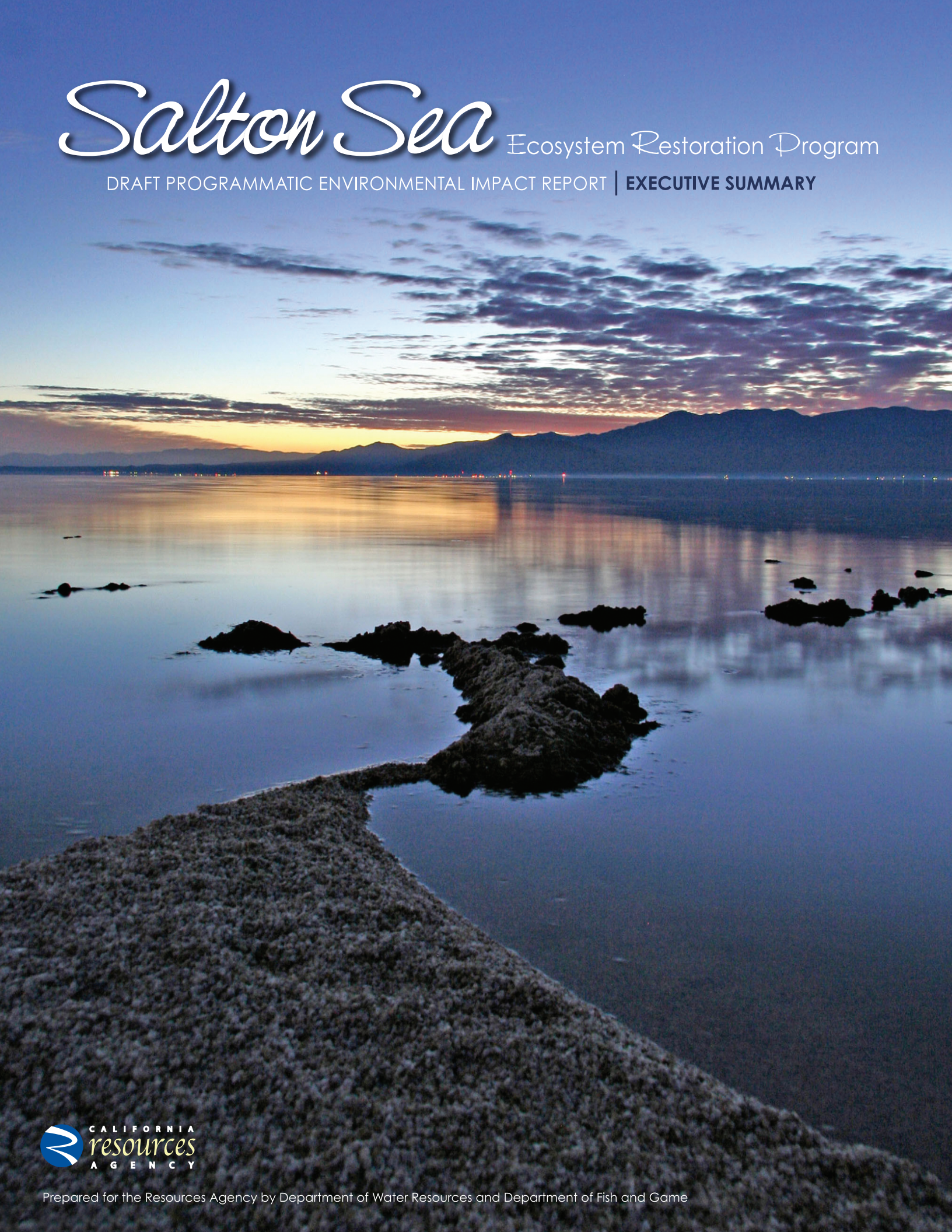
Salton Sea Ecosystem Restoration Program

DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT REPORT | **EXECUTIVE SUMMARY**



CALIFORNIA resources AGENCY

Prepared for the Resources Agency by Department of Water Resources and Department of Fish and Game

EXECUTIVE SUMMARY

Salton Sea Ecosystem Restoration Program

Draft Programmatic Environmental Impact Report

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State of California
The Resources Agency

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Cover Photo by Ian Parker, 2005

SALTON SEA ECOSYSTEM RESTORATION PROGRAM DESCRIPTION

The Salton Sea ecosystem is an extremely valuable resource for resident and migratory birds, including a large number of threatened, endangered, and species of concern. Until recently, the Salton Sea also supported a robust marine sport fishery. Increasing salinity and declining water quality have eliminated the marine fish species, and, with inflows that will be diminishing in the future, threaten the continued ability of the Salton Sea ecosystem to support birds and other wildlife. In recognition of the importance of the Salton Sea ecosystem, the state Legislature established a state policy for restoring the Salton Sea and permanently protecting the fish and wildlife resources dependent upon it.

State law requires that the Secretary for Resources undertake a study to determine a preferred alternative for the restoration of the Salton Sea ecosystem and the permanent protection of wildlife dependent on that ecosystem.

This is a summary of the Salton Sea Ecosystem Restoration Study and the Draft Programmatic Environmental Impact Report (PEIR) that are requirements of the Salton Sea Restoration Act and related legislation to implement the Colorado River Quantification Settlement Agreement (QSA).[1] The PEIR and Ecosystem Restoration Study are available on the attached compact disk.

The PEIR evaluates and analyzes potential environmental impacts of alternatives developed for restoration of the Salton Sea. The alternatives were developed through the evaluation of biological, hydrologic, air quality management, geotechnical, and engineering issues at the Salton Sea in response to the project objectives summarized here and described in detail in Chapter 1 of the PEIR.

PURPOSE OF THE PROGRAM

Since the Salton Sea was created by a levee break along the Colorado River in 1905, it has supported a dynamic fishery and currently is an extremely important

[1] The QSA is an agreement among Coachella Valley Water District (CVWD), Imperial Irrigation District (IID), and Metropolitan Water District of Southern California (Metropolitan). It was signed in 2003 to settle a long-standing dispute among the agencies regarding the use of California's apportionment of Colorado River water. The QSA agreement itself and more than 30 related agreements are commonly referred to as the QSA, and that designation will be used throughout this document.

area for numerous avian species. However, the Salton Sea is continually changing due to the lack of a natural outlet, evaporation, and the quality of inflows. By 2003, these effects had eliminated the marine sport fishery that was established in the 1950s, leaving only a remnant population of the very salt tolerant tilapia as the primary fish species. These changes now threaten the ability of the Salton Sea to continue to support fish, avian, and other wildlife species.

The discussion of Salton Sea restoration cannot take place without recognizing the QSA. The QSA was signed in 2003. It addresses water allocation issues between the holders of water rights to Colorado River water and enables California to stay within its 4.4 million acre-foot annual apportionment of Colorado River water. It also establishes a water transfer from agricultural water users to urban water users. During the first 15 years of the transfer, the Imperial Irrigation District (IID) is providing water to the Salton Sea to meet the inflow trajectory that would have occurred without the transfer. The inflow trajectory includes other activities in the watershed unrelated to the QSA that will result in declining water levels in the Salton Sea. After the first 15 years, this transfer will reduce agricultural return flows to the Salton Sea and accelerate progressive increases in salinity. This will decrease the time that the Salton Sea can continue to support fish, avian, and other wildlife species. The reduced agricultural return flows projected under the QSA will also reduce the physical size of the Salton Sea and expose lake bed sediments (playa) that, with the prevailing winds in this area, could exacerbate dust problems for an already degraded air basin.

One of the conflicts identified during negotiations of the QSA was the extent of ecosystem mitigation and associated need for restoration within the Salton Sea watershed, and specifically for the Salton Sea. Recognizing these conflicts, the Legislature passed Salton Sea restoration legislation to facilitate environmental mitigation and allocate responsibility among water agencies involved in the QSA and the state. Salton Sea restoration legislation not only allowed the QSA to be executed, but also limited environmental mitigation responsibilities for IID, Coachella Valley Water District, and San Diego County Water Authority. The legislation establishes a cost limit on environmental mitigation requirements for the water agencies involved in the QSA. Under the legislation, any future state actions to restore important functions of the Salton Sea will be the sole responsibility of the state.

The Salton Sea restoration legislation requires the Secretary for Resources to undertake a restoration study to determine a preferred alternative for the restoration of the Salton Sea ecosystem and the permanent protection of wildlife dependent on that ecosystem. The Salton Sea ecosystem is defined to include, but not be limited to, the Salton Sea, agricultural lands surrounding the Salton Sea, and the tributaries and drains within the Imperial and Coachella valleys that deliver water to the Salton Sea.

The preferred alternative, when determined, is to provide the maximum feasible attainment of the following objectives:

- ✓ Restoration of long term stable aquatic and shoreline habitat for the historic levels and diversity of fish and wildlife that depend on the Salton Sea;

- ✓ Elimination of air quality impacts from the restoration project; and
- ✓ Protection of water quality.

This program developed a Salton Sea ecosystem restoration study and PEIR as required by the legislation.

Purpose of the Draft Programmatic Environmental Impact Report

The purpose of the PEIR is to develop a preferred alternative by exploring alternative ways to restore important ecological functions of the Salton Sea that have existed for about 100 years. To start that discussion, the draft document contains no preferred alternative, allowing one to be selected only after an open public discussion on the document has taken place. The PEIR describes eight alternatives and compares these to existing conditions and two No Action Alternative scenarios. The PEIR compares for each alternative the functions that are protected, their environmental impacts, and costs. Through the public review and comments on the PEIR, and the assistance of the Salton Sea Advisory Committee, a preferred restoration alternative will be identified for inclusion into the Final PEIR. A funding plan will then be developed to explore the restoration of critical ecological functions of the Salton Sea.

The California Resources Agency is the lead agency for preparation of the PEIR and Ecosystem Restoration Study in accordance with the Salton Sea Restoration Act and related legislation, and the California Environmental Quality Act (CEQA). The PEIR was prepared under the direction of the Department of Water Resources (DWR) and Department of Fish and Game (DFG) on behalf of the Resources Agency and the Secretary for Resources.

Study Period for the Salton Sea Ecosystem Restoration Program

The study period for the Salton Sea Ecosystem Restoration Program is consistent with the complete implementation period for the QSA, which is 75 years. This time period is defined as 2003 to 2078.

Use of the Draft Programmatic Environmental Impact Report

The PEIR is a programmatic document, the purpose of which is to identify a series of related actions that can be assessed as one project for the purpose of CEQA analysis. The PEIR will serve as an informational document for decision makers, public agencies, non-government organizations, and the general public regarding the potential direct and indirect environmental consequences of implementing any of the alternatives. It also will serve as an information source to be incorporated in future environmental compliance documents for evaluating broad alternatives and cumulative impacts. It is anticipated that future site-specific environmental analysis would be developed based on information from this document.

The PEIR does not include a preferred alternative. The Secretary for Resources will present the preferred alternative to the Legislature after receiving a recommendation from the Salton Sea Advisory Committee and following additional public participation, including input from stakeholders, interested agencies and the public.

STUDY PARTICIPANTS AND STAKEHOLDER COORDINATION

The PEIR was prepared in coordination with a variety of federal, state, tribal, local agencies, and other organizations that have an interest in the Salton Sea. Stakeholder participation was facilitated by the Salton Sea Advisory Committee and the various technical sub-groups of the Advisory Committee. The Advisory Committee is comprised of 32 members, and includes representatives from a variety of federal, state, and local public agencies, tribal governments, and non-governmental organizations. They were selected to provide balanced representation of a variety of interests in the Salton Sea in accordance with the Salton Sea Restoration Act and related legislation. The Secretary for Resources consulted with the Advisory Committee and held 20 Advisory Committee and 27 technical sub-group meetings throughout the preparation of the PEIR.

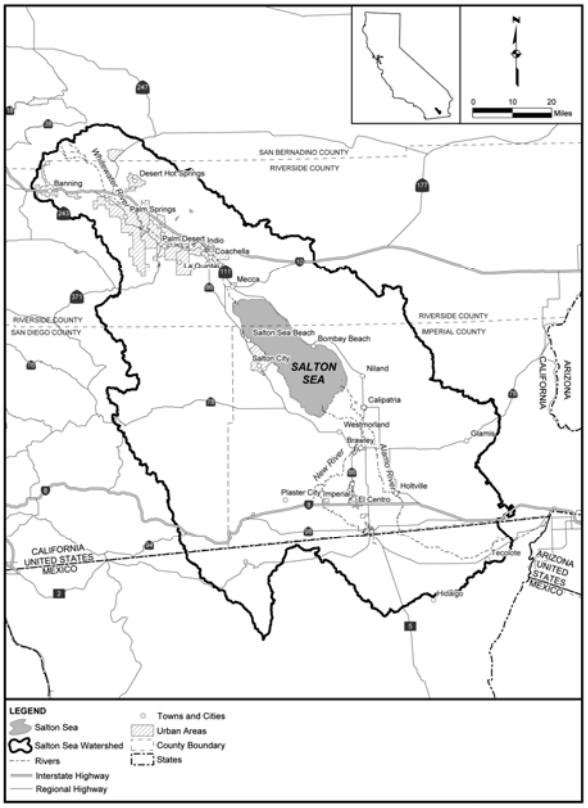
In addition, an extensive public outreach effort was conducted to facilitate public participation in the development of the PEIR. Twenty-eight public outreach meetings were held in communities throughout the Salton Sea watershed and three public outreach meetings were held outside of the Salton Sea watershed prior to the issuance of the PEIR. To keep the public informed on the status of the PEIR process, brochures and updates were distributed via direct mail and email. DWR also launched, and continues to maintain, an extensive Web site at *www.saltonsea.water.ca.gov*, that provides up-to-date information.

The PEIR is being circulated for a 90-day public review period. Comments received during the public review period will be considered by the lead agency, and responses to comments will be included in the Final PEIR. Additional public outreach meetings will be held prior to the completion of the Final PEIR. Please see *www.saltonsea.water.ca.gov* for information on these meetings.

THE SALTON SEA

The Salton Sea is located in Imperial and Riverside counties (see figure on following page), and is the largest lake in California. It is about 35 miles long and 15 miles wide. The Salton Sea surface water elevation is currently about -228 feet mean sea level (msl) and the greatest water depth is about 50 feet.

Though the current Salton Sea has existed only since 1905, a much larger lake known as Lake Cahuilla filled the Salton Sink on several occasions in past centuries. The Colorado River periodically changed course, and sometimes flowed into the Salton Sink. After flow in the river returned to the Gulf of Mexico, Lake Cahuilla would gradually disappear through evaporation until the next time the Colorado River changed course. Current water development and control projects in the Colorado River Basin prevent the river from returning to the Salton Sink.



SALTON SEA AND VICINITY

The current Salton Sea is a hypersaline and eutrophic (nutrient-rich) water body with no outlet. Most of the water that flows into the Salton Sea is agricultural drain water that was originally diverted from the Colorado River for irrigation use in the Coachella Valley in Riverside County, Imperial Valley in Imperial County, and Mexicali Valley in Mexico. The California agricultural industry's ability to use the Salton Sea for a repository of agricultural drainage was protected when President Calvin Coolidge in 1924 and 1928 ordered specific sections of land under the Salton Sea to be withdrawn from settlement, location, sale, or entry, and reserved for the purposes of creating a drainage reservoir. Precipitation in the watershed is low and contributes little natural runoff to the Salton Sea.

Until recently, inflows to the Salton Sea contributed about 1,300,000 acre-feet/year and 4,000,000 tons of salts per year. These historic inflows were about equal to the water evaporated from the surface of the Salton Sea. Therefore, the Salton Sea elevation has remained relatively stable. Because the Salton Sea is a terminal body of water, the salinity continues to increase as salts are left behind when water evaporates from the surface. The current salinity averages about 48,000 milligrams/liter (mg/L). Over time, the Salton Sea would naturally become more saline, similar to other terminal water bodies, such as Mono Lake in California, Great Salt Lake in Utah, and Dead Sea in Israel.

The Salton Sea is a dynamic system and is constantly changing over time. Many of these changes, such as the gradual increase in salinity and fluctuations in the elevation, occur naturally. However, the speed at which these changes occur is expected to increase due to ongoing and anticipated future human activities. For example, the QSA, along with other projects in the Coachella, Imperial, and Mexicali valleys, will reduce inflows to the Salton Sea, increasing the salinity and decreasing the elevation, as described in the 2002 Programmatic Environmental Impact Report for Implementation of the Colorado River Quantification Settlement Agreement by Coachella Valley Water District (CVWD), Imperial Irrigation District (IID), Metropolitan Water District of Southern California (Metropolitan), and San Diego County Water Authority (SDCWA).

IMPORTANCE OF THE SALTON SEA ECOSYSTEM

The Salton Sea is adjacent to the lower Colorado River delta and the northern portion of the Gulf of California. Due to the significant loss of wetlands in California and other areas, the Salton Sea ecosystem has become one of the most important wetlands for birds in North America and supports some of the highest levels of avian biodiversity in the southwestern United States. Recent studies have documented the great importance of the Salton Sea ecosystem in providing habitat for migrating and resident waterbirds, particularly Pacific Flyway waterbirds.

More than 400 resident, migratory, and special status bird species have been recorded in the Salton Sea area since its formation, with about 270 of those species using the Salton Sea on a fairly regular basis. In addition to the diversity of birds, studies have indicated that the large number of individual birds using the Salton Sea is even more ecologically relevant than the number of species.

Since the Salton Sea's formation in 1905, a series of aquatic communities have thrived. A single native fish, the desert pupfish (which is listed as endangered), had inhabited two streams and several inundated springs in the Salton Trough, and persists today in the two streams, agricultural drains, and shallow parts of the Salton Sea. The other original members of the Salton Sea fish community, including carp, striped mullet, humpback sucker, rainbow trout, and bonytail chub, were carried directly from the Colorado River into the Salton Sea as it was filling. In the late 1940s to the mid-1950s, DFG stocked more than 30 species of marine fishes as the salinity of the Salton Sea approached ocean levels. Populations of introduced orangemouth corvina, sargo, and gulf croaker established and thrived. Introduced marine invertebrates, including pileworms and barnacles, came to dominate the lower end of the aquatic food chain, and provided the forage base which supported large fish populations and high bird use. During the 1960s and 1970s, tilapia unexpectedly invaded the Salton Sea from irrigation drains, and ultimately came to dominate the fish community. The tilapia population provided a new abundant forage base for the marine sport fish and fish-eating birds.

Supported by nutrients from agricultural drain water inflows, the Salton Sea fisheries from 1960 to 2000 were phenomenally productive. These popular fisheries were a fundamental driver of the burgeoning recreational use of the Salton Sea during those decades. However, as salinity and nutrients increased in the Salton Sea over time, wildlife health was negatively affected and chronic large scale die-offs of fish and birds fueled the public perception of a deteriorating ecosystem. Starting in 2000, all sport fish populations at the Salton Sea have undergone a dramatic decline due to a combination of increasing salinity and deteriorating water quality. Sargo, gulf croaker, and orangemouth corvina have been undetected in gill net sampling since mid-May 2003. Tilapia populations have rebounded since their lowest recorded levels in 2003, but currently persist in the Salton Sea at levels that are only 10 percent of those recorded in the 1990s.

THE FUTURE OF THE SALTON SEA WITHOUT RESTORATION

Under the QSA and California Fish and Game Code, IID must convey water into the Salton Sea until the year 2017 to mitigate some of the adverse impacts caused by the transfer of water from IID to SDCWA. Between now and 2018, surface water elevations in the Salton Sea would decline due to factors unrelated to the QSA from the existing elevation of about -228 feet msl to -235 feet msl, and salinity would increase from the current level of about 48,000 mg/L to 60,000 mg/L. After 2018, when mitigation water is no longer conveyed to the Salton Sea, inflows and the surface water elevation would decline rapidly and salinity would increase. By 2078, the elevation would be about -260 feet msl and salinity would exceed 300,000 mg/L. The surface water area would decline from the existing 230,000 acres to 213,000 acres in 2018 and 140,000 acres by 2078.

With increased salinity, the aquatic food web would become less complex. The pileworm, a primary component of the Salton Sea food chain, would have reduced reproduction when the salinity exceeds 50,000 mg/L (which could occur as early as 2008). Other invertebrates may already have ceased reproduction. As the salinity increases, more salt tolerant species, such as brine flies and brine shrimp, would increase (which could occur as early as 2020) but would disappear when salinity exceeds 200,000 mg/L (which could occur as early as 2038).

Tilapia serve as the primary forage species for piscivorous (fish-eating) birds at the Salton Sea. Tilapia may be present until salinity exceeds 60,000 mg/L (which could occur as early as 2021). Tilapia could likely continue to persist in lower salinity areas where the rivers, creeks, and drains enter the smaller Salton Sea. How long fish would persist in these areas would depend on the size of the areas and whether wind events would cause enough mixing to increase salinity to levels above fish tolerance.

Other fish would continue to inhabit the drains, as well as constructed pupfish channels and sedimentation and distribution basins that are components of the No Action Alternative. Sailfin mollies and desert pupfish can move easily between the drains via the Salton Sea. Under existing mitigation requirements for the QSA, pupfish channels would be constructed on the sea bed to allow this movement between drains when salinity in the Salton Sea would no longer support these fish.

The decline and ultimate loss of open water fish populations would reduce and possibly eliminate use of the Salton Sea by fish-eating birds, such as pelicans, double-crested cormorants, and black skimmers by the early 2020s. Some of these birds could use the areas where the rivers, creeks, and drains enter the Salton Sea if fish continue to persist in these locations. The relative abundance of bird species that forage on invertebrates likely would change over time with increases in salinity and resultant changes in the invertebrate community.

Snags used for roosting and nesting would disappear by 2020 as the Salton Sea recedes and the snags break and collapse due to degradation by wind, brine, and time. The loss of snags could limit nesting opportunities for several species of colonial nesting birds, including herons and egrets. Loss of nesting or communal roosting areas (snags and islands) for special status birds would be a significant impact.

As the Salton Sea recedes in future years, the distance between the open water shoreline and freshwater wetlands, agricultural lands, and human communities would increase. Though air quality management methods would be implemented, there could be dust from the exposed playa, affecting both wildlife and humans.

DEVELOPMENT OF ALTERNATIVES

Salton Sea restoration legislation assigned responsibility to the state to prepare an ecosystem restoration study to determine a preferred alternative for the restoration of the Salton Sea ecosystem and protection of wildlife dependent on that ecosystem. The legislation provided guidelines for establishing the range of alternatives, including consideration for strategies for salinity control, habitat creation and restoration, different shoreline elevations, surface area configurations, and different inflow conditions. However, the legislation did not

specifically identify the alternatives to be considered in the restoration study or environmental document.

During preparation of the PEIR, including the Ecosystem Restoration Study, a series of alternatives was developed to represent a range of methods for restoring the Salton Sea ecosystem and the permanent protection of the fish and wildlife dependent on that ecosystem. These alternatives included strategies for salinity control, habitat creation and restoration, and different shoreline elevations and surface area configurations. In addition, these alternatives considered the range of possible inflow conditions that could occur under a No Action Alternative. The alternatives were developed to provide the maximum feasible attainment of the program objectives, as required by the Fish and Game Code. The statutory program objectives were further defined through discussions with the Salton Sea Advisory Committee, which was established by the restoration legislation to provide recommendations on the restoration plan to the Secretary for Resources. The resultant guidelines defined salinity objectives that ranged from 20,000 to 200,000 mg/L with varying water depths to provide a mosaic of habitat types, support desert pupfish, and reduce vector issues. The objectives also included compliance with endangered species, environmental protection, water quality, and air quality regulations. Using these guidelines, the following concepts were identified:

- ✓ Whole Sea Concepts – import and export of water to maintain a stable water surface elevation throughout the sea bed, with saltwater disposal outside the sea bed to maintain marine salinity;
- ✓ Partial Sea Concepts - use of barriers to divide the sea bed to maintain a marine sea in only certain areas, with saltwater disposal outside the sea bed or in a brine sink in the sea bed; and
- ✓ Shallow Saline Habitat Concepts - use multiple berms to maintain shallow water cells (Saline Habitat Complex) with different salinities and depths in shallow areas of the sea bed, with saltwater disposal outside the sea bed or in a brine sink.

Through a multiple step screening process, the final alternatives were defined based upon the partial sea and shallow saline habitat concepts. The whole sea concepts were not included in the final range of alternatives because adequate surplus water did not exist under Colorado River water rights, and the presence of environmentally protected areas would limit the ability to construct conveyance and divert water from or discharge into the Pacific Ocean and Gulf of California. In addition, import and export using the Gulf of California was not included because Mexico would control access for construction and operations and maintenance. If a waterway is developed from the Gulf of California to Mexicali, a Whole Sea Concept could be re-evaluated.

DESCRIPTION OF ALTERNATIVES

The eight final alternatives evaluated in the PEIR consist of one or more of the following components:

PHALAROPES AT PILOT SALINE HABITAT COMPLEX
(Photo by Doug Barnum)

- ✓ **Saline Habitat Complex:** This component would provide a series of 1,000-acre cells with water depths of less than six feet. The cells would be constructed with berms formed by excavating sea bed soils. The sea bed soils also would be used to form islands and peninsulas within the cells. Deep holes would be excavated in some areas of the cells to provide shelter for fish. The salinity in each cell could vary to provide habitat for different fish and/or invertebrate species. Salinity in some cells would be higher than 60,000 mg/L and would only support invertebrates. All of the cells would provide habitat for a variety of birds;

- ✓ **Deep Marine Sea:** This component would provide habitat similar to historic conditions at the Salton Sea. Salinity objectives would range from 20,000 to 40,000 mg/L to support marine sport fish, such as sargo or corvina. The deepest water could extend to more than 50 feet, depending upon the location of the Marine Sea on the sea bed. The Marine Sea would be formed by a high rockfill barrier that would extend across the sea bed and primarily be constructed using barges. The alternatives were developed based upon a shoreline elevation of -230 feet msl to provide a similar basis of comparison. However, in project-level analyses, a range of shoreline elevations could be evaluated in detail. There is uncertainty about hydrogen sulfide and ammonia accumulation in the deep Marine Seas and the potential for fish kills when these constituents are mixed from lower depths into the water column. This condition currently occurs; however, experts disagree on the probability of this condition continuing in the future, especially after water quality improvements are implemented for the inflows assumed under the No Action Alternative;

- ✓ **Moderately Deep Marine Sea:** This component also would provide water with salinity ranging from 20,000 to 40,000 mg/L to support marine sport fish. The deepest water could extend to 10 feet. The moderately deep Marine Seas would be formed by low rockfill barriers or geotubes that generally would parallel the existing shoreline and primarily be constructed using barges. The alternatives were developed based upon a shoreline elevation of about -230 feet msl to provide a similar basis of comparison;

WATER EFFICIENT VEGETATION FOR CONTROL OF FUGITIVE DUST
(Photo by John Dickey)

- ✓ **Air Quality Management:** In the No Action Alternative and in six of the alternatives, a conservative approach was included based on a combination of monitoring of the exposed playa, and use of irrigated water efficient vegetation or brine stabilization for areas with particulate emissions. This approach would require water conveyance; filtration equipment, and distribution of water in buried drip irrigation pipelines. Use of brine for stabilization of soils and temporary irrigation of native vegetation were considered in one alternative;

- ✓ **Desert Pupfish Connectivity:** The desert pupfish is an endangered species that inhabits the agricultural drains and San Felipe and Salt creeks. Due to the protected status of this species, all alternatives incorporate components to ensure the continued survival of this species, and provide varying degrees of connectivity between populations. Currently, the desert pupfish populations have been able to interact by swimming between these areas in the Salton Sea. When the salinity in the Salton Sea exceeds 90,000 mg/L, the water body would not be able to support the desert pupfish. Therefore, the alternatives include a range of methods, depending upon the facilities in each alternative, to allow connections of the drains and creeks to allow for the continued genetic conductivity among the desert pupfish populations;

- ✓ **Brine Sink:** The Brine Sink is the water body that the Salton Sea would become through implementation of the alternatives. Runoff from other components, such as the Saline Habitat Complex and Marine Sea, and flows from the rivers and creeks that exceed the flows needed in the habitat components would be conveyed to the Brine Sink. The size and salinity of the Brine Sink would fluctuate throughout any year. However, the Brine Sink area would decline and become more saline over the 75 year study period; and

- ✓ **Freshwater Reservoir:** A freshwater reservoir to be constructed by IID is included in one alternative. The reservoir would not be part of the Ecosystem Restoration Program. It would encompass 11,000 acres.

Based on these concepts and components, eight restoration alternatives were developed:

- ✓ Alternative 1 – Saline Habitat Complex I;
- ✓ Alternative 2 – Saline Habitat Complex II;
- ✓ Alternative 3 – Concentric Rings;
- ✓ Alternative 4 – Concentric Lakes;
- ✓ Alternative 5 – North Sea;
- ✓ Alternative 6 – North Sea Combined;
- ✓ Alternative 7 – Combined North and South Lakes; and
- ✓ Alternative 8 – South Sea Combined

Phased Implementation of the Alternatives

Inflows are projected to change over the 75-year study period in response to implementation of the QSA as well as reductions in flows from Mexico, potential changes in agricultural practices, improved groundwater management in the watershed, and global climate change. Saline Habitat Complex, air quality management, and pupfish connectivity components could not be constructed until the current Salton Sea water level recedes. Therefore, construction would extend for several decades. These changes would cause the impacts and benefits to vary throughout the study period. To provide a better understanding of the timing of the impacts and benefits, the No Action Alternative and the eight alternatives are described for the following four phases in the 75-year study period:

- ✓ **Phase I -** Present to 2020: Inflows would be relatively stable until 2018 when flows would decline due to QSA provisions. Planning and design activities would be completed in this phase. Construction would start by 2014 under most alternatives. Many alternatives would have some of the components in operation by 2018.
- ✓ **Phase II -** 2020 to 2030: Inflows would decline rapidly. Construction would be completed in this phase for most components.
- ✓ **Phase III -** 2030 to 2040: Inflows would be relatively stable. Construction of all facilities would be completed by the end of this phase.
- ✓ **Phase IV -** 2040 to 2078: Inflows would change slightly in this phase due to QSA provisions.

Summary of the Alternatives

The restoration alternatives and a No Action Alternative are briefly described below. A detailed description of the alternatives can be found in Chapter 3 of the PEIR. Facilities included in the alternatives are summarized in Table ES-1, located at the end of the Executive Summary. The order in which the restoration alternatives are presented is based on increasing complexity and number of components, and does not indicate any preference.

No Action Alternative

CEQA requires the evaluation of a "no project" alternative to allow comparison of impacts of the restoration alternatives with those of not implementing any project. The No Action Alternative, which is the term used in this document for the no project alternative, reflects existing conditions plus changes that are reasonably expected to occur in the foreseeable future if the restoration is not implemented. The description of the No Action Alternative includes two different assumptions regarding inflow patterns over the 75-year study period and construction of QSA related facilities in the sea bed.

Definition of Inflows for the No Action Alternative

It is difficult to predict changes in inflows over a 75-year period due to the influences of many future actions that cannot be accurately predicted now.

Therefore, two inflow scenarios were developed for the No Action Alternative in the PEIR.

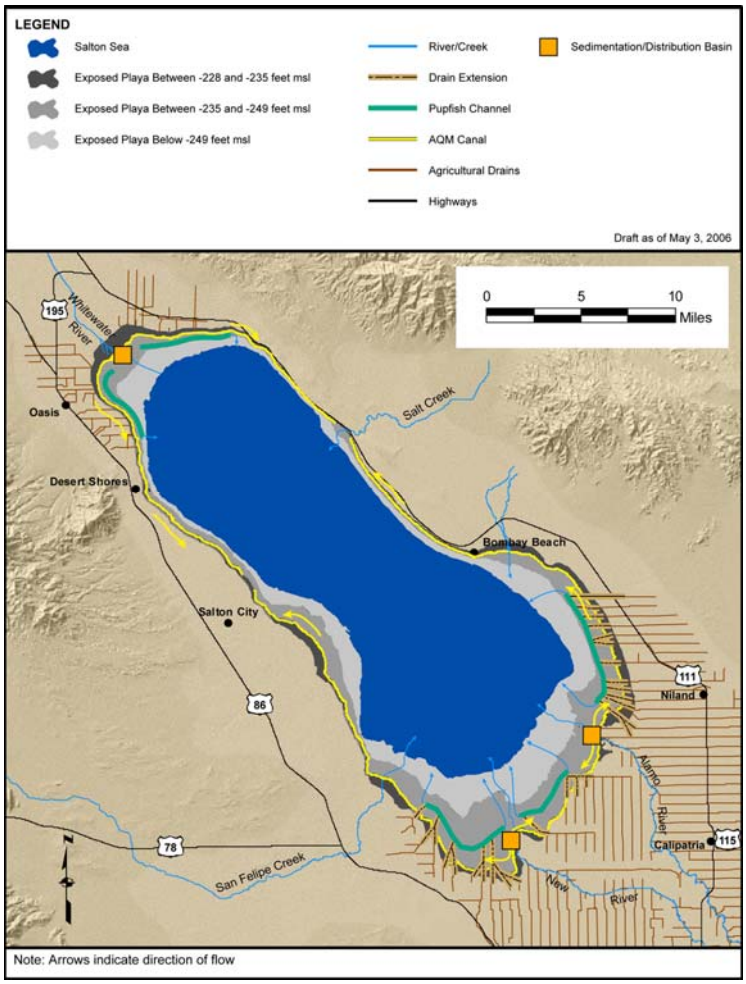
One scenario is based upon future actions that have been previously defined in environmental documentation, including QSA implementation, reductions in flows from Mexico (due to new wastewater management facilities in Mexicali), and groundwater management in the Coachella Valley. This scenario, referred to as the No Action Alternative-CEQA Conditions, was developed in accordance with the CEQA Guidelines requirement for a no project alternative. The average inflows assumed for the No Action Alternative-CEQA Conditions from 2018 to 2078 would be 922,000 acre-feet/year (as compared to the existing conditions value of 1,300,000 acre-feet/year).

The second scenario is based upon implementation of actions under the No Action Alternative-CEQA Conditions and a conservative projection of changes in inflows due to potential changes in agricultural practices, further reductions in inflows from Mexico, and delayed implementation of groundwater management in the Coachella Valley. The No Action Alternative-CEQA Conditions may not accurately reflect future conditions over the 75-year study period. Therefore, this second scenario, referred to as the No Action Alternative-Variability Conditions, was developed to reflect these future uncertainties, and includes consideration of a wider range of projects and plans potentially developed by others that would affect inflows to the Salton Sea. Future variability is important to consider because it would be difficult to modify facilities should conditions change in the future. Under this scenario, the average inflows from 2018 to 2078 would be 717,000 acre-feet/year. For the purposes of comparison, this more conservative inflow scenario was used to develop Alternatives 1 through 8.

Facilities to be Constructed under the No Action Alternative

The No Action Alternative in the PEIR includes numerous actions and facilities to be constructed in accordance with implementation of the QSA. Most of these actions and facilities would not be located within the sea bed and would be considered to occur in all alternatives. However, several of the QSA provisions require actions or construction of components within the sea bed that could be modified substantially through implementation of the PEIR alternatives, including:

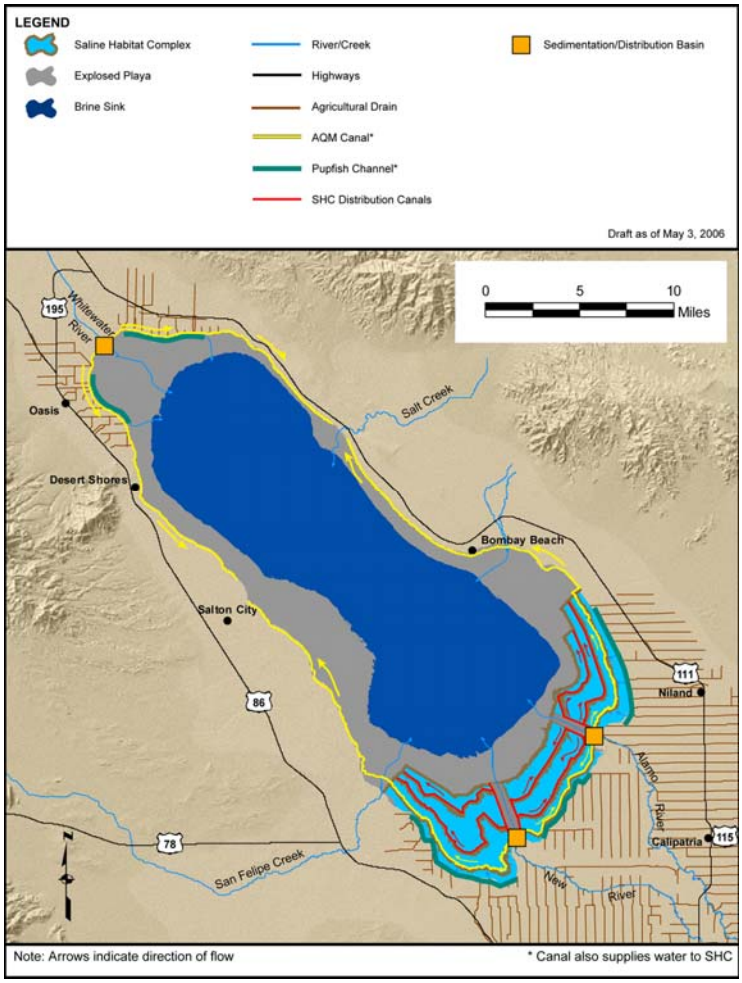
- ✓ Air Quality Management - Mitigation of particulate emissions from the exposed playa between -235 and -248 feet msl; and
- ✓ Pupfish Connectivity - Construction of five pupfish channels on the sea bed.



These measures would be part of the mitigation for the IID Water Conservation and Transfer Program and costs would be jointly funded by IID, SDCWA, and CVWD up to a maximum amount of $133,000,000 (in 2003 dollars). Costs in excess of this amount would be the responsibility of the State, as determined in the QSA. These measures would be modified in each of the alternatives. Estimated costs for implementing these measures and impacts from construction and operations and maintenance are presented in the PEIR for comparative purposes. Facilities and costs would be identical for No Action Alternative-CEQA Conditions and No Action Alternative-Variability Conditions.

NO ACTION ALTERNATIVE-VARIABILITY CONDITIONS AS OF 2078

- **Brine Sink** = 140,000 acres
- **Exposed Playa** = 81,000 acres
- **Construction Cost** = $0.8 Billion (2006 dollars)
- **Annual Operations and Maintenance Cost** = $48 Million (2006 dollars)



Alternative 1 - Saline Habitat Complex I

Alternative 1 would provide Saline Habitat Complex in the southern sea bed. Additional features include the Brine Sink, desert pupfish connectivity, and air quality management components.

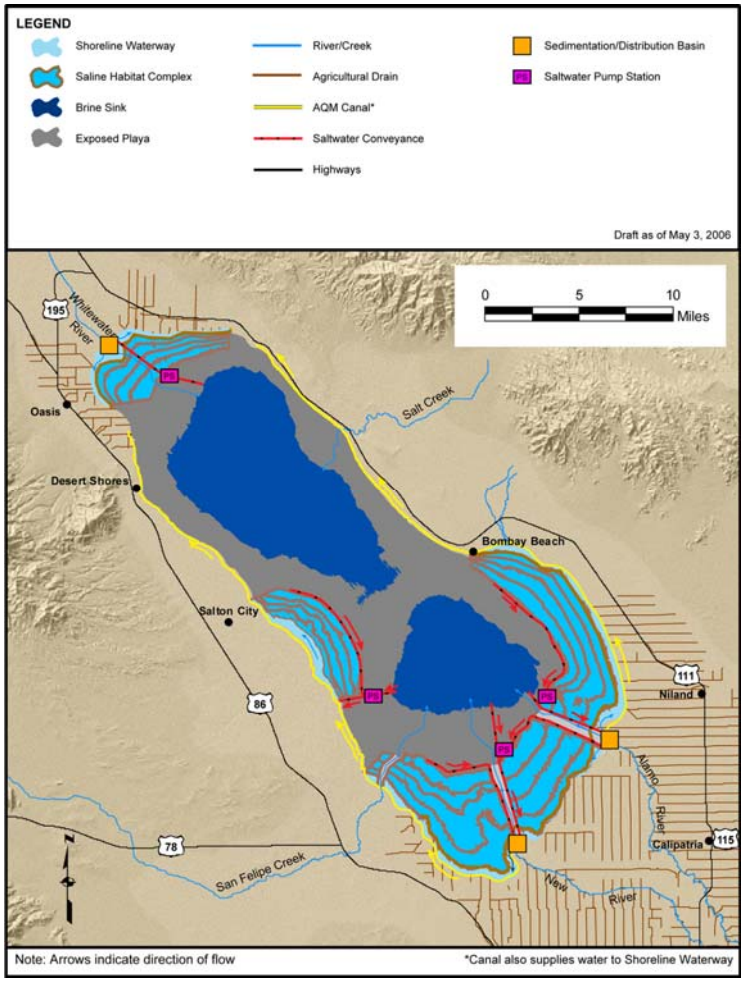
Pupfish channels would be constructed along the shoreline. However, because these channels will not be connected to each other, five different populations of desert pupfish would be created. San Felipe and Salt creeks would not be connected to other areas and would flow into the Brine Sink.

Air quality management actions include stabilization with brine and irrigation of water efficient vegetation in emissive areas.

The primary benefit of this alternative would be to provide habitat that would support tilapia, invertebrates, and a wide variety of birds. Water along the southern shoreline would minimize changes to the effects of the proximity of a large water body on the local climate (microclimate) and aesthetic values in the agricultural lands. Alternative 1 could also provide opportunities for fishing, use of non-motorized boats, bird watching, hiking, hunting, and day use activities.

ALTERNATIVE 1 AS OF 2078

- **Saline Habitat Complex** = 38,000 acres
  Full implementation by 2025
- **Brine Sink** = 123,000 acres
- **Exposed Playa** = 77,000 acres
- **Construction Cost** = $2.3 Billion (2006 dollars)
- **Annual Operations and Maintenance Cost** = $91 Million (2006 dollars)



Alternative 2 - Saline Habitat Complex II

Alternative 2 would be similar to Alternative 1, but with more areas of Saline Habitat Complex. Alternative 2 would include Saline Habitat Complex in both the southern and northern portions of the sea bed. Brine Sink, desert pupfish connectivity, and air quality management components would also be included.

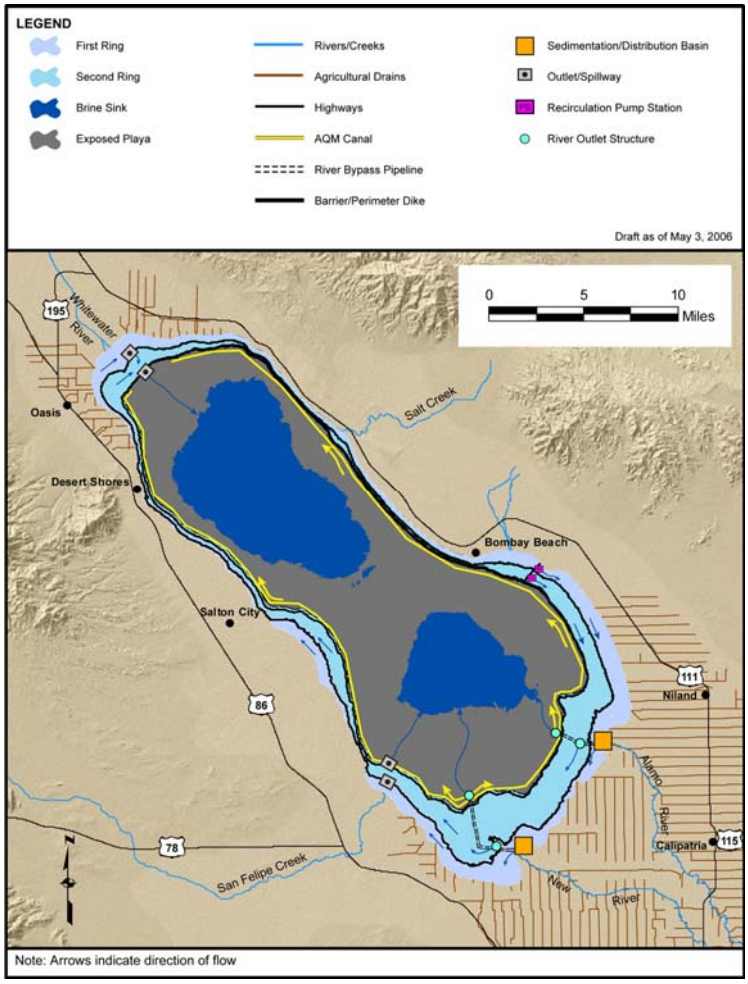
Desert pupfish connectivity would occur in the northern and southern shoreline waterways. However, five different populations of desert pupfish would be created since the shoreline waterways are divided by the Whitewater River in the north and the Alamo and New rivers in the south. San Felipe Creek would be connected to the shoreline waterway during low flow, but would flow into the Brine Sink at high flows. Salt Creek would not be connected to other areas.

Air quality management actions include stabilization with brine and irrigation of water efficient vegetation in emissive areas.

The primary benefit of this alternative would be to provide habitat that would support tilapia, invertebrates, and a wide variety of birds. Water along the southern, western, and northern shorelines would minimize changes to the microclimate and aesthetic values in these areas. Alternative 2 could also provide opportunities for fishing, use of non-motorized boats, bird watching, hiking, hunting, and day use activities.

ALTERNATIVE 2 AS OF 2078

- **Saline Habitat Complex** = 75,000 acres
  Full Implementation by 2031
- **Brine Sink** = 85,000 acres
- **Exposed Playa** = 91,000 acres
- **Construction Cost** = $3.3 Billion (2006 dollars)
- **Annual Operations and Maintenance Cost** = $107 Million (2006 dollars)



Alternative 3 - Concentric Rings

Alternative 3 would include two Concentric Rings that would provide moderately deep Marine Seas. Brine Sink, desert pupfish connectivity, and air quality management components are also included.

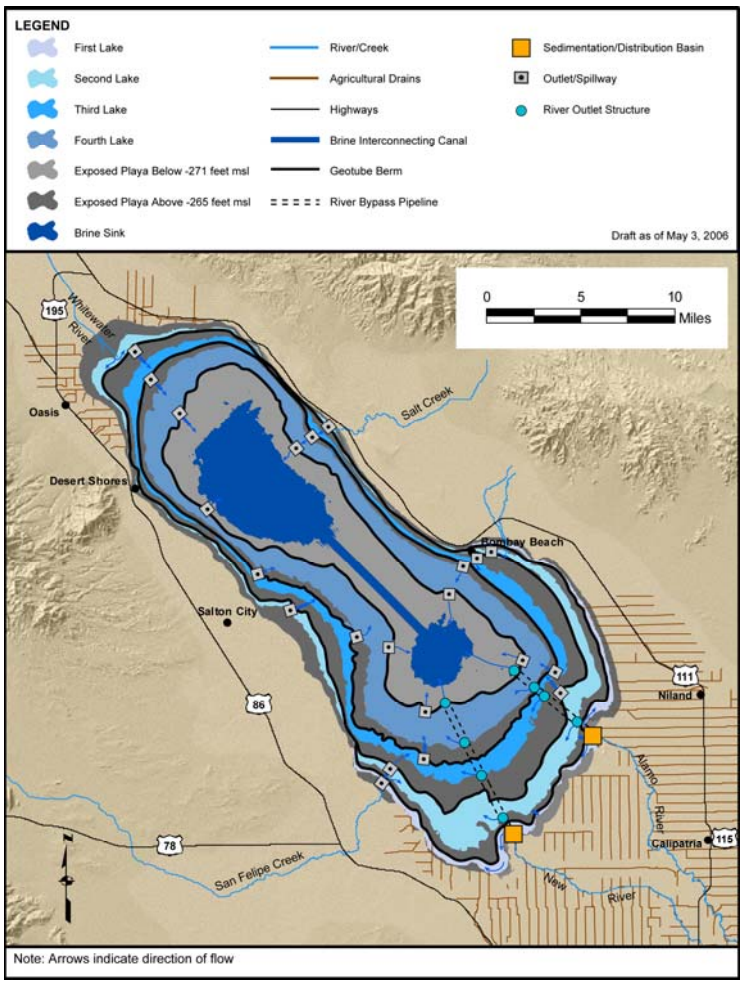
All desert pupfish populations would be connected in the First Ring.

Air quality management actions include stabilization with brine and irrigation of water efficient vegetation in emissive areas.

The primary benefit of this alternative would be to provide habitat that would support marine sport fish as well as tilapia, invertebrates, and a wide variety of birds. This alternative also would provide habitat and water along all of the shoreline and connect all desert pupfish populations. Water along the shoreline would minimize changes to the microclimate and aesthetic values. Alternative 3 could also provide opportunities for fishing, use of motorized and non-motorized boats, water skiing, bird watching, hiking, hunting, swimming, camping, and day use activities.

ALTERNATIVE 3 AS OF 2078

- **Saline Habitat Complex** = 0 acres
- **Moderately Deep Marine Sea** = 61,000 acres
  Full Implementation by 2021
- **Brine Sink** = 68,000 acres
- **Exposed Playa** = 127,000 acres
- **Construction Cost** = $4.9 Billion (2006 dollars)
- **Annual Operations and Maintenance Cost** = $138 Million (2006 dollars)



Alternative 4 - Concentric Lakes

Alternative 4 was defined by the Imperial Group, which is a coalition of Imperial Valley farmers. This alternative is comprised of four separate lakes that provide habitat similar to Saline Habitat Complex without individual cells, with design salinity of 20,000 to 60,000 mg/L. Brine Sink, desert pupfish connectivity, and air quality management components are included.

The First Lake would provide desert pupfish connectivity for all of the direct drains, San Felipe Creek, and other tributary waters along the southern shoreline. The Second Lake would connect all of the northern drains and Salt Creek.

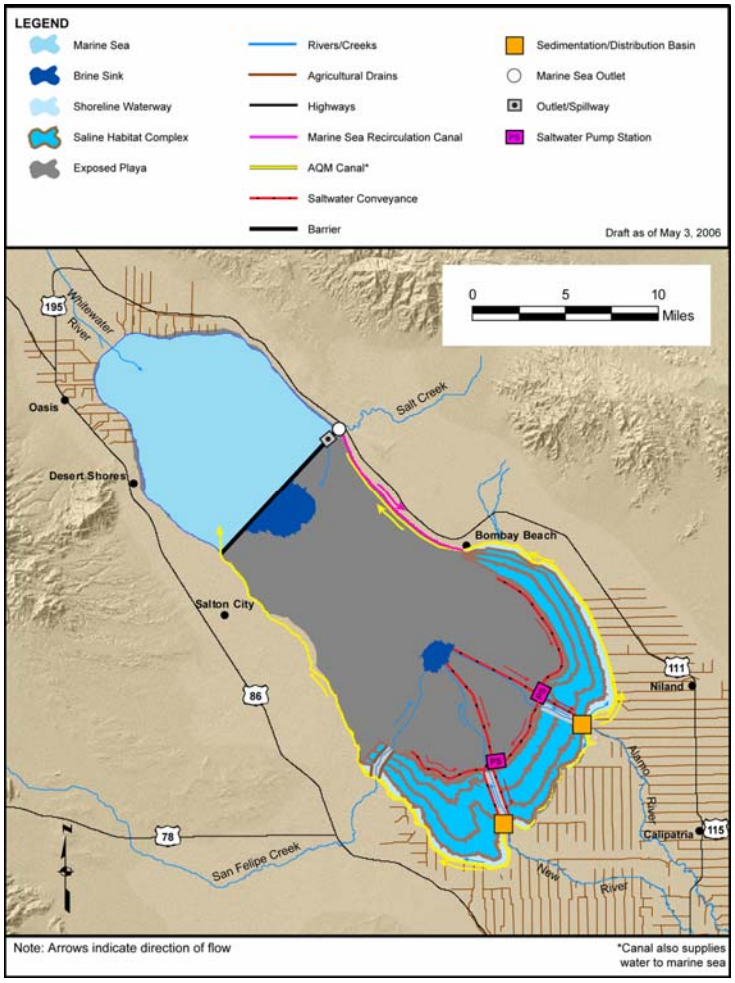
This alternative includes irrigation water supply. However, based upon the information provided by the Imperial Group, no long term irrigation facilities were included. Therefore, long term air quality management is not included in this alternative.

The lakes would be formed by berms using a different method than in the other alternatives. Alternative 4 would use Geotube® berms which deploy geo-membrane tubes filled with dredged material from the sea bed. The berms would primarily be constructed using barges.

The primary benefit of this alternative would be to provide habitat that would support tilapia, invertebrates, and a wide variety of birds. Water along the southern shoreline would minimize changes to the microclimate in the agricultural lands. Water, however, would not be located along the current western or northern shorelines. Alternative 4 could also provide opportunities for fishing, use of motorized and non-motorized boats, water skiing, bird watching, hiking, hunting, swimming, camping, and day use activities.

ALTERNATIVE 4 AS OF 2078

- **Lakes (similar to Saline Habitat Complex)** = 88,000 acres Full Implementation by 2040
- **Brine Sink** = 22,000 acres
- **Exposed Playa** = 111,000 acres
- **Construction Cost** = $2.3 Billion (2006 dollars)
- **Annual Operations and Maintenance Cost** = $20 Million (2006 dollars)



Alternative 5 - North Sea

Alternative 5 would include a deep Marine Sea at the north side of the sea bed. Other features include Saline Habitat Complex in the south, Brine Sink, desert pupfish connectivity, and air quality management components.

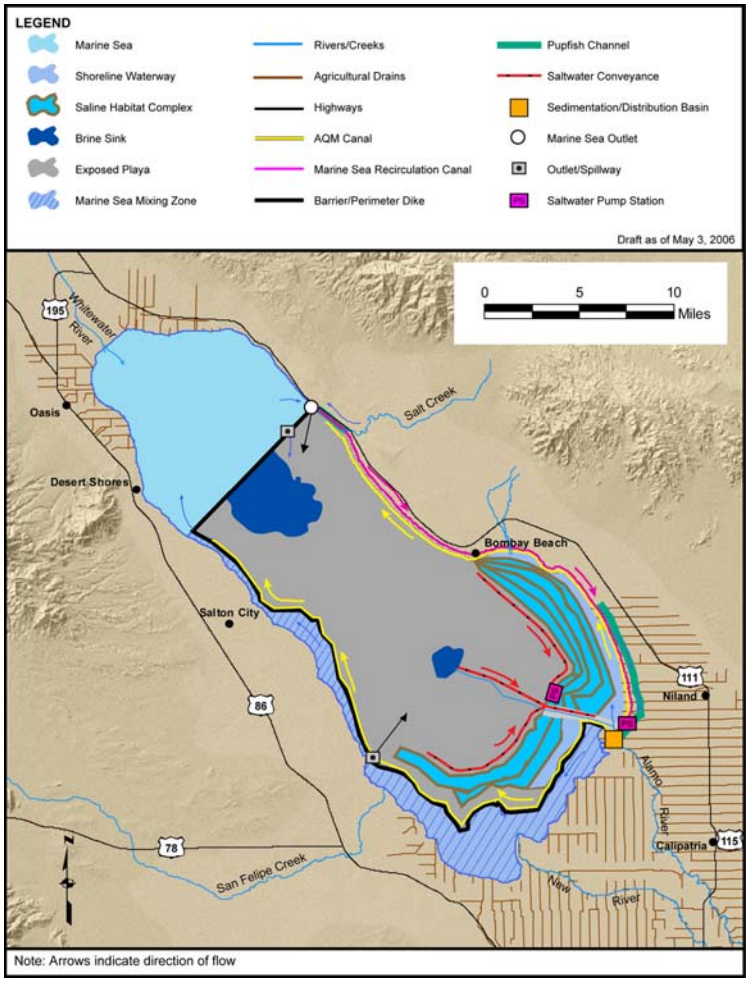
Three separate areas containing desert pupfish would occur along the southern shoreline in the shoreline waterway, including one area that would connect San Felipe Creek. San Felipe Creek would flow to the Brine Sink during high flows. The Marine Sea would connect all of the northern drains and Salt Creek.

Air quality management actions include stabilization with brine and irrigation of water efficient vegetation in emissive areas.

The primary benefit of this alternative would be to provide habitat that would support marine sport fish as well as tilapia, invertebrates, and a wide variety of birds. Water along the southern shoreline would minimize changes to the microclimate in the agricultural lands. This alternative also would provide habitat and water along the northern shoreline. Alternative 5 could also provide opportunities for fishing, use of motorized and non-motorized boats, water skiing, bird watching, hiking, hunting, swimming, camping, and day use activities.

ALTERNATIVE 5 AS OF 2078

- **Saline Habitat Complex** = 45,500 acres
- **Deep Marine Sea** = 62,000 acres
  Full Implementation by 2027
- **Brine Sink** = 13,000 acres
- **Exposed Playa** = 117,000 acres
- **Construction Cost** = $4.5 Billion (2006 dollars)
- **Annual Operations and Maintenance Cost** = $134 Million (2006 dollars)



Alternative 6 - North Sea Combined

Alternative 6 would include a deep Marine Sea in the north combined with a moderately deep Marine Sea in the south, connected along the western shoreline. Saline Habitat Complex would be developed in the southern sea bed. Brine Sink, desert pupfish connectivity, and air quality management components are also included.

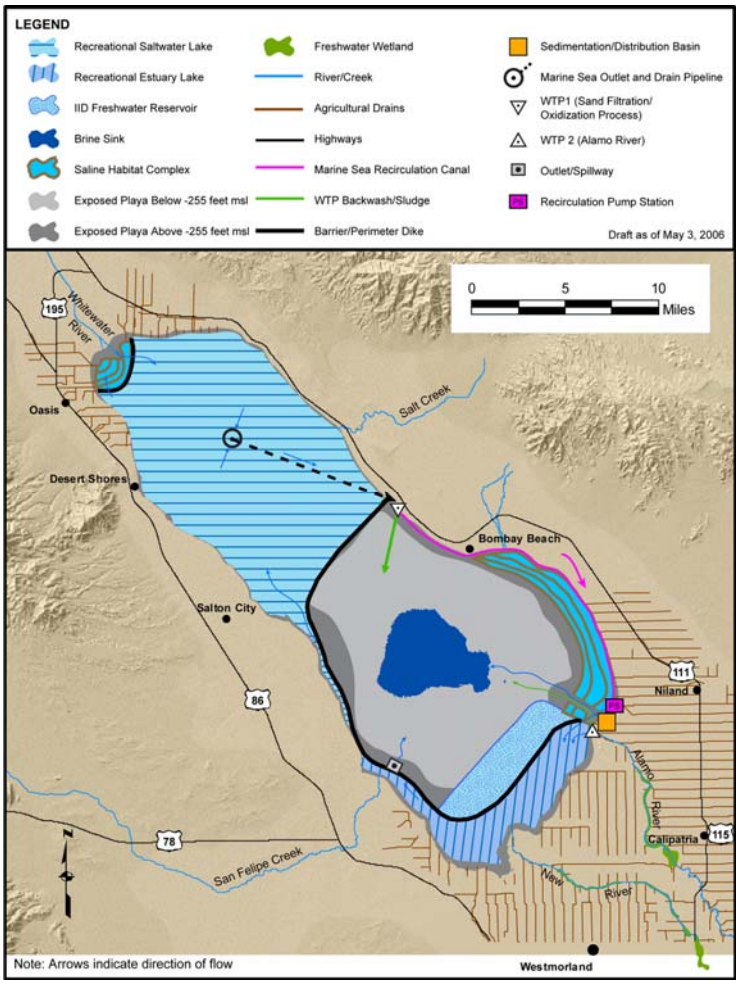
Desert pupfish in the drains along the southern shoreline and San Felipe Creek would be connected by the Marine Sea Mixing Zone. A pupfish channel would connect drains that are north of the Alamo River. All of the northern drains and Salt Creek would be connected by the Marine Sea.

Air quality management actions include stabilization with brine and irrigation of water efficient vegetation in emissive areas.

The primary benefit of this alternative would be to provide habitat that would support marine sport fish as well as tilapia, invertebrates, and a wide variety of birds. Water along the southern shoreline would minimize changes to the microclimate in the agricultural lands. This alternative also would provide habitat and water along the shoreline along the western and northern shorelines. Alternative 6 could also provide opportunities for fishing, use of motorized and non-motorized boats, water skiing, bird watching, hiking, hunting, swimming, camping, and day use activities.

ALTERNATIVE 6 AS OF 2078

- **Saline Habitat Complex** = 29,000 acres
- **Deep and Moderately Deep Marine Seas** = 74,000 acres
  Full Implementation by 2032
- **Brine Sink** = 11,000 acres
- **Exposed Playa** = 131,000 acres
- **Construction Cost** = $5.9 Billion (2006 dollars)
- **Annual Operations and Maintenance Cost** = $149 Million (2006 dollars)



Alternative 7 - Combined North and South Lakes

Alternative 7 was developed by the Salton Sea Authority and would include a deep Marine Sea (i.e., Recreational Saltwater Lake) in the north combined with a moderately deep Marine Sea (i.e., Recreational Estuary Lake) in the south. Saline Habitat Complex would be developed along the southeastern shoreline. Other features include Brine Sink, desert pupfish connectivity, air quality management components, and an 11,000 acre freshwater reservoir to be operated by IID.

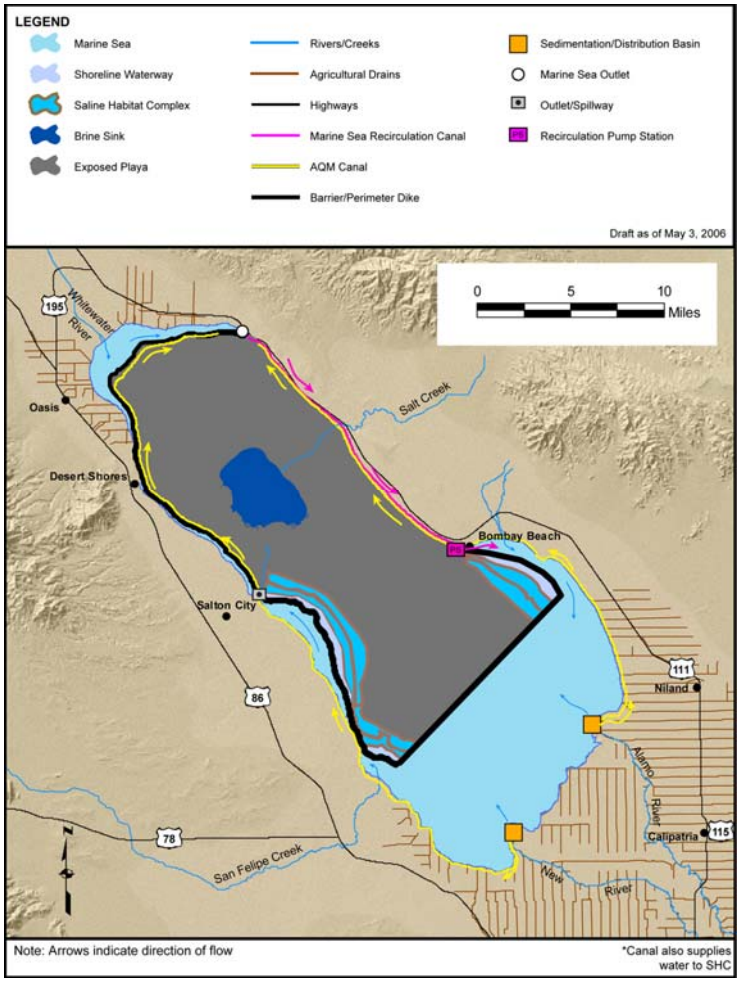
Desert pupfish in drains along the northern and southern shorelines and San Felipe and Salt creeks would be connected by the Saltwater and Estuary lakes. The drains along the southeastern shoreline would not be connected.

Air quality management actions include creation of a protective salt crust using salt crystallizer ponds.

The primary benefits of this alternative would be similar to Alternative 6. The main difference between Alternative 6 and 7 is the location of the barrier. Alternative 7 includes a barrier that would form a larger Marine Sea if average inflows from 2018 to 2078 were 800,000 acre-feet/year. However, to provide a uniform basis of comparison, this alternative also was evaluated assuming an average inflow of 717,000 acre-feet/year. Under the lower flows, the surface area would be smaller and the salinity would be higher than projected in the definition of this alternative. Alternative 7 could also provide opportunities for fishing, use of motorized and non-motorized boats, water skiing, bird watching, hiking, hunting, swimming, camping, and day use activities.

ALTERNATIVE 7 AS OF 2078

- **Saline Habitat Complex** = 12,000 acres
- **Deep and Moderately Deep Marine Seas** = 104,000 acres if inflows are 717,000 acre-feet/year. Full implementation of salinity objectives would not occur by 2078.
  If inflows are 800,000 acre-feet/year, the area would be 115,000 acres and salinity objectives would be accomplished in Phase III
- **Brine Sink** = 15,000 acres
- **Exposed Playa** = 97,000 acres
- **Construction Cost** = $5.2 Billion (2006 dollars)
- **Annual Operations and Maintenance Cost** = $82 Million (2006 dollars)



Alternative 8 - South Sea Combined

Alternative 8 would include a deep Marine Sea in the south combined with a moderately deep Marine Sea in the north, connected along the western shoreline. Saline Habitat Complex would be created along the southwestern and southeastern shorelines. Brine Sink, desert pupfish connectivity, and air quality management components are also included.

Desert pupfish would be connected along the northern and southern shorelines and would include all of the drains and San Felipe Creek. Desert pupfish in Salt Creek would not be connected to other populations.

Air quality management actions include stabilization with brine and irrigation of water efficient vegetation in emissive areas.

The primary benefit of this alternative would be to provide habitat that would support marine sport fish as well as tilapia, invertebrates, and a wide variety of birds. A large water body along the southern shoreline would maintain the microclimate in the agricultural lands. This alternative also would provide habitat and water along the western and northern shorelines. Alternative 8 could also provide opportunities for fishing, use of motorized and non-motorized boats, water skiing, bird watching, hiking, hunting, swimming, camping, and day use activities.

ALTERNATIVE 8 AS OF 2078

- **Saline Habitat Complex** = 18,000 acres
- **Deep and Moderately Deep Marine Seas** = 83,000 acres
  Full Implementation would occur in 2027
- **Brine Sink** = 9,000 acres
- **Exposed Playa** = 128,000 acres
- **Construction Cost** = $5.8 Billion (2006 dollars)
- **Annual Operations and Maintenance Cost** = $145 Million (2006 dollars)

Land Ownership Assumptions

The No Action Alternative and Alternatives 1 through 8 assume that easements or deeds would be obtained for the entire sea bed from -228 feet msl to allow construction and operations and maintenance. Costs of acquisition of easements and deeds are not included in the cost estimates included in the PEIR.

If other land uses extend into the sea bed, the alternatives would need to be modified in project-level analyses. For example, if exposed lands are converted to cultivated agriculture to an elevation of -235 feet msl, either the components would need to be constructed at lower elevations or displacement dikes would be required to protect the agricultural land.

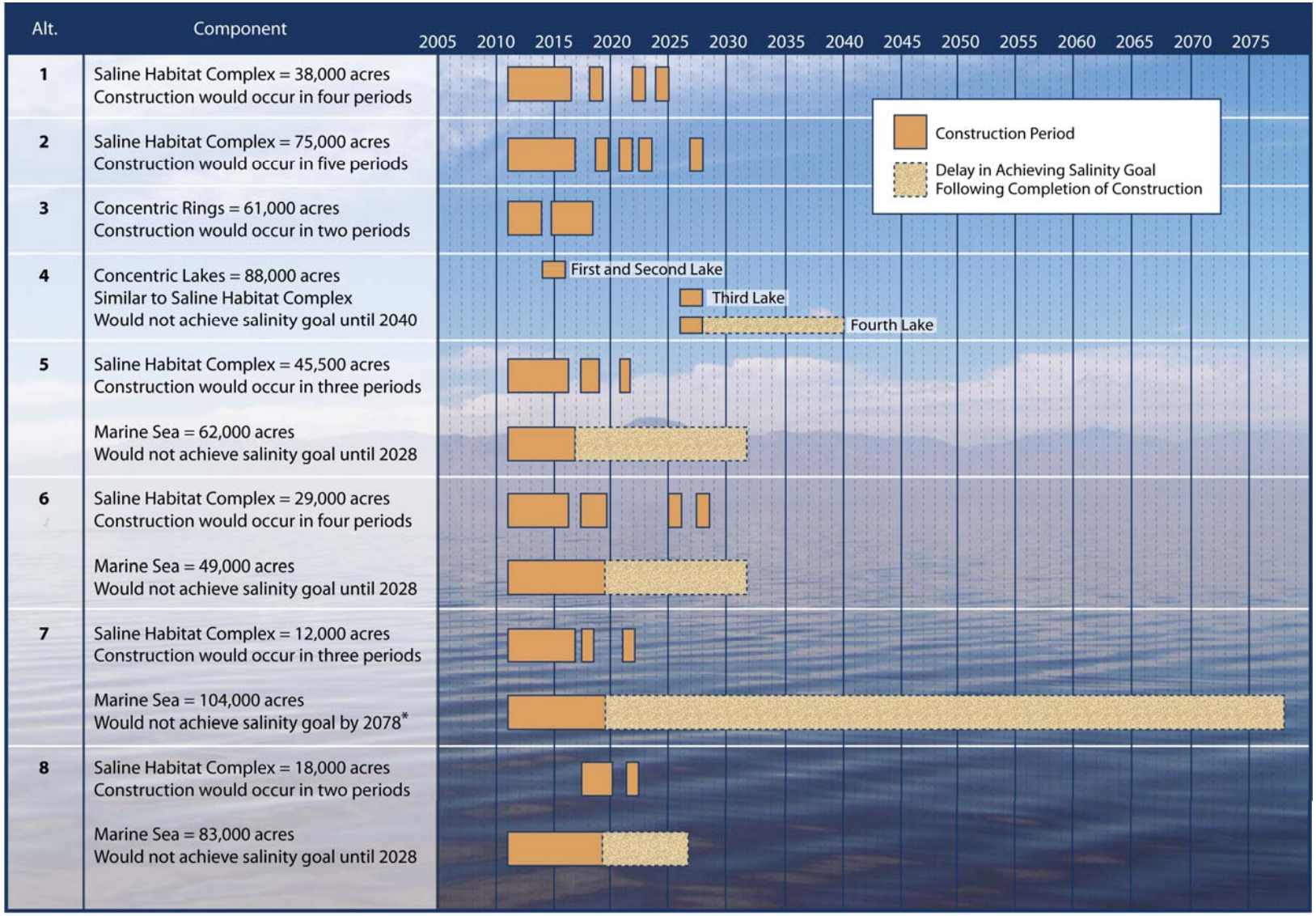
Construction Schedule Assumptions

The schedules assumed that the alternatives could be funded, designed, and permitted in a reasonable time period following the selection of a preferred alternative. This analysis does not include specific assumptions related to the implementing agency, methods to make funding available, or land or easement acquisition. The following assumptions were used in this analysis for pre-construction activities:

- ✓ PEIR completed by mid 2007;
- ✓ Preferred alternative approved by the Legislature by late 2007;
- ✓ Implementing agencies and funding identified by late 2007;
- ✓ Project-level analyses and environmental documentation completed by 2010;
- ✓ Final design completed by 2012;
- ✓ Permits, approvals, and easements or deeds obtained by 2013; and
- ✓ Major construction initiated by 2014.

Based upon these assumptions, the alternatives would be constructed over the next 15 to 30 years, as shown in Figure ES-1. The Saline Habitat Complex areas would be constructed as the water recedes when the soils are no longer influenced by high groundwater. Saline Habitat Complex in all alternatives would achieve salinity goals within a one-year period following construction.

Marine Seas in Alternatives 3, 5, 6, 7, and 8 and Concentric Lakes in Alternative 4 would be constructed when the sea bed is inundated to accommodate barges. However, except for Alternative 3, the water bodies would not achieve salinity goals for several years or decades, depending on the alternative.



* Would meet salinity objective in 2056 if inflows averaged 800,000 acre-feet per year.

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FIGURE ES-1
ESTIMATED CONSTRUCTION SCHEDULE FOR ALTERNATIVES 1 THROUGH 8

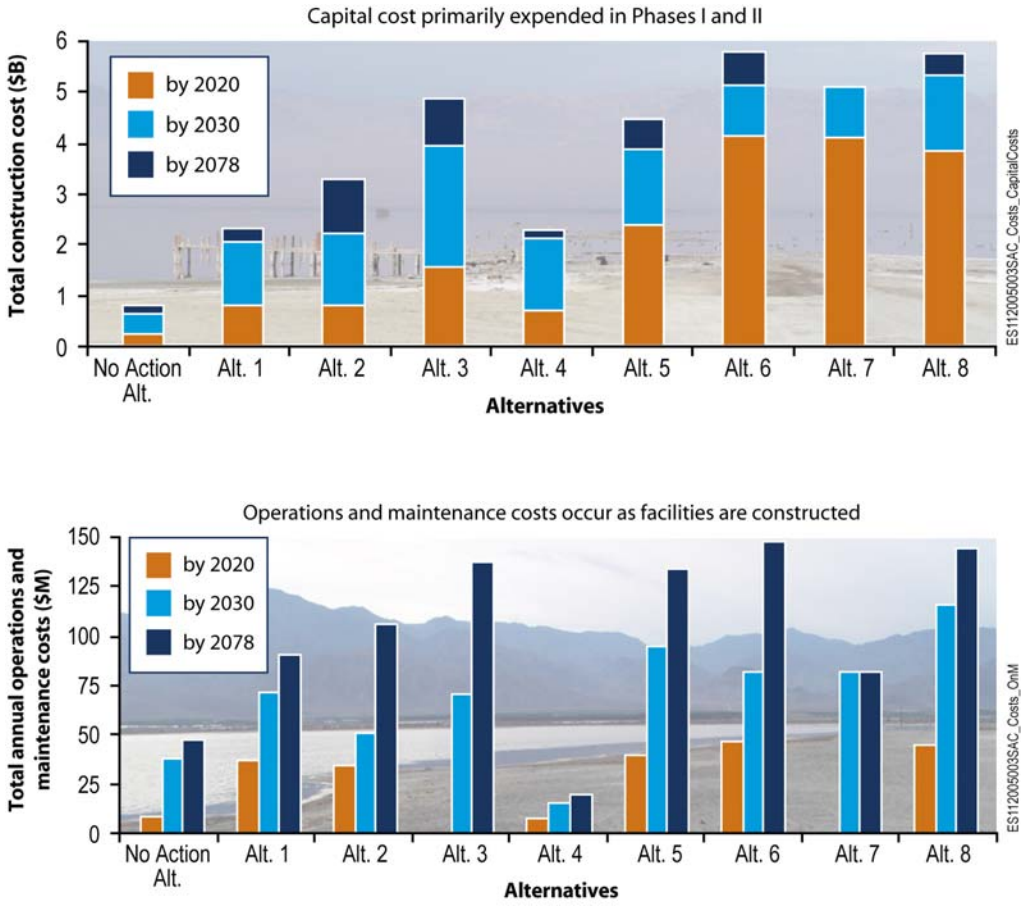

FIGURE ES-2
COMPARISON OF CONSTRUCTION COSTS AND OPERATIONS AND MAINTENANCE COSTS

Early Start Habitat

All eight alternatives would include up to 2,000 acres of shallow saline habitat for use by birds after the Salton Sea salinity becomes too high to sustain some species. This habitat would be constructed prior to construction of full-scale habitat components, and is referred to as Early Start Habitat. Early Start Habitat was assumed to be located at elevations between -228 and -232 feet msl. Early Start Habitat would be a temporary feature for two to six years and would be eliminated or assimilated as the alternatives are constructed along the southern shoreline prior to 2020. These lands could subsequently be used for other purposes, including geothermal development, agriculture, and open space.

For the purposes of the PEIR, it was assumed that the Early Start Habitat area would be located along the southern shoreline because the flat slope of the sea bed would provide a large area for the shallow water cells. The area is currently used by many birds. Most agricultural drains in this area are pumped into the Salton Sea and could provide a stable source of inflows into the Early Start Habitat. Saline water from the Salton Sea would be pumped into the cells to be mixed with freshwater from the drains to provide salinity between 20,000 and 60,000 mg/L.

The area would be divided into cells with berms excavated from sea bed materials. Average water depths within each cell would be less than four feet. Temperatures outside the tolerance range of fish, such as tilapia, could cause fish kills or reduce their sustainability. Specific design criteria would be developed in a project-level analysis that could incorporate findings from the U.S. Department of the Interior, Geological Survey (USGS) Salton Sea Shallow Water Habitat Pilot Project.

The Early Start Habitat would require completion of additional studies, environmental documentation, permit applications, and deeds or easements for the land. It is assumed that the Early Start Habitat could be implemented before 2011 if easements or deeds could be acquired.

Transfers Under the Quantification Settlement Agreement

Various permits related to the water transfer between IID and SDCWA, under the QSA, require up to 800,000 acre-feet of water conserved by IID to be conveyed into the Salton Sea until the year 2017 to mitigate a portion of the adverse impacts caused by the transfer of water from IID to SDCWA (SWRCB Order WRO 2002-0013). This water is frequently referred to as the (c)(2) water. The QSA and legislation allow for sale of this water to Metropolitan prior to 2017 if the Secretary for Resources determines that the transfer is consistent with the preferred alternative.

The legislation also allows for the transfer of a separate 800,000 acre-feet of conserved water from IID to DWR at $175/acre-foot in 2003 dollars and adjusted for inflation (Fish and Game Code Section 2081.7(c)(1). This water is frequently referred to as (c)(1) water. The QSA and legislation allow for sale of this water to Metropolitan if certain conditions are met.

DWR would be responsible for mitigating any environmental impacts related to the transfer of (c)(1) water and for environmental impacts due to changes in Salton Sea salinity related to the transfer of (c)(2) water.

Transfer of these waters was not considered under the No Action Alternative. However, potential impacts and benefits were considered for Alternatives 1 through 8. A hydrologic/hydraulic model run was conducted to determine the impact on surface water elevations and salinity of the Brine Sink if these waters were transferred starting in 2008. The results indicate that the transfers would cause an additional decline in the Brine Sink surface water elevation by up to two feet by 2020 with the transfer of either (c)(2) or (c)(1) water, and up to four feet with the transfer of both of these waters. The Brine Sink salinity in 2020 would increase by about seven percent with the transfer of either (c)(2) or (c)(1) water, and up to 18 percent with the transfer of both of these waters. There would be minimal or no differences by the end of Phase II or in Phases III and IV.

These changes would affect implementation of the alternatives. For Alternatives 3, 4, 5, 6, 7, and 8, the Brine Sink surface water elevation must remain as high as possible to facilitate construction with the barges. If a water transfers occurred, more of the construction would need to be completed from the shoreline, which would increase the construction costs.

Under Alternatives 1 and 2, transfer of (c)(2) or (c)(1) water could be beneficial because areas for Saline Habitat Complex would be exposed earlier than without the water transfers. However, these benefits would only occur if the environmental documentation, design efforts, and easement or land acquisitions could be completed prior to 2016 when construction of the Saline Habitat Complex would be initiated without the water transfer.

Transfer of the (c)(1) water also would require mitigation of impacts associated with that transfer. The impacts would include exposure of playa earlier than anticipated under the alternatives, and this could change the phasing of implementation of air quality management. In addition, the salinity would increase at a more rapid rate than projected under the alternatives. The higher salinities could result in the need to expand the Early Start Habitat or construct pupfish channels along the shoreline under all alternatives as a short term mitigation measure until habitat components are implemented.

Therefore, the analysis indicates that the transfer of (c)(2) or (c)(1) water could increase the construction costs of Alternatives 3 through 8 because the use of barges would become limited due to the loss of water in the Brine Sink. In addition, there would be a need to accelerate implementation of the air quality management actions and possibly construct short term pupfish channels on the shoreline. These measures would increase the costs of the alternatives. Specific cost estimates were not developed for these short term measures, however, the monetary benefit from the sale of (c)(2) or (c)(1) water does not appear to be significantly greater than the costs associated with the mitigations.

RESULTS OF THE IMPACT ASSESSMENT

The results of the impact assessment indicate that all of the alternatives would provide more habitat and water along the shoreline than under the No Action Alternative throughout the study period. The results also indicate that all of the alternatives would provide more habitat benefits than existing conditions.

Construction impacts would occur related to soil disturbance, biological resources, air quality, cultural resources, paleontological resources, noise, visual resources, traffic, and power demands, even after implementation of mitigation measures (referred to as Next Steps in the PEIR). Long term operations and maintenance would result in significant impacts to the resource categories of soils and geology, biological resources, air quality, and visual resources as compared to the No Action Alternative or existing conditions, even after implementation of mitigation measures. The results of the impact assessment are summarized in Table ES-2, presented at the end of the Executive Summary.

Environmentally Superior Alternative

In accordance with the CEQA Guidelines, Sections 15120 and 15126.6(e)(2), the PEIR identifies an environmentally superior alternative. To identify the environmentally superior alternative, each of the alternatives was evaluated based on the significance thresholds in Appendix G of the CEQA Guidelines for each resource category. The alternative with the fewest adverse impacts was identified for each resource category, as summarized below.

Overall, and for the reasons summarized below, Alternative 3 would have the least amount of adverse impacts, and, therefore, would be the environmentally superior alternative.

The environmentally superior alternative is not the preferred alternative, which is required to be identified as a result of the Ecosystem Restoration Study, in accordance with the Salton Sea Restoration Act. The Secretary for Resources will present the preferred alternative to the California Legislature following additional public participation, including input from stakeholders and interested agencies, consideration of comments received during the public review period for the Draft PEIR, and after receiving a recommendation from the Salton Sea Advisory Committee.

Water Resources

None of the alternatives would have any adverse impacts on surface waters outside of the sea bed. Water quality impacts would occur in the Marine Seas and Saline Habitat Complex due to eutrophic conditions. However, Alternative 8 would have the least adverse impacts because the Marine Sea in the shallower southern sea bed would be better mixed, thereby reducing the accumulation of hydrogen sulfide. Alternative 7 also would have few adverse impacts if proposed use of water treatment plants was effective. The No Action Alternative and Alternative 4 would have the least adverse impacts to groundwater because both alternatives would reduce potential saltwater intrusion into the Coachella Valley.

Biological Resources

Impacts to special status species would result primarily from construction of sedimentation and distribution basins at river deltas, isolation of the desert pupfish downstream of pupfish channels, and general disturbance associated with construction along the shoreline, particularly at the southern shore. Alternatives 6 and 7 would have the fewest sedimentation and distribution basins and pupfish channels. Therefore, Alternatives 6 and 7 would have the least impact on special status species due to construction. For a similar reason, Alternatives 6 and 7 would have the least adverse impacts on riparian, sensitive natural communities, and wetlands along the shoreline. Alternative 3 would have the least long term impact on desert pupfish populations because all drains and creeks would be connected into the First Ring. Alternatives 3 and 5 through 8 would have the least adverse impacts related to compliance with local policies that address biological resources because these alternatives include Marine Seas with salinity of 30,000 to 40,000 mg/L. Overall, the impact on desert pupfish movement and connectivity was given the greatest priority because of its status as an endangered species and the long term nature of the impact. Therefore, Alternative 3 was determined to have the least amount of adverse biological impacts.

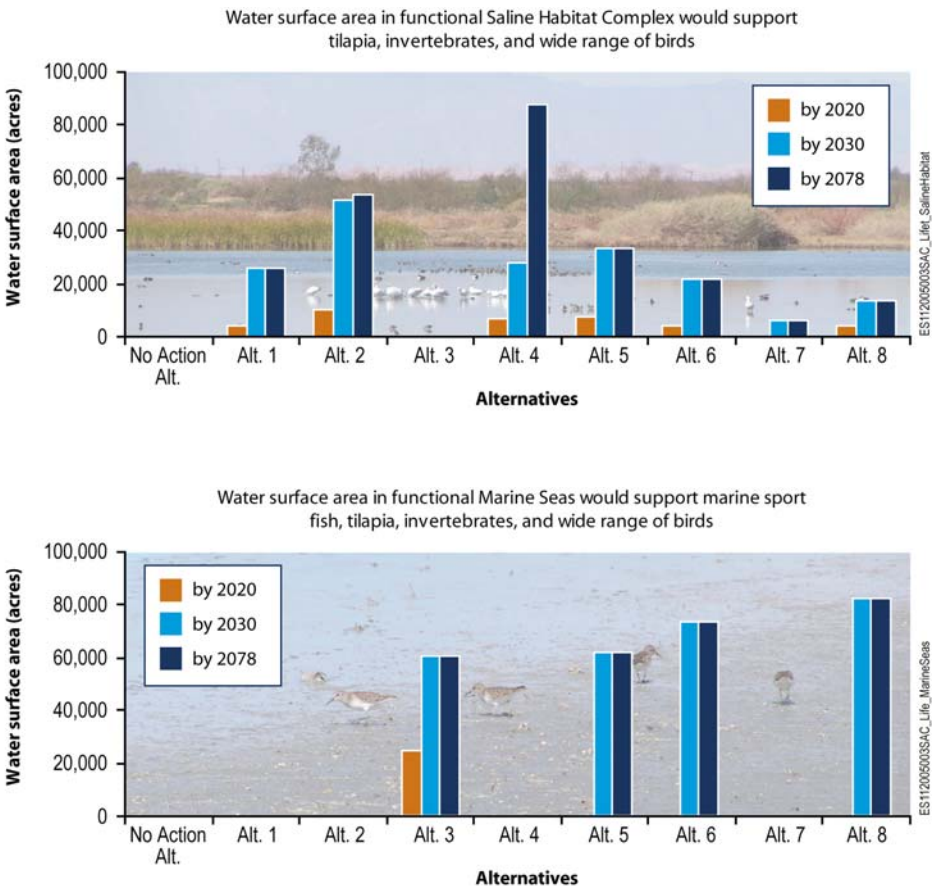

FIGURE ES-3
COMPARISON OF FUNCTIONAL SALINE HABITAT COMPLEX AND MARINE SEA HABITATS

Geology and Soils Resources

The alternatives that would have the least amount of adverse impacts on soils due to the amount of soils excavated and rock and gravel imported would be Alternatives 1 and 3. Alternatives 1 and 2 would have the least adverse impacts due to seismic risks because these alternatives would have the smallest volumes of water that could be released if all berms, barriers, and perimeter dikes failed simultaneously during a major seismic event.

Air Quality

Air quality impacts would result from fugitive dust associated with construction activities and wind erosion of exposed playa, and exhaust emissions from the combustion of fossil fuels used in equipment and vehicles. Priority was placed on analysis of impacts associated with the nonattainment pollutants: particulate matter less than 10 microns in aerodynamic diameter (PM_{10}) and oxides of nitrogen (NOx), an ozone precursor. The No Action Alternative and Alternatives 1 and 2 would have the lowest PM_{10} and NOx emissions, as shown in Figure ES-4, because these alternatives would have the least amount of dredging, imported rock and gravel, and exposed playa. Emissions of PM_{10} during the Peak Construction Year early in the program, are primarily related to truck travel on unpaved roads used for delivery of construction materials. Later in the program, during the Peak Operations and Maintenance Year, PM_{10} emissions are primarily

related to fugitive dust from Exposed Playa areas, after implementation of control measures. Alternative 8, followed by Alternatives 1 and 2, would have the least potential for adverse odor impacts because the shallower and comparatively well mixed nature of the water bodies would reduce the potential for stratification and build up of hydrogen sulfide, ammonia, and other odorous compounds.

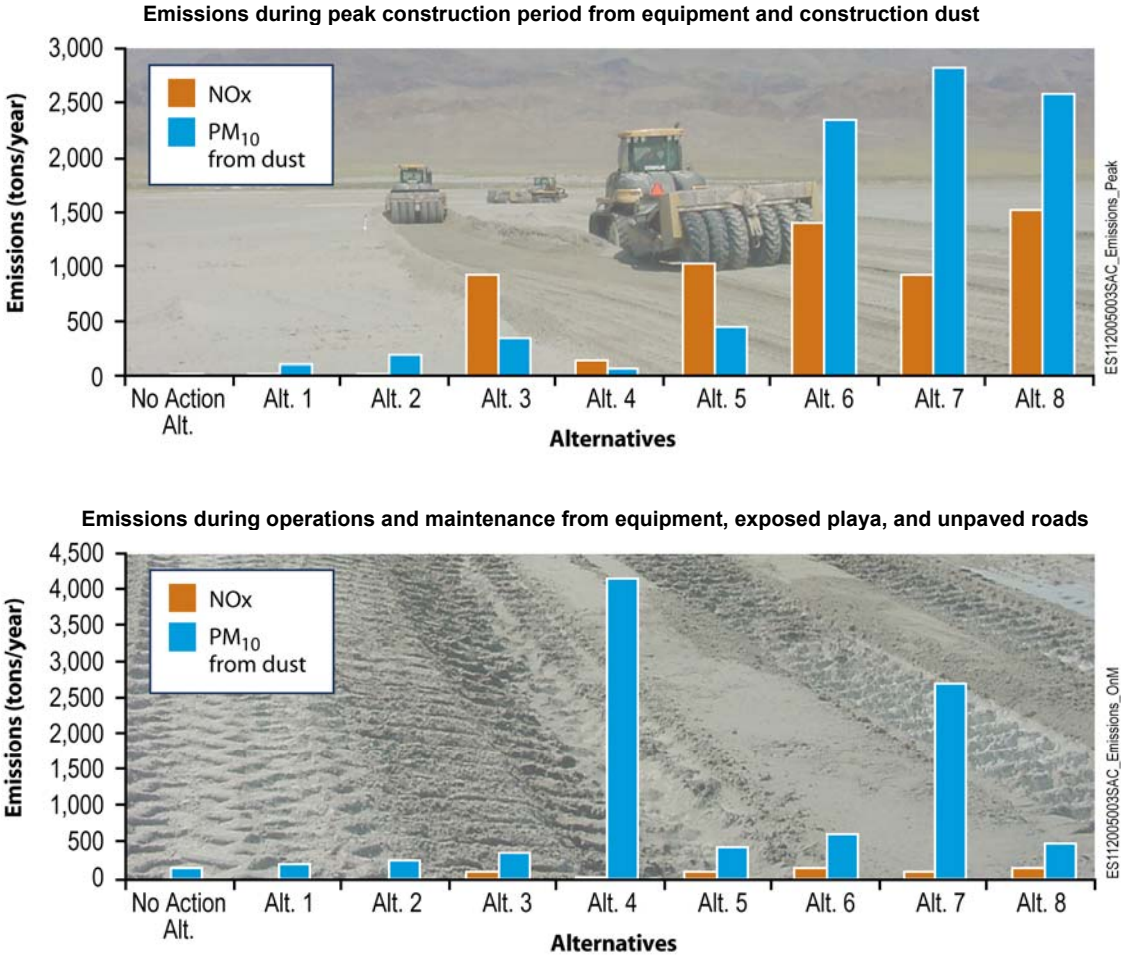

FIGURE ES-4
COMPARISON OF EMISSIONS DURING CONSTRUCTION AND OPERATIONS AND MAINTENANCE

Land Use, Population, and Housing

Adverse impacts to land use were measured by the ability to provide compliance with local land use plans and to provide water along the existing shoreline. Alternatives 3 and 5 through 8 would comply with the Imperial County General Plan provisions to support a Marine Sea. The No Action Alternative and Alternative 4 would have the least impacts on implementation of the Torres Martinez Indian Tribe land use plans because areas near the northern shoreline would be exposed. Alternative 3 would provide a major water body along the entire current shoreline, and would have the least adverse impacts on current shoreline land uses.

None of the alternatives would have any impacts on population and housing during construction or operations and maintenance activities.

Recreational Opportunities

All of the alternatives would provide recreational opportunities. However, the opportunities would vary depending upon the type of water bodies contained in a particular alternative.

Hazards

Alternatives 3 and 7 would have the least adverse impacts due to potential exposure to hazards in the sea bed because these alternatives would have the least disturbance of the sea bed.

Cultural and Paleontological Resources

Alternatives 3 and 7 would have the least adverse impacts due to disturbance of cultural or paleontological resources in the sea bed because these alternatives would have the least disturbance of the sea bed.

Noise

Alternatives 1 and 3 would have the least adverse impacts due to noise because these alternatives would have the least excavation and imported rock and gravel.

Visual Resources

Alternative 3 would provide major water bodies along all of the current shoreline, and would have the least adverse impacts on aesthetics from the existing shoreline land uses.

Public Services

The need for public services would be related to the extent of construction activities. The amount of excavation and imported rock and gravel were used to identify the alternatives with the most construction activities. Based on this analysis, Alternatives 1 and 3 would have the least adverse impacts on public services.

Traffic

Alternatives 1 and 4 would result in the least amount of vehicles during construction and operations and maintenance activities.

Power and Energy Demands

Alternatives 1 and 4 would result in the least amount of power demand during operations and maintenance activities.

Table ES-1
Comparison of Infrastructure Features in Alternatives

Component	Alternatives									
	No Action Alternative - CEQA Conditions	No Action Alternative - Variability Conditions	Alternative 1 Saline Complex Habitat I	Alternative 2 Saline Habitat Complex II	Alternative 3 Concentric Rings	Alternative 4 Concentric Lakes	Alternative 5 North Sea	Alternative 6 North Sea Combined	Alternative 7 Combined North and South Lakes	Alternative 8 South Sea Combined
Air Quality Management Canals and Pumping plants	92 miles 19 pumping plants	92 miles 19 pumping plants	88 miles 28 pumping plants	73 miles 30 pumping plants	78 miles 34 pumping plants	251 miles of temporary irrigation	52 miles 32 pumping plants	55 miles 35 pumping plants	-	79 miles 42 pumping plants
Pupfish Channel	30 miles	30 miles	30 miles	-	-	-	-	10 miles	-	-
Marine Sea Recirculation Canal and Pumping plant	-	-	-	-	1 pumping plant	-	20 miles 1 pumping plant	28 miles 1 pumping plant	20 miles 1 pumping plant	17 miles 1 pumping plant
Deep Marine Sea and Moderately Deep Marine Sea	-	-	-	-	61,000 acres	-	62,000 acres	74,000 acres	104,000 acres	83,000 acres
Saline Habitat Complex Component	-	-	38,000 acres	75,000 acres	-		45,500 acres	29,000 acres	12,000 acres	18,000 acres
Concentric Lakes - Similar to Saline Habitat Complex without separate cells and wide range of salinity						88,000 acres				
Salton Sea or Brine Sink at 2078	172,000 acres	140,000 acres	123,000 acres	85,000 acres	68,000 acres	22,000 acres	13,000 acres	11,000 acres	15,000 acres	9,000 acres
Sedimentation and Distribution Basins	3 basins of 200 acres each	3 basins of 200 acres each	3 basins of 200 acres each	3 basins of 200 acres each	2 basins of 200 acres each	2 basins of 200 acres each	2 basins of 200 acres each	1 basin of 200 acres	1 basin of 200 acres	2 basins of 200 acres each
Air Quality Management with water efficient vegetation	24,000 acres	24,000 acres	41,000 acres	46,000 acres	63,000 acres	-	59,000 acres	66,000 acres	-	64,000 acres
Air Quality Management with Brine Stabilization	9,000 acres	9,000 acres	17,000 acres	18,000 acres	26,000 acres	-	24,000 acres	26,000 acres	66,500 acres	26,000 acres

Table ES-1
Comparison of Infrastructure Features in Alternatives

Component	Alternatives									
	No Action Alternative - CEQA Conditions	No Action Alternative - Variability Conditions	Alternative 1 Saline Complex Habitat I	Alternative 2 Saline Habitat Complex II	Alternative 3 Concentric Rings	Alternative 4 Concentric Lakes	Alternative 5 North Sea	Alternative 6 North Sea Combined	Alternative 7 Combined North and South Lakes	Alternative 8 South Sea Combined
Imperial Irrigation District Reservoir	-	-	-	-	-	-	-	-	11,000 acres	-
Treatment Plants	-	-	-	-	-	-	-	-	2	-
Volume of imported rock and gravel	1,680,000 cubic yards	1,680,000 cubic yards	6,720,000 cubic yards	11,670,000 cubic yards	85,150,000 cubic yards	7,420,000 cubic yards	53,730,000 cubic yards	93,650,000 cubic yards	79,650,000 cubic yards	100,270,000 cubic yards
Volume of Sea Bed soils excavated or dredged	5,050,000 cubic yards	5,050,000 cubic yards	77,140,000 cubic yards	136,530,000 cubic yards	18,810,000 cubic yards	154,215,000 cubic yards	86,770,000 cubic yards	66,970,000 cubic yards	33,522,000 cubic yards	47,230,000 cubic yards
Trucks to import rock and gravel per day during peak construction periods	4	4	50	100	1,200	90	1,400	2,500	2,200	2,700
Employees per day during peak construction period (does not include drivers of trucks in previous row of this table)	500	500	1,000	1,500	1,500	1,500	1,500	2,000	2,000	2,000
Employees per day during operations and maintenance	100	100	200	300	300	25	300	350	200	300
Energy demand during operations and maintenance	10 Gigawatt-hour/year	10 Gigawatt-hour/year	16 Gigawatt-hour/year	19 Gigawatt-hour/year	27 Gigawatt-hour/year	8 Gigawatt-hour/year	26 Gigawatt-hour/year	30 Gigawatt-hour/year	44 Gigawatt-hour/year	29 Gigawatt-hour/year

Notes:
- = component not included

Table ES-2
Summary of Benefit and Impact Assessments

Alternative	Basis of Comparison	Changes by Phase[a]				Next Steps
		I	II	III	IV	
Surface Water Resources						
Criterion: Cause alteration of surface waters that would cause erosion, siltation, or flooding.						
No Action Alternative	Existing Conditions	L	L	L	L	Best Management Practices in accordance with the Stormwater National Pollutant Discharge Elimination System permits.
	No Action Alternative	NA	NA	NA	NA	
Alternatives 1 - 8	Existing Conditions	L	L	L	L	
	No Action Alternative	L	L	L	L	
Criterion: Cause structures to be placed within 100-year flood hazard area in the Sea Bed.						
No Action Alternative	Existing Conditions	L	L	L	L	Define specific locations and use of elevated platforms for facilities on the Sea Bed to protect against flooding.
	No Action Alternative	NA	NA	NA	NA	
Alternatives 1 -8	Existing Conditions	L	L	L	L	
	No Action Alternative	L	L	L	L	
Criterion: Create or contribute runoff water that could cause polluted runoff.						
No Action Alternative	Existing Conditions	L	L	L	L	Best Management Practices in accordance with Stormwater National Pollutant Discharge Elimination System permit. Collect sludge at the water treatment plant(s) and haul to a certified disposal site.
	No Action Alternative	NA	NA	NA	NA	
Alternatives 1 - 8	Existing Conditions	L	L	L	L	
	No Action Alternative	L	L	L	L	
Criterion: Cause inundation by seiche.						
No Action Alternative	Existing Conditions	B	B	B	B	None available.
	No Action Alternative	NA	NA	NA	NA	
Alternatives 1 -8	Existing Conditions	B	B	B	B	
	No Action Alternative	B	B	B	B	
Surface Water Quality						
Criterion: Violate water quality standard.						
No Action Alternative	Existing Conditions	O	O	O	O	Additional studies of influent concentrations and relationships between nutrients in the inflows, sediment, and water column could identify methods to improve water quality.
	No Action Alternative	NA	NA	NA	NA	
Alternatives 1 - 8	Existing Conditions	L	L	L	L	
	No Action Alternative	L	L	L	L	

Table ES-2
Summary of Benefit and Impact Assessments

Alternative	Basis of Comparison	Changes by Phase[a]				Next Steps
		I	II	III	IV	
Criterion: Substantially degrade water quality.						
No Action Alternative	Existing Conditions	S	S	S	S	Additional studies of influent concentrations and relationships between nutrients in the inflows, sediment, and water column could identify methods to improve water quality.
	No Action Alternative	NA	NA	NA	NA	
Alternatives 1 – 4 and 6	Existing Conditions	L	L	L	L	
	No Action Alternative	L	B	B	B	
Alternatives 5, 7, and 8	Existing Conditions	L	L	L	L	Additional studies of influent concentrations and relationships between nutrients in the inflows, sediment, and water column could identify methods to improve water quality.
	No Action Alternative	L	L	L	L	
Groundwater Resources						
Criterion: Substantially deplete groundwater supplies, interfere with groundwater recharge, or cause saltwater intrusion						
No Action Alternative	Existing Conditions	O	B	B	B	None available.
	No Action Alternative	NA	NA	NA	NA	
Alternative 1	Existing Conditions	O	B	B	B	
	No Action Alternative	O	O	O	O	
Alternatives 2 - 8	Existing Conditions	O	O	O	O	Determine if the design criteria for the surface water elevation of water adjacent to the Indio Subbasin of the Coachella Valley Basin should be designed to further reduce saltwater intrusion.
	No Action Alternative	O	S	S	S	
Criterion: Cause groundwater quality degradation, not including saltwater intrusion						
No Action Alternative	Existing Conditions	L	L	L	L	A Stormwater Pollution Prevention Plan would be prepared.
	No Action Alternative	NA	NA	NA	NA	
Alternatives 1 - 8	Existing Conditions	L	L	L	L	
	No Action Alternative	L	L	L	L	

Table ES-2
Summary of Benefit and Impact Assessments

Alternative	Basis of Comparison	Changes by Phase[a]				Next Steps
		I	II	III	IV	
Biological Resources						
Criterion: Overall effects (benefits) of implementation on fish and wildlife						
No Action Alternative	Existing Conditions	S	S	S	S	Monitor biological resources to inform project-level design and adaptive management. Implement measures to avoid disturbance of fish and wildlife resources during construction and maintenance.
	No Action Alternative	NA	NA	NA	NA	
Alternatives 1 and 3 - 8	Existing Conditions	S	L	L	L	Conduct pilot studies and monitoring programs. Avoid disturbance during construction. Studies to further characterize the distribution of selenium in the sediments, and collect additional co-located biota, sediment, and water samples to refine predictions of selenium risk and reduce uncertainty. Modify design to minimize selenium uptake in the food web.
	No Action Alternative	B	B	B	B	
Alternative 2	Existing Conditions	S	B	B	B	
	No Action Alternative	B	B	B	B	
Criterion: Substantial adverse effect on candidate, sensitive, or special status species						
No Action Alternative	Existing Conditions	S	S	S	S	Implement measures to avoid or minimize impacts on breeding or roosting special status birds and desert pupfish during construction or maintenance activities.
	No Action Alternative	NA	NA	NA	NA	
Alternatives 1 -2	Existing Conditions	S	L	L	L	Same as No Action Alternative.
	No Action Alternative	O	B	B	B	Evaluate the need and methods for incorporating areas of freshwater within Saline Habitat Complex to accommodate the requirements of breeding birds and their young. Determine the appropriate ratio of wetted to dry areas within the Saline Habitat Complex necessary to maximize the habitat value. Prior to project-level design, implement studies to further characterize the distribution of selenium in the sediments, especially in the interior portion of the Salton Sea, and collect additional co-located biota, sediment, and water samples to refine predictions of selenium risk and reduce uncertainty. Modify design to minimize selenium uptake in the food web.
Alternative 3 - 8	Existing Conditions	S	L	L	L	
	No Action Alternative	B	B	B	B	
Criterion: Substantial adverse effect on any riparian habitat, other sensitive natural community, or wetlands						
No Action Alternative	Existing Conditions	S	O	O	O	Implement measures for Sedimentation/Distribution Basins to reduce losses of riparian vegetation and wetland values during construction and encourage development of riparian vegetation and wetland values along channels that route water over the exposed Sea Bed to the Salton Sea.
	No Action Alternative	NA	NA	NA	NA	
Alternatives 1 - 3 and 5 - 7	Existing Conditions	S	O	O	O	
	No Action Alternative	L	L	L	L	
Alternatives 4 and 8	Existing Conditions	S	S	S	S	
	No Action Alternative	L	L	L	L	

Table ES-2
Summary of Benefit and Impact Assessments

Alternative	Basis of Comparison	Changes by Phase[a]				Next Steps
		I	II	III	IV	
Criterion: Interfere substantially with the movement of any resident or migratory fish or wildlife species						
No Action Alternative	Existing Conditions	S	S	S	S	Develop genetic exchange program for desert pupfish.
	No Action Alternative	NA	NA	NA	NA	
Alternatives 1 and 2	Existing Conditions	S	S	S	S	
	No Action Alternative	S	O	O	O	
Alternative 3	Existing Conditions	S	O	O	O	
	No Action Alternative	S	B	B	B	
Alternative 4 - 8	Existing Conditions	S	S	S	S	
	No Action Alternative	S	B	B	B	
Geology, Soils, Faults, Seismicity, And Mineral Resources						
Criterion: Exposure of people to risks related to fault rupture, seismic shaking, and seismic-induced ground failure						
No Action Alternative	Existing Conditions	S	S	S	S	Facilities would be constructed in accordance with the California Building Code and applicable design standards.
	No Action Alternative	NA	NA	NA	NA	
Alternatives 1 - 8	Existing Conditions	S	S	S	S	
	No Action Alternative	S	S	S	S	
Criterion: Exposure of people to risks related to unstable soils						
No Action Alternative	Existing Conditions	S	S	S	S	Facilities would be constructed in accordance with the California Building Code and applicable design standards.
	No Action Alternative	NA	NA	NA	NA	
Alternative 1 - 8	Existing Conditions	S	S	S	S	
	No Action Alternative	S	S	S	S	
Criterion: Loss of availability of a known mineral resource or a locally important mineral resource recovery site						
No Action Alternative	Existing Conditions	S	S	S	O	Facilities could be sited to minimize disturbance of mineral resources that are identified as the water recedes. Future construction methods and materials may be able to minimize use of mineral resources.
	No Action Alternative	NA	NA	NA	NA	
Alternatives 1 - 8	Existing Conditions	S	S	S	O	
	No Action Alternative	S	S	S	O	

Table ES-2
Summary of Benefit and Impact Assessments

Alternative	Basis of Comparison	Changes by Phase[a]				Next Steps
		I	II	III	IV	
Climate and Air Quality[b]						
Criterion: Construction fugitive dust (PM_{10}) emissions exceed local significance thresholds of 150 pounds/day (daily threshold) or 70 tons/year (annual threshold)						
No Action Alternative	Existing Conditions	L	L	L	L	Project-level analyses would need to do more detailed emissions estimation, impact analysis, and mitigation planning.
	No Action Alternative	NA	NA	NA	NA	
Alternatives 1 - 8	Existing Conditions	S	N	N	N	
	No Action Alternative	S	N	N	N	
Criterion: Hazardous air pollutants (HAPs) in fugitive dust (PM_{10}) emissions associated with construction expose sensitive receptors to substantial pollutant concentrations						
No Action Alternative	Existing Conditions	S	S	S	S	Project-level analyses would need to do more detailed emissions estimation, exposure and health impact analysis, and mitigation planning. Control of fugitive dust would reduce human exposures.
	No Action Alternative	NA	NA	NA	NA	
Alternatives 1 - 8	Existing Conditions	S	N	N	N	
	No Action Alternative	U	U	U	U	
Criterion: Construction exhaust (NO_x) emissions exceed local significance thresholds of 100 pounds/day or 50 tons/year						
No Action Alternative	Existing Conditions	L	L	L	L	Project-level analyses would need to do more detailed emissions estimation, impact analysis, and mitigation planning.
	No Action Alternative	NA	NA	NA	NA	
Alternative 1	Existing Conditions	L	L	L	L	
	No Action Alternative	L	L	L	L	
Alternatives 2 - 8	Existing Conditions	S	N	N	N	
	No Action Alternative	S	N	N	N	
Criterion: Diesel PM_{10} emissions associated with construction expose sensitive receptors to substantial pollutant concentrations						
No Action Alternative	Existing Conditions	S	N	N	N	Project-level analyses would need to do more detailed emissions estimation, exposure and health impact analysis, and mitigation planning.
	No Action Alternative	NA	NA	NA	NA	
Alternatives 1 - 8	Existing Conditions	S	N	N	N	
	No Action Alternative	N	N	N	N	

Table ES-2
Summary of Benefit and Impact Assessments

Alternative	Basis of Comparison	Changes by Phase[a]				Next Steps
		I	II	III	IV	
Criterion: Operations and maintenance related fugitive dust (PM_{10}) emissions exceed local significance thresholds of 150 pounds/day or 70 tons/year						
No Action Alternative	Existing Conditions	L	L	L	L	Project-level analyses would need to do more detailed emissions estimation, impact analysis, and mitigation planning.
	No Action Alternative	NA	NA	NA	NA	
Alternatives 1, 2, and 4	Existing Conditions	L	L	L	L	
	No Action Alternative	L	L	L	L	
Alternatives 3 and 5	Existing Conditions	L	N	N	S	
	No Action Alternative	L	N	N	S	
Alternatives 6 - 8	Existing Conditions	S	S	S	S	
	No Action Alternative	S	S	S	S	
Criterion: Operations and maintenance related exhaust (NO_x) emissions exceed local significance thresholds of 55 pounds/day or 50 tons/year						
No Action Alternative	Existing Conditions	L	L	L	L	Project-level analyses would need to do more detailed emissions estimation, impact analysis, and mitigation planning.
	No Action Alternative	NA	NA	NA	NA	
Alternatives 1 and 2	Existing Conditions	L	L	L	L	
	No Action Alternative	L	L	L	L	
Alternative 3	Existing Conditions	S	N	N	S	
	No Action Alternative	S	N	N	S	
Alternative 4	Existing Conditions	L	N	N	S	
	No Action Alternative	L	N	N	S	
Alternatives 5 - 8	Existing Conditions	S	S	S	S	
	No Action Alternative	S	S	S	S	
Criterion: Fugitive dust (PM_{10}) emissions associated with exposed playa, after air quality management and control measures, exceed local significance thresholds of 150 pounds/day or 70 tons/year						
No Action Alternative	Existing Conditions	L	N	S	S	Project-level analyses would need to do more detailed emissions studies and estimation, control measure identification, impact analysis, and mitigation planning.
	No Action Alternative	NA	NA	NA	NA	
Alternatives 1 - 8	Existing Conditions	S	S	S	S	
	No Action Alternative	S	S	S	S	

Table ES-2
Summary of Benefit and Impact Assessments

Alternative	Basis of Comparison	Changes by Phase[a]				Next Steps
		I	II	III	IV	
Criterion: Hazardous air pollutants (HAPs) in fugitive dust (PM_{10}) emissions associated with playa expose sensitive receptors to substantial pollutant concentrations						
No Action Alternative	Existing Conditions	S	S	S	S	Project-level analyses would need to do more detailed emissions estimation, exposure and health impact analysis, and mitigation planning. Control of fugitive dust would reduce human exposures.
	No Action Alternative	NA	NA	NA	NA	
Alternatives 1 - 8	Existing Conditions	S	S	S	S	
	No Action Alternative	S	S	S	S	
Criterion: Net emissions increase of nonattainment pollutants exceed general conformity de minimis thresholds of 70 tons/year (PM_{10}) and 50 tons/year (NO_x)						
No Action Alternative	Not Applicable.					
Alternative 1	Existing Conditions	S	L	L	L	Project-level analyses would need to do more detailed emissions estimation, impact analysis, and mitigation planning.
	No Action Alternative	S	L	L	L	
Alternatives 2 - 8	Existing Conditions	S	N	N	S	
	No Action Alternative	S	N	N	S	
Criterion: Odorous emissions associated with changes in water quality affect a substantial number of people						
No Action Alternative	Existing Conditions	S	S	B	B	Project-level analyses would need to do more detailed emissions estimation, exposure and health impact analysis, and mitigation planning.
	No Action Alternative	NA	NA	NA	NA	
Alternatives 1 - 4	Existing Conditions	S	B	B	B	
	No Action Alternative	S	B	B	B	
Alternatives 5 - 8	Existing Conditions	S	S	S	S	
	No Action Alternative	S	S	S	S	
Criterion: Changes substantially modify the existing microclimate characteristics adjacent to the Salton Sea						
No Action Alternative	Existing Conditions	S	S	S	S	Project-level analyses would need to do more detailed microclimatic impact analysis and mitigation planning.
	No Action Alternative	NA	NA	NA	NA	
Alternatives 1 - 8	Existing Conditions	S	S	S	S	
	No Action Alternative	U	U	U	U	

Table ES-2
Summary of Benefit and Impact Assessments

Alternative	Basis of Comparison	Changes by Phase[a]				Next Steps
		I	II	III	IV	
Land Use						
Criterion: Conflict with Imperial County General Plan provisions related to conditions in the Salton Sea						
No Action Alternative	Existing Conditions	S	S	S	S	None available.
	No Action Alternative	NA	NA	NA	NA	
Alternatives 1 - 4	Existing Conditions	S	S	S	S	
	No Action Alternative	L	L	B	B	
Alternatives 5 - 8	Existing Conditions	S	B	B	B	
	No Action Alternative	L	B	B	B	
Criterion: Conflict with Torres Martinez Tribe Land Use Plans						
No Action Alternative	Existing Conditions	L	B	B	B	Facilities could be located to reduce impacts to land uses along the shoreline.
	No Action Alternative	NA	NA	NA	NA	
Alternative 1	Existing Conditions	L	B	B	B	
	No Action Alternative	L	B	B	B	
Alternatives 2, 3, 4, and 8	Existing Conditions	L	B	B	B	Provisions could be included to provide access to exposed Tribal lands or locations of the rings could be modified to expose these lands.
	No Action Alternative	L	L	L	L	
Alternatives 5 - 7	Existing Conditions	O	O	O	O	Displacement dikes could be used to expose Tribal lands.
	No Action Alternative	S	S	S	S	
Criterion: Conversion of agricultural land						
No Action Alternative	Existing Conditions	L	L	L	L	To the extent possible, Sedimentation/Distribution Basins should be located away from agricultural lands.
	No Action Alternative	NA	NA	NA	NA	
Alternatives 1 - 2	Existing Conditions	L	L	L	L	
	No Action Alternative	O	O	O	O	
Alternatives 3 - 8	Existing Conditions	L	L	L	L	
	No Action Alternative	B	B	B	B	

Table ES-2
Summary of Benefit and Impact Assessments

Alternative	Basis of Comparison	Changes by Phase[a]				Next Steps
		I	II	III	IV	
Criterion: Distance from shoreline to open water						
No Action Alternative	Existing Conditions	S	S	S	S	None available.
	No Action Alternative	NA	NA	NA	NA	
Alternatives 1 - 2 and 4 - 8	Existing Conditions	S	S	S	S	Displacement Dikes to contain water near shorelines.
	No Action Alternative	O	S	S	S	
Alternative 3	Existing Conditions	S	S	S	S	None available.
	No Action Alternative	B	B	B	B	
Population And Housing						
Criterion: Induce population growth directly due to construction activities						
No Action Alternative	Existing Conditions	O	O	O	O	None required
	No Action Alternative	NA	NA	NA	NA	
Alternatives 1 - 8	Existing Conditions	O	O	O	O	
	No Action Alternative	O	O	O	O	
Recreation						
Criterion: Substantially change recreational opportunities						
No Action Alternative	Existing Conditions	O	S	S	S	During project-level analyses, evaluate opportunities.
	No Action Alternative	NA	NA	NA	NA	
Alternatives 1 - 8	Existing Conditions	O	B	B	B	
	No Action Alternative	O	B	B	B	
Hazards, Hazardous Waste And Public Health						
Criterion: Increased exposure to hazardous materials						
No Action Alternative	Existing Conditions	L	L	L	L	Coordinate with U.S. Navy to confirm removal of ordnance prior to disturbance. Training provided to workers to reduce risk of handling and transporting hazardous materials. Life-support equipment may need to be available for all workers when in boats on the water.
	No Action Alternative	NA	NA	NA	NA	
Alternatives 1 - 8	Existing Conditions	L	L	L	L	
	No Action Alternative	L	L	L	L	

Table ES-2
Summary of Benefit and Impact Assessments

Alternative	Basis of Comparison	Changes by Phase[a]				Next Steps
		I	II	III	IV	
Criterion: Increased risk of consumption of fish and wildlife tissue with high selenium concentrations						
No Action Alternative	Existing Conditions	B	B	B	B	Continued coordination with regulatory agencies and monitoring of fish and wildlife tissue.
	No Action Alternative	NA	NA	NA	NA	
Alternatives 1 - 8	Existing Conditions	B	B	B	B	
	No Action Alternative	B	B	B	B	
Criterion: Increased risk due to exposure to vectors or disease						
No Action Alternative	Existing Conditions	L	L	L	L	Continued coordination with mosquito abatement agencies. Monitoring programs and worker training to reduce exposure to vectors and disease as soils are disturbed.
	No Action Alternative	NA	NA	NA	NA	
Alternatives 1 - 8	Existing Conditions	L	L	L	L	
	No Action Alternative	L	L	L	L	
Cultural Resources						
Criterion: Cause substantial adverse change in the significance of a historical or unique archaeological resource or disturb human remains						
No Action Alternative	Existing Conditions	S	S	S	S	Implement mitigation measures required by implementation of the IID Water Conservation and Transfer Project from -235 to -248 feet msl.
	No Action Alternative	NA	NA	NA	NA	
Alternatives 1 - 8	Existing Conditions	S	S	S	S	Implement same measures as described in the No Action Alternative. If disturbed lands are federal or tribal lands, complete analyses subject to federal oversight following Section 106 compliance pathways of the NHPA and implementing regulations under 36 CFR 800, as amended. Discovered sites should be properly recorded with the appropriate California Historic Resource Information System (CHRIS) office.
	No Action Alternative	S	S	S	S	
Paleontological Resources						
Criterion: Physical damage to a scientifically useful fossil or unearthing of fossils and removal without appropriate scientific recordation						
No Action Alternative	Existing Conditions	S	S	S	S	Implement mitigation measures required by implementation of the IID Water Conservation and Transfer Project from -235 to -248 feet msl.
	No Action Alternative	NA	NA	NA	NA	
Alternatives 1 - 8	Existing Conditions	S	S	S	S	Implement same measures as described in the No Action Alternative.
	No Action Alternative	S	S	S	S	

Table ES-2
Summary of Benefit and Impact Assessments

Alternative	Basis of Comparison	Changes by Phase[a]				Next Steps
		I	II	III	IV	
Noise						
Criterion: Exposure of people to or generate noise levels in excess of standards						
No Action Alternative	Existing Conditions	L	L	L	L	Use hydraulically or electrically powered impact tools and exhaust mufflers. Install manufacturer's standard noise control devices. Locate equipment as far as possible from noise sensitive receptors. Notify property users when noisy work might occur. Keep idling of construction equipment to a minimum. Install acoustic barriers and noise enclosures.
	No Action Alternative	NA	NA	NA	NA	
Alternatives 1 and 2	Existing Conditions	L	L	L	L	
	No Action Alternative	L	L	L	L	
Alternatives 3 - 8	Existing Conditions	S	S	S	S	
	No Action Alternative	S	S	S	S	
Criterion: Exposure of people to or generate excessive ground-borne vibration or ground-borne noise levels						
No Action Alternative	Existing Conditions	S	S	S	O	Potentially could reduce vibrations by isolating the pile-driving equipment.
	No Action Alternative	NA	NA	NA	NA	
Alternatives 1 - 8	Existing Conditions	S	S	S	O	
	No Action Alternative	L	L	L	O	
Aesthetic And Visual Resources						
Criterion: Substantially degrade visual character, quality, or scenic vistas						
No Action Alternative	Existing Conditions	S	S	S	S	Several locations would be evaluated in project-level analyses for all facilities. Methods to camouflage large facilities could be considered.
	No Action Alternative	NA	NA	NA	NA	
Alternatives 1 - 8	Existing Conditions	S	S	S	S	
	No Action Alternative	S	S	S	S	
Criterion: Create a new source of light or glare						
No Action Alternative	Existing Conditions	L	L	L	L	Use non-glare lighting with on-demand switching.
	No Action Alternative	NA	NA	NA	NA	
Alternatives 1 - 8	Existing Conditions	L	L	L	L	
	No Action Alternative	L	L	L	L	

Table ES-2
Summary of Benefit and Impact Assessments

Alternative	Basis of Comparison	Changes by Phase[a]				Next Steps
		I	II	III	IV	
Public Services And Utilities						
Criterion: Results in impacts to or requires new or altered facilities for fire and police protection or emergency care						
No Action Alternative	Existing Conditions	L	L	L	L	Develop traffic plans and emergency response plans for construction sites. Construction sites could provide private security and fire protection at the sites. Fee schedules for construction permits could include re-imbursements to provide funds for emergency services.
	No Action Alternative	NA	NA	NA	NA	
Alternatives 1 - 8	Existing Conditions	L	L	L	L	
	No Action Alternative	L	L	L	L	
Criterion: Results in non-compliance or requires new or altered solid waste facilities						
No Action Alternative	Existing Conditions	S	S	S	O	Fee schedule at solid waste facilities could be developed specifically for construction of the alternative to promote recycling and minimize solid wastes. Mandate hauling of solid waste outside of the study area.
	No Action Alternative	NA	NA	NA	NA	
Alternatives 1 - 8	Existing Conditions	S	S	S	O	
	No Action Alternative	S	S	S	O	
Transportation And Traffic						
Criterion: Cause a substantial increase in traffic						
No Action Alternative	Existing Conditions	L	L	L	L	Comply with all applicable traffic regulations and maintain emergency access. Traffic studies would be conducted to identify methods to minimize impacts.
	No Action Alternative	NA	NA	NA	NA	
Alternatives 1 - 8	Existing Conditions	L	L	L	L	
	No Action Alternative	L	L	L	L	
Power Production And Energy Resources						
Criterion: New or physically altered power facilities, the construction of which could cause significant environmental impacts						
No Action Alternative	Existing Conditions	L	L	L	L	Energy savings measures including conservation and use of alternative energy sources would be considered during project-level analyses. Placement of the extended facilities would need to be evaluated in project-level analyses.
	No Action Alternative	NA	NA	NA	NA	
Alternative 4	Existing Conditions	L	L	L	L	
	No Action Alternative	O	O	O	O	
Alternatives 1 - 3 and 5 - 8	Existing Conditions	L	L	L	L	
	No Action Alternative	L	L	L	L	

Table ES-2
Summary of Benefit and Impact Assessments

Alternative	Basis of Comparison	Changes by Phase[a]				Next Steps
		I	II	III	IV	
Criterion: Loss of access to a known geothermal resource area that would substantially affect existing and future resource extraction activities						
No Action Alternative	Existing Conditions	B	B	B	B	
	No Action Alternative	NA	NA	NA	NA	Coordinate with geothermal industry to minimize conflicts between Air Quality Management and geothermal facilities. Air Quality Management measures may be reduced if geothermal industries become responsible for dust control near the generation facilities.
Alternatives 1 - 6 and 8	Existing Conditions	O	O	O	O	
	No Action Alternative	L	L	L	L	
Alternative 7	Existing Conditions	B	B	B	B	Reduce size of water bodies to provide corridors for geothermal areas.
	No Action Alternative	B	B	B	B	

Note
[a]

S = Significant or Potentially Significant Impact
L = Less than Significant
O = No Change
B = Benefit
U = Unknown
NA = Not Applicable
N = Not Analyzed.

[b] The air quality analysis focused on a Peak Construction Year in Phase I, and a Peak Operations Year in Phase IV. For the most part, Phases II and III were not analyzed. Exceptions to this occurred if inferences could be made from the available information. For example, if construction impacts were predicted to be less than significant in the Peak Construction Year, it was inferred that construction impacts would be less than significant in all phases. As another example, if significant or potentially significant impacts were predicted in both Phase I and Phase IV, it was inferred that significant or potentially significant impacts would occur in all phases.

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