

## CALIFORNIA COASTAL COMMISSION

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# Th3a

Energy and Ocean Resources

Staff: SMH, JLL, JD & SONGS  
Mitigation Program Scientific  
Team—SF

Staff Report: November 23, 2005

Hearing Date: December 15, 2005

Item Number: Thursday, 3a

Commission Action:

## **SONGS Mitigation Program: 2006 and 2007 Two-Year Work Program and Budget**

### **EXECUTIVE SUMMARY**

The staff is recommending Commission approval of a two-year work program and \$2,266,141 budget for the Commission's independent monitoring and technical oversight of the SONGS mitigation projects. The projects are required under Southern California Edison Company's coastal development permit (No. 6-81-330-A, formerly 183-73). The staff is also recommending Commission approval of a \$185,512 contingency fund to be used, in consultation with SCE, if needed for the specified purposes (additional time for the Scientific Advisory Panel, early office lease termination, and replacement or repair of field vehicles or engines).

The permit conditions originally were adopted by the Commission in 1991 to mitigate the adverse impacts of the operation of SONGS Units 2 and 3 on the marine environment. The conditions require SCE and its partners to (1) create or substantially restore a minimum of 150 acres of southern California wetlands (Condition A), (2) install fish barrier devices at the power plant (Condition B), and (3) construct an artificial reef large enough to sustain 150 acres of medium to high density kelp bed community together with funding for a mariculture/marine fish hatchery (Condition C). The conditions also require SCE to provide the funds necessary for Commission technical oversight and independent monitoring of the mitigation projects, to be carried out by independent contract scientists under the direction of the Executive Director (Condition D). In 1993, the Commission added a requirement for the permittee to partially fund construction of an experimental fish hatchery. The Commission has since approved amendments to the conditions in April 1997, October 1998, and October 2005.

### **Permittee's Funding Requirement**

Condition D of the permit requires SCE to fund the Commission's oversight of the mitigation and independent monitoring functions identified in and required by Conditions A through C. The permittee is required to provide "reasonable and necessary costs" for the Commission to retain

personnel with appropriate scientific or technical training and skills, as well as reasonable funding 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 convened by the Executive Director to provide advice on the design, implementation, monitoring and remediation of the mitigation projects. The Commission has operated under approved work programs and budgets since 1993.

### **Consultation with Permittee**

Pursuant to the permit conditions, the staff has consulted with SCE on the proposed work program and budget for 2006 and 2007. Following the initial consultation on the work tasks, staff revised the proposed tasks to include suggestions from SCE, to better explain the reasons for proposed tasks, and to adjust the timing of tasks to coordinate with SCE's anticipated implementation schedules. After further discussion, SCE indicated its satisfaction with the proposed work plan for 2006-2007.

Although SCE agreed with the proposed tasks, SCE had questions regarding the appropriateness of the level of effort—and corresponding budget—on one of the reef tasks, *Muricea* Management, in which staff proposes to develop cost-effective techniques for managing the dense populations of invasive sea fans (*Muricea*) that could prevent the mitigation reef from meeting the SONGS permit performance standards. Discussion focused on the Commission's structure for implementing the technical oversight and independent monitoring program, i.e., through a contract with the University of California, Santa Barbara that utilizes highly qualified full time university employees in order to maintain consistency in data collection and processing and to ensure that the field work is accomplished in a timely manner. As discussed more fully in Section D, below, the monitoring program is managed as a whole and each of the field staff is assigned to work on whatever needs to be done to accomplish all of the tasks in the work program efficiently. SCE is in agreement that the proposed work program represents a carefully thought out minimum staffing model to accomplish the monitoring tasks that both the staff and the permittee agree upon. SCE's letter of support is attached.

### **Implementation of Commission Oversight and Independent Monitoring**

The Commission retains a science advisory panel and a small technical oversight team (two scientist positions and administrative support) under contract to provide the necessary scientific expertise to the Commission and serve as project managers for the monitoring program. Field assistants also are retained under contract to conduct the monitoring, and independent consultants and contractors are called upon when specific expertise or assistance is needed for specific tasks.

The staff implements the field monitoring program through a contract with the University of California, Santa Barbara, that uses the existing contract scientists as project managers at no additional cost, with data collection done by contract field assistants under their direction. Based on a comparison of estimated costs from UCSB, other universities, and private consultants, the Commission previously found that implementing the monitoring program through a contract with UCSB was the most efficient, cost-effective, scientifically rigorous, and timely method of achieving the goals of the independent monitoring required by the SONGS permit.

## **Work Program for 2006 and 2007**

The status of each mitigation project guides the Commission's work program for the next two calendar years.

On October 12, 2005, the Commission approved the coastal development permit for the San Dieguito wetland restoration project (CDP #6-04-88). During the 2006 and 2007 work period, the staff and contract scientists will consult with SCE to ensure that the restoration proceeds in a timely manner according to the approved Final Restoration Plan and in compliance with the conditions of the CDP, and the contract scientists will conduct the independent construction monitoring as required in the SONGS permit.

Also on October 12, 2005, following completion of the five-years of post-construction monitoring on the experimental reef, the Commission concurred with the Executive Director's determination for the type of hard substrate and the percent cover of hard substrate that is required of the artificial reef to be constructed to mitigate for the loss of kelp forest habitat caused by SONGS operations. Reef tasks for the 2006 and 2007 work period include reviewing SCE's preliminary plan for the full mitigation reef, developing the mitigation reef independent monitoring plan, and developing a cost-effective strategy for managing populations of large sea fans that colonize the mitigation reef.

In October 2000, the Commission reviewed the conclusions on the effectiveness of the fish behavioral barrier, and has monitored the reduction of fish losses at SONGS. Contract scientists will continue to review SCE's annual reports and investigate any unusual mortality events. In addition permanent Commission staff will continue to participate in the oversight of the fish hatchery program operated by the Department of Fish and Game's Ocean Resources Enhancement and Hatchery Program, with very minor assistance from the contract scientists.

## **Budget for 2006 and 2007**

The proposed budget for calendar years 2006 and 2007 covers the monitoring and technical oversight program costs for the Commission's contract scientists, contract field personnel, science advisory panel, consultants, administrative support, and operating expense. The proposed staff (reduced by four field personnel from the previous work plan) is the minimum needed to meet the goals specified by the permit under Condition D and to complete the tasks identified in the 2006-2007 work program. The proposed funding totals \$2,266,141 for the two years.

Staff also is proposing pre-approved contingency funds in the amount of \$185,512 specifically for potential additional costs for (1) the Scientific Advisory Panel, (2) early office lease termination, and (3) repair or replacement of field vehicles or engines. Staff proposes these pre-approved contingency funds as a way of reducing the overall budget, but still providing the necessary Commission authorization for certain specified activities that may become necessary. Staff has used this approach for the previous two two-year work programs (i.e., since 2002-2003), but has not yet had to tap the contingency funds.

A contingency amount is proposed for the Scientific Advisory Panel as that effort may well increase over past years' expenditures for advice to the Commission on both the wetland

restoration implementation and construction monitoring and design of the full mitigation reef. Although the permit authorizes for the Scientific Advisory Panel up to \$100,000 *per year*, plus annual adjustments due to increases in the consumer price index applicable to California<sup>1</sup>, staff proposes *total* funding for the Scientific Advisory Panel of only \$163,000 (\$80,000 in 2006 and \$83,000 in 2007). The overall budget does not provide any cushion for any increased effort; thus, the staff proposes a pre-approved contingency fund amount of \$133,014 (the authorized annual amount, as adjusted, less the budgeted \$163,000) to be earmarked for the Scientific Advisory Panel to allow the timely response to changing circumstances.

In addition, staff proposes funds for early office lease termination. The need for early lease termination is unlikely; however, should circumstances arise that necessitate canceling the lease, the contingency fund amount of \$27,498 would be available to satisfy the lease obligations. Similarly, the contingency fund includes \$25,000 for potentially replacing or repairing the ten year old, high mileage field vehicles or their engines.

Any expenditure from the pre-approved contingency fund would be made in consultation with SCE. If a dispute arises, the staff would bring the issue to the Commission for resolution.

## **I. STAFF RECOMMENDATION**

The staff recommends that the Commission approve a two-year work program and budget for calendar years 2006 and 2007 for a total amount of \$2,266,141 for both years in support of the Commission's independent monitoring and technical oversight of the San Onofre Nuclear Generating Station (SONGS) Units 2 and 3 marine resource mitigation projects required in Conditions A through C of permit 6-81-330-A (formerly 183-73). The Commission's independent monitoring and technical oversight program is to be funded by the permittee, Southern California Edison and the other SONGS owners, in accordance with the provisions of Condition D of the permit. In addition, staff recommends that the Commission approve a contingency fund in the amount of \$185,512 for the Commission's program, to be funded by the permittee and to be expended in consultation with SCE for the purposes of increasing the time required from the Scientific Advisory Panel, covering the cost of early termination of the office space lease, and/or repairing or replacing field vehicles or their engines, as specified in the staff report.

## **II. MOTION AND RESOLUTION**

Commission approval of the 2006 and 2007 two-year Work Program and Budget requires the following motion:

I hereby move that the Commission approve the 2006 and 2007 two-year SONGS Work Program and Budget and contingency fund as recommended by the staff.

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<sup>1</sup> Based on the average percent change in the Consumer Price Index-All Urban Consumers for the San Francisco and San Diego areas from the initial 1992 budget to mid-year 2005, the adjusted amount for 2006 is \$144,750. A 4.5% escalator is used for estimating adjustments for 2007, based on the average percent change from the previous budget approved in 2003 to mid-year 2005, resulting in an adjusted amount for 2007 of \$151,264.

The staff recommends a “yes” vote on the foregoing motion, which will result in the adoption by the Commission of the following resolution:

The Commission hereby determines that the 2006 and 2007 two-year SONGS Work Program and Budget and contingency fund that is set forth in the staff recommendation, dated November 23, 2005, carries out the intent of Condition D of Permit 6-81-330-A (formerly 183-73) by requiring the permittee to provide reasonable and necessary funding for the Commission contract staff’s technical oversight and independent monitoring responsibilities pursuant to the mitigation and lost resource compensation conditions (A through C).

### **III. FINDINGS AND DECLARATIONS IN SUPPORT OF 2006 AND 2007 TWO-YEAR WORK PROGRAM AND BUDGET**

#### **A. SONGS PERMIT BACKGROUND**

In 1974, the California Coastal Zone Conservation Commission issued a permit (No. 6-81-330-A, formerly 183-73) to Southern California Edison Company for Units 2 and 3 of the San Onofre Nuclear Generating Station (SONGS). A condition of the permit required study of the impacts of the operation of Units 2 and 3 on the marine environment offshore from San Onofre, and mitigation of any adverse impacts. As a result of the impact studies, in 1991 the Coastal Commission added new conditions to mitigate the adverse impacts of the power plant on the marine environment which require the permittee to (1) create or substantially restore at least 150 acres of southern California wetlands, (2) install fish barrier devices at the power plant, and (3) construct a 300-acre kelp reef (Conditions A through C). The 1991 conditions also require SCE to provide the funds necessary for Commission contract staff technical oversight and independent monitoring of the mitigation projects (Condition D). In 1993, the Commission added a requirement for the permittee to partially fund construction of an experimental white sea bass hatchery. Due to its experimental nature, the Commission did not assign mitigation credit to the hatchery requirement.

After extensive review of new kelp impact studies, 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 by keeping the river mouth permanently open, and (3) revise the kelp mitigation requirements in Condition C. Specifically, the revised Condition C requires construction of an artificial reef large enough to sustain 150 acres of medium to high density kelp bed community (which could result in a reef larger than 150 acres) together with funding for a mariculture/marine fish hatchery 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 which combinations of substrate type and substrate coverage will most likely 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 in April 1997 that there is continuing importance for the independent monitoring and technical oversight required in Condition D to ensure full mitigation under the permit.

## **B. COMMISSION OVERSIGHT AND INDEPENDENT MONITORING**

Condition D establishes the administrative structure to fund the independent monitoring and technical oversight of the mitigation projects. It specifically: (1) enables the Commission to retain contract scientists and technical staff to assist the Commission in carrying out its oversight and monitoring functions, (2) provides for a scientific advisory panel to advise the Commission on the design, implementation, monitoring, and remediation of the mitigation projects, (3) assigns financial responsibility for the Commission's oversight and monitoring functions to the permittee and sets forth associated administrative guidelines, and (4) provides for periodic public review of the performance of the mitigation projects.

Pursuant to this condition, the Commission has operated under approved work programs and budgets since 1993. The Commission retains a science advisory panel and a small technical oversight team (two scientist positions and administrative support) under contract to provide the necessary scientific expertise to the Commission and serve as project managers for the monitoring program. Field assistants also are retained under contract to conduct the monitoring. In addition, independent consultants and contractors are called upon when specific expertise or assistance is needed for specific tasks. Costs for permanent Coastal Commission staff that spend a portion of their time on this program are *not* paid by the permittee but are absorbed by the Commission.

In approving previous years' work programs and budgets for the monitoring and oversight program, the Commission authorized an implementation structure through a contract with the University of California, Santa Barbara, that utilizes the existing contract scientists as project managers at no additional cost, with data collection done by contract field assistants under their direction. The Commission found, based on a comparison of estimated costs from UCSB, other universities, and private consultants, that this implementation structure is the most efficient, cost-effective, scientifically rigorous, and timely method of achieving the goals of the independent monitoring required by the permit. This implementation structure will continue during the two-year period of the 2006 and 2007 work program.

## **C. STATUS OF MITIGATION PROGRAM**

### **C.1. Status of Wetland Restoration Mitigation**

#### *Mitigation Requirement*

Condition A of the permit requires the permittee to create or substantially restore a minimum of 150 acres of wetlands to mitigate for the reduction in the standing stocks of nearshore fishes caused by the operation of SONGS Units 2 and 3. In April 1997, the Commission revised Condition A to allow up to 35 acres enhancement credit for permanent, continuous tidal maintenance at San Dieguito Lagoon.

### *Planning and Environmental Review*

In June 1992, following an evaluation of eight sites, the Commission approved SCE's selected restoration site, the San Dieguito River Valley. In April 1997, the Commission reaffirmed its prior decision that San Dieguito River Valley is the restoration site that meets the minimum standards and best meets the objectives set forth in Condition A.

In November 1997 the Commission approved SCE's preliminary wetland restoration plan as largely conforming with the minimum standards and objectives stated in the permit. The CEQA/NEPA environmental review incorporated the mitigation project into the overall San Dieguito River Valley Regional Open Space Park project. The lead agencies for the CEQA/NEPA environmental review were the San Dieguito River Valley Regional Open Space Park Joint Powers Authority (JPA) and the U.S. Fish and Wildlife Service.

Following the review period on the January 2000 Draft EIR/S, the Final EIR/EIS was released in September 2000. On September 15, 2000, the JPA certified the EIR/EIS after public hearing. The EIR/EIS designated the Mixed Habitat plan as the environmentally preferred alternative.

Lawsuits challenging the adequacy of the Final EIR/EIS were filed by the Del Mar Sandy Lane Association and Citizens United to Save the Beach. On July 27, 2001, the San Diego Superior Court ruled that the EIR/EIS did not comply with CEQA and remanded the EIR/EIS back to the JPA for revisions. However, on August 4, 2003, the California Court of Appeals overturned the Superior Court's ruling and upheld the adequacy of the EIR/EIS.

Following the conclusion of the litigation, the USFWS issued its final Record of Decision on the Final EIR/EIS on November 28, 2003.

### *Steps in Implementing Wetland Restoration*

Following the preparation of the wetland restoration project design and engineering plans, on August 17, 2004, SCE and JPA submitted their Coastal Development Permit Application (#6-04-88) to the Commission's San Diego and San Francisco offices. The Commission's contract scientists and staff reviewed the application and associated documents, requesting additional information where necessary. On October 12, 2005, the Commission approved the Final Restoration Plan and CDP #6-04-88, as conditioned, for the San Dieguito Wetland Restoration Project.

In approving the preliminary restoration plan in 1997, the Commission acknowledged and accepted that a small amount of existing wetland would be lost in implementing the overall wetland restoration project at San Dieguito. The Commission had determined that if the Final Plan involves any loss that such loss would be mitigated and an amendment to the SONGS permit would be considered to allow the restoration project to go forward in compliance with the SONGS permit conditions. On October 12, 2005, the Commission approved an amendment to CDP #6-81-330-A4 to revise Standard 1.3.h of Condition A to allow the minimal loss of existing wetlands as "specifically authorized by the Coastal Commission in Coastal Development Permit No. 6-04-88 for the San Dieguito Wetland Restoration Project Final Restoration Plan."

At the same time, the long-standing obligation of the 22<sup>nd</sup> Agricultural District to provide for Least Tern nesting habitat as a requirement of its coastal development permit No. 6-84-525 was resolved with the inclusion of four new nesting sites in the Final Restoration Plan. On October 12, 2005, the Commission approved an amendment to CDP #6-84-525 to require the provision, maintenance and monitoring of the new Least Tern nesting habitat to be constructed as part of the San Dieguito Wetland Restoration Project.

The next steps toward project implementation include obtaining any remaining permits and preparing the final plans in compliance with the special conditions in CDP #6-04-88. SCE expects to begin clearing vegetation in upland areas in January 2006. Construction of the wetland restoration project is planned to begin in the spring of 2006 and will take about three years to complete.

### *Wetland Restoration Monitoring*

The SONGS permit establishes physical and biological performance standards that shall be met by the restored wetland. As part of the Commission's technical oversight, monitoring and management responsibilities under Condition D, the contract scientists conducted pre-restoration monitoring in San Dieguito Lagoon and in other southern California wetlands, including those that will be used as reference sites in post-restoration monitoring. Pre-restoration monitoring included the collection of physical and biological data on the wetland attributes to be monitored during post-restoration monitoring. These data were needed to develop sampling designs that can effectively determine whether the various performance standards have been met. The results of the pre-restoration monitoring studies are incorporated into the CCC Monitoring Plan for the SONGS Wetland Mitigation Program, approved as part of the Commission's approval of the coastal development permit for the wetland restoration project. An important goal of pre-restoration monitoring was to develop sampling designs that will minimize adverse impacts to wetland resources.

Data were acquired during pre-restoration monitoring on the temporal and spatial scales over which the densities and numbers of wetland species vary. These data will facilitate the design of a sampling program for these taxa because they provide much needed information on optimal sample sizes, sampling frequency and sampling locations. A principle focus of pre-restoration monitoring was on developing cost-effective methods to sample fish, which can be highly mobile and variable in abundance at nearly all temporal and spatial scales and thus difficult to adequately sample. This work included a determination of the optimal configurations of sampling gear and methods to balance the conflicting goals of adequate spatial and temporal sample replication and the time and cost of sampling fish in the restored and reference wetlands.

There was also a need to identify methods that accounted for spatial variation in the densities and number of species of invertebrates and birds in the habitats of interest. This work included an examination of sampling methods that may reduce costs associated with the monitoring of these taxa. The density and number of species of birds, in particular, can be extremely variable within an estuary. Existing data on the number of species and abundance of birds in the tidal wetlands of southern California and northern Baja California were reviewed and used to determine the most appropriate methods and spatial and temporal scales for the sampling of birds in the restored and reference wetlands during post-restoration monitoring.



Data were also acquired during pre-restoration monitoring on the use of low-level aerial photography in combination with ground-truthing to monitor performance standards relating to the proportion of salt marsh vegetation cover and open space and habitat areas.

Water quality is important to the health, abundance, and richness of estuarine biota in San Dieguito Lagoon and is one of the long-term physical standards that will be used to measure the performance of the restored wetland. The contract scientists continued to collect baseline data on salinity, dissolved oxygen concentration, water temperature and tidal height in San Dieguito Lagoon.

### *Monitoring Plan and Adaptive Management*

Condition A (Wetland Mitigation) of the coastal development permit for SONGS requires that monitoring of the wetland restoration be done over the full operating life of SONGS Units 2 and 3. This monitoring will be done to measure compliance of the mitigation project with the performance standards specified in the SONGS permit. In accordance with Condition D (Administrative Structure) of the permit, scientists retained by the Executive Director shall develop the Monitoring Plan to guide the monitoring work and will oversee the monitoring studies outlined in the Plan. The SONGS permit provides a description of the performance standards and monitoring required for the wetland mitigation project.

A Draft Monitoring Plan for the SONGS Wetland Mitigation Program was distributed to State and Federal agencies and SCE for review on May 18, 2005. The period to receive comment ended August 29, 2005. A revised Monitoring Plan was part of the coastal development permit (No. 6-04-88) for the wetland restoration project considered and approved by the Commission on October 12, 2005.

The Monitoring Plan for the SONGS Wetland Mitigation Program closely adheres to the monitoring requirements of the SONGS permit. The performance standards that will be used to measure the success of the wetland restoration project fall into two categories. The first category includes long-term physical standards relating to topography (erosion, sedimentation), water quality (e.g., oxygen concentration), tidal prism, and habitat areas. The second category includes biological performance standards relating to biological communities (e.g., fish, invertebrates, and birds), marsh vegetation, *Spartina* canopy architecture, reproductive success of marsh plants, food chain support functions, and exotic species. The Monitoring Plan includes a description of each performance standard and the methods that will be used to determine whether the various performance standards have been met. The successful achievement of the performance standards will in some cases be measured relative to three reference wetlands, which are specified in the permit to be 1) relatively undisturbed, 2) natural tidal wetlands, and 3) within the Southern Bight. The wetlands that best met these three criteria and that were selected as reference sites are Tijuana River Estuary, Mugu Lagoon, and Carpinteria Salt Marsh.

Management issues relevant to the SONGS wetland mitigation requirement are also discussed in the Monitoring Plan. These issues include inlet maintenance, excessive changes in topography, and exotic species. Although the Commission's contract scientists are not responsible for managing the wetland restoration, their monitoring will measure several parameters that can be used in adaptive management to ensure the success of the restoration project.

SCE has a permit requirement and a plan for managing the inlet in perpetuity to ensure uninterrupted tidal flushing of the restored wetland. This plan provides conditions that would indicate the need for additional maintenance dredging at the inlet. Commission contract scientists will measure water elevation, salinity, and dissolved oxygen concentration during water quality monitoring in the wetland. These variables change dramatically with a reduction in tidal flushing and provide a useful trigger for inlet maintenance. Topographic degradation of the wetland and berms is likely to occur over time as a result of sedimentation and scour. If aerial photographs or topographic surveys taken as part of post-restoration monitoring indicate that major topographic degradation has occurred, then the appropriate corrective action (e.g., dredging) will be taken to reconfigure the wetland to its “as designed” condition. Exotic species may invade restored habitats. If invasive exotic species are found in the restored wetland during post-restoration monitoring, and these species could adversely affect the success of the restoration, experts working in this field will be consulted and a program to control the spread of these species will be developed.

## **C.2. Status of Kelp Reef Mitigation**

### *Mitigation Requirement*

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

In April 1997, the Commission added the requirement for a payment of \$3.6 million to the State’s Ocean Resource Enhancement and Hatchery Program (OREHP) to fund a mariculture / marine fish hatchery to provide compensation for resources not replaced by the artificial mitigation reef. SCE has fully satisfied this requirement. Permanent Commission staff participate in the oversight of the fish hatchery program with very minor assistance from the contract scientists (see section D.4, below).

### *Planning and Construction of Experimental Reef*

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

The Coastal Commission approved the coastal development permit for the experimental reef on July 15, 1999. The final plan approved by the Coastal Commission was for an experimental

artificial reef located off San Clemente, California that tested eight different reef designs that vary in substrate composition (quarry rock or recycled concrete), substrate coverage (17%, 34%, and 67%), and presence of transplanted kelp. All eight reef designs were represented as individual 40 m x 40 m modules that were replicated in seven areas (i.e., blocks) for a total of 56 artificial reef modules totaling 22.4 acres. The Army Corps of Engineers issued its permit on August 13, 1999, and SCE completed construction of the experimental reef on September 30, 1999.

### *Monitoring of Experimental Reef*

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

Five years of post-construction monitoring were completed in December 2004. Results from the five-year experimental phase of the artificial reef mitigation project were quite promising in that all six artificial reef designs and all seven locations (i.e., blocks) tested showed a near equally high tendency to meet the performance standards established for the mitigation reef. It was concluded from these findings that a low relief concrete rubble or quarry rock reef constructed off the coast of San Clemente, California has a good chance of providing adequate in-kind compensation for the loss of kelp forest biota caused by the operation of SONGS Units 2 and 3.

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

## **C.3. Status of Fish Behavioral Mitigation**

### *Mitigation Requirement*

Condition B of the SONGS permit (as amended April 1997 and October 1998) requires SCE to install and maintain behavioral barrier devices, including, but not limited to, mercury lights and sonic devices, in Units 2 and 3 to reduce fish impingement losses.

### *Background*

Between 1983 and 1991 the Marine Review Committee found that annual losses of juvenile and adult fish in the cooling water systems of SONGS Units 2 and 3 under normal operations averaged about 20 metric tons. Although the SONGS permit does not specify any criteria for evaluating the effectiveness of these devices, the recommendation of the Marine Review Committee (Section IV—Proposed Findings and Declarations in the SONGS 1991 permit) was

that “the techniques” (behavioral barrier devices) “be tested on an experimental basis, and implemented if they reduce impingement by at least 2 metric tons (MT) per year”, which is equivalent to at least 10% of the average loss due to impingement.

Beginning in 1991, prior to the imposition of Condition B, SCE modified its procedure for its heat cleaning treatment of the cooling water intake systems of Units 2 and 3. This modification (termed the Fish Chase procedure) has reduced in-plant fish losses on average by approximately 4.3 MT per year.

### *Compliance to Date*

To comply with Condition B, SCE installed mercury vapor lights in Units 2 and 3 in September 1992 and tested them for approximately one year. Scientists contracted by the Commission evaluated the results of this experiment in a number of ways, and no clear conclusion could be reached concerning the effectiveness of the lights.

In 1994 the staff instructed SCE to conduct a series of laboratory and in-plant experiments to test the behavioral response of fish to lights and sound. (At this time staff also informed SCE that if the experiments indicated that the installed devices would not decrease fish impingement losses by 2 metric tons per year, then compliance with Condition B would be attained without further testing provided the modified heat cleaning treatment (i.e., Fish Chase procedure) was maintained for the operating life of Units 2 and 3.) Pursuant to this instruction, SCE conducted laboratory studies from 1995 to 1997 on the behavioral response of fish to different intensities of light and different frequencies of sound. Results of these experiments indicated that certain species of fish displayed behavioral responses to incandescent light and sound that could be exploited to reduce impingement in the cooling system. However, the use of sonic devices in the plant was determined not to be feasible due to the logistic difficulty and high cost of reproducing in the plant the frequencies and intensities of sound that were needed to elicit a behavioral response in the laboratory. Staff then instructed SCE to begin in-plant testing using incandescent lights. Installation of the lights in Units 2 and 3 was completed in December 1998 and a three-phased experiment investigating the effect of these lights in reducing fish losses was conducted between February and December 1999. Results from these experiments showed no evidence that using lights in the cooling water systems of Units 2 and 3 would reduce fish impingement losses. Consequently, the Executive Director has determined that the lights and sound devices tested by SCE are not effective as fish behavioral barriers at SONGS.

Although the MRC had recommended testing lights and sound devices as the most promising effective behavioral barriers to reduce fish impingement losses, SCE, in consultation with the Commission’s contract scientists, considered other alternatives, including strobe lights, air bubble curtains, pneumatic guns, poppers and electrified nets. Most of these deterrents were inconsistent, either from site to site or from species to species. Some cause adverse effects to marine life and others presented severe installation and maintenance concerns. As a result, the Executive Director also has determined that there currently are no alternative behavioral barriers that are likely to be effective or feasible at SONGS, but that if future new technologies are developed that would be effective, SCE is obligated to make every effort to test and if found feasible install such devices.

The Executive Director has concluded, and the Commission has concurred, that no further testing of alternative behavioral barriers should be required at this time. Compliance with the requirements of Condition B will be satisfied provided that SCE: (1) continues to implement the modification in its heat cleaning treatment that has resulted in an annual average reduction in the loss of fish of 4.3 MT (i.e., the Fish Chase procedure), and (2) monitors its effectiveness.

During the 2005-2006 work period contract scientists reviewed data and analyses on the fish chase procedure at SONGS that were contained in SCE's *Annual Marine Environmental Analysis* reports for 2003 and 2004. Information contained in these reports showed that SCE was in compliance with the requirements of Condition B for the years 2003 and 2004 with regard to maintaining the Fish Chase Procedure and reporting requirements. However, there were events in 2004 that were not consistent with the standards enumerated in the Executive Director's determination of October 12, 2000 regarding Condition B. Monitoring data collected during the Fish Chase Procedures revealed the following results:

- The impingement for 2003 was about 21,923 kg, which was 6,050 kg more than in 2002 but still less than the long-term average of about 22,064. The Fish Chase procedure resulted in 2,386 kg of fish returned live to the ocean, a decrease of 2,715 kg from 2002. For the year 2003 the Fish Chase effectiveness relative to impingement was 11%, which meets the 10% target value.
- The impingement for the year 2004 was about 54,244 kg, which was 32,321 kg more than in 2003 and much more than the long-term average of about 23,527. The Fish Chase procedure resulted in 2,616 kg of fish returned live to the ocean, an increase of 230 kg from 2003. However the return for 2004 (2,616 kg) was much less than the long term average of 4,074 kg (a 4.82% reduction relative to impingement, which was substantially less than the 10% target value). There was a huge increase in the impingement of sardines in 2004. By weight sardines constituted ~80% of impingement in 2004, whereas in 2003 they constituted ~10%. By contrast with overall impingement, sardines were much rarer during Fish Chase procedures (about 3%). Finally, there were a series of unusually high mortality events during the Fish Chase Procedure that met the definition of 'unusual events' specified in the Executive Director's determination. Consequently, SCE's annual report (dated July 2005) indicate that the results of the Fish Chase Procedure during 2004 were not consistent with the standards enumerated in the Executive Director's determination.

In order to assess the importance of such significant deviation in the results of the Fish Chase Procedure, staff in a letter to SCE dated November 18, 2005, has requested additional information on the impingement and heat treatment data for the years 2000-2004, as well as an interim report for the current year (2005).

#### **C.4. Status of Hatchery Program**

##### *Permit Requirement*

In 1992 the Commission required the permittee to contribute \$1.2 million towards the construction of an experimental marine fish hatchery and an evaluation program to determine

whether the hatchery is effective at increasing the stock of fish. (Condition F). The permittee paid the initial sum, therefore fulfilling its permit condition.

### *Department of Fish and Game Hatchery Program*

The marine fish hatchery program is operated by the State of California through the Ocean Resources Enhancement and Hatchery Program (OREHP), which is administered by the Department of Fish and Game (DFG). Hubbs-Sea World Research Institute, under contract to DFG, constructed and operates the fish production hatchery at Agua Hedionda Lagoon in Carlsbad, California.

A ten-member panel, the Ocean Resources Enhancement Advisory Panel (OREAP), assists DFG in establishing policy for the program. Although the permittee provided funding for the hatchery program, the permittee does not take part in it. Instead the program is overseen by DFG and OREAP. Most of the conditions for the hatchery program contained in the permit therefore have to be met by DFG and OREAP, through a 1994 Memorandum of Agreement (MOA), rather than by the permittee. As of this writing, the ORHEP program has exhausted the original \$3.6 million dollars of SONGS mitigation money, plus the approximately \$500,000 earned in interest.

The DFG has been overseeing field sampling associated with sea bass enhancement efforts since at least 1989; the formal evaluation program called for in the MOA was initiated in 1994.

White sea bass are cultured at the hatchery until they reach a length of about 3 inches. At that time they are transferred to grow-out pens, which are maintained throughout southern California by a network of community volunteers. After the fish attain a length of about 10 inches they are tagged and released.

In September 2004, in accordance with coastal permits for the grow-out pens, OREAP requested authorization from the Executive Director to raise the annual release limit from 125,000 fish to 350,000 fish. The Executive Director authorized the increase for two years, and required that in that time the program address certain issues of concern to Commission staff. These issues include:

- Revising the Comprehensive Hatchery Plan to reflect actual broodstock handling procedures developed since the hatchery became operational in 1994;
- Developing environmental standards for the grow-out facilities, including a benthic monitoring plan;
- Developing an adaptive management plan for fish releases, based on research currently being conducted on the genetic makeup of the wild population;
- Applying for coastal development permits for certain grow-out facilities that are currently operating without a permit.

Oversight of the hatchery program is conducted primarily by permanent Coastal Commission staff, with minor assistance provided by contract scientists. Commission staff has been working

closely with DFG, Hubbs-Seaworld and OREAP during 2004-2005 to develop the documents listed above.

#### **D. WORK PROGRAM: 2006 AND 2007**

Condition D requires the permittee to fund scientific and support staff retained by the Commission to oversee the site assessments, project design and implementation, and monitoring activities for the mitigation projects.

##### *Implementation Structure*

Scientific expertise is provided to the Commission by a small technical oversight team hired under contract. The technical oversight team members include three Research Biologists from UC Santa Barbara (Principal Scientists): Stephen Schroeter, Ph.D., marine ecologist, Mark Page, Ph.D., wetlands ecologist (half time), and Daniel Reed, Ph.D., kelp forest ecologist (half-time). A half-time administrator completes the core contract program staff. In addition, a science advisory panel advises the Commission on the design, implementation, monitoring, and remediation of the mitigation projects. Current science advisory panel members include Richard Ambrose, Ph.D., Professor, UCLA, Peter Raimondi, Ph.D., Professor, UC Santa Cruz, and Russell Schmitt, Ph.D., Professor, UC Santa Barbara.

To meet the goals specified in the permit under Condition D and to complete the tasks identified in the 2006-2007 work program, the contract program staff is aided by contract field assistants who are responsible for collecting and assembling the monitoring data. The contract program staff is also assisted on occasion by independent consultants and contractors when expertise for specific tasks is needed or when additional field assistance is needed for short-term monitoring tasks. The Commission's permanent staff also spend a portion of their time on this program, but their costs are paid by the Commission and are not included in the SONGS budget.

The staff implements the Commission's technical oversight and independent monitoring program through a contract with the University of California, Santa Barbara. UCSB has an international reputation for excellence in ecology and marine biology and is well equipped at supporting extramural contracts and grants in these areas. The UCSB contract uses the existing Principal Scientists as project managers for both the wetland restoration and reef mitigation oversight and independent monitoring, with data collection done by the contract field assistants under their direction. They are responsible for supervising the contract field assistants, authorizing purchases and subcontracts, and interacting with UC administrative staff on issues pertaining to personnel, budget, and UC policies (e.g., boating and diving safety regulations) relevant to the project. Monitoring of these projects is being adaptively managed in order to streamline effort and minimize costs without compromising the integrity of the data and their value in decision making with regards to the performance of the mitigation projects. Continuous interaction between the Principal Scientists and field assistants is crucial to fulfilling the monitoring tasks for both the wetland restoration and experimental reef.

At the start of the five-year experimental reef monitoring program, staff conducted a cost comparison among UCSB, other universities, and private consultants and concluded that use of a qualified university would save SCE a substantial sum over use of private consultants. Based on 1995 real cost data from private consultants for work that included the same physical and biological variables used in the SONGS reef monitoring program, personnel rates for private consultants ranged primarily from \$65-80 per hour and diving related costs (dive boat, equipment, travel costs) and profit margins added by the private consultants exceeded \$650,000 per year. In contrast, eleven years later, the fully-loaded 2006 personnel rates for UCSB-hired field assistants (salary, benefits and indirect costs) range from \$30-38 per hour and field-related costs for both the wetland and reef monitoring are less than \$120,000 per year.

In making the decision to implement the monitoring program through UCSB, the Commission recognized that there are important differences between the way the university and a private consulting company service a contract. Foremost among these differences is the need for full time university employees to service contracts located far from campus (i.e., more than a reasonable commuting distance). Unlike large consulting firms or on-campus university research groups, the Commission's SONGS monitoring project (located in Carlsbad, California) is a relatively self-contained unit that does not have the flexibility to cost-share personnel or resources with other university projects. Retaining university employees with the knowledge and expertise required for the SONGS project on a part time or seasonal basis would be extremely difficult, if even possible. Past experience has proven that staffing the project with full time employees is necessary to maintain consistency in data collection and processing and for getting the field work accomplished in a timely manner. Despite the need for full time employees, UCSB's overall costs for conducting the monitoring work are still far below those of a private consulting firm.

Staff further evaluated whether the field component could be operated separately from the contract with UCSB by another, perhaps local, university. Although personnel rates at other universities likely would be comparable to UCSB rates, splitting the program between two or more academic institutions would necessitate at least one additional Ph.D. level scientist (per institution) to serve as "Principal Investigator" (i.e., project manager) for the university contract. The staff determined that adding another high-level scientist to perform work duplicative of the existing UCSB-contract Principal Scientists was not cost-effective or efficient, and would jeopardize the close collaboration needed between the scientists to successfully implement the monitoring plan.

The Commission concurred with staff at the start of the monitoring program and continues to find that implementing the field monitoring programs through a contract with UCSB is the most efficient, cost-effective, scientifically rigorous, and timely method of achieving the goals of the independent monitoring required by the SONGS permit.



### *Consultation with Permittee*

Pursuant to the permit conditions, the staff has consulted with SCE on the proposed work program and budget for 2006 and 2007. Staff initiated consultation with a preliminary draft proposal for the work tasks to be accomplished. Staff revised the proposed tasks to include suggestions from SCE, to better explain the reasons for the proposed tasks, and to adjust the timing of tasks to coordinate with SCE's anticipated implementation schedules. After further discussion, SCE accepted the staff's revisions and indicated its satisfaction with the proposed work plan for 2006-2007.

Although SCE agreed with the proposed tasks, SCE questioned the appropriateness of the level of effort—and corresponding budget—on reef task 2.3 below, *Muricea* Management, in which staff proposes to develop cost-effective techniques for managing the dense populations of invasive large sea fans (*Muricea*) that could prevent the mitigation reef from meeting the SONGS permit performance standards. SCE's concern was based on a draft allocation of time by task that SCE had requested in the past as a result of an internal audit at SCE. Staff has always recognized that such time allocations by task are arbitrary at best, given how the oversight and monitoring program is structured (i.e., through the university with full time staff) and managed. In actuality, the Principal Scientists manage the oversight and monitoring program as a whole, rather than allocating specific amounts of time to individual tasks, and assign the field staff to work on whatever needs to be done to accomplish all of the tasks in the work program efficiently and in a timely manner.

In further consultation with SCE, staff demonstrated that the proposed staffing of four full time university-certified scientific divers for the reef tasks is the minimum needed to meet the goals specified by the permit under Condition D and to complete the proposed tasks for several reasons. First, university and industry accepted standards require that diving be done in pairs. Because most kelp forest organisms show substantial seasonal variation in recruitment, growth and overall abundance, data needs to be collected at the same time each year. This, coupled with the often-marginal diving conditions typical of the project site prevent two divers from doing the work of four divers in twice the amount of time. As a result, a minimum of two pairs of divers is needed to collect field data in a timely fashion. Second, full time university-trained research divers can deal much more cost-effectively with the inevitable unforeseen contingencies caused by weather or logistical constraints that arise during the course of the monitoring work than can part time employees. Third, completion of the field work requires a substantial level of expertise and training. UCSB's project staff are trained in identifying over 200 species of benthic algae and invertebrates and some 45 species of kelp forest fishes, which is needed to properly evaluate the performance standards for the artificial reef.

Use of part-time biologists would require either highly paid experts or would entail significant (and costly) training of less qualified individuals. Moreover, the logistics of deploying part-time technicians in an environment where field conditions for diving are often marginal and vary unpredictably is inefficient and can result in a less than satisfactory completion of assigned tasks

(as was borne out during the 1999-2001 work programs in which consultants were used for one of the tasks).

Lastly, in addition to being experts in scientific diving and data collection, UCSB's research divers are trained in a number of other tasks necessary for completing the monitoring requirements of the mitigation projects. These tasks include: data management (data entry, quality control and quality assurance) and processing using statistical and database software, equipment maintenance, fabrication of sampling devices, small marine boat operations and maintenance, and expertise in information technology. If ocean conditions are not conducive for diving, then the science staff are assigned other project-related tasks. They do not sit idle waiting for the diving conditions to improve. (This multi-tasking is one of the reasons that trying to predict staff effort by task is of limited use in managing the oversight and monitoring program as a whole.)

One of the unwritten goals staff has in managing the monitoring program is to have no backlog in processing and analyzing the collected data, so that the work the Commission is doing does not become a bottleneck that delays the mitigation projects. Field staff are highly qualified scientists and capable of performing all technical and scientific aspects of the monitoring program. Without them, the Principal Scientists and staff could not complete the data analysis in a timely fashion.

The one instance in which staff does propose to use temporary part-time field assistants is during the summer, the period of the most intense sampling surveys. These are lower level research assistants who are qualified to drive the boats, which is especially critical during the fish surveys as the diving teams complete multiple short dives on each module without having to anchor the boat at each location. Temporary staff also are certified divers that can fill in on a dive team if necessary, prepare for the field work, and perform data entry.

In sum, the staffing identified in the work plan is predicated on meeting the monitoring requirements specified in the SONGS permit. The currently proposed work program represents a carefully thought out minimum staffing model to accomplish the monitoring tasks that both the staff and the permittee agree upon (see attached letter of support).

## **D.1. Wetlands Tasks**

### *1.1 Wetland Restoration Planning*

During the 2006-2007 work period, the contract scientists will be involved in the following tasks to facilitate planning and execution of the San Dieguito Wetland restoration project:

- a. Consult with the permittee on the restoration.* Attend meetings and interact with permittee and their contractors to ensure that restoration proceeds in a timely manner according to the Final Wetland Restoration Plan approved by the Coastal Commission and in accordance with the conditions of the SONGS coastal development permit.

- b. Assist CCC staff as needed regarding scientific issues on CDP #6-04-88 Condition Compliance.*
- c. Synthesize construction monitoring data and present the results at an annual public workshop that reviews the status of planning and monitoring of the wetland restoration project.*
- d. Decide on the criteria for assessing compliance of the wetland mitigation project with the performance standards specified in the permit over the lifetime operation of SONGS. In consultation with the CCC staff, and with input from SCE, the contract scientists will develop criteria for determining overall project compliance given that the various performance standards specified in the permit may be met at different times during the lifetime operation of SONGS.*
- e. Prepare a written annual report of the proceedings of the annual workshop that includes the results of independent construction monitoring by CCC contract scientists and distribute it to SCE and other interested parties.*
- f. Prepare quarterly reports for the Commission on the status of the wetland project including results of independent construction monitoring by CCC contract scientists.*
- g. Respond to requests from SCE and other parties for data and analyses.*

## **1.2 Construction Monitoring**

Condition A of the SONGS CDP requires independent monitoring by Commission contract scientists during and immediately after each stage of construction to ensure that the restoration work is conducted according to approved plans. To accomplish this task, CCC contract scientists will interact closely with project contractors, surveyors, biologists, and others retained by SCE involved with implementation of the Final Plan. CCC construction monitoring will be event driven, with the level of monitoring dependent on the timing and types of activity at the construction site. The level of activity of CCC monitoring will be highest during the initial coordination and planning phase, during the early stages of each construction phase (e.g., of each module), towards the end of each construction phase, and at the conclusion of construction. Spot checks coordinated with other monitors will be conducted during periods of more routine activity to minimize unnecessary duplication of oversight. Spot checks will involve visitation by CCC personnel to the job site, but these may of short duration.

- a. Coordinate CCC construction monitoring with other monitoring occurring on-site and with construction personnel.*
- b. Attend planning meetings and briefings for each phase of construction.*
- c. Conduct monitoring to:*

- i) *Ensure that SCE's monitoring activities are implemented as specified in the Final Restoration Plan.*
- ii) *Conduct spot checks at the construction site with regard to proper implementation of the Final Plan (e.g., module boundaries, elevations, avoidance of sensitive habitats and species, and planting program,).*
- iii) *Monitor for changes in existing sensitive habitat outside the construction footprint using aerial photos and ground-truth surveys (twice annually).*
- iv) *React to unforeseen events (e.g., unplanned slumping, errors or changes in implementation).*
- v) *Produce reports of CCC construction monitoring activity.*
- d. *Review monitoring reports associated with the restoration produced by other agencies or SCE consultants.*
- e. *Enter, organize, manage, and analyze data collected during the monitoring and consult with database consultants as needed.*
- f. *Consult with permittee, resource agencies and other wetland ecology experts on wetland management issues. These issues include dredging for inlet maintenance, dredging for restoration-site maintenance, establishment of viable least tern nesting sites, and control of exotic species.*

### 1.3 *Wetland Management, Oversight, and Administration*

- a. *Direct the monitoring studies described in the work plan. This involves planning these activities and managing personnel to carry them out.*
- b. *Resolve any issues pertaining to logistics and data analyses that arise.*
- c. *Work with University of California administrative staff on project issues pertaining to contracts, payroll, purchasing and personnel.*
- d. *Maintain database software, hardware, and network services. Troubleshoot and remedy any problems that arise. Consult with computer consultants as needed to maintain reliability and security of network and desktop operations.*
- e. *Consult with members of the Science Advisory Panel, Coastal Commission staff, other resource agencies, and the permittee and its contractors on the status of the monitoring studies.*
- f. *Prepare 2008-2009 Work Plan.*

## **D.2. Reef Tasks**

The permit requires the Commission's contract scientists to oversee the planning and design of the mitigation artificial reef to ensure that it conforms to the permit requirements and to monitor the mitigation reef to determine whether it meets the performance standards established for it. During 2006-2007 contract scientists and their field assistants will conduct the following activities to accomplish these tasks.

### *2.1 Mitigation Reef Planning*

During the 2006-2007 work-period the contract scientists will be involved in the following tasks to facilitate planning and construction of the mitigation reef:

- a. Review the preliminary plan describing the location and design of the mitigation reef. Provide SCE with clear guidance on the scope and content required for the preliminary plan. Determine whether the plan meets the permit requirements and the overall project goal of providing 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.*
- b. Review the final plan for the mitigation reef. Determine whether the final plan substantially conforms to the preliminary plan approved by the Executive Director. Consult with experts as needed in the fields of engineering, and Geographic Information System (GIS) databases. Assist staff review of a coastal development permit application for construction of the mitigation reef.*
- c. Consult with the permittee and other agencies on the environmental review, planning, permitting, and construction of the mitigation reef. Attend meetings to provide guidance on issues related to the design and engineering of the mitigation reef. Ensure that reef mitigation project proceeds according to the coastal development permit in a timely manner.*

### *2.2 Mitigation Reef Monitoring Plan*

Contract scientists will prepare a monitoring plan for the mitigation reef that shall provide an overall framework to guide the monitoring work. The plan shall be completed within six months of approval of a coastal development permit for the mitigation reef proposed in the final plan. The plan shall describe the sampling methodology, analytical techniques, and methods for measuring performance of the mitigation reef relative to the performance standards identified in the SONGS permit. The following tasks will be done during the 2006- 2007 work period to complete the mitigation reef monitoring plan.

- a. Develop method(s) for evaluating the performance standards pertaining to fish reproductive rates.*

- i) *Develop a set of indicator species for evaluating the standards pertaining to fish reproductive rates.* Contract scientists will review the literature and consult with Department of Fish and Game and NOAA Fisheries staff to identify existing life history information for fishes inhabiting shallow reefs in southern California. Efforts will focus on size-specific reproduction and growth, length-mass and length-fecundity relationships, and the spatial and temporal variation in these relationships. Species will be classified by trophic guild, life history (based on type of sex allocation [gonochore, protogynous], reproductive mode [oviparous, live-bearing], pelagic larval duration, adult body size), economic importance (recreational or commercial), relative biomass at the study sites, and other biologically and socially relevant characteristics. The information gathered will be used to select candidate species that adequately represent the overall fish assemblage of the region, acknowledging that *all* species inhabiting the mitigation reef cannot be adequately sampled.
  - ii) *Evaluate existing techniques and develop sampling protocols for measuring reproductive rates for candidate species.* A range of techniques for measuring fish reproductive rates will be evaluated for the candidate species. Evaluations will include estimates of the samples sizes needed for each technique to detect differences in fecundity (of reasonable magnitude) among the artificial reef and natural reference reefs, cost-effectiveness, feasibility and potential negative impacts of destructive sampling. Information gained from these evaluations will be used to develop cost-effective sampling protocols for estimating reproductive rates of the candidate species.
- b. *Develop approach for evaluating the performance standards pertaining to fish production.* The high mobility of most reef fishes (relative to the spatial arrangement of the artificial reef modules of the experimental reef) coupled with the relatively small size of the artificial reef modules precluded obtaining reasonable estimates of fish production for the different reef designs tested in the experimental phase that could be scaled up to the size of the mitigation reef. Consequently this performance standard was not evaluated during the five-year experimental reef phase and the methodologies for evaluating this standard were not developed. Obtaining accurate estimates of fish production on artificial reefs is of much interest to resource managers and fisheries biologists alike as there is a need for artificial reefs constructed for mitigation to produce new fish rather than attract existing fish from nearby areas.

Despite the widespread interest in obtaining accurate estimates of fish production on artificial reefs there are no generally accepted state-of-the-art methods for doing so. With this in mind, contract scientists convened a workshop during the 2004-2005 work-period to explore the most cost effective means of evaluating the SONGS performance standards pertaining to fish production. The three experts invited to the workshop (Drs. Edward DeMartini, Marc Mangel, and Craig Osenberg) prepared a report following the

workshop that included recommendations for future studies needed to develop the methodology to evaluate the SONGS performance standards pertaining to fish production and reproductive rates. The work planned for 2006-2007 includes a subset of these recommended studies that the contract scientists and their science advisors consider to be the most valuable for developing cost-effective methods of evaluating this standard.

- i) *Conduct surveys of fish sizes and densities on the experimental reef modules of SCAR and the two reference reefs (San Mateo and Barn) which are potential sources of immigrants and recruit for the mitigation reef.* One way to assess the degree to which the mitigation reef produces new fish versus attracts existing fish from nearby reefs is to monitor natural reefs and assess the degree to which fish abundance (or production) on them is altered by the construction of the mitigation reef. Given the scale of effects, this is probably best done using a sampling design that allows for the lack of spatial replicates such as the Before-After/Control-Impact Paired Series design (BACIPS). BACIPS was used by the Marine Review Committee in their original studies of SONGS impacts. In this design, the Control site would be a natural reef sufficiently distant from the mitigation reef to be unaffected by it, but within the same biogeographic region (e.g., Barn kelp bed); the Impact site would be another natural reef sufficiently close to the mitigation reef (e.g., San Mateo kelp bed) to have its production reduced by the presence of the mitigation reef, with incomplete compensation by the remaining fish, and displacement of fish from the natural reef to the mitigation reef. Conversely, the mitigation reef could result in increased production or abundance or both on the Impact reef.

Successful application of BACIPS to the attraction-production problem requires identification of possible sources of fish attracted to the mitigation reef. The four most likely possibilities are: 1) San Mateo kelp bed; 2) diffuse hard substrate interspersed throughout the sand habitat of the mitigation reef lease site; 3) San Clemente Pier and a natural reef located near it; which are located one to several km upcoast of the project site; and 4) the existing experimental reef modules within the project site. Possibilities 1 and 4 are the only feasible options for BACIPS studies because they are the only ones for which a sufficient Before time-series can be generated. At present, the time series for Barn, San Mateo and the rock modules of SCAR extends from 2000 to 2005. Additional data at these sites collected prior to construction (planned for 2008) will provide a continuous eight-year time series for the Before period, which is critical for assessing whether the mitigation reef is a source of attraction vs. a source of production of reef fishes.

The type of BACIP studies proposed have been touted in the literature as a powerful means for addressing the fish production vs. attraction issue on artificial

reefs, but have seldom been attempted because conditions that lend themselves to using this analysis rarely exist. The SONGS artificial reef project is a rare exception in this regard. The propose BACIP study builds upon the existing five-year times series of fish abundance data collected during the experimental phase of the SONGS mitigation project and the future fish time series planned for the mitigation phase. The only additional work that is proposed here is the continuation of the fish surveys during the interim reef planning and construction period. The annual effort required to do this is approximately two weeks time for four divers. Staff believes that this is a small amount of effort that has a potential for large return of knowledge that is directly applicable to SCE's obligation for compliance monitoring.

In addition to providing information on the extent to which the mitigation reef produces new fish versus attracts existing fish, the data collected for the BACIPS analysis will be useful assessing potential impacts of construction on the fish assemblages at the reference sites.

- ii) *Assess whether data collected for the purpose of assessing other performance standards are sufficient for evaluating the performance standard for fish production.* The most cost effective way to evaluate the fish production standard would be to rely on information collected for other purposes. To this end contract scientists will explore whether data collected for evaluating the performance standards pertaining to fish density, richness, recruitment, standing stock and reproductive rates can be used to evaluate the performance standard for fish production. This will be accomplished using existing stage-structured demographic models to answer the question "What is the likelihood that fish production at two sites will be different if fish density, standing stock, size structure, reproductive rates (for target species), recruitment rates, and species composition at the two sites are similar?" If this analysis indicates that the likelihood is high, then similarity in fish production between the mitigation reef and reference sites will be inferred from similarity of fish density, standing stock, size structure, reproductive rates (for target species), recruitment rates, and species composition. If the results of the modeling effort indicate that similarity in production cannot be inferred from the data collected for the other fish performance standards, then additional data on fish growth for targeted species will be needed to evaluate the standard for fish production (the report from the three fish production experts identified data on density, reproduction and growth as all being essential for estimating fish production). In this event the development of methods for estimating fish growth would be proposed in a subsequent work plan.

The modeling work proposed above is aimed specifically at addressing the issues as to whether fish production can be reliably inferred from data used to evaluate



the other performance standards for fish. At this point, it is premature to draw conclusions about how the fish production standard will be assessed. Staff's strategy is to explore alternative approaches in search of the most cost-effective scientifically defensible approach, starting with the modeling proposed in the 2006-2007 work plan as a way of providing critical information about the least costly alternative. Although the final decision about the approach to be used may not be required for some years, developing the information necessary to inform this decision may take some time, and planning for future compliance monitoring activities and expenses will be easier once the decision about the fish production approach has been made, hence staff's proposal to work on this problem in the 2006-2007 work plan.

- c. *Decide on the methods to be used for determining compliance for the different performance standards and overall success of the mitigation reef over the operating life of SONGS.* The performance standards that will be used to evaluate the mitigation reef fall into two categories: absolute standards, which require that the variable of interest attain or exceed a predetermined value, and relative standards, which require that the value of the variable of interest be similar to that measured on natural reference reefs. While the SONGS permit explicitly defines the values of the fixed standards (e.g., 150 acres of >4 plants/100 m<sup>2</sup>, and 42% of the reef covered by hard substrate) it does not specify the spatial scales at which these values need to be achieved. The manner in which the fixed standards are explicitly defined will influence the sampling methodology used to evaluate them. For example, different methodologies would be needed for evaluating the kelp standard of 150 acres >4 plants/100 m<sup>2</sup> at the 1 acre scale vs. the 100 m<sup>2</sup> scale. Contract scientists in consultation with CCC staff and SCE shall explicitly define the spatial context of the fixed performance standards and develop the sampling methodology to evaluate them.

Two methods were used during the experimental phase of the artificial reef mitigation project to evaluate whether various artificial reef designs met the relative performance standards. These methods (the Universe Approach and Sample Approach) differed in their assumptions about whether the reference reefs used for comparisons of similarity represented the "universe" of all possible reefs or a random "sample" of reefs in the region that were suitable for comparisons. Contract staff will review these assumptions in the context of data collected during the five-year experimental phase and other studies to determine which of these two methods have the most merit for evaluating the relative performance standards.

In consultation with the CCC staff and with input from SCE, the contract scientists will develop the criteria for determining overall project compliance. Upon completion of ten years of monitoring that demonstrate that the mitigation reef is in compliance, the monitoring will be reduced to annual site inspections. The general requirements of the annual site inspections will be determined during the 2006-2007 work period and

incorporated into the monitoring plan for the mitigation reef as specified in section 2.4 of the SONGS coastal development permit. Because annual site inspections are not expected to occur for at least ten years, the specific methodologies to be used in the annual inspections will be determined in future work plans so as to take advantage of any new technological developments that make for more cost-effective monitoring.

- d. *Develop sampling design and prepare monitoring plan.* Determine dimensions of sampling areas, sample sizes, and sampling locations for the artificial reef and natural reefs used for reference. Analyze and evaluate data collected from the experimental reef and other sources as needed to aid in these determinations.

### 2.3 *Muricea* Management

The reasonable possibility that dense populations of large sea fans could prevent the mitigation reef from meeting the performance standards justifies the need to develop cost-effective techniques for managing *Muricea*. Contract scientists will address this need by (a) analyzing existing data in search of features that can be incorporated into the design of the mitigation reef that will aid in deterring *Muricea*, and (b) collecting new data that aid in developing a cost-effective strategy for managing populations of *Muricea* that recruit to the mitigation reef. As the work progresses, staff and contract scientists will consult regularly with SCE and its technical consultants to adapt the tasks if necessary to ensure the most useful result.

- a. *Continue analyzing data from experimental reef and other studies in search of features that can be incorporated into the design of the mitigation reef that will deter *Muricea* recruitment, growth, and/or survival.*
- b. *Develop methods for cost effective management of *Muricea**
  - i) *Test different field techniques for *Muricea* reduction.* Evaluate the cost effectiveness of different methods of reducing the density of *Muricea* (e.g., kill in place, dislodge, remove, etc). Evaluate the need for offsite disposal of dislodged sea fans or sea fan parts. Obtain proper collecting permits from the California Department of Fish and Game. Estimate effort required for reduction for different levels of sea fan density, percent reduction, and reef area.
  - ii) *Determine the effectiveness of different levels of *Muricea* reduction.* Data on the densities and sizes at which *Muricea* inhibit other reef biota is vague at best. Such information is crucial to the development of a cost-effective management program for *Muricea* in order to avoid unnecessarily removing sea fans, which if left undisturbed, would have little effect on the mitigation reef's ability to meet the performance standards. The effectiveness of and need for removing *Muricea* at a range of densities and sizes will be evaluated by manipulating *Muricea* abundance in fixed quadrats having different densities and sizes of sea fans. The biological responses to *Muricea* removal will be followed in the quadrats over time to

determine the densities and sizes of *Muricea* most likely to negatively influence other reef biota.

#### 2.4 Construction Monitoring of the Mitigation Reef

The schedule for the construction of the mitigation reef has not been determined as of this writing. All indications are that construction will not begin until 2008, in which case tasks a-c described below will be deferred to the 2008-2009 work plan. These tasks will be initiated during the 2006-2007 work period in the event that construction begins before 2008.

- a. *Develop a construction monitoring plan that identifies the methods that will be used to monitor whether the mitigation reef was built according to plan.*
- b. *Conduct diver surveys to monitor percent cover of artificial substrate. Diver-collected data on the percent cover of hard substrate and underwater observations will be used in conjunction with sonar surveys after the construction of each phase of the mitigation reef to determine the as-built condition to verify that the bottom coverage of artificial substrate targeted for the mitigation reef is being attained.*
- c. *Consult with the permittee. Attend meetings and conduct onsite visits to ensure that reef construction proceeds according to the Final Plan approved by the Coastal Commission and the coastal development permit, and in a timely manner.*

#### 2.5 Reef Data Analyses and Reporting

- a. *Enter, organize, manage and analyze data collected during the monitoring and method-assessment studies and consult with database consultants as needed.*
- b. *Synthesize data on the monitoring and process studies of the artificial reef experiment and present the results at annual public workshops and at scientific meetings deemed appropriate by the Coastal Commission.*
- c. *Prepare quarterly reports for the Commission on the status of the mitigation reef project.*
- d. *Conduct annual workshop to report on status of the mitigation reef project.*
- e. *Prepare a written report of the proceedings of the annual workshop and distribute it to SCE and other interested parties.*
- f. *Respond to requests from SCE and other parties for data and analyses.*

#### 2.6 Reef Management, Oversight, Administration, and Daily Operation

- a. *Consult with the permittee. Correspond and meet with the permittee and their contractors to ensure that reef construction proceeds in a timely manner according to*

the Final Plan approved by the Coastal Commission and conforms to the SONGS coastal development permit.

- b. Direct the field and analytical studies described in the 2006-2007 Work Plan for the mitigation phase of the artificial reef. This involves and managing a team of University research assistants (i.e., marine biologists trained in scientific diving and data management/analyses). Lead contract scientists will also dive at the artificial reef and nearby reference reefs as needed to assist in data collection, resolve issues that arise in the monitoring and process studies, and conduct site visits to inspect routine and unexpected changes in the physical and biological properties of the artificial reef and natural reference reefs.*
- c. Perform assorted tasks to maintain University of California research diver certification (e.g. pass physical exams, attend classes in CPR, First-Aid, Nitrox, O<sub>2</sub> administration, complete dive logs, service scuba equipment, etc) and to conform with IACUC (Institution of Animal Care and Use Committees) which is required for all University sponsored research involving vertebrates (i.e., fish).*
- d. Maintain boats, vehicles and other equipment in proper working condition.*
- e. Perform assorted tasks to maintain a functional working environment. The base of operations for the project is in off campus lease space that does not provide custodial services. Project staff will perform routine janitorial tasks, purchase janitorial and office supplies, and will interact with and respond to requests from the landlord.*
- f. Work with University of California administrative staff on project issues pertaining to contracts, payroll, purchasing and personnel.*
- g. Maintain database software, hardware, and network services. Troubleshoot and remedy any problems that arise. Consult with computer consultants as needed to maintain reliability and security of network and desktop operations.*
- h. Consult with members of the Science Advisory Panel, Coastal Commission staff, other resource agencies, and the permittee and its contractors on the status of the monitoring and process studies.*
- i. Prepare 2008-2009 Work Plan.*

### **D.3. Behavioral Barriers Tasks**

#### **3.1 Condition Compliance Review**

Contract scientists will: (a) review the permittee's annual report on impingement losses, fish chase procedures and efficacy of fish return system, (b) consult with Science Advisory Panel and SCE on issues pertaining to the report, and (c) provide the Executive Director with an annual

summary on the status of Condition B and on whether SONGS operations during the previous year were in compliance with it.

#### **D.4. Hatchery Tasks**

The majority of the work will be done by permanent Commission staff with very minor assistance from the contract scientists funded through this work program. These tasks add no costs to the overall budget.

##### *4.1 Oversight of the fish hatchery program*

- a. Participate on Joint Panel.* Permanent Commission staff member Dr. John Dixon is a member of the Joint Panel that oversees the evaluation of the fish hatchery program and the genetic quality assurance program. The panel's tasks include development of Requests for Proposals, recommendation of contractor selections to the Director of DFG, development of contract terms, and oversight and evaluation of contractor performance in carrying out the evaluation and genetic quality assurance programs.
- b. Review reports on environmental degradation.* Contractors hired by DFG will monitor the hatchery fish to ensure that they are not causing environmental degradation. Each year the contractors will provide written and verbal reports to the Commission for review. If the Executive Director determines that the hatchery is causing significant degradation of the environment, he may order that the hatchery operations be halted.
- c. Review reports on evaluation of success.* A contractor hired by DFG will evaluate the success of the hatchery program by: (1) estimating the contribution of hatchery fish to the catch; and (2) estimating the mortality rate of hatchery fish. Each year the contractor will provide written and verbal reports to the Commission for review.

#### **E. BUDGET: 2006 AND 2007**

Condition D of the permit requires SCE to fund the Commission's oversight of the mitigation and independent monitoring functions identified in and required by Conditions A through C. The permittee is required to provide "reasonable and necessary costs" for the Commission to retain personnel with appropriate scientific or technical training and skills, as well as reasonable funding 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 convened by the Executive Director to provide advice on the design, implementation, monitoring and remediation of the mitigation projects. The Commission has operated under approved work programs and budgets since 1993.

The budgets for the Commission's monitoring and oversight program are "zero-based budgets," that is, each budget period begins anew, based on the proposed activities, with no funds from the previous budget carried forward to the new budget period. The total budget to implement the work program is intended as a "not-to-exceed" amount. The permittee provides funds periodi-

cally throughout the budget period rather than as a lump sum to minimize the advance outlay of cash. Any funds not expended at the end of the budget period are returned to the permittee.

*History of Commission Expenditures*

The Commission began its oversight and monitoring program in November 1991 following adoption in July 1991 of the SONGS mitigation requirements. This start-up period was funded directly by SCE and covered the work necessary to establish the implementing structure and the initial administration of the program. The next year the Commission operated under an interim work program and budget, during which time the first contract scientists were hired and the Scientific Advisory Panel convened to begin working with SCE on project planning. The Commission approved annual work programs and budgets for calendar years 1994 through 1997, and then, in accordance with the provisions of the permit, adopted two-year work programs and budgets for 1998-1999, 2000-2001, 2002-2003, and 2004-2005. These work programs focused initially on planning and permit compliance issues. The work programs for 2000-2001, 2002-2003, and 2004-2005 also contained the Commission’s experimental reef monitoring program in addition to continuing wetland restoration planning, environmental analyses, and pre-restoration monitoring. The status section of this report (see Section C) summarizes the accomplishments of the Commission’s program during the 2004-2005 work period.

The Commission’s budgets and expenditures for the SONGS oversight and monitoring program since its inception are summarized below. As a normal practice, the Commission requires an independent financial audit of its expenditures for each budget period. To date, those audits have disclosed no discrepancies or deficiencies in the financial systems.

<b>Period</b>	<b>Total Budget</b>	<b>Total Expenditures</b>
Nov 1991-Dec 1992	\$ 57,654	\$ 57,654
Oct 1992-Dec 1993	610,646	334,632
1994	1,173,105	387,096
1995	849,084	467,888
1996	440,139	397,631
1997	423,035	379,571
1998-1999	1,039,072	970,118
2000-2001	2,293,162	2,151,820
2002-2003	2,423,045	2,174,706
2004-2005	<u>2,338,957</u>	<u>2,299,418</u> (projected)
14-YEAR TOTAL	\$11,647,899	\$9,620,534

The Commission has consistently come in under budget, and in some years substantially so. The early work programs and budgets were marked by considerable uncertainty in the timing of the planning process for the two major projects (wetland restoration and experimental kelp reef) as well as significant discussions with SCE regarding the Commission staff’s interpretation of the permit conditions. In more recent years, the staff has been able to better predict the funding necessary to carry out the program.

Although there still remains uncertainty around the timing of wetland restoration condition compliance and construction, as well as planning for the full mitigation reef, the staff, in consultation with SCE, has made its best predictions for the required tasks, timing, and funding necessary to support those tasks in the 2006 and 2007 work program and budget.

*Proposed Budget for 2006 and 2007*

The proposed budget for calendar years 2006 and 2007 covers the monitoring and oversight program costs for the Commission's contract scientists, contract field biologists to monitor the wetlands and experimental reef, science advisory panel, consultants, contract administrative support, and operating expense (including one-time expense for electrical and phone installations and other code improvements to the office in Carlsbad) during the two-year budget period. Costs associated with the implementation of the SONGS permit and attributable to permanent Coastal Commission staff work are not paid by the permittee and thus are not included in this budget.

All of the current and proposed contract program staff except for the half-time administrator are hired under contract with the University of California, Santa Barbara. Drs. Reed, Schroeter and Page are the principal contract scientists overseeing the Commission's technical oversight and monitoring program; they also serve as project managers for the experimental reef and wetland pre-restoration monitoring programs. Costs for all UCSB contract personnel salaries and benefits, including the field assistants for the wetland and reef monitoring, as well as travel costs for field assistants and general expense under the UCSB contract, are "loaded" rates, i.e., the rates include the University's indirect costs.

The funding proposed to cover the monitoring and oversight program costs during the two-year budget period (calendar years 2006 and 2007) is \$2,266,141, as shown below. This budget is based on the minimum scientific staff required to accomplish the goals of the SONGS permit and carry out the proposed tasks (see discussion above). Personnel rates are set by U.C. Systemwide Administration. Narrative budget notes explaining each budget category are contained in Appendix A.

**SONGS PROGRAM BUDGET 2006**

	<b>2006 Wetland</b>	<b>2006 Reef</b>	<b>2006 Admin/Mgt</b>	<b>2006 Total</b>
<b>SALARIES</b>				
<b>Core Program Staff (2.5 PY)</b>				
Principal Scientist (0.5 PY)	4,877	43,895		48,772
Principal Scientist (1.0 PY)	44,990	44,989		89,979
Principal Scientist (0.5 PY)	36,806			36,806
Senior Administrator (0.5 PY)			37,044	37,044
<b>Field Assistants (5.68 PY)</b>				
Assistant Research Biologist (0.08 PY)		5,479		5,479
Staff Research Associate IV (1.0 PY)		51,108		51,108
Staff Research Associate II (1.0 PY)		40,449		40,449
Staff Research Associate II (1.0 PY)		40,449		40,449
Staff Research Associate II (1.0 PY)		40,449		40,449
Staff Research Associate II (1.0 PY)	40,449			40,449
Staff Research Associate I @ 3 mo/yr (0.25 PY)		8,562		8,562
Staff Research Associate I @ 3 mo/yr (0.25 PY)		8,562		8,562
Student Assistant I @ 200 hr/yr (0.10 PY)	2,000			2,000
<b>SUBTOTAL SALARIES</b>	<b>129,122</b>	<b>283,942</b>	<b>37,044</b>	<b>450,108</b>
UCSB Indirect Cost @ 26% (excluding SrAdmin)	33,572	73,825	0	107,397
<b>TOTAL SALARIES</b>	<b>162,694</b>	<b>357,767</b>	<b>37,044</b>	<b>557,505</b>
<b>BENEFITS</b>				
<b>Core Program Staff</b>				
Principal Scientist	1,122	10,096		11,218
Principal Scientist	10,798	10,797		21,595
Principal Scientist	8,465			8,465
Senior Administrator			17,154	17,154
<b>Field Assistants</b>				
Assistant Research Biologist		1,041		1,041
Staff Research Associate IV		10,733		10,733
Staff Research Associate II		9,708		9,708
Staff Research Associate II		10,517		10,517
Staff Research Associate II		9,708		9,708
Staff Research Associate II	13,753			13,753
Staff Research Associate I		1,969		1,969
Staff Research Associate I		1,969		1,969
Student Assistant I	88			88
<b>SUBTOTAL BENEFITS</b>	<b>34,226</b>	<b>66,538</b>	<b>17,154</b>	<b>117,918</b>
UCSB Indirect Cost @ 26% (excluding SrAdmin)	8,899	17,300	0	26,199
<b>TOTAL BENEFITS</b>	<b>43,125</b>	<b>83,838</b>	<b>17,154</b>	<b>144,117</b>
<b>SCIENTIFIC ADVISORY PANEL</b>	<b>40,000</b>	<b>40,000</b>	<b>0</b>	<b>80,000</b>



**2006 Budget continued.**

	<b>2006 Wetland</b>	<b>2006 Reef</b>	<b>2006 Admin/Mgt</b>	<b>2006 Total</b>
<b>CONSULTANTS AND CONTRACTORS</b>				
<b>Wetlands</b>				
Task 1.2c.ii-wetland engineering/GPS	8,000			8,000
Task 1.2c.iii-aerial photo surveys	20,000			20,000
Task 1.2e-database consultant	2,500			2,500
Task 1.3d-computer systems consultant	2,500			2,500
<b>Reef</b>				
Task 2.2b.i-fish production modeling consultant		40,000		40,000
Task 2.5a-database consultant		2,500		2,500
Task 2.6g-computer systems consultant		2,500		2,500
<b>TOTAL CONSULTANTS &amp; CONTRACTORS</b>	<b>33,000</b>	<b>45,000</b>	<b>0</b>	<b>78,000</b>
<b>TRAVEL</b>				
Core Program Staff (excl. Principal Scientist airfare)	4,713	4,712		9,425
UCSB Field Assistants & Principal Scientist airfare	8,000	8,000		16,000
UCSB indirect cost (excl. core staff)	2,080	2,080		4,160
<b>TOTAL TRAVEL</b>	<b>14,793</b>	<b>14,792</b>	<b>0</b>	<b>29,585</b>
<b>OPERATING EXPENSE</b>				
General expense (SF office)			9,146	9,146
General expense (UCSB contract, incl. indirect cost)	18,761	73,385		92,146
Facilities operations (Carlsbad office)	23,863	71,592		95,455
Marina storage/offsite facilities (UCSB contract)	345	6,261		6,606
Computer technical support, repair & maintenance			1,500	1,500
Review workshop			2,200	2,200
Audit				0
Administrative/financial processing services			18,000	18,000
<b>TOTAL OPERATING EXPENSE</b>	<b>42,969</b>	<b>151,238</b>	<b>30,846</b>	<b>225,053</b>
<b>EQUIPMENT</b>				
SF office			1,000	1,000
Computer networking equipment (UCSB contract)	4,400	6,600		11,000
Miscellaneous equipment, as needed (UCSB)	5,000	5,000		10,000
<b>TOTAL EQUIPMENT</b>	<b>9,400</b>	<b>11,600</b>	<b>1,000</b>	<b>22,000</b>
<b>TOTAL EXPENSE 2006</b>	<b>\$345,981</b>	<b>\$704,235</b>	<b>\$86,044</b>	<b>\$1,136,260</b>

### SONGS PROGRAM BUDGET 2007

	2007 Wetland	2007 Reef	2007 Admin/Mgt	2007 Total
<b>SALARIES</b>				
<b>Core Program Staff (2.5 PY)</b>				
Principal Scientist (0.5 PY)	5,176	46,581		51,757
Principal Scientist (1.0 PY)	47,733	47,733		95,466
Principal Scientist (0.5 PY)	38,580			38,580
Senior Administrator (0.5 PY)			38,897	38,897
<b>Field Assistants (5.68 PY)</b>				
Assistant Research Biologist (0.08 PY)		5,881		5,881
Staff Research Associate IV (1.0 PY)		52,899		52,899
Staff Research Associate II (1.0 PY)		43,320		43,320
Staff Research Associate II (1.0 PY)		43,320		43,320
Staff Research Associate II (1.0 PY)		43,320		43,320
Staff Research Associate II (1.0 PY)	43,320			43,320
Staff Research Associate I @ 3 mo/yr (0.25 PY)		9,171		9,171
Staff Research Associate I @ 3 mo/yr (0.25 PY)		9,171		9,171
Student Assistant I @ 200 hr/yr (0.10 PY)	2,000			2,000
<b>SUBTOTAL SALARIES</b>	<b>136,809</b>	<b>301,396</b>	<b>38,897</b>	<b>477,102</b>
UCSB Indirect Cost @ 26% (excluding SrAdmin)	35,570	78,363	0	113,933
<b>TOTAL SALARIES</b>	<b>172,379</b>	<b>379,759</b>	<b>38,897</b>	<b>591,035</b>
<b>BENEFITS</b>				
<b>Core Program Staff</b>				
Principal Scientist	1,190	10,714		11,904
Principal Scientist	11,456	11,456		22,912
Principal Scientist	8,873			8,873
Senior Administrator			18,011	18,011
<b>Field Assistants</b>				
Assistant Research Biologist		1,117		1,117
Staff Research Associate IV		11,109		11,109
Staff Research Associate II		10,397		10,397
Staff Research Associate II		11,263		11,263
Staff Research Associate II		10,397		10,397
Staff Research Associate II	14,729			14,729
Staff Research Associate I		2,109		2,109
Staff Research Associate I		2,109		2,109
Student Assistant I	88			88
<b>SUBTOTAL BENEFITS</b>	<b>36,336</b>	<b>70,671</b>	<b>18,011</b>	<b>125,018</b>
UCSB Indirect Cost @ 26% (excluding SrAdmin)	9,447	18,374	0	27,822
<b>TOTAL BENEFITS</b>	<b>45,783</b>	<b>89,045</b>	<b>18,011</b>	<b>152,840</b>
<b>SCIENTIFIC ADVISORY PANEL</b>	<b>41,500</b>	<b>41,500</b>	<b>0</b>	<b>83,000</b>

**2007 Budget continued.**

	<b>2007 Wetland</b>	<b>2007 Reef</b>	<b>2007 Admin/Mgt</b>	<b>2007 Total</b>
<b>CONSULTANTS AND CONTRACTORS</b>				
<b>Wetlands</b>				
Task 1.2c.ii-wetland engineering/GPS	8,000			8,000
Task 1.2c.iii-aerial photo surveys	20,000			20,000
Task 1.2e-database consultant	2,500			2,500
Task 1.3d-computer systems consultant	2,500			2,500
<b>Reef</b>				
Task 2.5a-database consultant		2,500		2,500
Task 2.6g-computer systems consultant		2,500		2,500
<b>TOTAL CONSULTANTS &amp; CONTRACTORS</b>	<b>33,000</b>	<b>5,000</b>	<b>0</b>	<b>38,000</b>
<b>TRAVEL</b>				
Core Program Staff (excl. Principal Scientist airfare)	4,925	4,924		9,849
UCSB Field Assistants & Principal Scientist airfare	8,360	8,360		16,720
UCSB indirect cost (excl. core staff)	2,174	2,174		4,347
<b>TOTAL TRAVEL</b>	<b>15,459</b>	<b>15,458</b>	<b>0</b>	<b>30,916</b>
<b>OPERATING EXPENSE</b>				
General expense (SF office)			9,558	9,558
General expense (UCSB contract, incl. indirect cost)	19,606	76,687		96,293
Facilities operations (Carlsbad office)	17,147	51,443		68,590
Marina storage/offsite facilities (UCSB contract)	360	6,544		6,904
Computer technical support, repair & maintenance			1,500	1,500
Review workshop			2,300	2,300
Audit			8,000	8,000
Administrative/financial processing services			18,000	18,000
<b>TOTAL OPERATING EXPENSE</b>	<b>37,113</b>	<b>134,674</b>	<b>39,358</b>	<b>211,145</b>
<b>EQUIPMENT</b>				
SF office			1,000	1,000
Computer networking equipment (UCSB contract)	4,598	6,897		11,495
Miscellaneous equipment, as needed (UCSB)	5,225	5,225		10,450
<b>TOTAL EQUIPMENT</b>	<b>9,823</b>	<b>12,122</b>	<b>1,000</b>	<b>22,945</b>
<b>TOTAL EXPENSE 2007</b>	<b>\$355,057</b>	<b>\$677,558</b>	<b>\$97,266</b>	<b>\$1,129,881</b>

**TWO-YEAR TOTAL EXPENSE FOR 2006 and 2007**

**\$2,266,141**

## F. PRE-APPROVED CONTINGENCY FUND FOR 2006 AND 2007

Staff is proposing pre-approved contingency funds in the amount of \$185,512 specifically for potential additional costs for (1) the Scientific Advisory Panel, (2) early office lease termination, and (3) repair or replacement of field vehicles or engines. Staff proposes these pre-approved contingency funds as a way of reducing the overall budget, but still providing the necessary Commission authorization for certain specified activities that may become necessary during the two-year work period. Staff has used this approach for the previous two work programs (i.e., since 2002-2003). To date, staff has not had to tap the contingency funds.

A contingency amount is proposed for the Scientific Advisory Panel as that effort may well increase over past years' expenditures for advice to the Commission on the wetland restoration implementation and construction monitoring as well as the design of the full mitigation reef. Although the permit authorizes the Scientific Advisory Panel to be funded up to \$100,000 *per year*, plus annual adjustments due to increases in the consumer price index applicable to California<sup>2</sup>, staff proposes *total* funding for the Scientific Advisory Panel of only \$163,000 (\$80,000 in 2006 and \$83,000 in 2007). The overall budget does not provide any cushion for any increased effort; thus, the staff proposes a pre-approved contingency fund amount of \$133,014 (the authorized annual amount, as adjusted, less the budgeted \$163,000) to be earmarked for the Scientific Advisory Panel to allow the timely response to changing circumstances.

In addition, staff proposes funds for early office lease termination. The need for early lease termination is unlikely; however, should circumstances arise that necessitate canceling the lease, the contingency fund amount of \$27,498 would be available to satisfy the lease obligations. Similarly, the contingency fund includes \$25,000 for potentially replacing or repairing the ten year old, high mileage field vehicles or their engines.

Any expenditure from the pre-approved contingency fund would be made in consultation with SCE. If a dispute arises, the staff would bring the issue to the Commission for resolution.

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<sup>2</sup> Based on the average percent change in the Consumer Price Index-All Urban Consumers for the San Francisco and San Diego areas from the initial 1992 budget to mid-year 2005, the adjusted amount for 2006 is \$144,750. A 4.5% escalator is used for estimating adjustments for 2007, based on the average percent change from the previous budget approved in 2003 to mid-year 2005, resulting in an adjusted amount for 2007 of \$151,264.

## APPENDIX A: BUDGET NOTES

**SALARIES.** Includes salaries and wages for the contract program staff, which includes two scientist positions, administrative support, and field assistants (5.68 PY). All of the current and proposed contract program staff except a half-time administrator are hired under contract with the University of California, Santa Barbara; costs include the University's indirect costs.<sup>3</sup> The half-time administrator is hired under contract with Simpson & Simpson Business and Personnel Services, the firm that provides financial services for the program. The costs for the Commission's permanent staff that spend a portion of their time on this program are not included here; they are paid by the Commission.

**BENEFITS.** Includes benefits and employer-paid payroll taxes for contract program staff. Includes the indirect costs for personnel hired under contract to UCSB.

**SCIENTIFIC ADVISORY PANEL.** The Scientific Advisory Panel is a panel of experts established by the Commission pursuant to the permit conditions to provide scientific and technical advice. Expenses cover members' time and travel and are authorized in the permit at \$100,000 per year adjusted annually in accordance with the consumer price index (CPI) applicable to California. CPI adjustments have been made in previous budgets. Based on expenditures in the past four years, staff budgeted less than the originally authorized amount. However, staff proposes additional funds in a pre-approved contingency fund up to the adjusted yearly authorized amount to be expended as needed, in consultation with SCE.

**CONSULTANTS AND CONTRACTORS.** Includes estimated costs for consultants and contractors to provide the technical and expert advice identified in individual tasks of the work program to assist the contract scientists in completing the tasks. Estimated costs are based on previous experience with similar consultants, at rates ranging from \$100-190 per hour.

**TRAVEL.** Covers travel for meetings with SCE, Commission staff, consultants and contractors, field monitoring work, attendance at agency and public workshops and meetings, site visits, and attendance at conferences related to wetland and kelp forest community restoration issues. Total travel costs are based on previous years' expenditures plus anticipated increases in airline fares. A 4.5% escalator is applied for 2007.

**GENERAL EXPENSE (SF).** Covers operating expense for contract program staff working out of the Commission's San Francisco office (half-time administrator). Annual costs are based on the Commission's operating expense per PY for general expense, printing, communications, postage, training and facilities operations. A 4.5% escalator is applied for 2007.

**GENERAL EXPENSE (UCSB CONTRACT).** Covers annual costs for reef surveys (NITROX for SCUBA), miscellaneous office, laboratory and field supplies, annual boat operating expense, annual insurance, registration and license fees for boats and vehicles, annual dive physicals required of each diver, and on-campus communications services for contract staff located at UCSB. A 4.5% escalator is applied for 2007.

**FACILITIES OPERATIONS (CARLSBAD OFFICE).** Rented office space in Carlsbad houses one full time contract scientific staff and contract field assistants for the reef and wetland mitigation programs. Annual costs cover space rental, office services and supplies, and communications (including telephone, cell phone service, and DSL service). Also includes one-time costs for electrical and phone line installations, and other code improvements to the office suite. A 4.5% escalator is used for 2007 where anticipated increases are not yet known.

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<sup>3</sup> The indirect cost rate of 26% of direct costs is the U.S. Department of Health and Human Services negotiated, pre-determined off-campus rate for research projects. For these costs, the project receives: office space at UCSB for two 0.5 PY contract scientists (even though the on-campus overhead rate is normally 46%), utilities, internet services, laboratory facilities and equipment, administrative services associated with payroll, employee benefits, liability insurance, dive and boat safety programs, and purchasing for both on-campus staff and staff located in the Carlsbad office, library services, UC subsidized pricing on goods and services, site licenses for software, and access to faculty and staff expertise on a wide variety of issues.

**OFFSITE STORAGE/FACILITIES (UCSB CONTRACT).** Covers costs for storage and launch fees for the reef dive boats, internal security and water services for the Carlsbad office. A 4.5% escalator is applied for 2007.

**COMPUTER TECHNICAL SUPPORT.** Covers annual costs for maintaining the computers used by contract program staff and field assistants, including regular maintenance, repairs, and technical support needed for troubleshooting problems.

**REVIEW WORKSHOP.** Covers costs for conducting an annual review workshop, excluding costs for consultants who may be requested to attend the workshop. The intent of the review workshop is to determine whether performance standards have been met, whether revisions to the standards are necessary, and whether remedial measures are required. While it is premature to apply these issues to the mitigation projects still in the planning or construction stages, annual status reviews of the mitigation projects will be conducted for the Commission and the public during the two-year budget.

**AUDIT.** Covers costs for an independent audit of the contract reimbursements and service fees for the Commission's oversight and monitoring program. Independent audits have been conducted since 1994; no deficiencies in the financial systems have been discovered. Costs are estimated for a 2-year audit.

**ADMINISTRATIVE/FINANCIAL PROCESSING SERVICES.** Covers the annual cost of administrative and financial processing services provided by Simpson & Simpson Business and Personnel Services, Inc.

**EQUIPMENT.** Covers durable equipment for the reef and wetland mitigation programs, including computers and networking equipment, office equipment (such as fax and copier), and miscellaneous equipment for the reef and wetland mitigation programs. A 4.5% escalator is applied where applicable for 2007.



November 18, 2005

**RECEIVED**  
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CALIFORNIA  
COASTAL COMMISSION

Ms. Susan M. Hansch, Chief Deputy Director  
Energy and Ocean Resources  
California Coastal Commission  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105-2219

Dear Ms. Hansch:

**SUBJECT:** SONGS Mitigation Program:  
2006-07 Two-Year Work Program and Budget

I have reviewed the draft work program and budget for the SONGS Mitigation Program, as revised, and I am pleased to support your request for its approval by the Coastal Commission.

The revised draft reflects our recent discussions. SCE appreciates your efforts to help us contain the costs of Coastal Commission oversight and monitoring of the mitigation projects. We also appreciate your efforts to clearly articulate the specific tasks to be undertaken by your contract scientists, the justification for those tasks and the estimated costs of each.

The proposed work program could cost SCE and the other SONGS owners over \$2 million during the next two years. However, I am hopeful that continued collaboration between our respective team members will further economize the work program as it progresses.

Please call me at (626) 302-2149 if you should have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "David W. Kay".

DAVID W. KAY  
Manager of Environmental Projects

cc: Ms. Jody Loeffler, California Coastal Commission

SCE LETTER OF SUPPORT

P.O. Box 800  
2244 Walnut Grove Ave.  
Rosemead, CA 91770