



**P O S E I D O N   R E S O U R C E S**

**CARLSBAD DESALINATION PROJECT**

**COASTAL HABITAT RESTORATION  
AND ENHANCEMENT PLAN**

**November 2007**



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### **COASTAL HABITAT RESTORATION AND ENHANCEMENT PLAN**

#### **1.1 BACKGROUND**

The Carlsbad desalination project (CDP) is proposed to be located adjacent to the Encina Power Station (EPS) and, when constructed, will use the power plant cooling water system as source water for production of 50 million gallons per day (MGD) of fresh drinking water. When both the EPS and the CDP are operating, the EPS would provide an adequate volume of seawater for the operation of the CDP. Under this mode of operation, the incremental impingement and entrainment effects and discharge impacts of the CDP would be insignificant.

When the EPS operations are discontinued or the EPS intake flow is lower than the minimum flow of 304 MGD needed for operation of the CDP, the CDP's use of the EPS's existing intake may result in potential incremental impingement and entrainment of marine organisms. The purpose of this Coastal Habitat Restoration and Enhancement Plan (Restoration Plan) is to outline key steps and potential alternatives for mitigation of the unavoidable impingement and entrainment effects of the CDP operations.

#### **1.2 BASIS FOR PROPOSED RESTORATION MEASURES**

The proposed Restoration Plan is based on a model (Empirical Transport Model) that estimated the portion of the larvae of each target fish species at risk of entrainment with the intake source water. Multiplying the average percent of populations at risk by the physical area from which the fish larvae might be entrained, yields an estimate of the amount of habitat that must be restored to replace the lost fish larvae. This estimate is referred to as the area (acreage) of habitat production foregone (APF).

The entrainment effect of the stand-alone operation of the desalination plant extends over 12.2 percent of the total area that could be potentially impacted by the intake operations. Specifically, 12.2 percent of the area of Agua Hedionda Lagoon's habitat that supports the entrained species is 36.8 acres. Thus, the restoration area needed to fully mitigate the CDP entrainment losses is 36.8 acres. The restoration requirement is estimated under worst-case conditions when the power plant is not operating and the existing pumps are operated solely to deliver 304 MGD of seawater for the operation of the desalination plant.

Consistent with similar mitigation plans approved by the California Energy Commission, Poseidon is proposing to develop a comprehensive habitat restoration plan that includes 40.71 acres replacement marine wetlands habitat for the APF in Agua Hedionda Lagoon of 36.8 acres (mitigation ratio of 1.1:1.0). It is generally accepted that this approach results in an overestimate



of the number acres that would be necessary to fully mitigate the CDP entrainment and impingement effects, resulting in a net enhancement of the coastal habitat. The proposed Restoration Plan provides significant environmental benefits beyond fully mitigating the CDP's potential intake impacts because the APF calculation does not take into account the enormous ecological value of the restored acreage that will accrue to valuable wetland species completely unaffected by CDP operations, such as the numerous riparian birds, reptiles and mammals that will utilize the wetland for foraging, cover and nesting. Nor does the calculation consider the myriad of phytoplankton, zooplankton and invertebrate species that are largely unaffected by CDP intake operations and benefit directly from the lagoon's expanded carrying capacity.

The Restoration Plan includes the restoration and enhancement of at least 36.8 acres of coastal wetlands and/or other activities which will benefit the coastal environment in San Diego County and will be consistent with applicable policies of State, regional and local regulatory agencies. Poseidon has agreed to provide restoration with the project and has agreed to make this restoration enforceable as a condition of approval of the CDP. The proposed Restoration Plan will be enforceable through conditions of approval of the project and the program's success will be monitored through performance standards, monitoring and reporting.

### 1.3 KEY OBJECTIVE AND GOALS

The main objective of the Restoration Plan is to implement one or more activities which preserve, restore and enhance existing wetlands, lagoons or other high-productivity near-shore coastal areas located in the vicinity of Agua Hedionda Lagoon and/or elsewhere in San Diego County. The main RESTORATION PLAN goals are:

- Creation or Restoration of Coastal Habitat. The primary objective of the Restoration Plan is to create or restore coastal habitat similar to that of Agua Hedionda Lagoon, which will provide measurable long term environmental benefits adequate to mitigate potential impingement and entrainment impacts associated with CDP operations.
- Development of a Technically Feasible Project. The coastal enhancement activities will rely on well-established methods, techniques and technologies for development and nurturing of coastal habitat of high productivity and long-term sustainability.
- Stakeholder Acceptance for the Selected Project. Implementation of project(s) with a well-defined scope and high priority for the host community and environmental agencies and organizations in charge of coastal habitat preservation, restoration development.
- Ability to Measure Performance. The Restoration Plan will target coastal restoration and enhancement activities with clearly defined methodology to measure performance and success which can be completed within one year from the startup of the operation of the CDP.



### **1.3 IDENTIFICATION OF PREFERRED PROJECT**

In order to identify suitable coastal habitat enhancement alternatives, on August 31, 2007, Poseidon issued a request for expression of interest (REI) for Development and Implementation of Coastal Habitat Enhancement Project associated with the Carlsbad Desalination Plant. Poseidon received eight Statements of Interest for coastal restoration and enhancement projects in response to the REI.<sup>1</sup> One proposal was received that meets or exceeds the Restoration Plan objectives, the San Dieguito Wetland Restoration Plan.

Subject to the Regional Board and Coastal Commission's approval, Poseidon intends to move forward with the restoration proposal submitted by the San Dieguito Joint Powers Authority (JPA). The JPA proposal is one part of a larger restoration project that has already been approved by the Coastal Commission, on October 12, 2005, CDP # 6-04-88 (Attachment 1). Additionally the San Dieguito Wetland Restoration Plan was the subject of a Final Environmental Impact Report that was prepared and certified by the San Dieguito River Park Joint Powers Authority and U.S. Fish and Wildlife Service. As such, the Plan includes more than a sufficient level of certainty to determine that the proposal will conform to the Restoration Plan goals and objectives.

### **1.4 SAN DIEGUITO WETLAND RESTORATION PROJECT**

Pursuant to the requirements of the Coastal Commission (CDP # 6-04-88), Southern California Edison (SCE) is creating 115 acres of tidal wetlands at San Dieguito and will keep the river mouth open in perpetuity. The San Dieguito Wetlands Restoration Project includes a new deep water lagoon on the west side of I-5, extensive finger channels on the east side of I-5 north of the river, California least tern nesting sites and berms along the river to keep the water in the riverine channel flowing to the sea without dropping sediment or flooding the newly created wetlands under normal conditions. The proponent for this project is San Dieguito River Park Joint Powers Authority (local government agency in partnership with the San Dieguito River Valley Conservancy (501 (c) (3) organization). The JPA is the agency responsible for creating a natural open space park in the San Dieguito River Valley, which will one day extend from the ocean at Del Mar to Volcan Mountain, just north of Julian.

The San Dieguito Lagoon is located approximately 12.5 miles south of Agua Hedionda Lagoon, and was historically one of the largest lagoons in San Diego County. All property within the proposed restoration project is in public ownership. The JPA is responsible for implementing the San Dieguito River Park Master Plan. Features of the Park Master Plan include trails and interpretive programs, enhancement of the lagoon ecosystem through creation of associated native grassland and coastal sage scrub habitat, expansion of tidal wetlands beyond the SCE project limits, and creation of a series of water quality treatment ponds. The JPA is responsible for maintaining the project area and precluding any uses not consistent with the conservation of wetland habitat.

#### **1.4.1 Proposed Wetlands Restoration Project**

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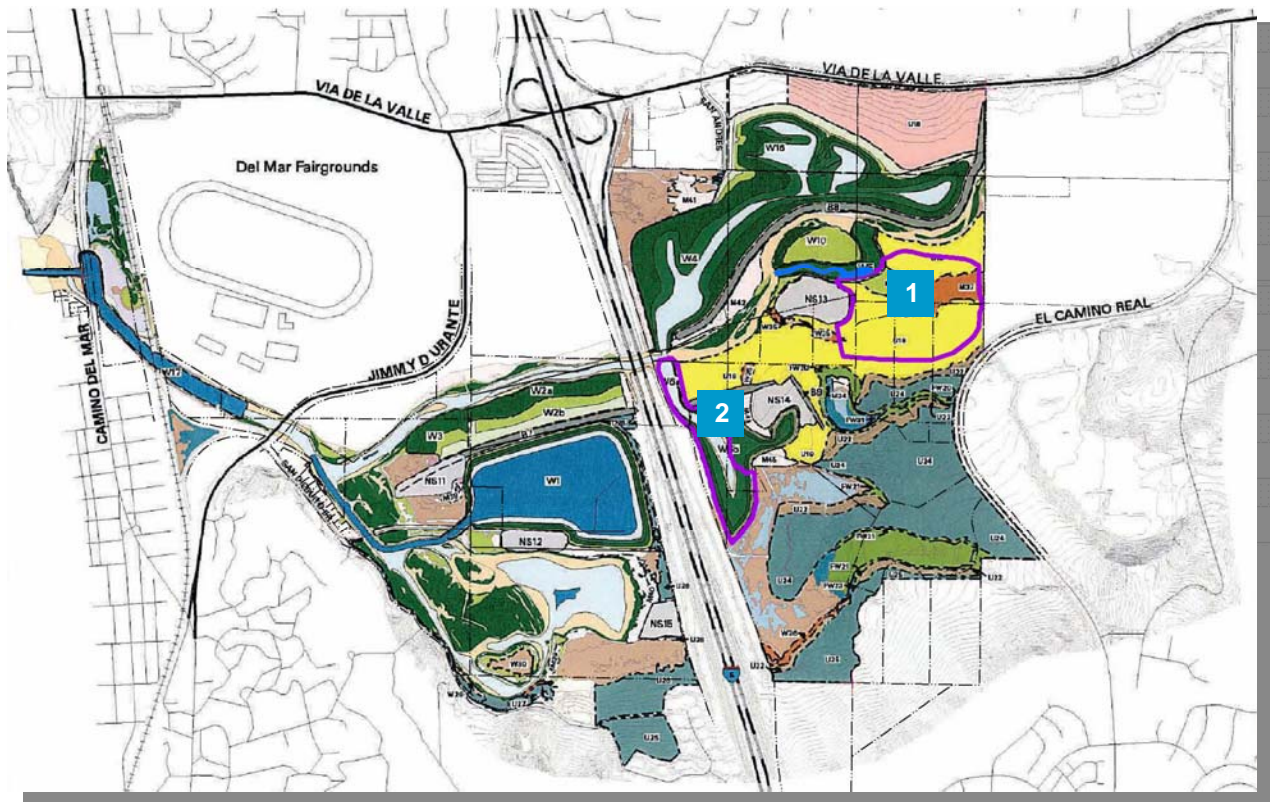
<sup>1</sup> A copy of the Statements of Interest was sent to the State Lands Commission staff under a separate cover.



Poseidon’s proposed restoration would expand the number of acres of functional wetlands and associated habitat in the San Dieguito Lagoon area, by supplementing the 115-acre SCE Wetlands Restoration Project. The proposed restoration projects will create 40.71 acres of marine wetlands and seasonal marsh habitat from what is now entirely disturbed land. The current state of the land chosen for this project, results from decades of fill, grading and/or agricultural use, rendering it unsuitable for supporting native species that rely on freshwater/intertidal marsh or upland habitat.

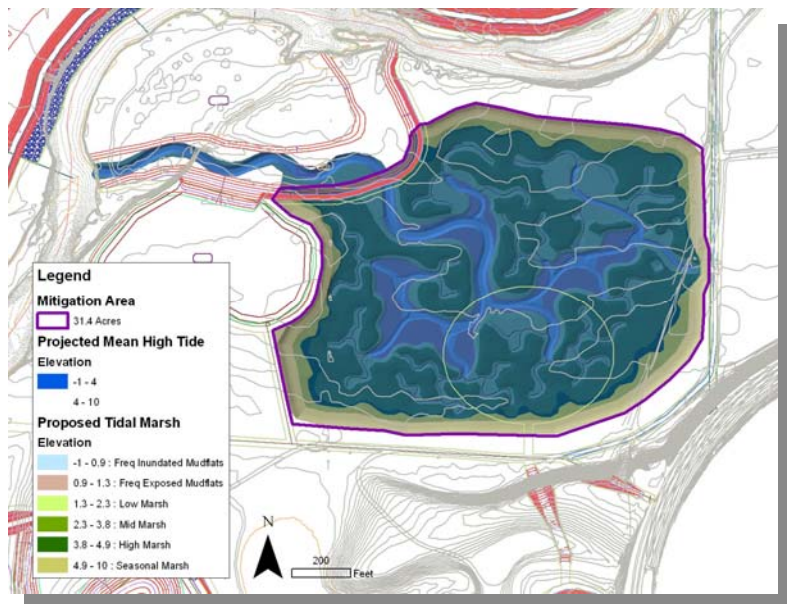
Poseidon’s proposed restoration program would provide an additional 40.71 acres of coastal wetland habitat in San Dieguito Lagoon above and beyond what is included in the ongoing SCE Project. The majority of the coastal habitat (37.65 acres) will be marine wetlands located at or below the elevation of the mean high tide for this area. As shown in figures 1-3, the key elements of the project are excavation and grading to create wetland habitat, including subtidal, intertidal, transitional, and seasonal salt marsh habitats east of I-5.

**Figure 1 – San Dieguito Wetlands Restoration Project**

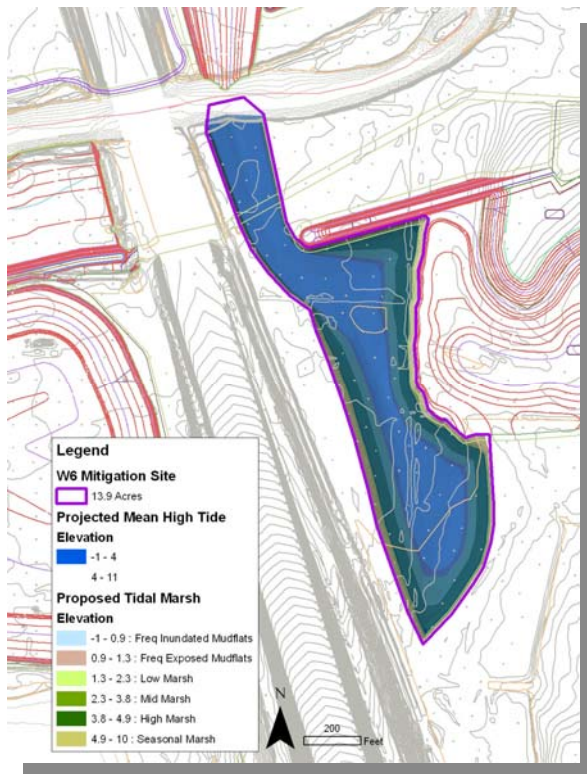




**Figure 2 – Restoration Parcel One - 28.29 acres**



**Figure 3 – Restoration Parcel Two - 12.42 acres**



The central feature of the proposed restoration project is the conversion of disturbed land to more valuable tidal saltmarsh or open water. All of the acreage that will be converted to tidal habitats is currently disturbed upland that supports weedy, generally non-native (ruderal) vegetation. After restoration to tidal saltmarsh, these habitats will be subject to tidal action throughout the year, which will enable saltmarsh plants to be healthier with higher productivity. These goals will be accomplished by grading the site to substantially create an area that is subject to regular tidal inundation.

The proposed San Dieguito Coastal Habitat Restoration Project:

- Will generate 40.71 acres of coastal wetlands habitat comparable to that found in and around Agua Hedionda Lagoon;
- Is consistent with the requirements of, and is supported by, a broad array of local, state and federal agencies, including the California Coastal Commission, Regional Water Quality Control Board, National Marine Fisheries Service, US Fish & Wildlife Service and the California Dept. of Fish & Game;
- Is located in San Diego County, on the coast, approximately 12 miles south of the Agua Hedionda Lagoon;
- Will provide sustainable, comprehensive environmental benefits for water quality, habitat diversity for species abundance and for sensitive and endangered species; and
- Leverages a specific grant of \$550,000 from the State Water Resources Control Board; however, in reality it leverages a great deal more due to the association with the restoration of the tidal wetlands



in the San Dieguito Lagoon; the previous work by public agencies in purchasing land in the lagoon; public support and involvement in creation and approval of the Park Master Plan and the Environmental documents for the San Dieguito Coastal Area restoration.

The habitat restoration will not only compensate for the unavoidable entrainment and impingement impacts, but also enhance the coastal environment. The proposed Restoration Plan will generate benthic habitat, salt marsh and uplands habitat, thereby extending the benefits from the proposed mitigation measure far beyond the area of actual impact of the desalination plant operations.

The Coastal Commission found this location to be acceptable for mitigation of the entrainment and impingement impacts of the San Onofre Nuclear Generating Station which is 45 miles away from San Dieguito Lagoon and is impacting open water fish species that don't necessarily reside in a lagoon environment. The proposed desalination facility is much closer to the proposed mitigation site (12 miles) and Poseidon is proposing to replace tidally exchanged coastal lagoon habitat with like habitat.

#### **1.4.2 Quality Assurance**

Pursuant to the terms of the Coastal Development Permit approved for the Carlsbad Desalination Project, Poseidon will submit to and obtain from the Coastal Commission approval of a plan that includes the following:

- Goals, objectives, performance criteria and maintenance and monitoring to ensure the success of the proposed Restoration Plan.
- Identification of specific creation, restoration, or enhancement measures that will be used at each site, including grading and planting plans, the timing of the mitigation measures, monitoring that will be implemented to establish baseline conditions and to determine whether the sites are meeting performance criteria.
- Identification of contingency measures that will be implemented should any of the mitigation sites not meet performance criteria.
- As-built plans for each site and annual monitoring reports for no less than five years or until the sites meet performance criteria.
- Legal mechanism(s) proposed to ensure permanent protection of each site – e.g., conservation easements, deed restriction, or other methods.

Additionally, the Restoration Plan is an element of Poseidon's Flow, Entrainment and Impingement Minimization Plan that is subject to the review and approval of the San Diego Regional Water Quality Control Board. Poseidon submitted the initial draft Flow, Entrainment and Impingement Minimization Plan (Plan) to the Regional Board in February 2007. The Regional Board circulated the draft Plan for public comment. Poseidon revised the Plan in response to comments received from the Regional Board and members of the public and resubmitted it to the Regional Board June 2007. The Regional Board is currently taking comments on the revised Plan and will hold a public hearing on the Plan prior to approval.



### **1.4.3 Schedule**

CEQA documentation and permitting for the proposed project was completed as part of the broader SCE restoration project. However, the Coastal Commission has indicated that a separate Coastal Development Permit will be needed for the Restoration Plan. The JPA plans to amend the contract of the contractor that is currently constructing the SCE restoration project to include Poseidon's restoration project. The construction of the restoration project would be timed so that the restoration sites would reach full capacity to produce sustainable environmental benefits within one year of the commencement of commercial operation of the desalination facility.

### **1.4.4 Sustainability**

The intent of the proposed restoration project is to develop a fully functioning, sustainable natural lagoon ecosystem. Because the health of the lagoon ecosystem is largely a function of the lagoon mouth and whether the lagoon inlet stays open to the sea, SCE was required by the Coastal Commission to maintain the lagoon inlet in an open condition in perpetuity. SCE has funded an endowment with the JPA to ensure the lagoon mouth will remain open and manage the lagoon ecosystem in perpetuity.

### **1.4.5 Restoration Project Cost**

The proposed San Dieguito Lagoon Restoration Project is estimated to cost \$3 to \$4 million and restore 40.71 acres, which exceeds Poseidon's commitment to restore and enhance 36.8 acres of coastal habitat, and will serve to more than fully mitigate any impacts of the CDP.