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Item No:	5a

**STAFF REPORT  
REGULAR CALENDAR**

**Application No:** E-97-10

**Project Applicant:** Southern California Edison Company (SCE)  
(as managing partner)

**Location:** State waters 0.6 miles offshore from the City of San Clemente, Orange County (Exhibit 1)

**Project Description:** Construction of an experimental artificial reef in shallow water (c. 40 - 50 ft) to determine which of several designs is most likely to support the development of a giant kelp forest community. The results of this 5-year experiment will be used to design an artificial reef that provides at least 150 acres of medium to high density kelp forest and the associated community to compensate partially for the resource losses caused by the operation of Units 2 and 3 of the San Onofre Nuclear Generating Station. The proposed project is a component of a comprehensive mitigation program required by the Coastal Commission in permits granted to Southern California Edison Company and its partners.

**Substantive File Documents:** See Appendix A.

**SYNOPSIS**

On April 9, 1997, the Coastal Commission adopted a resolution approving amended conditions to the coastal development permit granted to Southern California Edison Company (SCE) and its partners for the San Onofre Nuclear Generating Station (SONGS). Condition C of the amended

permit requires the construction of an artificial reef which will support a community of reef-associated biota similar in composition, diversity and abundance to the San Onofre kelp bed and which will compensate for the losses incurred by the operation of SONGS. This reef shall be constructed in two phases: (1) an initial experimental phase, and; (2) a second mitigation phase. The 1997 amended Condition C requires the Executive Director to review a preliminary plan for the design of the experiment reef and requires Commission approval of a Coastal Development Permit for the final design and construction of the reef.

The California State Lands Commission (SLC) was the lead agency under California Environmental Quality Act (CEQA) for construction of the experimental artificial reef. Staff of the SLC determined that an Environmental Impact Report was necessary and decided that a Program EIR was most appropriate due to the reasonably foreseeable later construction of a larger mitigation reef. During the environmental review process required under the CEQA, there was substantial public interest in the project and many suggestions for alterations to the originally proposed project were received. All these suggestions were given careful consideration by SLC Staff, Commission scientific staff, California Department of Fish and Game and SCE. As a result of this process, SCE altered its proposed project to incorporate those suggestions that were found to be both useful and feasible.

The purpose of the proposed experimental reef is to assess the effectiveness of alternative reef designs and materials and management techniques, and to identify the designs which are most likely to meet performance standards. The final experimental design of the proposed project was developed by SCE with substantial review and input from Commission scientists and from the California Department of Fish and Game. SCE proposes construction of an artificial kelp reef using two substrates (concrete and quarry rock), each deployed in 3 configurations (17%, 34%, and 67% coverage of the sandy seafloor). In addition, they propose testing kelp-transplanting techniques on both concrete and quarry rock, each deployed at 34% coverage of the seafloor. The experimental design calls for these 8 experimental treatments to be grouped near one another and for 7 replicate groups of treatments to be spaced more-or-less uniformly throughout the SCE lease site. This will require 22.4 acres of constructed reef. The 862-acre lease site is located offshore from the city of San Clemente in southern Orange County, California.

Table 1 (below) summarizes project-related significant issues, potential impacts, and mitigation measures that the applicants will need to implement to avoid, or reduce to insignificance any impacts to coastal resources.

### ***Recommendation***

As described in the findings, the proposed project, as conditioned, is consistent with the Coastal Act and staff therefore recommends **approval** of the project as conditioned.

## **1.0 STAFF RECOMMENDATION**

### **Approval With Conditions**

The staff recommends conditional approval of the permit application.

**Motion:**

I move that the Commission approve Coastal Development Permit Application No E-97-10, subject to the conditions specified in the staff recommendation dated June 24, 1999.

The staff recommends a YES vote. To pass the motion, a majority vote of the Commissioners present is required. Approval of the motion will result in the adoption of the following resolution and findings.

**Resolution:**

The Coastal Commission hereby **grants** permit No. E-97-10, subject to the conditions specified below, on the grounds that as conditioned the development will (1) conform with the provisions of Chapter 3 of the California Coastal Act of 1976, and (2) meet the requirements of Section 21080.5 of the California Environmental Quality Act in that there are no feasible alternatives or feasible mitigation measures, other than those specified in this permit, which would substantially lessen any significant adverse impact which the activity may have on the environment.

**Table 1. Issue Summary: Potential Project-Related Impacts and Mitigation Measures**

Potential Impact	Analysis
<b>Marine Resources</b>	<p><b>Issue:</b> Habitat Conversion. Inherent in any artificial reef project is the conversion of sand-bottom habitat to rocky reef habitat. This is generally accepted as providing a net benefit because (1) along the southern California coast the shallow areas covered by sand are much more common and much larger than shallow areas with rocky substrates, and; (2) the biological productivity of rocky reef communities, especially kelp forests, is much higher than sand-bottom habitats. However, there are sand-bottom communities, such as a large, dense sand dollar beds, that are considered special features due their relative rarity and importance for other species.</p> <p><b>Mitigation Measures:</b> Special Condition C of the applicant's amended coastal development permit, incorporated herein as <b>Special Condition 1</b>, requires minimal disruption of sensitive or rare biotic communities. The applicant is in the process of surveying each of the 56 locations chosen for the experimental modules. <b>Special Condition 5</b> requires the applicant to obtain Executive Director approval of a report that demonstrates that no rare or sensitive biota are present within the module sites prior to beginning construction.</p> <p><b>Issue:</b> Damage to existing biota. The sand-bottom that has been identified as suitable for an artificial reef is near and sometime interspersed with existing rocky habitats. There is the potential for damaging existing rocky communities by placing reef materials on them and by anchoring activities.</p> <p><b>Mitigation Measures:</b> Special Condition C of the applicant's amended coastal development permit, incorporated herein as <b>Special Condition 1</b>, requires minimal disruption of natural reef or cobble habitats. <b>Special Condition 5</b> requires the applicant to obtain Executive Director approval of a report that demonstrates that no significant rocky habitat is present within the module sites prior to beginning construction. <b>Special Condition 6</b> requires the applicant to obtain Executive Director approval of an anchoring plan that avoids damage to sensitive rocky habitats prior to beginning construction.</p> <p><b>Issue:</b> Degradation of water quality through the introduction of artificial reef materials. The California Department of Fish and Game provides criteria for the selection of suitable artificial reef materials. The clean, high-density concrete and quarry rock which will be used for the proposed project are safe and acceptable materials according to the Department's criteria. There will be no degradation of water quality and no mitigation is required.</p>
<b>Commercial and Recreational Fishing</b>	<p><b>Issue:</b> Avoidance of the project area by harvestable fish and invertebrates. It is likely that many motile species will avoid the immediate area of construction activities. These activities will take place for only a few days in each locality and the total area of each block within which construction will take place is about 8 - 14 acres. These temporary changes will not cause a significant impact.</p> <p><b>Issue:</b> Exclusion of fishing activities and damage to fishing gear. Within each construction block of about 8 - 14 acres, commercial and recreational fishing activities will be excluded for about 4 days. There are many nearby areas that have traditionally provided fishing opportunities. However, if commercial fishermen and party-boat operators do not know where construction is taking place, they may place traps in harms way or have to alter their fishing plans in the field with a consequent loss of time.</p> <p><b>Mitigation Measures:</b> <b>Special Condition 7</b> requires the applicant to provide notice to mariners of the location and duration of construction activities. This will enable fishermen to plan their activities to avoid construction conflicts. The temporary loss of anchorage and fishing opportunities will not significantly impact commercial or recreational fishing.</p> <p><b>Issue:</b> Lost or damaged habitat. This issue is discussed in the Marine Resources Section, above.</p>

**Table 1 (cont.). Issue Summary: Potential Project-Related Impacts and Mitigation Measures**

<b>Air Quality</b>	<p><b>Issue:</b> Potentially significant emissions of air pollutants during the construction period. Actual emissions of pollutants will depend on the source of materials and transport and construction methods. During the approximately 30 days of construction there may be significant emissions of nitrous oxides and fine particulates.</p> <p><b>Mitigation Measures:</b> <b>Special Condition 8</b> requires that, prior to beginning construction, the applicant shall submit (1) a copy of the written determination from the appropriate air district(s) that no permits or mitigation are required; or, (2) a copy of the Authority to Construct issued by the appropriate air district(s).</p>
<b>Recreational Areas</b>	<p><b>Issue:</b> Possible rocks on the beach. Large waves can dislodge rocks from the seafloor and move them about. If the rock is buoyed by an attached kelp plant, movement is more likely. However, the quarry rocks and concrete pieces that will be used for reef construction weight several hundred pounds and are unlikely to be moved the 0.6 mi to the beach. However, there is a small possibility that smaller broken materials could be transported onto nearby beaches endangering beach users.</p> <p><b>Mitigation Measures:</b> <b>Special Condition 9</b> requires the applicant to monitor the beach from 1 km (.6 mi) upcoast to 1 km downcoast from the project boundaries and to remove all reef materials encountered. Monitoring will be conducted bi-weekly from December through March and monthly during the rest of the year.</p> <p><b>Issue:</b> Kelp on the beach. Each acre of kelp forest can result in up to 10 yd<sup>3</sup> of dislodged kelp washing onto the shore each year. This kelp wrack is sometimes considered a nuisance and is occasionally removed by the City of San Clemente and by the California Department of Parks and Recreation, although CDPR considers kelp wrack a natural feature of beaches and usually leaves it in place. The proposed experimental reef would result in a relatively small increase in kelp wrack which would not constitute a significant impact. However, the reasonably foreseeable large mitigation reef could potentially produce significant amounts of kelp wrack that might impact local public services.</p> <p><b>Mitigation Measures:</b> <b>Special Condition 9</b> requires the applicant to monitor the quantity of kelp wrack on the beach for a period of 6 years or until the mitigation reef is constructed. This will provide a quantitative basis for determining whether the larger mitigation reef has any significant impacts on local recreational beaches.</p>
<b>Public Access</b>	<p><b>Issue:</b> Possible interference with access to the coast during the approximately 30-day construction period. The additional truck traffic associated with the proposed project could reduce the level of service on some streets and highways near the coast. This is only expected to occur during the morning and afternoon "rush" hours.</p> <p><b>Mitigation Measures:</b> <b>Special Condition 10</b> restricts project-related truck trips to off-peak hours (9:00 a.m. to 4:00 p.m. and 6:00 p.m. to 7:00 a.m.) thereby avoiding interference with the public's right to access the coast.</p>

## **2.0 STANDARD CONDITIONS**

See Appendix B.

## **3.0 SPECIAL CONDITIONS**

The Commission grants this permit subject to the following special conditions:

### **Existing Special Conditions**

1. Revised Special Conditions C and D to Permit 6-81-330-A adopted on April 9, 1997 are incorporated herein by reference and are contained in Appendix C.

### **Construction Monitoring**

2. Before the construction barge leaves the area of each 8-module experimental block, the applicant shall estimate the actual size, shape, and relief of each experimental module using high-resolution side-scanning sonar and diver observations. If the applicant determines that an experimental module has not been built to plan, the module shall be altered, to the extent feasible, to attain the design specifications before the barge is moved to another block.
3. If any experimental modules are not built to plan and can not reasonably be altered to attain the design specification, the applicant shall immediately submit a report to the Executive Director. The report shall include the location and a map of the perimeter (based on differential GPS positioning) of each module which is significantly different from specifications, and the estimated average relief and average percentage cover of the seafloor covered with reef materials for each such module. If after consultation with the applicant and its consultants, the SONGS mitigation scientific staff, and the California Department of Fish and Game, the Executive Director determines that the value of the experiment is seriously compromised, the applicant shall immediately prepare a Remediation Plan for the experimental reef which will include alterations or additions necessary to accomplish the goals of the experimental design. The plan shall be submitted as soon as possible for Commission approval as an amendment to this permit.
4. Within 60 days following construction of all modules of the experimental reef, the applicant shall submit a final post-construction survey to the Executive Director and the Department of Fish and Game. This survey shall be based on high-resolution side-scanning sonar and diver observations and shall be geo-referenced using a differential geographic positioning system (DGPS). The report shall include a map showing the position and perimeter of each experimental module, and the average topographic relief (height) and average percentage of the seafloor covered with quarry rock or concrete within each module. The report shall also contain an estimate of the uniformity of rock coverage within the perimeter of each module.

### **Marine Resources**

5. SCE shall conduct a diver survey of each of the locations proposed for the construction of an experimental module to insure that there are no rare or sensitive sand-bottom communities or significant hard substrate present. If such important communities or habitats are present, the module site shall be moved appropriately. Prior to construction, SCE shall submit for review

and approval by the Executive Director a report which demonstrates that no significant biota or rocky habitat is present in any of the module sites.

6. SCE shall avoid anchoring the construction barge, if feasible. If anchoring of the barge is necessary, prior to construction of each 8-module block SCE shall submit an anchoring plan for review and approval by the Executive Director. The anchoring plan shall be based on direct observations of the bottom in the areas affected by anchors and cables and shall demonstrate that the project will avoid adverse impacts to kelp and significant rocky habitats that may be present in the area.

#### **Recreational and Commercial Fishing**

7. Pursuant to the CDFG's artificial reef notification procedures (see Appendix E), the applicant shall notify the U.S. Coast Guard at least two weeks prior to any barge operations for the proposed reef construction, and such notice will be included in the Coast Guard's Aids to Navigation and Notice to Mariners. These measures will provide sufficient advance notification to commercial and recreational fishermen of the construction activities.

#### **Air Quality**

8. Prior to beginning construction, the applicant shall submit to the Executive Director (1) a copy of the written determination from the appropriate air district(s) that no permits or mitigation are required for the project; or, (2) a copy of the Authority to Construct issued by the appropriate air district(s).

#### **Development Adjacent to Parks and Recreation Areas**

9. The applicant shall monitor the beach adjacent to the project site from 1 km up coast to 1 km down coast from the project boundaries. Monitoring shall be conducted bi-weekly during the period December through March and monthly during the rest of the year. Monitoring shall include (1) quantitative estimates of the amount of kelp (percent of beach covered and volume) on the beach; (2) a count of rocks and concrete pieces present, in the unlikely event of artificial reef materials washing ashore, and; (3) documentation of beach clean-up activities by state or municipal agencies. The applicant shall remove from the beach any rocks or concrete washed ashore from the experimental reef. Monitoring shall commence within 1 month of the completion of construction and shall continue for a period of 6 years or until the beginning of construction of the mitigation reef, whichever is earlier. An annual report shall be submitted to the Executive Director within 3 months of completion of each 12-month monitoring period.

#### **Traffic**

10. The applicant and all project contractors shall restrict project-related truck trips to off-peak travel hours (9:00 a.m. to 4:00 p.m. and 6:00 p.m. to 7:00 a.m.).

## **4.0 FINDINGS AND DECLARATIONS**

The Commission finds and declares as follows:

### **4.1 PROJECT DESCRIPTION**

#### **4.1.1 Project Background**

A detailed history of the permitting process for the construction of the San Onofre Nuclear Generating Station (SONGS) and for the implementation of mitigation measures is presented in Appendix D.

SONGS is located in northern San Diego County (Exhibit 1). SONGS Unit 1 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.

The permit for construction of SONGS Units 2 and 3 was approved in 1974 amidst considerable debate concerning the potential adverse effects SONGS might have on the marine environment. To address these issues, a condition of the permit required (1) studying the impacts of the operation of Units 2 and 3 on the marine environment offshore from San Onofre, and (2) mitigating any identified adverse impacts. An independent Marine Review Committee (MRC) was established to predict, and later to measure, the effects of SONGS Units 2 and 3 on the marine environment.

As a result of the impact studies, in 1991 the Coastal Commission added new conditions requiring the permittee to implement a mitigation program to: (A) create or substantially restore at least 150 acres of Southern California wetlands, as compensatory mitigation for fish losses in the Southern California Bight; (B) install fish behavioral barrier devices at the power plant as avoidance mitigation for losses of local midwater fish; and (C) construct a 300-acre artificial reef, as compensatory mitigation for adverse impacts to the San Onofre Kelp Forest community. Permit Condition D required the permittee to provide the funds necessary for technical oversight by Commission staff and for independent monitoring of the wetland and artificial reef mitigation elements.

Condition C (Kelp Reef Mitigation) required that the mitigation reef be located in the vicinity of SONGS, but outside the influence of the SONGS discharge plume and water intake. It required the reef to be constructed of rock and be built in two phases. The initial phase reef would be the smallest size which was yet large enough to represent the important processes affecting a 300-acre reef. The initial phase reef would be monitored for 3 years to determine if the design was likely to meet the required performance standards and management techniques would be tested. At the conclusion of the initial monitoring period, any appropriate design modifications would be instituted and the remainder of the 300-acre reef would be constructed.

In a separate action, the San Diego Regional Water Quality Control Board, which issues and administers the federal Clean Water Act National Pollutant Discharge Elimination System (NPDES) permit for SONGS, reviewed compliance with NPDES permit conditions and



concluded there were no NPDES permit violations. Earth Island Institute intervened and filed action in Federal District Court, alleging violations of the Clean Water Act. The case was settled, requiring SONGS owners to, among other things, undertake restoration of additional wetland acreage near or adjacent to the San Dieguito wetlands, which the Commission had previously approved as the restoration site for the permit mitigation program.

In 1993, the Commission added a requirement for the permittee to partially fund (\$1.2 million) construction of an experimental white sea bass hatchery. Due to its experimental nature, the Commission did not assign mitigation credit to this requirement.

After work on implementation of the mitigation conditions stalled due to the permittee's changing interpretations and disputes with the staff over its permit obligations the permittee submitted amendment requests in 1995 and 1996. The Executive Director rejected the first request, determining that the proposed amendment would drastically reduce the mitigation requirements. After extensive work, including an independent review of new kelp impact studies, and three public hearings, in April 1997 the Commission approved amended conditions which (1) reaffirm the Commission's prior decision that San Dieguito is the site that best meets the permit's standards and objectives for wetland restoration, (2) allow up to 35 acres credit for enhancement of wetland habitat at San Dieguito Lagoon, (3) revise the kelp mitigation to require an artificial reef large enough to sustain 150 acres of medium to high density kelp bed and the associated community which could require substantially more than 150 acres of reef area, and (4) require \$3.6 million to fund a mariculture/marine fish hatchery program. The last two mitigation measures were meant to compensate for the loss of 179 acres of medium to high-density kelp bed and its associated community resulting from the operation of SONGS Units 2 and 3.

The new Condition C (Kelp Reef Mitigation) includes key elements of the Commission's 1991 permit condition, including site assessment, site selection, and performance standards, and independent monitoring (Appendix C). In addition to the reduction in the size of reef required for mitigation, the new Condition C modifies the two phases of the reef (experimental and mitigation). It requires an experimental reef at least 16.8 acres in size specifically designed to test several different substrate types and configurations to determine which can best provide conditions for sustaining giant kelp and other reef-associated biota. Condition C requires a Commission approved coastal development permit for the final design and construction of the experimental artificial reef.

As required by Conditions C and D of amended coastal development permit 6-81-330-A, the experimental reef shall be monitored independent of the permittee for a period of 5 years. Condition C requires an independent monitoring program to assess the effectiveness of alternative reef designs, materials and management techniques. The framework contained in the monitoring plan developed by Commission mitigation scientists will guide the monitoring program. 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. Information on the performance of the experimental reef will be used to identify the design that would be likely to meet the performance standards for the mitigation reef.

Condition C also specifies the following siting criteria for the experimental and mitigation reefs:

1. Location as close as possible to the SOK [San Onofre Kelp Forest], 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 without a persistent kelp biological community, or 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.

Following the Commission's April 1997 action, the permittee submitted a preliminary plan for the design of the experimental reef in June 1997, which was approved by the Executive Director and forwarded to state and federal agencies for review. The State Lands Commission, as lead agency under the California Environmental Quality Act (CEQA), then undertook the environmental analyses for a Program Environmental Impact Report (PEIR) for both the experimental reef and the larger mitigation reef. After consideration of the public comments on the draft PEIR, SCE submitted a revised preliminary plan for the experimental reef in March 1999, which was approved by the Executive Director. SCE then submitted this revised plan to appropriate state and federal agencies for review. The State Lands Commission certified the Final Program EIR and approved the offshore lease on June 14, 1999.

#### **4.1.2 Project Location**

The project site encompasses 356 acres of a suitable sand substrate for reef construction contained within an 862-acre lease area identified in the California State Lands Commission applications (March 1999). It is located approximately 0.6 miles offshore of the City of San Clemente in southern Orange County, California (see map, Exhibit 1). The San Onofre Nuclear Generating Station is located about 2.3 miles south of the southern edge of the lease area.

#### **4.1.3 Project Overview**

It is generally acknowledged by marine scientists that an artificial reef will function like a natural reef to the extent that the physical habitat mimics nature and the location is appropriate for the

communities of interest. The proposed project is planned for an area that has historically supported persistent stands of giant kelp and so appears to be an appropriate location for a constructed reef. The natural reefs in the region are predominantly composed of boulders and cobbles in a sand and gravel matrix. Since the intent of the ultimate mitigation project is to construct a similar reef, the permit originally required the use of quarry-rock boulders. However, the applicants and others have expressed an interest in the use of clean, high-density recycled concrete. The use of this material has several attractive features: (1) the cost is lower; (2) a waste material is recycled; and, (3) it avoids the impacts associated with quarrying activities. Anecdotal evidence suggests that giant kelp will grow on both substrates but that there are fewer sessile invertebrates on concrete. However, there has never been a study of the relative effectiveness of concrete and quarry rock reefs for supporting the variety of organisms that make up a natural kelp forest community. Also, there are no data that suggest the optimal quantity of materials to use in the construction of a reef. Therefore, the amended permit requires a field experiment to identify a design which is most likely to result in a constructed reef that meets the performance standards contained in the permit.

#### **4.1.4 Project Design**

The field experiment is designed to test substrate type, substrate quantity, and the effectiveness of "seeding" the reef with juvenile stages of giant kelp. Two substrate types will be tested: high-density concrete and quarry rock. The quantity of substrate is expressed as the proportion of the seafloor that will be covered. For each substrate type, 3 coverages will be tested: 17%, 34%, and 67 % of the seafloor covered with hard substrate. In addition, juvenile stages of giant kelp will be transplanted onto both concrete and quarry rock at 34% cover. Each of these 8 treatments will be incorporated into a 0.4-acre reef module. A group of 8 modules, one for each treatment, constructed near one another is called a "block". There will be 7 blocks of treatments positioned more-or-less uniformly along the coast within the lease area (Exhibit 2). Therefore, there will be a total of 56 0.4-acre modules covering a total of 22.4 acres of the seafloor.

#### **4.1.5 Schedule**

SCE expects to complete construction of the experimental kelp reef by October 1999.

### **4.2 Other Agency Approvals**

#### **4.2.1 State Lands Commission**

The State Lands Commission (SLC) acted as the lead agency under the California Environmental Quality Act (CEQA). Staff of the Coastal Commission and the Department of Fish and Game cooperated in the environmental review process. Because the current project was the first phase of a much larger, and reasonably foreseeable project, the SLC staff decided that an Environmental Impact Report (EIR) would be required and that it should be a Program Environmental Impact Report that would examine the potential impacts of both the current project and the probable future project. During the public review and comment process, many suggestions were made for both the experimental and mitigation phases of the project. These were all carefully evaluated both by agency staff and by SCE. SCE considered several

alterations to its proposed project based on public input and discussions with agency staff and undertook significant field studies to evaluate some of the proposals. They altered their proposed project to incorporate feasible public suggestions that would strengthen the experimental design. The State Lands Commission certified the Program Environmental Impact Report (PEIR) and approved a lease to SCE for the proposed project location on June 14, 1999.

#### **4.2.2 Air Pollution Control Districts**

Project-related activities could occur in both the South Coast Air Basin (SCAB) and the San Diego Air Basin (SDAB). The South Coast Air Quality Management District has jurisdiction over the SCAB and the San Diego Air Pollution Control District has jurisdiction over the SDAB. These are the governing bodies responsible for implementing federal and state air quality standards in the project area. **Special Condition 8** requires SCE to submit to the Executive Director evidence that the appropriate air districts have determined that no permits or mitigation are required for the project or have issued an Authority to Construct prior to construction.

#### **4.2.3. 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 San Diego Regional Water Quality Control Board issued a 401 waiver on June 16, 1999.

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

SCE has applied to the U.S. 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 June 1, 1999. The public comment period ended June 21, 1999. The ACOE is expected to grant approval for the proposed project.

Pursuant to section 307(c)(3)(A) of the Coastal Zone Management Act, any applicant for a required federal permit to conduct an activity affecting any land or water use or natural resource in the coastal zone must obtain the Coastal Commission's concurrence in a certification to the federal permitting agency that the project will be conducted in a manner consistent with the California Coastal Zone Management Program. The Commission's action on this permit amendment application shall comprise its federal consistency review for SCE's experimental reef mitigation project.

### 4.3 Coastal Act Issues

#### 4.3.1 Marine Resources

Coastal Act Section 30230 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.*

Coastal Act Section 30231 states in relevant part:

*The biological productivity and the quality of coastal waters...appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored....*

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 applicant conducted biological surveys of the areas of sand bottom that geophysical surveys had 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. Fewer than ten fish and no sand dollars were observed during surveys by two different sets of consultants. The species making up this community are common and widespread.

The proposed project will alter or replace the sand-bottom community over a 22.4-acre area and the reasonably foreseeable mitigation reef will have the same effect over an area of at least 105 acres. The net effect of the mitigation 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. Since the mitigation project will result in the enhancement of marine resources and biological productivity, it is consistent with Sections 30230 and 30231 of the Coastal Act.

*Effect of Construction Activities on Existing Biota*

There have been extensive siting surveys in the project area. In 1997, the applicant collected geological, geophysical, and biological data at the project site in south San Clemente to insure that a sufficiently large area met the siting criteria for an artificial kelp reef<sup>1</sup>.

The bedrock in this area is predominantly siltstone and sandstone from the Upper Miocene Capistrano Formation and from the Pliocene to Pleistocene San Mateo Formation. Silt, sand, gravel, cobble, and boulders overlay both formations. In the area surveyed, the seafloor is generally sand with some areas of protruding bedrock and exposed cobbles and boulders.

The important siting criteria addressed by this study are (1) suitable depth for kelp; (2) < 0.5 m of sediment over bedrock to reduce the probability of subsidence and burial; (3) No significant hard substrate, and; (4) No sensitive, rare, or otherwise important biotic communities (e.g., extensive sand dollar beds).

Based on results from a side-scanning sonar survey, a sub-bottom seismic profiling survey, and a ground-truth survey by divers, the applicant identified a band of sea floor that is most suitable for construction of an artificial reef designed to support a kelp bed community. Depth varies from 12-15 m (39 - 49 ft) which is suitable for giant kelp and other algae. Sub-bottom profiling and diver ground-truth efforts indicate that the sand layer of the area is less than 0.5 m (20 in). 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. Approximately 356 acres have been identified by SCE and Commission scientists as suitable for construction of a reef to mitigate for the losses due to SONGS.

For the experimental reef, the site of placement for each of the 56 0.4-acre modules has been identified (Exhibit 2) within the suitable area described above. Each of these particular 56 locations are being surveyed by divers to verify that the siting criteria described above are met<sup>2</sup>. **Special Condition 5** requires SCE to submit for review and approval by the Executive Director a report which demonstrates that no significant biota or rocky habitat is present in any of the module sites prior to construction. The proposed project also has the potential to damage important rocky substrate communities in the surrounding area as a result of anchoring activities. **Special Condition 6** requires the applicant to avoid all high-relief rocky habitats during anchoring and construction. Since existing rocky habitats will be avoided, the project, as conditioned, is consistent with sections 30230 and 30231 of the Coastal Act.

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<sup>1</sup> Ecosystems Management Associates. 1997. 1997 Site assessment surveys: San Clemente, San Onofre Area, and Mission Beach.

<sup>2</sup> Telephone conversation between Dr. John Dixon (CCC staff) and Bob Grove (SCE) on June 21, 1999.

### *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, both high-density concrete and quarry rock are suitable materials for the construction of artificial reefs. Clean quarry rock and clean high-density concrete are each (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) each has a surface suitable for the growth of microorganisms, algae, and invertebrate species. The Commission therefore finds that the use of both high-density concrete and quarry rock as the proposed artificial reef materials is consistent with Coastal Act Sections 30230 and 30231, which require that marine resources be "maintained, enhanced, and where feasible, restored."

### *Conclusion – Marine Resources*

Following the requirements of Special Condition C of Permit 6-81-330A, incorporated herein as **Special Condition 1**, the applicant has designed and sited the proposed experimental artificial kelp reef project in a manner that will protect the biological productivity and quality of coastal waters. **Special Condition 5** requires SCE to submit for review and approval by the Executive Director a report which demonstrates that no significant biota or rocky habitat is present in any of the module sites prior to construction. **Special Condition 6** requires that prior to commencing construction, the applicant have an approved anchoring plan that avoids significant rocky habitat. Therefore, the Commission finds the project, as conditioned, consistent with Coastal Act sections 30230 and 30231.

### **4.3.2 Recreational and Commercial Fishing**

Coastal Act Section 30234.5 states:

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

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 30-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 only take place for 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 Fishermen from the Construction Area*

The proposed project is estimated to require about 28 days of construction activities. During that time the construction barge will be moved from place to place to construct the various experimental modules which will be placed in 7 different areas. Therefore, within any given small area (up to ~34 ac or 13.8 ha) fishing will be restricted for only about 4 days. There are many areas nearby that provide fishing opportunities. **Special Condition 7** requires the applicant to provide notification of project-related activities to fishermen and other mariners that conduct operations in the area. This will allow them to select alternative fishing sites in an orderly manner. The temporary loss of anchorage and fishing opportunities 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. **Special Condition 7** requires the applicant to provide notification of project-related activities to fishermen and other mariners that conduct operations in the area. This will allow the fishermen to select alternative fishing sites and to remove any fishing equipment from the project area prior to construction.

#### *Lost Habitat*

Condition C of the amended permit requires minimal disruption of natural rocky habitats and of sensitive or rare biotic communities in any habitat. SCE has identified a 356-acre plot estimated by side-scanning sonar interpretation to have less than 10% cover of rocky materials (**Exhibit 2**). Within this area, the designated locations of each module of the experimental reef will be surveyed by divers to verify that there is no significant hard substrate present and that there are no special biotic features, such as sand dollar beds, on the sand bottom. **Special Condition 5** requires SCE to submit for review and approval by the Executive Director a report which demonstrates that no significant biota or rocky habitat is present in any of the module sites prior to construction. In addition, the proposed artificial reef will increase habitat for many important species and it is expected to provide a benefit both to the recreational fishing community and to commercial benthic fisheries.

#### *Conclusion – Recreational and Commercial Fishing*

**Special Condition 5** requires SCE to submit for review and approval by the Executive Director a report which demonstrates that no significant biota or rocky habitat is present in any of the module sites prior to construction. **Special Condition 7** requires the applicant to provide notification of project-related activities to fishermen and other mariners that conduct operations



in the area. The Commission thus finds that, as conditioned, the proposed reef construction project is consistent with Coastal Act Sections 30234.5 which requires that the "economic, commercial, and recreational importance of fishing activities shall be recognized and protected."

#### 4.3.3 Air Quality

Coastal Act section 30253(3) 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 found that construction of the proposed experimental reef could result in significant daily emissions of nitrous oxide (NO<sub>x</sub>) and fine (< 10 micron) particulate material (PM<sub>10</sub>), and significant quarterly emission of NO<sub>x</sub>. The actual emissions can not be accurately estimated until SCE has chosen construction contractors, since emissions are a function of location and distance of transport. Prior to construction, SCE must obtain either a determination from the appropriate air district(s) that no permits or mitigation are required or an Authority to Construct (ATC).

#### *Conclusion – Air Quality*

**Special Condition 8** requires SCE to submit to the Executive Director evidence that the appropriate air districts have determined that no permits or mitigation are required for the project or have issued an Authority to Construct prior to construction.

#### 4.3.4 Development Adjacent to Parks and Recreation Areas

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.*

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.*

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 will be

torn from the substrate and carried onto the beach, and; (2) during large wave events, concrete or quarry rock from the artificial reef could potentially be carried to shore.

#### *Kelp on the Beach*

A portion of the kelp growing on the experimental artificial reef will dislodge and carried onto nearby beaches during storms. California Department of Parks and Recreation (CDPR) considers kelp wrack a natural part of the ecosystem and generally does not consider it a problem. CDPR does not remove drift kelp from San Clemente and San Onofre State Beaches. The City of San Clemente occasionally removes kelp from the beach after storms. The Program Environmental Impact Report estimates that that an acre of kelp forest can produce up to 20 yd<sup>3</sup> of kelp wrack each year. Using this estimate, around 448 yd<sup>3</sup> of kelp wrack could be contributed to beaches near San Clemente and San Onofre each year. This represents a relatively small increase of kelp on these beaches and will not result in a significant impact.

The construction of a much larger mitigation reef is a reasonably foreseeable event. The effects of a larger reef and kelp forest could be more significant. However, neither the City of San Clemente nor the CDPR collect data on the amount of kelp washed ashore or the prevalence of rocks on the beach. Therefore, there currently are no data upon which later to estimate the effect of the large mitigation reef on kelp accumulation on the beach. **Special Condition 9** requires a monitoring program which will establish a baseline prior to construction of the large mitigation reef. This will provide the data necessary to enable the Commission to appropriately condition the permit for the mitigation reef to avoid significant impacts to recreational beaches.

#### *Rocks on the Beach*

Large waves can dislodge boulders from the seafloor and move them about. Boulders with kelp plants attached have added buoyancy and hence are easier to move. The PEIR cites observations at San Diego beaches which found that the largest rock with a kelp holdfast that washed ashore weighed 13 lb. The average rock or piece of concrete rubble used in construction for this experimental project will weigh about 400 lb<sup>3</sup>. The PEIR also noted that the Mission Beach Maintenance Manager has not found any concrete materials from the existing Mission Beach artificial reef washed ashore. Therefore, it is extremely unlikely that there will be any significant impacts of reef materials on the beach. Nevertheless, in conjunction with monitoring kelp wrack on the beach, **Special Condition 9** requires documentation and removal of any artificial reef materials carried to shore by storms.

#### *Conclusion – Development Adjacent to Parks and Recreation Areas*

The reef will not affect beach users or surfers and will provide new recreational diving opportunities. The proposed project is unlikely to have any significant impacts on local beaches. However, construction of a larger mitigation reef is a reasonably foreseeable event which has greater potential for significant impacts. **Special Condition 9** requires a monitoring program

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<sup>3</sup> Telephone conversation between Dr. John Dixon (CCC staff) and Dr. Hany Elway (Coastal Environments) on June 17, 1999.

that requires documentation of reef materials and kelp on beaches near the project site, and removal of any washed up quarry rock or concrete from the artificial reef. Therefore, the Commission finds the proposed project is consistent with Coastal Act Section 30240(b).

#### 4.3.5 Access

Coastal Act Section 30211 states in relevant part:

*Development shall not interfere with the public's right of access to the sea...*

During the approximately 30 days of construction of the proposed experiment kelp reef, materials will be hauled in trucks to the Port of Los Angeles, the Port of Long Beach, or the Port of San Diego. For both the experimental and mitigation reefs, about 91 truckloads of material will be conveyed each day during the construction period. According to the PEIR, truck traffic associated with the proposed project would reduce the level of service on some coastal streets and highways in both the San Diego and Los Angeles/Long Beach areas during peak travel hours. The impacts during the rest of the day were not considered significant. However, during morning and afternoon "rush" hours, the project could interfere with the public's access to the sea by increasing congestion.

To avoid reducing the level of service on streets and highways near the coast, **Special Condition 10**, restricts project-related truck trips to off-peak travel hours (9:00 a.m. to 4:00 p.m. and 6:00 p.m. to 7:00 a.m.). By limiting project-related traffic impacts to off-peak hours, interference with the public's right to access the coast will be avoided.

#### *Conclusion – Access*

**Special Condition 10** assures that the project will not significantly affect coastal traffic and, hence, will not interfere with access to the sea. Therefore, the Commission finds that the project, as conditioned, is consistent with Coastal Act Section 30211.

#### 4.3.6 Filling of Coastal Waters

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

*(a) The diking, filling, or dredging of open coastal waters... 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:*

*...(8) Nature study, aquaculture, or similar resource dependent activities*

The proposed kelp reef constitutes "fill" as defined by Coastal Act Section 30108.2, which states:

*"Fill" means earth or any other substance or material, including pilings placed for the purposes 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....*

#### *Conclusion – Allowable Use*

The proposed reef construction project consists of the deposition of clean quarry rock and clean concrete rubble 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, the Commission finds that proposed project is a resource dependent activity similar to aquaculture and is consistent with section 30233(a)(8) of the Coastal Act.

Coastal Act Section 30233 also requires the Commission to find that there is no feasible less environmentally damaging alternative to the proposed project, and that feasible mitigation measures are provided to minimize adverse environmental effects.

#### *Project Alternatives*

Through the CEQA process many possible project alternatives were identified. Public review of the draft PEIR resulted in suggestions for different experimental treatments, additional sites for both the experimental and mitigation reef, and different methods of growing kelp. Many reviewers thought that alternative locations should be included in order to provide additional information regarding the success of various locations and provide a back-up if the San Clemente site did not succeed in growing kelp as expected. Also, sites closer to the Port of San Diego would help reduce the air quality impacts of construction.

*Alternatives that were considered in the PEIR.*

Experimental Reef Alternatives

- *Experimental Reef at Multiple Locations.* This alternative would test rock and concrete at 34 and 67 percent coverage at San Clemente, South Carlsbad, and Mission Beach. This would provide information on different project sites that could be used for the mitigation reef build-out. This alternative has larger experimental modules that are placed closer together. The effect of these changes would be to provide larger experimental kelp reefs than the proposed project.
- *150-Acre Reef Built Now with an Experiment.* This alternative would result in the immediate construction of a 150-acre artificial reef at the San Clemente site using only recycled concrete at 17 percent coverage. An experimental project would be embedded in the larger artificial reef to test both quarry rock and concrete at 17, 34 and 67 percent coverage.
- *Experimental Compound Reefs (High and Low Relief) at Multiple Locations.* This alternative would involve building experimental reefs at South Carlsbad and Mission Beach sites in San Diego County which in aggregate would cover 38.4 acres. There would be two low-relief modules of concrete and two of rock at 34 and 67 percent coverage, and two compound reef modules of concrete and two of rock having high-relief centers (12 feet) and low-relief perimeters with 34 and 67 percent coverage.
- *Kelp Planting Experiment.* This alternative would rely on planting juvenile kelp plants on existing sand and rock substrate rather than constructing an artificial reef. This includes a 20-acre experimental phase at the San Clemente site with two years of monitoring.

Mitigation Reef Alternatives.

- *Multiple Locations.* North Carlsbad (30 acres), South Carlsbad (64 acres), Leucadia (25 acres), Encinitas (25 acres), and Mission Beach (85 acres). These offshore sites are located between San Onofre and Point Loma. Since none of the sites provides the number of acres needed for the mitigation reef build-out, it would be necessary to combine several sites and possibly include part of the San Clemente site to achieve the necessary acreage.
- *Northern San Clemente Site* (300 acres). This alternative site was suggested by local commercial fishing groups and would locate the artificial reef to an area just north of the San Clemente Pier and the current proposed project site.
- *San Clemente Site Farther Offshore* (200 acres). This alternative site was suggested by local commercial fishing groups and would situate the artificial reef farther offshore from San Clemente (at a depth of 50-55 feet), just west and adjacent to the proposed project site.
- *150-Acre Reef Built Now with Possible Remediation and Additional Construction.* This alternative proposes that a 150-acre artificial reef be constructed right away at the San Clemente site using all recycled concrete at 17 percent coverage, with an experiment embedded in the design. Depending on the success of the reef additional reef remediation and construction (for a total of up to 300 acres) could be needed in a second phase.
- *Compound Reefs (High and Low Relief) at Multiple Locations.* This alternative would involve building the mitigation reef at the South Carlsbad and Mission Beach sites, and possibly at other sites as well, based on the results of the experiment listed above in Section

6.2.1. The build-out phase would include from 111.6 acres up to 261.6 additional acres of construction for a total of 150 to 300 acres of artificial reef.

- *Compound Reefs at Big Sycamore Canyon (inside and outside the preserve) and/or Pitas Point.* Alternative sites proposed by the United Anglers Association.
- *Kelp Planting.* This project would involve planting 150 acres of juvenile kelp plants at the San Clemente site (and possibly at Mission Beach) on existing rock and sand substrate. The planting methods involve anchoring flexible floats that remain one meter (3.3 ft) above the sea bottom to avoid disturbance by sediments and bottom feeders. Planting would occur in two phases, with an initial 20-acre experiment that would be monitored for two years. Artificial substrates would be installed on the bottom to enhance fish and invertebrate production, if necessary.

#### Other Alternatives.

- *Decommissioning of SONGS.* This would require closing down San Onofre Units 2 and 3 to remove the source of damage to the San Onofre kelp bed.

#### *Alternatives eliminated from detailed analysis in the PEIR.*

The primary purpose of the first phase of the proposed project is to create an experimental artificial reef project to test quarry rock and recycled concrete materials, levels of materials coverage and location factors. The primary purpose of the second phase of the project is to create an artificial reef with a minimum of 150 acres of medium-to-high density giant kelp and associated biota. The following alternatives were considered in the PEIR, but eliminated because they did not meet the project purposes:

- *Northern San Clemente Site.* During the site selection process for the artificial mitigation reef, this area was evaluated but did not meet the siting criteria. It was determined that kelp beds were less likely to be successful in this area because of the closer proximity to San Juan Creek and the greater chance of deleterious effects of sedimentation.
- *San Clemente Site Farther Offshore.* During the site selection process for the artificial mitigation reef, this area was evaluated but did not meet the siting criteria. The deeper water in this area reduces light levels, which in turn reduces the chance that kelp will recruit and grow. In addition, the greater depth of sand cover on the ocean bottom increases the risk of subsidence and burial.
- *Experimental Projects at Big Sycamore Canyon (inside and outside the preserve) and Pitas Point.* Big Sycamore Canyon is approximately 96 miles from San Onofre in Ventura County. Pitas Point is even farther north. These sites are too distant to provide in-kind mitigation for the lost kelp bed resources at San Onofre.
- *Kelp Planting Experimental Project and Mitigation Project.* This proposal does not adequately address the project purposes as described in the SONGS Permit conditions adopted by the CCC. In particular, the project would not provide adequate conditions for a community of reef-associated biota similar in composition, diversity and abundance to the San Onofre kelp bed. The habitat of the San Onofre kelp bed consists of kelp forest on low relief, cobble-boulder reef. The habitat produced by the kelp-planting project would be

quite different, consisting of a large grid of floats supporting giant kelp plants. Therefore, the algae, invertebrate and fish species associated with this project would likely be quite different from the assemblage of species found in the San Onofre kelp bed. Finally, the kelp planting project would not create a hard substrate reef, as required by the permit, and would result in a project more similar in appearance to a kelp farm than to a natural kelp forest ecosystem. Although the kelp planting proposal does not adequately satisfy the project objectives, some of the methods described could prove useful as remediation in case of failure of a mitigation reef project. For example, various forms of kelp planting methods may be done, if natural recruitment of kelp to the reef is inadequate.

- *Decommissioning of SONGS.* This proposal and other types of out-of-kind mitigation measures for damages at the SOK were debated in public hearing before the CCC. This proposal was evaluated and ultimately rejected by the CCC. Instead, the SONGS Permit conditions adopted by the CCC require that an artificial reef be constructed to provide in-kind mitigation to replace losses at the SOK. As a result, it was not required by CEQA to be considered further in the PEIR.

#### *Alternatives Evaluated in the PEIR.*

The PEIR evaluated four alternatives to the proposed project: (1) No project; (2) Experimental and mitigation reefs constructed at several locations; (3) Immediate construction of a 150-acre reef with an imbedded experiment; and (4) Low-relief reef and "compound" reefs (with both high-relief and low-relief features) constructed at several locations. Each of the three experimental reef alternatives is naturally linked to the build-out of a larger mitigation reef.

- **Alternative 1. No project.** CEQA regulations require the consideration of a no project alternative. Since there are no other proposals for use or development of the proposed project lease, the site would continue to be used for commercial and sport fishing, boating, swimming, scuba diving and other recreational uses. Accordingly, this alternative would eliminate all of the environmental impacts identified for the proposed project. However, none of the project purposes would be met and there would be no in-kind mitigation for losses of resources at the San Onofre kelp bed.
- **Alternative 2. Experimental and mitigation reefs at several locations.** This alternative includes an initial phase with experimental reefs built at San Clemente, South Carlsbad and Mission Beach. Different reef designs would be tested using experimental modules grouped together to provide large areas of reef for kelp forest development. The total surface area of the experimental reef at the three sites combined would be 48 acres. Based on the outcome of the experimental phase, mitigation reefs totaling 150 to 300 acres would be constructed by adding 102 to 252 acres of reef material at some combination of the following sites: San Clemente, North Carlsbad, South Carlsbad, Leucadia, Encinitas, and Mission Beach.

The PEIR concludes that both the experimental and mitigation reef would meet the basic project objective to create an artificial reef to replace resource losses at SOK. The experimental reef meets the project objectives of testing recycled concrete and quarry rock, and of testing different levels of coverage of the reef material. The San Clemente, North Carlsbad and South Carlsbad sites meet all of the siting criteria including proximity to San

Onofre. The Leucadia and Encinitas sites are more distant, but are thought to have the same basic site characteristics required for the artificial reef. The Mission Beach site is very distant from San Onofre and has deep sand.

The impacts resulting from this alternative are qualitatively similar to those associated with the proposed project. Important differences are that the total area of the experimental reefs is much larger than the proposed project, and are built at three sites. The alternative project requires more than three times the quantity of material.

- Alternative 3. Construction of a 150-acre, low-cover concrete reef with an imbedded experiment. This alternative potentially provides immediate mitigation for lost resources at the San Onofre kelp bed by immediately constructing 150 acres of reef, rather than waiting five years for the results of the experimental phase of the reef. The experimental portion of the project is similar to the proposed project, but without kelp planting treatments and with one less replicate. At the end of a five-year monitoring period, remediation activities might be undertaken based on the experimental results. These might include increasing the percentage coverage of reef materials, increasing the size of the reef footprint, and changing the mix of concrete and quarry rock.

The PEIR concludes that the experimental portion of the reef meets the project objective of testing recycled concrete and quarry rock, and of testing different levels of coverage of the reef material. The San Clemente site meets all of the siting criteria. There is no basis for determining whether the 150-acre mitigation reef constructed of recycled concrete at 17% cover would be likely to compensate for the lost resources at San Onofre. This alternative would go ahead with a large, low coverage, concrete reef on a trial basis before the results of the experiment were known.

- Alternative 4. Experimental low relief and compound reefs (high-relief center and low-relief perimeter) and mitigation reefs at several locations. In addition to testing different materials and coverages, this alternative is designed to compare the performance of low relief artificial reefs with that of compound reefs which contain both low and high relief structures. A compound reef might provide increased habitat structure and perhaps greater species diversity. It would also attract fish regardless of whether kelp successfully grew on the reef or survived during years of unfavorable environmental conditions. On the other hand, the associated community, including giant kelp and other large algae, might be different from that at San Onofre.

The compound reefs would consist of areas of scattered low-relief materials surrounding high-relief mounds. Two configurations (low-relief and compound reefs) of two materials (quarry rock and recycled concrete) at two coverages (34% and 67%) would be tested at South Carlsbad and at Mission Beach. The experimental reef would be monitored for five years to evaluate the different reef sites and designs. The monitoring program and performance criteria would be similar to those of the proposed project. The results of the monitoring program would be used to determine the location and design of the mitigation reef. The latter would be constructed by adding materials to some combination of the following sites: South Carlsbad, North Carlsbad, and Mission Beach.



The PEIR concludes that both the experimental and mitigation reefs in this alternative meet the basic project purpose to create an artificial reef to replace resource losses at San Onofre. The experimental reef also meets the project objective for testing recycled concrete and quarry rock material, and of testing different levels of coverage of the reef material. The North Carlsbad and South Carlsbad sites meet the siting criteria, including proximity to SOK. The Leucadia and Encinitas sites are more distant, but are thought to have the same basic site characteristics required for the artificial reef. The Mission Beach site is very distant from San Onofre and has deep sand.

### *Environmentally Superior Alternative*

The PEIR provided the following analysis of the environmentally superior alternative:

"The proposed project evaluated in this PEIR has two phases of development, an experimental reef phase and a mitigation reef build out phase. Only the experimental reef will be considered for approval at this time."

"The alternatives to the proposed project all include more construction in the first phase of the project, which could mean less construction in a second phase. Alternatives 2 and 4 have much larger experimental reefs that are located at several sites. The size of the reef at each of the individual sites is more comparable to the proposed project. With one exception, these projects have the same significant impacts as the proposed project. Alternatives 2 and 4 do not create a significant impact to recreation and public services related to kelp wrack washing onshore. This is significant for the proposed project and Alternative 3, but it can be mitigated to a less-than-significant level. Both Alternative 2 and 4 have a significant impact for offshore mineral resources at the South Carlsbad and Mission Beach sites that is not present at the San Clemente site. However, this impact can be mitigated to a less-than-significant level as well."

"Alternative 3 is more difficult to compare because it includes both the experimental and mitigation reef phases of the project right away, and it has greater uncertainty regarding the need for future development. This project has all of the same significant impacts as the proposed project because it is located at the San Clemente site."

"The major differences among the project alternatives are in the phasing of the experimental and mitigation reefs and the overall total construction necessary for the two phases. This in turn affects the overall air quality impacts for each alternative in the first and second phases. Because the alternatives involve more construction in the first phase they all have greater air quality impacts initially. However, the second phases of these alternatives involve somewhat less construction and less air emissions under most scenarios. The second phase of Alternative 4 may or may not involve less construction, depending on whether or not the high relief mounds are included in the reef design. The air quality impacts for the mitigation reef/build-out of the proposed project and the alternatives may be difficult to mitigate to a less-than-significant level. This will depend

on the final size of the reef, the level of coverage required and the choice of materials used."

"Based on the experimental reef phase only, the environmentally preferred project would be the proposed project because it involves less construction and less impacts initially."

The Commission concurs with this analysis. However, the Commission also believes that the alternatives considered in the PEIR are much less likely to meet the project goals than the proposed project. At issue are siting considerations and reef design.

- Siting of the Experimental and Mitigation Reefs

The original siting surveys<sup>4</sup> were conducted in 1992 and were based on geophysical and biological studies of 6 sites between south Laguna in Orange County and north Carlsbad in San Diego County (mussel cove at south Laguna, 3 sites between San Juan Creek and San Clemente pier, 1 site ~1.5 km south of San Onofre, and 1 site ~1 km north of the mouth of Aqua Hedionda Lagoon in north Carlsbad). Based on the siting criteria in the SONGS Permit, the southern San Clemente site appeared most favorable for an artificial reef. From May 1993 until January 1994, temperature, irradiance, and seston flux were monitored at 5 uniformly spaced stations in the south San Clemente area (from San Mateo Point to about 6 km north). In addition, historical records of kelp in rocky areas of that section of the coast were analyzed for persistence. The southern-most area from San Mateo Point to the vicinity of San Clemente Pier was judged to be the only acceptable location for an artificial kelp reef within 50 km (30 mi) of San Onofre<sup>5</sup>. In 1997, additional geological, geophysical, and biological data were collected at the south San Clemente site to insure that a sufficiently large area met the siting criteria for an artificial kelp reef<sup>6</sup>. A similar survey was conducted in an area south of the San Onofre and the Department of Fish and Game reef at Mission Beach was examined. Three hundred five (305) acres at south San Clemente and a narrow band of about 50 acres at south San Onofre met the siting criteria. At Mission Beach, the artificial reef and the immediately adjacent area were surveyed, but no attempt was made to evaluate the overall area as a potential site for a kelp reef. A 1998 report<sup>7</sup> summarized the available information for 15 potential reef sites (from north to south: south Laguna, Salt Creek, San Clemente, south San Mateo, south San Onofre, south Oceanside, north Carlsbad, south Carlsbad, Leucadia, Encinitas, Cardiff, Solana Beach, Del Mar, Torrey Pines, and Mission Beach). Based on the siting criteria, potential sites in order of precedence were San Clemente, Leucadia, Encinitas, north Carlsbad, south Carlsbad, and Mission Beach.

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<sup>4</sup> Ecosystems Management Associates. 1993. Surveys of potential sites for the construction of an artificial reef. A report submitted to SCE in January 1993.

<sup>5</sup> Dean, T., L. Deysher, and A. Jahn. 1995. Siting issues final report; Experimental reef for kelp final plan. Report to SCE dated September 11, 1995.

<sup>6</sup> Ecosystems Management Associates. 1997. 1997 Site assessment surveys: San Clemente, San Onofre Area, and Mission Beach.

<sup>7</sup> Elwany, H. and L. Deysher. 1998. Review of site selection process for Southern California Edison's mitigation reef. A report to SCE dated 17 March 1998.

Very serious consideration was given to alternative sites for the experimental and mitigation reefs. Commission scientific staff worked cooperatively with SCE personnel and consultants in an attempt to develop an experimental design that incorporated several sites. This was of interest for several reasons: (1) The experiment would be less susceptible to confounding from possible localized random short-term environmental anomalies; (2) The generality of the experimental results would be increased; (3) The experiment would provide information on the suitability of several sites for reef development, and; (4) It would be responsive to public concerns and suggestions.

Among sites which met the other siting criteria, the preferred alternative locations were near the city of Carlsbad, due to the relative proximity to the San Onofre Kelp bed. However, the actual size of potentially suitable areas was uncertain, because geophysical studies had never been conducted. In early March 1999, SCE's consultants conducted geophysical surveys along a 3-mile section of coast offshore from the City of Carlsbad<sup>8</sup>. Unfortunately, the results showed small areas of sandy bottom interspersed with patches of hard substrate all along the coast. Only a very narrow band of ocean bottom had the appropriate thin veneer of sand (< 0.5 m) for artificial reef construction. The seafloor over most of the area was a thick sand where artificial reef material would be at high risk of subsidence and burial. It was thought that the adjacent areas offshore from Leucadia and Encinitas would probably have similar characteristics. Therefore, the potential sites offshore from Carlsbad, Leucadia, and Encinitas were removed from consideration. Due to the shortage of appropriate seafloor characteristics, these small sites do not have sufficient acreage to provide a real alternative for the mitigation reef.

Consideration was also given to adding an experimental reef at the Mission Beach site. There was much local interest in the Mission Beach site both because of the presence of a small low-relief Fish and Game artificial reef on which kelp was growing, and due to its proximity to San Diego Harbor and Mission Bay. However, this site was rejected because it is too far from the San Onofre Kelp bed (42 mi) to provide replacement for the resources lost due to the operation of SONGS (Exhibit 3 – letter from D. Bedford, CDFG). It is also located between and very close to the two largest persistent kelp beds in San Diego County. Kelp forest resources in the area of loss due to SONGS are much less abundant. The suggested sites at Big Sycamore Canyon and Pitas Point in Ventura County are even more distant and therefore even less appropriate for mitigating for lost resources near San Onofre.

- Design of the Experimental and Mitigation Reefs

The purpose of the experimental reef is to determine the best means of constructing a large mitigation reef that will meet the performance standards in the SONGS Permit. The Department of Fish and Game recognizes both clean high-density concrete and quarry rock as acceptable materials for reef construction<sup>9</sup>. The relative performance of these two

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<sup>8</sup>Ecosystems Management Associates. 1999. South Carlsbad offshore site characterization for artificial reef siting. A report to SCE dated March 1999.

<sup>9</sup>CDFG. 1997. Materials specification guidelines and notification procedure for augmentation of artificial reefs with surplus materials. Prepared by Dennis Bedford, Marine Resources Region – Long Beach. October 30, 1997.

materials as habitat for kelp, fish, and invertebrates has never been assessed. Both the type and amount of material used to construct the reef may affect habitat value and will certainly affect both cost and environmental impacts associated with construction. The proposed experiment will provide the basis for identifying the most appropriate design. A low-relief design was chosen because: (1) natural kelp beds are associated with low-relief reefs, and; (2) none of the many high relief reefs constructed to attract fish have supported a persistent kelp bed.

The rationale for immediately building a 150-acre reef of recycled concrete with 17% bottom coverage was that if it worked it would immediately have mitigative value. If it did not meet performance standards, the information from the imbedded experiment could guide efforts at remediation. This design has never been tested. If the reef did not meet performance standards, there would be 150 acres of inappropriate substrate in the ocean that could not be removed. In addition, it is much more difficult and expensive to remediate an existing configuration than to build to a plan.

The idea behind the compound reef design is that it might enable one to have kelp and eat fish too. It is well known that high-relief reefs attract fish and provide predictable recreational fishing opportunities. However, no high-relief artificial reef has supported persistent stands of kelp. This design would provide much the same information as the proposed project plus additional information on relief, however the reef would be larger and impacts would be greater. Although the additional information would be interesting, the additional impacts are not justified since existing data argue for a low-relief design.

In summary, after considering siting options, design considerations, and potential environmental impacts, the proposed project is the environmentally superior alternative and the only alternative likely to succeed in fulfilling the project objectives.

#### *Conclusion – Environmentally Least Damaging Alternative*

The project has been designed and conditioned herein to avoid all potential impacts to marine resources, to recreational and commercial fishing, to parks and recreational beaches, to air quality and to coastal access. . Because there is no less environmentally damaging alternative that substantially meets the goals of compensating for losses due to the operation of SONGS and because feasible mitigation measures are provided to reduce to insignificance all adverse environmental impacts, the Commission finds that the proposed project is consistent with Coastal Act Section 30233.

#### **4.3.7 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...*

Section 30105.5 defines cumulative impacts 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 far outweighs the percentage of hard substrate in the area. Furthermore, the proposed project is intended to replace biological resources that were previously lost, and will serve to benefit the environment by increasing the biological productivity of coastal waters.

The PEIR identified 8 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.

#### *Conclusion – Cumulative Impacts*

The Commission finds, therefore, that there will be no significant negative cumulative impacts to marine resources from the proposed artificial kelp reef and that the project is consistent with Coastal Act Section 30250.

#### **4.3.8 The California Environmental Quality Act (CEQA)**

The State Lands Commission certified the Program Environmental Impact Report on June 14, 1999.

Section 13096 of the Commission's administrative regulations requires Commission approval of CDP applications to be supported by a finding showing the application, as modified 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 the CEQA prohibits approval of a proposed development if there are feasible alternatives or feasible mitigation measures available that would substantially lessen any significant impacts that the activity may have on the environment.

The project as conditioned herein incorporates measures necessary to avoid any significant environmental effects under the Coastal Act, and there are no less environmentally damaging feasible alternatives. Therefore, the Commission finds that the proposed project is consistent with the resource protection policies of the Coastal Act and with the CEQA.

**APPENDIX A**  
**SUBSTANTIVE FILE DOCUMENTS**

CDFG. 1997. Materials specification guidelines and notification procedure for augmentation of artificial reefs with surplus materials. Prepared by Dennis Bedford, Marine Resources Region – Long Beach. October 30, 1997.

Coastal Development Permit 6-81-330A, including all substantive file documents

Dean, T., L. Deysher, and A. Jahn. 1995. Siting issues final report; Experimental reef for kelp final plan. Report to SCE dated September 11, 1995.

Ecosystems Management Associates. 1993. Surveys of potential sites for the construction of an artificial reef. A report submitted to SCE in January 1993.

Ecosystems Management Associates. 1997. 1997 Site assessment surveys: San Clemente, San Onofre Area, and Mission Beach.

Ecosystems Management Associates. 1999. South Carlsbad offshore site characterization for artificial reef siting. A report to SCE dated March 1999.

Electronic mail from Greig Peters (San Diego Regional Water Quality Control Board) to John Dixon (CCC) and David Zoutendyk (Army Corps of Engineers) dated June 16, 1999 waiving water quality certification for the public noticed project (PN95-2021400-DZ).

Elwany, H. and L. Deysher. 1998. Review of site selection process for Southern California Edison's mitigation reef. A report to SCE dated 17 March 1998.

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.

**APPENDIX B**  
**STANDARD CONDITIONS**

1. Notice of Receipt and Acknowledgment. The permit is not valid and development shall not commence until a copy of the permit, signed by the permittee or authorized agent, acknowledging receipt of the permit and acceptance of the terms and conditions, is returned to the Commission office.
2. Expiration. If development has not commenced, the permit will expire two years from the date on which the Commission voted on the application. 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 prior to the expiration date.
3. Compliance. All development must occur in strict compliance with the proposal as set forth in the application for permit, subject to any special conditions set forth below. Any deviation from the approved plans must be reviewed and approved by the staff and may require Commission approval.
4. Interpretation. Any questions of intent of interpretation of any condition will be resolved by the Executive Director or the Commission.
5. Inspections. The Commission staff shall be allowed to inspect the site and the development during construction, subject to 24-hour advance notice.
6. Assignment. The permit may be assigned to any qualified person, provided assignee files with the Commission an affidavit accepting all terms and conditions of the permit.
7. 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.

**APPENDIX C  
CONDITIONS C AND D FROM THE APRIL 1997  
PERMIT AMENDMENT**

Except where otherwise indicated, notes are from the April 1997 staff report.

**"CONDITION C: KELP REEF MITIGATION**

NOTE: The following text of revised Condition C includes key elements of the Commission's 1991 permit condition. Site assessment, site selection, and performance standards and monitoring are substantially the same as the 1991 condition. The changes that the Commission approved on April 9, 1997 are:

1. Clarification and modification of the condition as it relates to the two phases of the reef (experimental and mitigation reef). These changes include more specifics about the goals of the experimental reef.
2. Reduction of the size of the reef required in the 1991 permit condition from 300 acres of medium-to high-density kelp to 150 acres of medium-to high-density kelp and the addition of \$3.6 million to OREHP to fund a mariculture/fish hatchery program.

Mitigation for losses to kelp bed resources through the construction of an artificial reef will occur in two phases, an initial experimental phase followed by a mitigation phase.

**1.0 EXPERIMENTAL REEF**

The permittee shall, using qualified professionals and in consultation with the Executive Director, select a site and construct an experimental artificial reef for kelp to determine the optimal reef design for mitigating resource losses at the San Onofre Kelp bed (SOK) caused by SONGS' operation. The experimental reef shall test the design parameters necessary to provide a persistent giant kelp forest and associated ecosystem.

**1.1 Site Assessment**

The permittee shall select at least three potential sites and conduct pre-construction site assessments at these potential sites.

The permittee shall obtain sufficient information about each potential experimental reef site to allow the permittee to determine which site best meets the final site selection criteria described below. This information shall be used in both the site selection and design of the experimental reef. Necessary information shall include: (1) a description of existing biota at the site, (2) a reasonable prediction of the likelihood that a healthy kelp bed will be established and persist at the site, (3) a reasonable prediction of the extent of rock burial due to sediment deposition and/or



sinking into soft sediment that could be expected at the site, and (4) a prediction of the effect of the proposed reef on local sand transport and local beach profiles.

## **1.2 Final Site Selection**

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

1. Location as close as possible to the SOK, 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 without a persistent kelp biological community, or 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.

## **1.3 Experimental Reef Design and Final Plan**

The permittee shall submit a preliminary plan describing the location and design of the experimental reef to the Executive Director for review and approval. Following the Executive Director's approval of the preliminary plan, but no later than June 30, 1997, the permittee shall apply for a coastal development permit for construction of an experimental reef for kelp. The coastal development permit application shall include an experimental reef plan that specifies the design and construction methods of the experimental reef. The design of the reef shall allow for identification of those parameters important to the establishment of a persistent, healthy giant kelp forest and associated ecosystem.

The primary goal of the experimental reef shall be to test several different substrate types and configurations to determine which of these can best provide: (1) adequate conditions for giant kelp recruitment, growth, and reproduction and (2) adequate conditions to establish a community of reef-associated biota. Information gained from the experimental reef will be used in designing the mitigation phase of Condition C. This will help to ensure full compensation for kelp bed losses in a cost-effective manner.

The total areal extent (as measured at the ocean bottom and equal to the surface area within the perimeter of the reef's outermost hard substrate/sand interface area, as installed by the permittee) of the experimental reef shall be a minimum of 16.8 acres.

#### **1.4 Experimental Reef Construction**

The experimental reef shall be constructed within 12 months of approval of the coastal development permit for the experimental reef. A post-construction survey shall be carried out by the permittee to demonstrate that the experimental 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.

#### **1.5 Experimental Reef Monitoring**

The experimental reef shall be monitored independent of the permittee (as per Condition D) for 5 years. A monitoring plan will be developed by Commission scientists pursuant to Condition D. The independent monitoring program for the experimental reef shall be designed to assess the effectiveness of alternative reef designs, materials and management techniques. Monitoring shall be conducted with funds provided by the permittee through Condition D and shall include the monitoring and management of any additional experiments deemed necessary by the Executive Director. Successful completion of the experimental reef does not depend on the achievement of performance standards. However, information on the performance of different module designs will be used to identify those designs that would be likely to meet the performance standards for the mitigation reef. This information will be used to design the most cost-effective mitigation reef that is likely to meet the performance standards listed in Section 2 below.

### **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) caused 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 damaged resources at the San Onofre kelp bed and result in 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 describe 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 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>10</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 any 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 suggests 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 permittee shall be required to implement any remedial measures determined 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. As described under the funding option (Condition D) of this permit, the cost of remediation shall not be limited if the permittee elects to implement the mitigation reef."

#### **"CONDITION D: ADMINISTRATIVE STRUCTURE**

NOTE: The following italicized text is the original version of the Commission's 1991 permit Condition D. The non-italicized text is the language added or revised by the 1997 amendment. In its April 9, 1997 action, the Commission revised Condition D to add an optional funding option package (D.4.0) to fully satisfy the permittee's responsibilities.

##### **1.0 ADMINISTRATION<sup>11</sup>**

*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. The Executive Director will retain approximately two scientists and one administrative support staff to perform this function.*

*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*

<sup>10</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.

<sup>11</sup> Text that is the same text as the 1991 Conditions is in italics.

*Executive Director's direction. The contractors will be responsible for collecting the data, analyzing and interpreting it, and reporting to the Executive Director.*

*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. The panel shall consist of recognized scientists, including a marine biologist, an ecologist, a statistician and a physical scientist.*

## **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 in a form and manner determined by the Executive Director to be consistent with requirements of State law, and which will ensure efficiency and minimize total costs to 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. If the permittee and the Executive Director cannot agree on the budget or work program, the disagreement will be submitted to the Commission for resolution.*

*The budget to be funded by the permittee will be for the purpose of reasonable and necessary costs to retain personnel with appropriate scientific or technical training and skills needed to assist the Commission and the Executive Director in carrying out the mitigation and lost resource compensation conditions (II-A through C) approved as part of this permit action. In addition, reasonable funding will be included in this budget for necessary support personnel, equipment, overhead, consultants, the retention of contractors needed to conduct identified studies, and to defray the costs of members of any scientific advisory panel(s) convened by the Executive Director for the purpose of implementing these conditions.*

*Costs for participation on any advisory panel shall be limited to travel, per diem, meeting time and reasonable preparation time and shall only be paid to the extent the participant is not otherwise entitled to reimbursement for such participation and preparation. Total costs for such advisory panel shall not exceed \$100,000 per year adjusted annually by any increase in the consumer price index applicable to California.*

*The work program will include:*

- a. A description of the studies to be conducted over the subsequent two year period, including the number and distribution of sampling stations and samples per station, methodology and statistical analysis (including the standard of comparison to be used in comparing the mitigation projects to the reference sites.)*



- b. A description of the status of the mitigation projects, and a summary of the results of the monitoring studies to that point.*
- c. A description of the performance standards that have been met, and those that have yet to be achieved.*
- d. A description of remedial measures or other necessary site interventions.*
- e. A description of staffing and contracting requirements.*
- f. A description of the Scientific Advisory Panel's role and time requirements in the two year period.*

*The Executive Director may amend the work program at any time, subject to appeal to the Commission.*

### **3.0 ANNUAL REVIEW**

*A duly noticed public workshop will be convened and conducted by the Executive Director or the Commission each year to review the status of the mitigation projects. The meeting will be attended by the contractors who are conducting the monitoring, appropriate members of the Scientific Advisory Panel, the permittee, Commission staff, representatives of the resource agencies (CDFG, NMFS, USFWS), and the public. Commission staff and the contractors will give presentations on the previous year's activities, overall status of the mitigation projects, identify problems and make recommendations for solving them, and review the next year's program. The permittee shall report on the status of the behavioral barrier devices.*

*The public review will include discussions on whether the artificial reef and wetland mitigation projects have met the performance standards, identified problems, and recommendations relative to corrective measures necessary to meet the performance standards. The Executive Director will utilize information presented at the annual public review, as well as any other relevant information, to determine whether any or all of the performance standards have been met, whether revisions to the standards are necessary, and whether remediation is required. Major revisions shall be subject to the Commission's review and approval.*

*The mitigation projects will be successful when all performance standards have been met each year for a three-year period. The Executive Director shall report to the Commission upon determining that all of the performance standards have been met for three years and that the project is deemed successful. If the Commission determines that the performance standards have been met and the project is successful, the monitoring program will be scaled down, as recommended by the Executive Director and approved by the Commission. A public review shall thereafter occur every five years, or sooner if called for by the Executive Director. The work program shall reflect the lower level of monitoring required. If subsequent monitoring shows*

*that a standard is no longer being met, monitoring may be increased to previous levels, as determined necessary by the Executive Director.*

*The Executive Director may make a determination on the success or failure to meet the performance standards or necessary remediation and related monitoring at any time, not just at the time of the annual public review.*

#### **4.0 FUNDING OPTION PACKAGE**

NOTE: The Commission imposed a new funding requirement that the permittee pay \$3.6 million toward the OREHP mariculture/fish hatchery program, as described in Condition C, Section 3.0. The \$3.6 million requirement is in addition to the costs in the funding option for the mitigation requirements of Conditions A, C, and D. The \$3.6 million requirement is not optional and is therefore not included here in the funding option package. Refer to Appendix F for a full summary of the costs for SONGS mitigation.

The permittee has the option of satisfying the requirements of Condition A (wetland mitigation), Sections 1 and 2 of Condition C (kelp reef mitigation) and Sections 1.0 through 3.0 of Condition D by paying a total of \$114.05 million plus interest in accordance with the provisions set forth in Sections 4.0 through 4.3 of Condition D. To elect this option, the permittee must, within 60 days of the Commission's approval of this permit amendment (CDP No. 6-81-330-A), and no later than June 8, 1997, inform the Executive Director in writing of the permittee's election of this option. The funding option must be elected in its entirety. The permittee's election of the funding option is irrevocable."

[Note in staff report for E-97-10: The permittee did not exercise the funding option and the rest of the text of section 4.0 is not included herein]

## **APPENDIX D BACKGROUND ON COASTAL COMMISSION ACTIONS RELATED TO SONGS**

### **1.0 THE 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 almost 700 billion gallons per year.

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 multiport diffuser that rapidly mixes the cooling water with the surrounding water. The diffusers contain 63 discharge ports angled offshore that increase the velocity of the discharge. The discharge water is approximately 19°F warmer than the intake water temperature. 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.

### **2.0 PERMIT HISTORY**

Southern California Edison (SCE) and San Diego Gas and Electric (SDG&E) submitted a coastal development permit application to construct Units 2 and 3 of SONGS in 1973. On December 5, 1973, the California Coastal Zone Conservation Commission (CCZCC) denied the SONGS permit application primarily due to the anticipated adverse impacts of SONGS to the marine environment. SCE and SDG&E filed suit and the Commission stipulated in court to accept the permit on remand, thereby scheduling a new vote on the project.<sup>1</sup>

On February 28, 1974, the CCZCC approved a permit for the construction of SONGS Units 2 and 3. At that time, there was considerable debate concerning the potential adverse effects SONGS would have on the marine environment. In public hearings, SCE scientists testified that the environmental effects of the new generating units would be minimal. Opponents testified to the contrary. Little reliable scientific information was then available. The probability of any Commission decision resulting in additional litigation was high, and SCE and SDG&E contended that the costs of delay were substantial.

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<sup>1</sup> The court remanded the decision on a technicality, finding that the Commission had exceeded its authority by basing its decision in part on nuclear safety considerations.

In this context the CCZCC approved coastal permit 183-73 to construct Units 2 and 3 of SONGS, subject to special conditions. The permit: (1) established a three-member independent Marine Review Committee (MRC) comprised of individuals appointed by the Commission, the permittees, and an environmental coalition that had opposed the project; (2) authorized the Commission to require the permittees to make future changes in the SONGS cooling system (as extensive as the installation of cooling towers) to address adverse impacts to the marine environment identified by the MRC; and (3) required the Commission to forward recommendations to the San Diego Regional Water Quality Control Board and the State Water Resources Control Board based on the findings of the MRC regarding water quality and Federal Clean Water Act National Pollutant Discharge Elimination System (NPDES) permit monitoring.

## **2.1 Mandate to the Marine Review Committee**

The CCZCC directed the MRC to carry out a comprehensive and continuing study of the marine environment offshore from SONGS to predict, and later to measure, the effects of SONGS Units 2 and 3 on the marine environment. Coastal development permit 183-73 specifically directed the MRC to: (1) determine the effects of the cooling system of the SONGS Unit 1 on the adjacent marine ecosystem; (2) predict the effects of SONGS Units 2 and 3; and (3) monitor the effects of Units 2 and 3. The aim was to obtain information that would allow the CCZCC to decide whether or not changes in the cooling system should be required to prevent or reduce any significant adverse impacts on the marine environment caused by operation of Units 2 and 3.

In November 1979, after a public hearing to review the status of the MRC studies, the Commission recognized that some effects might be mitigated without requiring extremely expensive changes in the cooling system. The Commission found that,

...Changes such as requiring cooling towers, extended diffusers or single point discharges could cost hundreds of millions of dollars and result in unit shutdown for a period of time. ...The Commission also recognizes that operational changes or mitigation measures might adequately compensate for any marine life damages resulting from the operation of Units 2 and 3. The Commission, therefore, requests the MRC to study the feasibility and effects of selected promising mitigation measures, including construction of an artificial reef, as suggested by Southern California Edison. The MRC should recommend what measures might be taken to assure there would be no net adverse effect on the marine environment from operation of SONGS Units 2 and 3.

## **2.2 MRC Submits Results and Recommendations for Mitigation**

The MRC submitted its Final Report to the Commission in August 1989. The report concluded that the operation of SONGS was causing substantial adverse effects to the organisms in the San Onofre

kelp bed, the fish stocks in the Southern California Bight, and to local midwater fish populations, kelp bed fish, kelp, and kelp bed biota.<sup>2</sup> These effects are summarized below.

San Onofre Kelp Bed:

- The discharge plume from SONGS Units 2 and 3 results in a substantial reduction in the abundance and density of kelp plants.
- The discharge plume results in a substantial reduction in the abundance and biomass (total weight) of most of the kelp bed fish species that the MRC studied.
- The discharge plume results in a substantial reduction in the abundance of large invertebrates inhabiting the kelp reef.

Fish stocks in the Southern California Bight:

- Intake loss of immature fish is projected to cause substantial reductions in Bight-wide adult fish populations.

Local midwater fish populations:

- Substantial reductions in local abundance of midwater fish populations were measured out to a distance of 3 km from SONGS.

The MRC recommended options for mitigation based on its analysis of the effects of SONGS on the marine environment. The MRC considered an array of techniques to mitigate for the adverse impacts of operating SONGS including: (1) creating a kelp bed artificial reef, (2) upgrading the existing fish exclusion/return systems at SONGS, and (3) restoration of a wetland.

Although the MRC studies were comprehensive and used state-of-the-art techniques, there is always some measure of uncertainty in quantifying the extent of adverse impacts where impacts are on-going and far reaching, and where environmental conditions are dynamic. The MRC could have, at considerable additional cost and time, continued its studies to more definitively determine the extent of SONGS' impacts on the marine environment. However, the Commission, with the strong urging of the permittee, terminated the field work of the MRC in 1988 and specified the mitigation measures required to offset the adverse impacts of SONGS. The MRC recommendations provided the basis for the mitigation measures required by the Commission.

### 2.3 MRC Costs in Perspective

In its 1996 summary of costs<sup>3</sup> spent on mitigation for SONGS Units 2 and 3, the permittee included the cost (\$48 million) of funding the MRC's work. The Commission recognized that the MRC costs

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<sup>2</sup> Marine Review Committee. 1989. *Final Report of the Marine Review Committee to the California Coastal Commission*. MRC Document No. 89-02.

were substantial, but found these costs are separate and distinct from the costs of mitigating the adverse impacts of SONGS. The MRC costs represented the cost of determining the impacts of SONGS Units 2 and 3 after construction. The MRC's results were used by the Commission to determine necessary and appropriate mitigation. The Commission has never considered the work completed by the MRC as compensatory mitigation. Rather, it was the MRC's undertaking that enabled the permittee to proceed with the construction and operation of SONGS for more than a decade before any mitigation requirement was invoked. The MRC was able to evaluate the effect of SONGS on all major components of the marine environment at an average annual cost of \$3 million.

When the application to construct SONGS Units 2 and 3 came before the Commission, there was a great deal of controversy surrounding the question of whether the once-through ocean water cooling system should be permitted at all, given expected adverse impacts to the marine environment. The MRC was conceived as a way of dealing with this conflict, and as a way to avoid costly and time-consuming project delays and litigation.

In a 1973 letter to the Executive Director of the CCZCC, the permittee estimated that delays in construction of the power plant would cost the utility \$1.5 million per week. If, instead of setting up the MRC, the Commission had required the permittee to avoid adverse impacts by constructing cooling towers, the permittee's costs would have been increased by an estimated \$500 million to \$2 billion.<sup>4</sup>

## **2.4 Use of the MRC Results and Recommendations**

Following issuance of the MRC's Final Report in 1989, the Commission staff worked extensively with the MRC scientists, the permittee, environmental groups, fish and wildlife agencies, the Coastal Conservancy, the San Diego Regional Water Quality Control Board, the State Water Resources Control Board, wetland and kelp scientists, and others to develop a mitigation package for recommendation to the Commission. The goal of the staff was to develop a set of findings and conditions for the Commission's consideration that followed the MRC's recommendations and addressed existing Coastal Commission and wildlife agencies practices and policies. The permittee agreed that the mitigation options recommended by the MRC and adopted by the Commission were the most cost-effective means of dealing with the impacts reported by the MRC.<sup>5</sup>

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<sup>3</sup> Volume I, Section G, page 6, Table 1. In: *Submittal to Amend and Fulfill Certain Conditions of Coastal Development Permit No. 6-81-330 (SONGS Units 2 & 3)*. August 16, 1996 Submitted by Southern California Edison.

<sup>4</sup> Ambrose R.F. 1990. *Technical Report to the California Coastal Commission: H. Mitigation*. Marine Review Committee, Inc.

<sup>5</sup> Permittee's comments on CCC Staff Recommendation to further condition Permit No. 183-73, July 10, 1991.

## 2.5 1991 Coastal Commission Hearing

The staff presented its recommended mitigation package to the Commission at a public hearing on July 16, 1991. The Commission concluded that a compensatory mitigation program was the most cost-effective means of dealing with the adverse impacts caused by operation of SONGS Units 2 and 3 because costs borne by the permittee would be lower and, unlike the costlier prevention options considered but rejected, compensatory mitigation would not interfere with plant operations or reduce plant efficiency. The Commission therefore further conditioned permit 6-81-330 (formerly 183-73) to require implementation of the following mitigation program elements:

- creation or substantial restoration of at least 150 acres of Southern California wetlands, as compensatory mitigation for Bight-wide fish losses;
- installation of fish behavioral barrier devices at the power plant as avoidance mitigation for losses of local midwater fish; and
- construction of a 300-acre artificial reef, as compensatory mitigation for adverse impacts to the San Onofre Kelp community.

The permit conditions adopted by the Commission also required the permittee to provide the funds necessary to implement a specific administrative structure, which includes Commission staff oversight and independent monitoring of the wetland and artificial reef mitigation elements. The permit conditions require program oversight and monitoring to be conducted by a small mitigation monitoring program team and necessary scientific contractors under the direction of the Commission's Executive Director. This administrative structure was included because of the uncertainties associated with the use of compensatory mitigation to fully offset the adverse impacts of SONGS. The Commission found that the required administrative structure "addresses this uncertainty by providing information on the success of mitigation projects, and by providing a mechanism for 'adaptive management' of the created resource."

In adopting this mitigation package the Commission found:

The adopted conditions which set up a mitigation, monitoring, and remediation program is viewed as a minimum package. The Commission believes that the only way that Edison should be allowed to mitigate impacts rather than make extensive SONGS cooling system and operational changes to prevent impacts is through the fully adopted mitigation package... A lesser mitigation package would not fully address the impacts caused by SONGS and would not be in compliance with the coastal permit conditions. (July 1991 adopted Commission findings.)

The Commission then directed the staff to consider the need for additional mitigation, identifying specifically that consideration be given to a fish hatchery program. On March 23, 1993, the Commission added a requirement for the permittee to partially fund (\$1.2 million) construction of

an experimental white seabass hatchery. Due to its experimental nature, the Commission did not assign mitigation credit to this requirement.

## **2.6 NPDES Compliance and Earth Island Institute Lawsuit Settlement**

In a separate action, the San Diego Regional Water Quality Control Board, which issues and administers the Federal Clean Water Act National Pollutant Discharge Elimination System (NPDES) permit for the SONGS, began proceedings to review the MRC's 1989 findings that the SONGS might not be in compliance with the NPDES permit conditions. Earth Island Institute intervened in these proceedings to encourage the Regional Board to take enforcement action against the permittee. Earth Island Institute also filed action in Federal District Court, alleging violations of the Clean Water Act as a result of SONGS operations. The Regional Board held a hearing in October 1991, after the Coastal Commission had acted to further condition permit 6-81-330.

In early 1992 the Board concluded that the evidence did not clearly indicate any NPDES permit violations and thus terminated the proceeding. Earth Island subsequently filed Petitions for Review with the State Board and prepared its case for trial. In June 1993, before the case went to trial, the permittee settled the matter with the Earth Island Institute. The resultant settlement agreement, approved by the District Court, includes the following obligations agreed to by the SONGS' owners:

- restoration of wetland acreage in addition to that required by the Coastal Commission near or adjacent to the San Dieguito wetlands project;
- funding for wetlands restoration research; and
- inclusion of a Marine Science Education Center and ongoing education program targeted for disadvantaged youths at SCE's existing marine laboratory at Redondo Generating Station.

## **2.7 Termination of the MRC**

Though the MRC's field studies terminated in 1988, and its final report was published in 1989, the Commission continued the existence of the MRC until 1993 to assess outstanding issues pursuant to the RWQCB's NPDES compliance hearings and to provide public testimony at a series of hearings regarding the Earth Island Institute's federal Clean Water Act lawsuit against the permittee.

On December 15, 1993, the Commission adopted the following resolution to authorize termination of the MRC:

The Marine Review Committee for the San Onofre Nuclear Generating Station has completely and fully accomplished the mandate given to it under Permit No. 183-73 in an admirable and responsible manner. Accordingly, the California Coastal Commission (Coastal Commission) hereby authorizes the Marine Review Committee to terminate its



existence. Although the Marine Review Committee will no longer exist as an entity, the Coastal Commission will maintain the ability to consult with its former members, consultants and staff to seek clarification or interpretation of any of its findings. Southern California Edison Company (Edison) shall fund such consultation. Should Edison propose a modification to Permit No. 183-73, Edison shall also fund the Coastal Commission's consultation with technical experts the Commission believes is necessary to evaluate such a proposal.

## **2.8 Implementation of the Adopted Mitigation Conditions**

From 1992 to 1995 Commission staff worked with the permittee to implement the mitigation conditions adopted by the Commission and agreed to by the permittee. Initially, staff efforts focused on implementation of Condition D, Administrative Structure, by establishing the mitigation monitoring program team and establishing various advisory panels such as the Interagency Wetland Advisory Panel (IWAP).

During this time, staff also worked intensively with the permittee during the site selection processes for both the wetland mitigation and artificial reef projects. Staff attended numerous permittee-sponsored meetings to discuss design plans for the mitigation projects. Over time, however, much of the discussion initiated by the permittee began to focus on permit condition interpretation rather than condition implementation. As a result, the staff was increasingly re-directed to the review of increasing amounts of technical information concerning the permittee's changing interpretations of its permit obligations.

By 1994, implementation of the wetland and artificial reef conditions stalled. With the exception of Conditions B (behavioral barriers to repel fish and thereby reduce midwater fish impingement losses) and F (contribution of \$1.2 million for partial cost of the construction of a marine fish hatchery), none of the mitigation required in the 1991 permit had entered the implementation phase by 1995.

## **2.9 The 1995 Amendment Request**

In September 1995, the permittee submitted a request to amend certain conditions of Permit 6-81-330. This request proposed to amend four of the six conditions agreed to in the 1991 permit for SONGS. The permittee proposed amendments to:

- reduce the requirement to create or substantially restore 150 acres of coastal wetland habitat to 65 acres at San Dieguito Lagoon, with the remaining 85 acres provided through enhancement (e.g., maintenance of the lagoon inlet);
- reduce the requirement to construct a 300-acre artificial kelp reef to a 12-acre experimental reef;

- delete or change performance standards and reduce or eliminate the permittee's obligation to ensure project success; and
- replace independent monitoring with self monitoring and reduce the monitoring period to 10 years.

#### **The Executive Director's Determination:**

The Commission's regulations (section 13166(a)(1)) provide that the Executive Director use the following standard to determine whether or not an application for an amendment to a previously approved coastal development permit shall be accepted for Coastal Commission review:

An application for an amendment shall be rejected if, in the opinion of the executive director, the proposed amendment would lessen or avoid the intended effect of a partially approved or conditioned permit unless the applicant presents newly discovered material information, which he could not, with reasonable diligence, have discovered and produced before the permit was granted.

The Executive Director determined on the basis of these criteria, that the proposed amendment would drastically reduce the mitigation requirements of the permit. As the Commission had found these requirements to be the minimum necessary to address the adverse impacts of operating SONGS, the Executive Director concluded that the proposed amendments would have lessened or avoided the intended effect of the Commission's decision.

The Executive Director's determination was not overturned by the Commission; thus all of the 1991 permit conditions remained in full force. While upholding the Executive Director's determination, the Commission also directed the staff to work with the permittee to develop a mutually acceptable amendment package for Commission consideration.

#### **2.10 The 1996 Amendment Request**

In accordance with the Commission's direction, the staff worked intensively with the permittee to develop a mutually acceptable amendment package. In an effort to resolve specific issues:

- The staff worked with the wetland resource agencies (CDFG, USFWS, NMFS, etc.) to try to meet the permittee's desire to satisfy some of the wetland mitigation obligation through partial credit for the enhancement of existing wetlands that will result from inlet maintenance. The 1991 permit calls for creation or substantial restoration of at least 150 acres of coastal wetland, and the maintenance of continuous tidal flushing. Thus, allowing satisfaction of the requirement to create or substantially restore 150 acres by enhancement activities (e.g., inlet maintenance at San Dieguito Lagoon) requires a permit amendment. Through this approach, the staff offered to support the permittee in seeking Commission approval for an amendment to allow partial credit

for inlet maintenance. The permittee's amendment requested full credit for enhancement of existing wetland by inlet maintenance.

- As a way to reach an agreement on the amount of partial credit for inlet maintenance at San Dieguito Lagoon, the staff and the permittee sought the advice and recommendations of the Interagency Wetland Advisory Panel (IWAP). However, the permittee's mitigation plan for San Dieguito Lagoon requested substantially more credit for inlet maintenance than either the IWAP or staff recommended.
- The staff worked with the permittee to develop a mutually acceptable design for the experimental artificial reef. This work entailed meetings with Commission staff, the permittee, Department of Fish and Game staff, and potential construction contractors.
- Although the 1991 permit requires that the kelp mitigation reef be constructed of quarry rock, the permittee expressed interest in using concrete because it is cheaper. The staff agreed to consider the possible use of concrete as a construction material for the kelp mitigation reef. The staff suggested that concrete be incorporated into the design of the experimental kelp reef to determine whether it would be a suitable building material for the larger kelp mitigation reef.
- The staff offered numerous compromises on the intensity and breadth of the required monitoring programs. The staff also suggested numerous monitoring strategies that uphold the spirit and intent of the 1991 permit, but do so at a lower overall cost to the permittee.

## **2.11 Independent Review Panel for Kelp Studies**

The Commission staff worked with the permittee to resolve concerns about the implications of further kelp studies conducted by the permittee.

The Commission's resolution authorizing the dissolution of the MRC (1993) states that if the permittee chooses to seek revisions to the mitigation requirements, the permittee must fund former MRC scientists to review any new data collected after the MRC studies if such data is the basis of the proposed amendment. The permittee offered instead to establish a three-member scientific panel to review the permittee's kelp data. Although the Commission staff believed that the MRC scientists were more qualified to evaluate the new data because of their in-depth understanding of the methods and analysis used on the existing data, the staff agreed to jointly select a three-member panel with the permittee and form the questions for the panel to consider.

The Independent Review Panel published its conclusions on June 26, 1996. The panel agreed with the permittee's qualitative conclusion that the impacts to the San Onofre Kelp Bed (SOK) were less than previously estimated but did not quantify the reduction.

## **2.12 Hearings in 1996**

The permittee's application for the proposed amendments to CDP 6-81-330 was first heard at the Commission's October 1996 meeting. The Commission heard public testimony and continued the item to its November 1996 hearing. At the November hearing, the San Dieguito River Park Joint Powers Authority (JPA) cited deficiencies in the permittee's proposed plan for San Dieguito Lagoon that invalidated agreements between the permittee and the JPA, thus nullifying the permittee's authorization to use key lands owned and managed by the JPA. As the permittee's resultant lack of authority to use these lands rendered many aspects of the proposed amendments and mitigation plans unworkable, the Commission staff recommendation was withdrawn and the staff made a verbal recommendation of denial. After a long public hearing, the Commission continued the matter, asking that a further hearing be held by the following February.

In the wake of the Commission's November 1996 continuation, Commission staff requested that the permittee clarify whether its amendment application should now be revised to reflect any of the modified proposals put forth by the permittee at the previous hearings or whether staff should continue its review of the amendment based only on the permittee's August 1996 submittal. The permittee's response did not address this issue and instead sought additional time to resolve concerns. Staff held numerous meetings and conference calls with the permittee, attended workshops and meetings on outstanding issues concerning the San Dieguito Lagoon Plan, and worked with numerous other interested parties to develop further information for the Commission to consider the permittee's amendment request.

## **2.13 April 1997 Approval of Revised Conditions**

On April 9, 1997, the Commission approved amended conditions for the wetland restoration mitigation which reaffirmed the Commission's prior decision that San Dieguito is the site that best meets the permit's standards and objectives for wetland restoration and allow up to 35 acres credit for enhancement of wetland habitat at San Dieguito Lagoon.

The Commission approved amended conditions for the kelp reef mitigation that require construction of an artificial reef large enough to sustain 150 acres of medium to high density kelp bed community and provision of \$3.6 million for a mariculture/marine fish hatchery program as compensation for the loss of 179 acres of high density kelp bed community resulting from the operation of SONGS Units 2 and 3. The artificial reef is to consist of an experimental reef of at least 16.8 acres and a larger mitigation reef to meet the 150-acre requirement. The purpose of the experimental reef is to determine what combination of substrate type and substrate coverage will best achieve the performance standards specified in the permit. The design of the mitigation reef will be contingent on the results of the experimental reef.

The Commission also found that there is continuing importance for the required independent monitoring and technical oversight to ensure full mitigation under the permit.

Finally, the Commission denied the permittee's preliminary plans for wetland restoration but conditionally approved the experimental reef plan.

#### **2.14 October 1998 Approval of Revised Wetland Restoration Plan Schedule**

Due to the extensive and detailed work necessary for the environmental review process under CEQA and NEPA, the Commission amended the permit in October 1998 to modify the schedule for submitting the final wetland restoration plan and coastal development permit application for the wetland restoration mitigation project at San Dieguito Lagoon.

### **3.0 MITIGATION IMPLEMENTATION**

#### **3.1 Wetland Restoration Mitigation**

The permittee submitted the preliminary wetland mitigation plan for San Dieguito Lagoon in October 1997. Following some revisions, in November 1997 the Commission approved the revised preliminary plan as being largely in conformity with the minimum standards and objectives stated in the permit. The permittee collaborated with the Commission staff to complete peer reviews of technical studies conducted to determine the effects of various restoration alternatives on stream flow, sediment transfer and tidal hydrology. The results of these studies were needed before environmental review could be initiated.

The planning and environmental review process for the wetland restoration mitigation project incorporates the mitigation project into the overall San Dieguito River Valley Regional Open Space Park project and also includes additional wetland restoration required under the permittee's settlement agreement with the Earth Island Institute. The San Dieguito River Valley Regional Open Space Park Joint Powers Authority (JPA) and U.S. Fish and Wildlife Service are the lead agencies for CEQA and NEPA, respectively. Environmental analyses for the EIR/S commenced in June 1998. A public draft is expected to be released at the end of June 1999.

A number of issues essential to completing the final restoration plan and subsequent permitting processes remain to be resolved and are the subject of ongoing discussion and negotiation between the principal parties to the restoration project, the JPA, SCE and 22nd District Agricultural Association (District). Issues include inlet maintenance, trail alignment and use, an extended berm proposal, and disposal of excavated soils. The staff expects that some of these issues will be resolved in the environmental analyses.

Once the EIR/S is complete, the permittee will submit a final restoration plan and coastal development permit application, and the staff will develop a monitoring plan for the wetland mitigation project.

### **3.2 Kelp Reef Mitigation**

The permittee submitted the preliminary plan for the experimental reef in June 1997, which was approved by the Executive Director and forwarded to state and federal agencies for review. The permittee also submitted a coastal development permit application, which could not be filed until other agency approvals had been obtained, and filed a lease application with the California State Lands Commission for an offshore lease to construct the experimental reef. The State Lands Commission determined that under the requirements of CEQA a Program EIR should be prepared to evaluate both the experimental reef and the subsequent full mitigation reef. SCE then filed an amended application with State Lands in February 1998.

As lead agency for CEQA, the State Lands Commission began the environmental review process in March 1998. A draft PEIR was released in November 1998 and a public meeting held in December 1998. As a result of public and agency comments received on the draft PEIR, SCE and staffs of both the State Lands Commission and Coastal Commission revised the size and design of the experimental phase originally planned at San Clemente. In March 1999, the Executive Director approved the modified design for the experimental phase conditional on it being deemed the preferred plan after environmental review under CEQA and on SCE requesting such an amendment to its proposed project. SCE provided these project modifications to State Lands in early April. At the same time, SCE submitted its revised application for the experimental reef to the U.S. Army Corps of Engineers.

The final PEIR was released in May 1999 and concluded that for the experimental reef phase only, the environmentally preferred project would be the proposed project because it involves less construction and less impacts initially than the other alternatives (other than the No Project alternative). The State Lands Commission certified the final PEIR and issued the offshore lease for the experimental reef on June 14, 1999.

The staff plans to bring the coastal development permit and the monitoring plan for the experimental reef before the Commission in July 1999 and the Army Corps expects to issue its permit following the Commission's action. SCE has indicated it will be ready to begin construction by August 1, 1999 so that it can be completed by October 1, 1999 to avoid conflicts with the commercial lobster fishing season.

### **3.3 Fish Behavioral Mitigation**

The permittee submitted its initial installation plan for fish behavioral barrier devices in March 1992. The staff did not accept the plan, primarily because of deficiencies in statistical design. A revised study plan was submitted in April 1994 and the issues of what constitutes compliance and how to attain it were resolved in October 1994.

Following the permittee's experiments on light and sound devices, the permittee considered fish guidance lights to be more effective in preventing fish from being trapped and killed. The Executive Director approved a new installation plan for the lights in October 1998. The engineering and construction design was then approved by plant operators and the lights were installed in December 1998.

Monitoring to evaluate the effectiveness of the fish guidance lights began in March 1999, although it was interrupted during April while the plant units were shut down for maintenance. The initial data has been collected and provided to the staff for analysis.

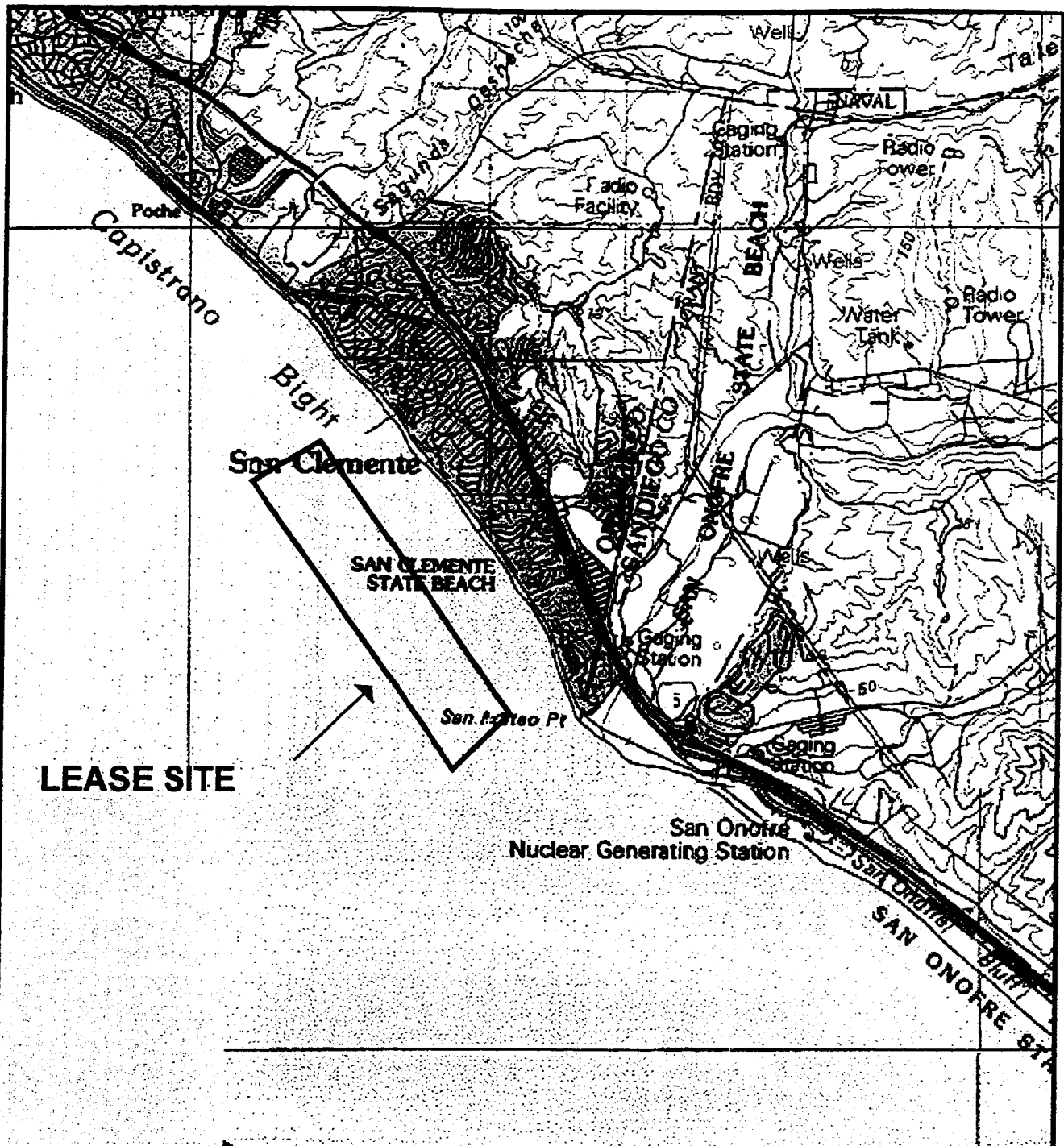
## **APPENDIX E NOTICE TO MARINERS**

NOTIFICATION: The barge contractor must notify the U.S. Coast Guard two weeks prior to moving any material to the reef site. The Coast Guard must be given a minimum of two weeks lead time to include this job in their Aids to Navigation and Notice to Mariners.

This notification must include:

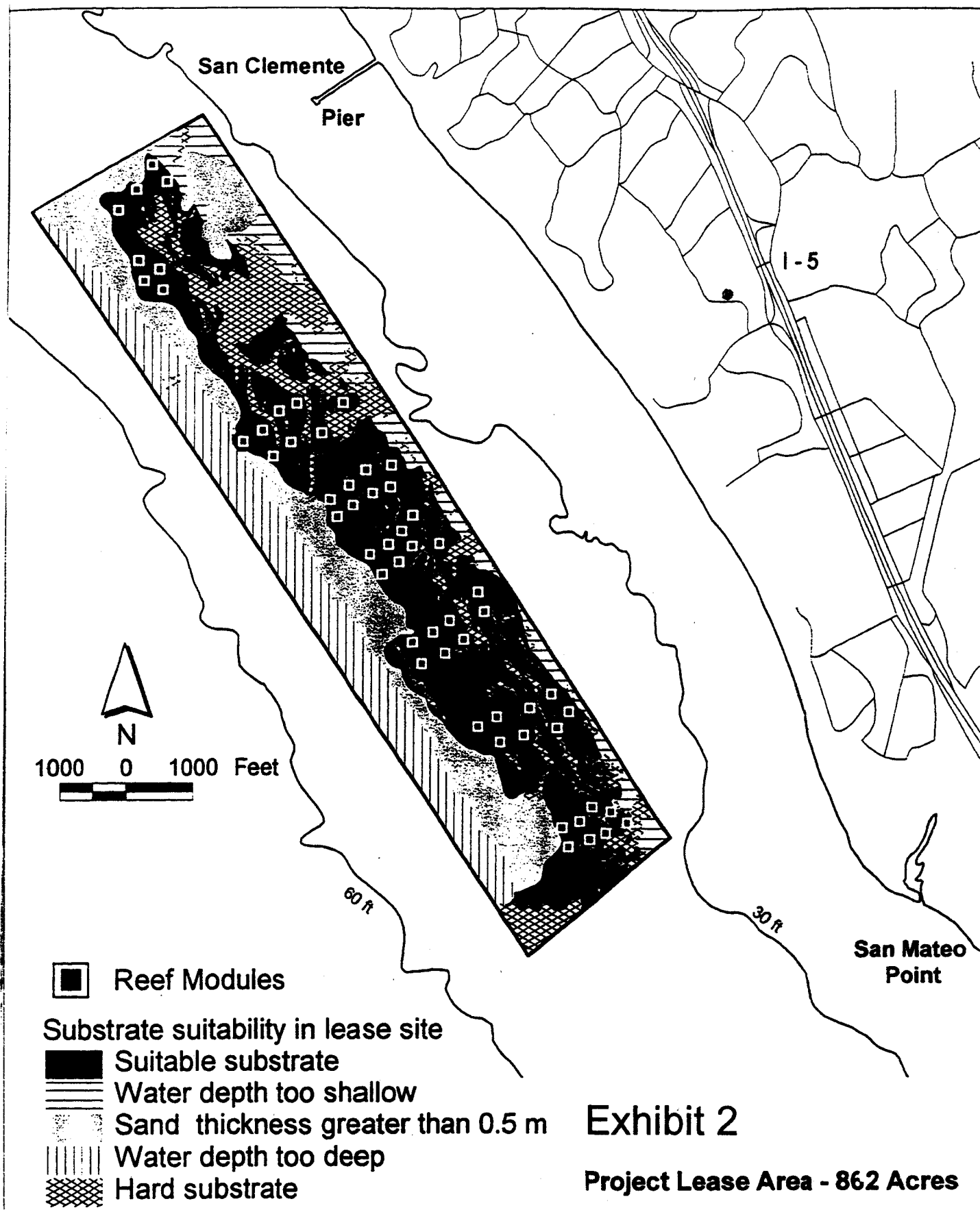
- (1) Location of work site.
- (2) Size and type of equipment that will be performing the work,
- (3) Name and radio call sign for working vessels, if applicable.
- (4) Telephone numbers for on site contact with project engineers.
- (5) Schedule for completing the project.





## Exhibit 1

Map of Project Area



Proposed positions of experimental reef modules and substrate suitability within the SCE lease site offshore of San Clemente CA.

STATE OF CALIFORNIA-THE RESOURCES AGENCY  
DEPARTMENT OF FISH AND GAME

Gray Davis, Governor



Marine Region  
Southern Operations  
330 Golden Shore, Suite 50  
Long Beach, California 90802  
(310) 590-5171

March 18, 1999

Ms. Elaine Russell  
California State Lands Commission  
100 Howe Avenue, Suite 100 South  
Sacramento, CA 95825-8202

Dear Ms. Russell:

During the public response period to the Draft PEIR it was suggested that Mission Beach, San Diego County, should be considered as an alternate site for the experimental and/or build out phases for the Southern California Edison Company kelp reef mitigation project.

The Department of Fish and Game, Artificial Reef Program has considered this alternative and has found it to be unacceptable for the following reasons:

- Mission Beach is too far away from the impact site. A long standing policy within the Department is that, whenever possible mitigation should be "in kind" and "as close as practical to the impact site." Other sites, much closer to San Onofre have been identified during the SCE siting studies. If an alternative site to San Clemente is deemed desirable, one of these would be far more appropriate than Mission Beach.
- The existing CDFG Mission Beach Artificial Reef site is sandwiched between the two largest and most persistent kelp beds along the southern California coast. It has already been demonstrated that kelp will grow on an artificial reef there. This fact has been cited by proponents of "concrete only as reef material" and of "utilizing Mission Beach for some or all of the mitigation reef." These proponents are attempting to answer the wrong question. The appropriate question is not, "how can we grow the maximum amount of kelp on an artificial reef?" If that was the appropriate question, any of the Channel Islands, or perhaps the Big Sur coastline might be an even better choice. The appropriate question is, can SCE replace the kelp, fish and invertebrates lost through the operation of SONGS through the construction of an artificial reef? The area in the immediate vicinity of SONGS has less of these natural resources than prior to power plant start up. Can these resources be replaced?

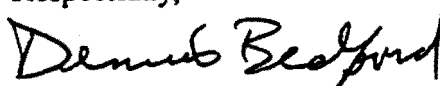
Exhibit 3

Letter from D. Bedford, CDFG

Ms. Elaine Russell  
March 18, 1999  
Page Two

We find no merit in the suggestion to utilize Mission Beach as an alternative site to San Clemente. We would urge the State Lands Commission staff to give no further consideration to this proposal.

Respectfully,

A handwritten signature in black ink, appearing to read "Dennis Bedford". The signature is fluid and cursive, with the first name "Dennis" and last name "Bedford" clearly distinguishable.

Dennis Bedford  
Marine Biologist, Coordinator  
CDFG Artificial Reef Program

cc: John Dixon, California Coastal Commission  
Russ Kaiser, U.S. Army Corps of Engineers