

CALIFORNIA COASTAL COMMISSION

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CONDITION COMPLIANCE

September 22, 2010

To: To Commissioners and Interested Parties

From: Peter Douglas, Executive Director
Alison Dettmer, Deputy Director, Energy, Ocean Resources, and Federal Consistency Division
Kate Huckelbridge, Energy, Ocean Resources, and Federal Consistency Division

Regarding: **Condition Compliance for CDP No. E-06-013, Special Condition 8 – Poseidon Resources (Channelside), LLC; Submittal of a Proposed Mitigation Site and Preliminary Restoration Plan as required by the approved Marine Life Mitigation Plan**

SUMMARY

On November 15, 2007, the Coastal Commission approved CDP No. E-06-013 for Poseidon's proposal to construct and operate a desalination facility in Carlsbad, San Diego County. Special Condition 8 of that permit required Poseidon to submit a Marine Life Mitigation Plan (MLMP) addressing the impacts that will be caused by the facility's use of estuarine water and entrainment of marine organisms. The MLMP, developed jointly by Commission staff and Poseidon, was approved by the Commission on August 8, 2008. The MLMP requires Poseidon to first submit a proposed site and a preliminary restoration plan to the Commission for approval. Within 18 months of Commission approval of a preliminary site and plan, Poseidon is to conduct the necessary CEQA review, obtain necessary approvals, and submit a CDP application to the Commission for final mitigation site design. This report details staff's analysis of Poseidon's site selection process and preliminary restoration plan for its proposed site.

Poseidon proposes to build its wetland mitigation project at the Otay River Floodplain in the San Diego Bay National Wildlife Refuge (see Exhibits 1 and 2). Poseidon chose this site based on the results of a site comparison study that examined the advantages and disadvantages of 12 different sites in the Southern California Bight. According to the study, the Otay River Floodplain site held the greatest promise for a successful mitigation project, largely because it provides adequate acreage and has an existing conceptual restoration plan developed through a programmatic EIR completed by the USFWS in August 2006. Staff and members of a Scientific

Advisory Panel (SAP) reviewed Poseidon’s site comparison analysis and concurred that of all the sites analyzed, the Otay River Floodplain site has the greatest likelihood of meeting the requirements and objectives of the MLMP. Staff and the SAP also identified several potential site constraints that could affect Poseidon’s ability to meet those requirements and objectives. It appears that most of these constraints are likely to be resolved to allow for successful wetland restoration; however, the proposed site will only meet the requirements and objectives of the MLMP if the intakes and outfalls at the nearby South Bay Power Plant cease to operate. Poseidon has developed a preliminary restoration plan that includes three potential wetland designs. Commission staff and the SAP have reviewed the preliminary restoration plan and recommend that the Commission approve Poseidon’s proposed preliminary restoration plan and this mitigation site, contingent upon the termination of use of the intakes and outfalls at the South Bay Power Plant.

[Click on the link below to go to the exhibits.](#)

Exhibit 1 – (a) Location of South San Diego Bay National Wildlife Refuge
(b) Map of South San Diego Bay National Wildlife Refuge

Exhibit 2 – Poseidon’s Proposed Mitigation Site

Exhibit 3 – Poseidon’s Preliminary Restoration Plan

Exhibit 4 – Poseidon’s Approved Marine Life Mitigation Plan

Exhibit 5 – Poseidon’s Site Comparison Study: “Comparison of Selected Southern California Tidal Wetlands as Potential Sites for Mitigation of Impacts Associated with Poseidon Resources Proposed Carlsbad Desalination Plant”

Exhibit 6 – Poseidon’s Hydrology Report: “Tidal Hydraulics of Wetlands Restoration Alternatives in the Otay River Floodplain, Carlsbad Desalination Project Marine Life Mitigation Plan”

Exhibit 7 – September 21, 2010 Letter from California Coastal Conservancy

Exhibit 8 – September 21, 2010 Letter from San Diego Regional Water Quality Control Board staff

1.0 MOTION & RESOLUTION

Motion:

“I move that the Commission approve the Proposed Mitigation Site, contingent upon the cessation of use of the intakes and outfalls at the South Bay Power Plant, and Preliminary Restoration Plan attached to the staff recommendation as Exhibits 2 and 3, as required by the Marine Life Mitigation Plan, approved by the Commission pursuant to Special Condition 8 of CDP E-06-013.”

Resolution to Approve:

The Commission hereby approves the Proposed Mitigation Site, contingent upon the cessation of use of the intakes and outfalls at the South Bay Power Plant, and Preliminary Restoration Plan submitted by the permittee, Poseidon Resources (Channelside) LLC, in compliance with the Marine Life Mitigation Plan, approved on August 6, 2008 in accordance with Special Condition 8 of CDP E-06-013.

Staff Recommendation:

Staff recommends a “**YES**” vote, which will result in the **approval** of the proposed mitigation site, contingent upon the cessation of use of the intakes and outfalls at the South Bay Power Plant, and preliminary restoration plan as required by the Marine Life Mitigation Plan in accordance with Special Condition 8 and adoption of the motion, resolution, and findings herein. The motion passes only by an affirmative vote of a majority of the Commissioners present. Staff’s recommendation is detailed in Section 4.0 of this memorandum.

2.0 STANDARD OF REVIEW

The Coastal Commission must determine whether the proposed site and preliminary restoration plan conforms to applicable requirements of the Marine Life Mitigation Plan (MLMP), included as Exhibit 4, approved on August 8, 2008 in accordance with Special Condition 8 of CDP E-06-013 (see Section 3.0 for additional details about the development of the MLMP). The MLMP requires Poseidon to submit a proposed site(s) and preliminary wetland restoration plan to the Commission within 10 months of permit issuance, which occurred on November 3, 2009.¹ The Commission must then determine if the proposed site and preliminary restoration plan provide suitable opportunities to meet applicable requirements of the MLMP.

The MLMP includes standards and requirements to ensure adequate mitigation for marine life impacts at the Carlsbad desalination facility. The Plan allows a phased approach to the mitigation project. During Phase I, Poseidon is required to provide at least 42.5 acres of estuarine wetland restoration at one or no more than two sites. After Commission approval of the proposed site(s) and preliminary restoration plan, Poseidon must submit a complete coastal development permit (CDP) application for the Phase I mitigation within two years of the date of issuance of the desalination facility permit (the Poseidon Carlsbad desalination facility CDP was issued on November 3, 2009). This CDP application is to provide a final proposed restoration

¹ The MLMP allows the Executive Director to extend deadlines upon request of the applicant and for good cause. On July 21, 2010, the Executive Director provided a one-month extension to allow Poseidon to address site-related issues described in Section 4.0 of this report. The new deadline for Poseidon’s submittal of its proposed site(s) and preliminary restoration plan is October 3, 2010. Staff received Poseidon’s complete submittal prior to this deadline, on September 13, 2010.

plan for Commission review and approval. In Phase II, Poseidon is required to provide an additional 23.9 acres.² The Phase II CDP application is due five years from the date of issuance of the desalination facility permit. Poseidon may choose to combine Phases I and II into one project.³ With the current proposal at the Otay River Floodplain site, Poseidon is proposing to provide all 66.4 acres of required mitigation acreage during Phase I.

The key sections of the MLMP guiding the Commission’s review of Poseidon’s site selection and preliminary restoration plan are its Section 3.0 Plan Requirements. Section 2.0 of the MLMP, entitled “Site Selection” states that the “...basis for selection shall be an evaluation of the site(s) against the minimum standards and objectives set forth in subsections 3.1 and 3.2 below.” These sections, and section 3.3, entitled “Restrictions”, are included below for reference:

3.0 PLAN REQUIREMENTS

In consultation with Commission staff, the permittee shall develop a wetland restoration plan for the wetland site(s) identified through the site selection process. The wetland restoration plan shall meet the minimum standards and incorporate as many as feasible of the objectives in subsections 3.1 and 3.2, respectively.

3.1 Minimum Standards

The wetland restoration project site(s) and preliminary plan(s) must meet the following minimum standards:

- a. Location within Southern California Bight;*
- b. Potential for restoration as tidal wetland, with extensive intertidal and subtidal areas;*
- c. Creates or substantially restores a minimum of 37 acres and up to at least 55.4 acres of habitat similar to the affected habitats in Agua Hedionda Lagoon, excluding buffer zone and upland transition area;*
- d. Provides a buffer zone of a size adequate to ensure protection of wetland values, and at least 100 feet wide, as measured from the upland edge of the transition area.*

² The MLMP alternatively allows Poseidon to propose alternative mitigation in lieu of up to 18.4 of the Phase II restoration acreage.

³ In September 2009, based on re-evaluation of the project’s likely impingement impacts, Poseidon voluntarily agreed to add 11 acres to the amount required in the MLMP, with at least 5.5 acres to be included in Phase I and the balance to be included in Phase II, bringing the total acreage requirements to 66.4 acres.

- e. *Any existing site contamination problems would be controlled or remediated and would not hinder restoration;*
- f. *Site preservation is guaranteed in perpetuity (through appropriate public agency or nonprofit ownership, or other means approved by the Executive Director), to protect against future degradation or incompatible land use;*
- g. *Feasible methods are available to protect the long-term wetland values on the site(s), in perpetuity;*
- h. *Does not result in a net loss of existing wetlands; and*
- i. *Does not result in an adverse impact on endangered animal species or an adverse unmitigated impact on endangered plant species.*

3.2 Objectives

The following objectives represent the factors that will contribute to the overall value of the wetland. The selected site(s) shall be determined to achieve these objectives. These objectives shall also guide preparation of the restoration plan.

- a. *Provides maximum overall ecosystem benefits, e.g. maximum upland buffer, enhancement of downstream fish values, provides regionally scarce habitat, potential for local ecosystem diversity;*
- b. *Provides substantial fish habitat compatible with other wetland values at the site(s);*
- c. *Provides a buffer zone of an average of at least 300 feet wide, and not less than 100 feet wide, as measured from the upland edge of the transition area.*
- d. *Provides maximum upland transition areas (in addition to buffer zones);*
- e. *Restoration involves minimum adverse impacts on existing functioning wetlands and other sensitive habitats;*
- f. *Site selection and restoration plan reflect a consideration of site specific and regional wetland restoration goals;*
- g. *Restoration design is that most likely to produce and support wetland-dependent resources;*
- h. *Provides rare or endangered species habitat;*

- i. *Provides for restoration of reproductively isolated populations of native California species;*
- j. *Results in an increase in the aggregate acreage of wetland in the Southern California Bight;*
- k. *Requires minimum maintenance;*
- l. *Restoration project can be accomplished in a reasonably timely fashion; and,*
- m. *Site(s) in proximity to the Carlsbad desalination facility.*

3.3 Restrictions

- a. *The permittee may propose a wetland restoration project larger than the minimum necessary size specified in subsection 3.1(c) above, if biologically appropriate for the site(s), but the additional acreage must (1) be clearly identified, and (2) must not be the portion of the project best satisfying the standards and objectives listed above.*
- b. *If the permittee jointly enters into a restoration project with another party: (1) the permittee's portion of the project must be clearly specified, (2) any other party involved cannot gain mitigation credit for the permittee's portion of the project, and (3) the permittee may not receive mitigation credit for the other party's portion of the project.*

The permittee may propose to divide the mitigation requirement between a maximum of two wetland restoration sites, unless there is a compelling argument, approved by the Executive Director, that the standards and objectives of subsections 3.1 and 3.2 will be better met at more than two sites.

Another key aspect of the MLMP is the performance standards detailed in section 5.4. While not required as part of site selection, these performance standards will be used to determine mitigation success at the selected site(s). This section includes both long-term physical and biological standards that Poseidon's wetland restoration project must meet:

- a. **Long-term Physical Standards.** *The following long-term standards shall be maintained over the full operative life of the desalination facility:*
 - 1. **Topography.** *The wetland(s) shall not undergo major topographic degradation (such as excessive erosion or sedimentation);*
 - 2. **Water Quality.** *Water quality variables [to be specified] shall be similar to reference wetlands;*
 - 3. **Tidal prism.** *If the mitigation site(s) require dredging, the tidal prism shall be maintained and tidal flushing shall not be interrupted; and,*
 - 4. **Habitat Areas.** *The area of different habitats shall not vary by more than 10% from the areas indicated in the restoration plan(s).*

*b. **Biological Performance Standards.** The following biological performance standards shall be used to determine whether the restoration project is successful. Table 1, below, indicates suggested sampling locations for each of the following biological attributes; actual locations will be specified in the work program:*

- 1. **Biological Communities.** Within 4 years of construction, the total densities and number of species of fish, macroinvertebrates and birds (see Table 1 in Exhibit 4) shall be similar to the densities and number of species in similar habitats in the reference wetlands;*
- 2. **Vegetation.** The proportion of total vegetation cover and open space in the marsh shall be similar to those proportions found in the reference sites. The percent cover of algae shall be similar to the percent cover found in the reference sites;*
- 3. **Spartina Canopy Architecture.** The restored wetland shall have a canopy architecture that is similar in distribution to the reference sites, with an equivalent proportion of stems over 3 feet tall;*
- 4. **Reproductive Success.** Certain plant species, as specified by in the work program, shall have demonstrated reproduction (i.e. seed set) at least once in three years;*
- 5. **Food Chain Support.** The food chain support provided to birds shall be similar to that provided by the reference sites, as determined by feeding activity of the birds; and,*
- 6. **Exotics.** The important functions of the wetland shall not be impaired by exotic species.*

In addition to the Commission-approved MLMP, the Regional Water Quality Control Board (RWQCB) imposed its own mitigation requirements. The RWQCB adopted the Commission-approved MLMP as a requirement of Poseidon's NPDES permit and, based on its review of the expected fish losses due to impingement rates at the Carlsbad facility, additionally required Poseidon to ensure its mitigation would provide fish productivity at a rate of at least 1,715.5 kg/year to compensate for the desalination facility's projected impingement losses. The RWQCB included this requirement as a "Biological Performance Standard" in section 5.4b of the MLMP.⁴

3.0 PLAN DEVELOPMENT AND REVIEW

On November 15, 2007, the Commission approved CDP No. E-06-013 for Poseidon's proposal to construct and operate a desalination facility in Carlsbad, San Diego County. As part of that approval, the Commission required Poseidon, through Special Condition 8, to submit for additional Commission review and approval a Marine Life Mitigation Plan (MLMP) addressing the impacts that will be caused by the facility's use of estuarine water and entrainment of marine

⁴ The MLMP, along with the additional fish productivity standard, was adopted by the RWQCB on May 13, 2009 as part of Order No. R9-2009-0038. The fish productivity rate of 1,715.5 kg/year is based on an impingement estimate of 4.7 kg/day at the Carlsbad desalination facility. To demonstrate that the mitigation wetlands meet this requirement, the Regional Board required Poseidon to develop a Productivity Monitoring Plan, subject to review by the SAP, which incorporates the productivity measurement methodologies presented in Allen, "Seasonal Abundance, Composition, and Productivity..." Fishery Bulletin, Vol. 80, NO.4 1982, pages 769-790. Fish productivity monitoring will be conducted once per month for a 13 month period, beginning four years after the completion of construction of the wetlands.

organisms (see Exhibit 4). The MLMP, developed jointly by staff and Poseidon, was approved by the Commission on August 8, 2008.

Since the Commission's approval of the MLMP in August 2008, staff has worked with Poseidon to develop a proposed site and preliminary restoration plan that would meet MLMP requirements. To assist in the review of the more technical aspects of this project, staff enlisted the help of a Scientific Advisory Panel (SAP), a group of independent scientists who have previously provided scientific guidance to the Commission on the San Dieguito Restoration Project implemented by Southern California Edison as mitigation for the San Onofre Nuclear Generating Station. Currently, the SAP representatives reviewing Poseidon's proposed site and plan are Dr. Richard Ambrose, Professor and Director of Environmental Science & Engineering Program, Department of Environmental Health Sciences, University of California Los Angeles, Dr. Pete Raimondi, Professor and Chair of Ecology and Evolutionary Biology, University of California, Santa Cruz and Dr. Brett Sanders, Professor of Civil and Environmental Engineering, University of California, Irvine. Dr. Jonna Engel, Commission staff biologist, also provided her review and expertise.

In January 2010, Poseidon completed a study comparing 12 potential restoration sites within the Southern California Bight (see Exhibit 5). The study evaluated each site based on the objectives, criteria and timeline established by the Commission in the MLMP. One site, the Otay River floodplain in the South San Diego Bay National Wildlife Reserve, is identified as having the greatest likelihood of meeting the objectives set forth in the MLMP (see section 4.0 for more discussion). At a meeting on April 20, 2010 attended by representatives of the Commission staff, the SAP, Poseidon, United States Fish and Wildlife Service (USFWS) and the Regional Water Quality Control Board (RWQCB), Poseidon presented its initial analysis of the Otay River floodplain site. Staff and the SAP reviewed this analysis and initiated a dialogue with Poseidon and its consultants with the purpose of determining if the Otay River floodplain site could support a wetland restoration project that would meet the requirements outlined in the MLMP.

In general, staff and the SAP concurred with Poseidon's initial analysis (see Appendix A of Exhibit 5) that the Otay River floodplain was a suitable mitigation site because it was consistent with the requirements, objectives and restrictions outlined in the MLMP. Staff and SAP's review is discussed in more detail in Sections 4.1 and 4.2. Based on Poseidon's analysis and the ensuing review and discussion, the attendees of the April 20th meeting collectively decided that Poseidon should move forward to develop a preliminary restoration plan for the Otay River floodplain site. However, this decision was based on the need for Poseidon to resolve several potential site constraints – such as land ownership, buffer adequacy, and others, which are discussed further in Section 4.3.

On June 21, 2010, Poseidon presented further analysis of the site constraints mentioned above as well as a proposed preliminary restoration plan for review by Commission staff and the SAP (see Exhibit 3). Poseidon's current proposed plan, including the rationale for selecting the Otay River floodplain as the preferred site, and the results of reviews by staff and the SAP are described in Section 4.0 below.

4.0 ANALYSIS FOR CONFORMITY TO MLMP

4.1 Selection of Preferred Site

Poseidon's January 2010 "Comparison of Selected Southern California Tidal Wetlands as Potential Sites for Mitigation of Impacts Associated with Poseidon Resources Proposed Carlsbad Desalination Plant" (see Exhibit 5) compared twelve potential restoration sites against seven criteria:

- status of existing plans,
- status of environmental documentation,
- status of required permits,
- habitat distribution,
- potential impacts to existing habitats,
- land ownership, and
- ease of compliance with Coastal Commission objectives and criteria.

Based on an analysis of these criteria, each site was then assigned an overall rank of "low", "moderate" or "high". Poseidon gave ten of the twelve sites an overall ranking of "low," generally either because the sites required complex property acquisitions or because involved landowners and stakeholders had not yet agreed on preliminary restoration plans for the sites, thus diminishing the likelihood that Poseidon could complete the restoration within the required timeframe. Two sites were given a more favorable ranking: the Otay River floodplain in the San Diego Bay National Wildlife Refuge (NWR) and the Tijuana Estuary. The Tijuana Estuary has a well-developed restoration plan and has been identified as a reference site for other mitigation projects. However, sedimentation continues to be a problem at this site, which could affect the success of a restoration project. According to Poseidon's site comparison study, the Otay River Floodplain in the San Diego Bay NWR holds the greatest promise for a successful mitigation project. The site provides adequate acreage and has a conceptual restoration plan developed through a programmatic EIR completed by the USFWS in August 2006. Based on its January 2010 analysis, Poseidon chose the Otay River floodplain as its preferred mitigation site.

After reviewing Poseidon's comparison study, Commission staff and members of the SAP concurred with Poseidon's determination that the Otay River floodplain site provided a suitable site for a successful restoration project that would mitigate the impingement and entrainment impacts expected from operation of the Carlsbad desalination facility, as long as certain underlying assumptions are borne out. One reason why the site is appropriate for this restoration is that it is located in the Southern California Bight, fulfilling one of the requirements of the MLMP. In addition, choosing the Otay River floodplain site as the single restoration site is consistent with the MLMP restriction that Poseidon's mitigation requirement be divided between a maximum of two wetland restoration sites. Further, the site has sufficient acreage for converting non-wetland areas into tidal wetlands, including extensive intertidal and subtidal areas, which is consistent with the requirement that there is potential for restoration as tidal wetland and that the project does not result in a net loss of existing wetlands. Staff and the SAP, however, also identified several potential constraints that could limit or prevent the site from providing the necessary and successful restoration. The following two sections include an

overview of the site and the preliminary restoration plan, a description of the site constraints and how they are being addressed, and a discussion of how the Otay River Floodplain site and restoration plan conform to the goals and objectives laid out in the MLMP.

4.2 Description of the Otay River Floodplain Site

The Otay River Floodplain is part of the South San Diego Bay Unit of the San Diego NWR, managed by the USFWS (see Exhibits 1 and 2). The site is approximately 35 miles south of the Aqua Hedionda Lagoon where Poseidon's Carlsbad Desalination Plant is located. The South San Diego Bay Unit includes 2,300 acres of open bay, solar salt evaporation ponds and the Otay River floodplain subarea, consisting of approximately 140 acres of upland and wetland habitat. The site contains a relatively long channel flowing south and east from the southern tip of San Diego Bay and opening into the historic floodplain of the Otay River. To the north and west of the site is a system of large ponds that currently or historically were used for salt production. To the east of the site is Interstate 5 and to the south are both developed and undeveloped properties owned by the City of San Diego and the Port of San Diego. Historically, the Otay River floodplain subarea consisted of intertidal mudflats and salt marsh, but was filled in for agricultural use and salt production. The Lower Otay River is dammed approximately 11 miles upstream of the Otay River Floodplain site and drains a watershed consisting of a mix of residential, commercial, industrial and undeveloped land. For most of its length, the Otay River retains a natural channel with few flood control improvements.

In August of 2006, the USFWS released a Comprehensive Conservation Plan (CCP) and Environment Impact Statement (EIS) for the Sweetwater Marsh and South San Diego Bay Units of the San Diego Bay NWR. The CCP/EIS proposed two alternative restoration scenarios for the Otay River Floodplain. The second option, which is most similar to the restoration requirements in the MLMP, called for restoration of approximately 90 acres of intertidal salt marsh and mudflat, 35 acres of native uplands and 15 acres of freshwater marsh.

Poseidon's preliminary restoration plan includes three different wetland design concepts, presented in Exhibit 3. Each concept includes subtidal (i.e., permanently flooded) areas, mudflats, low marsh, mid marsh, upper marsh, an uplands transitional zone and a buffer zone on the eastern and southern portions of the site. The concepts differ in the specific acreage of each wetland zone and the manner in which these zones are laid out on the landscape. Generally, the intertidal areas are expected to provide mitigation for the desalination facility's expected entrainment impacts while the subtidal areas are largely meant to provide the level of fish productivity required by the RWQCB. Concept 1, also called the mixed habitat plan (Exhibit 3a), consists of 74.25 acres of marsh and is characterized by a fairly large subtidal basin at the center of the site, accounting for approximately 25% of the total area. Intertidal areas account for about 57% of the marsh acreage. Concept 2, also called the maximum subtidal plan (Exhibit 3b), includes more subtidal habitat and less intertidal habitat as compared to Concept 1. In Concept 2, the subtidal basin makes up about 44% of the total marsh area, while intertidal areas decrease by approximately 30% from Concept 1. Concept 3, also called the maximum intertidal plan (Exhibit 3c) takes the opposite approach from Concept 2, maximizing intertidal areas and minimizing subtidal areas. In this design, subtidal areas account for about 20% of the overall acreage, while intertidal areas account for about 61% (an increase of about 7% from Concept 1).

These conceptual wetland designs, although not fully developed, indicate that Poseidon has a high likelihood of meeting the requirements and objectives of the MLMP. The site contains enough area to meet the acreage requirements in the MLMP, including space for transition and buffer areas. With proper design and implementation, the acreage devoted to subtidal habitat is likely sufficient to meet the fish productivity requirements imposed by the RWQCB. In addition, the site as it currently exists has minimal habitat value, and thus it is not likely that this mitigation project will have adverse impacts on existing flora and fauna. Further, the site is part of the San Diego Bay National Wildlife Refuge and has been included in a broader planning and restoration effort.⁵ This is important in two ways. First, because a programmatic EIS has already been completed, the project specific environmental review process should be slightly faster, thus increasing the likelihood that Poseidon will be able to complete the project in the timeframe provided in the MLMP. Second, the site, once restored, will not be an isolated system, but will be contiguous to a larger complex of critical wetland and shallow water habitat and easily integrated into a larger management structure. In addition to the positive attributes of the Otay River Floodplain site mentioned above, staff and the SAP did identify several potential site constraints that required further exploration. The following section provides a detailed discussion of these constraints.

4.3 Site Constraints

The Commission staff and the SAP's initial review of the Otay River floodplain site identified several site constraints to be resolved before recommending Commission approval of the site. These issues, described in further detail below, include:

- land ownership and restrictions on the use of the site,
- ensuring adequate buffers,
- the status of the South Bay Power Plant,
- potential soil contamination at the site, and
- hydrologic suitability of the site for Poseidon's planned mitigation project.

4.3.1 Land Ownership/Restrictions on Use of Site

The MLMP requires that site preservation be guaranteed in perpetuity (through appropriate agency or nonprofit ownership, or other means approved by the Executive Director), to protect against future degradation or incompatible land use. Although the USFWS manages the entire site, it owns just part of the land. The western portion of the site was purchased by the State Lands Commission using Port district airport user fees and is leased to USFWS for their use as part of the San Diego Bay NWR. The land is owned by the State of California, and there are no known restrictions on using the property for wetland mitigation. The eastern portion of the site, also known as the "Egger-Ghio" property was purchased by the Southwest Wetlands Interpretive Association (SWIA) using funds from the California Coastal Conservancy (Conservancy) and

⁵ Although the Otay River Floodplain site was included in the Comprehensive Conservation Plan (CCP) and Environment Impact Statement (EIS) for the Sweetwater Marsh and South San Diego Bay Units of the San Diego Bay NWR, prior to Poseidon's involvement, no funding source had been identified for restoration of this area.

then conveyed to the USFWS in fee title. Prior to the land purchase and transfer to the USFWS, the Conservancy adopted the “Lower Otay River Wetlands Enhancement Plan” which calls for the acquisition, protection and restoration of wetland and riparian habitats on the Egger-Ghio property. The MOU governing the land deal between SWIA, the Conservancy and USFWS states that the Egger-Ghio property shall be restored and managed in “a manner consistent with” the Enhancement Plan. The CCP, released by the USFWS, incorporated the goals, objectives and conceptual plans outlined in the Enhancement Plan. In order for Poseidon to be able to use this site for mitigation, its final restoration plan must be consistent with the CCP, and therefore the terms of the MOU governing use of the property. In addition, in a letter to Chairperson Neely, dated September 21, 2010 (Exhibit 7), the Conservancy also raised the issue that the people of the State of California should be compensated by Poseidon for its use of public, rather than private, property for its mitigation project. Although this issue does not affect the site’s potential for providing successful wetland restoration, it is something that Poseidon will need to address as it continues to develop its plans for restoration at this site.

4.3.2 Buffers

Another potential site constraint was the feasibility of incorporating adequate buffers into the restoration design. The MLMP requires a buffer zone of at least 100 feet, but also includes an objective of an average 300-foot buffer as measured from the upland edge of the transition area. The initial conceptual design presented by Poseidon did not include buffers, and the Commission staff and SAP questioned whether restrictions on the availability of land surrounding the site would make it difficult to meet this standard while also meeting the minimum marsh acreage requirements. In response to this question, both Poseidon and the USFWS assured staff and the SAP that the restoration design could accommodate a minimum 100-foot buffer to ensure protection of wetland values and to satisfy the requirements of the MLMP. The conceptual designs submitted by Poseidon (Exhibit 3) appear to support this contention.

4.3.3 Status of the South Bay Power Plant

Operations of the intake and outfall at the South Bay Power Plant, located on the east side of San Diego Bay about 1.4 miles north of the proposed mitigation site, would negatively impact restoration at the Otay River floodplain site. Built in 1963 and operated by Dynergy Energy Incorporated, the South Bay Power Plant uses a “once-through cooling process,” which involves the intake of Bay water into the plant to cool the plant’s generators and the subsequent discharge of the heated water into the San Diego Bay. This is harmful to marine life at both ends of the process. Many fish, larvae, and eggs are killed when they are drawn into the screens at the power plant intakes. In addition, the heated water discharged from the plant alters the ecosystem of the receiving waters, resulting in mortality and displacement of marine life. In the case of the South Bay Power Plant, the intake system uses up to 601.1 million gallons of bay water per day, and the thermal plume discharged from the plant can extend up to 1.7 miles from the point of discharge.⁶ A 2004 study that evaluated impacts to the San Diego Bay from the South Bay Power Plant Cooling system estimated that about 17% of all larval species present in the Bay

⁶ Duke Energy Engineering and Services, Marine Mammal Protection Act Small Take Permit Application for Moss Landing, Morro Bay and South Bay Power Plants. February 20, 2001

were killed due to entrainment (i.e, drawn into the intake system) in 2001 and 2002. In addition, the study reported a total impingement (i.e, larger fishes trapped against the screens covering the intake system) rate of 385,588 individuals weighing 556 kg (1,226 lb) under full operation flow rates.

To address the impacts from the once-through cooling process, the state Water Resources Control Board adopted a new policy on May 4, 2010 requiring that these cooling systems be phased out and replaced with a less environmentally damaging alternative. In response to this policy and in recognition of the significant impacts to the San Diego Bay, the San Diego Regional Water Quality Control Board (SDRWQCB) voted on May 12, 2010 not to renew water discharge permits for the South Bay Power Plant (due to expire in December 2010), in support of the Port of San Diego's plans to dismantle the power plant. However, before the South Bay Power Plant can be deconstructed, the California Independent System Operator (ISO) must determine that the plant is not needed as part of the State's electricity supply. Currently, the ISO is in the process of evaluating whether or not this power plant is needed in the future, and Dynergy recently submitted an application to the Regional Board for a five-year renewal of its discharge permit.

Continued operation of the power plant's intake system would compromise any benefits provided by the Otay River floodplain site to adequately compensate for wildlife impacts at the Carlsbad desalination facility. The purpose of the MLMP is to ensure mitigation for entrainment impacts at the desalination plant. If the intake and discharge systems at the South Bay Power Plant are not shut down, a substantial proportion of the marine life "created" at the Otay River floodplain site will be killed or injured due to entrainment, impingement or thermal effects. This would significantly decrease the efficacy of Poseidon's mitigation project, and could result in the project not meeting some of the MLMP objectives – i.e., the objective to "provide maximum overall ecosystem benefits". Staff and members of the SAP raised these concerns with Poseidon during the site selection review process and recommended that if Poseidon did propose this site as its preferred site that it also develop a back-up site in case the power plant issue is not favorably resolved. Poseidon chose to move forward with the Otay River floodplain site and has not presented a secondary site alternative. If the intakes and outfalls at the South Bay Power Plant continue to operate, this site will not provide adequate mitigation for the impacts at the Carlsbad desalination plant and thus, will not meet the requirements and objectives of the MLMP or constitute compliance with the conditions of the CDP. Thus, the Commission's approval of the Otay River Floodplain site is necessarily contingent upon the termination of use of the intakes and outfalls at the South Bay Power Plant before Poseidon completes construction of its mitigation site. If the intakes and outfalls at the South Bay Power Plant do not cease to operate, as is expected, then Poseidon will need to seek approval for an alternative mitigation site.

4.3.4 Potential Soil Contamination

Potential soil contamination is an important issue to address when selecting a wetland restoration site. Land with a history of agricultural or industrial uses, such as the Otay River floodplain site, may contain contaminated soils that if not addressed, could seriously impair the restoration potential for that site. To this effect, the MLMP requires that "Any existing site contamination problems would be controlled or remediated and would not hinder restoration." To explore this

issue at the Otay River floodplain site, Poseidon presented the results from two relatively recent soil sampling programs and also conducted its own preliminary soil assessment (see p. A-3 of Exhibit 5). The results from the earliest soil test, sampled in 1989, indicated the presence of DDT and its derivatives (2,200 parts per billion (ppb) – 4,050 ppb), toxaphene (3,000 ppb – 4,200 pb) and several heavy metals (concentrations unknown) on the surface, although it is important to note that this test included a very small sample set of only three samples. Additional soil testing conducted in 1999 as part of the USFWS pre-acquisition activities, involved the collection of 15 samples across the property. Results of this sampling effort also indicated the presence of DDT and its metabolites, with concentrations ranging from 8 to 1,400 ppb. Heavy metals were not analyzed in the 1999 soil test. In December 2009, Poseidon conducted a screening level soil contaminants assessment that involved collecting eight soil borings, four in the Pond 20A area and four in the former agricultural lands adjacent to the Otay River (see Exhibit 2). Only one of the eight soil borings indicated the presence of DDT and its derivatives. Poseidon's data suggest that there may be areas of the site that are uncontaminated and thus suitable for restoration without further intervention. However, all three sets of soil samples were limited in scope and analysis, and thus, do not provide an adequate picture of possible contamination at this site. After discussing these concerns, Poseidon assured staff and the SAP at our meeting on June 20, 2010, that Poseidon would be conducting a thorough soil analysis before presenting a final restoration plan to the Commission. In the event that significant soil contamination is found, in order to meet the requirements of the MLMP and therefore Poseidon's CDP,⁷ Poseidon will be obligated to clean up the contaminated portion of the site as part of its restoration project (in which case, a detailed soil remediation plan would need to be included in the final restoration plan, to be presented to the Commission for approval or disapproval in 14 months).

4.3.5 Hydrology/Tidal Prism

Hydrology is one of the key components driving any wetland restoration project. As staff and the SAP reviewed the Otay River floodplain site for compatibility with the objectives of the MLMP, two related hydrological concerns were raised: 1) Is the hydrology and tidal prism available to this site sufficient to sustain a functioning tidal wetland?; and, 2) Can this site support enough subtidal habitat to meet the fish productivity requirement added to the MLMP by the RWQCB? To respond to these concerns, Poseidon contracted with Scott Jenkins of Jenkins Engineering, Inc. to provide a preliminary hydrological analysis. The results of this analysis were presented to staff and the SAP on June 20, 2010 and a final report was issued on September 13, 2010 (see Exhibit 6).

Mr. Jenkins analyzed tidal exchange and sediment dynamics of the three different design concepts in his initial study. He determined that the Otay River channel leading to the restoration site could convey the potential tidal prism required for this restoration project. Historic maps indicate that before the area was developed, tidal marshes and various channels of the Otay River covered the entire site. Mr. Jenkins determined that if the Otay River channel was dredged to approximately –6 ft NGVD, the former floodplain could be recontoured to

⁷ The MLMP states in section 3.1(e) that "Any existing site contamination problems will be controlled or remediated and would not hinder restoration."

support a maximum of 75 acres of marsh, including subtidal, intertidal and supratidal zones. This analysis estimated that, depending on the specific wetland design, the mean inundated area of marsh over an average diurnal tidal cycle would fluctuate between 18.5 acres (at San Diego Bay's mean lower low water levels) and 60.6 acres (at mean higher high water levels) for design concept 1 (Exhibit 3a), between 32.8 and 62.6 acres for design concept 2 (Exhibit 3b), and between 14.8 and 60.0 acres for design concept 3 (Exhibit 3c). This result is significant in two ways. First, Mr. Jenkins calculated that the wetland would need to have an absolute minimum of 11 acres to meet the fish productivity requirement imposed by the RWQCB. The design with the smallest subtidal basin includes a mean sub-tidal acreage of 14.8 acres, which is greater than this minimum requirement, thus providing a margin of error. Even at San Diego Bay's extreme low water elevations, the minimum subtidal area is estimated to be 14.3 acres for the design with the smallest subtidal basin, larger than the minimum of 11 acres required for fish production to meet the RWQCB requirement.⁸ Second, the mean inundated area at mean higher high water was calculated to be between 60 and 62.6 acres, which means that over an average daily tidal cycle, 60-62.6 acres of marsh will be inundated at high tide. At San Diego Bay's extreme high water levels, approximately 82.8-6-82.8 acres of marsh would be inundated, depending on the design chosen. This is consistent with the requirement that Poseidon restore up to 66.4 acres of wetland, including extensive intertidal and subtidal areas as well as high marsh and uplands that are not inundated on a daily basis.

Mr. Jenkins' initial analyses of sediment dynamics also indicate that the site is suitable for tidal wetland restoration. The relatively long Otay channel that drains into San Diego Bay was formed by scour resulting from historic flooding on the Otay River. Because it was a naturally formed channel, as opposed to an "engineered" channel, it can be considered relatively stable and should be able to withstand the additional flow required to support a tidal wetland. Hydrologic modeling showed that flow velocities generally stay below the threshold velocity for erosion and scour for all three design concepts. There are a few pinch points in the channel where, depending on the design, maximum velocities equal or even exceed the threshold velocity and thus could be at risk for erosion. Depending on the wetland design chosen, it may be desirable to widen the channel at these pinch points to increase the capacity of the channel and reduce the risk of erosion. Mr. Jenkins also concluded that because the Otay River carries a relatively small sediment load due to the upstream dam, sediment deposition in the project area should not be a significant concern. Thus, after initial project-related dredging, the channel could be self-sustaining and might not require additional dredging. Similarly, the inlet to the Otay River should not require dredging to keep it open. The lower energies present in the San Diego Bay, as opposed to the open ocean, make the inlet more stable and less prone to sediment deposition. The likely dredging and channel maintenance requirements are expected to be addressed during the upcoming CEQA review for the mitigation site.

One related issue that was raised by Commission staff and the SAP was the potential impact of the large-scale restoration of the South Bay Salt Ponds on the Otay River Floodplain site. As mentioned previously, the Otay River Floodplain site is part of the San Diego National Wildlife Refuge, South San Diego Bay Unit (see Exhibit 1b). Currently, most of the acreage included in

⁸ In a letter dated September 21, 2010 (see Exhibit 8), RWQCB staff noted that they intend to bring Poseidon's site selection and preliminary restoration plan to their Board in November and will be recommending approval.

the South San Diego Bay Unit consists of managed salt ponds. A few of these ponds are currently undergoing restoration to tidal wetlands, some are inactive and some are still actively managed for salt production. The long term goal for this part of the Refuge is to restore most of the former salt ponds to tidal wetlands and shallow water habitat. This large-scale restoration effort would alter the regional hydrology of the South San Diego Bay and thus affect the tidal dynamics in the Otay River channel; however, Mr. Jenkins thought, based on his knowledge of the system, that these impacts would be insignificant. Regardless, Commission staff and SAP members intend to evaluate this issue further during the upcoming CEQA and CDP review process. It is also important to note that any potential hydrologic impacts from restoration of the South Bay salt ponds are not likely to affect the overall suitability of the Otay River Floodplain as Poseidon's mitigation site, though they may affect the specific wetland design selected for the site.

Staff and the SAP reviewed Mr. Jenkins' hydrologic analysis and determined that it had addressed the major concerns raised above. When asked by Dr. Raimondi if he could think of any hydrologic issues that would preclude the restoration of this site to tidal wetlands, Mr. Jenkins replied that he did not see any problematic hydrologic issue that could not be addressed by the wetland design and that in fact, this site had several advantages, such as the lack of a need for maintenance dredging, that are absent at many other sites. Mr. Jenkins' analysis, although preliminary, was sufficient to convince staff and the SAP that there are no major hydrological issues that would preclude the use of the Otay River floodplain site as mitigation for Poseidon's Carlsbad desalination plant.

5.0 Conclusion

In summary, staff and the SAP believe that based on the facts available today, including the assumption that the intakes and outfalls at the South Bay Power Plant will cease to operate, Poseidon has chosen an appropriate site for mitigation of impacts from the Carlsbad desalination plant and has adequately addressed the potential site constraints raised in the previous section. Should the intakes and outfalls at the South Bay Power Plant continue to operate, however, this site would no longer meet the requirements of the MLMP or Poseidon's CDP, and Poseidon would need to seek the Commission's approval of an alternate mitigation site. Thus, staff and the SAP recommend that the Commission approve Poseidon's proposed mitigation site, contingent upon the cessation of use of the intakes and outfalls at the South Bay Power Plant, and preliminary restoration plan as required by Section 2.0 of the MLMP.