#### CALIFORNIA COASTAL COMMISSION

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# **W-4**

Energy and Ocean Resources Staff: SMH, JJL & SONGS Mitigation Program Scientific Team—SF Staff Report: November 1, 2007 Hearing Date: November 14, 2007 Item Number: W-4 Commission Action:

# SAN ONOFRE NUCLEAR GENERATING STATION (SONGS) Mitigation Program: 2008 and 2009 Two-Year Work Program and Budget

#### **EXECUTIVE SUMMARY**

The staff is recommending Commission approval of a two-year work program and \$3,055,170 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 \$333,970 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, repair and/or replacement of field vehicles and engines, and a multi-beam sonar survey of the constructed mitigation reef).

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.

SONGS 2008 and 2009 Work Program and Budget November 1, 2007 Page 2

#### 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 a 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 2008 and 2009. Because staff anticipated that a major topic of discussion with SCE would be the monitoring of the mitigation reef, staff provided an early copy of the draft Monitoring Plan for the SONGS' Reef Mitigation Project. Included in the draft monitoring plan is a document prepared by the contract scientists and Scientific Advisory Panel in March 2007 entitled "The Definition of Compliance with the Determination of Similarity in the Context of the SONGS Mitigation Projects." Together these two documents provide staff's rationale for the timing and scope of the monitoring proposed in the 2008-2009 work program, which can be summarized as follows:

- 1. The SONGS permit requires performance monitoring of the mitigation reef to begin immediately after construction.
- 2. Results from the experimental phase of the SONGS mitigation reef project indicate that the proposed mitigation reef has a reasonable chance of being in compliance with the performance standards soon after it is constructed.
- 3. The initiation of monitoring immediately after construction is critically important for adaptive management and for determining whether remediation is needed and, if so, what form it should take. Early detection of such problems that can be solved with corrective actions is in the public's best interest because it minimizes, to the extent possible, the period of kelp forest loss.

Following consultation on the work tasks, SCE agreed with staff's rationale for the reef monitoring schedule, and indicated its satisfaction with the proposed Commission oversight and independent monitoring work plan for the wetland, reef and fish behavioral mitigation for 2008-2009. Staff accepted suggestions from SCE for revising the reef monitoring plan, which will be finalized during the 2008-2009 work period. 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 2008 and 2009

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). Construction began in August 2006 and is expected to be completed at the end of 2009. During the 2008 and 2009 work period, the contract scientists will continue independent construction monitoring as required in the SONGS permit to ensure that the restoration proceeds according to the approved Final Restoration Plan and in compliance with the conditions of the CDP. Contract staff also will prepare to implement performance monitoring at the conclusion of the wetland project construction.

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. On August 8, 2006 the Commission concurred with the Executive Director's determination that SCE's preliminary mitigation reef plan meets the requirements of the SONGS permit. Staff received the final reef mitigation plan and a preliminary CDP application on October 3, 2007, and expects to schedule it for Commission hearing early in 2008. Construction is expected to begin in April 2008 and be completed by October 1, 2008. Reef tasks for the 2008 and 2009 work period include consulting with SCE on the construction of the mitigation reef, finalizing the mitigation reef independent monitoring plan, conducting construction monitoring, and initiating post-construction performance monitoring.

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, and

to work with SCE on monitoring fish impingement levels and the possible need to develop and implement new technologies that could significantly reduce fish losses.

### Budget for 2008 and 2009

The proposed budget for calendar years 2008 and 2009 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 is the minimum needed to meet the goals specified by the permit under Condition D and to complete the tasks identified in the 2008-2009 work program. The proposed funding totals \$3,055,170 for the two years.

Staff also is proposing pre-approved contingency funds in the amount of \$333,970 specifically for potential additional costs for (1) the Scientific Advisory Panel<sup>1</sup>, (2) early office lease termination, (3) repair or replacement of field vehicles or engines, and (4) a multi-beam sonar survey of the constructed mitigation reef. 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 since the 2002-2003 work programs. To date, staff has not had to tap the contingency funds, although a small amount of contingency funds for the Scientific Advisory Panel may be required later this year.

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 2008 and 2009 for a total amount of \$3,055,170 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 by 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 \$333,970 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

<sup>&</sup>lt;sup>1</sup> 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 and mitigation reef projects. Although the SONGS 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 application to California, staff proposes a lower amount of funding for the Scientific Advisory Panel, based on current rates of expenditure. However, the overall budget does not provide any cushion for any increased effort; thus, the proposed pre-approved contingency fund amount up to the authorized annual amount for the two years, as adjusted, will allow timely response to changing circumstances.

space lease, repairing or replacing field vehicles or their engines, and/or conducting a multibeam sonar survey of the constructed mitigation reef, as specified in the staff report.

# **II. MOTION AND RESOLUTION**

Commission approval of the 2008 and 2009 two-year Work Program and Budget requires the following motion:

I hereby move that the Commission approve the 2008 and 2009 two-year SONGS Work Program and Budget and contingency fund as recommended by the staff.

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 2008 and 2009 two-year SONGS Work Program and Budget and contingency fund that is set forth in the staff recommendation, dated November 1, 2007, 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 2008 AND 2009 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

SONGS 2008 and 2009 Work Program and Budget November 1, 2007 Page 7

monitoring required by the permit. This implementation structure will continue during the twoyear period of the 2008 and 2009 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 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, respectively.

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

Upon completion of the wetland restoration project design and engineering plans, SCE and JPA submitted their Coastal Development Permit Application (#6-04-88) in August 2004. 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. Thus, on October 12, 2005, the Commission also approved an amendment to SONGS 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  $22^{nd}$  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.

#### Wetland Restoration Condition Compliance

Following the Commission's approval of CDP #6-84-88, SCE and JPA began preparing the final plans in compliance with the special conditions in CDP #6-04-88 that must be met prior to issuance of the permit, prior to commencement of construction, during construction, at the completion of construction, and on an on-going basis. Material submitted in compliance with the special conditions has been reviewed by the Executive Director and found to fulfill the requirements of certain of those conditions, as follows:

- On August 22, 2006, Commission staff issued the Notice of Acceptance for condition compliance required *prior to issuance of the permit* and issued CDP #6-04-88.
- On September 13, 2006, Commission staff issued the Notice of Acceptance for condition compliance required *prior to commencement of construction*; however, the Notice of Acceptance excluded authority to construct certain plan elements that require compliance with additional site-specific conditions (i.e., least tern nesting habitat, public trails, freshwater runoff treatment ponds, inlet dredging, use of North Beach staging area and beach restoration activities, river bend revetment, a disposal site, and a mitigation site).
- On October 2, 2006, Commission staff issued the Notice of Acceptance for condition compliance required *prior to commencement of construction of segments 1 through 3 of the Coast-to-Crest public trail* (from Jimmy Durante Boulevard along the northern edge of the river to I-5).

- On November 20, 2006, Commission staff issued the Notice of Acceptance for condition compliance required *prior to commencement of construction on disposal site DS32*.
- On November 29, 2006, Commission staff issued the Notice of Acceptance for condition compliance on a revised design and alignment for the temporary construction haul road under Interstate Highway 5.
- On January 29, 2007, Commission staff issued the Notice of Acceptance for condition compliance required *prior to commencement of construction of the Least Tern nesting sites*.
- On February 20, 2007, Commission staff issued the Notice of Acceptance for condition compliance on a revised construction haul road route to Disposal Site 36.
- Commission staff is currently reviewing the mitigation plan submitted by the JPA for impacts associated with the public trail and freshwater runoff treatment ponds.

#### Wetland CDP Amendments

The following permit amendments have been submitted:

- 1. On August 24, 2006, the Commission issued a non-material amendment to modify special condition #4 to read prior to commencement of construction of the revetment located on the south side of the river east of Jimmy Durante Boulevard rather than prior to issuance of the coastal development permit.
- 2. On July 10, 2007, the Commission approved an amendment to include in the wetland restoration project the removal of the berm north/northeast of the Grand Avenue Bridge.
- 3. On August 20, 2007, SCE withdrew an amendment request to build a temporary river crossing.
- 4. On August 14, 2007, SCE submitted an amendment request to address several changes in the Final Restoration Plan, including changes to restoration module W45, exclusion of the riverbank revetment, and an alternative South Beach access plan. This amendment will be scheduled for Commission hearing at the earliest possible time.
- 5. On October 3, 2007, Commission staff issued a Notice of Proposed Permit Amendment for a non-material amendment to modify special condition #8 regarding the mitigation plan for impacts from construction of the trail and wetland treatment ponds.

#### Wetland Restoration Construction Update

Construction of the wetland restoration project at San Dieguito began in August 2006 and is expected to be completed in December 2009. Construction activities began with the delivery of rock and gravel material for use in constructing the haul roads and berms, installation of construction fencing to delineate project boundaries and sensitive habitat, and BMP (best management practice) fencing to contain soils within the project area during rainfall events.

Construction proceeded with the construction of haul roads to transport dredge materials to disposal sites, the importation, screening, and stockpiling of rock and sandy clay to create berms and permanent access roads, and the clearing and grubbing of vegetation and debris from project areas to the south of the San Dieguito River and west and east of Interstate 5. Upland topsoil was stripped from the disposal sites and stockpiled, and wetland base soil was removed from excavation areas and stockpiled. Construction of the large subtidal and intertidal basin (44 acres) commenced in December 2006 and will continue through 2007. Opening of this basin to the main channel and tidal exchange is expected to occur in May 2008.

In April 2007, the construction of wetland habitat commenced in other areas within the restoration site. This included modules on the east side of Interstate 5, both north and south of the San Dieguito River that will be primarily high and middle salt marsh and exposed mud flat habitat. These areas are currently being graded to the planned elevations. Material excavated from the construction site is being deposited in disposal sites within the project area. These disposal sites will be covered with topsoil and hydroseeded to control erosion. Berms that will constrain storm runoff are currently being constructed along the boundary of the effective flow area of the San Dieguito River.

Restrictions given in the Adopted Findings and Conditions of the CDP for implementation of the San Dieguito Wetland Restoration Plan provide that construction activities shall not occur in areas where breeding is occurring by migratory birds. In March and April 2007 breeding migratory birds were found within project boundaries and accommodated following guidelines provided in the CDP for project construction and in consultation with US Fish and Wildlife and California Department of Fish and Game.

Four relic storage tanks were uncovered during excavation; three of these tanks were not expected. The one tank that was known was empty, and two tanks contained diesel fuel and bunker oil, respectively. The fourth tank was a water tank. The diesel tank was punctured during removal, resulting in a leak of approximately 1200 gallons that was contained within the adjacent soil. The bunker oil tank disintegrated during removal and a portion of the oil soaked into the surrounding soils before it could be pumped out. All of the tanks have now been removed. Construction on the south side of the basin has been temporarily halted pending approval of remediation by the San Diego Regional Water Quality Control Board. However, by shifting construction effort to other areas within the project site while the contamination issues are resolved, the project has been able to proceed on schedule.

#### Wetland Construction Monitoring

The SONGS permit also requires independent monitoring by Commission contract scientists to ensure that the restoration work is conducted according to approved plans. To accomplish this task, CCC contract scientists have established good communication with SCE and its partners involved with implementation of the Final Plan and a frequent on-site presence at the restoration site. CCC contract scientists are conducting routine monitoring of planned construction activities through attendance at briefings and field inspections of work in progress. CCC contract scientists have also been involved in monitoring the impacts of unplanned construction activities. Unplanned construction changes have involved impacts to existing habitat through changes in the alignment of a haul road, and unforeseen impacts of a disposal site and berm on wetland habitat. Staff administers these changes through condition compliance, where appropriate, and permit amendments as needed. CCC contract scientists have also worked cooperatively with SCE consultants in the assessment of the suitability of seasonal wetland habitat for mitigation of project permanent impacts to seasonal wetland. SCE and its construction team have been very responsive to the requirements of the permit.

#### Monitoring Plan and Adaptive Management

Condition A of the SONGS permit 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 reviewed by State and Federal agencies and SCE in May 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.

# 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%,

SONGS 2008 and 2009 Work Program and Budget November 1, 2007 Page 13

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.

#### Summary of 2006-2007 Reef Monitoring

Reef monitoring for 2006-2007 focused on (1) developing the mitigation reef monitoring plan and (2) collecting information needed to evaluate sea fan population trajectories and investigate potential methods for their management.

#### 1. Development of the mitigation reef monitoring plan:

Contract scientists prepared a draft monitoring plan for the mitigation reef that provides an overall framework to guide the monitoring work. The plan describes the sampling methodology, analytical techniques, and methods that will be used to determine whether the mitigation reef is in compliance with the performance standards identified in the SONGS permit. Two critical issues that reside at the core of this determination are: (1) the level and duration of performance by the mitigation projects that is needed to achieve compliance with specific conditions of the SONGS coastal development permit and (2) a methodological approach to determining whether the mitigation projects are performing similarly to naturally undisturbed reference sites.

A first step in developing the mitigation reef monitoring plan was to produce a document whose purpose was to provide SCE with: (1) clear and consistent interpretations of key terms in the SONGS coastal development permit which provide the basis for determining the level and duration of post construction monitoring that will be used by the CCC to assess compliance of the reef mitigation projects, and (2) a description of the methodological approach that the CCC will use to determine whether the reef mitigation project is performing similarly to naturally undisturbed reference sites. Because these two issues apply equally to the wetland mitigation requirement the document prepared for SCE was written to include both the wetland and reef mitigation projects. This document was sent to SCE for internal review on March 30, 2007 and contract scientists and CCC staff met with SCE in San Francisco on April 23, 2007 to discuss the implications of this document for monitoring of the SONGS mitigation projects. CCC contract scientists prepared a draft monitoring plan, which was sent to SCE for internal review on July 25, 2007. SCE provided comments on the draft monitoring plan to CCC staff in a letter dated September 7, 2007. CCC contract scientists and staff will continue to consult with SCE in their development of a cost effective monitoring plan, which is scheduled to be finalized in 2008.

Contract scientists have been working with experts in ichthyology at California State University of Northridge to develop methods and gather data that can be used to design the sampling necessary to evaluate the performance standard pertaining to fish reproductive rates. Five key indicator species have been identified and all relevant information on their reproductive biology has been assimilated. The objective for field work planned for summer 2008 is to collect information that will fill in critical gaps in knowledge that will allow size-fecundity relationships for each species to be established. This information will be used to assess the performance standard pertaining to fish reproductive rates on the mitigation reef.

Another performance standard by which the mitigation reef will be judged pertains to fish production. 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. Most of the methods that have been used are very labor intensive and relatively expensive to implement. 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. One of the recommendations made at this workshop was to determine whether data collected for the purpose of assessing other performance standards (total abundance and species richness) are sufficient for evaluating the performance standard for fish production. Contract scientists then began working with population biologists at the University of California, Santa Cruz to determine whether demographic models that incorporated data fish density, size structure, species composition, and reproduction (which will be collected to evaluate other fish performance standards) could be used to evaluate the performance standard on fish production. The conclusions from this effort were that demographic models could be used make projections

on fish production that could be used to assess the fish production performance standard, but that the data collected by contract scientists thus far were inadequate for these types of models. In particular, greater sampling frequency is needed to obtain the precision in estimates of fish density and size structure required for the models. Contract scientists are currently working on developing more precise methods for sampling fish density and size for inclusion in the reef monitoring plan.

#### 2. Sea fan population trajectories and management:

One of the more notable invasive species on shallow reefs in southern California is the native sea fan Muricea spp. It is known to form high densities on artificial and natural reefs and to exclude kelp, understory algae and other sessile invertebrates. Of particular concern to the SONGS artificial reef mitigation project is the ability of *Muricea* to withstand disturbance and ultimately displace giant kelp. This appears to have happened at nearby Pendleton and Torrey Pines artificial reefs. The concern about the potential for Muricea domination on SCAR was heightened in winter 2002 when large numbers of small (i.e., 1 cm tall) young Muricea californica (and fewer numbers of small M. fructicosa, a related species) were observed on the artificial reef modules. By summer 2002, the mean density of recently colonized Muricea was near or above 10 m<sup>-2</sup> on all artificial reef designs. Contract scientists have continued to collect and analyze data from the experimental artificial reef and nearby reference reefs to determine population projections for sea fans in the vicinity of the project site and to evaluate methods for the cost effective management. Results show that sea fan density on the artificial reef modules has been relatively constant at  $\sim 12/m^{-2}$  since 2002, while the percent of space occupied by Muricea on the artificial reef has steadily increased since 2002 averaging ~6% in 2006. Sea fan densities appear to be maintained by annual recruitment of new individuals coupled with relatively high annual survivorship (~70-80%). The major unknowns at this time are: (1) how long it will take for sea fan coverage to reach a level that is dense enough to inhibit kelp and other reef biota, and (2) to what extent will disturbance reduce sea fan density and prevent it from out-competing other reef biota for space. Contract staff will continue to follow sea fan populations on the experimental reef modules to obtain much needed insight into these unknowns.

In summer 2006 contract scientists began investigating methods for managing sea fan populations in the event that sea fans begin to inhibit the development of other reef biota. Results to date indicate that *Muricea* can be selectively reduced with no adverse long-term effects on other biota. In fact, results from surveys done in summer 2007 revealed a dramatic increase in the abundance of kelp and its associated flora and fauna in areas where sea fans had been removed. The effort required to reduce *Muricea* densities on a 150 acre reef would be substantial, but because of its relatively slow growth rates such reductions, if deemed necessary, would only be needed every 10 to 20 years.

SONGS 2008 and 2009 Work Program and Budget November 1, 2007 Page 16

#### Mitigation Reef Planning and Permitting

On August 8, 2006, the Commission concurred with the Executive Director's determination that SCE's preliminary mitigation reef plan meets the requirements of the SONGS permit. The mitigation reef calls for the addition of 127.6 acres of reef construction to the existing 22.4 acres built in September 1999 for the Phase I experimental reef. The project area is located offshore of San Clemente, California, on an 862-acre parcel leased from the California State Lands Commission. The preliminary design creates a low-profile, single-layer reef constructed of quarried boulders and distributed in quantities similar to those of the lowest substrate coverage used for the experimental reef project. The design consists of 11 polygons that vary in area from 2.4 to 37.5 acres. The reef design achieves the following: (1) locates the final construction site in close proximity to the San Mateo Kelp Bed, (2) avoids hard substrate areas, (3) maintains the integrity of the experimental reef modules, (4) provides for navigation channels, and (5) avoids areas of historical kelp growth as well as areas of special interest to local fisheries.

On October 3, 2007, SCE submitted its Final Plan and a preliminary CDP application for the mitigation reef. Staff expects to schedule it for Commission hearing early in 2008. Construction of the mitigation reef is estimated at 100 working days.

# C.3. Status of Fish Behavioral Mitigation

#### Mitigation Requirement

Condition B of the SONGS permit requires SCE to install and maintain behavioral barrier devices at SONGS Units 2 and 3 to reduce fish impingement losses.

#### Fish Behavioral Mitigation Compliance

The impact studies for the operation of SONGS Units 2 and 3 conducted between 1983 and 1991 found that annual losses of juvenile and adult fish in the cooling water systems 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 Commission accepted the studies' recommendation 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. (Section IV–Proposed Findings and Declarations in the SONGS 1991 permit)

SCE conducted a number of laboratory and in-plant experiments testing the behavioral response of fish to lights and sound devices from 1992 through 1999. None of the experiments showed evidence that these devices would reduce fish impingement losses as required by Condition B. At the same time, SCE continued its modified heat cleaning treatments of the cooling water intake systems of Units 2 and 3 (called the Fish Chase procedure), which result in a considerable reduction in fish impingement.

In October 2000, the Commission reviewed the results of the experiments and concluded that no further testing of alternative behavioral barriers should be required at this time, provided that (1)

SCE continues to adhere to the operating, monitoring, and reporting procedures for the modified heat cleaning treatments and (2) SCE makes every effort to test and install, if feasible, future technologies or techniques for fish protection if such techniques become accepted industry standards or are required by the Commission in other power plant regulatory actions.

The contract scientists and staff review the annual data and analyses on the fish chase procedure at SONGS. The reports indicate that the fish chase procedure generally has been consistent with the Commission's requirements. However, the Fish Chase Procedure effectiveness relative to impingement dropped below the 10% target value in both 2004 (4.82%) and 2005 (7.6%). In 2004 the mortality rates associated with the fish chase also failed to meet the standards.

SCE submitted follow-up analyses to the 2005 report in April 2006, which indicated that there had been no changes in the procedures or operation of the fish return system or heat treatments during 2004 to explain increases in fish impingement. SCE noted that the increases in fish impingement were associated entirely with increases in the entrainment of Pacific sardines. Following the staff's review of the data for the year 2005 (contained in SCE's July 2006 report), on October 23, 2006 staff requested SCE provide additional data and analyses in order to assess the importance of the continuing sub-standard performance of the Fish Chase Procedure. Staff also indicated the need to initiate discussions with SCE on the possibility of implementing new technologies that could significantly reduce losses due to heat treatments and normal impingement.

Staff met with SCE on April 23, 2007 to discuss: (1) the current status of impingement levels at SONGS, (2) the need for additional monitoring to more accurately assess impingement levels, and (3) implementation of new technologies that could significantly reduce fish losses.

In September 2007, SCE submitted to the Commission its annual report for the year 2006 on SONGS impingement and fish return data. SCE contends that preliminary data indicate fish impingement losses at SONGS during 2006 were significantly reduced. SCE attributes this reduction to a shift in the local fish assemblage to species that are less inclined to be impinged by SONGS. Commission staff is reviewing the full data presented in the 2006 annual report. Contract scientists also will work with SCE to evaluate the adequacy of SCE's current quarterly sampling program in providing reliable estimates of annual fish impingement losses. Prior to 1999 impingement sampling at SONGS was done monthly. The accuracy and precision of the annual estimates obtained from the data collected monthly prior to 1999 will be compared to that of more recent years to determine whether quarterly sampling is sufficient for estimating annual fish impingement losses.

SCE is currently waiting for a federal ruling on water quality that effectively sets the level of fish losses allowed for cooling systems of power plants. Once that ruling has been finalized, SCE will actively work to develop new technologies at SONGS for meeting the more strict standards currently proposed by the federal government.

# C.4. Status of Hatchery Program

#### Permit Requirement

In two separate permit actions in 1993 and 1997, the Coastal Commission required the permittee to contribute to the California Department of Fish and Game's Ocean Resources Enhancement and Hatchery Program (OREHP) a total of \$4.8 million toward the construction of an experimental white sea bass fish hatchery and an evaluation program to determine if the hatchery is effective at increasing the stock of white sea bass. The permittee has paid the \$4.8 million, therefore fulfilling its permit condition requirement.

#### 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). Although the SONGs' mitigation funds were exhausted at the end of the 2004-2005 fiscal year, the OREHP program is ongoing. White sea bass are cultured at a hatchery in Carlsbad operated by the Hubbs-Sea World Research Institute and then transferred to grow-out facilities operated jointly by the California Department of Fish and Game and volunteer fishermen. After the fish attain a length of 10 inches, they are tagged and released. The OREHP program operates under the terms and conditions of a Memorandum of Agreement among the California Department of Fish and Game, Coastal Commission, and OREHP's Scientific Advisory Panel. OREHP may release 350,000 fish annually.

Review of the hatchery program is conducted by permanent Coastal Commission staff' thus, there are no tasks funded through the SONGS work program.

# D. WORK PROGRAM: 2008 AND 2009

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 senior administrator (Jody Loeffler) 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 2008-2009 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 spends 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.

Before starting 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 to \$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, thirteen years later, the fully-loaded 2008 personnel rates for UCSB-hired field assistants (salary, benefits and indirect costs) range from about \$28 to \$65 per hour and field-related operating costs for both the wetland and reef monitoring average less than \$200,000 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. Past experience has proven that staffing the project with

full time employees, supplemented by additional seasonal 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 mostly 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.

# Staffing Levels for Reef Monitoring

Staff has determined the staffing levels for mostly full-time university-certified scientific divers for the reef monitoring tasks based on a number of considerations. 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, for example, two divers from doing the work of four divers in twice the amount of time. 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.

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.

Staff does propose to use temporary field assistants during the summer, the period of the most intense sampling surveys. These are lower level research and laboratory assistants who are qualified to dive and 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.

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.

#### Consultation with Permittee

Pursuant to the permit conditions, the staff has consulted with SCE on the proposed work program and budget for 2008 and 2009. Because staff anticipated that a major topic of discussion with SCE would be the monitoring of the mitigation reef, staff provided an early copy of the draft Monitoring Plan for the SONGS' Reef Mitigation Project. Included in the draft monitoring plan is a document prepared by the contract scientists and Scientific Advisory Panel in March 2007 entitled "The Definition of Compliance with the Determination of Similarity in the Context of the SONGS Mitigation Projects." Together these two documents provide staff's rationale for the timing and scope of the monitoring proposed in the 2008-2009 work program, which can be summarized as follows:

- 1. The SONGS permit requires performance monitoring of the mitigation reef to begin immediately after construction.
- 2. Results from the experimental phase of the SONGS mitigation reef project indicate that the proposed mitigation reef has a reasonable chance of being in compliance with the performance standards soon after it is constructed.

3. The initiation of monitoring immediately after construction is critically important for adaptive management and for determining whether remediation is needed and, if so, what form it should take. Early detection of such problems that can be solved with corrective actions is in the public's best interest because it minimizes, to the extent possible, the period of kelp forest loss.

Following consultation on the work tasks, SCE agreed with staff's rationale for the reef monitoring schedule, and indicated its satisfaction with the proposed Commission oversight and independent monitoring work plan for the wetland, reef and fish behavioral mitigation for 2008-2009. Staff accepted suggestions from SCE for revising the reef monitoring plan, which will be finalized during the 2008-2009 work period. SCE's letter of support is attached.

# D.1. Wetlands Tasks

Condition A of the SONGS permit requires independent monitoring by Commission contract scientists to ensure that construction of the wetland is conducted according to approved plans. To accomplish this task, CCC contract scientists will continue to interact closely with SCE, project contractors, biologists, and others involved with implementation of the Final Plan. They will be assisted in their efforts by one full time wetland biologist, a database programmer/systems analyst working 10% time, and a wetland biologist/database assistant working 100% time during the last six months of 2009. During the 2008-2009 work period, CCC contract scientists and their support staff will complete the following wetland tasks.

#### 1.1 Wetland Restoration Implementation

- a. Consult with the permittee on the restoration. Attend meetings and interact with the 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 on scientific issues pertaining to compliance of the wetland restoration project with the SONGS permit.

# 1.2 Construction Monitoring

Construction of the wetland is expected to be completed in December 2009. CCC construction monitoring will continue to include the monitoring of both planned construction activities, as set forth in the Final Plan, and of unplanned changes and impacts that arise during construction. To implement Construction Monitoring, CCC contract scientists will:

- a. Coordinate CCC construction monitoring with other monitoring occurring on-site and with construction personnel to minimize duplication in oversight.
- b. Attend regular planning meetings and briefings on the status of construction.

- c. Conduct on-site monitoring to:
  - *i)* Ensure that SCE's monitoring activities are implemented as specified in the Final Restoration Plan.
  - *ii)* Spot check the construction site with regard to proper implementation of the Final Plan (e.g., timetable, placement of module boundaries, elevations, avoidance of sensitive habitats and species, best management practices, and planting program). Engage consultants as needed to verify that the placement of module boundaries and wetland elevations conform to the Final Plan.
  - *iii)* Monitor for changes in existing sensitive habitat outside of the construction footprint using aerial photos taken twice annually and ground-truthing.
  - *iv) React to unforeseen events (e.g., changes in haul road configuration, discovery of buried fuel tanks, and occurrence of listed species in the construction area).*
- *d. Review monitoring reports associated with the restoration produced by other agencies or SCE consultants to make sure they are complete and up to date.*
- e. Consult with permittee, resource agencies and other wetland ecology experts on wetland restoration and management issues. These issues include changes in construction methods or timetable, planting plan implementation, and sensitive species.

#### 1.3. Compliance Monitoring

Compliance monitoring of the wetland is expected to begin in January 2010 upon completion of wetland construction. Although the activities and costs of this monitoring will be covered in the 2010–2011 work plan and budget, the following tasks will need to be completed during this work plan to prepare for compliance monitoring:

- a. Refine Commission approved wetland monitoring plan to include estimates of effort and schedules for monitoring.
- b. Assemble monitoring team to begin work in January 2010.
- c. Develop structure of wetland databases and web forms for data entry.
- d. Purchase and prepare sampling gear for compliance monitoring.

#### 1.4 Wetland Data Management, Analyses and Reporting

a. Enter, organize, and manage data collected during construction monitoring and consult with database consultants as needed. All monitoring data for the wetland and reef mitigation projects are entered and stored in electronic databases that use a highly redundant, multi-server system to ensure maximum data integrity, preservation, and uptime.

- b. Prepare semiannual status reports for the Commission on the progress of the wetland restoration project including the results of independent construction monitoring by CCC contract scientists.
- c. Respond to requests from SCE and other parties for data and analyses.
- d. Update public website with current information on the monitoring of the wetland restoration project. Contract scientists are developing a public website that provides information on the history, current status, and other relevant information pertaining to the monitoring of the SONGS reef and wetland mitigation projects. The website will serve as a repository for progress reports, workshop proceedings and other project related documents and thus help facilitate the transfer of information between the contract scientists and the CCC, SCE, other agencies and the general public.
- e. Synthesize construction monitoring information and use this information to assess whether the wetland restoration is in compliance with the SONGS permit.
- f. Present monitoring results at annual public workshops and at scientific meetings deemed appropriate by the Coastal Commission.
- g. Prepare a written report of the proceedings of the annual workshop and distribute it to SCE and other interested parties, post on web site.

#### 1.5 Wetland Management, Oversight, and Administration

- a. Direct the monitoring studies described in the work plan. This involves planning these activities, managing personnel, and engaging consultants as needed 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. Attend monthly Science Advisory Panel (SAP) meetings to consult on the status of the monitoring studies. Consult with members of other resource agencies, and the permittee and its contractors on the status of the monitoring studies.
- f. Prepare 2010-2011 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. Monitoring the construction and performance of the mitigation reef and assembling, maintaining, and analyzing the data obtained from it is a large task that requires a team of marine biologists to assist the CCC's contract scientists. The primary monitoring activities identified for this team of biologists in 2008 include monitoring the construction of the mitigation reef and field and laboratory work associated with refining the sampling methodologies identified in the mitigation reef monitoring plan. These activities require four diver biologists working full time during the six month field season (May to October).

The permit also requires that the mitigation reef be monitored upon completion of construction to: (1) determine whether the performance standards of Condition C are met, (2) if necessary, determine the reasons why any performance standard has not been met, and (3) develop recommendations for appropriate remedial measures. Thus the primary monitoring activities planned for 2009 entail collecting data that will be used to evaluate the performance of the mitigation reef. The particular monitoring activities needed to accomplish this task are specified in the Monitoring Plan for the SONGS Mitigation Reef. Eight diver biologists working full time during the six month field season of 2009 are needed to complete these monitoring activities. Data management, analysis and reporting, network administration, equipment repair and maintenance, planning and preparation for the annual workshop required by the SONGS permit, and other assorted tasks needed to maintain a functional working environment are the primary staff activities during the non-field season and require five biologists working fulltime in 2009.

During the 2008-2009 work period contract scientists and their support staff will complete the following tasks pertaining to the mitigation reef.

# 2.1 Mitigation Reef Planning and Construction

a. Consult with the permittee and other agencies on the environmental review, planning, *permitting, and construction of the mitigation reef.* Provide guidance on issues related to the design, engineering of the mitigation reef to ensure that it is consistent with the SONGS coastal development permit.

# 2.2 Mitigation Reef Monitoring Plan

a. Select the permanent sampling locations at the mitigation reef and the two reference reefs where post construction monitoring will be done. Contract scientists will use the permitee's final design plan of the mitigation reef to determine the positions of the fixed transects on the mitigation reef where performance monitoring will be done. The

contract scientists will assemble and analyze SCE's kelp persistence data to determine the positions of the fixed transects at the two reference reefs.

- b. Work with a team of reef fish experts from California State University Northridge during 2008 to develop field protocols for collecting and processing specimens of the targeted species that will be used to evaluate the performance standard for fish reproductive rates.
- c. Refine the techniques that will be used to evaluate the performance standard that requires the benthic community to provide food-chain support for fish. The stomachs of several species of benthic feeding reef fish will be examined and their "fullness" will be used as an indicator of the contribution of the benthic community to the diets of reef associated fishes. Contract scientists will work with ichthyologists from California State University Northridge during 2008 to refine the techniques that will be used to measure gut fullness.
- d. Conduct sensitivity analyses of the cohort model that will be used to evaluate the performance standard for fish production. The permit requires that fish production on the mitigation reef be similar to that of natural reference reefs in the region. Estimating fish production on a reef is a difficult and potentially expensive task because it requires knowledge (or scientifically defensible assumptions) of the size of the fish standing stock and its rates of growth, mortality, emigration and immigration. For this reason a great deal of thought has gone into developing the most accurate and cost-effective way to evaluate this performance standard. The method selected for estimating fish production involves the use of a cohort model that relates fish abundance and size structure to production. The model will be used to estimate annual growth and mortality rates under the assumption of no net migration. Contract scientists will work with experts in population modeling to conduct sensitivity analyses on different sources of error in the cohort model to determine the conditions and sample sizes needed for the model to serve as a useful means of assessing the fish production standard.
- e. Refine techniques for measuring growth in targeted species of fish using otoliths to evaluate the fish production performance standard. Estimates of growth derived from annual growth rings of otoliths (small ear bones in fish that are commonly used in estimating age and growth) will be used to cross-check growth estimates based on cohort analyses to determine their level of accuracy. Otoliths typically need to undergo some level of processing in order to make the annual rings visible. Contract scientists will work with ichthyologists from California State University Northridge during 2008 to refine the techniques that will be used to process otoliths of targeted species.
- f. Evaluate the reef monitoring plan in the context of the final design plan of the mitigation reef approved by the CCC and modify the monitoring plan if necessary.

# 2.3 Construction Monitoring of Mitigation Reef

To implement construction monitoring of the mitigation reef, contract scientists will consult with the permittee, its contractors, CCC staff, and other agencies as needed during the construction of the mitigation reef, attend meetings and conduct onsite visits to ensure that reef construction proceeds according to the Final Plan approved by the CCC. The mitigation reef is expected to be constructed by October 2008.

- a. Oversee construction to ensure that the mitigation reef is built with materials that are consistent with the Permit. The SONGS permit requires the mitigation reef to be constructed of rock, concrete, or a combination of these materials. Furthermore, the CCC concurred with the Executive Director's determination that 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. The size structure of the material to be used for the mitigation reef may vary from that of the experimental reef provided that the vast majority of material used to construct the mitigation reef is within the size range selected by the sorting procedure used for the experimental reef. Contract scientists will oversee construction to ensure that the mitigation reef is built to these specifications.
- b. Evaluate whether the total area of the mitigation reef is at least 150 acres. The SONGS permit requires that the total area of the mitigation reef (including the experimental reef and all larger artificial reefs) shall be no less than 150 acres. SCE's proposed design for the mitigation reef consists of a 127.6 acre low-profile (<1 m in height) single-layer quarry rock reef arranged in 11 polygons, which when combined with the 22.4 acres of rock and concrete reef modules built during the experimental phase will form 150 acres of artificial reef. The SONGS permit requires SCE to complete a post construction survey to demonstrate that the reef was built to approved specifications. SCE will conduct a multibeam sonar survey in 2008 immediately after construction. Contract scientists will compare the results from this as-built sonar survey with those obtained from the pre-construction sonar survey done in 2005 to determine whether the mitigation reef constitutes 150 acres of additional reef habitat.

Data on the as-built specifications of the mitigation reef are also needed by the CCC contract scientists to determine whether the mitigation reef is in compliance with the performance standards (see Section 2.4, below). In order to reduce costs and eliminate duplicative effort, a single survey could be done by SCE's contractor in 2008 to fulfill both SCE's requirements and those of the CCC contract scientists. To preserve performance monitoring that is independent of SCE, it is imperative that the CCC contract scientists be an equal collaborator with SCE in the planning and oversight of the 2008 multibeam sonar survey and that their analyses of the data obtained from that survey be done independently of SCE. The successful completion of this task will be best achieved if the CCC enters into a Memorandum of Agreement with SCE or

otherwise works with SCE to ensure that the terms of SCE's contract for the 2008 multibeam survey meet CCC independent monitoring requirements. In the unlikely event that SCE or its contractor is unable to meet the Commission's independent monitoring requirements, CCC contract staff would need to engage an independent contractor to conduct a separate as-built multibeam sonar survey. Funding for this scenario is included in the pre-approved contingency fund (see Section F).

- c. Determine whether the mitigation reef covers 42 to 86% of the bottom. The Executive Director determined that the percent of the bottom covered by quarry rock or rubble concrete on the mitigation reef shall average at least 42%, but no more than 86% (as determined using the uniform point contact method employed by divers during the five-year experimental reef phase). Discrete areas of the mitigation reef may be composed of substrate that covers less than 42% or more than 86% of the bottom, but the overall average coverage of hard substrate of the 150 acre mitigation reef shall be between 42% and 86%. Contract scientists will conduct diver surveys to monitor the percent cover of artificial substrate on the mitigation reef.
- *d.* Monitor for potential damage to biological communities on existing hard substrate caused by construction activities. Contract scientists will conduct qualitative diver surveys during the construction of the mitigation reef to look for visible signs of biological damage caused by anchor lines, vessel relocation, misplacement of artificial reef material and other construction related activities.

# 2.4 Performance Monitoring of Mitigation Reef

- a. Conduct multibeam sonar survey of the mitigation reef in summer 2009 to evaluate whether the area of hard substrate has changed from the as-built condition. Data from the experimental reef demonstrated that the biggest changes in the substrate are likely to occur within the first year following construction. Contract scientists will compare data from the independently contracted 2009 multibeam sonar survey to those obtained from the as-built multibeam sonar survey done in 2008 immediately after construction to determine whether the mitigation reef is in compliance with the performance standard that requires 90% of the exposed hard substrate on the mitigation reef to remain available for the attachment of reef biota.
- b. Conduct diver surveys of the mitigation reef and reference reefs in summer 2009 to assess the performance standards pertaining to substrate coverage, kelp density and the benthic community.
- c. Conduct diver surveys of the mitigation reef and reference reefs in autumn 2009 to assess the performance standards pertaining to the standing stock, density, species richness, and recruitment of kelp bed fishes.

- d. Work with fish experts from California State University Northridge to collect fish specimens during the spawning season in 2009 and process their gonads, otoliths, and guts for use in evaluating the performance standards for fish production, fish reproductive rates, and benthic food chain support.
- e. Collect observational data on fishing intensity on the mitigation reef and nearby reference reefs to determine whether differences in fishing pressure exist among the reefs, and whether such differences need to be accounted for when evaluating compliance with the performance standards.

#### 2.5 Reef Data Management, Analyses and Reporting

- a. Enter, organize, and manage data collected during the monitoring and methodassessment studies. Data management and quality assurance is a critically important task that requires a substantial amount of effort by the team of contract scientists. All monitoring data for the wetland and reef mitigation projects are entered and stored in electronic databases. The SONGS reef mitigation monitoring project's data entry procedures have been redesigned to facilitate rapid data entry while continuing to ensure the quality and integrity of the data as they are transformed from physical to electronic form. The project employs a highly redundant, multi-server system to ensure maximum data integrity, preservation, and uptime. The system consists of a central data server, and multiple mirror and backup servers located at UCSB's Carlsbad office, and at the Marine Science Institute on UCSB's main campus in Santa Barbara, CA. The operation, maintenance, and security of this system requires a dedicated system administrator in Carlsbad (D. Huang) who works closely with the scientific staff on the project and with system administrators on UCSB's main campus.
- b. Prepare semiannual reports for the Commission on the status of the mitigation reef project.
- c. Respond to requests from SCE and other parties for data and analyses.
- d. Update public website with current information on the monitoring of the reef mitigation project. Contract scientists are developing a public website that provides information on the history, current status, and other relevant information pertaining to the monitoring of the SONGS reef and wetland mitigation projects. The website will serve as a repository for progress reports, workshop proceedings and other project related documents and thus help facilitate the transfer of information between the contract scientists and the CCC, SCE other agencies and the general public.
- e. Synthesize monitoring data and use them to assess whether the mitigation reef is in compliance with the biological and physical performance standards specified in the SONGS permit.

- f. Present monitoring results at annual public workshops and at scientific meetings deemed appropriate by the Coastal Commission.
- g. Prepare a written report of the proceedings of the annual workshop that includes an assessment of permit compliance and distribute it to SCE and other interested parties, post on web site.

#### 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 2008-2009 Work Plan for the mitigation phase of the artificial reef. The contract scientists manage a team of University research assistants (i.e., marine biologists trained in scientific diving and data management/analyses) who are responsible for conducting the rigorous field work and extensive data management. The 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 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.
- 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. Work with UC 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.

SONGS 2008 and 2009 Work Program and Budget November 1, 2007 Page 31

i. Prepare 2010-2011 Work Plan.

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

- 3.1 Condition Compliance Review
  - a. Review the permittee's annual report on impingement losses, Fish Chase Procedures and efficacy of the Fish Return System and consult with Science Advisory Panel and SCE on issues pertaining to the report.
  - b. Determine the appropriate sampling design needed to produce an accurate estimate of the effectiveness of the Fish Chase Procedure and the Fish Return System. Analyses of SCE's 2004 and 2005 annual reports that were submitted during the 2006–2007 work plan showed that the effectiveness of the Fish Chase Procedure was lower than that required by the SONGS permit (i.e., 10% reduction in impingement). During 2006-2007 SCE increased its sampling frequency for impingement from 4 to 26 samples per year as part of a study that SCE performed to satisfy conditions in the SONGS Units 2 and 3 National Pollutant Discharge Elimination System (NPDES) permits (CA0108073 and CA0108181). The estimate of the effectiveness of the Fish Chase Procedure derived from SCE's 2006-2007 study was far higher than any estimate previously calculated despite a lower than normal estimate of impingement and a higher than normal estimate of the weight of fish returned via the Fish Chase procedure. These findings bring into question the accuracy of previous estimates of effectiveness of the Fish Chase Procedure, which were based on much less data. Contract scientists working for the CCC will analyze SCE's impingement and fish return data to determine: (1) the sampling effort needed to obtain an accurate and reliable estimate of the effectiveness of the Fish Chase Procedure and the Fish Return System, and (2) whether inadequate sampling could have been the cause for the reduced effectiveness of the Fish Chase Procedure observed during 2004 and 2005.
  - 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. Fish Hatchery Tasks

SCE has fulfilled all of its obligations for funding the fish hatchery requirements of the SONGS permit. Thus, there are no fish hatchery tasks to be conducted by CCC contract scientists or funded through this work program. Permanent Commission staff provides oversight of the Department of Fish and Game's continuing fish hatchery program.

# E. BUDGET: 2008 AND 2009

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 periodically 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 beginning with the 1998-1999 period. These work programs have included planning, environmental analyses, permit compliance issues, five years of experimental reef monitoring, pre-restoration and construction monitoring for the wetland project, development of performance monitoring plans, and necessary studies for managing potentially invasive species. The status section of this report (see Section C) summarizes the accomplishments of the Commission's program.

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.

SONGS 2008 and 2009 Work Program and Budget November 1, 2007 Page 33

Period	Total Budget	Total Expenditures
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	2,338,957	2,256,543
2006-2007	<u>2,266,141</u>	<u>2,183,589</u> (projected)
16-YEAR TOTAL	\$13,914,040	\$11,761,248

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. 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 2008 and 2009 work program and budget.

#### Proposed Budget for 2008 and 2009

The proposed budget for calendar years 2008 and 2009 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 during the two-year budget period. 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. 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.

The funding proposed to cover the monitoring and oversight program costs during the two-year budget period (calendar years 2008 and 2009) is \$3,055,170, 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 2008

	2008 Watland	2008	2008	2008
	wetland	Reet	Admin/Ngt	Total
SALARIES				
Core Program Staff (2.5 PY)				
Principal Scientist (0.5 PY)	5 725	51 524		57 249
Principal Scientist (1.0 PY)	48 694	48 694		97,388
Principal Scientist (0.5 PY)	36 563	4 062		40 625
Senior Administrator (0.5 PY)	00,000	1,002	39 653	39 653
Field Assistants (5 10 PY)			00,000	00,000
Staff Research Associate IV (1 0 PY)	7 342	66 086		73 428
Staff Research Associate II (1 0 PY)	7,012	49 476		49 476
Staff Research Associate II (1.0 PY)		44 358		44 358
Staff Research Associate II (1.0 PY)	41 793	44,000		41 793
Staff Research Associate I (1.0 PY)	41,700	34 794		34 794
Student Assistant I @ 200 hr/vr (0 10 PY)	2 000	04,704		2 000
	142 117	208 004	39 653	480 764
UCSB Indirect Cost @ 26% (excluding SrAdmin)	36 950	77 739	00,000	114 689
TOTAL SALARIES	179.067	376.733	39.653	595.453
	,		,	,
BENEFITS				
Core Program Staff				
Principal Scientist	1,202	10,820		12,022
Principal Scientist	12,174	12,174		24,348
Principal Scientist	8,775	975		9,750
Senior Administrator			18,361	18,361
Field Assistants				
Staff Research Associate IV	2,254	20,288		22,542
Staff Research Associate II	,	14,744		14,744
Staff Research Associate II		17,921		17,921
Staff Research Associate II	17,135	,		17,135
Staff Research Associate I	,	10,090		10,090
Student Assistant I	88	,		88
SUBTOTAL BENEFITS	41,628	87,012	18,361	147,001
UCSB Indirect Cost @ 26% (excluding SrAdmin)	10,823	22,623	, 0	33,446
TOTAL BENEFITS	52,451	109,635	18,361	180,447

# 2008 Budget continued.

	2008 Wetland	2008 Reef	2008 Admin/Mg	2008 gt Total
SCIENTIFIC ADVISORY PANEL	45,125	45,125	0	90,250
CONSULTANTS AND CONTRACTORS Wetlands				
Task 1.2c.ii-wetland engineering Task 1.2c.iii-aerial photo surveys <b>Reef</b>	40,000 20,000			40,000 20,000
Task 2.2b-c-fish reproductive rates Task 2.2d-fish production modeling	60 000	50,520 15,000	0	50,520 15,000
TOTAL CONSULTANTS & CONTRACTORS	60,000	63,320	U	125,520
TRAVEL SrAdmin & reimbursement for permanent CCC staff UCSB Principal Scientists & Field Assistants UCSB indirect cost (excl. SrAdmin & CCC staff) TOTAL TRAVEL	5,690 20,000 5,200 <b>30,890</b>	3,793 25,000 6,500 <b>35,293</b>	0	9,483 45,000 11,700 <b>66,183</b>
<b>OPERATING EXPENSE</b> General expense (SF office) General expense (UCSB contract, incl. indirect cost) Facilities operations (Carlsbad office) Marina storage/offsite facilities (UCSB contract)	22,751 17,709	85,521 53,127 5,226	15,000	15,000 108,272 70,836 5,226
Computer technical support, repair & maintenance Review workshop Administrative/financial processing services TOTAL OPERATING EXPENSE	40,460	143,874	1,500 2,200 18,000 <b>36,700</b>	1,500 2,200 18,000 <b>221,034</b>
EQUIPMENT SE office			1 000	1 000
19' Dive boat and motor (UCSB contract) 175 hp outboard engine (UCSB contract) Miscellaneous equipment, as needed (UCSB)	5,000	40,000 10,000 5,000	1,000	40,000 10,000 10,000
TOTAL EQUIPMENT	5,000	55,000	1,000	61,000
TOTAL EXPENSE 2008	\$412,993	\$831,180	\$95,714	\$1,339,887

# SONGS PROGRAM BUDGET 2009

	2009 Wetland	2009 Reef	2009 Admin/Mgt	2009 Total
SALARIES				
Core Program Staff (2.5 PY)				
Principal Scientist (0.5 PY)	6 091	54 824		60 915
Principal Scientist (1.0 PY)	51 770	51 770		103 540
Principal Scientist (0.5 PV)	38 //1	1 271		100,040
Senior Administrator (0.5 PY)	30,441	7,271	41 633	41 633
Field Assistants (8 10 PV)			41,000	41,000
Staff Pasaarch Associate IV (1 0 PV)	7 500	68 307		75 006
Staff Research Associate II (1.0 PT)	7,555	52 002		52 002
Staff Passarch Associate II (1.0 PT)		47 509		17 509
Staff Dessarch Associate II (1.0 PY)	44 700	47,506		47,500
Staff Bassarah Associate I (1.0 PT)	44,700	25 025		25 025
Staff Dessarch Associate I (1.0 PT)		30,030		25,030
Staff Desserve Associate I (1.0 P f)	47.040	30,030		30,030
Stall Research Associate I (0.5 PY)	17,916	47.040		17,910
Laboratory Assistant III (0.5 PY)		17,319		17,319
Laboratory Assistant III (0.5 PY)		17,319		17,319
Laboratory Assistant III (0.5 PY)	0.000	17,319		17,319
Student Assistant I @ 200 nr/yr (0.10 PY)	2,000	400.000	44.000	2,000
SUBTOTAL SALARIES	168,577	403,389	41,633	613,599
UCSB Indirect Cost @ 26% (excluding SrAdmin)	43,830	104,881	0	148,711
TOTAL SALARIES	212,407	508,270	41,633	762,310
BENEFITS				
Core Program Staff				
Principal Scientist	1,279	11,513		12,792
Principal Scientist	12,943	12,943		25,886
Principal Scientist	9,226	1,025		10,251
Senior Administrator			19,279	19,279
Field Assistants				
Staff Research Associate IV	2,333	20,998		23,331
Staff Research Associate II		15,792		15,792
Staff Research Associate II		19,193		19,193
Staff Research Associate II	18,352	,		18,352
Staff Research Associate I		10,392		10,392
Staff Research Associate I		10.392		10.392
Staff Research Associate I	3.942	- ,		3,942
Laboratory Assistant III	- / -	3.811		3.811
Laboratory Assistant III		3.810		3,810
Laboratory Assistant III		3.810		3.810
Student Assistant I	88	-,		88
SUBTOTAL BENEFITS	48,163	113 679	19,279	181 121
UCSB Indirect Cost @ 26% (excluding SrAdmin)	12,522	29.557	0	42.079
TOTAL BENEFITS	60,685	143,236	19,279	223,200

#### 2009 Budget continued.

	2009 Wetland	2009 Reef	2009 Admin/Mg	2009 t Total
SCIENTIFIC ADVISORY PANEL	46,253	46,253	0	92,506
CONSULTANTS AND CONTRACTORS Wetlands				
Task 1.2c.ii-wetland engineering Task 1.2c.iii-aerial photo surveys <b>Reef</b>	20,000 22,550			20,000 22,550
Task 2.2b-c-fish reproductive rates Task 2.2d-fish production modeling Task 2 4a-multi-beam sonar survey		125,150 15,000 129,765		125,150 15,000 129 765
TOTAL CONSULTANTS & CONTRACTORS	42,550	269,915	0	312,465
TRAVEL				
SrAdmin & reimbursement for permanent CCC staff	5,690	3,793		9,483
UCSB Principal Scientists & Field Assistants	20,500	25,625		46,125
UCSB indirect cost (excl. SrAdmin & CCC staff)	5,330	6,663	•	11,993
IOIAL IRAVEL	31,520	36,081	0	67,601
OPERATING EXPENSE				
General expense (SF office)			15,000	15,000
General expense (UCSB contract, incl. indirect cost)	23,319	98,488		121,807
Facilities operations (Carlsbad office)	18,472	55,412		73,884
Computer technical support repair & maintenance		5,460	1 500	5,400 1,500
Review workshop			2 300	2 300
Audit			8.000	8,000
Administrative/financial processing services			18,000	18,000
TOTAL OPERATING EXPENSE	41,791	159,360	44,800	245,951
EQUIPMENT				
SF office			1,000	1,000
Miscellaneous equipment, as needed (UCSB)	5,125	5,125		10,250
TOTAL EQUIPMENT	5,125	5,125	1,000	11,250
TOTAL EXPENSE 2009	\$440.331	\$1.168.240	\$106.712	51.715.283

TWO-YEAR TOTAL EXPENSE FOR 2008 and 2009

\$3,055,170

# F. PRE-APPROVED CONTINGENCY FUND FOR 2008 AND 2009

Staff is proposing pre-approved contingency funds in the amount of \$333,970 specifically for potential additional costs for: (1) the Scientific Advisory Panel, (2) early office lease termination, (3) repair and/or replacement of field vehicles and engines, and (4) a multi-beam sonar survey of the constructed mitigation reef. 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 since the 2002-2003 work program. To date, staff has not had to tap the contingency funds, although a small amount of contingency funds for the Scientific Advisory Panel may be required later this year.

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 construction and performance monitoring 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 less total funding for the Scientific Advisory Panel for the two budget years (\$182,756) based on current rates of expenditure. However, the overall budget does not provide any cushion for any increased effort; thus, the staff proposes a pre-approved contingency fund amount of \$138,612 to be earmarked for the Scientific Advisory Panel to allow the timely response to changing circumstances. This amount is derived from the total authorized amount for the two years as adjusted (\$321,368, see footnote) less the budgeted amount (\$182,756).

In addition, staff proposes funds for early lease termination for the Carlsbad office. The need for early lease termination is unlikely; however, should circumstances arise that necessitate canceling the lease, the contingency fund amount of \$28,758 would be available to satisfy the lease obligations. Similarly, the contingency fund includes \$40,000 for replacing or repairing the 14 year old, high mileage field vehicles or their engines.

Finally, the staff proposes funds for an independent multi-beam sonar survey of the constructed mitigation reef. SCE is required to conduct an "as built" multi-beam survey of the reef and staff intends to work in collaboration with SCE to ensure that the contractor carries out the survey in a manner that meets the Commission's independent monitoring requirements. A \$126,600 contingency for conducting a separate survey is included in the unlikely event that SCE or its contractor is unable to meet the staff's requirements.

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.

<sup>&</sup>lt;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 original 1991 permit to mid-year 2007, the adjusted amount for 2008 is \$158,700. A 2.5% escalator is used for estimating adjustments for 2009, based on the average percent change from 2006 to mid-year 2007, resulting in an adjusted amount for 2009 of \$162,668. Thus, the total adjusted amount for the two budget years 2008 and 2009 is \$321,368.

#### **APPENDIX A: BUDGET NOTES**

**SALARIES**. Includes salaries and wages for the contract program staff, which includes two scientist positions, administrative support, and field assistants. 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 Management Consulting, Inc., 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 previous years' expenditures, 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 \$50 to \$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 2.5% escalator is applied for 2009.

**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.

**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 oncampus communications services for contract staff located at UCSB. A 2.5% escalator is applied for 2009.

**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). A 2.5% escalator is used for 2009 where anticipated increases are not yet known.

<sup>&</sup>lt;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 offcampus 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.

SONGS 2008 and 2009 Work Program and Budget November 1, 2007 Page 40

**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 2.5% escalator is applied for 2009.

**COMPUTER TECHNICAL SUPPORT**. Covers 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 the mitigation projects are still in the construction stages, annual status reviews of the mitigation projects may be conducted for the Commission and the public.

**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 Management Consulting, 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 2.5% escalator is applied where applicable for 2009. Also included are funds for a dive boat and outboard engine for the reef monitoring program.

SONGS 2008 and 2009 Work Program and Budget November 1, 2007 Page 41



October 24, 2007

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. Hanschi



SUBJECT:

T: SONGS Mitigation Program: 2008-09 Two-Year Work Program and Budget

Southern California Edison (SCE) has 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. Although we do not always agree completely with every element of your proposed monitoring program, SCE appreciates your efforts to help us contain the costs of Coastal Commission oversight and monitoring of the mitigation projects as required by our Coastal Development Permit. 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 will cost SCE and the other SONGS owners over \$3 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,

DAVID W. KAY Manager of Environmental Projects

cc: Ms. Jody Loeffler, California Coastal Commission

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