section 3 [(3)(19)]). Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns (50 Code of Federal Regulations [CFR] Section 17.3). "Harass" is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns (50 CFR Section 17.3). Actions that result in take can result in civil or criminal penalties.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) generally prohibits the killing, possessing, or trading of migratory birds, bird parts, eggs, and nests, except as provided by the statute. The MBTA authorizes the Secretary of the Interior to regulate the taking of migratory birds. It further provides that it is unlawful, except as permitted by regulations, "to pursue, take, or kill any migratory bird, or any part, nest or egg of any such bird…" (16 United States Code [USC] 703).

The MBTA, first enacted in 1916, prohibits any person, unless permitted by regulations, to "pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird, included in the terms of this Convention…for the protection of migratory birds…or any part, nest, or egg of any such bird" (16 U.S. Code 703).

Clean Water Act

Pursuant to Section 404 of the Clean Water Act (CWA), the U.S. Army Corps of Engineers (USACE) is authorized to regulate any activity that would result in the discharge of dredged or fill material into jurisdictional waters of the United States, which include those waters listed in 33 CFR Part 328

(Definitions). USACE, with oversight by the U.S. Environmental Protection Agency (USEPA), has the principal authority to issue CWA Section 404 Permits.

Pursuant to Section 401 of the CWA, the Colorado River Basin Regional Water Quality Control Board (RWQCB), Region 7, certifies that any discharge into jurisdictional waters of the United States will comply with state water quality standards. The RWQCB, as delegated by USEPA, has the principal authority to issue a CWA Section 401 water quality certification or waiver. Based on the literature and database review and biological resources assessment, the project site does not support waters that would be subject to the CWA.

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act was originally enacted in 1940 as the Bald Eagle Protection Act to protect bald eagles and was later amended to include golden eagles. The Act prohibits the taking, possession, or commerce of bald and golden eagles, parts, feathers, nests, or eggs with limited exceptions. Take is defined as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb", and includes both direct taking of individuals and take due to disturbance. "Disturb" is defined as (50 CFR 22.3):

> *"to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to any eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior."*

The definition of "disturb" is further defined by USFWS (2007) as follows:

> *"In addition to immediate impacts, this definition also covers impacts that result from human-caused alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagles return, such alterations agitate or bother an eagle to a degree that injures an eagle or substantially interferes with normal breeding, feeding, or sheltering."*

Bald eagles may not be taken for any purpose unless a permit is issued prior to the taking. Activities which can be authorized by permit include scientific collection/research, exhibition, tribal religious, depredation, falconry, and the taking of inactive golden eagle nests, which interfere with resource development or recovery operations. Currently, USFWS has a permitting process proposed for other activities that would allow disturbance to bald eagles or take of an eagle nest where their location poses a risk to human or eagle safety.

California Fish and Game Code §§ 1600-1616

Pursuant to Section 1600 et seq. of the CFGC, the CDFW regulates activities of an applicant's project that would substantially alter the flow, bed, channel, or banks of streams or lakes, unless certain conditions outlined by CDFW are met by the applicant. The limits of CDFW jurisdiction are defined in CFGC Section 1600 et seq. as the "bed, channel, or bank of any river, stream, or lake designated by CDFW in which there is at any time an existing fish or wildlife resource or from which these resources derive

benefit[1] However, in practice, CDFW usually extends its jurisdictional limit and assertion to the top of a bank of a stream, the bank of a lake, or outer edge of the riparian vegetation, whichever is wider. No stream banks or other CFGC Section 1600 resources occur within the construction limits; therefore, this regulation is not applicable to the project.

California State Fish and Game Code §§ 3503, 3503.5 and 3513

Under these sections of the CFGC, the project operator is not allowed to conduct activities that would result in the taking, possessing, or destroying of any birds of prey; the taking or possessing of any migratory nongame bird; the taking, possessing, or needlessly destroying of the nest or eggs of any raptors or nongame birds; or the taking of any nongame bird pursuant to CFGC Section 3800. CFGC §3513 adopts the federal migratory bird take provisions under the MBTA that prohibit the intentional take or possession of birds designated by the MBTA as migratory nongame birds except as allowed by federal rules and regulations pursuant to the MBTA. CFGC Section 3513 does not prohibit the incidental take of birds if the underlying purpose of the activity is not to take birds.

Native Plant Protection Act (California Fish and Game Code §§ 1900 et seq.)

The Native Plant Protection Act (NPPA) was enacted in 1977 and allows the Fish and Game Commission to designate plants as rare or endangered. There are 64 species, subspecies, and varieties of plants that are protected as rare under the NPPA. The NPPA prohibits take of endangered or rare native plants but includes some exceptions for agricultural and nursery operations; emergencies; and after properly notifying CDFW for vegetation removal from canals, roads, and other sites, changes in land use, and in certain other situations.

California Endangered Species Act (California Fish and Game Code §§ 2050 et seq.)

CESA establishes the policy of the state to conserve, protect, restore, and enhance threatened or endangered species and their habitats. CESA mandates that state agencies should not approve projects that would jeopardize the continued existence of threatened or endangered species if reasonable and prudent alternatives are available that would avoid jeopardy. There are no state agency consultation procedures under CESA. For projects that would affect a listed species under both CESA and FESA, compliance with FESA would satisfy CESA if CDFW determines that the federal incidental take authorization is "consistent" with CESA under CFGC Section 2080.1. For projects that would result in take of a species listed under the CESA only, the project operator would have to apply for a take permit under Section 2081(b).

[1] This also includes the habitat upon which they depend for continued viability (CFGC Division 5, Chapter 1, Section 45, and Division 2, Chapter 1, Section 711.2[a]).

California Fish and Game Code 2080 and 2081

Section 2080 of the CFGC states that "No person shall import into this state [California], export out of this state, or take, possess, purchase, or sell within this state, any species, or any part or product thereof, that the Commission [State Fish and Game Commission] determines to be an endangered species or threatened species, or attempt any of those acts, except as otherwise provided in this chapter, or the Native Plant Protection Act, or the California Desert Native Plants Act." Pursuant to Section 2081, CDFW may authorize individuals or public agencies to import, export, take, or possess state-listed endangered, threatened, or candidate species. These otherwise prohibited acts may be authorized through Incidental Take permits or Memoranda of Understanding if the take is incidental to an otherwise lawful activity, impacts of the authorized take are minimized and fully mitigated, the permit is consistent with any regulations adopted pursuant to any recovery plan for the species, and the project operator ensures adequate funding to implement the measures required by CDFW, which makes this determination based on available scientific information and considers the ability of the species to survive and reproduce.

California Fish and Game Code 3503, 3503.5, and 3513

Under Sections 3503, 3503.5, and 3513 of the CFGC, the project operator is not allowed to conduct activities that would result in the taking, possessing, or destroying of any birds of prey; the taking or possessing of any migratory nongame bird; the taking, possessing, or needlessly destroying of the nest or eggs of any raptors or nongame birds; or the taking of any nongame bird pursuant to CFGC Section 3800. CFGC Section 3513 adopts the federal migratory bird take provisions under the MBTA that prohibit the intentional take or possession of birds designated by the MBTA as migratory nongame birds except as allowed by federal rules and regulations pursuant to the MBTA. CFGC Section 3513 does not prohibit the incidental take of birds if the underlying purpose of the activity is not to take birds.

California Environmental Quality Act Guidelines, Section 15380

Although threatened and endangered species are protected by specific federal and state statutes, California Environmental Quality Act (CEQA) Guidelines Section 15380(b) provides that a species not listed on the federal or state list of protected species may be considered rare or endangered if the species can be shown to meet certain specified criteria. These criteria have been modeled after the definition in FESA and the section of the CFGC dealing with rare or endangered plants or animals. This section was included in CEQA primarily to deal with situations in which a public agency is reviewing a project that may have a significant effect on, for example, a candidate species that has not been listed by either USFWS or CDFW. Thus, CEQA provides an agency with the ability to protect a species from the potential impacts of a project until the respective government agencies have an opportunity to designate the species as protected, if warranted. CEQA also calls for the protection of other locally or regionally significant resources, including natural communities. Although natural communities do not at present have legal protection of any kind, CEQA calls for an assessment of whether any such resources would be affected and requires findings of significance if there would be substantial losses. Natural communities listed by CNDDB as sensitive are considered by CDFW to be significant resources and fall under the State CEQA Guidelines for addressing impacts. Local planning documents such as General Plans often identify these resources as well.

Porter-Cologne Water Quality Control Act (California Water Code Section 13000 et seq)

The State Water Resources Control Board (SWRCB) and the RWQCB (together "Boards") are the principal State agencies with primary responsibility for the coordination and control of water quality. The Boards regulate activities pursuant to Section 401(a)(1) of the federal CWA as well as the Porter-Cologne Water Quality Control Act (Porter-Cologne) (Water Code Section 13260). Section 401 of the CWA specifies that certification from the State is required for any applicant requesting a federal license or permit to conduct any activity including but not limited to the construction or operation of facilities that may result in any discharge into navigable waters. The certification shall originate from the State in which the discharge originates or will originate, or, if appropriate, from the interstate water pollution control agency having jurisdiction over the navigable water at the point where the discharge originates or will originate. Any such discharge will comply with the applicable provisions of Sections 301, 302, 303, 306, and 307 of the CWA.

In Porter-Cologne, the Legislature declared that the "State must be prepared to exercise its full power and jurisdiction to protect the quality of the waters in the State from degradation..." (California Water Code Section 13000). Porter-Cologne grants the Boards the authority to implement and enforce the water quality laws, regulations, policies and plans to protect the groundwater and surface waters of the State. It is important to note that enforcement of the State's water quality requirements is not solely in the purview of the Boards and their staff. Other agencies (e.g., CDFW) have the ability to enforce certain water quality provisions in state law.

Appendix BIO-2

Special Status Species with Potential to Occur

TABLE BIO-1
SPECIAL STATUS SPECIES WITH POTENTIAL TO OCCUR

				Potential to Occur		
Common Name	**Scientific Name**	**Sensitivity Status**	**Preferred Habitat**	**Lower Colorado River**	**IID Water Service Area and All-American Canal**	**Salton Sea**
Plants						
Algodones Dunes sunflower	*Helianthus niveus spp. Tephrodes*	Federal: - State: SE CDFW: - BLM: BLMS	Desert dunes, creosote bush scrub	Moderate Potential: The Action Area supports marginal habitat for a particular species.	Low Potential: The Action Area supports limited habitat for this species.	Moderate Potential: The Action Area supports marginal habitat for a particular species.
Coachella Valley milk-vetch	*Astragalus lentiginosus var. coachellae*	Federal: FE State: - CDFW: - BLM: -	Desert dunes, creosote bush scrub	Not Expected: The Action Area is out of the known range for this species.	Not Expected: The Action Area is out of the known range for this species.	Not Expected: The Action Area is out of the known range for this species.
Parish's daisy	*Erigeron parishii*	Federal: FT State: - CDFW: - BLM: -	Desert scrub	Not Expected: The Action Area is out of the known range for this species.	Not Expected: The Action Area is out of the known range for this species.	Not Expected: The Action Area is out of the known range for this species.
Peirson's milk-vetch	*Astragalus magdalenae var. peirsonii*	Federal: FE State: SE CDFW: - BLM: -	Desert dunes, creosote bush scrub	Moderate Potential: The Action Area supports marginal habitat for a particular species.	Low Potential: The Action Area supports limited habitat for this species.	Moderate Potential: The Action Area supports marginal habitat for a particular species.
Triple-ribbed milk-vetch	*Astragalus tricarinatus*	Federal: FE State: - CDFW: - BLM: -	Desert scrub	Not Expected: The Action Area is out of the known range for this species	Not Expected: The Action Area is out of the known range for this species	Not Expected: The Action Area is out of the known range for this species
Wiggin's croton	*Croton wigginsii*	Federal: - State: SR CDFW: - BLM: BLMS	Desert dunes, creosote bush scrub	Moderate Potential: The Action Area supports marginal habitat for a particular species.	Low Potential: The Action Area supports limited habitat for this species.	Moderate Potential: The Action Area supports marginal habitat for a particular species.
Invertebrates						
Cheeseweed moth lacewing	*Oliarces clara*	Federal: - State: - CDFW: - BLM: -	Desert, creosote bush scrub	Present: The species has been observed along the Colorado River	Low Potential: The Action Area supports limited habitat for this species.	Present: The species has been observed along the Salton Sea.
Andrew's dune scarab beetle	*Pseudocotalpa andrewsi*	Federal: - State: - CDFW: - BLM: -	Desert, Algodones Dunes	Present: The species has been observed along the Colorado River	Low Potential: The Action Area supports limited habitat for this species.	Low Potential: Limited habitat exists, species is not expected to occur within the Action Area.
Fish						
Bonytail chub	*Gila elegans*	Federal: FE State: SE CDFW: - BLM: -	Aquatic, Colorado River basin flowing waters, Colorado River basin standing waters	Present: Species is known to occur in the Lower Colorado River, documented near the Cibola National Wildlife Refuge, and Lake Mohave.	Not Expected: The Action Area does not support habitat for a particular species.	Not Expected: The Action Area does not support habitat for a particular species.
Colorado pikeminnow	*Ptychochelus lucius*	Federal: FE State: SE CDFW: FP BLM: -	Aquatic, Colorado River basin flowing waters	Not Expected: The Action Area does not support habitat for a particular species.	Not Expected: The Action Area does not support habitat for a particular species.	Not Expected: The Action Area does not support habitat for a particular species.

				Potential to Occur		
Common Name	**Scientific Name**	**Sensitivity Status**	**Preferred Habitat**	**Lower Colorado River**	**IID Water Service Area and All-American Canal**	**Salton Sea**
Desert pupfish	*Cyprinodon macularius*	Federal: FE State: SE CDFW: - BLM: -	Aquatic, artificial flowing waters, artificial standing waters, Colorado River basin flowing waters, Colorado River basin standing waters	Present: This species has been observed along the Lower Colorado River, in a feeder stream located within the Buzzards Peak Wilderness area. This watershed feeds into the Proposed Action Area.	Present: Desert pupfish are found in drains spanning from the southwestern corner of the Salton Sea near the Sonny Bono National Wildlife Refuge up through the Imperial Irrigation District Managed Marsh Complex and Imperial Wildlife Areas.	Present: Desert pupfish are found in drains spanning from the southwestern corner of the Salton Sea near the Sonny Bono National Wildlife Refuge up through the Imperial Irrigation District Managed Marsh Complex and Imperial Wildlife Areas.
Razorback sucker	*Xyrauchen texanus*	Federal: FE State: SE CDFW: FP BLM: -	Aquatic, Colorado River basin flowing waters	Present: The species is known to inhabit the mainstem Lower Colorado River below Parker Dam, Lake Mohave, Lake Mead and Lake Havasu. Razorback suckers have been documented along the Lower Colorado River, near Martinez Lake up to Deer Island.	Present: The species is known to inhabit areas adjacent to the Salton Sea north of the Imperial Wildlife Area bordering the Chocolate Mountains.	Not Expected: The Action Area does not support habitat for a particular species.
Amphibians And Reptiles						
Banded gila monster	*Heloderma suspectum cinctum*	Federal: - State: - CDFW: SSC BLM: BLMS	Desert; Mojavean desert scrub, Riparian scrub, Sonoran desert scrub	Present: The species has been observed along the Colorado River.	Not Expected: Suitable habitat for the species is not present.	Not Expected: Suitable habitat for the species is not present.
Couch's spadefoot toad	*Scaphiopus couchii*	Federal: - State: - CDFW: SSC BLM: BLMS	Desert; Arid and semiarid habitats of the southwest	Present: The species has been observed along the Colorado River. .	Low Potential: The Action Area supports limited habitat for this species.	Present: The species has been observed along the Salton Sea.
Desert Tortoise	*Gopherus agassizi*	Federal: FT State: ST CDFW: - BLM: -	Desert; Sandy washes, Canyons, and gravel beds dominated by creosote bush scrub with ocotillo, cactus, and yucca	Present: The species has been observed along the Colorado River.	Low Potential: The Action Area supports limited habitat for this species.	Present: The species has been observed along the Salton Sea.
Flat-tailed horned lizard	*Phrynosoma mcallii*	Federal: FPT State: - CDFW: SSC BLM: BLMS	Desert; sparsely vegetated, sandy areas	Present: The species has been observed along the Colorado River.	Present: The species has been observed within the IID Service Area.	Present: The species has been observed along the Salton Sea.
Lowland leopard frog	*Lithobates yavapaiensis*	Federal: - State: - CDFW: SSC BLM: BLMS	Wetland, Aquatic; small streams and marshes that support emergent vegetation	Present: The species has been observed along the Colorado River.	Present: The species has been observed within the IID Service Area.	Present: The species has been observed along the Salton Sea.
Sonoran mud turtle	*Kinosternon sonoriense*	Federal: - State: - CDFW: SSC BLM: -	Aquatic; backwaters	Present: The species has been observed along the Colorado River.	Present: The species has been observed within the IID Service Area.	Present: The species has been observed along the Salton Sea.

				Potential to Occur		
Common Name	**Scientific Name**	**Sensitivity Status**	**Preferred Habitat**	**Lower Colorado River**	**IID Water Service Area and All-American Canal**	**Salton Sea**
Birds						
Aleutian Canada Goose	*Branta canadensis leucopareia*	Federal: - State: - CDFW: WL BLM: -	Agricultural fields, Wetlands	Not Expected: Suitable habitat for the species is not present.	Present: The species has been observed within the IID Water Service Area.	Not Expected: Suitable habitat for the species is not present.
American peregrine falcon	*Falco peregrinus anatum*	Federal: - State: - CDFW: S BLM: -	General; wide range of open country habitats from desert mountains to seacoasts	Not Expected: Suitable nesting habitat for the species is not present, foraging activities not likely to be impacted by the Proposed Project.	Not Expected: Suitable nesting habitat for the species is not present, foraging activities not likely to be impacted by the Proposed Project.	Not Expected: Suitable nesting habitat for the species is not present, foraging activities not likely to be impacted by the Proposed Project.
American white pelican	*Pelecanus erythrorhynchos*	Federal: - State: - CDFW: SSC BLM: -	Aquatic habitat, predominantly Salton Sea	Not Expected: Suitable habitat for the species is not present.	Not Expected: Suitable habitat for the species is not present.	Present: The species has been observed within a particular portion of Action Area.
Arizona Bell's vireo	*Vireo bellii arizonae*	Federal: - State: SE CDFW: - BLM: BLMS	Riparian forest	Present: Species has been documented along the Lower Colorado River from the Fort Yuma Indian Reservation up to the Cibola National Wildlife Refuge.	Present: Species has been documented within the IID Water Service Area within the Imperial Irrigation District Managed Marsh Complex.	Not Expected: Suitable habitat for the species is not present.
Bald eagle	*Haliaeetus leucocephalus*	Federal: - State: SE CDFW: FP BLM: BLMS	Agricultural field, Wetlands	Low Potential: The Action Area supports limited habitat for this species.	Low Potential: The Action Area supports limited habitat for this species.	Present: The species has been observed within a particular portion of Action Area.
Bank swallow	*Riparia riparia*	Federal: - State: ST CDFW: - BLM: BLMS	Riparian scrub, Riparian woodland	Low Potential: The Action Area supports limited habitat for this species.	Present: The species has been observed within the IID Water Service Area.	Low Potential: The Action Area supports limited habitat for this species.
Black skimmer	*Rynchops niger*	Federal: - State: - CDFW: SSC BLM: -	Aquatic habitat, predominantly Salton Sea	Not Expected: Suitable habitat for the species is not present.	Not Expected: Suitable habitat for the species is not present.	Present: The species has been observed along the Salton Sea.
Black tern	*Chlidonias niger*	Federal: - State: - CDFW: SSC BLM: -	Agricultural; Aquatic habitat, predominantly Salton Sea	Not Expected: Suitable habitat for the species is not present.	Present: The species has been observed within the IID Water Service Area.	Present: The species has been observed along the Salton Sea.
Brown-crested flycatcher	*Myiarchus tyrannulus*	Federal: - State: - CDFW: WL BLM: -	Aquatic; riparian groves of cottonwood, mesquite, and willow	Low Potential: The Action Area supports limited habitat for this species.	Moderate Potential: The Action Area supports marginal habitat for this species.	Low Potential: The Action Area supports limited habitat for this species.
Burrowing owl	*Athene cunicularia*	Federal: - State: - CDFW: SSC BLM: BLMS	Agricultural fields	Present: The species has been observed along the Colorado River.	Present: The species has been observed within the IID Water Service Area.	Present: The species has been observed along the Salton Sea.
California black rail	*Laterallus jamaicensis coturniculus*	Federal: - State: ST CDFW: FP BLM: BLMS	Wetlands	Present: Resident in Project area, documented at southern end of LCR, within the Imperial National Wildlife Refuge and further north towards the junction of Cibola Lake and the Colorado River.	Present: Resident in Project area, documented in the Imperial Wildlife Area and Imperial Irrigation District Managed Marsh Complex. Further inland they have been observed along the New River and adjacent to the southwestern border of the Chocolate Mountains.	Present: Resident in Project area, bordering the Salton Sea and within the IID Water Service Area California black rail have been documented in the Imperial Wildlife Area and Imperial Irrigation District Managed Marsh Complex.

				Potential to Occur		
Common Name	**Scientific Name**	**Sensitivity Status**	**Preferred Habitat**	**Lower Colorado River**	**IID Water Service Area and All-American Canal**	**Salton Sea**
California Brown pelican	*Pelecanus occidentalis californicus*	Federal: - State: - CDFW: - BLM: BLMS	Aquatic habitat, predominantly Salton Sea	Not Expected: Suitable habitat for the species is not present.	Not Expected: Suitable habitat for the species is not present.	Present: The species has been observed along the Salton Sea.
Cooper's hawk	*Accipiter cooperi*	Federal: - State: - CDFW: WL BLM: -	Riparian	Present: The species has been observed along the Colorado River.	Present: The species has been observed within the IID Water Service Area.	Low Potential: The Action Area supports limited habitat for this species.
Crissal thrasher	*Toxostoma crissale*	Federal: - State: - CDFW: SSC BLM: BLMS	Desert	Present: The species has been observed along the Colorado River.	Present: The species has been observed within the IID Water Service Area.	Present: The species has been observed along the Salton Sea.
Elf owl	*Micrathene whitneyi*	Federal: - State: SE CDFW: - BLM: BLMS	Desert, Riparian	Present: The species has been observed along the Colorado River.	Present: The species has been observed within the IID Water Service Area.	Not Expected: Suitable habitat for the species is not present.
Ferruginous hawk	*Buteo regalis*	Federal: - State: - CDFW: WL BLM: -	Agricultural fields	Not Expected: Suitable habitat for the species is not present.	Present: The species has been observed within the IID Water Service Area.	Not Expected: Suitable habitat for the species is not present.
Gila woodpecker	*Melanerpes uropygialis*	Federal: - State: SE CDFW: - BLM: BLMS	Riparian	Present: The species has been observed along the Colorado River.	Present: The species has been observed within the IID Water Service Area.	Present: The species has been observed along the Salton Sea.
Gilded flicker	*Colaptes chrysoides*	Federal: - State: SE CDFW: - BLM: BLMS	Riparian	Present: The species has been observed along the Colorado River.	Not Expected: Suitable habitat for the species is not present.	Not Expected: Suitable habitat for the species is not present.
Least Bell's vireo	*Vireo bellii pusillus*	Federal: FE State: SE CDFW: - BLM: -	Riparian forest, Riparian scrub, Riparian woodland	Not Expected: Suitable habitat for the species is not present.	Present: The species has been documented within the IID Water Service Area within the Imperial Irrigation District Managed Marsh Complex and adjacent to the Salton Sea.	Not Expected: Suitable habitat for the species is not present.
Least bittern	*Ixobrychus exilis*	Federal: - State: - CDFW: SSC BLM: -	Wetland; extensive cattail and bulrush marshes	Present: The species has been observed along the Colorado River.	Not Expected: Suitable habitat for the species is not present.	Present: The species has been observed along the Salton Sea.
Le Conte's thrasher	*Toxostoma lecontei*	Federal: - State: - CDFW: SSC BLM: BLMS	Desert; open desert wash, desert scrub, alkali desert scrub, and desert succulent shrub	Present: The species has been observed along the Colorado River.	Present: The species has been observed within the IID Water Service Area.	Present: The species has been observed along the Salton Sea.
Long-eared owl	*Asio otus*	Federal: - State: - CDFW: SSC BLM: -	Riparian; tamarisk scrub habitat along the New and Alamo Rivers, Salton Sea, and agricultural drains	Not Expected: Suitable habitat for the species is not present.	Low Potential: The Action Area supports limited habitat for this species.	Low Potential: The Action Area supports limited habitat for this species.

				Potential to Occur		
Common Name	**Scientific Name**	**Sensitivity Status**	**Preferred Habitat**	**Lower Colorado River**	**IID Water Service Area and All-American Canal**	**Salton Sea**
Merlin	*Falco columbarius*	Federal: - State: - CDFW: WL BLM: -	Extremely diverse habitats ranging from deserts to tropical forests and including prairies, open farmland, and urban areas	Low Potential: The Action Area supports limited habitat for this species.	Present: The species has been observed within the IID Water Service Area.	Present: The species has been observed along the Salton Sea.
Mountain plover	*Charadrius montanus*	Federal: - State: - CDFW: SSC BLM: BLMS	Agricultural fields; dry, open plains	Present: The species has been observed along the Colorado River.	Present: The species has been observed within the IID Water Service Area.	Present: The species has been observed along the Salton Sea.
Short-eared owl	*Asio flammeus*	Federal: - State: - CDFW: SSC BLM: -	Agricultural fields; prairies, marshes, grassy plains, and tundra	Low Potential: The Action Area supports limited habitat for this species.	Present: The species has been observed within the IID Water Service Area.	Present: The species has been observed along the Salton Sea.
Southwestern willow flycatcher	*Empidonax traillii extimus*	Federal: FE State: SE CDFW: - BLM: -	Riparian; cottonwood-willow riparian systems throughout southwestern riverine systems	Present: The species has been documented along the Lower Colorado River near the Palo Verde Diversion Dam, Imperial National Wildlife Refuge and south towards the Laguna Mountains.	Present: the species has been documented east of the Imperial Wildlife Area bordering the Chocolate Mountains, and adjacent to the Salton Sea within the Sonny Bono National Wildlife Refuge and Imperial Irrigation District Managed Marsh Complex.	Not Expected: Suitable habitat for the species is not present.
Summer tanager	*Piranga rubra*	Federal: - State: - CDFW: SSC BLM: -	Riparian; cottonwood-willow forests along rivers and streams but can also occur in tamarisk stands along the Colorado River	Present: The species has been observed along the Colorado River.	Moderate Potential: The Action Area supports marginal habitat for this species.	Low Potential: The Action Area supports limited habitat for this species.
Vermilion flycatcher	*Pyrocephalus rubinus*	Federal: - State: - CDFW: SSC BLM: -	Riparian	Present: The species has been observed along the Colorado River.	Present: The species has been observed within the IID Water Service Area	Low Potential: The Action Area supports limited habitat for this species.
Western snowy plover	*Charadrius nivosus nivosus*	Federal: FT State: - CDFW: SSC BLM: -	Aquatic habitat, predominantly Salton Sea	Not Expected: Suitable habitat for the species is not present.	Not Expected: Suitable habitat for the species is not present.	Present: The species has been observed along the Salton Sea.
Western yellow-billed cuckoo	*Coccyzus americanus*	Federal: FT State: SE CDFW: - BLM: BMS	Riparian; Mature stands of cottonwood-willow	Present: The species has been observed along the Colorado River.	Low Potential: The Action Area supports limited habitat for this species.	Low Potential: The Action Area supports limited habitat for this species.
White-faced ibis	*Plegadis chihi*	Federal : - State: - CDFW: WL BLM: -	Agricultural fields, Wetlands; typically nest in extensive marshes, constructing nests in tall marsh plants such as cattails and bulrushes over water	Low Potential: The Action Area supports limited habitat for this species.	Present: The species has been observed within the IID Water Service Area	Present: The species has been observed along the Salton Sea.

				Potential to Occur		
Common Name	**Scientific Name**	**Sensitivity Status**	**Preferred Habitat**	**Lower Colorado River**	**IID Water Service Area and All-American Canal**	**Salton Sea**
Yellow warbler	*Setophaga petechia*	Federal: - State: - CDFW: SSC BLM: -	Riparian; riparian scrub and riparian forest habitats from lowland riparian areas up to the mixed north-slope forest zone	High Potential: The Action Area supports suitable habitat for this species.	Moderate Potential: The Action Area supports marginal habitat for this species.	Low Potential: The Action Area supports limited habitat for this species.
Yellow-breasted chat	*Icteria virens*	Federal: - State: - CDFW: SSC BLM: -	Riparian; cottonwood-willow riparian habitats, in which they primarily use the willow scrub component	Present: The species has been observed along the Colorado River.	Moderate Potential: The Action Area supports marginal habitat for this species.	Present: The species has been observed along the Salton Sea.
Yuma Ridgeway's Rail	*Rallus obsoletus yumanensis*	Federal: FE State: ST CDFW: FP BLM: -	Freshwater marsh, Marsh and swamp, Wetland	Present: The species has been documented along the Lower Colorado spanning from the Little Picacho Wilderness Area up through the watershed to the Riverside Mountains Wilderness Area.	Present: The species has been documented at the New and Alamo Rivers within the city of Holtville and along the All-American Canal. Further north towards the Salton Sea the species has been documented within the Sonny Bono National Wildlife Refuge, Imperial Irrigation District Managed Marsh Complex, and Imperial Wildlife Area.	Present: The species has been observed along the Salton Sea.
Mammals						
Big free-tailed bat	*Nyctinomops macrotis*	Federal: - State: - CDFW: SSC BLM: -	Rugged rocky terrain, although a wide range of habitats, including desert scrub, woodlands, and evergreen forests, are visited during foraging and migration	Low Potential: The Action Area supports limited habitat for this species.	Present: The species has been observed within the IID Water Service Area.	Low Potential: The Action Area supports limited habitat for this species.
California leaf-nosed bat	*Macrotus californicus*	Federal: - State: - CDFW: SSC BLM: BLMS	Desert scrub, alkali scrub, desert washes, riparian associations, and palm oases	Present: The species has been observed along the Colorado River.	Present: The species has been observed within the IID Water Service Area.	Low Potential: The Action Area supports limited habitat for this species.
Cave myotis	*Myotis velifer*	Federal: - State: - CDFW: SSC BLM: BLMS	Creosote bush scrub, paloverde, brittlebrush, cactus, and desert riparian	Present: The species has been observed along the Colorado River.	Low Potential: The Action Area supports limited habitat for this species.	Low Potential: The Action Area supports limited habitat for this species.

				Potential to Occur		
Common Name	**Scientific Name**	**Sensitivity Status**	**Preferred Habitat**	**Lower Colorado River**	**IID Water Service Area and All-American Canal**	**Salton Sea**
Yuma hispid cotton rat	*Sigmodon hispidus eremicus*	Federal: - State: - CDFW: SSC BLM: -	Agricultural fields, Riparian; occupy moist, grassy habitats where they cut runways through the grass	Present: The species has been observed along the Colorado River.	Present: The species has been observed within the IID Water Service Area.	Present: The species has been observed along the Salton Sea.

FE: Federally endangered
FC: Federal Candidate
FT: Federally threatened
FPT: Federal Proposed threatened
FPE: Federal Proposed endangered
SE: State endangered
ST: State threatened concern
SR: State rare
SC: Species of concern
SSC: CDFW Species of Special Concern
S: CDFW sensitive
FP: CDFW fully protected
WL: CDFW watch list
BLMS: Bureau of Land Management, Sensitive Species

Appendix BIO-3
QSA EIR/EIS Comparison Impact Table

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TABLE BIO-3
DRAFT SUMMARY OF POTENTIAL BIOLOGICAL IMPACTS WITH IMPLEMENTATION OF THE PROPOSED ACTION COMPARED TO THE QSA ANALYSIS

QSA EIR Impacts	QSA EIR Mitigation	QSA EIR Significance after Mitigation	DRAFT Proposed Action - Impacts	Proposed Mitigation	TCRCP Significance After Mitigation
Lower Colorado River					
BR–1: Reduced flow levels in the LCR could reduce the acreage of cottonwood-willow communities	Under the Proposed Project, Reclamation would implement the following measures to address impacts to southwestern willow flycatchers: • Monitor 372 acres of occupied habitat that could be affected by the change in the point of diversion for 400 KAF of water • Restore and maintain 372 acres of new replacement willow flycatcher habitat along the LCR within 5 years of execution of the SIA that provides federal approval for the water transfer actions • Restore and maintain additional habitat (up to 744 acres) if monitored habitat is found to be affected	Less than significant impact with implementation of biological conservation measures	The temporary short-term (3 years) reduction of flows due to reduced orders by IID would mimic dry year conditions and would not permanently reduce acreage of cotton-wood communities. Any reduction of acreage of cotton-wood communities resulting from reduced flows would be reversed when flow volumes rebound in 2027.	N/A	Less than significant impact
BR–2: Reduced flow levels in the LCR could reduce the acreage of honey mesquite bosque communities	No Mitigation: Although groundwater is the primary source of water for the maintenance of mesquite bosques, additional water is derived from surface flow (e.g., flooding) and precipitation (Minckley and Brown 1982; Stromberg et al. 1992). Some honey mesquite could be lost because of reduced groundwater levels, but the relative magnitude of the impact would be less than for cottonwood-willow habitat because honey mesquite is less sensitive to groundwater changes. Honey mesquite bosque does not provide primary habitat for special-status species, potential changes in the acreage or structural characteristics of honey mesquite under the Proposed Project would be a less-than-significant impact.	Less than significant impact	The temporary short-term (3 years) reduction of flows due to reduced orders by IID would mimic dry year conditions and would not permanently reduce acreage of honey mesquite bosque communities. Any reduction of acreage of honey mesquite bosque communities resulting from reduced flows would be reversed when flow volumes rebound in 2027.	N/A	Less than significant impact
BR–3: Reduced flow levels in the LCR could reduce the acreage of screwbean mesquite bosque communities.	No Mitigation: Mesquite seedlings that germinate in areas with low soil moisture have low survivorship (Stromberg 1993), and mortality, stunting, or extremely slow growth occurs at soil moisture levels of less than 2 percent (Reclamation 1988). Thus, changes in surface water or groundwater elevations could reduce the suitability for mesquite in some areas. The amount or structural characteristics of screwbean mesquite could be altered by reduced surface water or groundwater levels. However, because screwbean mesquite bosque does not provide primary habitat for special-status species, these potential changes would be a less-than-significant impact.	Less than significant impact	The temporary short-term (3 years) reduction of flows due to reduced orders by IID would mimic dry year conditions and would not permanently reduce acreage of screwbean mesquite bosque communities. Any reduction of acreage of screwbean mesquite bosque communities resulting from reduced flows would be reversed when flow volumes rebound in 2027.	N/A	Less than significant impact
BR–4: Reduced flow levels in the LCR could reduce the acreage of backwater habitat	Under the Proposed Project, Reclamation would restore 44 acres of backwater habitat along the LCR between Parker and Imperial Dams. With this replacement of backwater habitat affected by reduced flows, impacts of the Proposed Project to backwater habitat along the LCR would be less than significant.	Less than significant with implementation of biological conservation measures	The temporary short-term (3 years) reduction of flows due to reduced orders by IID would mimic dry year conditions and would not permanently reduce backwater habitat or adversely affect razorback sucker or bonytail chub. Any reduction of acreage of backwater habitat or razorback sucker or bonytail chub resulting from reduced flows would be reversed when flow volumes rebound in 2027.	N/A	Less than significant impact
BR–5: Reduced acreage of cottonwood-willow vegetation could affect special-status species	As described in Impact BR-1 under the Proposed Project, Reclamation would replace cottonwood-willow habitat occupied by willow flycatchers that is affected by reduced flows, and depending on monitoring results, potentially increase the amount of cottonwood- willow habitat. As a result, impacts to other special-status species associated with cottonwood-willow habitat along the LCR would be less than significant.	Less than significant with implementation of biological conservation measures	The temporary short-term (3 years) reduction of flows due to reduced orders by IID would mimic natural dry year conditions and would not permanently reduce acreage of cotton-wood communities or the sensitive species that occupy the habitat. Any reduction of acreage of cotton-wood communities resulting from reduced flows would be reversed when flow volumes rebound in 2027.	N/A	Less than significant impact
BR – 6: Reduced acreage of open water in backwaters could affect special-status wildlife species	Between 14 and 21 acres of emergent vegetation habitat (Table 3.2-37) could be affected by the Proposed Project. As described in Impact BR-4 under the Proposed Project, Reclamation would restore 44 acres of backwaters. Thus, impacts to this habitat and associated special-status species would be less than significant.	Less than significant with implementation of biological conservation measures	The temporary short-term (3 years) reduction of flows due to reduced orders by IID would mimic natural dry year conditions and would not permanently reduce acreage of open water affecting sensitive species that occupy the habitat. Any reduction of acreage of open water resulting from reduced flows would be reversed when flow volumes rebound in 2027.	N/A	Less than significant impact
BR – 7: Reduced acreage of emergent vegetation in backwaters could affect special-status species	As described in Impact BR-4 under the Proposed Project, Reclamation would restore 44 acres of backwaters. Thus, impacts to this habitat and associated special-status species would be less than significant.	Less than significant with implementation of biological conservation measures	The temporary short-term (3 years) reduction of flows due to reduced orders by IID would mimic natural dry year conditions and would not permanently reduce acreage of emergent vegetation affecting sensitive species that occupy the habitat. Any reduction of acreage of emergent vegetation	N/A	Less than significant impact

QSA EIR Impacts	QSA EIR Mitigation	QSA EIR Significance after Mitigation	DRAFT Proposed Action - Impacts	Proposed Mitigation	TCRCP Significance After Mitigation
			resulting from reduced flows would be reversed when flow volumes rebound in 2027.		
BR – 8: Reduced acreage of aquatic habitat could affect special-status fish species	Under the Proposed Project, Reclamation will restore or create 44 acres of backwaters. Reclamation also will re-introduce and monitor 20,000 sub-adult razorback suckers below Parker Dam and continue the ongoing study of Lake Mead for an additional 4 years to determine reasons for persistence of adult razorback suckers in the reservoir. Reclamation will fund the capture of wild-born or F1 generation bonytail chubs from Lake Mohave to be incorporated into broodstock for this species (USFWS 2001). With implementation of these measures, impacts to razorback suckers and bonytail chub under the Proposed Project would be less than significant.	Less than significant with implementation of biological conservation measures	The temporary short-term (3 years) reduction of flows due to reduced orders by IID would mimic dry year conditions and would not permanently reduce aquatic habitat that could adversely affect special status fish species. Any reduction of acreage of aquatic habitat resulting from reduced flows would be reversed when flow volumes rebound in 2027.	N/A	Less than significant impact
BR – 9: Reduced diversions from the LCR could affect special-status fish species	No Mitigation. Razorback suckers could be entrained in canals by water diversion from the LCR. Assuming the potential for entrainment is proportional to the amount of water diverted, the Proposed Project would reduce this potential. Under the Proposed Project, IID would reduce its diversion at Imperial Dam by 200 to 300 KAFY. Water transferred to SDCWA service area or MWD service area would serve as replacement water for these agencies, and the overall amount of water diverted at Parker Dam would not change.	Beneficial impact	The temporary short-term (3 years) reduction of flows due to reduced orders by IID would reduce potential impacts from diversions.	N/A	N/A
IID Water Service Area and All-American Canal					
BR – 10: Reduced Flows in the Drains Could Alter Drain Vegetation and Affect Wildlife	No Mitigation. Much of the vegetation in the drainage system is tamarisk and *Phragmites*. These exotic and highly invasive species are tolerant of a wide range of conditions. As such, they would adjust to flow changes in the drains, and their occurrence and distribution of species would not change substantially. Cattails and other wetland plants are limited. Cattails are concentrated in the bottom of the drain. Because of the steep sides of the drains, little difference in water depths would occur with lower flow volumes. If drains were drier for longer periods of time, minor, temporary changes in the extent of cattails would potentially occur. However, because drain maintenance activities probably have a greater influence on the extent of vegetation in the drains and the projected decrease in drain flows would be within the range of historic levels, changes in drain flows would not substantially change the amount or composition of drain habitat. Because drain vegetation would not change substantially, the species and numbers of wildlife using the drains would not be substantially affected. Therefore, changes in drain habitat and effects to associated wildlife resulting from changes in drain flows under the Proposed Project would be less than significant.	Less than significant.	Similar to the conclusions in the EIR/EIS, the temporary short-term (3 years) reduction of flows in drains would not reduce vegetation in drainages because water would remain available under current conditions. By-pass flows may be reduced, but vegetation in drains would not be adversely affected compared with existing flow variability. Any reduction in drainage flows would be reversed when flow volumes rebound in 2027.	N/A	Less than significant
BR – 11: Increased Salinity in the Drains Could Alter Drain Vegetation and Affect Wildlife	By increasing the ratio of tilewater to tailwater in the drains, the Proposed Project would increase the salinity in the drains. The total amount of cattail vegetation would decline as would the amount with good growing conditions (Table 3.2-39). With conservation of 300 KAFY under the Proposed Project through on-farm and system-based measures, the acreage of cattails supported in the drains would potentially be reduced by 4 acres. Most (46 acres) of the remaining cattail vegetation would be subjected to salinity levels that could stunt growth and reduce vigor of the plant. If all Fallowing is used to conserve water, there would be no change in salinity in the drains and therefore no impacts to cattail vegetation. Use of Fallowing to meet a portion of the conserved water would result in intermediate effects. However, implementation of the HCP component of the Proposed Project would reduce this potential impact to a less than significant level.	Less than significant with implementation of the HCP	The temporary short-term (3 years) reduction of flows in drains would not increase salinity in the drains that could alter habitat quality because the reduced flows would be temporary and reversed when flow volumes rebound in 2027. By-pass flows may be reduced, but aquatic species in drains would not be adversely affected compared with existing flow variability. Mitigation implemented by IID for QSA. No additional mitigation required.	N/A	Less than significant
BR – 12: Changes in Water Quality in Drains Could Affect Wildlife	Results of the analysis indicate that under the Baseline, the equivalent of approximately 48 miles of drain would be fully affected by waterborne selenium through hatchability effects (Table 3.2-40). Under the Proposed Project, up to an equivalent of about 94 miles would be affected depending on the total amount of conservation and methods of conservation (Table 3.2-40). The potential for reduced reproductive success of birds using the drains constitutes a potentially significant impact of the water conservation and transfer component of the Proposed Project. Implementation of the HCP component of the Proposed Project would reduce this impact to less than significant.	Less than significant with implementation of the HCP	The temporary short-term (3 years) reduction of flows in drainages would not alter water quality because the reduced flows would be temporary would be reversed when flow volumes rebound in 2027. By-pass flows may be reduced, but aquatic species in drainages would not be adversely affected compared with existing flow variability. Mitigation implemented by IID for QSA. No additional mitigation required.	N/A	Less than significant
BR – 13: Reduced flows in the rivers could alter vegetation and affect wildlife	Vegetation along the New and Alamo Rivers consists predominantly of tamarisk, often in dense stands. Tamarisk is a fairly drought-tolerant and invasive exotic species that has a high tolerance for environmental change (Kerpez and Smith 1987; Brotherson and Field 1987; Deloach et al. 1996). As the flow levels in the New and Alamo Rivers decrease under the Proposed Project, tamarisk would colonize newly exposed ground. Because tamarisk can survive on soil water alone, reductions in the groundwater level potentially resulting from reduced flows in the New and Alamo Rivers are unlikely to change the amount of tamarisk along these two rivers. Because the extent of tamarisk along the rivers would not change substantially, wildlife that use this habitat would not be substantially affected.	Less than significant	The temporary short-term (3 years) reduction of flows due to reduced orders by IID would mimic dry year conditions and would not permanently reduce acreages of habitat within the rivers. Any reduction in acreages of habitat would be reversed when flow volumes rebound in 2027.	N/A	Less than significant

QSA EIR Impacts	QSA EIR Mitigation	QSA EIR Significance after Mitigation	DRAFT Proposed Action - Impacts	Proposed Mitigation	TCRCP Significance After Mitigation
BR – 14: Installation of seepage recovery systems could remove tamarisk scrub and affect associated wildlife	No Mitigation. The plant species composition of the seepage communities adjacent to the East Highline Canal is diverse and varies substantially among the seepage areas. Arrowweed, common reed, and tamarisk are the most common species in the seepage communities, with mesquite, cattails, and cottonwoods in some areas. The reduction in acreage of seepage communities has the potential to affect migratory songbirds that use these habitats. However, most of the vegetation consists of tamarisk, which is of limited value to migratory songbirds, and is present in dense stands along rivers and in other locations throughout the region (Guers and Flannery 2000). Furthermore, the potential loss of seepage community vegetation constitutes only 10 percent of the available seepage community vegetation. As only a small amount of the seepage community vegetation would be lost, and the habitat is dominated by non-native plant species, the loss of seepage community vegetation is a less-than-significant impact to wildlife and wildlife habitat.	Less than significant. no impact if only on-farm or fallowing methods are used.	The Proposed Action does not include the installation of seepage recovery systems and therefore will not affect Tamarisk scrub habitat.	N/A	N/A
BR – 15: Reservoir construction could remove Tamarisk Scrub and affect associated wildlife	The small loss of tamarisk potentially resulting from this Project would not adversely affect wildlife or wildlife habitat.	Less than significant	The Proposed Action does not include any proposed ground disturbing construction activities; therefore, BR-15 will not apply.	N/A	N/A
BR – 16: Installation of on-farm irrigation system measures could affect wildlife using agricultural fields	No Mitigation. As described previously, installing on-farm irrigation system improvements could remove a small amount of agricultural field habitat, depending on the improvements implemented, and presents a minor potential for disturbance of wildlife. However, because agricultural field habitat is abundant in the Imperial Valley, the potential loss of some agricultural land is considered a less-than-significant impact to wildlife and wildlife habitat.	Less than significant	The Proposed Action does not include any proposed ground disturbing construction activities; therefore, BR-16 will not apply.	N/A	N/A
BR – 17: Operation of on-farm water conservation measures could affect wildlife using agricultural fields	No Mitigation. Farmers' water conservation practices would not change irrigation practices in a manner that would reduce habitat suitability for wildlife. A given crop consumes a certain amount of water. This consumptive use would not change with water conservation, and a given crop would need to be irrigated at the same frequency as under existing irrigation practices. The water conservation techniques would reduce the amount of tailwater (i.e., surface water that runs off the field), not the amount of water consumed by the crops. Also, except for drip irrigation systems, the water conservation techniques improve the efficiency of surface irrigation, rather than change how the crop is irrigated. For example, tailwater return systems collect and store water from a flood-irrigated field for use in subsequent flood irrigations. The improved efficiencies would reduce the amount of water leaving the field as tailwater. Thus, on-farm irrigation system improvements would not change the suitability of agricultural fields as foraging habitat.	No impact	The temporary short-term (3 years) reduction of active agriculture would temporarily reduce on-farm habitats used by wildlife. Wildlife would access actively farmed lands in close proximity.	N/A	No impact
BR – 18: Installation of system-based water conservation could reduce the acreage of agricultural fields and affect associated wildlife	No Mitigation. These activities could remove about 8,630 acres of agricultural field habitat. Relative to the entire irrigated area of Imperial Valley that covers about 500,000 acres, this potential loss constitutes about 1.7 percent of the agricultural land. Construction would not occur in agricultural fields under active production so the potential for disturbance of species using this habitat would be minor. Because agricultural field habitat is abundant in the Imperial Valley, the potential loss of some agricultural land is considered a less-than-significant impact to wildlife and wildlife habitat.	Less than significant	The Proposed Action does not include any proposed ground disturbing construction activities; therefore, BR-18 will not apply.	N/A	N/A
BR – 19: Fallowing could reduce the acreage of agricultural fields and affect associated wildlife	No Mitigation. Fallowing could reduce the acreage of irrigated agriculture available in the IID water service area at any one time. If only Fallowing is used to conserve water, about 50,000 acres of land would be needed. This acreage represents about 10 percent of the irrigated area in the IID water service area. Even with this reduction, agricultural field habitat would remain abundant in the IID water service area, consisting of about 450,000 acres. Because agricultural field habitat is abundant in the Imperial Valley, the potential loss of some agricultural land is considered a less-than- significant impact to wildlife and wildlife habitat. This potential effect would not occur if only on-farm irrigation system and water delivery system improvements are used to conserve water.	Less than significant.	The temporary short-term (3 years) reduction of active agriculture would temporarily reduce on-farm habitats used by wildlife. Wildlife would access actively farmed lands in close proximity.	N/A	Less than significant
BR – 20: Fallowing would not change the amount of desert habitat	No Mitigation. The likelihood of desert plants becoming reestablished would be influenced by the proximity of the retired land to desert habitat, soil conditions, and rainfall among others. Land retired for short periods of time probably would not be colonized by desert plants. Some fields in the Imperial Valley that have been out of agricultural production for many years do not support vegetation. The limited amount of vegetation that has developed consists of ruderal species rather than native desert plant species. Thus, Fallowing would not change the amount of desert habitat or otherwise affect wildlife associated with desert habitats.	No impact.	The temporary short-term (3 years) reduction of active agriculture would temporarily reduce on-farm habitats used by wildlife. Wildlife would access actively farmed lands in close proximity.	N/A	No Impact
BR – 21: Reduced flows in the drain could affect fish and aquatic habitat	Reductions in flows (and resulting decreases in water depths) could make fish residing in the drains more vulnerable to predation by fish-eating birds. The overall impact of this potential increase in predation, however, is moderated by the generally high turbidity of drainwater and thus the low visibility of fish in the drains. Reductions in the amount or	Less than significant	Similar to the conclusions in the EIR/EIS, the temporary short-term (3 years) reduction of flows in drains would not affect aquatic habitat or species in drains because water would remain available under	N/A	Less than significant

QSA EIR Impacts	QSA EIR Mitigation	QSA EIR Significance after Mitigation	DRAFT Proposed Action - Impacts	Proposed Mitigation	TCRCP Significance After Mitigation
	quality of aquatic habitat as a result of flow reductions in the drains not emptying to the Salton Sea would affect only aquatic invertebrates and non- native fish (e.g., tilapia, mosquitofish, and carp) that periodically inhabit these drains. No special-status species inhabit the drains emptying to the New and Alamo Rivers. Desert pupfish (a state- and federal-listed species) inhabit drains emptying directly to the Salton Sea and are not found in the New or Alamo Rivers or their drains. Impacts to desert pupfish, resulting from the Proposed Project, are discussed under Impact BR-24.		current conditions. By-pass flows may be reduced, but aquatic species in drains would not be adversely affected compared with existing flow variability. Any reduction in aquatic habitat would be reversed when flow volumes rebound in 2027.		
BR – 22: Water quality changes in the drains and rivers could affect fish and aquatic habitat	No Mitigation. The increase in selenium concentrations could reduce reproductive success of fish in the drains and rivers. The Proposed Project also would increase the miles of drains, with average salinity levels exceeding 4,000 mg/L. Except for desert pupfish, which inhabit drains that discharge directly to the Sea, all the fish in the drains and rivers are introduced species. A potential for reduced reproductive success of fish in the rivers and drains is not considered a significant impact to fish resources, because all the species are introduced species. Impacts to desert pupfish are addressed separately under Impact BR-24.	Less than significant	Similar to the conclusions in the EIR/EIS, the temporary short-term (3 years) reduction of flows in drains would not affect water quality in drains because water would remain available under current conditions.	N/A	Less than significant
BR – 23: Reduced flows in the rivers could affect fish and aquatic habitat	Fish populations in the New and Alamo Rivers are probably limited by food availability and water quality rather than by flow. The anticipated reductions in flows at the upper level of conservation would not significantly reduce the amount of fish habitat or limit fish productivity in the rivers. Reductions in the amount or quality of aquatic habitat as a result of flow reductions in the New and Alamo Rivers would affect only aquatic invertebrates and non-native fish. Therefore, impacts from flow reductions would be less than significant.	Less than significant	The temporary short-term (3 years) reduction of flows due to reduced orders by IID would mimic dry year conditions and would not permanently reduce acreages of habitat within rivers. Any reduction in aquatic habitat would be reversed when flow volumes rebound in 2027.	N/A	Less than significant
BR – 24: Reduced flows in the drains could affect desert pupfish	The changes in flow and water quality in the drains discharging directly to the Sea and supporting pupfish constitute a potentially significant impact of the water conservation and transfer component of the Proposed Project. However, implementation of the HCP component of the Proposed Project would reduce this potential impact to less than significant (see Impact BR – 38).	Less than significant with implementation of the HCP	The temporary short-term (3 years) reduction of flows in drains would not alter water quality or habitat availability due to the temporary reductions. The reductions would mimic natural dry year conditions due to climate variability. By-pass flows may be reduced, but aquatic species in drains would not be adversely affected compared with existing flow variability. Any reduction in drain habitat would be reversed when flow volumes rebound in 2027. Mitigation implemented by IID for QSA. No additional mitigation required.	N/A	Less than significant
BR – 25: Construction of system-based measures could affect Razorback suckers	Under the Proposed Project, the amount of water in the conveyance system would be reduced by 300 KAFY. Although the volume of water would be reduced, this reduction would not affect the amount of aquatic habitat in the canal system because the water surface elevation in the conveyance system is tightly controlled to maximize hydroelectric power generation and efficient delivery of irrigation water. Installation of some water delivery system improvements (e.g., canal lining) would require dewatering the canal. In accord with the HCP, a qualified biologist will be on-site when canals are dewatered. If razorback suckers are found in the canal when it is dewatered, they will be captured and returned to LCR. Thus, adverse impacts to razorback suckers would be avoided.	Less than significant with implementation of the HCP	The Proposed Action does not include any proposed ground disturbing construction activities; therefore, BR-25 will not apply. Mitigation implemented by IID for QSA. No additional mitigation required.	N/A	Less than significant
BR – 26: Water quality changes in the drains could affect special-status species	Assuming water conservation using on-farm irrigation-system and water delivery system improvements, the Proposed Project would decrease the concentration of pesticides in drainwater (as associated with TSS and sediment-associated contaminants), benefiting the special-status species associated with drain habitat, but the concentration of selenium, salinity, and dissolved constituents in the drains would increase relative to the Baseline. If no change in water quality conditions, as explained for Alternative 4. Thus, the magnitude of water quality changes under the Proposed Project would depend on the amount of water conserved through Fallowing. Nevertheless, the increase in selenium concentration that would occur with conservation using on-farm irrigation system and/or water delivery system improvements is a potentially significant impact of the water conservation and transfer component of the Proposed Project on special-status species. However, implementation of the HCP component of the Proposed Project would reduce this potential impact to less than significant. The HCP (Appendix C) contains a more detailed evaluation of the effects of implementing the HCP on special-status species.	Less than significant with implementation of the HCP	The temporary short-term (3 years) reduction of flows in drains would not alter water quality due to the temporary reductions. By-pass flows may be reduced, but aquatic species in drainages would not be adversely affected compared with existing flow variability. Any reduction in drain habitat would be reversed when flow volumes rebound in 2027. Mitigation implemented by IID for QSA. No additional mitigation required.	N/A	Less than significant
BR – 27: Changes in drain habitat could affect special-status species	The predicted reduction in cattails could adversely affect Yuma clapper rails and other special-status species using the drains. This effect constitutes a potentially significant impact of the water conservation and transfer component of the Proposed Project. In addition to changes in physical habitat, increased selenium concentration in the drains under the Proposed Project could adversely affect Yuma clapper rails and other special-status species using the drains. These potential effects are addressed under Impact BR –	Less than significant with implementation of the HCP	The temporary short-term (3 years) reduction of flows due to reduced orders by IID would mimic dry year conditions and would not permanently reduce acreages of habitat within drains that are occupied by special status species. Any reduction in drain habitat would be reversed when flow volumes	N/A	Less than significant

QSA EIR Impacts	QSA EIR Mitigation	QSA EIR Significance after Mitigation	DRAFT Proposed Action - Impacts	Proposed Mitigation	TCRCP Significance After Mitigation
	26. These water quality changes also are a potentially significant impact of the water conservation and transfer component of the Proposed Project. However, implementation of the HCP component of the Proposed Project would reduce these potential impacts to less than significant (see Impact BR – 32). The HCP (Appendix C) contains a more detailed evaluation of the effects of implementing the HCP on special-status species associated with drain habitat.		rebound in 2027. Mitigation implemented by IID for QSA. No additional mitigation required.		
BR – 28: Changes in the Tamarisk Scrub habitat could affect special-status species	The Proposed Project would not significantly reduce the availability of tamarisk scrub supported by the agricultural drains or along the New and Alamo Rivers as a result of changes in flow or water quality. Installation of seepage recovery systems and lateral interceptors could eliminate about 58 acres of tamarisk scrub habitat. This small reduction in tamarisk scrub would not significantly adversely affect special-status species because (1) tamarisk is common and abundant throughout the project area, (2) tamarisk is of limited habitat quality, and (3) none of the special-status species depend on this habitat.	No Impact	The Proposed Action does not include any proposed ground disturbing construction activities, or installation of seepage recovery systems; therefore, BR-28 will not apply.	N/A	No Impact
BR – 29: Water conservation practices could affect special-status species associated with agricultural fields	No Mitigation. As explained under Impacts BR-16, BR-18, and BR -19, installation of on-farm irrigation system and water delivery system improvements or fallowing would not substantially reduce the availability of agricultural lands in the IID water service area. Thus, the Proposed Project would not significantly affect special-status species associated with agricultural fields. Section 3.8 of the HCP (Appendix C) provides a species-by-species evaluation of the impacts of the Proposed Project on special-status species associated with agricultural fields in the IID water service area.	Less than significant	The temporary short-term (3 years) reduction of active agriculture would temporarily reduce on-farm habitats used by wildlife. Wildlife would access actively farmed lands in close proximity.	N/A	Less than significant
BR – 30: Water conservation practices could affect special-status species associated with desert habitat	The only features of the Proposed Project that could affect desert habitat would be water delivery system improvements involving construction (e.g., canal lining, reservoirs) along the canals adjacent to desert habitat. No regulating reservoirs, mid-lateral reservoirs, or canal lining are proposed along these canals. Seepage recovery systems could be installed along the East Highline Canal, but these systems would be constructed on the agricultural field side of the canal. Thus, no construction activities required for the water delivery system improvements would occur in desert habitat, and no significant impacts to special-status species would occur as a result of the water conservation and transfer component of the Proposed Project.	No Impact	The Proposed Action does not include any proposed ground disturbing construction activities, or installation of seepage recovery systems; therefore, BR-30 will not apply.	N/A	No Impact
BR – 31: Water conservation practices could affect burrowing owls.	No Mitigation. Fallowing could be used to generate a portion of the water conserved under the Proposed Project. As explained in more detail for Alternative 4 under Impact A4-BR-13, Fallowing has the potential to reduce the availability of insects on which burrowing owls prey. If fallowed fields are concentrated in a few areas, potentially, owls would abandon territories adjacent to fallowed fields. Because Fallowing would be only one of many methods used to conserve water under the Proposed Project and because owls are not limited by prey availability in the Imperial Valley, the amount of land fallowed would not reduce prey populations to a level that would be expected to cause owls to abandon territories. The HCP (Appendix C) contains a more detailed evaluation of the effects of implementing various water conservation activities and the HCP on burrowing owls.	Less than significant	The temporary short-term (3 years) reduction of active agriculture would temporarily reduce on-farm habitats used by wildlife. Wildlife would access actively farmed lands in close proximity.	N/A	Less than significant
HCP-BR – 32: Creation of managed marsh habitat would benefit wildlife associated with drain habitat	With implementation of the HCP component, the Proposed Project would have beneficial effects on special-status species associated with drain habitat. Section 3.5 Drain Habitat Conservation Strategy of the HCP (Appendix C) provides additional information on the effects of implementing the Drain Habitat Conservation Strategy on habitat conditions for species associated with drain habitat and the responses of special-status species.	Beneficial impact	This impact does not apply to the Proposed Action.	N/A	N/A
HCP-BR – 33: Creation of managed marsh could decrease agricultural field habitat	This potential reduction in agricultural field habitat would not significantly affect species using this habitat for two reasons. First, 652 acres constitutes a small amount (about 0.1 percent) of the total agricultural area in the IID water service area. Even with consideration of the potential loss of agricultural field habitat from other aspects of the Proposed Project (e.g., installation of tailwater return systems), agricultural land would remain abundant. Secondly, some of the species using agricultural fields also would use managed marsh habitat (e.g., white-faced ibis), resulting in no net loss of habitat value.	No impact	This impact does not apply to the Proposed Action.	N/A	N/A
HCP-BR – 34: Creation of native tree habitat could benefit wildlife associated with Tamarisk Scrub	By compensating for tamarisk scrub permanently lost with native tree habitat, species associated with tamarisk scrub would benefit from higher habitat quality. Section 3.4, Tamarisk Scrub Habitat Conservation Strategy of the HCP, provides additional information on the effects of implementing the Tamarisk Scrub Habitat Conservation Strategy on habitat conditions for species associated with tamarisk and the responses of special-status species.	Beneficial impact	This impact does not apply to the Proposed Action..	N/A	N/A
HCP-BR – 35: The desert habitat conservation strategy would avoid impacts to	Species not associated with desert habitat would not be affected by measures implemented under the Desert Habitat Conservation Strategy.	No impact	This impact does not apply to the Proposed Action..	N/A	N/A

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wildlife associated with desert habitat	Section 3.6, Desert Habitat Conservation Strategy of the HCP, provides additional information on the effects of implementing this strategy on desert habitat and the responses of special-status species.				
HCP-BR – 36: Avoidance measures would benefit burrowing owls	Implementation of the HCP would minimize adverse impacts associated with these activities while perpetuating aspects of the IID water service area's activities that benefit owls. The Burrowing Owl Conservation Strategy would contribute to the persistence of burrowing owls in the Imperial Valley and thereby further benefit the species. Section 3.7.1, Burrowing Owls of the HCP, discusses the effects of implementing this strategy on burrowing owls.	Beneficial impact	This impact does not apply to the Proposed Action.	N/A	N/A
HCP-BR – 37: Avoidance measures of burrowing owl conservation strategy would benefit other special-status species	The Burrowing Owl Conservation Strategy includes requirements to avoid construction activities and certain earth-disturbing O&M activities along the drains and canals during the owl's breeding period, if occupied burrows would be affected. If other species breed nearby, they would similarly benefit from the avoidance measure for burrowing owls.	Beneficial impact	This impact does not apply to the Proposed Action..	N/A	N/A
HCP-BR – 38: Desert pupfish conservation strategy would increase habitat for pupfish	With implementation of the HCP component, the Proposed Project would benefit desert pupfish. Section 3.7.2, Desert Pupfish of the HCP, discusses the response of desert pupfish to the HCP measures.	Beneficial impact	This impact does not apply to the Proposed Action..	N/A	N/A
HCP-BR – 39: Increased habitat from the desert pupfish conservation strategy would benefit other special-status species	The Desert Pupfish Conservation Strategy includes maintaining the existing amount of desert pupfish habitat and increasing the amount of pupfish habitat as the elevation of the Salton Sea recedes. So, this Strategy would contribute to maintaining and increasing the amount of drain habitat, benefiting species associated with drain habitat, both those with and without special state or federal status.	Beneficial impact	This impact does not apply to the Proposed Action..	N/A	N/A
HCP-BR – 40: HCP measures would avoid impacts to Razorback Suckers	Under the HCP, IID would salvage razorback suckers found when canals are dewatered and transport the fish to the LCR for release. As a result of this action, significant impacts to razorback suckers would be avoided.	No Impact	This impact does not apply to the Proposed Action..	N/A	No Impact
Salton Sea					
BR – 41: Reduced drain flows could affect adjacent wetlands dominated by cattail/bulrush vegetation	No Mitigation. The Salton Sea database identifies 217 acres of adjacent wetlands dominated by cattails and bulrushes. In the IID water service area, the Salton Sea database identifies three parcels dominated by cattails: one on the southwestern edge (35 acres) and two on the southern edge (32 acres). A fourth parcel on the eastern edge of the Sea is dominated by bulrushes (17 acres). The remaining 133 acres identified as adjacent wetland dominated by cattail or bulrush are adjacent to the northwestern area of the Salton Sea in CVWD's service area. Because cattails and bulrush cannot tolerate saline water, these areas must be supported by a freshwater source (i.e., drainwater from CVWD or IID). The Proposed Project would increase freshwater flows in drains in the CVWD service area and would potentially increase freshwater flows to the 133-acre adjacent wetland in the CVWD service area. The remaining three areas identified as adjacent wetlands are misclassified in the Salton Sea database. The first parcel of 35 acres is a managed duck club and does not meet the definition of an adjacent wetland (i.e., unmanaged areas). Of the two parcels totaling 32 acres, one is an IID drain, and the other is a marsh managed by USFWS. The drain parcel is managed by IID as part of its drainage system; impacts to drain vegetation are addressed under Impact BR- 10. The other parcel managed by USFWS does not meet the definition of an adjacent wetland (i.e., unmanaged areas). Habitat values of the parcel managed by USFWS and the duck club would not change with implementation of the Proposed Project; therefore, the two parcels would not be affected. The last parcel encompassing 17 acres is sustained by runoff from CDFG's managed marsh area in the Wister Unit. Because CDFG would not change management of marsh areas in the Wister Unit under the Proposed Project, the amount of water leaving the Wister Unit and supporting the 17-acre parcel would not change. Therefore, this parcel would not be affected under the Proposed Project.	No impact	The temporary short-term (3 years) reduction of flows due to reduced orders by IID would mimic dry year conditions and would not permanently reduce acreages of habitat adjacent to the Salton Sea including the emerging wetlands on the newly exposed playa. By-pass flows may be reduced, but flows would still reach the Salton Sea after flowing through adjacent wetland habitats. Any reduction of emerging wetland areas resulting from reduced flows would be reversed when flow volumes rebound in 2027.	N/A	No impact
BR – 42: Reduced sea elevation could affect the acreage of adjacent wetlands dominated by tamarisk and shoreline strand	No Mitigation. The extent to which the water surface elevation of the Sea contributes to supporting this community is uncertain. Depending on the relationship between the water surface elevation of the Sea and maintenance of the shoreline strand and adjacent wetlands, water conservation under the Proposed Project could change the amount of tamarisk scrub habitat in shoreline strand and adjacent wetland areas. There is, however, uncertainty about the extent and likelihood of these possible changes. As the Sea recedes, tamarisk could establish at lower elevations, replacing habitat lost at high elevations. Alternatively, it has been suggested that tamarisk will not establish in areas exposed by a receding sea level because of excessive soil salinity (Reclamation and SSA 2000). In areas where drainwater or shallow groundwater is the predominant water source, no change in tamarisk-dominated adjacent wetlands is expected. It is not possible to predict the	Less than significant	The temporary short-term (3 years) reduction of flows due to reduced orders by IID would mimic dry year conditions and would not permanently reduce acreages of habitat adjacent to the Salton Sea including the emerging wetlands on the newly exposed playa. By-pass flows may be reduced, but flows would still reach the Salton Sea after flowing through adjacent wetland habitats. Any reduction of emerging wetland areas resulting from reduced	N/A	Less than significant

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	magnitude of changes in tamarisk in shoreline strand and adjacent wetland areas. Although it is not possible to predict the magnitude of change in the tamarisk adjacent to the Salton Sea, a reduction in the amount would not be anticipated to cause a significant impact because (1) tamarisk is an invasive, non-native species of poor habitat quality for wildlife and (2) no special-status species depend on tamarisk. Implementation of the Salton Sea Conservation Strategy under the HCP component of the Proposed Project would further ensure that no significant impacts occur.		flows would be reversed when flow volumes rebound in 2027.		
BR – 43: Increased salinity would change invertebrate resources in the Salton sea	In accord with the significance criteria, because no invertebrates are candidate, sensitive, or special-status species, the acceleration in the changes in the invertebrate community of the Salton Sea is not a significant impact (less than significant). Regardless of the Proposed Project, the Salton Sea is naturally transitioning to a more saline system, as has occurred at Mono Lake and the Great Salt Lake. The change in the composition of the invertebrate community in and of itself is not a significant impact but could significantly affect bird or fish resources through reduced food availability. These potential impacts are addressed separately under Impact BR-44.	Less than significant	The temporary short-term (3 years) reduction of flows in drains would not degrade water quality compared to the long-term (up to 75 years) reductions posed by the QSA. Increased salinity may accelerate during the short-term (3 years) period of reduced flows, but would not result in increased salinity compared to long term impacts identified in the EIR/EIS.	N/A	Less than significant
BR – 44: Changes in the invertebrate community could affect shorebirds and other waterbirds:	Mono Lake is designated as part of the Western Hemisphere Shorebird Network and is 1 of only 17 sites in the Western Hemisphere with this designation. The lake supports large numbers of migrating shorebirds. Wilson's and red-necked phalaropes are abundant with maximum counts of about 45,000 and 70,000, respectively (Jones & Stokes Associates 1993). Annual counts of eared grebes typically range from 600,000 to 900,000 (Jones & Stokes Associates 1993). Other abundant shorebird species identified by Point Reyes Bird Observatory during surveys conducted in late August 1989, 1990, and 1991 were American avocet (8,467), western sandpiper (4,043), and least sandpiper (1,408). Ruddy ducks also are common with Christmas bird counts typically in the range of 500 to 900. Other shorebird species in smaller numbers at Mono Lake include black-bellied plover, greater and lesser yellowlegs, long-billed curlews, black-necked stilts, semipalmated plover, and willets. The species of shorebirds that use Mono Lake also occur at the Salton Sea as migratory birds or winter residents (see Tables 3.2-19 and 3.2-20). Similarly, eared grebes and ruddy ducks are abundant at both Mono Lake and the Salton Sea. Given that the shorebird and waterbird (grebes and ruddy ducks) species that use the Sea also use Mono Lake, in which the brine flies and brine shrimp are the primary prey species, it is reasonable to expect that these species would similarly exploit brine flies and brine shrimp as they become the dominant invertebrate at the Salton Sea. Therefore, changes in the invertebrate community would have less-than-significant impacts on shorebirds and other waterbirds using this resource.	Less than significant	The temporary short-term (3 years) reduction of flows due to reduced orders by IID would mimic dry year conditions and would not permanently reduce acreages of habitat at the Salton Sea including the emerging wetlands on the newly exposed playa. Habitat may recede during the period of reduced flows but would rebound following resumption of flows in 2027 and would not result in reduced habitat acreage compared to long term impacts identified in the EIR/EIS.	N/A	Less than significant
BR – 45: Increased salinity would reduce fish resources in the Salton Sea	Under both the Baseline and the Proposed Project, the salinity of the Salton Sea would rise and exceed levels at which fish species inhabiting the Salton Sea could reproduce. For gulf croaker and tilapia, the thresholds could be exceeded up to 5 and 11 years earlier under the Proposed Project, resulting in earlier declines in these two species. This acceleration is considered a less-than-significant impact to fish resources for two reasons. First, the differences between when species-specific salinity thresholds would be exceeded are small (5 to 11 years). Second, based on the significance criteria, only effects to candidate, sensitive or special-status species or certain effects to native fish (e.g., nursery habitat, migratory routes) constitute significant biological impacts. Because all fish species are introduced, non- native species, the impacts are less than significant.	Less than significant	The temporary short-term (3 years) reduction of flows in drains would not degrade water quality compared to the long-term (up to 75 years) reductions posed by the QSA. Increased salinity may accelerate during the short-term (3 years) period of reduced flows but would not result in increased salinity compared to long term impacts identified in the EIR/EIS.	N/A	Less than significant
BR – 46: Reduced fish abundance would affect piscivorous birds	The projected changes in fish abundance would occur under both the Proposed Project and the Baseline. The Proposed Project would accelerate the changes in fish abundance and the subsequent response of piscivorous birds by about 11 years. The earlier occurrence of adverse effects to piscivorous birds is considered a significant, but avoidable, impact of the water conservation and transfer component of the Proposed Project. Implementation of the HCP component of the Proposed Project would reduce this impact to less than significant.	Less than significant with implementation of the HCP	The temporary short-term (3 years) reduction of flows in drains would not reduce habitat compared to the long-term (45-75 years) reductions posed by the QSA. Reduced fish abundance would be similar to long term impacts identified in the EIR/EIS.	N/A	Less than significant
BR – 47: Changes in selenium in the Salton Sea would not affect fish and birds	No Mitigation. The Proposed Project would decrease annual loading of selenium to the Salton Sea relative to the Baseline. However, selenium exhibits unusual behavior in the Salton Sea, concentrating in the sediment rather than the water column. Most selenium in the Sea is in sediments, and the sediments are the dominant source for exposure to aquatic organisms. It is not possible to predict the selenium concentrations in biota or specific environmental media that would occur with implementation of the Proposed Project. However, it is likely that the Sea will continue to maintain waterborne concentrations near the current level of 2 □g/L and would not change exposure of fish and birds to waterborne selenium. The Proposed Project would decrease the amount of selenium entering the Salton Sea relative to the Baseline and in that way reduce the annual accumulation of selenium in sediments. However, because of the large amount of selenium stored in Sea sediments, the slight reduction in selenium loading relative to the Baseline would not	No impact	As concluded in the EIR/EIS, reduced flows would reduce loading of selenium into the Salton Sea. The temporary short-term (3 years) reduction of flows in drains would not degrade water quality compared to the long-term (up to 75 years) reductions posed by the QSA.	N/A	No impact

QSA EIR Impacts	QSA EIR Mitigation	QSA EIR Significance after Mitigation	DRAFT Proposed Action - Impacts	Proposed Mitigation	TCRCP Significance After Mitigation
	substantially change the exposure of fish and birds to selenium in the sea, in general. Therefore, the Proposed Project would have no effect on exposure of fish and birds to selenium in the Salton Sea.				
BR – 48: Reduced sea elevation could affect colonial nest/roost sites	Herons and egrets, along with other species, nest in communal rookeries in trees, large shrubs, and snags around the Salton Sea. In general, these rookeries are found over water or in trees in marshes or on islands. However, they also occur over land. Like the nesting/roosting islands and islets described, snags probably are in only a few feet of water. As with the nesting/roosting islands, these snags would connect to the mainland under both the Proposed Project and the Baseline, occurring up to 7 years earlier under the Proposed Project. Because of the small temporal difference in the snags connecting to the mainland, and considering that herons and egrets nest and roost in snags that are not surrounded by water, the Proposed Project would not significantly affect communal rookeries in snags or trees at the Salton Sea.	Less than significant	The temporary short-term (3 years) reduction of flows in drains may accelerate the reduction in sea elevation, but would not alter the long term predictions of the Salton Sea elevation resulting from the long-term (up to 75 years) reductions posed by the QSA.	N/A	Less than significant
BR – 49: Reduced sea elevation could affect the availability of mudflat and shallow water habitat	No Mitigation. Under both the Proposed Project and Baseline, shallow water/mudflat habitat could be lost or reduced as the Sea recedes, but under both alternatives, new areas of shallow water/mudflat habitat also would be created as the Sea recedes. Because the magnitude and likelihood of changes in the amount and characteristics of shallow water/mudflat habitat, either positively or negatively, would not differ substantially between the Proposed Project and the Baseline, the Proposed Project would not significantly affect the availability of shallow water/mudflat habitat.	Less than significant	The temporary short-term (3 years) reduction of flows in drains may accelerate the reduction in sea elevation, but would not alter the long term predictions of the Salton Sea elevation resulting from the long-term (up to 75 years) reductions posed by the QSA.	N/A	Less than significant
BR – 50: Water quality changes could increase the incidence of avian disease outbreaks	No Mitigation. The links between lake enrichment, productivity, and bird disease are weak and ill-defined. Nevertheless, conditions contributing to avian disease outbreaks would persist under both the Baseline and Proposed Project. Relative to the Baseline, the Proposed Project would likely reduce phosphorus and sediment-associated loading, but nitrate loading would increase along with dissolved constituents in general. It is unknown what such a change in the mix of nutrient loads would have on lake productivity. Regardless, the lake is already highly eutrophic, and trophic states are not quantitatively linked to avian disease. As a result, a change in the mix of nutrient loading under the Proposed Project is not expected to increase the incidence of avian disease.	No impact	The temporary short-term (3 years) reduction of flows in drains would not alter the long term predictions of the Salton Sea water quality resulting from the long-term (up to 75 years) reductions posed by the QSA.	N/A	No impact
BR – 51: Increased salinity could isolate drains supporting desert pupfish	Desert pupfish have a high salinity tolerance. Using 90 g/L as the threshold for when pupfish could no longer move among drains via the Salton Sea (Salton Sea Science Subcommittee 1999), the salinity projections for the Baseline show that salinity of the Sea would not exceed 90 g/L in 75 years. Under the Proposed Project, with conservation of 300 KAFY the salinity of the Sea would exceed 90 g/L in 2022. At this salinity, the Sea could become intolerable to pupfish and prevent them from moving among drains. If the Sea becomes a barrier to pupfish, pupfish could be isolated in individual drains. Small, isolated populations are at risk of extinction because of environmental and genetic stochasticity. Ultimately, this condition also would occur under the Baseline, but at a later time. However, because of the large difference in when pupfish populations could be isolated between the Baseline and Proposed Project, this is a potentially significant impact of the water conservation and transfer component of the Proposed Project. However, implementation of the HCP component of the Proposed Project would reduce this impact to less than significant. Habitat Conservation Plan (Salton Sea Portion) • The Salton Sea Conservation Strategy of the HCP has several components to address potential impacts to biological resources at the Salton Sea. The strategy generally consists of measures to address the following: • Effects to piscivorous birds from an accelerated decline in fish abundance • Effects to nesting/roosting sites from an accelerated decline in water surface elevation • Effects to species associated with tamarisk scrub from greater magnitude and rate of decline in water surface elevation • Effects to pupfish from accelerated increase in salinity levels **Approach 2 from QSA was implemented:** <u>HCP (Salton Sea Portion) Approach 2: Use of Conserved Water as Mitigation</u> Under Approach 2, IID would conserve additional water (beyond that required for transfer) and use it as mitigation water to offset the inflow reduction to the Salton Sea. In this way, IID would avoid any changes in inflow to the Sea from conservation and transfer of water. Thus, changes in the salinity, surface elevation, and surface area of the Sea under Approach 2	Less than significant with implementation of the HCP Note: IID implemented Approach 2 instead of Approach 1, as detailed in the QSA. HCP1-BR-52 through 55 were not implemented following completion of the QSA EIR/EIS.	The temporary short-term (3 years) reduction of flows in drains would not degrade water quality compared to the long-term (up to 75 years) reductions posed by the QSA. Increased salinity may accelerate during the short-term (3 years) period of reduced flows but would not result in increased salinity compared to long term impacts identified in the EIR/EIS. This impact does not apply to the Proposed Action	N/A	Less than significant

QSA EIR Impacts	QSA EIR Mitigation	QSA EIR Significance after Mitigation	DRAFT Proposed Action - Impacts	Proposed Mitigation	TCRCP Significance After Mitigation
	would be the same as the No Project alternative. The response of biological resources to change in salinity and surface elevation would be the same as described for the No Project alternative. By avoiding changes in inflow to the Sea from water conservation, this approach would avoid impacts to biological resources of the Sea.				
HCP1-BR – 52: Maintenance of fish resources would benefit piscivorous birds	Under the Baseline, the abundance of tilapia is expected to decline in about 2023, when the salinity of the Sea is projected to exceed 60 g/L. At this point, as described previously under Impact BR – 46, use of the Salton Sea by piscivorous birds would be expected to decline. As noted, tilapia have been collected at a salinity as high as 120 g/L. Assuming that fish could be successfully stocked until the salinity of the Sea surpasses 120 g/L. Approach 1 could maintain tilapia (and therefore use by piscivorous birds) at the Salton Sea until about 2032, about 10 years longer than under the Baseline. Following the stocking program, IID would construct ponds to continue to provide fish. The ponds would be maintained through the end of the permit term unless a long-term restoration project was implemented. In combination with the fish hatchery, Approach 1 would provide certainty that foraging opportunities would be available at the Sea for 75 years. In contrast, under the Baseline, by the end of the 75-year period, the salinity is projected to be about 86 g/L, and with few fish expected to persist, use of the Salton Sea by piscivorous birds likely would be minimal. Implementation of Approach 1 would ensure that foraging habitat was available throughout the 75-year permit term and benefit piscivorous birds (beneficial impact). The HCP contains a species-by-species evaluation of the effects of Approach 1 on species proposed for coverage under the HCP.	Note: IID implemented Approach 2 instead of Approach 1, as detailed in the QSA. HCP1-BR-52 through 55 were not implemented following completion of the QSA EIR/EIS	This impact does not apply to the Proposed Action	N/A	N/A
HCP1-BR – 53: Creation of nesting/roosting islands would benefit Gull-billed Terns and Black skimmers	Under the Baseline, islands currently used by black skimmers, gull-billed terns, and other colonial birds are projected to become connected to the mainland by 2015. The islands created under Approach 1 would be located so they would not become connected to the mainland. Therefore, they would be available to black skimmers, gull-billed terns, and other birds for a longer period of time than under the Baseline, benefiting these species.	Note: IID implemented Approach 2 instead of Approach 1, as detailed in the QSA. HCP1-BR-52 through 55 were not implemented following completion of the QSA EIR/EIS	This impact does not apply to the Proposed Action	N/A	N/A
HCP1-BR – 54: Creation of native tree habitat could benefit wildlife associated with Tamarisk Scrub	Tamarisk scrub is poor quality habitat, and most of the species associated with tamarisk scrub in the Proposed Project area find optimal habitat in native riparian communities or mesquite bosque. By compensating for net loss in tamarisk scrub with native tree habitat, species associated with tamarisk scrub would benefit from the higher habitat quality of the replacement habitat.	Note: IID implemented Approach 2 instead of Approach 1, as detailed in the QSA. HCP1-BR-52 through 55 were not implemented following completion of the QSA EIR/EIS	This impact does not apply to the Proposed Action	N/A	N/A
HCP1-BR – 55: Maintenance of population connectivity would benefit desert pupfish	To avoid the potential for isolating pupfish populations in the drains, under the HCP, IID would ensure continued genetic exchange among populations. When the salinity of the Salton Sea reaches 90 g/L (or lower as determined by the HCP Implementation Team), IID would implement actions agreed to by USFWS and CDFG to ensure genetic interchange among the pupfish populations in the drains. In addition to ensuring connectivity among pupfish populations, IID would contribute to the recovery of desert pupfish by constructing and managing a Tier 3 refugium pond to support a population of pupfish consistent with the goals of the Desert Pupfish Recovery Plan (Marsh and Sada 1993). This pond would increase the overall desert pupfish population and decrease the risk of loss of genetic diversity and extinction.	Note: IID implemented Approach 2 instead of Approach 1, as detailed in the QSA. HCP1-BR-52 through 55 were not implemented following completion of the QSA EIR/EIS	This impact does not apply to the Proposed Action	N/A	N/A

Appendix HYDRO-1
Flow Statistics Tables

Under the Proposed Action, IID will reduce diversions up to 300,000 acre feet (AF)/year from the Colorado River for a period of three years resulting in a maximum 900,000 AF of conserved water. The effect of the Proposed Action on the flow of water in the LCR and within the IID service area was evaluated as an average flow reduction, evenly applied both spatially and temporally. Monthly variability in discharge to the Salton Sea in the IID drain network under existing conditions was analyzed and compared to the Proposed Action for each drain.

IID's diversions from the Lower Colorado River have been decreasing since the implementation of the QSA in 2002 as shown in Table H1-1. An annual diversion of 2.535 MAF is assumed in this analysis as the existing average flow volume through the IID system. This volume is the same assumption used for DWR's SSAM and the Long Range Plan (DWR, 2022). The annual proportional reduction in diversions to IID using the Proposed annual reduction of 300 TAF divided by 2.535 MAF is 11.9 percent. To characterize the magnitude of monthly diversions to IID, the mean monthly and annual diversion volumes were calculated for the years 2000 through 2020 and re-scaled by the ratio of the 22-year annual average of 2.753 MAF and 2.535 MAF (**Table H1-1** and **Figure H1-1**). The mean monthly diversion volumes were then converted to mean daily diversion rates in cfs for existing conditions. The estimated mean daily diversion rate under the Proposed Action for each month was calculated by subtracting 414 cfs from the existing conditions mean daily mean diversion rate (**Table H1-2**). As a check, the diversion rate-weighted mean was calculated and was found to be 11.9 percent, which is in accord with the proportion of the Proposed annual reduction. The results are summarized in Table H1-2.

Estimates of the reduction in monthly drain flow to the Salton Sea were made by applying the monthly proportional reduction in Table H1-2 of the Proposed diversion reductions to mean monthly drain flow for the 2017 to 2023 period (Table H1-3). The standard deviation of monthly drain flow in AF was calculated for existing conditions and under the Proposed Action. In this way, the relative magnitude of drain discharge variability under existing conditions was compared to the magnitude of the effect of flow reduction under the Proposed Action. The effect of the Proposed Action would reduce flows by approximately 11.9 percent on annual basis. However, since a proportional reduction in discharge was applied to each monthly drain discharge, the relative effect of the Proposed Action is highest in those months with the least flow. For instance, the effect of flow reduction in the IID drainage network is lower in months with high runoff (April through September) and highest in months with lower runoff (October through March).

This average monthly flow reduction would be well within the standard deviation of historic (last five years) drainage flows for every drain. That is to say, impacts of the flow reduction would not significantly alter the pattern of flow variability for every drain. During any month of the year under existing conditions, drain flows vary significantly more than the 11.9 percent increment estimated to be the effect of the Proposed Action.

TABLE H1-1

U.S. BUREAU OF RECLAMATION COLORADO RIVER MONTHLY DIVERSIONS (AF) TO IMPERIAL IRRIGATION DISTRICT FOR YEARS 2000 TO 2022

Colorado River Monthly Diversions (AF) to Imperial Irrigation District													
Year	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**	**Total**
2000	159,534	179,174	283,818	352,066	362,321	332,461	352,379	305,213	179,293	145,911	179,311	145,975	2,977,456
2001	125,766	167,868	221,562	342,406	371,484	339,109	370,894	340,093	293,193	265,665	198,881	154,005	3,190,927
2002	153,082	192,273	277,049	332,514	360,734	333,917	377,089	341,232	272,637	257,724	187,775	143,876	3,230,252
2003	162,274	126,025	278,351	336,869	339,641	319,043	341,347	293,460	265,472	270,714	178,927	154,238	3,066,361
2004	141,009	142,098	266,314	296,357	331,689	321,012	325,220	299,970	254,353	200,251	142,698	101,823	2,822,794
2005	107,626	92,107	264,840	319,404	340,457	318,711	339,173	264,213	265,738	216,677	187,354	144,226	2,860,526
2006	155,181	177,064	236,042	299,375	342,111	316,698	326,189	302,081	265,331	244,800	176,117	153,336	2,994,325
2007	157,668	174,743	287,839	317,642	333,477	310,384	339,390	290,303	249,979	230,433	149,390	11,278	2,952,526
2008	121,090	179,039	302,559	354,756	326,038	294,192	324,639	288,199	234,857	221,274	164,539	107,926	2,919,108
2009	149,728	138,256	291,539	318,877	284,424	254,593	271,045	249,091	215,700	228,542	159,637	119,923	2,679,356
2010	87,028	103,002	245,534	291,276	321,872	282,699	311,096	274,205	245,160	186,780	169,938	122,179	2,640,769
2011	148,868	131,536	271,913	317,419	317,743	305,923	333,956	303,172	243,663	240,458	159,160	125,542	2,899,353
2012	146,018	175,122	282,788	332,230	334,585	316,965	303,373	244,271	240,452	243,470	166,409	111,919	2,897,602
2013	128,295	138,943	246,298	291,516	294,139	276,919	265,914	222,207	184,563	224,741	142,898	119,019	2,535,452
2014	112,654	147,221	240,771	267,407	300,923	283,010	291,138	215,476	199,711	192,825	153,596	91,696	2,496,428
2015	114,944	149,559	225,000	273,215	218,767	256,347	248,279	241,971	205,432	217,581	174,857	129,697	2,455,649
2016	84,186	168,966	241,342	242,006	275,253	280,128	254,111	235,997	198,192	203,110	156,965	121,306	2,461,562
2017	58,392	127,709	245,589	268,744	283,328	279,141	261,534	228,921	215,151	229,926	156,229	133,951	2,488,615
2018	123,031	165,030	222,166	281,155	298,009	279,935	258,328	242,009	205,137	210,785	150,338	79,292	2,515,215
2019	89,225	120,375	225,344	273,787	312,564	289,701	293,201	275,510	227,562	220,660	123,027	78,841	2,529,797
2020	110,253	133,835	147,400	236,304	327,819	288,291	277,937	244,294	216,451	220,493	158,613	125,686	2,487,376
2021	92,643	144,715	253,897	290,313	301,824	287,866	283,947	255,113	215,127	212,376	150,661	129,428	2,617,910
2022	125,484	173,712	268,163	302,782	326,101	290,967	258,839	211,687	169,125	190,311	163,413	132,451	2,613,035
Average:	124,086	149,929	253,309	301,670	317,622	298,174	304,740	268,204	228,795	220,674	163,075	119,027	2,753,582

Source: Colorado River Accounting and Water Use Report: Arizona, California, and Nevada for years 2000 through 2022. Available at https://www.usbr.gov/lc/region/g4000/wtracct.html

TABLE H1-2

ESTIMATED EXISTING CONDITIONS AND PROPOSED ACTION COLORADO RIVER MONTHLY USBR DIVERSION RATES (CFS) TO IID

Month	Existing Diversion (cfs)	Proposed Diversion (cfs)	Proposed Monthly Reduction (cfs)	Percent Reduction
January	1,857.9	1,443.5	414.4	22.3%
February	2,485.3	2,070.9	414.4	16.7%
March	3,792.7	3,378.3	414.4	10.9%
April	4,667.3	4,252.9	414.4	8.9%
May	4,755.6	4,341.2	414.4	8.7%
June	4,613.2	4,198.8	414.4	9.0%
July	4,562.7	4,148.3	414.4	9.1%
August	4,015.7	3,601.3	414.4	10.3%
September	3,539.8	3,125.4	414.4	11.7%
October	3,304.0	2,889.6	414.4	12.5%
November	2,523.0	2,108.6	414.4	16.4%
December	1,782.1	1,367.7	414.4	23.3%
				Weighted Mean: 11.9%

Source: ESA analysis of Colorado River Accounting and Water Use Report: Arizona, California, and Nevada for years 2000 through 2022. Available at https://www.usbr.gov/lc/region/g4000/wtracct.html

FIGURE H1-1. ESTIMATED EXISTING CONDITIONS AND PROPOSED ACTION COLORADO RIVER MONTHLY USBR DIVERSION RATES (CFS) TO IID

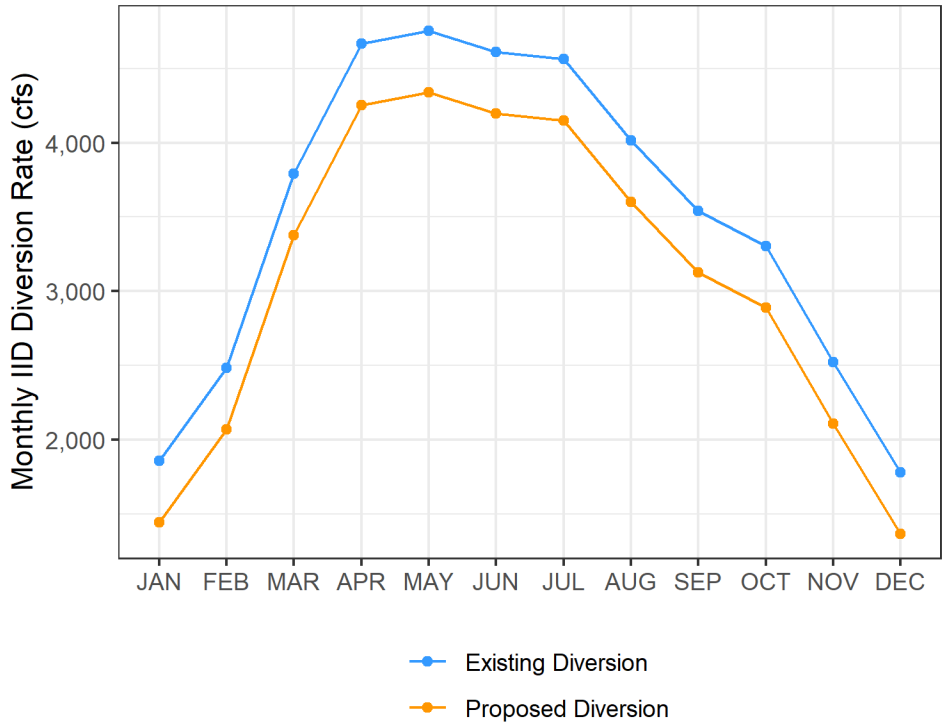

TABLE H1-3

SUMMARY OF MONTHLY MEAN IID DRAIN DISCHARGE (AF) FOR EXISTING CONDITIONS AND DRAIN DISCHARGE REDUCTION (AF) UNDER THE PROPOSED ACTION. THE STANDARD DEVIATION (SD) OF THE MEAN MONTHLY IID DRAIN DISCHARGE THE PROPOSED ACTION MONTHLY FLOW REDUCTION ARE ALSO PRESENTED

Drain	Month	Existing Mean Monthly AF	Proposed Mean Monthly AF	Existing Mean Monthly SD	Proposed Mean Reduction AF
Niland Drain 1	1	29.3	24.9	17.8	4.4
Niland Drain 1	2	20.9	16.9	15.2	4.0
Niland Drain 1	3	61.3	56.9	61.3	4.4
Niland Drain 1	4	38.0	33.7	21.0	4.3
Niland Drain 1	5	29.2	24.8	21.9	4.4
Niland Drain 1	6	46.6	42.3	39.0	4.3
Niland Drain 1	7	53.2	48.8	46.4	4.4
Niland Drain 1	8	32.8	28.4	16.6	4.4
Niland Drain 1	9	40.5	36.3	20.6	4.3
Niland Drain 1	10	34.6	30.2	29.2	4.4
Niland Drain 1	11	21.6	17.3	11.2	4.3
Niland Drain 1	12	29.7	25.2	8.1	4.4
Niland Drain 2	1	35.8	24.2	15.2	11.7
Niland Drain 2	2	42.8	32.3	17.7	10.5
Niland Drain 2	3	65.0	53.4	50.3	11.7
Niland Drain 2	4	91.7	80.4	56.1	11.3
Niland Drain 2	5	121.8	110.2	85.1	11.7
Niland Drain 2	6	165.9	154.6	69.3	11.3
Niland Drain 2	7	168.0	156.4	39.9	11.7
Niland Drain 2	8	144.0	132.3	52.0	11.7
Niland Drain 2	9	121.4	110.1	36.3	11.3
Niland Drain 2	10	103.3	91.6	60.4	11.7
Niland Drain 2	11	63.1	51.8	24.6	11.3
Niland Drain 2	12	35.8	24.2	10.6	11.7
Niland Drain 3	1	13.8	10.1	16.4	3.7
Niland Drain 3	2	30.6	27.3	13.0	3.4
Niland Drain 3	3	29.7	26.0	17.6	3.7
Niland Drain 3	4	35.3	31.7	34.8	3.6
Niland Drain 3	5	30.0	26.2	24.7	3.7
Niland Drain 3	6	37.6	34.0	27.1	3.6
Niland Drain 3	7	48.9	45.2	49.8	3.7
Niland Drain 3	8	44.4	40.7	31.7	3.7
Niland Drain 3	9	41.1	37.5	36.7	3.6
Niland Drain 3	10	30.4	26.6	27.9	3.7
Niland Drain 3	11	19.4	15.8	16.7	3.6
Niland Drain 3	12	9.5	5.7	7.2	3.7

Drain	Month	Existing Mean Monthly AF	Proposed Mean Monthly AF	Existing Mean Monthly SD	Proposed Mean Reduction AF
Niland Drain 4	1	18.6	15.2	21.2	3.4
Niland Drain 4	2	20.1	17.0	10.9	3.1
Niland Drain 4	3	26.7	23.2	15.4	3.4
Niland Drain 4	4	28.9	25.5	19.7	3.3
Niland Drain 4	5	18.8	15.4	28.7	3.4
Niland Drain 4	6	20.9	17.6	17.3	3.3
Niland Drain 4	7	33.4	30.0	35.9	3.4
Niland Drain 4	8	35.5	32.1	46.4	3.4
Niland Drain 4	9	54.7	51.4	71.6	3.3
Niland Drain 4	10	46.0	42.6	45.4	3.4
Niland Drain 4	11	18.5	15.1	7.2	3.3
Niland Drain 4	12	19.5	16.0	22.3	3.4
O Drain	1	444.0	376.7	153.0	67.4
O Drain	2	403.7	342.9	119.6	60.8
O Drain	3	641.6	574.2	152.0	67.4
O Drain	4	633.4	568.2	210.8	65.2
O Drain	5	624.3	557.0	126.1	67.4
O Drain	6	625.3	560.1	210.5	65.2
O Drain	7	663.1	595.8	345.0	67.4
O Drain	8	715.9	648.5	359.8	67.4
O Drain	9	597.2	532.0	259.0	65.2
O Drain	10	429.0	361.6	221.8	67.4
O Drain	11	431.3	366.1	138.1	65.2
O Drain	12	474.1	406.7	165.3	67.4
P Drain	1	176.6	134.8	100.6	41.8
P Drain	2	278.8	241.1	71.2	37.8
P Drain	3	368.1	326.3	82.7	41.8
P Drain	4	447.9	407.5	174.0	40.4
P Drain	5	474.6	432.8	82.3	41.8
P Drain	6	534.4	494.0	83.2	40.4
P Drain	7	502.1	460.3	85.4	41.8
P Drain	8	399.2	357.4	96.1	41.8
P Drain	9	303.7	263.3	92.5	40.4
P Drain	10	202.9	161.1	161.1	41.8
P Drain	11	260.0	219.6	160.6	40.4
P Drain	12	198.9	157.1	73.3	41.8
Pumice Drain	1	497.8	424.1	630.4	73.7
Pumice Drain	2	440.4	373.9	596.2	66.6
Pumice Drain	3	671.4	597.7	900.7	73.7

Drain	Month	Existing Mean Monthly AF	Proposed Mean Monthly AF	Existing Mean Monthly SD	Proposed Mean Reduction AF
Pumice Drain	4	622.8	551.4	1057.1	71.3
Pumice Drain	5	547.6	473.9	855.4	73.7
Pumice Drain	6	632.0	560.7	791.9	71.3
Pumice Drain	7	647.7	574.0	826.4	73.7
Pumice Drain	8	489.0	415.3	628.4	73.7
Pumice Drain	9	540.8	469.5	715.8	71.3
Pumice Drain	10	790.4	716.7	1075.0	73.7
Pumice Drain	11	806.9	735.5	972.1	71.3
Pumice Drain	12	626.2	552.5	744.0	73.7
Q Drain	1	134.2	109.4	82.9	24.8
Q Drain	2	122.5	100.2	82.1	22.4
Q Drain	3	182.2	157.4	71.5	24.8
Q Drain	4	230.4	206.4	61.0	24.0
Q Drain	5	299.9	275.1	154.6	24.8
Q Drain	6	281.0	257.0	112.6	24.0
Q Drain	7	311.1	286.3	123.0	24.8
Q Drain	8	244.5	219.7	88.3	24.8
Q Drain	9	226.9	202.9	105.6	24.0
Q Drain	10	153.0	128.2	134.3	24.8
Q Drain	11	142.6	118.6	59.5	24.0
Q Drain	12	130.9	106.1	46.5	24.8
R Drain	1	114.1	82.7	26.0	31.4
R Drain	2	134.8	106.5	49.4	28.4
R Drain	3	255.8	224.4	106.8	31.4
R Drain	4	264.9	234.5	120.4	30.4
R Drain	5	413.9	382.5	121.3	31.4
R Drain	6	331.5	301.2	67.6	30.4
R Drain	7	301.5	270.1	111.0	31.4
R Drain	8	391.1	359.7	175.0	31.4
R Drain	9	399.1	368.7	253.3	30.4
R Drain	10	254.4	223.0	174.8	31.4
R Drain	11	125.0	94.6	74.1	30.4
R Drain	12	129.1	97.7	32.3	31.4
S Drain	1	134.3	116.6	99.2	17.6
S Drain	2	122.7	106.8	88.2	15.9
S Drain	3	157.5	139.9	47.8	17.6
S Drain	4	133.4	116.3	43.3	17.1
S Drain	5	211.8	194.2	81.7	17.6
S Drain	6	185.6	168.6	56.9	17.1

Drain	Month	Existing Mean Monthly AF	Proposed Mean Monthly AF	Existing Mean Monthly SD	Proposed Mean Reduction AF
S Drain	7	179.0	161.4	58.1	17.6
S Drain	8	193.9	176.2	38.1	17.6
S Drain	9	143.7	126.7	54.3	17.1
S Drain	10	97.9	80.2	58.3	17.6
S Drain	11	86.1	69.0	60.4	17.1
S Drain	12	102.8	85.2	87.5	17.6
San Felipe Wash	1	167.9	154.1	113.6	13.7
San Felipe Wash	2	107.8	95.4	64.6	12.4
San Felipe Wash	3	106.8	93.1	60.7	13.7
San Felipe Wash	4	58.0	44.7	22.5	13.3
San Felipe Wash	5	37.7	24.0	25.4	13.7
San Felipe Wash	6	54.1	40.8	45.2	13.3
San Felipe Wash	7	90.3	76.5	52.5	13.7
San Felipe Wash	8	113.7	99.9	69.4	13.7
San Felipe Wash	9	119.6	106.3	79.8	13.3
San Felipe Wash	10	123.1	109.4	96.2	13.7
San Felipe Wash	11	175.6	162.3	107.2	13.3
San Felipe Wash	12	208.7	194.9	169.7	13.7
T Drain	1	318.6	293.9	101.6	24.6
T Drain	2	296.1	273.9	96.4	22.2
T Drain	3	224.6	200.0	125.5	24.6
T Drain	4	194.0	170.2	46.9	23.8
T Drain	5	236.0	211.3	92.6	24.6
T Drain	6	194.1	170.3	86.4	23.8
T Drain	7	172.1	147.5	52.7	24.6
T Drain	8	143.0	118.4	97.7	24.6
T Drain	9	96.6	72.8	53.8	23.8
T Drain	10	99.1	74.5	93.6	24.6
T Drain	11	237.5	213.7	155.5	23.8
T Drain	12	230.1	205.5	83.4	24.6
Trifolium 1 Drain	1	1560.4	1417.7	1567.1	142.7
Trifolium 1 Drain	2	1141.2	1012.3	1112.0	128.9
Trifolium 1 Drain	3	1313.9	1171.1	1180.1	142.7
Trifolium 1 Drain	4	1184.7	1046.5	837.5	138.1
Trifolium 1 Drain	5	847.0	704.2	867.2	142.7
Trifolium 1 Drain	6	866.7	728.6	772.0	138.1
Trifolium 1 Drain	7	858.1	715.3	751.7	142.7
Trifolium 1 Drain	8	913.0	770.2	794.0	142.7
Trifolium 1 Drain	9	801.6	663.4	918.6	138.1

Drain	Month	Existing Mean Monthly AF	Proposed Mean Monthly AF	Existing Mean Monthly SD	Proposed Mean Reduction AF
Trifolium 1 Drain	10	1269.3	1126.6	1372.0	142.7
Trifolium 1 Drain	11	1810.1	1671.9	1790.5	138.1
Trifolium 1 Drain	12	1596.9	1454.2	1679.4	142.7
Trifolium 12 Drain	1	214.0	159.2	104.7	54.8
Trifolium 12 Drain	2	375.2	325.7	104.8	49.5
Trifolium 12 Drain	3	605.4	550.7	244.5	54.8
Trifolium 12 Drain	4	598.4	545.4	164.5	53.0
Trifolium 12 Drain	5	523.7	468.9	93.7	54.8
Trifolium 12 Drain	6	425.3	372.3	79.4	53.0
Trifolium 12 Drain	7	502.0	447.2	63.0	54.8
Trifolium 12 Drain	8	465.3	410.5	79.9	54.8
Trifolium 12 Drain	9	454.9	401.9	84.4	53.0
Trifolium 12 Drain	10	663.3	608.5	746.5	54.8
Trifolium 12 Drain	11	334.4	281.4	119.4	53.0
Trifolium 12 Drain	12	273.0	218.2	106.2	54.8
Trifolium 20A Drain	1	43.1	38.1	44.1	5.0
Trifolium 20A Drain	2	29.0	24.5	25.4	4.5
Trifolium 20A Drain	3	39.8	34.8	24.9	5.0
Trifolium 20A Drain	4	45.8	41.0	24.1	4.9
Trifolium 20A Drain	5	42.9	37.9	13.6	5.0
Trifolium 20A Drain	6	51.7	46.8	24.9	4.9
Trifolium 20A Drain	7	64.8	59.8	42.6	5.0
Trifolium 20A Drain	8	59.9	54.8	32.8	5.0
Trifolium 20A Drain	9	49.5	44.7	27.7	4.9
Trifolium 20A Drain	10	28.8	23.7	26.2	5.0
Trifolium 20A Drain	11	21.6	16.7	25.6	4.9
Trifolium 20A Drain	12	20.8	15.8	29.1	5.0
Trifolium 22 Drain	1	239.9	205.4	85.3	34.5
Trifolium 22 Drain	2	264.2	233.1	57.2	31.2
Trifolium 22 Drain	3	651.6	617.1	306.6	34.5
Trifolium 22 Drain	4	506.5	473.1	81.3	33.4
Trifolium 22 Drain	5	206.0	171.5	70.1	34.5
Trifolium 22 Drain	6	162.0	128.6	85.1	33.4
Trifolium 22 Drain	7	226.6	192.1	84.0	34.5
Trifolium 22 Drain	8	248.4	213.9	81.1	34.5
Trifolium 22 Drain	9	179.0	145.6	63.8	33.4
Trifolium 22 Drain	10	219.4	184.9	114.4	34.5
Trifolium 22 Drain	11	258.0	224.6	58.4	33.4
Trifolium 22 Drain	12	260.6	226.1	70.5	34.5

Drain	Month	Existing Mean Monthly AF	Proposed Mean Monthly AF	Existing Mean Monthly SD	Proposed Mean Reduction AF
Trifolium 23 Drain	1	228.3	194.1	97.8	34.2
Trifolium 23 Drain	2	245.9	215.0	80.1	30.9
Trifolium 23 Drain	3	339.9	305.7	97.3	34.2
Trifolium 23 Drain	4	314.2	281.1	90.4	33.1
Trifolium 23 Drain	5	247.5	213.3	60.5	34.2
Trifolium 23 Drain	6	239.9	206.8	121.1	33.1
Trifolium 23 Drain	7	347.3	313.1	215.2	34.2
Trifolium 23 Drain	8	257.1	222.9	117.2	34.2
Trifolium 23 Drain	9	308.8	275.7	106.9	33.1
Trifolium 23 Drain	10	312.1	277.9	171.3	34.2
Trifolium 23 Drain	11	302.4	269.3	165.6	33.1
Trifolium 23 Drain	12	250.4	216.2	127.8	34.2
U Drain	1	231.5	216.7	168.6	14.8
U Drain	2	189.0	175.6	102.4	13.4
U Drain	3	127.2	112.4	78.7	14.8
U Drain	4	98.0	83.7	39.4	14.3
U Drain	5	72.4	57.6	36.2	14.8
U Drain	6	55.5	41.2	19.8	14.3
U Drain	7	56.3	41.5	19.3	14.8
U Drain	8	79.2	64.4	29.2	14.8
U Drain	9	98.1	83.7	59.1	14.3
U Drain	10	83.8	69.0	90.3	14.8
U Drain	11	162.1	147.8	147.2	14.3
U Drain	12	215.3	200.5	140.6	14.8
W+Y Drain	1	38.2	16.7	48.6	21.5
W+Y Drain	2	67.0	47.6	78.8	19.4
W+Y Drain	3	140.6	119.1	126.7	21.5
W+Y Drain	4	179.7	158.9	156.2	20.8
W+Y Drain	5	241.5	220.0	171.7	21.5
W+Y Drain	6	353.3	332.5	225.0	20.8
W+Y Drain	7	328.0	306.5	214.1	21.5
W+Y Drain	8	224.1	202.6	205.3	21.5
W+Y Drain	9	219.0	198.2	233.1	20.8
W+Y Drain	10	177.3	155.8	155.0	21.5
W+Y Drain	11	100.5	79.7	94.3	20.8
W+Y Drain	12	64.7	43.1	51.2	21.5
Z Drain	1	216.7	175.0	230.7	41.7
Z Drain	2	220.5	182.8	202.0	37.6
Z Drain	3	249.9	208.3	130.1	41.7

Drain	Month	Existing Mean Monthly AF	Proposed Mean Monthly AF	Existing Mean Monthly SD	Proposed Mean Reduction AF
Z Drain	4	279.3	239.0	49.6	40.3
Z Drain	5	341.7	300.0	94.9	41.7
Z Drain	6	446.2	405.9	88.9	40.3
Z Drain	7	499.2	457.5	98.9	41.7
Z Drain	8	404.4	362.7	120.0	41.7
Z Drain	9	382.4	342.0	64.2	40.3
Z Drain	10	272.5	230.8	165.3	41.7
Z Drain	11	516.4	476.1	706.5	40.3
Z Drain	12	304.9	263.2	333.0	41.7

Appendix HYDRO-2
Playa Evaporation Assessment

PLAYA EVAPORATION ASSESSMENT

Hydrology / Water Quality

An analysis was conducted to estimate evapotranspiration (ET) demand for the natural communities mapped along the exposed Salton Sea playa that are fed by IID drain flows. Species dominance within each natural community was used to create representative ET values. ET demand in AF were calculated for several representative areas of the exposed playa where drain data was available (**Figure H2-1**). Six land cover types were not treated as channel-fed vegetation and were excluded from the ET analysis: these were agriculture, barren land, developed land, disturbed land, salt-panne, and the unvegetated channel/ditch beds. Evapotranspiration was calculated by using meteorological data to estimate the evapotranspiration rate for a reference cover, E_{to}, (an irrigated grass surface) and applying a crop adjustment factor, K_v, to yield an estimated rate for the target vegetation type, E_{tv}. Crop adjustment factors have been calculated for a range of commercial crops and some native vegetation types (e.g., cattail marsh and willow-cottonwood forest), but were not available for all the covers present in the Action Area. Where no crop adjustment factors were available, a comparable vegetation type was substituted. For example, Tamarisk Thickets were modeled as large stand riparian, while Iodine Bush-Bush Seepweed Scrub were modeled as large stand permanent wetlands (**Table H2-1**). Monthly and annual reference cover E_{t0} rates were obtained from the California Irrigation Management Information System (CIMIS) meteorological station 41 at Calipatria, in the center of the Action Area and transformed to average ET in AF for each vegetation type in the Action Area (**Table H2-2**). Multiplying the average ET in AF for each vegetation type by the acreage of each mapped natural community polygon yields monthly estimate of ET demand (**Table H2-3**).

The drain data consisted of mean monthly flows in AF (see Appendix HYDRO-1) in 24 of the 29 IID drains with flow recorders that flow to the Salton Sea. Five aggregated natural community polygons were created (groups): three locations on the west shore where spatially adjacent natural communities were clearly supplied drain water from a single source were each aggregated, and two locations on the east shore where spatial adjacent natural communities were fed by multiple drains. In the latter case, monthly drain data were also aggregated for the analysis.

The analysis compared estimated ET demands of the existing mapped vegetation with the volume of flows from the drains, attempting to compare water demand with water availability. The analysis assumes that ET values are evenly distributed within each vegetation polygon. Actual conditions show this to be a conservative assumption because most polygons show a heterogenous mix of healthy and stressed vegetation. Similarly, the analysis assumes that the flow application is evenly distributed within the vegetation polygon. This is a conservative assumption because aerial images show that flows are directed in channels that meander and change over time, conveying some flow directly to the Sea.

Monthly and annual ET demand and drain flow volumes were compared under existing conditions to the Proposed Action conditions (**Table H2-4** and **Table H2-5**). The comparison shows that under existing conditions, there are some months in three of the five vegetation drain groups where ET demand is greater than the supply of drain water (values in red shown in Table H2-4) In the month of June, the East Drains, Elmore Lake Spill to San Felipe Wash, and the Trifolium 22 Drain groups show a deficit of drain flows. Elmore Lake Spill to San Felipe Wash show a deficit in June and July. Moreover, in the east drains the deficit spanned May through November. However, on an annual basis all the groups show a surplus of drain flows. A similar pattern for the water balance was found under the Proposed Action conditions (Table H2-6), except that the deficit during the summer months was greater. In the East Drains the span of months with a deficit was the same as for existing conditions. In addition, the span of deficit in the Pumice Drain and the Trifolium 22 Drain included the month of July. However, overall, there was not a deficit of drain flows on an annual basis due to the Proposed Action.

TABLE H2-1
NATURAL COMMUNITIES AND LAND COVER TYPES ALONG THE SALTON SEA IN THE IID ACTION AREA

Natural Community	ET Vegetation Type
Arrow Weed-Bush Seepweed Thickets/Scrub	Large stand riparian
Arrow Weed-BushSeepweed Thickets/Scrub	large stand riparian
Bush Seepweed Scrub	large stand permanent wetland
Cattail Marsh	large stand permanent wetland
Cattail-Common Reed Marsh	large stand permanent wetland
Common Reed Marsh	large stand permanent wetland
Iodine Bush Scrub	large stand riparian
Iodine Bush-Bush Seepweed Scrub	large stand permanent wetland
Iodine Bush-Cattail Scrub/Marsh	large stand permanent wetland
Tamarisk Thickets	large stand riparian
Tamarisk-Allscale Thickets/Scrub	large stand riparian
Tamarisk-Arrow Weed Thickets	large stand riparian
Tamarisk-Arrow Weed-Bush Seepweed Thickets/Scrub	large stand permanent wetland
Tamarisk-Arrow Weed-Iodine Bush Thickets/Scrub	large stand riparian
Tamarisk-Arrow Weed-Quailbush Thickets/Scrub	large stand riparian
Tamarisk-Bush Seepweed Thickets/Scrub	large stand permanent wetland
Tamarisk-Cattail Thickets/Marsh	large stand permanent wetland
Tamarisk-Cattail-Common Reed Thickets/Marsh	large stand permanent wetland
Tamarisk Common Reed Thickets/Marsh	large stand permanent wetland
Tamarisk-Iodine Bush Thickets/Scrub	large stand riparian
Tamarisk-Iodine Bush-Cattail Thickets/Scrub/Marsh	large stand permanent wetland
Tamarisk-Iodine Bush-Common Reed Thickets/Scrub/Marsh	large stand permanent wetland
Tamarisk-Iodine Bush-Quailbush Thickets/Scrub	large stand riparian
Tamarisk-Quailbush Thickets/Scrub	large stand riparian
Tamarisk-Quailbush-Cattail Thickets/Scrub/Marsh	large stand permanent wetland
Tamarisk-Quailbush-Common Reed Thickets/Scrub/Marsh	large stand permanent wetland

SOURCE: ESA

TABLE H2-2
MONTHLY AVERAGE EVAPOTRANSPIRATION (AF) FOR REFERENCE VEGETATION TYPES IN THE IID ACTION AREA.

ET Vegetation type	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Monthly Mean Evapotranspiration (AF)											
Large stand permanent wetland	0.7	0.7	0.8	1	1.05	1.2	1.2	1.2	1.05	1.1	1	0.75
Cottonwood	0.81	0.72	0.61	0.66	0.82	0.94	1.02	1.02	1.07	1.08	0.88	0.89

TABLE H2-3
VEGETATION TYPE, ACREAGE, DRAIN GROUP AND MONTHLY EVAPOTRANSPIRATION FOR MAPPED VEGETATION POLYGONS IN THE IID ACTION AREA.

Natural Community	ET Vegetation type	Acres	Drain Group	Jan ET	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
				Evapotranspiration (AF)											
Tamarisk-Cattail Thickets/Marsh	Large stand permanent wetland	0.5	East Drains	0.1	0.1	0.2	0.3	0.4	0.5	0.5	0.4	0.3	0.2	0.1	0.1
Tamarisk-Iodine Bush-Cattail Thickets/Scrub/Marsh	Large stand permanent wetland	19.8	East Drains	2.9	3.9	7.1	11.5	14.7	17.8	18.2	16.7	11.7	9.1	5.1	2.8
Tamarisk-Iodine Bush Thickets/Scrub	cottonwood	23.3	East Drains	4.0	4.8	6.4	9.0	13.5	16.5	18.2	16.7	14.1	10.6	5.3	3.9
Iodine Bush-Cattail Scrub/Marsh	Large stand permanent wetland	1.9	East Drains	0.3	0.4	0.7	1.1	1.4	1.7	1.8	1.6	1.1	0.9	0.5	0.3
Iodine Bush Scrub	cottonwood	2.0	East Drains	0.3	0.4	0.6	0.8	1.2	1.4	1.6	1.5	1.2	0.9	0.5	0.3
Tamarisk Thickets	cottonwood	0.6	East Drains	0.1	0.1	0.2	0.2	0.3	0.4	0.5	0.4	0.4	0.3	0.1	0.1
Tamarisk-Iodine Bush Thickets/Scrub	cottonwood	252.3	East Drains	43.4	51.5	69.1	97.0	146.5	178.4	196.8	180.7	152.2	114.4	57.1	42.1
Tamarisk-Cattail-Common Reed Thickets/Marsh	Large stand permanent wetland	0.9	East Drains	0.1	0.2	0.3	0.5	0.7	0.8	0.8	0.8	0.5	0.4	0.2	0.1
Tamarisk-Cattail Thickets/Marsh	Large stand permanent wetland	1.6	East Drains	0.2	0.3	0.6	0.9	1.2	1.5	1.5	1.4	1.0	0.7	0.4	0.2
Tamarisk-Iodine Bush Thickets/Scrub	cottonwood	36.2	East Drains	6.2	7.4	9.9	13.9	21.0	25.6	28.3	25.9	21.8	16.4	8.2	6.0
Tamarisk Thickets	cottonwood	424.3	East Drains	72.9	86.7	116.3	163.0	246.4	299.9	330.9	303.8	255.9	192.3	96.0	70.8
Iodine Bush Scrub	cottonwood	12.7	East Drains	2.2	2.6	3.5	4.9	7.4	9.0	9.9	9.1	7.7	5.8	2.9	2.1
Tamarisk-Iodine Bush Thickets/Scrub	cottonwood	63.0	East Drains	10.8	12.9	17.3	24.2	36.6	44.5	49.1	45.1	38.0	28.5	14.2	10.5
Tamarisk-Cattail Thickets/Marsh	Large stand permanent wetland	143.7	East Drains	21.3	28.5	51.7	83.7	106.9	129.7	131.9	121.1	85.1	66.4	37.0	20.2

Natural Community	ET Vegetation type	Acres	Drain Group	Jan ET	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Tamarisk-Cattail-Common Reed Thickets/Marsh	Large stand permanent wetland	2.6	East Drains	0.4	0.5	0.9	1.5	1.9	2.4	2.4	2.2	1.6	1.2	0.7	0.4
Cattail Marsh	Large stand permanent wetland	1.1	East Drains	0.2	0.2	0.4	0.6	0.8	1.0	1.0	0.9	0.6	0.5	0.3	0.2
Tamarisk-Cattail Thickets/Marsh	Large stand permanent wetland	261.5	East Drains	38.8	51.9	94.0	152.3	194.5	236.0	240.0	220.3	154.8	120.8	67.2	36.8
Tamarisk Thickets	cottonwood	10.3	East Drains	1.8	2.1	2.8	4.0	6.0	7.3	8.1	7.4	6.2	4.7	2.3	1.7
Tamarisk Thickets	cottonwood	12.0	East Drains	2.1	2.5	3.3	4.6	7.0	8.5	9.4	8.6	7.3	5.5	2.7	2.0
Tamarisk-Iodine Bush Thickets/Scrub	cottonwood	0.6	East Drains	0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.4	0.3	0.3	0.1	0.1
Tamarisk-Cattail-Common Reed Thickets/Marsh	Large stand permanent wetland	1.4	East Drains	0.2	0.3	0.5	0.8	1.0	1.2	1.3	1.2	0.8	0.6	0.4	0.2
Iodine Bush Scrub	cottonwood	4.6	East Drains	0.8	0.9	1.3	1.8	2.7	3.3	3.6	3.3	2.8	2.1	1.0	0.8
Iodine Bush Scrub	cottonwood	24.5	East Drains	4.2	5.0	6.7	9.4	14.2	17.3	19.1	17.5	14.8	11.1	5.5	4.1
Tamarisk-Iodine Bush Thickets/Scrub	cottonwood	13.7	East Drains	2.4	2.8	3.8	5.3	8.0	9.7	10.7	9.8	8.3	6.2	3.1	2.3
Tamarisk Thickets	cottonwood	2.6	East Drains	0.5	0.5	0.7	1.0	1.5	1.9	2.1	1.9	1.6	1.2	0.6	0.4
Tamarisk-Iodine Bush Thickets/Scrub	cottonwood	823.8	East Drains	141.6	168.3	225.8	316.6	478.4	582.3	642.6	589.8	496.8	373.5	186.4	137.5
Tamarisk Thickets	cottonwood	0.8	East Drains	0.1	0.2	0.2	0.3	0.5	0.6	0.6	0.6	0.5	0.4	0.2	0.1
Tamarisk-Quailbush Thickets/Scrub	cottonwood	21.9	Pumice Drain	3.8	4.5	6.0	8.4	12.7	15.5	17.1	15.7	13.2	9.9	5.0	3.7
Tamarisk Thickets	cottonwood	18.5	Pumice Drain	3.2	3.8	5.1	7.1	10.7	13.0	14.4	13.2	11.1	8.4	4.2	3.1
Tamarisk-Iodine Bush-Cattail Thickets/Scrub/Marsh	Large stand permanent wetland	7.2	Trifolium 23 Drain	1.1	1.4	2.6	4.2	5.3	6.5	6.6	6.0	4.2	3.3	1.8	1.0
Cattail-Common Reed Marsh	Large stand permanent wetland	1.7	Trifolium 23 Drain	0.3	0.3	0.6	1.0	1.3	1.5	1.6	1.4	1.0	0.8	0.4	0.2

Natural Community	ET Vegetation type	Acres	Drain Group	Jan ET	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Tamarisk-Cattail Thickets/Marsh	Large stand permanent wetland	3.8	Elmore Lake Spill to San Felipe Wash	0.6	0.8	1.4	2.2	2.8	3.4	3.5	3.2	2.2	1.8	1.0	0.5
Tamarisk-Cattail-Common Reed Thickets/Marsh	Large stand permanent wetland	0.9	Elmore Lake Spill to San Felipe Wash	0.1	0.2	0.3	0.5	0.7	0.8	0.8	0.8	0.5	0.4	0.2	0.1
Tamarisk-Cattail-Common Reed Thickets/Marsh	Large stand permanent wetland	1.0	Elmore Lake Spill to San Felipe Wash	0.1	0.2	0.4	0.6	0.7	0.9	0.9	0.8	0.6	0.5	0.3	0.1
Tamarisk-Allscale Thickets/Scrub	cottonwood	0.7	Trifolium 22 Drain	0.1	0.1	0.2	0.3	0.4	0.5	0.6	0.5	0.4	0.3	0.2	0.1
Cattail-Common Reed Marsh	Large stand permanent wetland	56.5	Trifolium 22 Drain	8.4	11.2	20.3	32.9	42.0	51.0	51.9	47.6	33.4	26.1	14.5	7.9
Tamarisk-Iodine Bush-Cattail Thickets/Scrub/Marsh	Large stand permanent wetland	211.4	East Drains	31.4	42.0	76.0	123.1	157.2	190.7	194.0	178.0	125.1	97.6	54.4	29.7
Tamarisk-Cattail Thickets/Marsh	Large stand permanent wetland	217.3	East Drains	32.3	43.2	78.1	126.5	161.6	196.1	199.4	183.0	128.6	100.3	55.9	30.6
Tamarisk-Iodine Bush Thickets/Scrub	cottonwood	33.9	East Drains	5.8	6.9	9.3	13.0	19.7	24.0	26.5	24.3	20.5	15.4	7.7	5.7
Tamarisk-Iodine Bush-Quailbush Thickets/Scrub	cottonwood	96.2	East Drains	16.5	19.7	26.4	37.0	55.9	68.0	75.1	68.9	58.0	43.6	21.8	16.1
Tamarisk-Iodine Bush Thickets/Scrub	cottonwood	108.2	East Drains	18.6	22.1	29.6	41.6	62.8	76.5	84.4	77.4	65.2	49.0	24.5	18.0
Iodine Bush-Cattail Scrub/Marsh	Large stand permanent wetland	50.2	East Drains	7.5	10.0	18.0	29.2	37.3	45.3	46.1	42.3	29.7	23.2	12.9	7.1
Tamarisk Thickets	cottonwood	56.9	East Drains	9.8	11.6	15.6	21.9	33.1	40.2	44.4	40.8	34.3	25.8	12.9	9.5
Tamarisk-Iodine Bush-Common Reed Thickets/Scrub/Marsh	Large stand permanent wetland	122.2	East Drains	18.2	24.3	43.9	71.2	90.9	110.3	112.2	103.0	72.3	56.4	31.4	17.2
Tamarisk-Iodine Bush-Cattail Thickets/Scrub/Marsh	Large stand permanent wetland	9.1	East Drains	1.4	1.8	3.3	5.3	6.8	8.2	8.3	7.7	5.4	4.2	2.3	1.3

Natural Community	ET Vegetation type	Acres	Drain Group	Jan ET	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Tamarisk-Iodine Bush-Cattail Thickets/Scrub/Marsh	Large stand permanent wetland	124.1	East Drains	18.4	24.6	44.6	72.2	92.3	112.0	113.8	104.5	73.4	57.3	31.9	17.4
Tamarisk Thickets	cottonwood	60.7	East Drains	10.4	12.4	16.6	23.3	35.2	42.9	47.3	43.5	36.6	27.5	13.7	10.1
Tamarisk Thickets	cottonwood	24.0	East Drains	4.1	4.9	6.6	9.2	14.0	17.0	18.7	17.2	14.5	10.9	5.4	4.0
Iodine Bush Scrub	cottonwood	91.8	East Drains	15.8	18.8	25.2	35.3	53.3	64.9	71.6	65.8	55.4	41.6	20.8	15.3
Tamarisk-Iodine Bush Thickets/Scrub	cottonwood	268.8	East Drains	46.2	54.9	73.7	103.3	156.1	190.0	209.7	192.5	162.1	121.9	60.8	44.9
Tamarisk-Cattail Thickets/Marsh	Large stand permanent wetland	90.3	East Drains	13.4	17.9	32.4	52.6	67.1	81.5	82.8	76.0	53.4	41.7	23.2	12.7
Tamarisk-Cattail-Common Reed Thickets/Marsh	Large stand permanent wetland	36.5	East Drains	5.4	7.2	13.1	21.2	27.1	32.9	33.5	30.7	21.6	16.8	9.4	5.1
Tamarisk Thickets	cottonwood	63.0	East Drains	10.8	12.9	17.3	24.2	36.6	44.6	49.2	45.1	38.0	28.6	14.3	10.5
Tamarisk-Iodine Bush Thickets/Scrub	cottonwood	3.2	East Drains	0.6	0.7	0.9	1.2	1.9	2.3	2.5	2.3	1.9	1.5	0.7	0.5
Tamarisk Thickets	cottonwood	27.5	Pumice Drain	4.7	5.6	7.5	10.6	16.0	19.4	21.5	19.7	16.6	12.5	6.2	4.6
Tamarisk-Cattail Thickets/Marsh	Large stand permanent wetland	138.7	Pumice Drain	20.6	27.5	49.9	80.8	103.2	125.2	127.3	116.8	82.1	64.1	35.7	19.5
Tamarisk-Iodine Bush-Common Reed Thickets/Scrub/Marsh	Large stand permanent wetland	29.4	Pumice Drain	4.4	5.8	10.6	17.1	21.9	26.6	27.0	24.8	17.4	13.6	7.6	4.1
Tamarisk-Cattail-Common Reed Thickets/Marsh	Large stand permanent wetland	81.0	Trifolium 22 Drain	12.0	16.1	29.1	47.2	60.3	73.1	74.3	68.2	47.9	37.4	20.8	11.4
Tamarisk-Arrow Weed-Iodine Bush Thickets/Scrub	cottonwood	51.9	Elmore Lake Spill to San Felipe Wash	8.9	10.6	14.2	20.0	30.2	36.7	40.5	37.2	31.3	23.6	11.8	8.7
Tamarisk Thickets	cottonwood	121.1	Trifolium 23 Drain	20.8	24.7	33.2	46.6	70.4	85.6	94.5	86.7	73.1	54.9	27.4	20.2
Tamarisk-Iodine Bush-Quailbush Thickets/Scrub	cottonwood	0.6	East Drains	0.1	0.1	0.2	0.2	0.3	0.4	0.5	0.4	0.3	0.3	0.1	0.1

Natural Community	ET Vegetation type	Acres	Drain Group	Jan ET	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Iodine Bush Scrub	cottonwood	1.8	East Drains	0.3	0.4	0.5	0.7	1.0	1.3	1.4	1.3	1.1	0.8	0.4	0.3
Iodine Bush Scrub	cottonwood	16.4	East Drains	2.8	3.4	4.5	6.3	9.5	11.6	12.8	11.8	9.9	7.4	3.7	2.7
Iodine Bush Scrub	cottonwood	5.5	East Drains	0.9	1.1	1.5	2.1	3.2	3.9	4.3	3.9	3.3	2.5	1.2	0.9
Tamarisk-Iodine Bush Thickets/Scrub	cottonwood	13.5	Pumice Drain	2.3	2.8	3.7	5.2	7.9	9.6	10.6	9.7	8.2	6.1	3.1	2.3
Tamarisk Thickets	cottonwood	16.6	Pumice Drain	2.8	3.4	4.5	6.4	9.6	11.7	12.9	11.9	10.0	7.5	3.8	2.8
Tamarisk Thickets	cottonwood	3.1	Pumice Drain	0.5	0.6	0.9	1.2	1.8	2.2	2.4	2.2	1.9	1.4	0.7	0.5
Tamarisk-Cattail Thickets/Marsh	Large stand permanent wetland	7.4	East Drains	1.1	1.5	2.6	4.3	5.5	6.7	6.8	6.2	4.4	3.4	1.9	1.0
Tamarisk-Cattail-Common Reed Thickets/Marsh	Large stand permanent wetland	0.7	East Drains	0.1	0.1	0.3	0.4	0.5	0.6	0.6	0.6	0.4	0.3	0.2	0.1
Tamarisk-Iodine Bush-Cattail Thickets/Scrub/Marsh	Large stand permanent wetland	0.7	East Drains	0.1	0.1	0.2	0.4	0.5	0.6	0.6	0.6	0.4	0.3	0.2	0.1
Iodine Bush Scrub	cottonwood	0.5	East Drains	0.1	0.1	0.1	0.2	0.3	0.3	0.4	0.3	0.3	0.2	0.1	0.1
Iodine Bush Scrub	cottonwood	4.0	East Drains	0.7	0.8	1.1	1.5	2.3	2.8	3.1	2.9	2.4	1.8	0.9	0.7
Iodine Bush Scrub	cottonwood	1.7	East Drains	0.3	0.3	0.5	0.7	1.0	1.2	1.3	1.2	1.0	0.8	0.4	0.3
Iodine Bush Scrub	cottonwood	0.5	East Drains	0.1	0.1	0.1	0.2	0.3	0.3	0.4	0.3	0.3	0.2	0.1	0.1
Tamarisk-Iodine Bush-Cattail Thickets/Scrub/Marsh	Large stand permanent wetland	0.7	East Drains	0.1	0.1	0.2	0.4	0.5	0.6	0.6	0.6	0.4	0.3	0.2	0.1
Cattail Marsh	Large stand permanent wetland	2.3	East Drains	0.3	0.5	0.8	1.3	1.7	2.1	2.1	1.9	1.4	1.1	0.6	0.3
Cattail Marsh	Large stand permanent wetland	0.2	East Drains	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
Tamarisk-Iodine Bush-Cattail Thickets/Scrub/Marsh	Large stand permanent wetland	0.1	East Drains	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0

Natural Community	ET Vegetation type	Acres	Drain Group	Jan ET	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Tamarisk-Iodine Bush-Cattail Thickets/Scrub/Marsh	Large stand permanent wetland	1.1	East Drains	0.2	0.2	0.4	0.7	0.9	1.0	1.1	1.0	0.7	0.5	0.3	0.2
Tamarisk-Cattail-Common Reed Thickets/Marsh	Large stand permanent wetland	20.8	East Drains	3.1	4.1	7.5	12.1	15.5	18.8	19.1	17.5	12.3	9.6	5.3	2.9
Cattail Marsh	Large stand permanent wetland	7.7	East Drains	1.1	1.5	2.8	4.5	5.7	6.9	7.0	6.5	4.5	3.5	2.0	1.1
Tamarisk-Quailbush-Cattail Thickets/Scrub/Marsh	Large stand permanent wetland	0.2	East Drains	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.0
Tamarisk-Iodine Bush-Cattail Thickets/Scrub/Marsh	Large stand permanent wetland	212.6	East Drains	31.6	42.2	76.4	123.8	158.1	191.9	195.1	179.1	125.8	98.2	54.7	29.9
Tamarisk-Cattail-Common Reed Thickets/Marsh	Large stand permanent wetland	4.3	East Drains	0.6	0.9	1.5	2.5	3.2	3.9	3.9	3.6	2.5	2.0	1.1	0.6
Tamarisk-Iodine Bush-Cattail Thickets/Scrub/Marsh	Large stand permanent wetland	2.9	East Drains	0.4	0.6	1.0	1.7	2.1	2.6	2.6	2.4	1.7	1.3	0.7	0.4
Tamarisk-Quailbush-Cattail Thickets/Scrub/Marsh	Large stand permanent wetland	15.4	East Drains	2.3	3.1	5.5	9.0	11.5	13.9	14.1	13.0	9.1	7.1	4.0	2.2
Tamarisk-Quailbush-Common Reed Thickets/Scrub/Marsh	Large stand permanent wetland	6.3	East Drains	0.9	1.2	2.3	3.7	4.7	5.7	5.8	5.3	3.7	2.9	1.6	0.9
Tamarisk-Quailbush Thickets/Scrub	cottonwood	0.1	East Drains	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
Tamarisk-Iodine Bush Thickets/Scrub	cottonwood	0.8	East Drains	0.1	0.2	0.2	0.3	0.5	0.6	0.6	0.6	0.5	0.4	0.2	0.1
Tamarisk-Cattail Thickets/Marsh	Large stand permanent wetland	0.5	East Drains	0.1	0.1	0.2	0.3	0.4	0.5	0.5	0.4	0.3	0.2	0.1	0.1
Tamarisk-Quailbush Thickets/Scrub	cottonwood	2.3	East Drains	0.4	0.5	0.6	0.9	1.3	1.6	1.8	1.7	1.4	1.1	0.5	0.4

Natural Community	ET Vegetation type	Acres	Drain Group	Jan ET	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cattail Marsh	Large stand permanent wetland	2.5	East Drains	0.4	0.5	0.9	1.5	1.9	2.3	2.3	2.1	1.5	1.2	0.6	0.4
Iodine Bush Scrub	cottonwood	1.9	East Drains	0.3	0.4	0.5	0.7	1.1	1.3	1.4	1.3	1.1	0.8	0.4	0.3
Tamarisk-Cattail Thickets/Marsh	Large stand permanent wetland	3.7	East Drains	0.6	0.7	1.3	2.2	2.8	3.4	3.4	3.1	2.2	1.7	1.0	0.5
Tamarisk-Cattail Thickets/Marsh	Large stand permanent wetland	0.8	East Drains	0.1	0.2	0.3	0.4	0.6	0.7	0.7	0.6	0.5	0.4	0.2	0.1
Tamarisk-Cattail-Common Reed Thickets/Marsh	Large stand permanent wetland	4.1	East Drains	0.6	0.8	1.5	2.4	3.1	3.7	3.8	3.5	2.4	1.9	1.1	0.6
Tamarisk Thickets	cottonwood	0.6	East Drains	0.1	0.1	0.2	0.2	0.3	0.4	0.5	0.4	0.4	0.3	0.1	0.1
Tamarisk-Cattail Thickets/Marsh	Large stand permanent wetland	0.2	East Drains	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.0	0.0
Tamarisk-Iodine Bush-Cattail Thickets/Scrub/Marsh	Large stand permanent wetland	2.0	East Drains	0.3	0.4	0.7	1.1	1.5	1.8	1.8	1.7	1.2	0.9	0.5	0.3
Tamarisk-Iodine Bush Thickets/Scrub	cottonwood	1.1	East Drains	0.2	0.2	0.3	0.4	0.6	0.7	0.8	0.8	0.6	0.5	0.2	0.2
Tamarisk-Cattail-Common Reed Thickets/Marsh	Large stand permanent wetland	147.8	East Drains	22.0	29.4	53.1	86.1	109.9	133.4	135.7	124.5	87.5	68.3	38.0	20.8
Tamarisk-Cattail Thickets/Marsh	Large stand permanent wetland	14.1	East Drains	2.1	2.8	5.1	8.2	10.5	12.7	13.0	11.9	8.4	6.5	3.6	2.0
Tamarisk-Cattail-Common Reed Thickets/Marsh	Large stand permanent wetland	1.9	East Drains	0.3	0.4	0.7	1.1	1.4	1.7	1.7	1.6	1.1	0.9	0.5	0.3
Tamarisk Thickets	cottonwood	0.8	East Drains	0.1	0.2	0.2	0.3	0.5	0.6	0.6	0.6	0.5	0.4	0.2	0.1
Tamarisk-Cattail Thickets/Marsh	Large stand permanent wetland	1.2	East Drains	0.2	0.2	0.4	0.7	0.9	1.0	1.1	1.0	0.7	0.5	0.3	0.2
Tamarisk Thickets	cottonwood	4.6	East Drains	0.8	0.9	1.3	1.8	2.7	3.3	3.6	3.3	2.8	2.1	1.1	0.8

Natural Community	ET Vegetation type	Acres	Drain Group	Jan ET	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Iodine Bush Scrub	cottonwood	10.3	East Drains	1.8	2.1	2.8	3.9	6.0	7.3	8.0	7.3	6.2	4.7	2.3	1.7
Iodine Bush Scrub	cottonwood	1.6	East Drains	0.3	0.3	0.4	0.6	0.9	1.1	1.3	1.2	1.0	0.7	0.4	0.3
Tamarisk-Iodine Bush-Quailbush Thickets/Scrub	cottonwood	0.9	East Drains	0.1	0.2	0.2	0.3	0.5	0.6	0.7	0.6	0.5	0.4	0.2	0.1
Tamarisk-Iodine Bush-Cattail Thickets/Scrub/Marsh	Large stand permanent wetland	4.4	East Drains	0.6	0.9	1.6	2.5	3.2	3.9	4.0	3.7	2.6	2.0	1.1	0.6
Tamarisk Thickets	cottonwood	1.2	East Drains	0.2	0.3	0.3	0.5	0.7	0.9	1.0	0.9	0.7	0.6	0.3	0.2
Tamarisk-Iodine Bush-Cattail Thickets/Scrub/Marsh	Large stand permanent wetland	1.0	East Drains	0.2	0.2	0.4	0.6	0.8	0.9	0.9	0.9	0.6	0.5	0.3	0.1
Tamarisk-Iodine Bush-Cattail Thickets/Scrub/Marsh	Large stand permanent wetland	0.5	East Drains	0.1	0.1	0.2	0.3	0.3	0.4	0.4	0.4	0.3	0.2	0.1	0.1
Iodine Bush Scrub	cottonwood	1.4	Trifolium 23 Drain	0.2	0.3	0.4	0.5	0.8	1.0	1.1	1.0	0.8	0.6	0.3	0.2
Iodine Bush Scrub	cottonwood	0.3	East Drains	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.2	0.2	0.2	0.1	0.1
Tamarisk Thickets	cottonwood	49.1	Elmore Lake Spill to San Felipe Wash	8.4	10.0	13.4	18.9	28.5	34.7	38.3	35.1	29.6	22.2	11.1	8.2
Tamarisk-Iodine Bush Thickets/Scrub	cottonwood	25.1	Trifolium 22 Drain	4.3	5.1	6.9	9.6	14.6	17.7	19.6	18.0	15.1	11.4	5.7	4.2
Cattail Marsh	Large stand permanent wetland	0.3	East Drains	0.1	0.1	0.1	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.0
Cattail Marsh	Large stand permanent wetland	62.8	East Drains	9.3	12.5	22.6	36.5	46.7	56.6	57.6	52.9	37.1	29.0	16.1	8.8
Cattail Marsh	Large stand permanent wetland	6.1	East Drains	0.9	1.2	2.2	3.5	4.5	5.5	5.6	5.1	3.6	2.8	1.6	0.9
Cattail Marsh	Large stand permanent wetland	64.8	East Drains	9.6	12.9	23.3	37.7	48.2	58.5	59.5	54.6	38.4	29.9	16.7	9.1

Natural Community	ET Vegetation type	Acres	Drain Group	Jan ET	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cattail-Common Reed Marsh	Large stand permanent wetland	0.5	East Drains	0.1	0.1	0.2	0.3	0.4	0.5	0.5	0.5	0.3	0.3	0.1	0.1
Tamarisk-Cattail Thickets/Marsh	Large stand permanent wetland	293.3	East Drains	43.6	58.2	105.4	170.8	218.1	264.6	269.1	247.0	173.6	135.4	75.4	41.2

TABLE H2-4

EXISTING CONDITIONS MONTHLY EVAPOTRANSPIRATION, MEAN MONTHLY DRAIN FLOWS, AND WATER BALANCE FOR NATURAL COMMUNITIES MAPPED ALONG THE EXPOSED PLAYA IN THE SALTON SEA SURVEY AREA. ANNUAL SUMMARIES OF EACH PARAMETER ARE ALSO SHOWN

Vegetation Drain Group	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Monthly ET (AF)													
East Drains	767	961	1,492	2,265	3,124	3,796	4,017	3,687	2,848	2,178	1,146	737	27,018
Elmore Lake Spill to San Felipe Wash	18	22	30	42	63	77	84	77	64	48	24	18	567
Pumice Drain	42	54	88	137	184	223	233	214	161	123	66	41	1,566
Trifolium 22 Drain	25	33	56	90	117	142	146	134	97	75	41	24	981
Trifolium 23 Drain	22	27	37	52	78	95	104	95	79	60	30	22	700
Mean Monthly Drain Flows (AF)													
East Drains	1,999	2,070	2,676	2,825	3,261	3,405	3,495	3,256	2,852	2,415	2,251	2,011	32,515
Elmore Lake Spill to San Felipe Wash	168	108	107	58	38	54	90	114	120	144	176	209	1,384
Pumice Drain	1,005	910	1,300	1,588	1,418	1,596	1,644	1,269	1,387	1,994	1,760	1,409	17,279
Trifolium 22 Drain	240	264	652	507	206	162	227	248	179	256	258	261	3,459
Trifolium 23 Drain	228	246	340	314	248	240	347	257	309	364	302	250	3,446
Existing Monthly Flows minus ET Demand Balance (AF)													
East Drains	1,231	1,109	1,184	561	138	(391)	(522)	(431)	4	237	1,105	1,274	5,498
Elmore Lake Spill to San Felipe Wash	150	86	77	16	(25)	(22)	6	37	55	95	151	191	817
Pumice Drain	963	856	1,212	1,451	1,235	1,372	1,411	1,055	1,226	1,870	1,694	1,368	15,712
Trifolium 22 Drain	215	232	595	417	89	20	80	114	82	181	217	237	2,478
Trifolium 23 Drain	206	219	303	262	170	145	244	162	230	304	272	229	2,746

Vegetation Drain Group	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Existing Monthly Flows minus ET Demand Balance (inch/Acre)													
East Drains	0.02	0.02	0.02	0.01	0.00	(0.01)	(0.01)	(0.01)	0.00	0.00	0.02	0.02	0.10
Elmore Lake Spill to San Felipe Wash	0.12	0.07	0.06	0.01	(0.02)	(0.02)	0.00	0.03	0.04	0.07	0.12	0.15	0.64
Pumice Drain	0.30	0.26	0.37	0.45	0.38	0.42	0.44	0.33	0.38	0.58	0.52	0.42	4.86
Trifolium 22 Drain	0.11	0.12	0.30	0.21	0.05	0.01	0.04	0.06	0.04	0.09	0.11	0.12	1.26
Trifolium 23 Drain	0.13	0.14	0.19	0.17	0.11	0.09	0.15	0.10	0.15	0.19	0.17	0.15	1.74

SOURCE: ESA

TABLE H2-5

PROPOSED ACTION MONTHLY EVAPOTRANSPIRATION, MEAN MONTHLY DRAIN FLOWS, AND WATER BALANCE FOR NATURAL COMMUNITIES MAPPED ALONG THE EXPOSED PLAYA IN THE SALTON SEA SURVEY AREA. ANNUAL SUMMARIES OF EACH PARAMETER ARE ALSO SHOWN.

Vegetation Drain Group	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Monthly ET (AF)													
East Drains	767	961	1,492	2,265	3,124	3,796	4,017	3,687	2,848	2,178	1,146	737	27,018
Elmore Lake Spill to San Felipe Wash	18	22	30	42	63	77	84	77	64	48	24	18	567
Pumice Drain	42	54	88	137	184	223	233	214	161	123	66	41	1,566
Trifolium 22 Drain	25	33	56	90	117	142	146	134	97	75	41	24	981
Trifolium 23 Drain	22	27	37	52	78	95	104	95	79	60	30	22	700
Mean Monthly Drain Flows (AF)													
East Drains	1,671	1,774	2,349	2,508	2,933	3,087	3,168	2,928	2,535	2,087	1,933	1,683	28,657
Elmore Lake Spill to San Felipe Wash	154	95	93	44	24	41	76	100	106	130	162	195	1,220
Pumice Drain	831	753	1,126	1,419	1,244	1,427	1,470	1,095	1,218	1,820	1,592	1,235	15,228
Trifolium 22 Drain	205	233	617	473	171	128	192	214	145	221	224	226	3,048
Trifolium 23 Drain	194	215	305	281	213	206	313	222	275	329	269	216	3,037
Proposed Monthly Flows minus ET Demand Balance (AF)													
East Drains	903.5	813.2	856.1	243.4	(190.1)	(708.2)	(849.7)	(759.1)	(312.8)	(91.0)	787.9	946.0	1,639.2
Elmore Lake Spill to San Felipe Wash	135.7	73.4	63.2	2.3	(39.2)	(36.0)	(7.7)	22.6	41.8	81.3	137.8	177.1	652.4
Pumice Drain	788.4	698.5	1,037.4	1,282.2	1,060.5	1,203.8	1,236.9	880.7	1,057.5	1,696.3	1,525.8	1,194.1	13,662.0
Trifolium 22 Drain	180.2	200.2	560.3	382.8	53.8	(14.1)	45.4	79.2	48.3	145.9	183.1	202.1	2,067.3
Trifolium 23 Drain	171.2	187.7	268.4	228.4	135.0	111.7	208.8	127.2	196.1	269.7	238.8	194.0	2,336.9

Vegetation Drain Group	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Proposed Monthly Flows minus ET Demand Balance (inches/Acre)													
East Drains	0.016	0.014	0.015	0.004	(0.003)	(0.012)	(0.015)	(0.013)	(0.005)	(0.002)	0.014	0.017	0.029
Elmore Lake Spill to San Felipe Wash	0.106	0.057	0.049	0.002	(0.031)	(0.028)	(0.006)	0.018	0.033	0.063	0.108	0.138	0.509
Pumice Drain	0.244	0.216	0.321	0.397	0.328	0.373	0.383	0.273	0.327	0.525	0.472	0.370	4.228
Trifolium 22 Drain	0.092	0.102	0.286	0.195	0.027	(0.007)	0.023	0.040	0.025	0.074	0.093	0.103	1.055
Trifolium 23 Drain	0.109	0.119	0.170	0.145	0.086	0.071	0.132	0.081	0.124	0.171	0.151	0.123	1.482

SOURCE: ESA

Appendix HYDRO-3
SSAM

Estimating Salton Sea Elevation and Salinity for Future Inflow Scenarios for the Imperial Irrigation District

Prepared by: Tetra Tech for the Salton Sea Management Program

December 18, 2023

Introduction

The Salton Sea is a terminal lake in Riverside and Imperial Counties, California, receiving runoff from Imperial Valley and Coachella Valley watersheds, including runoff from exports originating in the Colorado River basin. Over the past decades, the Sea's water level has been declining, and it has been the subject of various modeling efforts to quantify the decline and assess the resulting environmental impacts. This memo summarizes a modeling methodology and analysis to evaluate the consequences of water conservation actions being proposed by the Imperial Irrigation District over three calendar years, from 2024 to 2026.

The US Bureau of Reclamation developed a spreadsheet model in the early 2000s called the Salton Sea Accounting Model (SSAM) [1]. SSAM balances the Sea's water and salt mass on an annual timestep, assuming the Sea is uniformly mixed. The primary SSAM inputs are 1) a projected hydrology for the major inflows to the Sea 2) salinity-dependent evaporation, and 3) direct precipitation terms. The mass balance equation calculates the change in volume at each timestep, and the Sea's total volume is simulated for the duration of the projected hydrology. An elevation-area-capacity (EAC) curve derived from Sea bathymetric survey data allows for a singular relationship between the Sea's volume, surface area, and surface elevation.

Starting in the mid-2010s, Tetra Tech began updating the SSAM model (SSAM 2.0) to incorporate the latest available hydrological data, bathymetry data [2], and add new features to simulate water needs for various habitat projects, such as concepts in the Salton Sea Long Range Plan (LRP) [3] or projects that are part of the Phase 1 Salton Sea Management Program. This document describes the model framework, inputs, and outputs.

In response to ongoing drought, SSAM 2.0 is currently being used to estimate water management scenarios on the Colorado River. SSAM 2.0 calculates changes in salinity and exposed playa at Salton Sea based on contemplated allocation reductions. As part of this effort, Tetra Tech evaluated a set of scenarios with different levels of reduction and incorporated multiple fallowing and water-use efficiency considerations. The model assumptions and outputs were reviewed by IID, CVWD, the Bureau of Reclamation and the California Natural Resources Agency in a series of meetings in mid- to late-2022. A final set of updates were made in 2023 and are presented in this document.

Model Hydrology used in SSAM 2.0

The Salton Basin is the northern arm of the former Colorado River delta system. Agricultural return flows and drainage from these valleys and parts of the Mexicali Valley, in addition to municipal and industrial discharges in the watershed, feed the major rivers flowing to the Salton Sea. The Salton Sea watershed encompasses an area of approximately 8,000 square miles from San Bernardino County in the north to the Mexicali Valley (Republic of Mexico) to the south.

The principal sources of inflow to the Salton Sea are the Whitewater River to the north (also known as the Coachella Valley Stormwater Channel [CVSC]), the Alamo and New Rivers to the south, and direct return flows from agricultural drains in the Imperial Valley and Coachella Valley. The riverine sources of inflow are recorded by United States Geological Survey (USGS) gage stations situated at the river mouths, with observations dating back to at least 1988.

The Whitewater River (CVSC) is the primary river drainage channel of CVWD. It brings stormwater runoff, agricultural return flows, and municipal and fish farm discharges from the Coachella Valley to the Salton Sea. In the last few years, flows recorded by the Whitewater River USGS gage (USGS Station ID: 10259540) have been less than 50,000 AF/year.

The Alamo River originates approximately two miles south of the International Border with Mexico and flows north and into the Salton Sea. The USGS station that records Alamo River inflows into the Salton Sea is located near this point of discharge into the Sea (USGS Station ID: 10254730). The Alamo River is dominated by agricultural return flows from IID. In recent years, this flow has averaged 560,000 AF/year.

The New River also originates in Mexico. It travels through the Mexicali Valley, crosses the International Border, and flows into the Salton Sea. The New River carries urban runoff, industrial and municipal flows, and agricultural runoff from the Mexicali Valley. There are two USGS gages along the New River. One is in the Imperial Valley, near the mouth of the river at the Salton Sea (USGS Station ID: 10255550). The other is at the International Border (USGS Station ID: 10254970). Since 2018, flows at the New River (Imperial Valley) station have been consistently less than 350,000 AF/year. Flows at the New River (International Border) station have remained stable between 60,000 AF/year and 64,000 AF/year in the same timeframe.

Other outflows to the Salton Sea include a system of agricultural drains in the Imperial Valley, which discharge surface runoff into the Alamo and New Rivers, and agricultural drains in the Coachella Valley.

The agricultural drains in the Imperial Valley introduce approximately 830,000 AF/year of surface runoff to the Alamo and New Rivers.

The relationship between these flows, the Salton Sea, and the IID and CVWD watersheds are illustrated in Figure 1. Other losses are from IID and CVWD watershed evapotranspiration (ET) and evaporation out of the Salton Sea. Other inflows include precipitation, local watershed, and groundwater inflows into the Sea. The ungaged flows (italicized in Figure 1) can be estimated by using the reported irrigated acreage and ET rates in the valleys and local weather data that are available for Imperial County, California.

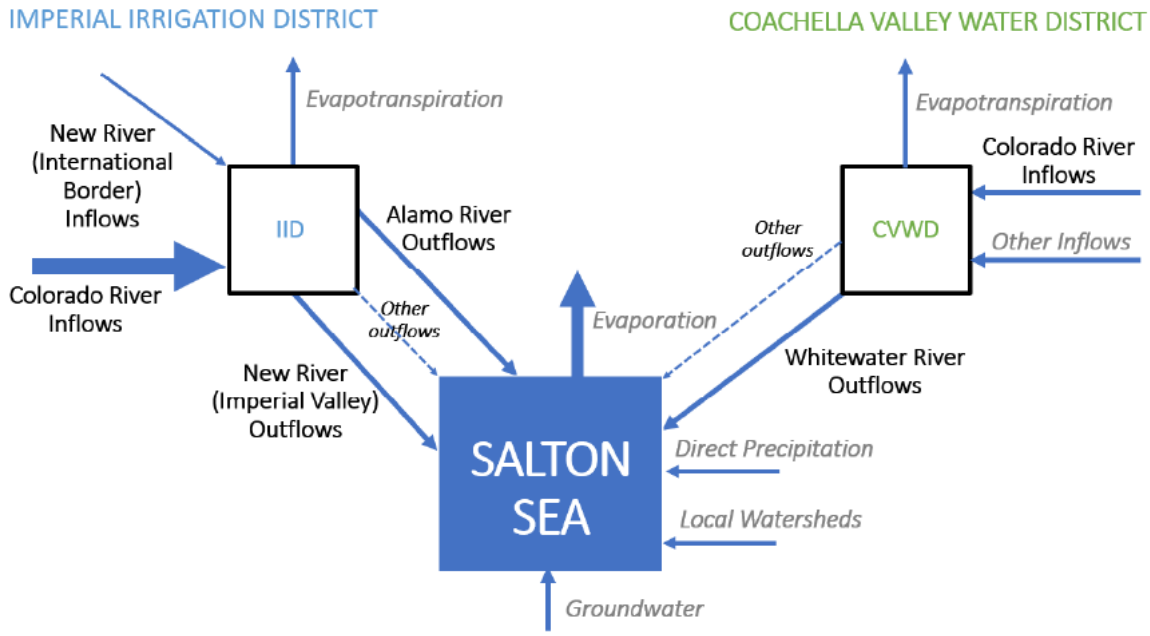

Figure 1. Flows into and out of the Imperial Irrigation District (IID), the Coachella Valley Water District (CVWD), and the Salton Sea. Flows that are italicized are ungaged but can be estimated.

Future Hydrology: Delivery allocations and climate change

The development of future inflow to the Sea is centered around determining how much the total freshwater inflow may change due to effects of climate change, including basin-wide ET changes for the areas producing the Sea's runoff, as well as any hypothetical changes to Colorado River water allocations, which make up the majority of Salton Sea inflows.

Long-term Colorado River allocations to Imperial Valley were made by considering the output of the Colorado River Simulation System (CRSS) model, which is used by USBR to provide long-term projections at the Colorado River basin.

On October 5, 2022, California users of Colorado River water released a statement proposing to conserve 400,000 AF of water each year from 2023 to 2026 to contribute towards stabilizing elevations in Lake Mead.[1] IID pledged to cut 250,000 AFY, an amount contingent on federal funding and voluntary participation of water users.[2] Other California users of Colorado River water that signed the statement were the Metropolitan Water District, CVWD, and the Palo Verde Irrigation District.

For the purpose of the EA for IID's Temporary Colorado River Conservation Project, developed in late 2023, the amount of targeted conservation examined for this memorandum is 300,000 AFY for the period 2024 to 2026, for a total of 900,000 AF of conservation. This amount forms the basis for the short-term (2024-2026) inflow reductions considered here, with two different total amounts based on the specific implementation of the reduction:

[1] http://crb.ca.gov/2022/10/california-water-agencies-pledge-to-conserve-additional-water-to-stabilize-the-colorado-river-basin/
[2] https://calmatters.org/environment/2022/10/california-colorado-river-water/

- Fallowing conservation program (300 TAFY)
- Hybrid conservation program (50 TAFY efficiency and 250 TAFY fallowing)

Based on a review of records over the past 5 years, the fallowing effect represents a 35.7% loss to the Sea, derived from the fraction of Salton Sea inflow compared to Colorado River water supply to IID. The resulting inflow reductions for the conservation programs over the years 2024 – 2026 are shown in Table 1.

Table 1. Inflow reduction to the Salton Sea as a consequence of reduction in water supplies from the Colorado River to IID.

Assumption	**Inflow Reduction for 300,000 AFY Drought Reduction**	**Equation for Inflow Reduction**
Baseline - No drought reduction	0	-
Fallowing (35.7% Loss)	107,100	35.7% * 300,000
50 TAFY Efficiency & Fallowing (35.7% Loss)	139,250	50,000 + 35.7% * (300,000 - 50,000)

These reductions are expected to be met through a combination of an On-Farm Efficiency Conservation Program, an Alternative Crop Efficiency Program, a Deficit Irrigation Program, and a Farm Unit Fallowing Program. It is to be understood that many of these programs do not constitute conventional all-or-nothing fallowing; nevertheless a "fallowed acres equivalent" can be computed based on the net ET and the overall average ET rate. A schematic of the inflow reduction scenarios, their net IID inflows to the sea, and the fallowed equivalents is shown in Figure 2.

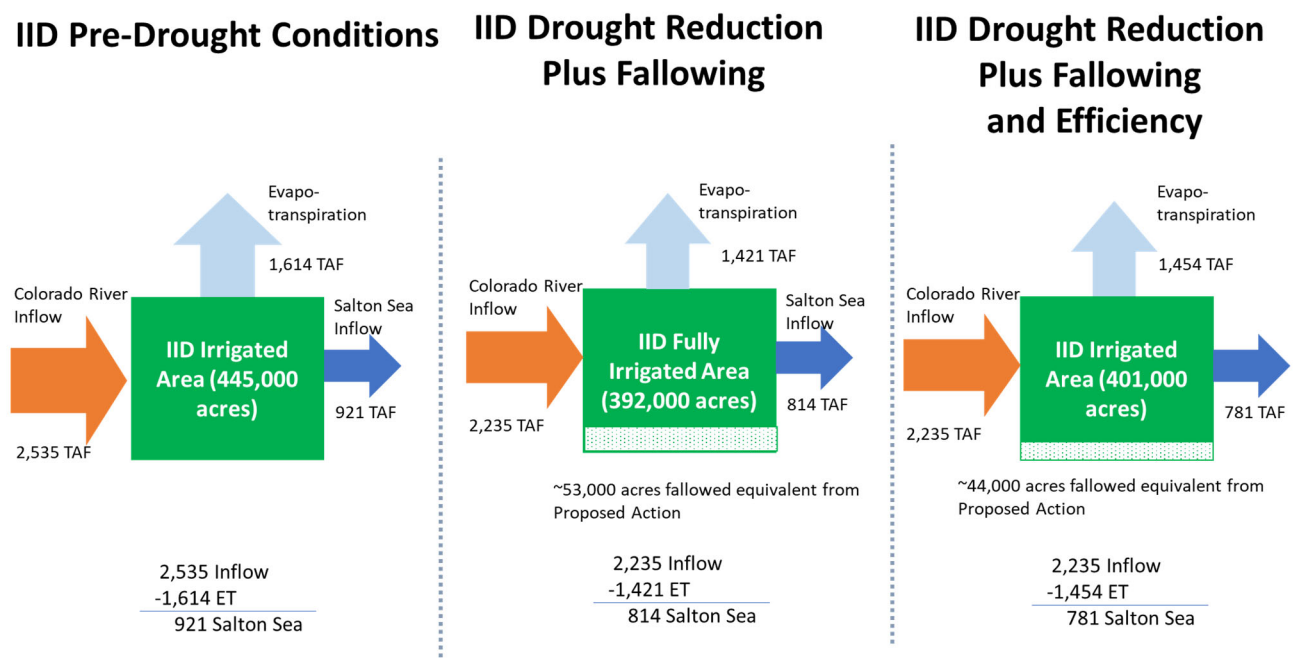

Figure 2. Schematic of the effects of Colorado River allocations on IID inflow to the Sea (modified from a previous version provided to Reclamation)

During earlier planning in 2022, CVWD suggested using delivery reductions of 25 TAFY (10% of inflow reduction to IID). The reduction would be achieved through voluntary Colorado River Water Conservation Program up to 10 TAFY. Average return flows to drains are 20%, so the maximum potential reduction in flows to Salton Sea over the four-year period would be approximately 2,000 AFY. The remainder and any amount that cannot be achieved by the Colorado River Water Conservation Program would be achieved by reducing recharge at CVWD groundwater recharge facilities, which would have no impact to flows to the Salton Sea for the four-year period. The impact on flows to the Salton Sea from Coachella Valley will be small, and therefore are not included in the modeling.

Projections of future IID water delivery were produced using the Colorado River Simulation System (CRSS) model developed by the US Bureau of Reclamation. The CRSS model was developed and is used by Reclamation to provide long-term projections at the Colorado River Basin (Reclamation, 2012 [4]). The June 2021 version of the CRSS model was obtained from Wheeler et al. (2022) [5] and was provided with the initial conditions in June 2021. Future water demands as the "2016 demands" (2016 Upper Colorado River Commission Schedule for the Upper Division States; and 2007 Final Environmental Impact Statement for the Colorado River Interim Guidelines with the update on Nevada demand in 2019 for the Lower Division States) provided in the CRSS June 2021 version (Wheeler et al. 2022 [5]) were used. The projections of water delivery and other conditions at the Colorado River Basin were obtained from the CRSS model during the period 2022–2060. For this work, a baseline water delivery of 2.535 MAF to IID was assumed, to which the drought reductions were applied.

The projected temperature and windspeed changes from California's Cal-Adapt RCP8.5 climate scenarios[3] were incorporated into estimates of ET using the Penman-Monteith equation. For both maximum/minimum temperature and windspeed, the projected change between 1991-2020 and 2035-2064 was added to a set of observed baseline numbers. For temperature, the baseline numbers were a seasonal pattern (monthly) of maximum/minimum temperature observations from 2004-2021. For wind speed, the baseline number was based on an average of four windspeed stations near the Salton Sea from 2015-2021. Based on these climate change effects, ET is expected to increase by 3.5 to 5.0% by 2035-2064 (see Table 2). As a conservative estimate for the future inflow scenarios, an increase of 5% is assumed. Therefore, the climate-adjusted ET rate is 3.78 AF/acre of irrigated land (or 5% increase from the current estimate of 3.60 AF/acre). The volume of water lost assumes an irrigated acreage value of 445,011 acres, which is the average over 2018 to 2021 for the Imperial Valley.

Table 2. Penman-Monteith estimates of ET.

Trace	Annual average maximum temperature increase (°C)	Annual average minimum temperature increase (°C)	Average wind speed change (m/s)	Estimated % increase in ET (1971-2000 to 2035-2064) via Penman-Monteith Equations
Low	1.69	1.66	0.987	3.56%
Average	2.01	1.96	0.988	4.46%
High	2.20	2.22	0.990	5.02%

In the Coachella Valley, the Indio Subbasin Water Management Plan Update (Indio Subbasin GSAs, 2021 [6]) was utilized as the source for future inflow to the Sea. The scenario representing future projects with climate change was selected as the most appropriate scenario with 70,000 AFY as the flow representing future conditions at the Sea. This represents the total inflow to the Sea from the Coachella Valley, including the gaged CVSC.

The model results shown here use a future hydrology that linearly decreases from current values to 889,448 (see Table 3) by 2040. Further details about the hydrology in the Salton Sea Long Range Plan modeling work can be found in Appendix B of [3].

[3] https://cal-adapt.org/

Table 3. Future long-term hydrology based on LRP high probability inflow.

INFLOW TERM	VALUE (AF/year)	JUSTIFICATION
Imperial Valley	852,900	Inflow to Imperial Valley (2,535,000 AFY) minus ET at 3.78 AF/acre of irrigated land
Mexico	0	Mexico flows gradually decrease to zero from the Scenario #1 value of 66,100 AFY
Coachella Valley	70,000	Simulated drain flow for future projects with climate change scenario (Indio Subbasin GSAs, 2021)
Local watershed	4,680	See Section 5.3.4 of Appendix B in [6]
Groundwater	11,900	See Section 5.3.5 of Appendix B in [6]
Lithium Allocation	-50,000	Lithium is a new and growing water use in the basin.
TOTAL	**889,000 AF/year**	

Primary Model Calculations

The model operates by water and salt mass conservation of the Sea. At each annual timestep, the following quantities of water volume are added (+) or subtracted (-) from the volume that was present at the beginning of the year:

- (+) Freshwater Inflows, a time series input from the relevant estimated hydrology scenario, as discussed above.
- (-) Total Water Volume needed to satisfy evaporation demands of fixed-size conservation projects, when applicable.
- (-) Total Water Volume needed to meet dust suppression obligations, defined as 1 acre-ft of water annually per acre of area within the 2003 shoreline not covered by the remaining Sea or any planned conservation projects in a given year.
- (-) Direct evaporation volume from the dynamically sized Sea, dependent on the area and salinity of the Sea in a given year, using the same quadratic polynomial regression in USGS's original SSAM model (see below), which takes a baseline evaporation rate (calibrated to be 69.9 inches annual, see below) and returns a smaller evaporation rate with increasing salinity.
- (+) Direct precipitation volume on the Sea. Values from 2004-2012 are from PRISM. More recent years (2013-2022) are filled in from California Irrigation Management Information System (CIMIS) Imperial Valley data. The historical average of the updated dataset is approximately equal to 2.5 inches per year, and that is the value used for all future years.

Similarly, salt mass has the following additions (+) and subtractions (-) at each timestep, assuming direct evaporation and precipitation of water to have minimal effect on salt balance:

- (+) Salt coming in with freshwater inflows, using the inflow-dependent regression present in USGS's original SSAM model, which has higher salt concentrations with lower inflow volumes.
- (-) Annual salt precipitation of 0.15% of the current salt mass in the Sea.
- (-) Any salt above saturation salinity of 280 ppt.

Bathymetry data and EAC curve

For any state of the Sea, there is a 1-1-1 relationship between its elevation, area, and capacity (volume), also known as the EAC relationship or EAC curve (see Figure 3 and Figure 4). This relationship was estimated from the latest available bathymetry data (interpolated to the nearest 0.1 ft using the underlying raster dataset in [3]) and is available to view in the model spreadsheet EACInput. For each model run, this EAC curve is used to get the initial Sea volume (as the initial conditions are specified as an elevation) and to convert the Sea volume at each timestep to a Sea area and Sea elevation (interpolated to the nearest tenth of a foot, NAVD88).

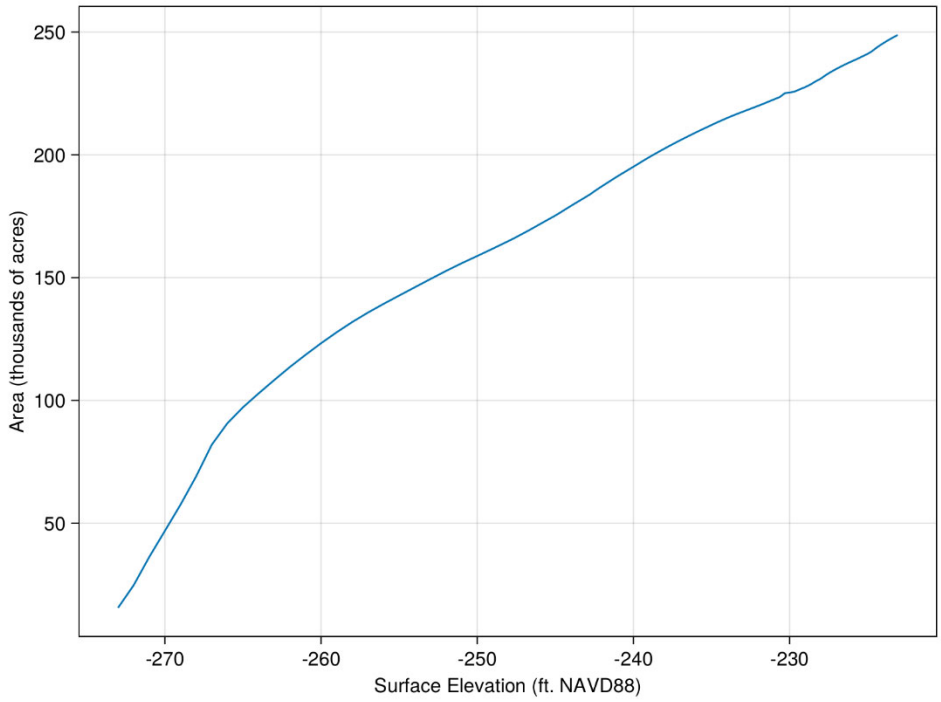

Figure 3. Relationship between elevation and area in the EAC curve used in these SSAM 2.0 modeling efforts.

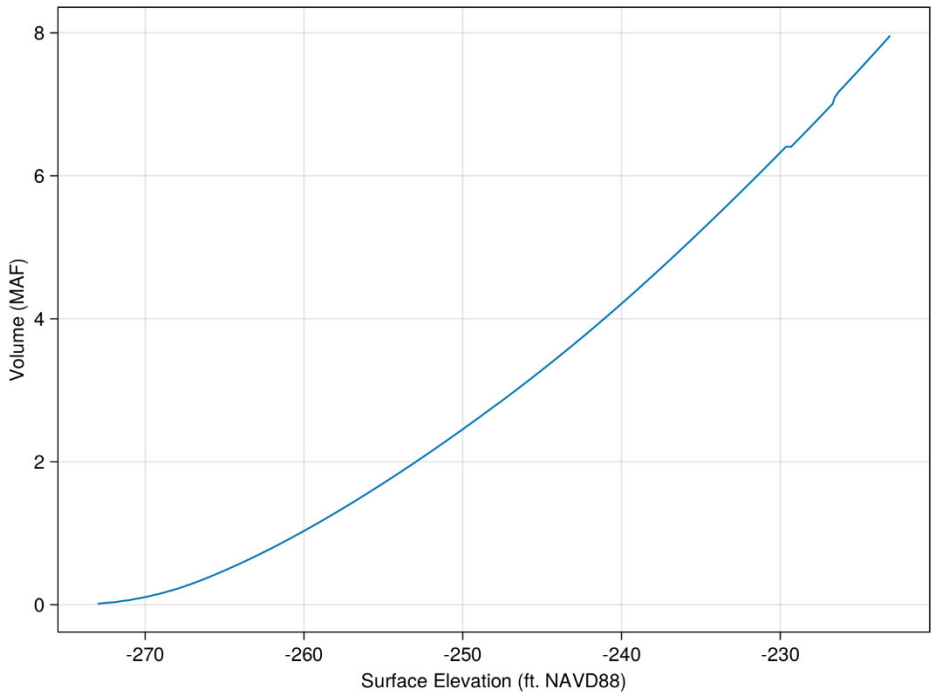

Figure 4. Relationship between elevation and volume in the EAC curve used in these SSAM 2.0 modeling efforts.

Salinity-Dependent Evaporation

The evaporation rate from the Sea's surface is reduced as salt concentration in the Sea increases. The original USBR SSAM modeled this effect using a regression of the form:

$$E_{net} = E_{base} \cdot \left(\frac{a+b\cdot(S/1000)^{2.5}}{a+b\cdot(S_{ref}/1000)^{2.5}} \right)^2,$$

where:

- E_{base} is the baseline evaporation amount for freshwater,
- S, is the Sea's salinity at the current timestep,
- S_{ref} is a reference salinity value (set to 45723.33 ppm),
- a and b are model constants with values 0.981902618 and -1.39819E-07, respectively.

The same equation was used in the SSAM 2.0 updated by Tetra Tech and is illustrated in Figure 5.

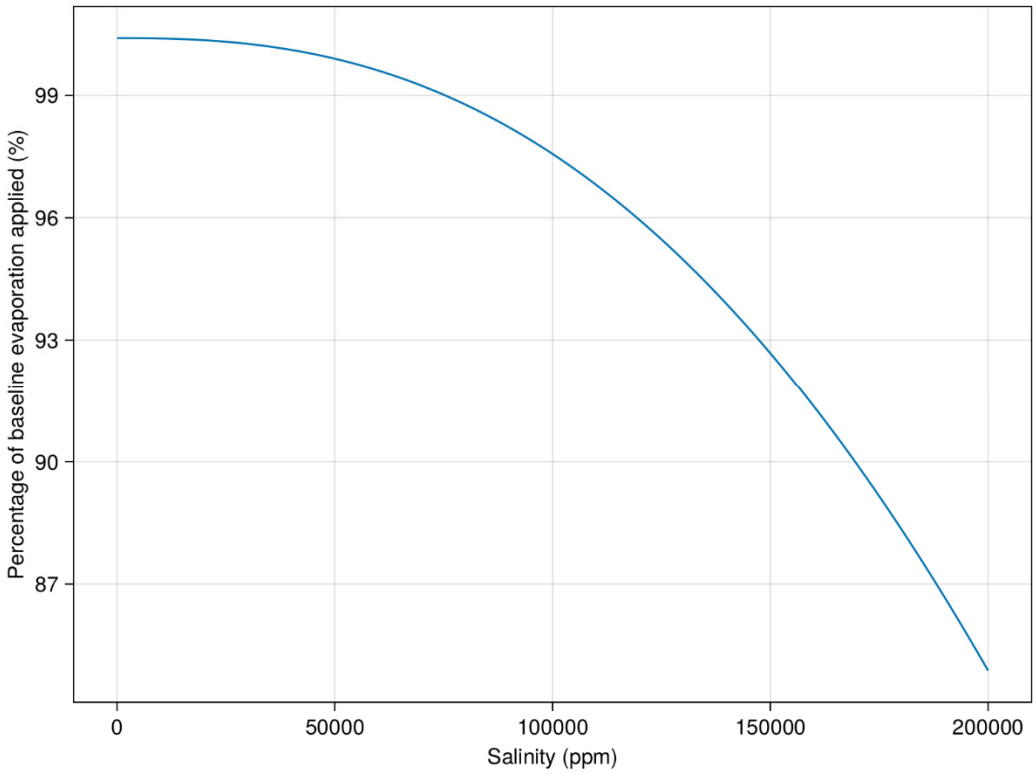

Figure 5. Illustration of decrease in net evaporation with salinity.

Salinity-Dependent Inflow Salinity

The salinity of the water specified as total inflow depends on the inflow volume in the form of a linear regression used in the original USBR model. $S_I = a + b \cdot V_I$, where $a = 5016.07448$ and $b = -0.00204508$, and this formulation has been retained in the Tetra Tech-updated version of SSAM.

Model Inputs

The main inputs the user is required to provide to the model are the following:

- The model begins in 2020 at an elevation of -235.5 ft NAVD88 with an initial salinity of 74,250 ppm.
- Total freshwater inflow each year, specified as a time series from the chosen starting year to 2100. This is the input that was modified to consider different drought mitigation scenarios.
- The baseline evaporation (i.e., evaporation before salinity-based modification) for each year. This was derived as a calibrated average value from historical data from 2004 to 2021. This average, i.e., a constant value of 69.9 inches per year, is used for all future years (2022 onwards).
- Although the model can simulate water use from conservation projects, the results shown in this memo do not include the effects of 10-Year plan projects, including SCH.

These input data are shown in **Table 4**.

Table 4. Primary SSAM 2.0 input data

Year	Inflow Baseline (af)	Inflow Fallowing (af)	Inflow Fallowing and Efficiency (af)	Base evaporation (in)	Precipitation (in)
2004	1,205,693	1,205,693	1,205,693	66.0	4.4
2005	1,252,187	1,252,187	1,252,187	66.0	4.4
2006	1,214,560	1,214,560	1,214,560	70.0	0.7
2007	1,206,227	1,206,227	1,206,227	66.0	1.9
2008	1,166,790	1,166,790	1,166,790	74.0	2.7
2009	1,058,828	1,058,828	1,058,828	66.0	1.0
2010	1,190,201	1,190,201	1,190,201	69.0	4.9
2011	1,172,468	1,172,468	1,172,468	66.0	1.9
2012	1,267,420	1,267,420	1,267,420	68.0	2.2
2013	1,143,849	1,143,849	1,143,849	74.0	1.8
2014	1,098,163	1,098,163	1,098,163	66.0	0.6
2015	1,126,640	1,126,640	1,126,640	73.0	1.5
2016	1,148,693	1,148,693	1,148,693	74.0	1.9
2017	1,104,305	1,104,305	1,104,305	74.0	4.0
2018	1,065,116	1,065,116	1,065,116	74.0	2.3
2019	1,044,076	1,044,076	1,044,076	68.0	3.4
2020	1,053,611	1,053,611	1,053,611	71.0	2.0
2021	1,093,575	1,093,575	1,093,575	74.0	2.0
2022	1,090,859	1,090,859	1,090,859	69.9	2.5
2023	1,080,139	1,080,139	1,080,139	69.9	2.5
2024	1,064,483	957,383	925,233	69.9	2.5
2025	1,048,826	941,726	909,576	69.9	2.5
2026	1,033,169	926,069	893,919	69.9	2.5
2027	1,017,513	1,017,513	1,017,513	69.9	2.5
2028	1,001,856	1,001,856	1,001,856	69.9	2.5
2029	986,199	986,199	986,199	69.9	2.5
2030	970,543	970,543	970,543	69.9	2.5
2031	954,886	954,886	954,886	69.9	2.5
2032	939,229	939,229	939,229	69.9	2.5
2033	923,573	923,573	923,573	69.9	2.5
2034	907,916	907,916	907,916	69.9	2.5
2035	892,259	892,259	892,259	69.9	2.5
2036	891,695	891,695	891,695	69.9	2.5
2037	891,131	891,131	891,131	69.9	2.5
2038	890,567	890,567	890,567	69.9	2.5
2039	890,003	890,003	890,003	69.9	2.5
2040	889,438	889,438	889,438	69.9	2.5

Model Outputs

The primary outputs of interest are Sea area, elevation, and salinity. These are all reported on an annual timestep in the ModelCalcs spreadsheet.

Model Calibration

No sufficiently robust sources of direct Salton Sea evaporation data exist, so the baseline evaporation rate was treated as a calibration parameter. Daily Sea elevation data from 2004-2021 and periodic salinity data (approximately every three months) from 2004-2020 were available for use in calibration.

The model was initialized to January 2004 based on the average data of the first month of each of the above series. Then, historical inflow from 2004-2020 was input into the model.

First, evaporation was initialized to 68 inches for all years. Then an iterative calibration process was then applied to each year from 2004 to 2020 to better match observed salinity and elevation data as follows:

- Evaluate the effect of setting the evaporation of the year in question to each value in the set of candidates: {66, 67, 68, …, 74}. This range was deemed to be consistent with previously used estimates of annual evaporation in other analyses.
- Linearly interpolate the model output within the calendar year since the observed data are daily while the model output is annual.
- Note the rank for each candidate according to best sum of squared error performance on each for salinity and elevation only within the year being evaluated.
- Choose the candidate salinity with the best performance according to the weighted average of three times the elevation rank and one times the salinity rank. The elevation data were given more weight because there is less noise in that dataset.
- Proceed to the next year and repeat the process.

The model was able to match the observed elevation and salinity data well after calibration (see Figure 6 and Figure 7). The resulting average annual evaporation used for all future years was 69.9 inches.

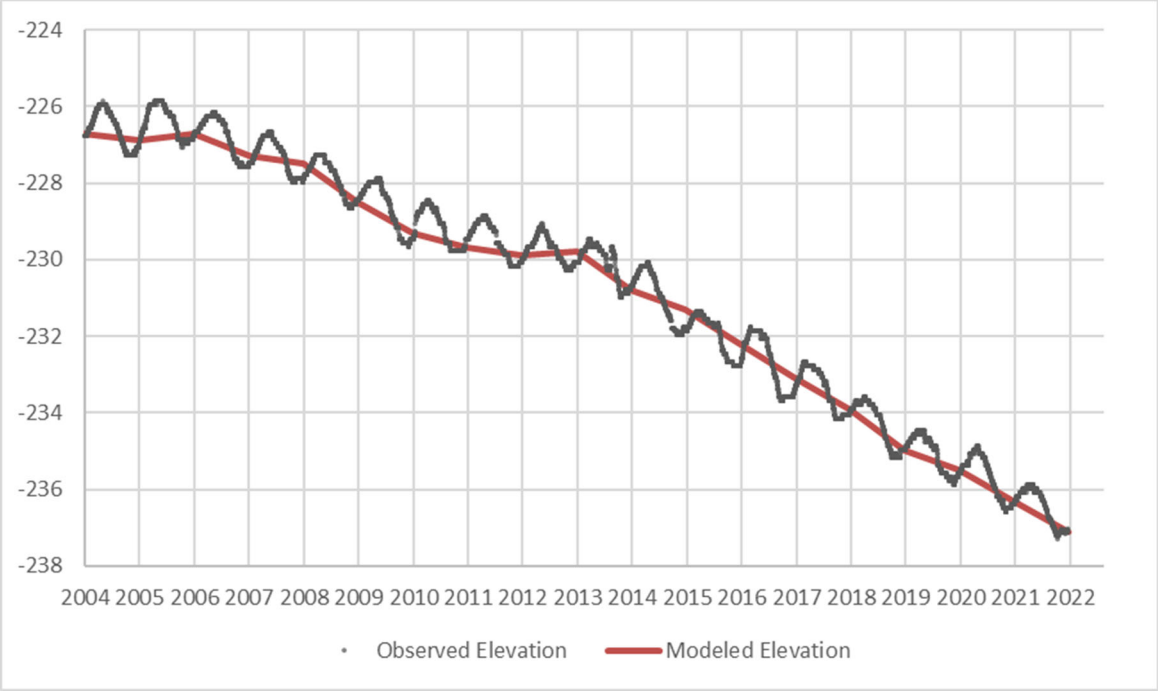

Figure 6. Observed and Calibrated Salton Sea Elevation (ft NAVD88)

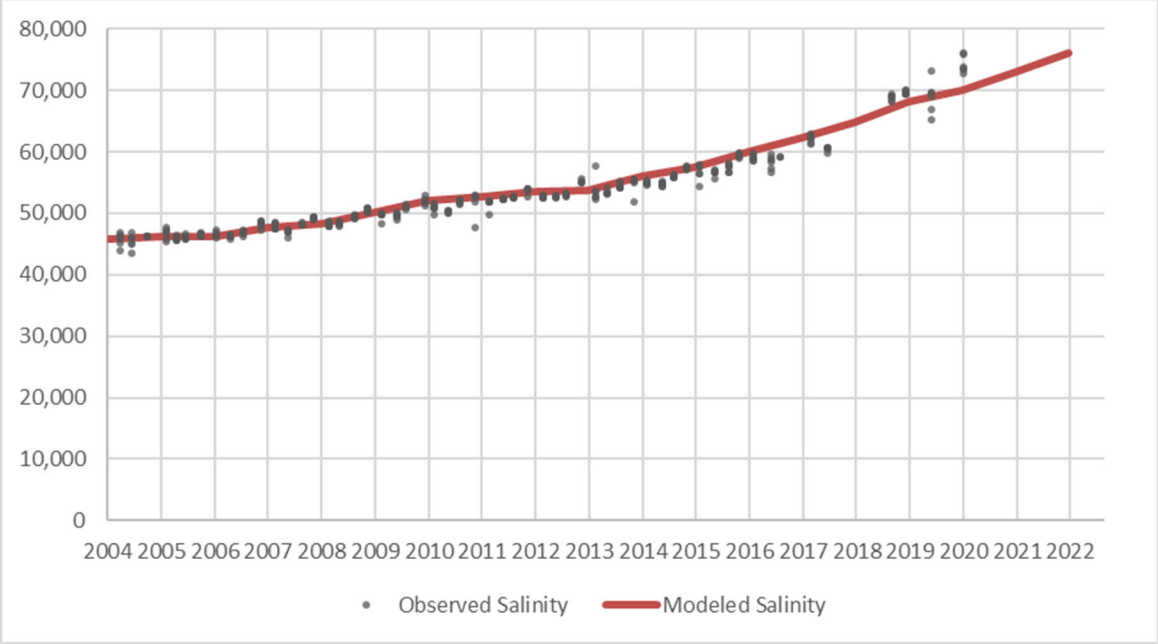

Figure 7. Observed and Calibrated Salton Sea Salinity (ppm)

As a sensitivity analysis, we also repeated the entire calibration with best-estimate historical inflows perturbed by +/- 5%. The case with 5% less inflow decreased the calibrated average evaporation to 68.0 inches, whereas the case with 5% more inflow increased it to 71.0 inches.

Modeled Inflow Scenarios

Figure 8 shows the three inflow scenarios used for the projections in this study, the baseline projected flow, and with drought conservation with fallowing on IID lands and with fallowing and efficiency on IID lands. Fallowing and efficiency results in lower inflows to the sea than fallowing alone. The drought conservation was applied for 3 calendar years (2024-2026). The results for other variables, including exposed lakebed and salinity, are shown in Figure 9 through Figure 12.

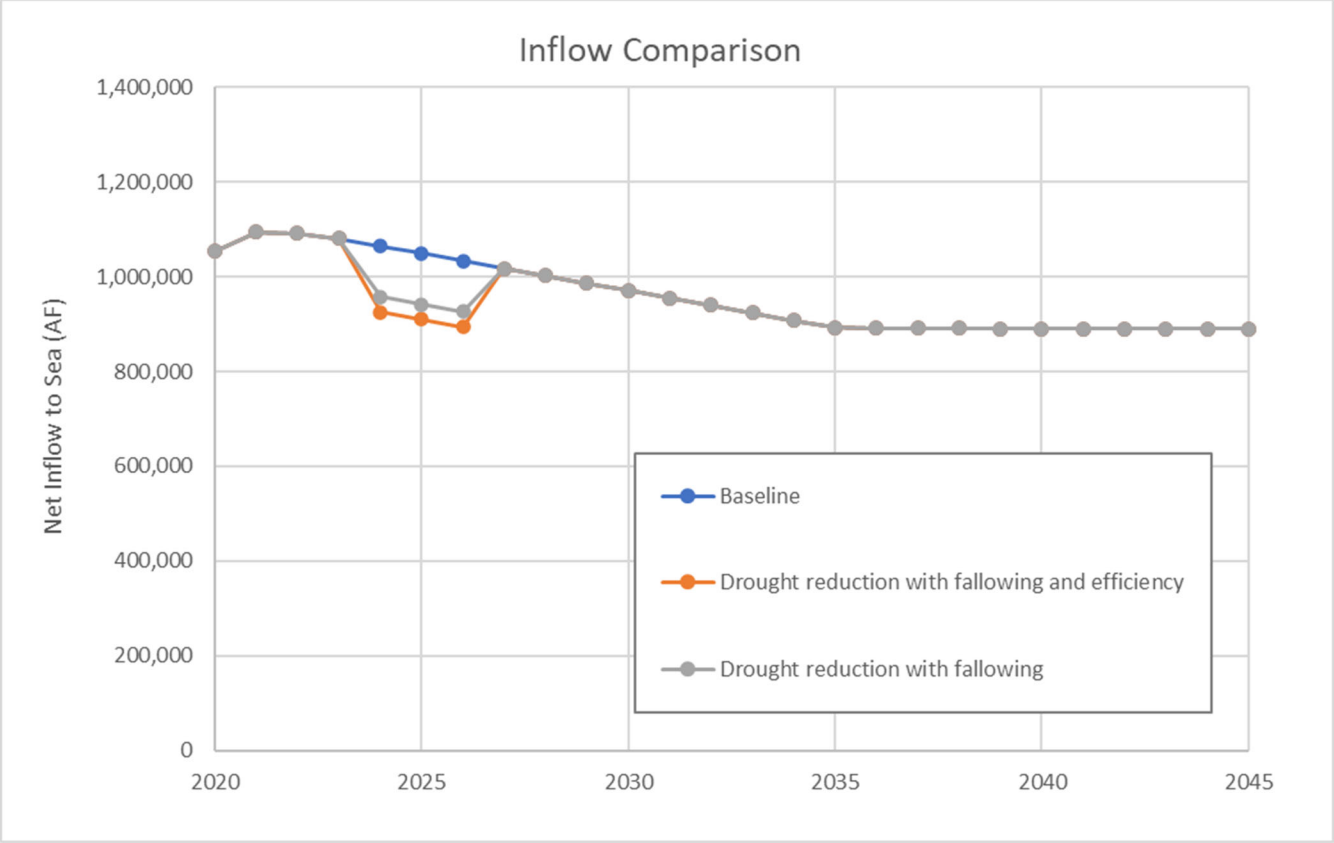

Figure 8. Effect of estimated drought reduction inflows on total inflow to Sea used by the model.

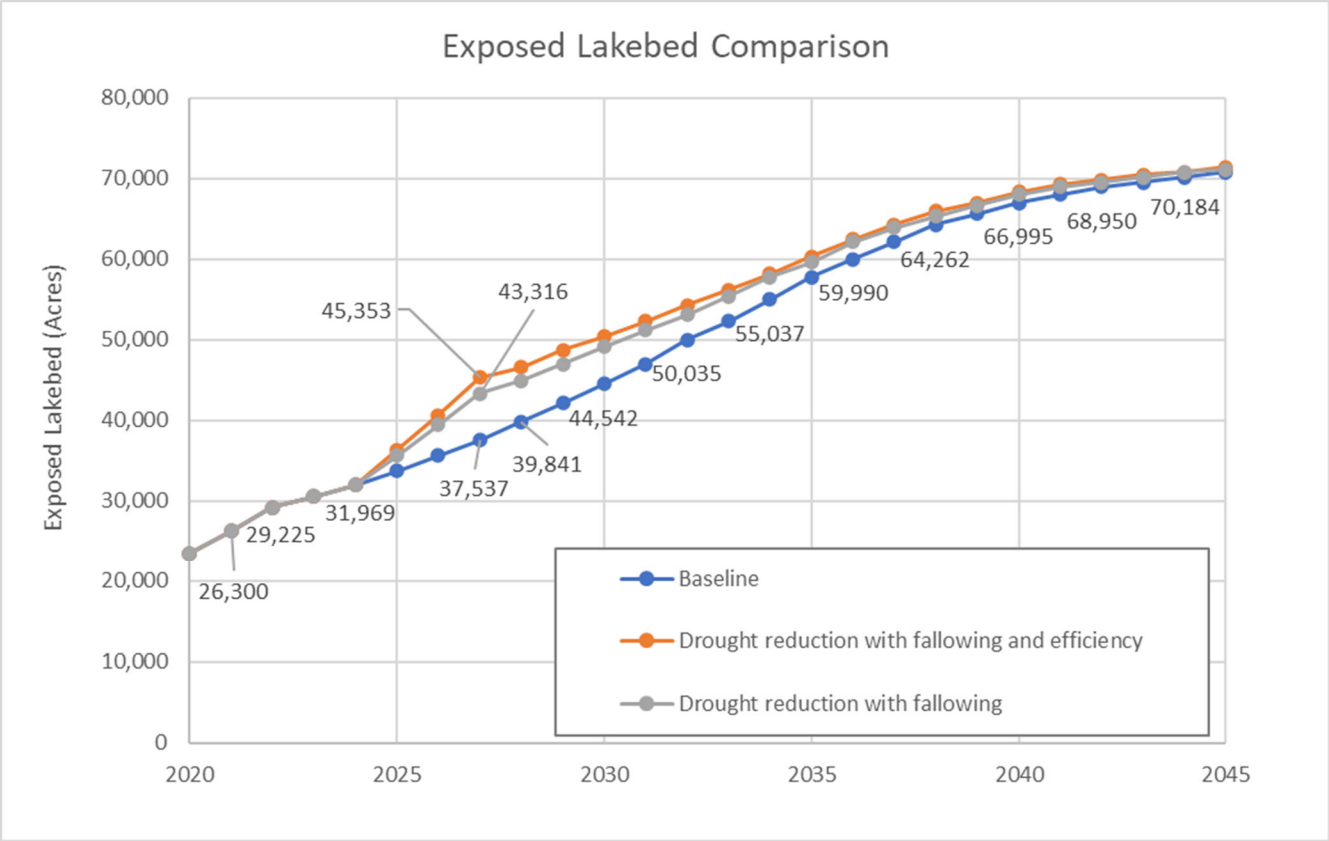

Figure 9. Impact to exposed lakebed from drought reduction scenarios (2020-2045)

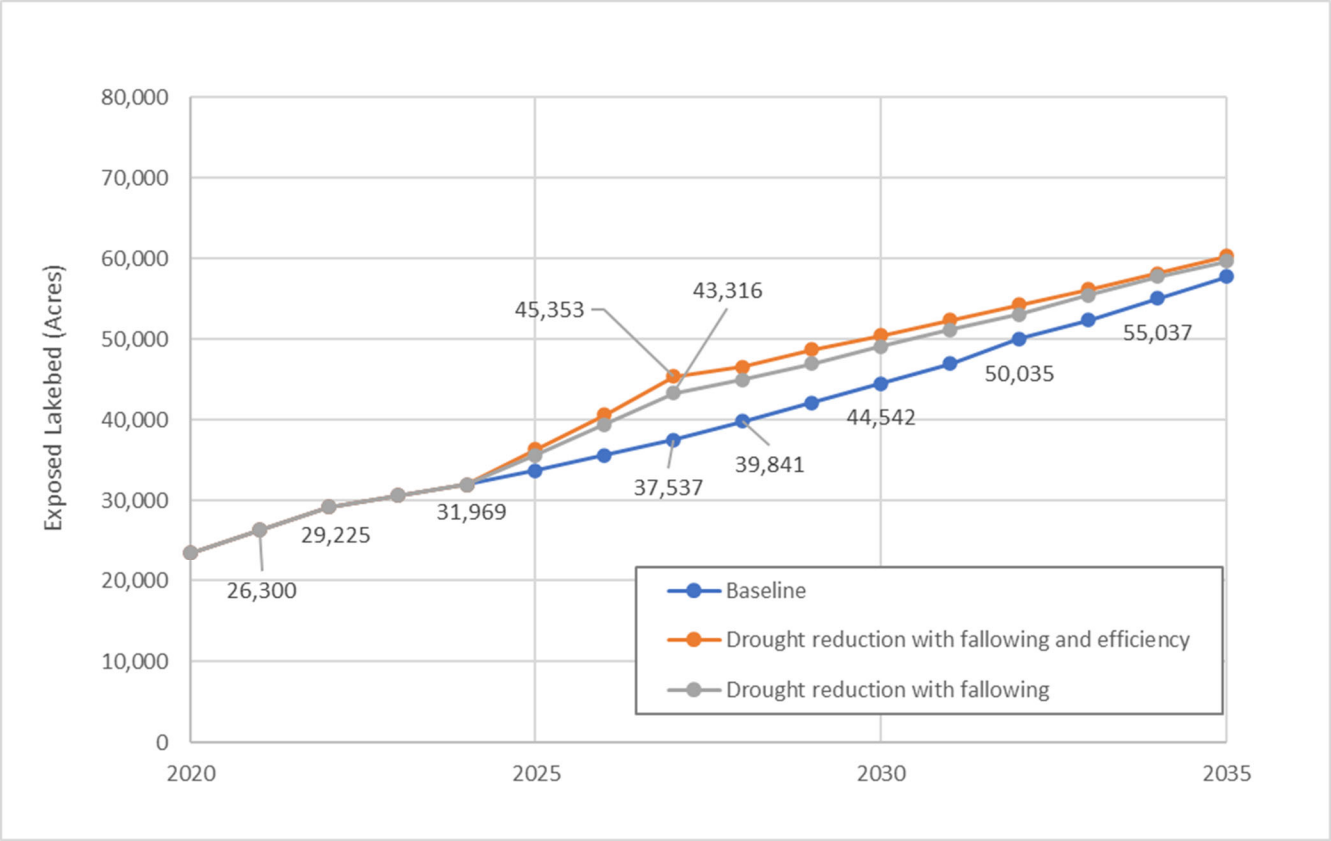

Figure 10. Impact to exposed lakebed from drought reduction scenarios (2020-2035)

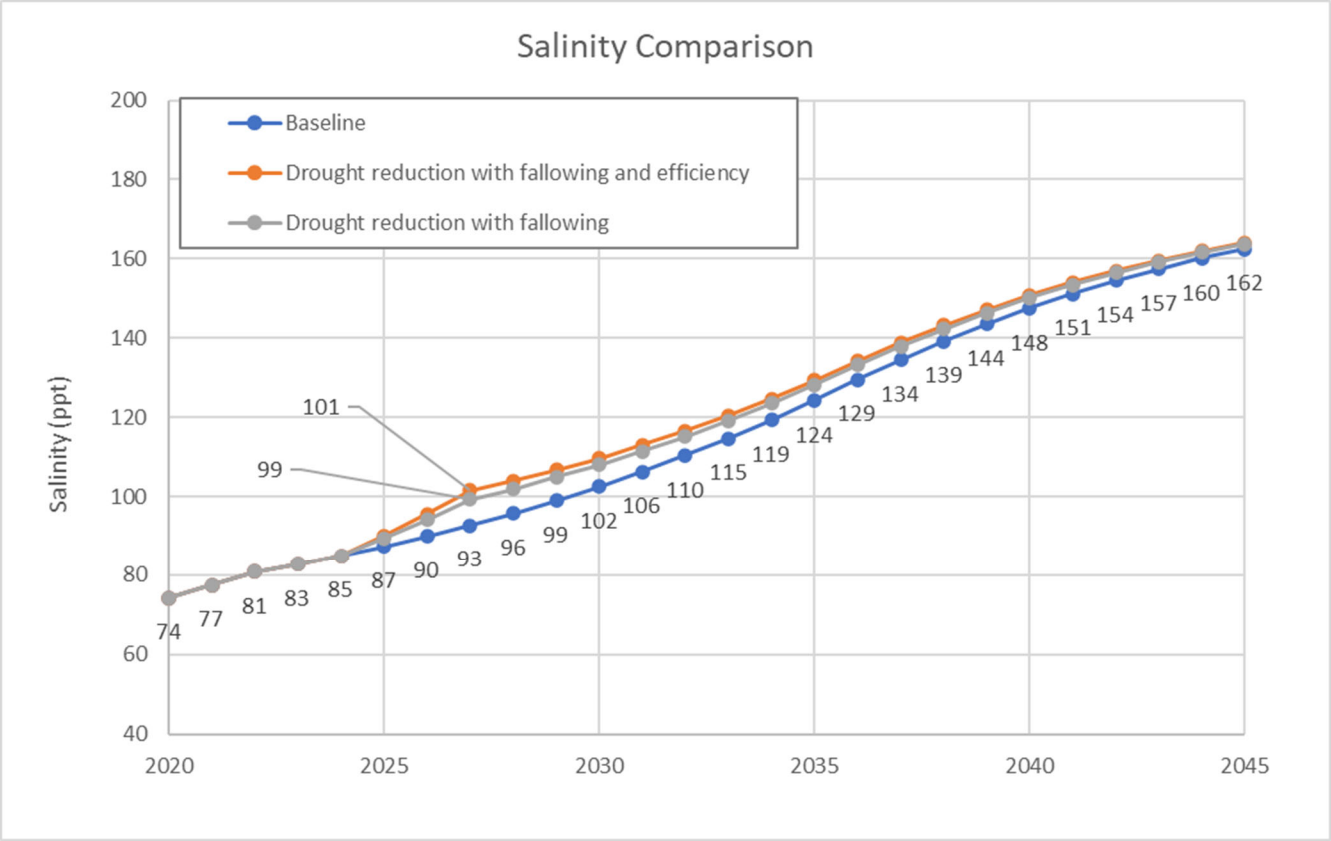

Figure 11. Impact to salinity from drought reduction scenarios (2020-2045)

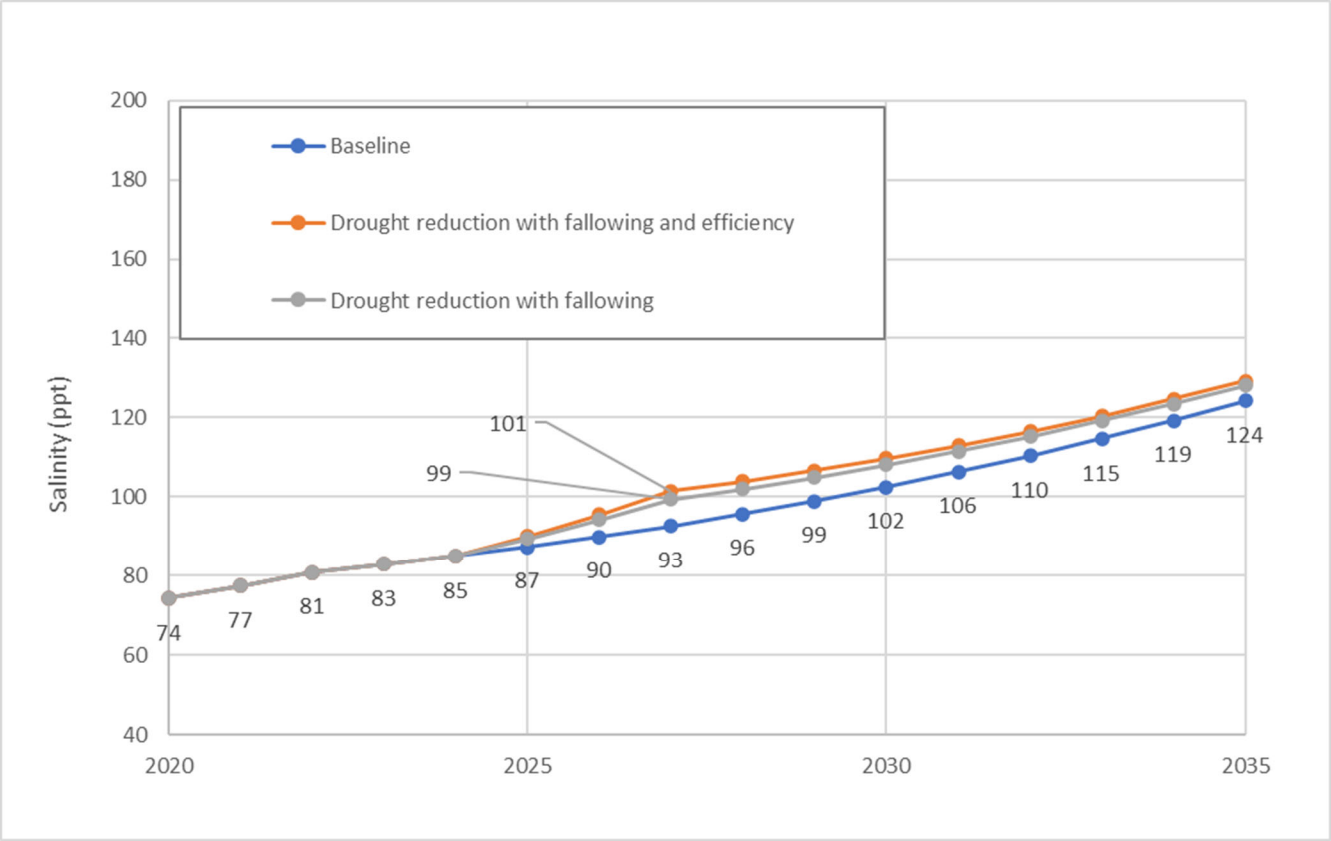

Figure 12. Impact to salinity from drought reduction scenarios (2020-2035)

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