EXECUTIVE SUMMARY

SALTON SEA RESTORATION PROJECT BACKGROUND

Salton Sea Facts

- Located south of Palm Springs in Imperial and Riverside counties
- Surface elevation is 227 feet below mean sea level
- Deepest area of the Sea bed is only five feet higher than lowest point in Death Valley
- Surface area is 365 square miles
- Contains 7.5 million acre-feet (maf) of water
- Evaporates 1.36 maf each year
- Salinity is 44,000 mg/L, compared to 35,000 mg/L for sea water
- All values are approximate and fluctuate with time

The Salton Sea is an excessively salty, nutrient-rich lake in a closed basin. The Sea exists primarily due to continued agricultural drainage from the Imperial, Coachella, and Mexicali valleys and smaller contributions from municipal effluent and stormwater runoff. The Sea has a productive sport fishery and provides important migratory and resident bird habitat within the Pacific Flyway. Seasonal bird use includes millions of birds, and approximately 400 bird species have been recorded at the Sea. Several endangered species, including the desert pupfish, brown pelican, and the Yuma clapper rail, inhabit the Salton Sea or adjacent habitats.

The Salton Sea ecosystem is under stress from increasing salinity, nutrient loading, oxygen depletion, and temperature fluctuations that may be threatening the reproductive ability of some biota, particularly sportfish species, and also causing additional ecosystem health problems. There are indications that the deteriorating environmental conditions may be contributing to the prominence of avian disease at the Sea. Without restoration, the ecosystem at the Sea will continue to deteriorate.

Congress passed Public Law (PL) 102-575 in 1992. The law directs the Secretary of the Interior to "conduct a research project for the development of a method or combination of methods to reduce and control salinity, provide endangered species habitat, enhance fisheries, and protect human recreational values . . . in the area of the Salton Sea." The Salton Sea Reclamation Act of 1998 (PL 105-372) was passed to further the restoration process. PL 105-372 directs the Secretary to "complete all studies, including, but not limited to environmental and other reviews, of the feasibility and benefit-cost of various options that permit the continued use of the Salton Sea as a reservoir for irrigation drainage and: (i) reduce and stabilize the overall salinity of the Salton Sea; (ii) stabilize the surface elevation of the Salton Sea; (iii) reclaim, in the long term, healthy fish and wildlife resources and their habitats; and (iv) enhance the potential for recreational uses and economic developments of the Salton Sea."

Developing the Salton Sea Restoration Project requires compliance with the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). To satisfy both NEPA and CEQA requirements, the US Department of the Interior Bureau of Reclamation (Reclamation) and the Salton Sea Authority (Authority), as the lead agencies in cooperation with a number of interested agencies, have prepared this joint draft environmental impact statement/environmental impact report (EIS/EIR). Founded in 1993, the Authority is a joint powers authority formed by the Coachella Valley Water District, Imperial County, the Imperial Irrigation District, and Riverside County.

PURPOSE AND NEED FOR THE SALTON SEA RESTORATION PROJECT

The purpose and need for the Salton Sea Restoration Project is to maintain and restore ecological and socioeconomic values of the Salton Sea to the local and regional human community and to the biological resources dependent upon the Sea. These requirements are reflected in the directives of PL 105-372. The purpose and need will be met by implementing a project that satisfies the goals and objectives discussed in chapter 1 of this EIS/EIR. The project is intended to have ecological, recreational, and economic benefits.

SALTON SEA RESTORATION PROJECT GOALS AND OBJECTIVES

Prior to implementing the NEPA/CEQA process, the Salton Sea Authority and the Bureau of Reclamation, working jointly with stakeholders and members of the public, developed five goal statements. The goal statements are consistent with the direction contained in PL 105-372, address the underlying purpose and need for the project, and provide guidance for developing project alternatives. The five goals of the Salton Sea Restoration Project are as follows:

1. Maintain the Sea as a repository of agricultural drainage;
2. Provide a safe, productive environment at the Sea for resident and migratory birds and endangered species;
3. Restore recreational uses at the Sea;
4. Maintain a viable sport fishery at the Sea; and
5. Enhance the Sea to provide economic development opportunities.

In order to measure the effectiveness of any actions designed and implemented to achieve the five project goals, specific objectives were developed in cooperation with stakeholders to further define each goal. In many cases, objectives overlap and result in mutual benefits. The goals and objectives have been used to guide the development of alternatives analyzed in this EIS/EIR. These same objectives ultimately would be used to guide efforts to monitor and evaluate the effectiveness of any restoration actions that are implemented.

Issue Identification Through the Public Scoping Process

The identification of issues to be addressed in the EIS/EIR included internal agency review and analysis and the public scoping process. The purpose of scoping is to encourage the public and government agencies to help identify issues and topics that an EIS/EIR should address. In general, the issues and concerns raised during public scoping meetings and additional workshops on alternatives included the following:

- Water quality and quantity;
- Salinity increase;
- Contaminants and public health;
- Aesthetics, particularly odors and visual impacts;
- Long-term management goals;
- Wildlife;
- Agriculture;
- Economic development;
- Recreation;
- Elevation stabilization;
- International boundary issues;
- Cultural and Native American issues;
- Alternative development;
- Timeframe for initiating solutions; and
- Project financing.

All of these issues were considered in developing the content of this EIS/EIR and, where appropriate, are addressed in the document.

Phased Implementation Strategy

The alternative screening and evaluation process has shown that certain components are needed sooner than others and that certain project components can be designed and constructed sooner than other components. For example, water imports will be needed only if future average inflows to the Sea decline; therefore, a phased alternative implementation strategy is proposed. Phase 1 actions would be implemented between the years 2003 and 2015. Phase 2 actions, if needed at all, are generally planned for the year 2030 and beyond. Phase 1 actions have been developed and analyzed in sufficient detail to allow for an appropriate action to be selected after the final version of this EIS/EIR is published. In addition to the EIS/EIR, other ongoing technical studies will be completed and made available to the lead agencies during refinement of Phase 2 actions. Recommendations will be provided by the lead agencies as to which Phase 2 actions should be retained for further analysis, design, and supplemental environmental analysis and documentation.

NO ACTION/NO PROJECT ALTERNATIVE

Project alternatives must be evaluated against a scenario that could reasonably be expected to occur in the foreseeable future if the project is not approved. This evaluation allows decision-makers to compare the effects of approving a project against the effects of not approving a project. The No Action Alternative describes probable future conditions based on the potential for current conditions to continue plus other assumptions about physical, biological, and socioeconomic changes that might occur without the project.

Projecting hydrologic conditions for this project is complicated by uncertainties of future water flows into the Sea. The flow of water will depend on external factors not associated with the Salton Sea Project, and the timing of the flow is unknown. Therefore, for purposes of analysis, project effects have been evaluated against three No Action/No Project inflow scenarios:

- Current (present-day) inflow conditions continue throughout both Phases 1 and 2, with average annual inflows of 1.36 maf/yr;
- Annual inflows are incrementally reduced throughout Phase 1 to 1.06 maf/yr at the beginning of Phase 2; inflows remain at 1.06 maf/yr throughout Phase 2; and
- Annual inflows are incrementally reduced throughout Phase 1 and continue to decline into Phase 2 until they reach 0.8 maf/yr.

These potential future inflows are considered reasonable future scenarios, in light of the varied other projects in the region currently under consideration that may ultimately gain approval and affect the inflow of water to the Sea.

In the future, in addition to changes in the quantities of inflows, the quality of inflowing water may also change. The Clean Water Act requires: (1) identification of the Region's waters that do not comply with water quality standards, (2) ranking of impaired water bodies, and (3) establishment of Total Maximum Daily Loads (TMDLs) for those pollutants causing the impairments. The TMDL process should have a long-term beneficial effect on the quality of waters flowing into the Sea. This benefit is expected to occur under the No Action Alternative as well as under project alternatives. While the project alternatives are focused on restoration of the Sea itself, the TMDL process should enhance the effectiveness of the restoration alternatives by improving the quality of the inflows.

RESTORATION ALTERNATIVES EVALUATED IN THE EIS/EIR

Alternatives have been developed with the recognition that inflows to the Sea may decrease in the future. Thus, each alternative includes actions that would be implemented under the reduced inflows considered. Table ES-1 displays how five complete alternatives have been formulated from individual actions for three inflow scenarios described in the previous section for the No Action Alternative. Schematic representations of all five alternatives can be found in Appendix A. The alternatives are

designed to address the wildlife, fishery, and recreation goals and objectives presented in chapter 1. In part, these objectives would be addressed by halting the present trend of increasing salinity and by ultimately reducing salinity to a target concentration of about +/-40,000 mg/L. All alternatives include salinity control measures during Phase 1. For Alternatives 1 and 5, an additional export action would be required to provide long-term salinity and elevation control. This action could be required as early as 2015 for Alternative 1 and is considered an accelerated Phase 2 action.

Alternative 1

Alternative 1 would involve constructing two evaporation ponds within the Sea. The combined surface area of the ponds would be approximately 33 square miles but would depend on the elevation of the water surface in the ponds and seasonal fluctuations. The ponds would act to concentrate the salts from the Sea and to assist in stabilizing the surface elevation. Approximately 98,000 af/yr of water would be pumped into these ponds from the Sea each year. Evaporation of this water would tend to concentrate salts in the ponds and allow the salinity in the remainder of the Sea to be maintained at an acceptable level. The ponds also would create a displacement, which would assist in maintaining the target elevation level of the Sea (+/- -230 feet) should inflows to the Sea decrease in the future. The ponds would be located at the south end of the Sea, with one west of the mouth of the New River and the other by the Salton Sea Test Base.

Alternative 2

Alternative 2 would involve constructing an Enhanced Evaporation System (EES) on a site north of Bombay Beach. The EES is a method to remove salts from the Sea by increasing evaporation rates through spraying. Alternative 2 involves constructing tower modules to process 150,000 af/yr of Salton Sea water. The system would operate on average 18 hours per day and automatically shut down when winds exceed 14 miles per hour (mph). Each module would consist of a line of towers and precipitation ponds.

Alternative 3

Alternative 3 would be similar to Alternative 2 in that it would involve construction of an EES; however, for Alternative 3 the EES would be located at the Salton Sea Test Base.

Table ES-1
Summary of Salton Sea Restoration Project Alternative Actions

Inflow	----------Phase 1 (before 2030)----------			----------Phase 2 (2030 and beyond)----------	
(maf/yr)	2003	2008	2015	2030	2060
Alternative 1					
1.36	Fish Harvesting Improve Rec. Facilities Shoreline Cleanup Wildlife Disease Control North Wetland Habitat	2 Ponds at 98 kaf/yr Pupfish Pond	Accelerated Export – 150 kaf/yr[1]		
1.06	Same as above	Same as above	Same as above, plus Displacement Dike	Import Central Arizona Salinity Interceptor (CASI) Water (up to 304.8 kaf/yr, as required)	
0.80	Same as above	Same as above	Same as above	Same as above, plus Import Flood Flows	
Alternatives 2 and 3					
1.36	Fish Harvesting Improve Rec. Facilities Shoreline Cleanup Wildlife Disease Control North Wetland Habitat	150 kaf/yr EES (showerline technology)			
1.06	Same as above	Same as above	Displacement Dike Import Flood Flows	Import CASI Water (up to 304.8 kaf/yr, as required)	
0.80	Same as above	Same as above	Same as above	Same as above	Additional Displacement or Inflow
Alternative 4					
1.36	Fish Harvesting Improve Rec. Facilities Shoreline Cleanup Wildlife Disease Control North Wetland Habitat	100 kaf/yr EES 1 Evaporation Pond (S) at 68 kaf/yr Pupfish Pond		Increase EES capacity to 150 kaf/yr	
1.06	Same as above	Same as above	Displacement Dike Import Flood Flows	Same as above, plus Import CASI Water (up to 304.8 kaf/yr, as required) Reduce EES at 100 kaf/yr	
0.80	Same as above	Same as above	Same as above	Same as above	
Alternative 5					
1.36	Fish Harvesting Improve Rec. Facilities Shoreline Cleanup Wildlife Disease Control North Wetland Habitat	150 kaf/yr EES in-Sea Evaporation Pond (N)		Export – 150 kaf/yr	
1.06	Same as above	Same as above	Displacement Dike Import Flood Flows	Import CASI Water (up to 304.8 kaf/yr, as required)	
0.80	Same as above	Same as above	Same as above	Same as above	Additional Displacement or Inflow

[1] Accelerated export implemented as a Phase 2 action

Alternative 4

This alternative combines the technology of Alternatives 1 and 3 to increase the effectiveness and speed at which salts are removed from the Sea. The EES would be constructed on the Salton Sea Test Base, but the size of the EES would be reduced to a capacity of 100,000 af/yr. The southwest evaporation pond would be constructed as described in Alternative 1.

Alternative 5

Alternative 5 combines an evaporation pond near the Salton Sea Test Base with a 150,000 af/yr EES incorporated within the pond itself. The EES used in this alternative would involve technology typically used in artificial snowmaking. Instead of the tower configuration described in Alternative 1, this method would utilize a series of portable, ground-based blowers that would use compressed air to spray piped Salton Sea water up into the air and into the evaporation pond, rather than dropping it from towers.

Common Actions

Common actions have been developed to further address the goals of wildlife maintenance and enhancement, restoration of recreational uses, maintenance of the sport fishery, and identification of economic development opportunities. The common actions would be included with each alternative except No Action and could be implemented as early as 2003. Pilot projects are planned for each common action to finalize the specifications of each action and test its effectiveness. The proposed common actions are as follows:

- **Fish Harvesting**– Harvesting tilapia is being considered as a method to reduce the internal nutrient load and fish population densities within the Salton Sea. In addition to reducing nutrient loads, reducing tilapia densities is expected to provide a healthier environment for the fishery and could improve the health of the tilapia population. Boat dock facilities and a processing plant would be located at one of several sites along the shore, including the Salton Sea Test Base or on Torres Martinez Indian Reservation lands.
- **Improved Recreational Facilities**– The public boat ramps and access roads around the Salton Sea would be repaired to enhance their usefulness. Some channelization may be required to provide deeper water for boats to improve access to the Sea.
- **Shoreline Cleanup**– A shoreline cleanup program would consist of removing dead fish and other debris from the water surface and the shoreline. Removing the fish would reduce odors and nutrients from the Sea. The Sea cleanup operation would use skimmer barges to retrieve fish floating on the water surface. In addition, beach cleaning equipment, involving a conveyor system that rakes the beach, would be used to maintain the shoreline.
- **Integrated Wildlife Disease Program**– This program would include an integrated, multi-agency effort involving the National Wildlife Health Center of the US Geological Survey (USGS), the US Fish and Wildlife Service (USFWS), the Salton Sea Authority, and the California Department of Fish and Game

(CDFG). The program would include field technician-level support for on-site methodical monitoring of the Sea for wildlife die-offs, response assistance, biological sample collection, and scientific information compilation relative to wildlife mortality at the Sea.

- **Long-term Management Strategy**– The long-term management strategy would define activity coordination, project operational responsibilities, scientific research and monitoring responsibilities, and resource protection and management. The plan would be based on the concept that management is adaptable, given the recognized unknowns that exist in the Salton Sea ecosystem and the need for operational flexibility to respond to future monitoring and research findings and varying resource conditions. Physical and economical conditions would be considered in any proposed modification to project operation or implementation of any additional restoration measures. The plan would be designed to strengthen the restoration effort and to better meet the purpose and need of the project.
- **Strategic Science Plan**– This strategic science plan would allow managers to adapt restoration actions to future ecological needs and assure scientific evaluation is an integral part of adaptive management. The strategic science plan would include conceptual modeling, monitoring to evaluate the success of restoration actions, quantitative modeling, focused investigations to fill in key information gaps, technical assistance to involve time-responsive short-term needs, and data management.

Other Features

As shown in Table ES-1, several features are being considered to enhance the performance of alternatives over the range of the future inflow scenarios under consideration. In most cases, these features would not be implemented unless inflows to the Sea are reduced in the future. These features are as follows:

- **North Wetland Habitat**– Reduced annual inflows to the Sea would threaten the important island and snag habitat currently used by wildlife in the northern portion of the Sea. This area provides the largest expanse of snag habitat at the Sea along with low island habitat. The north wetland habitat area would be constructed to preserve these existing values in the area as well as allow adaptive management of a freshwater/Salton Sea water interface to enhance habitat values.
- **Pupfish Pond**– This pond would be included in Alternatives 1 and 4 to maintain connectivity of drains for pupfish. To maintain this habitat and connectivity between the drains in this area, additional dikes would be constructed from the north and south ends of the south evaporation pond extending to the shoreline, effectively creating a nearshore habitat protection pond between the shore and the evaporation pond. Significant snag habitat on the west side of the New River and the habitat around the mouth of San Felipe Creek would also be protected within this pond.

- **Displacement Dike**– This dike would be constructed in the southern portion of the Sea under the reduced inflow scenarios. It is designed to essentially reduce the total area of the Sea, effectively displacing enough water to maintain elevations if annual inflows are reduced. The dike would reduce the surface area of the Sea by 13,500 acres. The Sea water in the area behind the dike would initially evaporate and thereafter could alternately be dry or wet depending on the season.
- **Flood Flows**– This action would involve augmenting inflow to the Sea by using a portion of the total flood flows available from the Colorado River. Colorado River flood flows are generally available approximately every three to seven years. The maximum amount of flood flows considered for diversion to the Sea over the planning horizon represents about 10 percent of the expected flood flow releases. Flood flows are beyond any entitled or surplus water dedicated to water users in the Basin states and in excess of flows needed to meet treaty obligations to Mexico.

Phase 2 Export and Import Actions

Phase 2 actions would export water from or import water to the Salton Sea if conditions of the Sea warranted such action in the future. These actions have been developed on a programmatic level; thus, descriptions provided represent typical alignments and pipeline details that could be used. Phase 2 actions may or may not be needed based on the efficiency of Phase 1 actions and reductions in inflow from water conservation and other diversions. Because none of these Phase 2 actions would be constructed for at least 15 to 30 years, detailed analyses of potential environmental consequences are not currently feasible. The joint lead agencies plan to continue to develop and refine these actions. Once specifics are determined, additional environmental analysis would be performed.

Export Actions– Phase 2 export options include:

- Expanded EES
- Export to the Gulf of California
- Export to the Pacific Ocean
- Export to Palen Dry Lakebed

Import through Yuma, AZ– This action would involve the import of water that originates as a brine stream from the proposed CASI, through Yuma to the Salton Sea. The CASI is designed to transport brackish water by gravity from the Tucson and Phoenix areas to Yuma. This water would be less saline, at approximately 4,400 mg/L, than the existing Salton Sea water and would help reduce salinity and stabilize elevation if annual inflows are significantly reduced. CASI water is expected to be available in approximately 25 years, with the current plans for its disposal including discharge to the Gulf of California. Approximately 304,800 af/yr are estimated to become available for diversion to the Salton Sea. This amount of CASI water could be conveyed

continuously at approximately 420 cfs through a newly constructed canal to parallel the existing, All-American Canal.

Cumulative Impacts

Twenty-six projects in the region have been identified that could potentially have cumulative effects when combined with the Salton Sea restoration project. The greatest probability that any given project would have cumulative effects would occur if the project could potentially cause some change to the future inflows to the Sea. With the competing demands for water in California, it is most likely that the cumulative effects of almost any combination of these projects would be a future reduction of inflows to the Sea. Rather than attempt to forecast the individual effects of each project, two reduced inflow scenarios have been evaluated for all alternatives including the No Action Alternative. The environmental effects of both reduced inflow scenarios have been discussed for each alternative. These discussions in essence address the cumulative effects of any number of projects that could cause reductions to the inflows to the Sea. In addition, a discussion of any other specific cumulative effects is included near the end of each resource section in chapter 4. Environmental documentation prepared for any of the projects considered in the cumulative analysis is expected to include any specific impacts that project would have on the Salton Sea.

Environmental Consequences

All alternatives would provide long-term beneficial effects to the aquatic and the avian habitat at the Sea. Other benefits could include socioeconomic recovery of the area. Some potentially significant adverse impacts also have been identified. Probably the greatest of these effects would be the visual impacts and loss of desert habitat associated with the EES facilities that are part of alternatives 2, 3, 4, and 5. In addition, for the evaporation ponds that are part of alternatives 1, 4, and 5, concerns include release of brine material in the event of a dike failure, possible effects on birds that try to feed on fish in the highly saline ponds, Native American resource impacts, and the ultimate fate of salts that accumulate in the ponds. The most substantive environmental effects expected to be associated with each alternative are as follows:

No Action

- The existing fishery will deteriorate and disappear
- Bird species would be threatened by loss of fisheries
- A significant drop in Sea elevation and decrease in surface area could occur if inflows to the Sea decrease in the future
- Local economic conditions and recreational opportunities would continue to decline

Alternative 1

- Long-term benefits compared to No Action for fisheries and bird species
- Beneficial effects to recreation and the local economy from restoration activities

- Fugitive dust problems could occur during construction
- Temporary disturbance of fisheries would occur during construction
- Visual changes due to alterations in the landscape in the vicinity of ponds and dike structures
- Potential traffic impacts (delays) between material borrow site and the Sea during construction activities
- Possible disturbance of cultural and Native American resources
- Additional effects associated with export options could occur during Phase 2

Alternative 2 & 3

- Long-term benefits compared to No Action for fisheries and bird species
- Beneficial effects to recreation and the local economy from restoration activities
- Fugitive dust problems could occur during construction
- Possible disturbance of cultural and Native American resources
- Loss of desert habitat and possible salt drift effects at and near EES site and associated potentially significant impacts to special status species
- Visual changes due to alterations in the landscape in the vicinity of ponds, dike structures, and the EES towers
- Potential adverse impacts to migrating birds due to tower configuration and height

Alternative 4

- Long-term benefits compared to No Action for fisheries and bird species
- Beneficial effects to recreation and the local economy from restoration activities
- Fugitive dust problems could occur during construction
- Potential traffic impacts (delays) between material borrow site and the Sea during construction activities
- Loss of desert habitat and possible salt drift effects at and near EES site
- Possible disturbance of cultural and Native American resources
- Visual changes due to alterations in the landscape in the vicinity of ponds, dike structures, and the EES towers
- Potential adverse impacts to migrating birds due to tower configuration and height

Alternative 5

- Long-term benefits compared to No Action for fisheries and bird species

- Beneficial effects to recreation and the local economy from restoration activities
- Fugitive dust problems could occur during construction
- Temporary disturbance of fisheries would occur during construction
- Potential noise impacts from ground-based EES
- Potential traffic impacts (delays) between material borrow site and the Sea during construction activities
- Possible disturbance of cultural and Native American resources
- Visual changes due to alterations in the landscape in the vicinity of ponds, dike structures, and the ground-based EES spray system
- Additional effects associated with export options could occur during Phase 2