

**CALIFORNIA COASTAL COMMISSION**

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Filed: 01/11/08  
 49<sup>th</sup>: 02/29/08  
 180<sup>th</sup> Day: 07/09/08  
 Staff: JDE-V-Tech. Services  
 Staff Report: 1/24/08  
 Hearing Date: 2/06/08  
 Item No.: W-6a  
 Commission Action/Vote: Approval/10-0

## **ADOPTED FINDINGS AND CONDITIONS**

**APPLICATION NO.:** E-07-010

**APPLICANT:** Southern California Edison Company (SCE)

**PROJECT DESCRIPTION:** Construction of a 127.6 acre artificial reef in shallow water to support development of a giant kelp forest community as partial mitigation for impacts arising from the cooling system discharge of the San Onofre Nuclear Generating Station (SONGS) Units 2 and 3. The reef is proposed to fulfill the requirements of Coastal Development Permit No. 6-81-330-A ("SONGS" permit), Special Condition C.

**PROJECT LOCATION:** The proposed project subtidal lease area encompasses 862 acres in state waters off the coast of the City of San Clemente, in Orange County, California. The lease area is approximately 0.6 mile offshore and extends 2.5 miles along the coast from San Mateo Point to just north of the San Clemente Pier.

**MOTION & RESOLUTION:** See Page 6.

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## **PROJECT SUMMARY AND STAFF RECOMMENDATION**

In July 1991, the Coastal Commission adopted certain requirements to mitigate the impacts to the marine environment resulting from the operation of the San Onofre Nuclear Generating Station

(SONGS) Units 2 and 3 (Coastal Development Permit No. 6-81-330-A, awarded to Southern California Edison (SCE) and its partners, hereinafter the "SONGS" permit). On April 9, 1997, the Coastal Commission adopted a resolution approving amended conditions to the SONGS permit. Condition C of the amended permit requires SCE and its partners to select a site and construct an artificial reef as partial mitigation for resource losses at the San Onofre Kelp Bed caused by operation of SONGS Units 2 and 3. The SONGS permit requires construction of a reef that will support a community of reef-associated biota that sufficiently compensates for the biota destroyed in the San Onofre Kelp Bed by SONGS operations, and that the reef be constructed in two phases: (1) an initial five-year experimental phase, and (2) a second mitigation phase with a duration equivalent to the operating life of SONGS Units 2 and 3. The reef resulting from the two phases is to be located in the vicinity of SONGS and shall create a minimum of 150 acres (= 60.75 hectares) of kelp forest community. The SONGS permit specifies the performance standards that must be achieved for the reef mitigation project. The SONGS permit conditions also require SCE to provide the funds necessary for technical oversight and independent monitoring of the mitigation projects, to be carried out by independent contract scientists under the direction of the Executive Director (Condition D).

This permit is for the construction of the Phase 2 Mitigation Reef. The mitigation requirements and performance standards of the SONGS permit remain in full force and effect.

### **Phase 1 Experimental Reef**

The Coastal Commission approved the coastal development permit for the Phase 1 Experimental Reef on July 15, 1999 (CDP #E-97-10). The final plan approved by the Coastal Commission was for an experimental artificial reef located off San Clemente, California that tested eight different reef designs that varied in substrate composition (quarry rock or rubble concrete), substrate coverage (high, medium or low), and presence of transplanted kelp. All eight reef designs were represented as individual 40 m x 40 m modules that were replicated in seven areas (i.e., blocks) for a total of 56 artificial reef modules totaling 22.4 acres. The Army Corps of Engineers issued its permit on August 13, 1999, and the permittee completed construction of the experimental reef on September 30, 1999.

Following construction, the experimental reef was monitored for five years by the Commission's contract scientists. Data collection on the experimental phase was completed in December 2004. The results of the experimental reef monitoring were compiled in a final report (Reed et al. 2005). The primary purpose of the experimental reef was to determine which combinations of substrate type and substrate coverage would most likely achieve the performance standards specified in the SONGS permit. Results from the five-year experimental phase of the artificial reef mitigation project were quite promising in that all six artificial reef designs and all seven locations (i.e., blocks) tested showed a near equally high tendency to meet the performance standards established for the mitigation reef. It was concluded from these findings that a low relief concrete rubble or quarry rock reef constructed off the coast of San Clemente, California, has a good chance of providing adequate in-kind compensation for the loss of kelp forest biota caused by the operation of SONGS Units 2 and 3. These findings formed the basis of the Executive Director's determination that: (1) the mitigation reef (Phase 2) shall be built of quarry

rock or rubble concrete having dimensions and specific gravities that are within the range of the rock and concrete boulders used to construct the SONGS experimental artificial reef, and (2) the percent of the bottom covered by quarry rock or rubble concrete on the mitigation reef should average at least 42%, but no more than 86%. The Commission concurred with the Executive Director's determination for the type and percent cover of hard substrate on October 12, 2005.

## **Phase 2 Mitigation Reef**

The permittee has applied the Phase 1 Experimental Reef monitoring results to the Final Design Plan of the Phase 2 Mitigation Reef to insure that the mitigation reef will have the best chance of meeting the performance standards set forth in Condition C, section 2.4, of the SONGS permit (CDP #6-81-330-A). The primary purpose of the Phase 2 Mitigation Reef is to fulfill the mitigation requirements in the SONGS permit for creating a fully functioning 150 acre kelp forest community, that is, 150 acres of medium-to-high density (defined as 4 plants per 100m<sup>2</sup>) giant kelp, *Macrocystis pyrifera*, and associated marine biota (algae, invertebrate, fish).

The California State Lands Commission (SLC) is the Lead Agency for the SCE Artificial Reef project pursuant to the California Environmental Quality Act (CEQA). SLC determined that a Programmatic Environmental Impact Report (PEIR) was the appropriate CEQA document for the SCE Artificial Reef Project because it involves two separate phases. The PEIR evaluated the environmental impacts of both phases of the project. SLC acknowledged that the difference in time between completion of Phase 1 and initiation of Phase 2 might necessitate, for any number of reasons, studies supplemental to the PEIR.

On April 17, 2006 the California State Lands Commission, acting on a request from the permittee, adopted a resolution declaring that the SONGS Phase 2 Mitigation Reef be named in honor of Dr. Wheeler North. The permittee submitted a preliminary design plan for the Phase 2 Mitigation Reef (Wheeler North Reef) to the Executive Director of the Coastal Commission on May 12, 2006. The proposed design creates 127.6 new acres of reef which when combined with the 22.4 acre experimental phase could satisfy the 150 acre artificial reef mitigation requirement if 150 acres of kelp forest community is created.

The permittee's proposed design for the new 127.6 acres is a low-profile, single-layer reef (< 1 m in height) of quarried boulders distributed on the sea floor in quantities similar to those of the lowest substrate coverage used in the experimental reef. The design consists of 11 polygons that vary in area from 2.4 to 37.5 acres with four contingency (remediation) polygons (totaling 33.4 acres) serving as potential alternative reef construction areas. The period of construction is estimated at 100 working days and is slated to begin Spring 2008.

On August 8, 2006, the Commission concurred with the Executive Director's determination that the Preliminary Design Plan for the Phase 2 Mitigation Reef meets the requirements of the SONGS permit. Following review of the permittee's preliminary design plan for the Phase 2 Mitigation Reef, SLC determined that subsequent studies under CEQA were not necessary.

The proposed low lying Phase 2 Mitigation Reef to be constructed of quarry rock off the coast of San Clemente, California, is consistent with the Executive Director's determination for mitigation reef substrate type, percent bottom coverage, bottom relief, and location. The analyses presented in the permittee's Final Design Plan (Appendix A, Seafloor Characteristics off San Clemente (2005-2006 Sonar Surveys), Appendix B, Summary of Biological Data from Diver Survey (February 2006), and Appendix C, Kelp Canopy Coverage off San Clemente (from 1967-2006)) provide convincing evidence that the proposed construction of the Phase 2 Mitigation Reef will avoid rocky habitat that supports resources of significant biological value as well as soft bottom habitats with any especially valuable biological resources.

Performance standards for reef substrate, giant kelp, fish, and benthos specified in Condition C of the SONGS permit will be used to evaluate the success of the Phase 2 Mitigation Reef in meeting the intended goal of compensating for kelp forest resources lost due to SONGS operations. Monitoring independent of the permittee shall be done in accordance with Condition D of the SONGS permit to: (1) determine whether the performance standards established for Condition C are met, (2) if necessary, determine the reasons why any performance standard has not been met, and (3) develop recommendations for appropriate remedial measures.

Commission staff has thoroughly reviewed the permittee's *Final Design Plan; Wheeler North Reef at San Clemente, California (SONGS Artificial Reef Mitigation Project, Phase 2 Mitigation Reef)* as well as the other documents and letters submitted as part of the coastal development permit application for this project. Commission staff recommends approval for this project as conditioned.

**TABLE OF CONTENTS**

**I. STAFF RECOMMENDATION .....6**

**II. STANDARD CONDITIONS.....6**

**III. SPECIAL CONDITIONS .....7**

**IV. FINDINGS AND DECLARATIONS .....10**

    A. BACKGROUND COMMISSION ACTIONS RELATING TO THE SONGS..... 10

        1. The SONGS Project.....10

        2. Permit History.....11

        3. Condition C: Reef Mitigation .....12

    B. PROJECT DESCRIPTION AND BACKGROUND..... 15

        1. Project Location and Setting.....15

        2. Project Description.....15

        3. Project Design.....15

        4. Project Management, Maintenance, and Monitoring Programs.....17

    C. COMPLIANCE WITH CONDITIONS OF SONGS CDP # 6-81-330-A ..... 17

    D. OTHER AGENCY APPROVALS ..... 19

        1. State Lands Commission.....19

        2. Air Pollution Control Districts.....19

        3. San Diego Regional Water Quality Control Board.....19

        4. U.S. Army Corps of Engineers .....19

        5. California Department of Fish and Game .....20

    E. COASTAL ACT ANALYSIS..... 20

        1. Marine Environment and Water Quality.....20

        2. Placing Fill.....24

        3. Air Quality .....26

        4. Commercial and Recreational Fishing.....28

        5. Public Access and Recreation.....29

        6. Oil Spill Prevention and Response .....31

        7. Cumulative Impacts .....32

    F. ADDITIONAL DATA ..... 33

    G. CEQA..... 33

**V. APPENDICES .....34**

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**EXHIBITS**

- Exhibit 1. CDP #6-81-330-A (“SONGS” Permit) Conditions C and D
- Exhibit 2. Project Location Map
- Exhibit 3. Proposed Phase 2 Mitigation Reef Design
- Exhibit 4. Phase 2 Mitigation Reef Bathymetry
- Exhibit 5. State Lands Commission Letter, October 29, 2007
- Exhibit 6. State Lands Commission Letter, December 5, 2007

## I. STAFF RECOMMENDATION

### A. APPROVAL WITH CONDITIONS

The staff recommends the Commission adopt the following resolution:

**MOTION I:** *I move that the Commission approve Coastal Development Permit E-07-010 pursuant to the staff recommendation.*

#### **STAFF RECOMMENDATION OF APPROVAL:**

Staff recommends a **YES** vote. Passage of this motion will result in approval of the permit as conditioned and adoption of the following resolution and findings. The motion passes only by affirmative vote of a majority of the Commissioners present.

#### **RESOLUTION TO APPROVE THE PERMIT:**

The Commission hereby approves a coastal development permit for the proposed Phase 2 Mitigation Reef and adopts the findings set forth below on grounds that the mitigation reef as conditioned will fulfill the requirements of Coastal Development Permit No. 6-81-330-A (“SONGS” permit), Special Condition C, will be in conformity with the policies of Chapter 3 of the Coastal Act, and will not prejudice the ability of the local government having jurisdiction over the area to prepare a Local Coastal Program conforming to the provisions of Chapter 3. Approval of the permit complies with the California Environmental Quality Act because either (1) feasible mitigation measures and/or alternatives have been incorporated to substantially lessen any significant adverse effects of the development on the environment, or (2) there are no further feasible mitigation measures or alternatives that would substantially lessen any significant adverse impacts of the development on the environment.

## II. STANDARD CONDITIONS

- (1) **Notice of Receipt and Acknowledgment:** This permit is not valid until a copy of the permit is signed by the permittee or authorized agent, acknowledging receipt of the permit and the acceptance of the terms and conditions, and is returned to the Commission office.
- (2) **Expiration:** This permit will expire two years from the date on which the Commission approved the proposed project if development has not begun. Construction of the development shall be pursued in a diligent manner and completed in a reasonable period of time. Application for extension of the permit must be made at least six months prior to the expiration date.
- (3) **Interpretation:** Any questions of intent or interpretation of any condition will be resolved by the Executive Director of the Commission (hereinafter, “Executive Director”) or the Commission.

- (4) **Assignment:** The permit may be assigned to any qualified person, provided the assignee files with the Commission an affidavit accepting all terms and conditions of the permit.
- (5) **Terms and Conditions Run with the Land:** These terms and conditions shall be perpetual, and it is the intention of the Commission and the permittee to bind all future owners and possessors of the subject property to the terms and conditions.

### III. SPECIAL CONDITIONS

The permit is subject to the following special conditions:

#### 1. Adherence to SONGS Coastal Development Permit #6-81-330

In addition to the special conditions set forth below, the Commission's approval of this coastal development permit is subject to all applicable conditions of Coastal Development Permit No. 6-81-330-A, Conditions C and D (included herein as Exhibit 1).

#### 2. Additional Data

Prior to commencement of construction of the Phase 2 Mitigation Reef, the permittee shall submit to the Executive Director:

- GIS data files/layers and associated metadata for the experimental reef modules;
- GIS data files/layers and associated metadata for the proposed mitigation reef polygons;
- Kelp persistence maps for the lease area and reference sites; and
- Detailed methods for all data provided.

#### 3. Other Permits

Prior to commencement of construction of the Phase 2 Mitigation Reef, the permittee shall provide to the Executive Director copies of all required state or federal discretionary permits for the project including, but not necessarily limited to, the U.S. Army Corps of Engineers Clean Water Act section 404 Permit, the Regional Water Quality Control Board Clean Water Act section 401 Permit, and any air quality permits required in Special Condition 11.

#### 4. Waiver of Liability and Indemnification

By acceptance of this coastal development permit, the permittee agrees to waive all claims of liability against, and to indemnify and hold harmless, the California Coastal Commission, its officers, agents and employees against any and all claims, demands, damages, costs, expenses or liability arising out of the acquisition, design, construction, operation, maintenance, existence or failure of the permitted project.

**5. Final Design Plan for the Phase 2 Mitigation Reef**

Prior to the issuance of the coastal development permit, the permittee shall submit for review and approval of the Executive Director a revised *Final Design Plan; Wheeler North Reef at San Clemente, California (SONGS Artificial Reef Mitigation Project Phase 2 Mitigation Reef)* that includes the revisions requested by Commission staff on December 12, 2007. The permittee shall undertake development in accordance with the approved Final Design Plan. Any proposed changes to the approved Plan shall be reported to the Executive Director. No changes to the plan shall occur without a Coastal Commission-approved amendment to this coastal development permit pursuant to the Commission's regulations unless the Executive Director determines that the changes are minor and within the scope of the Commission's permit approval and no amendment is required.

**6. Sonar Verification of As-Built Construction**

Prior to commencement of construction of the Phase 2 Mitigation Reef, the permittee shall submit for approval to the Executive Director a plan (As-Built Construction – Sonar Verification Method) to ensure that the mitigation reef is constructed in accordance with the Final Design Plan approved herein.

**7. Initial Construction Audit**

The permittee shall submit to the Executive Director for approval the inspection findings for quality control audits of initial polygon construction described in the Final Design Plan. The Executive Director shall complete review of the inspections findings within two business days. The permittee shall correct or ameliorate non-conformance with any construction and/or material specifications set forth in the Final Design Plan.

**8. Final Post-Construction Report**

Within 30 working days following construction of the Phase 2 Mitigation Reef, the permittee shall complete the As-built Construction Sonar Verification of all 11 polygons.

Within 60 days following construction of the Phase 2 Mitigation Reef, the permittee shall submit a final post-construction survey report to the Executive Director.

The report shall include:

- a map showing the position and perimeter of each polygon;
- the average topographic relief and average percentage of the seafloor covered with quarry rock within each polygon;
- an estimate of the uniformity of rock coverage within the perimeter of each polygon as well as rock overlap; and
- the location, perimeter map, average relief and average percent cover of any polygon that is significantly different from the specifications set forth in the Final Design Plan.

If, after consultation with the permittee, the Executive Director determines that the deviation(s) seriously compromise the value of the Phase 2 Mitigation Reef, then the permittee shall immediately prepare a construction remediation plan that will include alterations or additions necessary to correct the deviation(s). The permittee shall submit such construction remediation plan within 90 days of the final post-construction survey report for Commission approval as an amendment to this permit and shall implement the construction remediation plan as soon as is practicable following the Commission's approval.

#### **9. Quarry Rock Sources**

Prior to commencement of construction of the Phase 2 Mitigation Reef the permittee shall submit to the Executive Director a list of all proposed quarry rock sources and quantities expected to be obtained from each source. If the permittee proposes to obtain quarry rock from source(s) different from those sources evaluated in the PEIR, then the permittee shall conduct appropriate air quality analyses (see Special Condition 10) and shall submit the revised quarry rock source proposal to the Commission for approval as an amendment to this permit unless the Executive Director determines that the changes are minor and within the scope of the Commission's permit approval and no amendment is required.

#### **10. Revised Air Quality Impact Assessment**

Prior to commencement of construction of the Phase 2 Mitigation Reef the permittee shall submit to the Executive Director for approval, a revised air quality impact assessment that calculates all sources of air emissions following the final determination of the quarry rock source(s). The PEIR found air quality impacts to be significant, primarily due to emissions from truck transportation of reef material to the port of San Diego and the quantity of reef material that could be transported over a short period of time under some construction scenarios; however, truck transportation of reef material is not the preference of the Final Design Plan and the amount of reef material estimated in the PEIR is substantially greater than that proposed in the Final Design Plan. If the revised air quality impact assessment, as approved by the Executive Director, also shows significant impacts, then the permittee shall submit a permit amendment application for Commission approval that includes revised mitigation measures, including the possibility of constructing the reef over a two-year period so as to reduce the cumulative air quality impacts.

#### **11. Air Quality Permits**

Prior to commencement of construction of the Phase 2 Mitigation Reef, the permittee shall submit to the Executive Director: (1) a copy of the Authority to Construct issued by the appropriate air districts(s), if required, or (2) a written explanation that no air district permits or mitigation are required for the project.

#### **12. Kelp Wrack and Rock Hazard Monitoring**

For four years following construction of the Phase 2 Mitigation Reef, the permittee shall perform monitoring of the 3.7 miles of beach adjacent to the project site (from the first small point north

of San Clemente Pier to San Mateo Creek south of the pier) for (1) kelp wrack on the beach and (2) artificial reef substrate on the beach within 48 hours following large storm or swell events. If the four years of monitoring show significant amounts of kelp wrack or artificial reef substrate, the Executive Director may require additional monitoring. The permittee shall communicate biannually via written correspondence with the City of San Clemente beach maintenance department, with a copy to the Executive Director, for the operating life of SONGS Units 2 and 3 and will contribute mechanical, manpower, and/or monetary assistance should the city request help removing excess kelp wrack (documented to be beyond background quantities in monitoring results) or any reef material from the beach.

## **IV. FINDINGS AND DECLARATIONS**

The Commission hereby finds and declares:

### **A. BACKGROUND COMMISSION ACTIONS RELATING TO THE SONGS**

#### **1. The SONGS Project**

The San Onofre Nuclear Generating Station (SONGS) is located in north San Diego County. SONGS Unit 1, which generated up to 436 megawatts of electric power, began operation in 1968 and stopped operating in the early 1990s. Construction of SONGS Units 2 and 3 began in 1974 and was completed in 1981. Operation of Units 2 and 3 began in 1983 and 1984, respectively. Each unit generates up to 1,100 MW of electric power, and draws in seawater at a rate of 830,000 gallons per minute from an intake pipe 18 feet in diameter, originating 3,400 feet offshore. The plant draws in about 872 billion gallons of seawater per year, resulting in both direct losses of adult fish due to entrapment and indirect stock reductions caused by the intake and killing of larvae. Annual entrapment losses were estimated to be about 52 metric tons. Indirect losses of adults due to the intake and killing of larvae reduce standing fish stocks in the Southern California Bight by about 2,290 metric tons.

The discharge pipe for Unit 2 terminates 8,500 feet offshore, while the discharge pipe for Unit 3 terminates 6,150 feet offshore. The last 2,500 feet of the discharge pipes for Units 2 and 3 each consist of a multi-port diffuser that rapidly mixes the cooling water with the surrounding water. To cool the discharge water, the diffusers draw in ambient seawater at a rate about ten times the discharge flow and mix it with the discharge water. The surrounding water is swept up along with sediments and organisms and transported offshore at various distances, depending on the prevailing currents.

## **2. Permit History**

### **a. The Original SONGS Permit**

In 1973, the California Coastal Zone Conservation Commission (CCZCC, now the California Coastal Commission) denied a permit for the construction of SONGS Units 2 and 3. In 1974, the Commission approved Coastal Development Permit No. 183-73 (now numbered CDP #6-81-330-A) for the construction of the SONGS Units 2 and 3 with conditions that:

- (1) established a three-member independent Marine Review Committee (MRC) comprised of members appointed by the Commission, SCE and its partners (the permittee), and an environmental coalition that had opposed the project, to carry out a comprehensive field study to predict and measure the impacts of the SONGS on the marine environment; and
- (2) authorized the Commission to require the permittee to make future changes in the SONGS cooling system to address adverse impacts to the marine environment identified by the MRC.

In 1979, based on recommendations from the MRC, the Commission recognized that compensatory mitigation measures could be appropriate in addition to, or in-lieu of, changes to the SONGS cooling system.

In 1989 the MRC submitted its final report and recommendations, which documented significant impacts to fish populations in the Southern California Bight, and to the San Onofre kelp bed community. The MRC's final report also included recommendations for mitigating adverse impacts to the marine environment caused by the SONGS.

The 1974 permit is still in full force and effect, and its conditions gave the Commission the authority to further condition the coastal development permit to require the existing comprehensive mitigation package based on the findings and recommendations of the MRC.

### **b. The Commission's Adopted 1991 Conditions Requiring Mitigation**

In July 1991, based on the results of the impact studies and recommendations of the MRC, the Commission concluded that a compensatory mitigation program was the most cost-effective means of dealing with the impacts of SONGS Units 2 and 3 and therefore further conditioned the SONGS permit to require (1) creation or restoration of southern California wetlands, (2) installation of fish barrier devices at the power plant, and (3) construction of a kelp reef. The 1991 conditions also require SCE to provide the funds necessary for technical oversight and independent monitoring of the mitigation projects to be carried out by appropriate and independent scientific and technical personnel and consultants under the direction of the Commission's Executive Director. The Commission found that this oversight and monitoring condition addresses the uncertainties associated with the use of compensatory mitigation by providing both information on the success of mitigation resources and a mechanism for "adaptive management" of the created resource.

The Commission found the mitigation, monitoring and remediation program to be a minimum package and directed staff to consider the need for additional mitigation by means of a fish hatchery program. In March 1993, the Commission added a requirement for the permittee to partially fund construction of an experimental white seabass fish hatchery program. Due to its experimental nature, the Commission did not assign mitigation credit for the hatchery.

### **c. Permit Condition Compliance**

From 1992 to 1995 Commission staff worked with the permittee to implement the mitigation conditions. In 1992, at the permittee's request and after an extensive selection process established by the 1991 permit conditions, the Commission approved the San Dieguito Lagoon as the site for 150 acres of wetland restoration.

Planning continued through the next several years, but by 1994 implementation of the wetland and artificial reef conditions had stalled due to conflicts over the interpretation of permit conditions. Ultimately, the Commission approved a permit amendment in April 1997 that (1) reaffirmed the approval of San Dieguito Lagoon as the wetland restoration site, (2) allowed partial credit (35 acres) for enhancing existing tidal wetlands by permanent inlet maintenance at San Dieguito Lagoon, (3) revised the artificial kelp reef condition to require a mitigation reef of sufficient size to sustain 150 acres of medium to high density kelp bed community, and (4) added a requirement for payment of \$3.6 million to the State's Ocean Resource Enhancement and Hatchery Program to fund a mariculture/marine fish hatchery to provide compensation for resources not replaced by the artificial mitigation reef.

### **3. Condition C: Reef Mitigation**

The overall goal of the mitigation reef is to compensate for the loss of kelp bed resources including giant kelp, kelp bed invertebrates, and kelp bed fishes. Coastal Act section 30230 states "[m]arine resources shall be maintained, enhanced, and where feasible, restored." The operation of SONGS Units 2 and 3 has been shown to adversely impact the maintenance of populations of marine species. Construction of Units 2 and 3 was found to be consistent with the Coastal Act only if the significant adverse impacts to kelp bed resources would be fully mitigated. Condition C sets forth a process for site selection, mitigation plan development, plan implementation, project monitoring, and remediation. This comprehensive process was required to ensure the kelp reef mitigation project would compensate for the kelp bed resource losses over the full operating life of SONGS.

The Commission found that compensation for the kelp bed community losses, in the form of an artificial reef, was preferable to redesigning the SONGS cooling system to avoid the adverse impacts because: (1) the artificial reef is likely to replace the lost resources; and (2) the cooling system changes cause additional impacts, have engineering problems, and are costly.

**a. Requirements of Condition C**

Condition C of the SONGS permit (Exhibit 1) requires construction of an artificial reef that consists of an experimental reef and a larger mitigation reef. The experimental reef must be a minimum of 16.8 acres and the mitigation reef must be of sufficient size to sustain 150 acres of medium to high density kelp bed and its associated community. The purpose of the experimental reef is to determine which combinations of substrate type and substrate coverage will most likely achieve the performance standards specified in the SONGS permit. The design of the mitigation reef is to be determined based on the results of the experimental reef.

In April 1997, the Commission added the requirement for a payment of \$3.6 million to the State's Ocean Resource Enhancement and Hatchery Program (OREHP) to fund a mariculture / marine fish hatchery to provide compensation for resources not replaced by the artificial mitigation reef. The permittee has fully satisfied this requirement.

**b. Actions Pertaining to Compliance with Condition C**

Following the Commission's approval of the SONGS permit amendments in April 1997, the permittee submitted a preliminary conceptual plan for the experimental reef in June 1997, which was approved by the Executive Director and forwarded to state and federal agencies for review. As lead agency, the California State Lands Commission (SLC) determined that under the requirements of CEQA a Programmatic Environmental Impact Report (PEIR) should be prepared to evaluate both the experimental reef and the subsequent full mitigation reef. SLC began the environmental review process in March 1998, and certified the final PEIR and issued the offshore lease for the experimental reef on June 14, 1999.

The Coastal Commission approved the coastal development permit for the Phase 1 Experimental Reef (CDP #E-97-10) on July 15, 1999. The final plan approved by the Coastal Commission was for an experimental artificial reef located off San Clemente, California, that tested eight different reef designs that vary in substrate composition (quarry rock or recycled concrete), substrate coverage (17%, 34%, and 67%), and presence of transplanted kelp. All eight reef designs were represented as individual 40 m x 40 m modules that were replicated in seven areas (i.e., blocks) for a total of 56 artificial reef modules totaling 22.4 acres. The Army Corps of Engineers issued its permit on August 13, 1999, and the permittee completed construction of the experimental reef on September 30, 1999.

**c. Results from Phase 1 Experimental Reef**

Independent contract scientists working under the direction of the Executive Director produced a proposed monitoring plan for the experimental reef that was reviewed by the permittee, various resource agencies and other technical specialists, and also was included in the draft PEIR for general public review. The Commission approved the proposed monitoring plan for the experimental reef on July 15, 1999.

The Commission's contract scientists carried out a five-year study to monitor the 22.4-acre Experimental Artificial Reef built in September 1999 pursuant to the SONGS permit requirements. The results of the 1999-2004 initial experimental phase study were to be used to:

1. "Assess the feasibility of using an artificial reef as mitigation for replacing the kelp forest resources lost at San Onofre, and
2. Provide insight into the artificial substrate types and configurations that will have the greatest chance of meeting the performance standards used to evaluate the success of the mitigation reef" (Reed et al., 2005).

The results of this monitoring program and the recommendations for the final build-out reef are presented in Reed et al. (2005). In summary, they found that the design aspects of the Experimental Artificial Reef were quite promising, that is, all six artificial reef designs and all seven locations (blocks) showed nearly equally high tendencies to meet the SONGS permit performance standards established for the mitigation reef. They concluded that the densities of giant kelp, fish, and benthic invertebrates on the artificial reef modules were similar to or greater than those on the nearby reference reefs. Only the abundance and numbers of species of understory algae were lower on the artificial reef modules than on the natural reefs.

Reed et al. (2005) stated that the presence of understory algae is not likely to remain at low levels, but will increase over the long term due to natural disturbances. They concluded that a low-relief concrete rubble or quarry rock reef constructed off the coast of San Clemente, California had a very good chance of providing adequate in-kind compensation for the loss of kelp forest biota caused by the operation of SONGS Units 2 and 3. They warned, however, that the data they collected on recruitment, growth, and survivorship of the sea fan, *Muricea*, during the experimental phase indicated that it was reasonable to expect high densities of large *Muricea* to eventually inhabit the mitigation reef.

Reed et al. (2005) recommended that the final reef should be made of quarry rock or rubble concrete with an average vertical relief off the bottom not to exceed 1 m. Since the goal of the artificial reef is to compensate for losses to an entire kelp forest community, including giant kelp, understory algae, invertebrates, and fishes, it will be necessary for the average coverage of hard substrate to be at least as high as that of the low-coverage artificial reef design tested in the five-year experiment.

These findings and recommendations formed the basis of the Executive Director's determination that: (1) the mitigation reef shall be built of quarry rock or rubble concrete having dimensions and specific gravities that are within the range of the rock and concrete boulders used to construct the SONGS experimental artificial reef, and (2) the percent of the bottom covered by quarry rock or rubble concrete on the mitigation reef should average at least 42%, but no more than 86%. The Commission concurred with the Executive Director's determination for the type and percent cover of hard substrate on October 12, 2005.

Based on these findings, the permittee submitted a preliminary mitigation reef plan that calls for the addition of 127.6 acres of reef construction to the existing 22.4 acres built for the Phase 1

Experimental Reef. On August 8, 2006, the Commission concurred with the Executive Director's determination that this preliminary plan meets the requirements of the SONGS permit.

## **B. PROJECT DESCRIPTION AND BACKGROUND**

### **1. Project Location and Setting**

The project area is located in state waters offshore of San Clemente, California, in water depths of approximately 10 to 18 meters (33 to 59 ft) (Exhibit 2). The project area is an 862-acre leased parcel located 0.6 miles offshore of the San Clemente beach between the San Clemente City Pier to the north and San Mateo Point, approximately 2.5 miles to the south (Exhibit 3). The California State Lands Commission issued Lease PRC 8097 for the project area on August 4, 1999 and issued Amendment of Lease PRC 8097.1 for construction of the Phase 2 Mitigation Reef on December 19, 2006.

### **2. Project Description**

Phase 2 of the SONGS artificial reef project creates a 127.6-acre, low profile (<1 m), single-layer reef. The Phase 2 Mitigation Reef will be constructed of quarry rock that will be distributed on the sea floor such that the percent cover is between 42 to 86%.

### **3. Project Design**

The design for the Phase 2 Mitigation Reef (Wheeler North Reef) consists of 11 polygons, varying in area from 2.4 to 37.5 acres. Five contingency polygons (22.4 acres total) were designed as potential alternative or additional reef construction areas. These alternative sites will be used if it is determined during Phase 2 construction fieldwork that valuable biological resources would be directly or indirectly impacted by the anchoring locations without the modification of certain parts of the 11 primary polygon areas, or if surveys indicate inadequate areal coverage. The alternative sites may also be used for future remediation if the mitigation reef fails to meet the established performance standards set forth in Coastal Development Permit No. 6-81-330-A (SONGS Units 2 and 3), Condition C, section 2.4.

The siting of the reef polygons relied primarily on historical kelp canopy maps and the results of multi-beam and sub-bottom profiling sonar surveys (2005) conducted at the offshore lease site and subsequently verified (ground-truthed) by diver surveys (Coastal Environments and Fugro Pelagos, 2006b,c). In addition, the diver surveys evaluated the biological character of the lease area. The design also considers the historical physical and biological data collected during previous studies in the area and the results of the Phase 1 Experimental Reef monitoring between 1999 and 2004 by Reed et al. (2005).

The final reef design achieves the following: (1) it locates the Phase 2 Mitigation Reef as close as possible to San Onofre Kelp Bed but outside the influence of the SONGS discharge plume; (2) it avoids hard substrate areas; (3) it maintains the integrity of the Phase 1 Experimental Reef

modules; (4) it provides for navigation channels; and (5) it avoids areas of historical kelp growth as well as areas of special interest to local fisheries.

The reef construction material will consist exclusively of quarry rock cast upon sand bottom in a single-layer deposition at a density of approximately 790 tons per acre (42% bottom coverage as determined by point-of-contact method developed by the Commission contract scientists). This quarried construction material will conform to California Department of Fish and Game material specifications for augmentation of artificial reefs. The reef construction duration is estimated at 100 working days.

The exclusive building material for the construction of the Phase 2 Mitigation Reef will be quarry boulders. The boulders will be graded to assure a low projected profile (relief) and distributed on the bottom at a mean coverage density of 42% (790 tons per acre). The criteria used to determine and design the polygon areas for the mitigation reef are as follows:

- Sited within the State Lands lease area.
- As close as possible to San Onofre Kelp Bed.
- Water depth between 11.5 and 15 meters.
- Average thickness of sand layer equal to 0.5 meters ( $\pm 20\%$ ).
- Habitat designated as having less than 30% exposed hard substrate.
- Areas where giant kelp has not been present for more than one year in the historical database from 1967 to 2004.
- No construction related activities within at least 50 meters from areas of special interest (e.g., hard substrate and kelp habitat).
- Quarry rock will not be deposited within 7 meters of the existing experimental modules.
- Adequate navigation channels will be provided.

Eleven polygons were selected to construct the remaining 127.6 acres and comply with above criteria. The polygons have been overlaid onto a 3D GIS map of the seafloor bathymetry (Exhibit 4). The design achieves the following:

- Proximity to source populations in the San Mateo Kelp Bed.
- Avoids hard substrate and areas that sustain kelp growth.
- Isolates the experimental reef modules from the new reef.
- Allows several navigation lanes between inshore and offshore areas.

Five additional polygons (Exhibit 3) totaling 22.4 acres were designed as contingency areas for reef construction and potential future remediation. The contingency polygons will be used at the discretion of the permittee and serve as alternate locations for reef construction if site specific issues dictate termination of construction at any of the primary locations (polygon). In addition, the contingency polygons may be used for performance remediation if the mitigation reef fails to meet the required performance standards.

The proposed contingency area of 22.4 acres is approximately 18% of the total acreage to be constructed for the Phase 2 Mitigation Reef. The mitigation reef construction will be the

permittee's second project of this kind so there is some experience base. The estimated contingency (18%) is about the mid-point between that for projects with no experience base and those with some experience base. In summary, the proposed contingency area is appropriate and prudent.

The permittee also has reassessed the lease site and identified eleven additional acres that meet the construction specifications. These eleven acres are located in the northern area of the project, and constitute 9% bringing the total contingency potential to 27% of the target acreage, or 33.4 acres for alternate locations of reef polygon construction.

#### **4. Project Management, Maintenance, and Monitoring Programs**

The permittee shall be responsible for the management and maintenance of the mitigation reef for the operating life of SONGS Units 2 and 3. Performance monitoring of the mitigation reef will be conducted independently of the permittee and under the direction of the Executive Director in accordance with the provisions of Conditions C and D of Coastal Development Permit No. 6-81-330-A (Exhibit 1). Following the Executive Director's determination that the mitigation reef has met the performance standards for the requisite period of time, the performance monitoring can be reduced to annual site inspections. The permittee remains responsible for implementing any remedial actions based on the monitoring results and annual site inspections for the full operating life of SONGS Units 2 and 3.

### **C. COMPLIANCE WITH CONDITIONS OF SONGS CDP # 6-81-330-A**

The standard of review for permitting the construction of the Phase 2 Mitigation Reef (Wheeler North Reef at San Clemente, California), the subject of this coastal development permit, is conformity with the policies of Chapter 3 of the Coastal Act. However, the mitigation reef project is proposed and designed to comply with the requirements of the SONGS permit (CDP #6-81-330-A) Condition C (Exhibit 1).

As described above in the Project Description, the proposed project achieves the purpose of the mitigation reef to provide kelp bed community resources to compensate for the resources lost due to the operation of SONGS Units 2 and 3. Specifically, the mitigation reef is designed to replace the lost and damaged resources at the San Onofre Kelp bed and result in production of a persistent giant kelp forest and associated ecosystem. The five years of monitoring on the Phase 1 Experimental Reef provide a reasonable indication that the Phase 2 Mitigation Reef likely will meet the performance standards for substrate, kelp bed resources, fish stock and benthos community specified in Condition C of the SONGS permit. Should the mitigation reef not perform as expected, the permittee remains responsible for full remediation as may be determined by the Executive Director in consultation with state and federal resource agencies. Special Condition 5 requires the permittee to submit a Final Design Plan that includes the revisions requested by Commission staff. Therefore, the Commission finds that, as conditioned, the *Final Design Plan for Wheeler North Reef (SONGS Artificial Reef Mitigation Project, Phase 2 Mitigation Reef)*, dated 22 January 2008, substantially conforms to the preliminary reef plan and meets the requirements of Condition C of the SONGS permit (CDP #6-81-330-A).

### **Independent Reef Monitoring Program**

The SONGS permit also provides for the monitoring, management, and remediation of the reef mitigation project. Specifically, Condition C requires that monitoring of the mitigation reef independent of the permittee be done over the full operating life<sup>1</sup> of SONGS Units 2 and 3 to measure compliance of the mitigation project with the performance standards specified in the SONGS permit.

Monitoring independent of the permittee will be implemented to: (1) determine whether the performance standards of the SONGS kelp reef mitigation condition are met (i.e., whether the mitigation reef successfully compensates for the lost and damaged resources in the San Onofre Kelp bed); (2) if necessary, determine the reasons why any performance standard has not been met; and (3) develop recommendations for appropriate remedial measures. The permittee will be responsible for fully implementing any remedial measures deemed necessary by the Executive Director.

The independent monitoring will be carried out under the provisions of Condition D of the SONGS permit (Exhibit 1) and in accordance with a monitoring plan for the mitigation reef approved by the Executive Director that describes the sampling methodology, analytical techniques, and methods for measuring performance of the mitigation reef relative to the performance standards identified in Condition C of the SONGS permit. This independent monitoring is separate from the permittee's responsibilities to ensure that the mitigation reef is constructed according to approved plans.

A draft monitoring plan for the SONGS' Reef Mitigation Project (July 2007) was developed in consultation with the members of the Scientific Advisory Panel, convened by the Executive Director to provide guidance on the design, implementation and monitoring of the SONGS mitigation projects, and with the permittee. The draft monitoring plan is included in the permittee's Final Design Plan as Appendix H. When finalized by the Executive Director, the monitoring plan will serve to guide the evaluation of the mitigation reef's performance.

The Commission finds that the draft monitoring plan closely adheres to the monitoring requirements of the SONGS permit. The performance standards for reef substrate, giant kelp, fish and benthos community specified in Condition C of the SONGS permit will be used to evaluate the success of the mitigation reef in meeting the intended goal of compensating for kelp forest resources lost due to the operation of SONGS Units 2 and 3. The draft reef monitoring plan includes a description of each performance standard and the methods that will be used to determine whether the performance standards are being met. Data collected concurrently at natural kelp bed reference sites within the region will be used to determine similarity of the natural reefs with the mitigation reef for each of the performance standards. The San Mateo Kelp bed (located adjacent to the southern end of the proposed mitigation reef) and Barn Kelp bed (located approximately 12 km south of San Mateo Kelp bed) will serve as reference reefs.

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<sup>1</sup> The "full operating life" is defined in the SONGS permit to include past and future years of operation of SONGS units 2 and 3, including the decommissioning period to the extent there are continuing discharges.

## **D. OTHER AGENCY APPROVALS**

### **1. State Lands Commission**

The State Lands Commission (SLC) is the lead agency under the California Environmental Quality Act (CEQA) for the environmental review process of the SONGS Artificial Reef Project. Staff of the Coastal Commission and the Department of Fish and Game have cooperated in the environmental review process. SLC conducted a Programmatic Environmental Impact Report (PEIR) in order to evaluate the potential impacts of both the experimental artificial reef (Phase 1) and the mitigation reef (Phase 2). The Phase 1 Experimental Reef component of the SONGS Artificial Reef project has been completed. The results of the independent monitoring of the experimental reef (Reed et al. 2005), along with results from studies conducted by the permittee, have directed the design of the Phase 2 Mitigation Reef. SLC has reviewed the permittee's Final Design Plan and has deemed it to be consistent with the findings in the PEIR; SLC concluded that the PEIR is still relevant for the build-out phase of the mitigation reef (Exhibit 5). In addition, according to SLC, the source of quarry material is not an issue that would warrant a lease modification or filing an addendum to the PEIR (Exhibit 6; also see discussion of artificial reef quarry rock below).

### **2. Air Pollution Control Districts**

The San Diego Air Pollution Control District and the South Coast Air Pollution Control District are the local air districts responsible for implementing federal and state air quality standards in the proposed project area. The permittee is in communication with these air pollution control districts. The permittee is developing a comparison of the estimated emissions presented in the PEIR as the 'worst case' vs. 'real case' (with 1997 emission factors) vs. 'real case' (with current emission factors). Prior to commencement of construction of the Phase 2 Mitigation Reef, the permittee will obtain either a copy of the Authority to Construct issued by the appropriate air district(s), if required, or a written explanation that no air district permits or mitigation are required for the project.

### **3. San Diego Regional Water Quality Control Board**

Since the project involves a discharge of fill materials into coastal waters, water quality certification under section 401 of the Clean Water Act is required from the Regional Water Quality Control Board with jurisdiction in the project area. The permittee submitted a permit application to the San Diego Regional Water Quality Control Board on March 1, 2007 (File Number 07C-020). The application was deemed complete on October 2, 2007.

### **4. U.S. Army Corps of Engineers**

The permittee submitted a permit application on March 13, 2007, to the United States Army Corps of Engineers (ACOE) for authorization of the proposed project under section 404 of the Clean Water Act and section 10 of the Rivers and Harbors Act. The ACOE issued a Public

Notice of an Application for Permit on July 23, 2007. The public comment period ended August 23, 2007. The ACOE is expected to grant approval for the proposed project.

## **5. California Department of Fish and Game**

The permittee has contacted the California Department of Fish and Game requesting a letter of approval for the reef material type proposed for the mitigation reef and the artificial reef location for the mitigation reef.

## **E. COASTAL ACT ANALYSIS**

### **1. Marine Environment and Water Quality**

Section 30230 of the Coastal Act states:

*Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.*

Section 30231 of the Coastal Act states that:

*The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.*

Sections 30230 and 30231 of the Coastal Act mandate that marine resources and coastal water quality shall be maintained and where feasible restored, that protection shall be given to areas and species of special significance, and that uses of the marine environment shall be carried out in a manner that will sustain biological productivity of coastal waters. The proposed project could potentially degrade marine resources and the quality of coastal water by damaging rare, sensitive or ecologically important species populations as a result of (1) converting critical sandy habitats to rocky reef; (2) damaging existing biota by construction activities; or (3) negatively affecting water quality through introduction of foreign materials.

### **Effect of Habitat Conversion**

As part of extensive siting studies, the permittee conducted biological surveys of the areas of sand bottom that geophysical surveys identified as appropriate for reef construction. The subtidal sand bottom community at the project site is characterized by low densities of common invertebrates, including sea stars, sea pansies, sea pens, snails, and tube worms.

The proposed project will alter or replace the sand-bottom community over a 127.6 acre area. The net effect of the project will be to replace a low-diversity, low-density community of sand-bottom organisms, which are common throughout the region, with a high diversity, much less common, rocky reef community (coastal waters off of San Diego County are characterized by a significantly higher percentage of sand bottom compared to hard substrate). The Phase 2 Mitigation Reef will therefore result in the enhancement of marine resources and biological productivity as required by sections 30230 and 30231 of the Coastal Act.

### **Effect of Construction Activities on Existing Biota**

Based on results from sonar surveys, sub-bottom seismic profiling, and diver ground-truth surveys, the permittee has identified 11 polygons of varying sizes that add up to 127.6 acres. The 11 polygons have been sited for placement in sandy habitat that meets the criteria for the Phase 2 Mitigation Reef construction. The results of the biological survey show that the sandy bottom does not support significant populations of invertebrates, algae, or marine plants, so the impact of rock placement in the area will not cause significant harm to any sensitive species. Areas of hard substrate have been identified and mapped and will be avoided.

The permittee will conduct quality assurance, quality control activities as the mitigation reef polygons are constructed. To ensure that the derrick barge is positioned correctly, in addition to the GPS equipment on the derrick barge, the permittee will verify its location from land using accurate survey equipment (total station). The permittee will prepare a daily report recording: (a) equipment used (in list format), (b) personnel, (c) meteorological and oceanographic (e.g., swell height and period) conditions, (d) summary of completed work, (e) quarry material inventory, (f) polygon completion update, (g) anchoring report, and (h) general and specific permittee comments. In addition and specific to boulder deposition, a spreadsheet and plan view drawing will be part of the daily report that will document the quantity of quarry material deposited and the acreage covered within the reef polygon under construction. The daily report will be sent by email to permittee staff, consultants, Commission staff, and Commission contract scientists identified in the permittee's communication plan which is set forth in the Final Design Plan.

### **Anchor Plan Compliance**

The Final Design Plan includes a detailed anchor plan for the construction of the Phase 2 Mitigation Reef that avoids impacts to sensitive marine resources. Construction of the mitigation reef will require deployment of the six anchors in 18 locations. Seventy-nine of these anchor positions are on sand, and ten are on < 30% hard substrate. In addition the anchors are designed to minimize possible drag on the bottom. This will be achieved by connecting each offshore anchor to a ten ton concrete block located on the ocean floor and by connecting the cable from

the barge to each concrete block via a foam-filled can (surge-can). In developing the anchoring plan, the permittee considered: (a) the ocean bottom topography; (b) the existing potential for environmental harm to existing habitat as a result of the placement of anchors, chains, buoys, and/or cables; and (c) the weather conditions.

All movement of the anchoring hardware among locations will be conducted with ocean-capable tugboats with the capacity to pick up anchors off the ocean bottom. These tugboats are fitted with GPS navigational systems. Prior to every anchor deployment, the permittee will ensure that the tugboat captain re-evaluates the suitability of every anchor position using the 2005 bathymetric survey to confirm the substrate composition (e.g., sand or < 30% hard substrate). If the substrate composition does not comply with these parameters the tugboat captain will consult with the permittee and Commission contract scientists to determine an alternate anchor position. The permittee will record and report anchor positions and any necessary position adjustments as part of daily communications. Periodic tugboat crew inspection of the anchor location will be conducted during the daily construction cycle to assure there has been no anchor movement. Tugboat crews will observe anchor marker buoys for indications of significant anchor movement and will take appropriate action to re-seat the anchor if needed to avoid impacts to hard bottom biota. It is important to note that the six-anchor design limits the movement of any one anchor in the event that the barge pulls excessively on the array. This anchoring system, which was used successfully during construction of the Phase 1 Experimental Reef, will limit damage to the seafloor.

### **Construction Monitoring**

The permittee is obligated to develop a construction monitoring plan to ensure the Phase 2 Mitigation Reef is constructed according to the specifications of the SONGS permit and the Executive Director's determination. The permittee is developing the plan and will submit the plan for Executive Director approval prior to commencement of construction. The following is a conceptual approach to developing a monitoring approach that is intended to produce a two-dimensional mapping of the boundaries and the percent coverage of the reef polygons. The approach will entail a combination of sonar and diver techniques to arrive at a reliable estimation of the boundary and bottom coverage of rock on the constructed reef.

Condition C of the SONGS permit, Kelp Reef Mitigation, section 2.3, Mitigation Reef Construction (Exhibit 1), states: "The permittee shall complete a post-construction survey to demonstrate that the reef was built to specifications. If the Executive Director determines that the reef was not built to specifications, the permittee shall modify the reef to meet the approved specifications within 90 days of the post-construction survey."

The objectives of the post-construction survey are to determine:

- 1) the location and dimensions (footprint) of the constructed polygons;
- 2) the area(s) of the constructed polygon(s);
- 3) the percentage of the ocean bottom within each constructed polygon that is covered by quarry rock;
- 4) that boulder deposition avoids habitat of significant biological value; and

- 5) whether the constructed reef adheres to the design specifications defined in the approved Final Design Plan, including reef area, material dimensions, and percent coverage and layering of artificial reef material.

Side-scan and multi-beam down-looking sonar techniques were successfully used to determine the boundaries of the Phase 1 Experimental Reef modules (EcoSystems Management Associates, 1999; Coastal Environments & Fugro, 2006b,c). The permittee will reevaluate side-scan and multi-beam down-looking sonar methods to determine their inherent advantages and disadvantages, and to subsequently select the “best method.” The best sonar method will be used to determine the footprints of all constructed polygons. Under the independent monitoring provisions of the SONGS permit, the Executive Director retains the responsibility for determining the percentage of the bottom covered by quarry rock for all constructed polygons, which will be done using the diver uniform point contact method developed during the performance monitoring of the Phase 1 Experimental Reef (Reed et al. 2005).

All data and study results derived from the post-construction survey will be submitted in an acceptable format to the Executive Director for review and approval. Within 60 days following completion of construction of all mitigation reef polygons, the permittee will submit a final report on the post-construction survey to the Executive Director and the Department of Fish and Game. The report will include a map showing the position and perimeter of each polygon, and the average topographic relief and average percentage of the seafloor covered with quarry rock within each polygon as well as digital files used to construct the maps. The report will also contain an estimate of the uniformity of rock coverage within the perimeter of each polygon.

### **Changes in Water Quality**

The California Department of Fish and Game (CDFG) has had much experience in the construction of artificial reefs and has produced a set of criteria for materials suitable for the construction of artificial reefs. On the basis of CDFG’s criteria quarry rock is a suitable material for the construction of an artificial reef (Bedford, 1997). Clean quarry rock is (a) persistent, (b) non-toxic in the marine environment, (c) of sufficient density to remain permanently in place, (d) not hazardous to marine mammals or diving birds, and (e) has a surface suitable for the growth of microorganisms, algae, and invertebrate species. Section 5.1.1 of the Final Design Plan provides the physical specifications for the quarry rock and states that written approval for the reef material (quarry rock) will be obtained from CDFG prior to reef construction. The Commission therefore finds that the use of quarry rock as the material for the proposed artificial reef is consistent with Coastal Act sections 30230 and 30231, which require that marine resources be “maintained, enhanced and where feasible, restored.”

### **Artificial Reef Quarry Rock**

Reef construction material will be supplied by the Pebbly Beach Quarry and Empire Quarry, both located on Santa Catalina Island. The Final Design Plan identifies the Catalina Island quarry material source for the construction of the Phase 2 Mitigation Reef. The Catalina Island quarries have direct marine access for the loading of building materials, thus eliminating the need for truck hauling over public highways. Quarry boulders will be loaded directly onto flat-deck barges

and towed (two in tandem) approximately 60 nautical miles to the project site. An estimated time of 8 to 10 hours is required to deliver the barges to the project site. All reef materials will conform to the specifications contained in the Final Design Plan for construction of the Phase 2 Mitigation Reef. The Catalina quarries will operate at near maximum capacity to be able to produce the quantity (100,800 tons) and quality (size) and supply the requisite mass of quarry material within a calendar year. Currently, quarry operations are on schedule to supply the requisite material mass needed in time to complete the reef build-out during one calendar year (thus avoiding re-mobilization during a second year).

It is the permittee's intention to procure sufficient quarry stock from Catalina Island to complete construction of the Phase 2 Mitigation Reef within one year. Quarry production is proceeding and, barring work stoppages due inclement weather or other factors, the permittee is confident the Catalina facilities will be able to meet the production quotas. The estimated boulder mass (100,800 tons) does not include any contingencies in production interruptions or additional need for quarry stock reserve. The permittee's construction contract includes a provision that an additional 30,000 tons of quarry material be stockpiled at a separate quarry (most likely Ensenada, Mexico). This stockpile is to be held in reserve to assure continued supply if the Catalina quarries cannot deliver the requisite boulder mass, or if the current estimate for bottom coverage density requires augmentation.

Should it become necessary to obtain quarry material from sources other than the proposed Santa Catalina Island quarries, the permittee will consult with Commission staff, including submitting an application to amend this coastal development permit to sanction the procurement of boulders from an alternative source, if the Executive Director deems that a permit amendment is necessary. According to California State Lands Commission, the source of quarry material is not an issue that would warrant a lease modification or filing an addendum to the PEIR (Exhibit 6).

Special Condition 5, Final Design Plan for the Phase 2 Mitigation Reef, ensures that the reef will be built to the specifications required by the Executive Director and detailed in the Final Design Plan. In addition Special Conditions 6, 7, and 8 require procedures and reporting to confirm that the project be built to the specifications required by the Executive Director and ensure that the project avoid impacts upon sensitive biological resources. Special Condition 9 ensures that the artificial reef quarry rock source selection will be sanctioned by the Executive Director. Therefore, the Commission finds that the project, as conditioned, is consistent with sections 30230 and 30231 of the Coastal Act.

## **2. Placing Fill**

Coastal Act section 30233(a) states in relevant part:

*The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:*

...7) Nature study, aquaculture, or similar resource-dependent activities.

The proposed artificial reef project constitutes “fill” as defined by Coastal Act section 30108.2, that states:

*“Fill” means earth or any other substance or material, including pilings placed for the purpose of erecting structures thereon, placed in a submerged area.*

Coastal Act section 30100.2 defines aquaculture as follows:

*“Aquaculture” means a form of agriculture as defined in Section 17 of the Fish and Game Code. Aquaculture products are agricultural products, and aquaculture facilities and land uses shall be treated as agricultural facilities and land uses in all planning and permit-issuing decisions governed by this division.*

Similarly Fish and Game Code section 17 states:

*“Aquaculture” means that form of agriculture devoted to the propagation, cultivation, maintenance, and harvesting of aquatic plants and animals in marine, brackish, and fresh water...*

The proposed Phase 2 Mitigation Reef construction project involves placing fill (clean quarry rock) within coastal waters in the form of a 150 acre artificial reef. Coastal Act section 30233(a) allows the Commission to authorize fill in coastal waters if the proposed fill activity meets three tests. The first test requires the proposed activity to fit within one of seven categories of uses described in Coastal Act section 30233(a)(1)-(7). The second test requires that there be no feasible less environmentally damaging alternatives to the fill. The third test mandates that feasible mitigation measures be provided to minimize the project’s adverse environmental effects.

- 1) Allowable Use Test: Coastal Act section 30233(a)(7) allows fill in open coastal waters for nature study, aquaculture, or similar resource-dependent activities. The proposed artificial reef project consists of the deposition of clean quarry rock on existing sandy ocean bottom. The resultant hard substrate habitat will replace a soft substrate characterized by less diverse and abundant populations of marine plants and animals. The reef is intended to enhance both the production of living marine resources and recreational fishing potential. Therefore, as the Commission found when it approved the experimental reef (CDP #E-97-10), the Commission finds that the proposed mitigation reef project is a resource dependent activity similar to aquaculture and is in conformance with Coastal Act section 30233(a)(7).
- 2) No Feasible, Less Environmentally Damaging Alternatives: The second test of section 30233(a) requires an assessment of whether there are feasible less environmentally damaging alternatives to the proposed fill (quarry rock artificial reef). Through the CEQA process many possible project alternatives were identified for both the Phase 1 Experimental Reef and the Phase 2 Mitigation Reef. Public review of the draft PEIR resulted in suggestions for different experimental treatments, additional sites for both the

experimental and mitigation reef, different methods of growing kelp, and for decommissioning of SONGS. Analysis of alternate mitigation reef locations (North Carlsbad, South Carlsbad, Leucadia, Encinitas, Mission Beach) showed that none of the alternate sites were as suitable for an artificial reef as the San Clemente site. In addition, none of the alternate sites provides the number of acres needed for the mitigation reef build-out, and it would be necessary to combine several sites to meet the size requirements under Condition C of the SONGS permit. The experimental reef design incorporated different experimental treatments and different methods for growing kelp. Monitoring results from the experimental reef were submitted to the Executive Director in 2005. The Executive Director used the results to determine that the Phase 2 Mitigation Reef be comprised of 100% quarry rock and cover 42 to 86% of the ocean floor. Decommissioning of SONGS was not considered a viable alternative because it would require closing down San Onofre Units 2 and 3 to remove the source of damage to the San Onofre kelp bed. Therefore, the Commission finds that there are no feasible, less environmentally damaging alternatives to the proposed design set forth in the Final Design Plan for the Phase 2 Mitigation Reef and that it therefore meets the second test of Coastal Act section 30233(a).

- 3) Feasible Mitigation Measures: The third test under section 30233(a) requires that the project include feasible mitigation measures to minimize adverse environmental effects. The Final Design Plan incorporates a number of mitigation measures to minimize adverse environmental effects including location of the Phase 2 Mitigation Reef off of San Clemente in water 30 to 50 feet in depth, placement of quarry rock on sandy ocean bottom that does not exceed more than 30% hard substrate and that avoids any sensitive biological resources, limiting construction to avoid commercial lobster fishing season, and implementing a spill prevention plan. By requiring the permittee to adhere to these mitigation measures set forth in the Final Design Plan in Special Condition 5 the Commission finds the proposed project meets the third test of Coastal Act section 30233(a).

For the reasons above, the Commission finds this project consistent with section 30233(a) of the Coastal Act.

### **3. Air Quality**

Coastal Act section 30253 states:

*New development shall be consistent with requirements imposed by an air pollution control district or the State Air Resources Control Board as to each particular development.*

The San Diego Air Pollution Control District and the South Coast Air Pollution Control District are the local air districts responsible for implementing federal and state air quality standards in the proposed project area. The PEIR, using emission calculations based on the worst case scenario for a 300 acre mitigation reef, found that construction of the proposed mitigation reef could result in significant daily emissions of nitrous oxide (NO<sub>x</sub>) and fine (<10 micron)

particulate material (PM<sup>10</sup>), and significant quarterly emissions of NO<sub>x</sub>. The final design and location for the mitigation reef was not identified in the PEIR because these decisions would be made after five years of experimental reef monitoring. The PEIR states that "additional means of mitigating air emissions may be available (e.g., cleaner burning engines, etc.) and that it may be possible to create a final design for the mitigation reef that incorporates mitigation measures that reduce project emissions to a less-than-significant level." The emission sources used in PEIR for calculating the worst case scenario figure included truck transport of concrete and quarry rock from San Diego sources 20 miles away, tugboat transport from San Diego Port to the artificial reef site, and construction equipment for building a 300 acre reef.

A number of changes have occurred since the PEIR was certified in 1999. The SONGS permit was amended to require 150 acres of a fully functioning kelp forest community, thus reducing the potential acreage for the mitigation reef from 300 to 150 acres of kelp forest community. The total build out required for the Phase 2 Mitigation Reef is 127.6 acres to be added to the 22.4 acres constructed for the Phase 1 Experimental Reef. Thus, the total build-out for the artificial reef is 150 acres (although additional acreage may ultimately be needed to sustain 150 acres of kelp forest community), which will result in substantially less reef material than was assumed in the PEIR.

In addition, the Executive Director determined that the substrate material shall consist of quarry rock or rubble concrete and that the percent bottom cover will range from 42 to 86%. The permittee's decision to use 100% quarry rock from the Santa Catalina quarries eliminates the need for a land based reef material source which could eliminate the need for trucks to transport the reef material (see discussion on Artificial Reef Quarry Rock, above). (Although there is no need to acquire rubble concrete, additional land based quarry rock is a possibility.) The 42 to 86% bottom coverage is lower than the coverage figure applied to the worst case emission calculations presented in the PEIR. Finally, since the PEIR was certified, construction equipment upgrades and improvements have occurred further reducing the potential project emissions.

The permittee is preparing a revised assessment of the emission impacts from procuring reef material from the Catalina quarries or alternative sources such as the Ensenada, Mexico quarry. The permittee is assessing emissions for several alternative scenarios: (1) obtaining all quarry rock from Catalina quarries (preferred alternative); (2) obtaining the bulk of quarry rock from Catalina quarries and a smaller percentage from the Ensenada, Mexico quarry, and (3) obtaining the bulk of quarry rock from Catalina quarries and a smaller percentage from a San Diego or Los Angeles quarry. The permittee is updating and comparing estimated emissions presented in the PEIR as the 'worst case' vs. 'real case' (with 1997 emission factors) vs. 'real case' (with current emission factors). Additionally, should it become necessary to obtain quarry material from sources other than Santa Catalina Island, the permittee will consult with Commission staff, including submitting an application to amend this coastal development permit, if the Executive Director determines that a permit amendment is necessary. According to California State Lands Commission, the source of reef material is not an issue that would warrant a lease modification or filing an addendum to the PEIR. Prior to construction, the permittee will submit to the Executive Director: (1) the quarry source and emissions analysis required by Special Condition 10, and (2) a copy of the Authority to Construct issued by the appropriate air district(s), if required, or (3) a written explanation that no air district permits or mitigation are required for the

project as required by Special Condition 11. Therefore, the Commission finds that the project, as conditioned, is consistent with section 30253 of the Coastal Act.

#### **4. Commercial and Recreational Fishing**

Coastal Act section 30234.5 states:

*The economic, commercial, and recreational importance of fishing activities shall be recognized and protected.*

Currently the subtidal sand bottom community at the project site is characterized by low densities of common invertebrates and bottom dwelling fish. The proposed project will alter or replace the sand-bottom community over a 127.6 acre area. The net effect of the project will be to replace a low-diversity, low-density community of sand-bottom organisms, which are common throughout the region, with a high diversity, much less common, rocky reef community that will support numerous recreationally and commercially valuable invertebrate and fish species. Within the general project area, recreational fishing takes place from private skiffs and from commercial "party boats". In addition, the rocky areas are important to local commercial lobster fishermen. The proposed project could potentially have a negative impact on fishing activities during the approximately 100 day construction period by: (1) causing fish and motile invertebrates to avoid the project area in response to noise and physical disturbance; (2) excluding fishermen from the construction area; (3) damaging essential habitat; and (4) damaging fishing gear, such as traps.

#### **Behavioral Avoidance**

During placement of reef materials, it is likely that fish and perhaps crabs and lobsters will avoid the area of physical disturbance. However, this disturbance will take place for only a few days in any given area. Most fishes are highly motile and will simply avoid the construction areas. Lobster and sea urchins will be little affected in any event since their rocky habitat will not be directly affected. These temporary changes in movement and local abundance will not cause a significant impact.

#### **Excluding Fisherman from the Construction Area**

The Phase 2 Mitigation Reef is estimated to require about 100 days of construction activities. The Final Design Plan designates that reef construction be limited to the period between May 1 to September 30 to avoid conflict with the lobster fishing season. During construction the quarry rock barge will be moved from place to place to construct the 11 mitigation reef polygons. Therefore, within any given small area (up to ~34 acres or 13.8 hectares) fishing will be restricted for about four days. There are many areas nearby that provide fishing opportunities. Pursuant to the CDFG's artificial reef notification procedures, the permittee will notify the U.S. Coast Guard at least two weeks prior to any barge operations for the proposed mitigation reef construction, and such notice will be included in the Coast Guard's Aid to Navigation and Notice to Mariners. This will allow fishermen and other mariners that conduct operations in the area to select alternative fishing or recreation sites during construction activities. The temporary loss of

anchorage and fishing operations will not significantly impact commercial or recreational fishing.

### **Lost or Damaged Fishing Gear**

During construction activities, fishing equipment on the ocean floor could be damaged or destroyed. The permittee will provide notification of project-related activities to fishermen and other mariners that conduct operations in the area when they notify the U.S. Coast Guard of construction activities at least two weeks ahead of the start date. This will allow the fishermen to select alternative fishing sites and to remove any fishing equipment from the project area prior to construction.

With implementation of the above measures, the Commission finds the project consistent with section 30234.5 of the Coastal Act.

## **5. Public Access and Recreation**

Coastal Act section 30220 states:

*Coastal areas suited for water-oriented recreational activities that cannot readily be provided at inland water areas shall be protected for such uses.*

Coastal Act section 30240 (b) states:

*Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas.*

The site of the proposed project is located offshore from important recreational beaches including the San Clemente State Beach. The proposed project could potentially degrade these recreation areas through the following mechanisms: (1) during large wave events, kelp may be torn from the substrate and carried onto the beach; and (2) during large wave events, quarry rock from the artificial reef could potentially be carried to shore.

### **Kelp Wrack Monitoring**

The permittee conducted a six-year beach monitoring study starting in 1999 following construction of the 22.4 acre Phase 1 Experimental Reef. The study was required under special condition 9 of Coastal Development Permit No. E-97-10 and as specified in Volume II, Appendix H in the Final Program Environmental Impact Report. During the six-year study the amount of kelp that washed ashore each year did not represent a significant increase from background conditions. The average amount of kelp wrack (total of the five sampling stations spanning the 3.7 mile stretch of beach) observed each sampling year is as follows:

- 1999-2000 – 21 ft<sup>3</sup>
- 2000-2001 – 68 ft<sup>3</sup>

- 2001-2002 – 77 ft<sup>3</sup>
- 2002-2003 – 73 ft<sup>3</sup>
- 2003-2004 – 130 ft<sup>3</sup>
- 2004-2005 – 125 ft<sup>3</sup>

The larger Phase 2 Mitigation Reef has the potential to contribute significantly more kelp wrack to local beaches. Kelp wrack is an important component of sandy beach food webs (which include shore birds), but is viewed as a nuisance by many beach goers. Special Condition 12 requires the permittee to perform kelp wrack monitoring after construction of the mitigation reef for four years within 48 hours following large storm and swell events. If the monitoring shows significant amounts of kelp wrack, then additional monitoring may be required. Special Condition 12 also requires the permittee to assist the City of San Clemente with removal of excess kelp wrack if it is documented to be beyond the background quantities recorded in monitoring results and if the city requests help, using mechanical, manpower, and/or monetary assistance.

### **Reef Material Monitoring**

In addition to kelp wrack monitoring, reef material (concrete and quarry rock) monitoring also was conducted during the six-year beach monitoring study. During the entire six-year study, no project concrete or quarry rock was ever observed along the 3.7 mile study section of San Clemente Beach. The PEIR cites observations at San Diego beaches which found that the largest rock with a kelp holdfast that ever washed ashore weighed 13 lb. The smallest sized rock to be used in constructing the mitigation reef will weigh approximately 30 lb. Artificial reef quarry rock is not expected to wash ashore for a number of reasons: distance and depth of the artificial reef (0.6 miles offshore at a depth of approximately 50 feet), six years of monitoring results showing that no experimental reef material ever washed ashore, and anecdotal evidence that natural rocks larger than cobbles rarely wash ashore. Special Condition 12 requires that the permittee perform reef material (quarry rock) monitoring after construction of the mitigation reef for four years within 48 hours following large storm and swell events. Additional monitoring may be required if significant amounts of reef material are found. Special Condition 12 also requires the permittee to remove, or assist in the removal of, any reef material washed ashore when requested to do so by the City of San Clemente.

The 127.6 acre mitigation reef will not affect beach users or surfers and will provide new recreational diving and fishing opportunities. Therefore, the Commission finds that the proposed project is consistent with Coastal Act section 30220. Based on the six-year kelp wrack and rock material monitoring results from the experimental reef, the proposed project is unlikely to have any significant impacts on local beaches. However, because the mitigation reef is much larger than the experimental reef, the potential exists for kelp wrack beyond background quantities to wash ashore. Special Condition 12 requires that the permittee monitor kelp wrack and reef material and respond appropriately when necessary as described above. Therefore, the Commission finds that the proposed project is consistent with Coastal Act section 30240(b).

## 6. Oil Spill Prevention and Response

Coastal Act section 30232 states:

*Protection against the spillage of crude oil, gas, petroleum products, or hazardous substances shall be provided in relation to any development or transportation of such materials. Effective containment and cleanup facilities and procedures shall be provided for accidental spills that do occur.*

The project will use tugboats for the delivery and anchoring of the quarry rock construction barges in offshore and nearshore waters. There is a small risk of an accidental grounding or collision with other vessels (e.g., fishing, recreational, etc.) operating in the area that could result in an oil spill from the tugboat's fuel tanks impacting the sensitive coastal and marine resources in the project area. There is also a small risk of an oil spill from the tugboat's topside operations and machinery.

The first test of Coastal Act section 30232 requires the prevention of oil and hazardous substance spills. In order to avoid and minimize the risk of accidental vessel collision that could result in an oil spill, the applicant will provide information about the vessel locations and work schedules to the U.S. Coast Guard for inclusion in a Notice to Mariners so other vessels operating in the area will be able to avoid the project area during construction. This will be done at least 15 days in advance of commencement of offshore construction activities.

In addition, *A Management of Accidental Discharge Plan* for managing spills due to diesel fuel, oils, pipe leakage, and groundings is included in Appendix F of the project's Final Design Plan includes. This plan identifies a number of oil spill prevention, containment and clean-up measures to avoid and minimize the risk of an oil spill getting into the marine waters. These measures include, but are not limited to, the following: (1) regular inspection of equipment for leaks; (2) spill response equipment (sorbent pads, shovels, containers, etc.) on the tugboat to respond to spills; (3) emergency response training and procedures for the vessel crew to containment and clean-up small spills; and (4) procedures for immediate notification of the appropriate state agencies (i.e., Office of Emergency Services, Office of Spill Prevention and Response (OSPR)), federal agencies (i.e., US Coast Guard, National Response Center), and oil spill response organization (i.e., NRC Environmental) in the event of an emergency and/or spill.

The second part of section 30232 requires effective containment and clean-up measures for accidental spills that may occur. In addition to the spill containment and clean-up measures described above, the applicant has a contract with NRC Environmental. In the event of an oil spill, or a threat of an oil spill, impacting the marine waters, NRC Environmental would respond with its oil spill response vessels, booms, skimmers, storage, and trained personnel to contain and remove the oil from the marine environment and the shoreline. NRC Environmental has received an approval rating by California OSPR for "on-water containment and recovery" and "shoreline protection" pursuant to California regulation 14 CCR section 819.04(b)(1)."

For the reasons discussed above, the Commission finds the project consistent with the oil spill prevention and response requirements of Coastal Act section 30232.

## 7. Cumulative Impacts

Coastal Act section 30250 requires that:

*New...development...shall be located...where it will not have significant adverse effects, either individually or cumulatively on coastal resources.*

Coastal Act section 30105.5 defines cumulative impact as:

*"Cumulatively" or "cumulative effect" means the incremental effects of an individual project shall be reviewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.*

The proposed project would result in the exchange of natural sandy substrate for rocky substrate which, combined with other past, present or future artificial reef projects could cause a significant change in the habitat offshore Orange County. However, the percentage of soft substrate habitat is significantly greater than the percentage of hard substrate in the area. Furthermore, the proposed project is intended to compensate for biological resources that were previously lost, and will serve to benefit the environment by increasing the biological productivity of coastal waters.

The PEIR identified eight other marine construction projects along the southern California coast that involve dredging or filling and that could potentially affect resources in the vicinity of the project site. However, these projects are located from 15 to 25 miles away from the project site. These distances preclude any directed cumulative effects for water quality.

The PEIR determined with regard to air quality impacts that even if project emissions were below the daily and quarterly thresholds for significance, air emissions from the construction of the mitigation reef would still create unavoidable significant adverse effects on a cumulative basis. One of the remedies suggested in the PEIR to avoid the cumulative effect is to construct the reef over a two-year period. As discussed above in section 3, Air Quality, there have been changes in the proposed mitigation reef project since the PEIR was certified. These changes have resulted in a substantial decrease in the amount of reef material that needs to be transported to and placed at the mitigation reef site (from 777,280 tons to 100,800 tons) This reduction of rock, along with construction equipment upgrades and improvements that have the potential effect of further reducing project emissions, makes it likely that the emissions from the reef project, as now proposed, have been reduced to a level such that there will be no significant adverse cumulative effect.

The permittee is in the process of obtaining a revised air quality impact assessment that must be submitted to the Executive Director prior to the commencement of construction of the reef project (Special Condition 10). If the revised air quality impact assessment continues to show that there are unavoidable significant impacts, then the permittee is required to submit a permit amendment for Commission approval that includes additional mitigation measures, including the possibility of constructing the reef over a two-year period.

The Commission finds, therefore, that, as conditioned, there will be no significant adverse cumulative impacts and the project is therefore consistent with sections 30250 and 30105.5 of the Coastal Act.

## **F. ADDITIONAL DATA**

To properly assess whether the Phase 2 Mitigation Reef polygons have been appropriately located, Commission staff and contract scientists need to review the spatially explicit data files used to determine polygon placement. While some data collected during the hydrographic and geophysical survey for the mitigation reef have been provided, the data are not comprehensive with regard to the final reef design and do not have appropriate metadata, including but not limited to variable descriptions, units, and geographic and projected coordinate system. The permittee has committed to providing the Commission with these files prior to commencement of mitigation reef construction as required by Special Condition 2.

## **G. CEQA**

Section 13096(a) of the Commission's administrative regulations requires Commission approval of coastal development permit applications to be supported by a finding showing the application, as conditioned by any conditions of approval, to be consistent with any applicable requirements of the California Environmental Quality Act (CEQA). Section 21080.5(d)(2)(A) of CEQA prohibits a proposed development from being approved if there are feasible alternatives or feasible mitigation measures available which would substantially lessen any significant adverse effect, which the activity may have on the environment.

The Commission finds that, the proposed project, as conditioned, complies with the California Environmental Quality Act of 1970 because either (1) feasible mitigation measures and/or alternatives have been incorporated to substantially lessen any significant adverse effects of the development on the environment, or (2) there are no further feasible mitigation measures or alternatives that would substantially lessen any significant adverse impacts of the development on the environment. Therefore, the proposed project, as conditioned, has been adequately mitigated and is determined to be consistent with CEQA and the policies of the Coastal Act.

## V. APPENDICES

### APPENDIX A: SUBSTANTIVE FILE DOCUMENTS

- Bedford, W. D. 1997. Material Specification Guidelines and Notification Procedure for Augmentation of Artificial Reef with Surplus Materials. Department of Fish and Game, Marine Resources Region, Long Beach, California. 2 pp.
- Coastal Environments. 1999a. Construction of Southern California Edison Experimental Artificial Kelp Reef, San Clemente, California, Volume I. Report submitted to Southern California Edison, Rosemead, CA 91770, 24 November 1999, CE Ref. No. 99-14. 35 pp. and 4 Appendices.
- Coastal Environments. 1999b. Construction of Southern California Edison Experimental Artificial Kelp Reef, San Clemente, California, Volume II. Report submitted to Southern California Edison, Rosemead, CA 91770, 24 November 1999, CE Ref. No. 99-15. 6 pp. and 4 Appendices.
- Coastal Environments. 2006. Preliminary Design Plan for the Wheeler North Reef at San Clemente, California (SONGS Artificial Reef Mitigation Project), Phase 2 Mitigation Reef. Submitted to Southern California Edison, Rosemead, CA 91770, 12 May 2006, CE Ref. No. 06-04A. 30 pp. and 4 appendices.
- Coastal Environments, Fugro Pelagos, Inc., and EcoSystems Management Associates, Inc. 2006b. Sea Floor Characterization For Songs Artificial Reef Mitigation Project at San Clemente, California. Report submitted to Southern California Edison, Rosemead, CA 91770, 16 March 2006, Volume I, CE Ref. No. 06-01. 54 pages and 3 Appendices.
- Coastal Environments, Fugro Pelagos, Inc., and EcoSystems Management Associates, Inc. 2006c. Sea Floor Characterization For Songs Artificial Reef Mitigation Project at San Clemente, California. Report submitted to Southern California Edison, Rosemead, CA 91770, 16 March 2006, Volume II, CE Ref. No. 06-02.
- Elwany, H, Deysher, L. and T. Norall. October 2007. Final design plan, Work Execution Plan, Wheeler North Reef Construction, SONGS Artificial Reef Mitigation Project
- Elwany, H, Deysher, L. and T. Norall. December 2007. Revised Final Design Plan. Wheeler North Reef at San Clemente, California (SONGS Artificial Reef Mitigation Project, Phase 2 Mitigation Reef). Coastal Development Permit # E-07-010 for Southern California Edison Company. Prepared by Coastal Environments, CE Reference No. 07-23
- Elwany, H. 2006. Geology and soil report: Seafloor Characterization for SONGS Artificial Reef Mitigation Project at San Clemente, California, Vols. I and II, Coastal Environments,

Fugro Pelagos & EcoSystems Management Associates, 3/16/06 (CE Reference No. 06-01)

Final Program Environmental Impact Report for the Construction and Management of an Artificial Reef in the Pacific Ocean near San Clemente, California. Vol. I & II. Prepared for the California State Lands Commission by Resource Insights and dated May 1999.

Reed, C. D., S. C. Schroeter, and David Huang. 2005. Final Report on the Findings and Recommendations of the Experimental Phase of the SONGS Artificial Reef Mitigation Project. Prepared for the California Coastal Commission, Marine Science Institute, University of California, Santa Barbara, 1 August 2005. 136 pp.

Revised Final Design Plan: WNR at San Clemente, CA (SONGS Artificial Reef Mitigation Project, Phase 2 Mitigation Reef), 1/22/08 (CE Ref No. 07-23)

San Clemente Experimental Artificial Reef: San Clemente Kelp Mitigation Project, Sixth Annual Beach Monitoring Report, Nov 2004-Oct 2005

**EXHIBIT 1, Application #E-07-010  
EXCERPTS FROM CONDITIONS C AND D,  
CDP #6-81-330-A as amended April 1997**

**CONDITION C: KELP REEF MITIGATION**

NOTE: The following text excerpted from Condition C pertains to the Phase 2 Mitigation Reef.

...

**1.2 Final Site Selection**

Selection of the actual...reef site from among the potential sites shall be based on, but not limited, the following criteria:

1. Location as close as possible to the [San Onofre Kelp bed], and preferably between Dana Point (Orange Co.) and Carlsbad (San Diego Co.), but outside the influence of the SONGS discharge plume and water intake, and away from Camp Pendleton.
2. Minimal disruption of natural reef or cobble habitats and sensitive or rare biotic communities.
3. Suitable substrate with low mud and/or silt content (e.g., hard-packed fine to coarse grain sand, exposed cobble or bedrock covered with a thin layer of sand).
4. Location at a depth locally suitable for kelp growth and recruitment.
5. Location near a persistent natural kelp bed.
6. Location away from sites of major sediment deposition.
7. Minimal interference with uses such as vessel traffic, vessel anchorages, commercial fishing, mariculture, mineral resource extraction, cable or pipeline corridors.
8. Location away from power plant discharges, waste discharges, dredge spoil deposition sites, and activities of the U.S. Marine Corps.
9. Location that will not interfere with or adversely affect resources of historical or cultural significance such as shipwrecks and archeological sites.

...

**2.0 MITIGATION REEF**

In addition to construction of the 16.8-acre experimental reef, the permittee shall be responsible for the construction of at least 133.2 acres of artificial reef (yielding a minimum of 150 acres of artificial reef hereafter referred to as the "mitigation reef") that meets the performance standards listed below as mitigation for the resource losses at the San Onofre Kelp bed (SOK) cause by operation of the SONGS. The larger artificial reef may be an expansion of the experimental reef or may be established in a different location, provided that the larger reef

shall be located in the vicinity of SONGS, but outside the influence of SONGS discharge plume and water intake. The selection of a site for the larger artificial reef shall be based on the final site selection criteria stated in Section 1.2 above.

The purpose of the mitigation reef is to provide kelp bed community resources to replace the resources lost due to the operation of SONGS Units 2 and 3. Thus, the mitigation reef shall be designed to replace the lost and damage resources at the San Onofre kelp bed and resulting production of a persistent giant kelp forest and associated ecosystem.

## **2.1 Mitigation Reef Design and Planning**

Within six months after completion of independent monitoring of the experimental reef, the permittee shall submit a preliminary plan describing the location and design of the mitigation reef to the Executive Director for review and approval. The type of hard substrate and the percent cover of hard substrate proposed in the preliminary plan for the mitigation reef shall be determined by the Executive Director.

The Executive Director will consult with the Coastal Commission scientists, scientific advisors, resource agencies, and others as appropriate to evaluate whether the preliminary plan meets the goals set forth in Section 2.2 below. Within one month following the Executive Director's determination that the preliminary plan meets the specified criteria, the permittee shall initiate development of a final mitigation plan along with appropriate CEQA and/or NEPA environmental impact analyses necessary in connection with local, State or other agency approvals.

Within twelve months of the Executive Director's approval of a preliminary plan for the mitigation reef, the permittee shall submit a final mitigation plan to the Coastal Commission in the form of a coastal development permit application. The final plan shall specify location, depth, overall hard substrate coverage, size and dispersion of reef materials, and reef relief and shall substantially conform to the preliminary plan approved by the Executive Director.

## **2.2 Mitigation Reef Goals**

The primary goals of the mitigation reef shall be to provide adequate conditions for a community of reef-associated biota similar in composition, diversity and abundance to the San Onofre kelp bed that compensate for the losses incurred by SONGS operations.

## **2.3 Mitigation Reef Construction**

The permittee shall construct the reef in accordance with the final plan in the approved coastal development permit. The permittee shall begin construction of the reef no later than 6 months after Commission approval of a coastal development permit for the reef. The permittee shall complete a post-construction survey to demonstrate that the reef was built to approved specifications. If the Executive Director determines that the reef was not built to specifications, the permittee shall modify the reef to meet the approved specifications within 90 days of the post-construction survey. Extension of this time limit may be granted by the Executive Director for good cause.

## **2.4 Monitoring**

After construction of the mitigation reef is completed, the reef will be monitored, managed, and, if necessary, remediated. The following sections described the basic tasks required for monitoring the mitigation reef pursuant to this condition. Condition D specifies that the permittee

shall provide funds to the Commission or an independent entity designated by the Executive Director for the purpose of completing the monitoring, as specified below.

A monitoring plan for the mitigation reef shall be developed by the Commission staff scientists pursuant to Condition D. The monitoring plan shall be completed within six months of approval of a coastal development permit for the mitigation reef proposed in a final plan developed pursuant to this condition. The monitoring plan shall provide an overall framework to guide the monitoring work. The monitoring plan shall describe the sampling methodology, analytical techniques, and methods for measuring performance of the mitigation reef relative to the performance standards identified below.

Monitoring independent of the permittee shall be implemented in accordance with Condition D to: (1) determine whether the performance standards of this condition are met (i.e., whether the mitigation reef successfully replaces the lost and damaged resources in the San Onofre Kelp bed), (2) if necessary, determine the reasons why any performance standard has not been met, and (3) develop recommendations for appropriate remedial measures. The permittee shall be responsible for fully implementing any remedial measures deemed necessary by the Executive Director.

Following completion of construction the mitigation reef shall be monitored for a period equivalent to the operating life of SONGS. The independent monitoring program for the mitigation reef shall be designed to assess whether the performance standards have been met. If these standards are met after ten years following the completion of the construction, then monitoring can be reduced to annual site inspections. The permittee shall undertake necessary remedial actions based on the monitoring results and annual site inspections for the full operating life of the SONGS Units 2 and 3.

The following performance standards shall be used in measuring the success of the mitigation reef to determine whether remediation is necessary:

a. Substrate

1. The reefs shall be constructed of rock, concrete, or a combination of these materials, as determined from results of the experimental reef to be suitable for sustaining a kelp forest and a community of reef-associated biota similar in composition, diversity and abundance to the San Onofre kelp bed.
2. The total areal extent of the mitigation reef (including the experimental reef and all larger artificial reefs) shall be no less than 150 acres.
3. At least two-thirds (67 percent) of the 150-acre mitigation reef area shall be covered by exposed hard substrate. Should the results of the experimental reef indicate that a different coverage of hard substrate is necessary or adequate to meet this goal (as determined by the Executive Director), the Executive Director may change the coverage requirement.
4. At least 90 percent of the exposed hard substrate must remain available for attachment by reef biota. The permittee shall be required to add sufficient hard substrate to the mitigation reef to replace lost or unsuitable hard substrate, if at any time the Executive director determines that more than 10 percent of the hard substrate within the reef has become covered by sediment, or has become unsuitable for growth of attached biota due to scouring, and there is no sign of

recovery within three years. The Commission scientists in accordance with Condition D shall initiate surveys to monitor the amount and distribution of exposed hard substrate. These surveys shall begin immediately after construction is complete and continue for at least ten years.

b. Kelp bed

The artificial reef(s) shall sustain 150 acres of medium-to-high density giant kelp. For purposes of this condition, medium-to-high density giant kelp is defined as more than 4 adult *Macrocystis pyrifera* plants per 100 m<sup>2</sup> of substrate, as determined by down-looking sonar surveys or equivalent monitoring techniques in accordance with Condition D. If the average area of medium to high density giant kelp falls below 150 acres, then the reason for this failure shall be determined by independent monitoring overseen by Commission scientists. The permittee shall implement any remedial measures deemed necessary by the Executive Director.

The permittee's remediation requirement shall include the funding of independent studies that are necessary to determine the reasons for lack of kelp coverage as well as feasible corrective action, as determined by the Executive Director. If the failure is due to insufficient hard substrate, the corrective action shall entail the permittee adding more hard substrate to the reef.

If sufficient hard substrate appears to be available but kelp recruitment is low, then corrective action could include the permittee funding independent studies of kelp recruitment that are designed to determine the best method of establishing kelp on the reef. The Executive Director shall determine whether such studies are necessary.

The method determined by the Executive Director most likely to be a successful and reliable corrective action for low kelp abundance shall be implemented by the permittee until kelp coverage meets this performance standard; however, kelp establishment or augmentation methods shall not be required for more than a total of five years. If oceanographic conditions are unfavorable to kelp during part of this period, the Executive Director may defer the effort to establish kelp.

c. Fish

The standing stock of fish at the mitigation reef shall be at least 28 tons and the following performance standards shall hold:

1. The resident fish assemblage shall have a total density and number of species similar to natural reefs within the region.
2. Fish reproductive rates shall be similar to natural reefs within the region.
3. The total density and number of species of young-of-year fish (fish less than 1 year old) shall be similar to natural reefs within the region.
4. Fish production shall be similar to natural reefs within the region.

d. Benthos

1. The benthic community (both algae and macroinvertebrates) shall have coverage or density and number of species similar to natural reefs within the region.

2. The benthic community shall provide food-chain support for fish similar to natural reefs within the region.
3. The important functions of the reef shall not be impaired by undesirable or invasive benthic species (e.g., sea urchins or *Cryptoarachnidium*).

Independent monitoring data collected concurrently at natural kelp bed reference sites within the region shall be used by Commission scientists to determine the similarity for each variable listed above. The standard of comparison (i.e., the measure of similarity to be used and the method for determining the statistical significance of differences) shall be specified in the monitoring plan. If the standards listed above are not met within ten years after reef construction, then the permittee shall undertake those remedial actions the Executive Director deems appropriate and feasible.

The permittee shall insure that the performance standards and goals set forth in this condition will be met for at least the length of time equivalent to the full operating life of SONGS Units 2 and 3.<sup>2</sup> Upon completion of ten years of independent monitoring that demonstrate the mitigation reef is in compliance of the performance standards, the permittee shall be fully responsible for funding independent annual site inspections, which will serve to identify and noncompliance with the performance standards. The monitoring plan (specified above) shall describe the requirements and methods of the annual site inspections.

The Executive Director may also use any other information available to determine whether the performance standards are being met. If information from the annual site inspections or other sources suggest the performance standards are not being met, then the permittee shall be required to fund an independent study to collect the information necessary to determine what remediation is needed. The Executive Director shall determine the required remedial actions based on information from the independent study. The permit shall be required to implement any remedial measures determine necessary by the Executive Director in consultation with state and federal resource agencies, as well as provide funds for independent monitoring that evaluates the success of the required remediation. ...

## **CONDITION D: ADMINISTRATIVE STRUCTURE**

### **1.0 ADMINISTRATION**

Personnel with appropriate scientific or technical training and skills will, under the direction of the Executive Director, oversee the mitigation and monitoring functions identified and required by conditions II-A through C. ...

This technical staff will oversee the preconstruction and post-construction site assessments, mitigation project design and implementation (conducted by permittee), and monitoring activities (including plan preparation); the field work will be done by contractors under the Executive Director's direction. The contractors will be responsible for collecting the data, analyzing and interpreting it, and reporting to the Executive Director.

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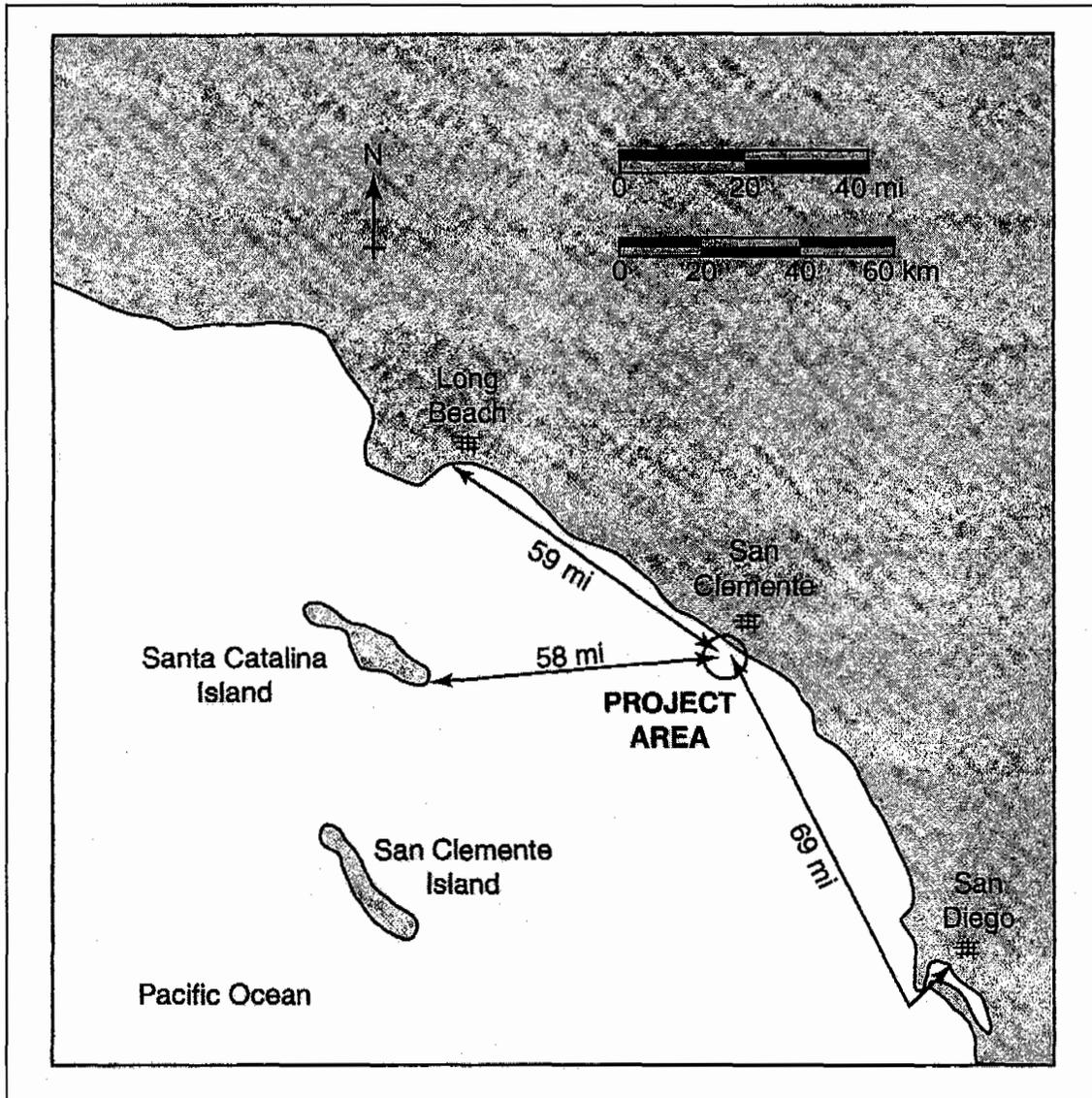
<sup>2</sup> "Full operating life" as defined in this permit includes past and future years of operation of SONGS Units 2 and 3, including the decommissioning period to the extent there are continuing discharges.

The Executive Director shall convene a scientific advisory panel to provide the Executive Director with scientific advice on the design, implementation and monitoring of the wetland restoration and artificial reef. ...

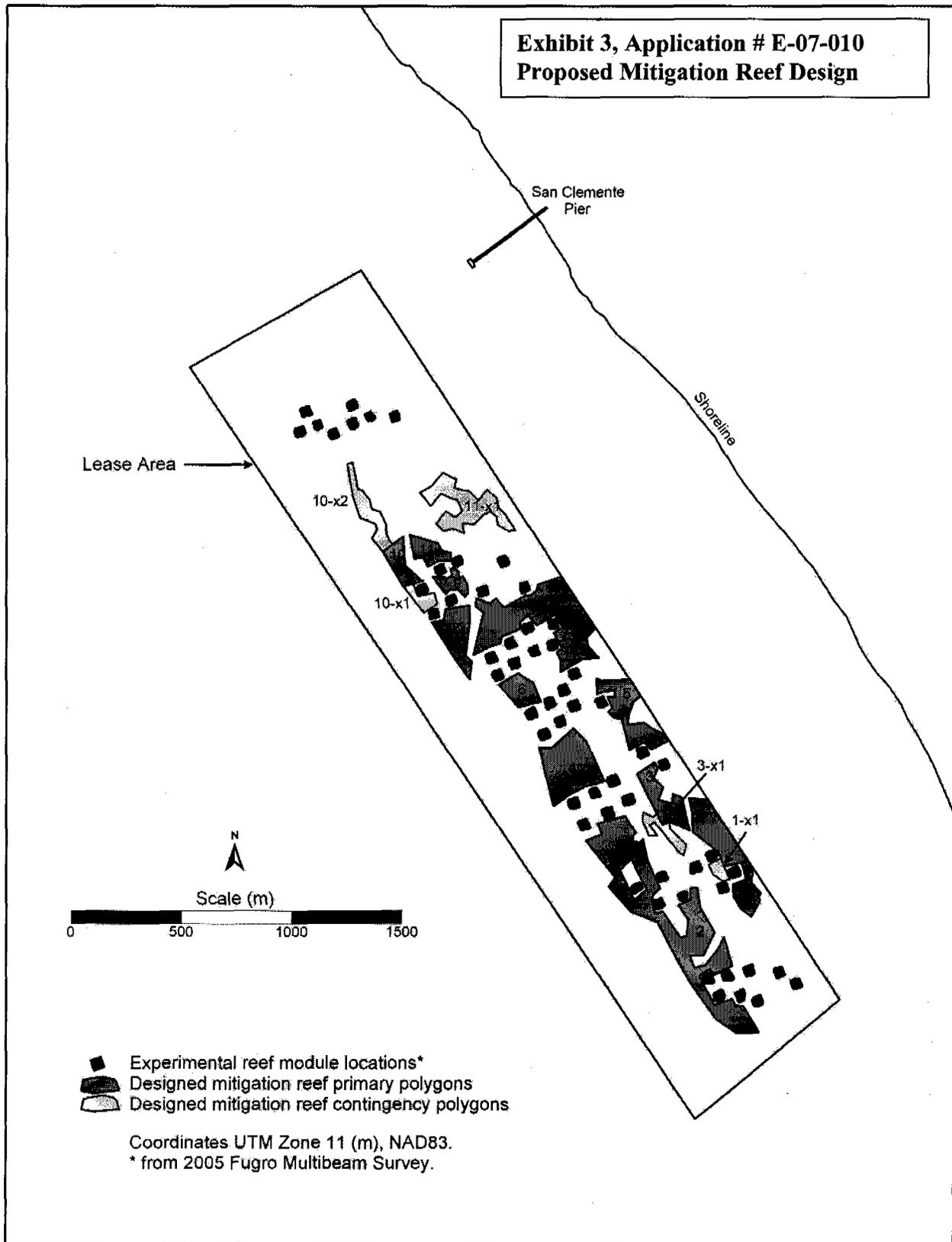
## **2.0 BUDGET AND WORK PROGRAM**

The funding necessary for the Commission and the Executive Director to perform their responsibilities pursuant to these conditions will be provided by the permittee ... The amount of funding will be determined by the Commission on a biennial basis and will be based on a proposed budget and work program, which will be prepared by the Executive Director in consultation with the permittee, and reviewed and approved by the Commission. ...

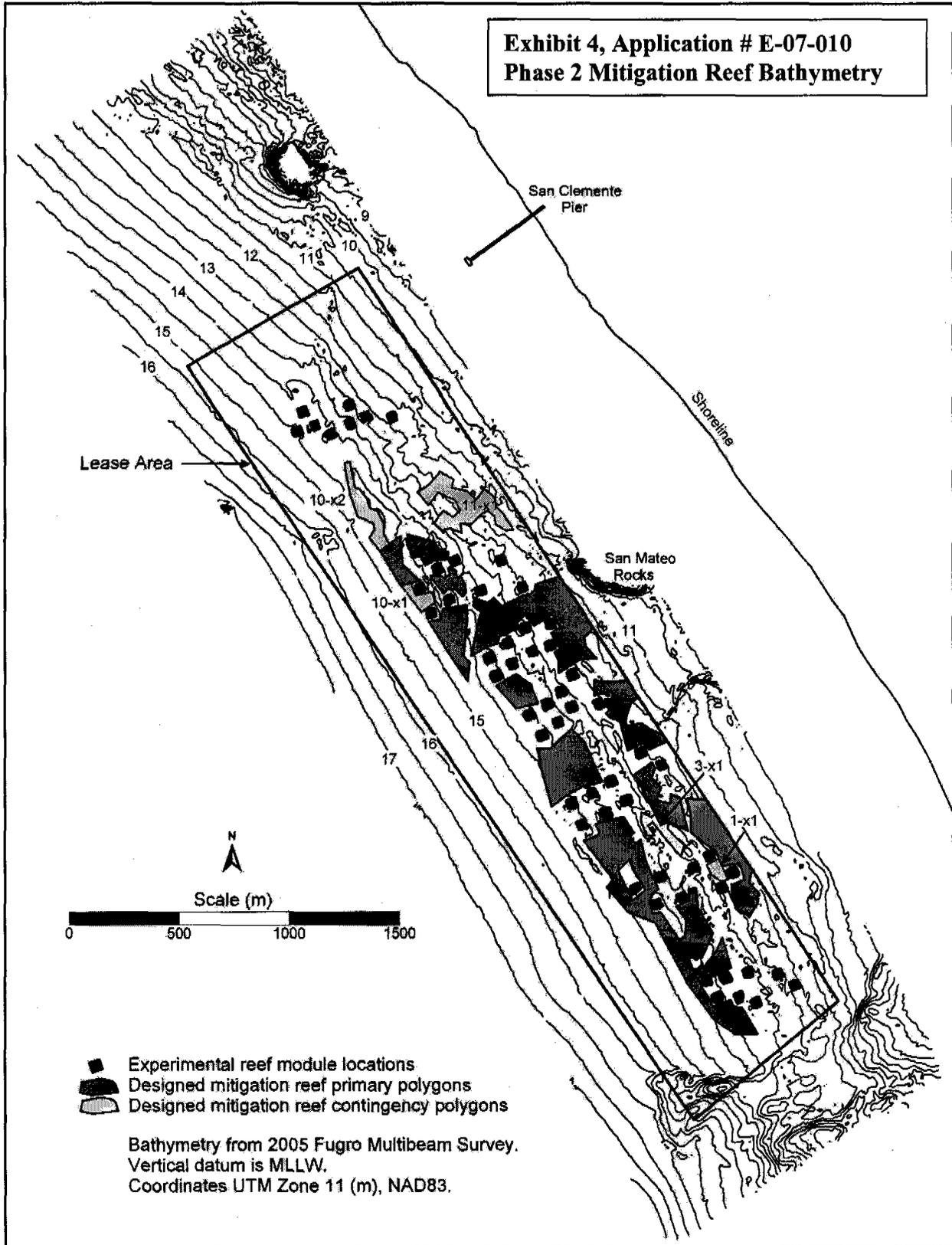
**Exhibit 2, Application # E-07-010  
Project Location Map**



*From Final Design Plan (12/10/07), Figure 1 -1. Location map of the project site.*



Adapted from Final Design Plan (12/10/07), Fig. 4.3, Phase 2 Mitigation Reef and contingency areas.



Adapted from Final Design Plan (12/10/07, Fig. A-1, Bathymetry)

**Exhibit 5, Application # E-07-010**

STATE OF CALIFORNIA

ARNOLD SCHWARZENEGGER, Governor

**CALIFORNIA STATE LANDS COMMISSION**  
100 Howe Avenue, Suite 100-South  
Sacramento, CA 95825-8202



**PAUL D. THAYER, Executive Officer**  
(916) 574-1800 FAX (916) 574-1810  
Relay Service From TDD Phone 1-800-736-2929  
from Voice Phone 1-800-736-2922

Contact Phone: (916) 574-1892  
Contact FAX: (916) 574-1925

October 29, 2007

File Ref: PRC 8097.1

Jonna Engel  
California Coastal Commission  
89 South California Street, Suite 200  
Ventura, CA 93001

Dear Ms. Engel:

**SUBJECT: Amendment of Lease PRC 8097.1 Authorizing Phase II of the  
Wheeler North Reef**

Pursuant to your request, this will confirm that on November 21, 2006, the California State Lands Commission (CSLC) approved the subject Lease Amendment for construction of Phase II of the Wheeler North Reef by the Southern California Edison Company (Minute Item 37). In approving the lease amendment, the CSLC found that the information and analyses contained in the Environmental Impact Report (Program), Findings and Mitigation Monitoring Program previously prepared, certified, and adopted by the CSLC on June 14, 1999, remained valid for the Phase II project.

If you have any further questions, please contact Colin Connor, Assistant Chief, at (916) 574-1241.

Sincerely,

A handwritten signature in cursive script, appearing to read "Jane E. Smith".

Jane E. Smith  
Public Land Management Specialist

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CALIFORNIA  
COASTAL COMMISSION  
SOUTH CENTRAL COAST DISTRICT

Exhibit 6, Application # E-07-010

STATE OF CALIFORNIA

ARNOLD SCHWARZENEGGER, Governor

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CALIFORNIA  
COASTAL COMMISSION  
SOUTH CENTRAL COAST DISTRICT

December 5, 2007

File Ref: PRC 8097.1

Jonna Engel  
California Coastal Commission  
89 South California Street, Suite 200  
Ventura, CA 93001

Dear Ms. Engel:

**SUBJECT:** Acquisition of Quarry Rock by Southern California Edison for Phase II of the Wheeler North Reef

Pursuant to your request, this will summarize the position of the staff of the California State Lands Commission (CSLC) concerning the proposed impacts of Southern California Edison Company's obtaining quarry rock for the Phase II project from a quarry near Ensenada, Mexico.

As you are aware, this was not a component of Edison's project at the time the CSLC prepared, certified and adopted the Program Environmental Impact Report, Findings and Mitigation Monitoring Program on June 14, 1999. In addition, the lease that was issued by the CSLC to Edison for the reef project (Lease No. PRC 8097.1) does not address from where the quarry rock will be obtained.

As to Coastal Commission staff's inquiry as to whether the CSLC should consider a supplemental PEIR, CEQA Guidelines 15162 (c) states: "Once a project has been approved, the lead agency's role in project approval is completed, unless further discretionary approval on that project is required. Information appearing after an approval does not require reopening of that approval. If after the project is approved, any of the conditions described in subdivision (a) occurs, a subsequent EIR or negative declaration shall only be prepared by the public agency which grants the next discretionary approval for the project, if any. In this situation no other responsible agency shall grant an approval for the project until the subsequent EIR has been certified or subsequent negative declaration adopted."

Jonna Engel

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December 5, 2007

It is the position of staff that no further discretionary approval by the CSLC is required. This is because the CSLC lease does not address the quarry rock source, and the lease does not need to be amended. If you have any further questions, please contact Pam Griggs, Staff Counsel, at (916) 574-1854.

Sincerely,



Jane E. Smith  
Public Land Management Specialist

cc: Robert Grove, SCE  
Pam Griggs, Staff Counsel  
Marina Brand, DEPM  
Colin Connor, Asst. Chief/LMD

