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Energy and Ocean Resources Staff: SMH, JJL, JD & SC

Staff Report: Hearing Date: Item Number: Commission Action: SMH, JJL, JD & SONGS Mitigation Program Scientific Team—SF November 21, 2001 December 12, 2001 Wednesday-14

SONGS Mitigation Program: 2002 and 2003 Two-Year Work Program and Budget

EXECUTIVE SUMMARY

The staff is recommending Commission approval of a two-year work program and \$2,423,045 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 \$158,500 contingency fund. Such a fund would be used, in consultation with SCE, only to cover the costs of sonar surveys of the experimental kelp reef if unusually severe storms or other reef-altering events occur and for additional time for the Scientific Advisory Panel if needed.

The permit conditions originally were adopted by the Commission in 1991 to mitigate the adverse impacts of the operation of 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 and October 1998.

Permittee's Funding Requirement

Condition D of the permit requires SCE to fund the Commission's oversight of the mitigation and independent monitoring functions identified in and required by Conditions A through C. The

permittee is required to provide "reasonable and necessary costs" for the Commission to retain personnel with appropriate scientific or technical training and skills, as well as reasonable funding for necessary support personnel, equipment, overhead, consultants, the retention of contractors needed to conduct identified studies, and to defray the costs of members of any scientific advisory panel convened by the Executive Director to provide advice on the design, implementation, monitoring and remediation of the mitigation projects. The Commission has operated under approved work programs and budgets since 1993.

Consultation with Permittee

Pursuant to the permit conditions, the staff has consulted with SCE on the proposed work program and budget for 2002 and 2003. Several issues were raised, which have been addressed to SCE's satisfaction (see SCE's letters of October 17, 2001 and November 15, 2001, attached):

- The cost of the two-year program has been reduced by discontinuing sampling the 14 kelp transplant modules, eliminating the kelp reef sonar surveys in 2002 and 2003, and reducing the amount budgeted for assistance from the Scientific Advisory Panel. (Funds for sonar surveys and additional funds for the Scientific Advisory Panel are contained in a pre-approved contingency fund to be expended in consultation with SCE should circumstances change.)
- Wetland pre-restoration monitoring tasks have been clarified.
- An estimation of allocation of time and cost by task has been provided.
- An annual summary report of monitoring results will be published following the annual workshop review of the mitigation projects.
- The staff will review the results of SCE's internal audit currently underway to determine if changes should be made to the work program and budget.

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 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 2002 and 2003

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

The environmental review and final planning for the wetland restoration project will continue over the next several months, culminating with SCE's submittal of a coastal development permit application and construction of the wetland. Lawsuits challenging the adequacy of the Final Environmental Impact Report (FEIR) resulted in a court ruling setting aside the certification of the FEIR and remanding the matter back to the San Dieguito River Valley Regional Open Space Park Joint Powers Authority (JPA) for further consideration. The ruling is being appealed, which will take some months to complete. In the meantime, SCE has agreed to move forward to address the issues raised by this litigation and to address other outstanding issues. The contract scientists' work will focus on assisting with the resolution of these issues, completing pre-restoration monitoring, finalizing the wetland monitoring and management plan, assisting the Commission with its review of the coastal development permit application, and initiating construction monitoring.

Construction of the experimental reef was completed in September 1999, and the five-year monitoring phase began in early 2000. Contract scientists and field assistants will continue to conduct the next two years of monitoring and undertake the process studies identified in the monitoring and management plan for the experimental kelp reef approved by the Commission.

In October 2000, the Commission reviewed the conclusions on the effectiveness of the fish behavioral barriers. Contract scientists will continue to monitor the reduction of fish losses at SONGS. In addition permanent Commission staff will continue to participate in the oversight of the fish hatchery program operated by the Department of Fish and Game's Ocean Resources Enhancement and Hatchery Program, with very minor assistance from the contract scientists.

Budget for 2002 and 2003

The proposed budget for calendar years 2002 and 2003 covers the monitoring and technical oversight program costs for the Commission's contract scientists, contract field personnel to monitor the wetlands and experimental reef, science advisory panel, consultants, administrative support, and operating expense. The proposed funding totals \$2,423,045 for the two years, which is about 5% higher than the budget for the previous two years, due primarily to increases in personnel rates (set by U.C Systemwide Administration) and the addition of a fish ecologist specialist to assist with the wetland pre-restoration monitoring.

In addition, staff is proposing pre-approved contingency funds in the amount of \$158,500. In an effort to reduce the overall budget, staff eliminated funding for sonar surveys of the experimental reef during 2002 and 2003 and reduced the funding for the Scientific Advisory Panel. However, there may be a need to respond quickly to changed circumstances, and the overall budget does not provide any cushion. Thus, the staff proposes a pre-approved contingency fund totaling \$158,500. Of this amount, \$58,500 is earmarked for sonar surveys of the experimental kelp reef in the event that unusually severe storms or other potentially reef-altering events (e.g., earth-quake) occur, or if changes are discovered in the course of monitoring which would warrant a

need to re-assess the footprint of the reef. Staff also proposes that \$50,000 per year, for a total of \$100,000 for the two year work program, be earmarked for the Scientific Advisory Panel. (The permit specifically authorizes up to \$100,000 *per year*, adjusted annually by any increase in the consumer price index applicable to California.) Because the Scientific Advisory Panel has not spent its allotted amount in the last two years, staff has reduced the amount in the proposed budget to only \$50,000 per year. However, there are many issues pending in the next two years that may increase demand on their time beyond that which is budgeted (e.g., approval of the final wetland plan, finalizing the monitoring and management plan for the wetland). Having the remainder of the authorized amount in a pre-approved contingency fund would allow the Scientific Advisory Panel to respond in a timely manner to changing circumstances. Any expenditure of the contingency funds would be made in consultation with SCE. If there are disputes, 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 2002 and 2003 for a total amount of \$2,423,045 for both years in support of the Commission's independent monitoring and technical oversight of the San Onofre Nuclear Generating Station (SONGS) Units 2 and 3 marine resource mitigation projects required in Conditions A through C of permit 6-81-330-A (formerly 183-73). The Commission's independent monitoring and technical oversight program is to be funded by the permittee, Southern California Edison and the other SONGS owners, in accordance with the provisions of Condition D of the permit. In addition, staff recommends that the Commission approve a contingency fund in the amount of \$158,500 for the Commission's program, to be funded by the permittee and to be expended in consultation with SCE for the purposes of conducting sonar surveys of the experimental kelp reef and increasing the time required from the Scientific Advisory Panel, as specified in the staff report.

II. MOTION AND RESOLUTION

Commission approval of the 2002 and 2003 two-year Work Program and Budget requires the following motion:

I hereby move that the Commission approve the 2002 and 2003 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 2002 and 2003 two-year SONGS Work Program and Budget and contingency fund that is set forth in the staff recommendation, dated November 21, 2001, 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 2002 AND 2003 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 rivermouth 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, direct operating expenses incurred in support of the Commission's permanent staff (such as travel), and indirect operating expenses associated with the program are *not* paid by the permittee but are absorbed by the Commission.

In December 1999, the Commission approved the 2000-2001 work program and budget for the monitoring and oversight program. The Commission approved an implementation structure through a contract with the University of California, Santa Barbara, that utilizes the existing contract scientists as project managers at no additional cost, with data collection done by contract field assistants under their direction. The Commission found, based on a comparison of estimated costs from UCSB, other universities, and private consultants, that this implementation structure is the most efficient, cost-effective, scientifically rigorous, and timely method of achieving the goals of the independent monitoring required by the permit. This implementation structure will continue during the two-year period of the 2002 and 2003 work program.

C. STATUS OF MITIGATION PROGRAM

C.1. Status of Wetland Restoration

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 impacts to fishes caused by the operation of SONGS. In April 1997, the Commission reaffirmed its 1992 approval of the permittee's choice of the San Dieguito River Valley as the site for the wetland restoration project and allowed for up to 35 acres credit for enhancement at San Dieguito Lagoon on the condition of perpetual inlet maintenance.

Planning and Environmental Review

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

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

Lawsuits challenging the adequacy of the Final EIR were filed by the Del Mar Sandy Lane Association and Citizens United to Save the Beach. Although in a July 2001 decision the Court rejected certain of the plaintiff's claims, it determined that the FEIR is inadequate with regard to several issues, most significantly that there is insufficient evidence supporting the FEIR's conclusion that the project will not increase scour and loss of sand at the river mouth. The Court set aside the JPA's certification of the FEIR and remanded the matter back to the JPA. The JPA expects to appeal those portions of the Superior Court ruling that are adverse to it.

Outstanding Issues

The permit requires SCE to submit a final restoration plan to the Commission that substantially conforms to the preliminary restoration plan approved by the Commission in November 1997 unless the CEQA/NEPA review concludes that an alternative plan that meets the conditions for minimum standards and objectives is the environmentally superior alternative. SCE is then required to submit a coastal development permit following receipt of other agency approvals and permits.

Although the JPA plans to appeal the Court's ruling on the FEIR, the JPA, SCE and USFWS have agreed to move forward during the appeals process to address the points other than the coastal process issue deemed inadequate by the Court in order to be ready to re-certify the FEIR if necessary. Regardless of the outcome of the appeals process, these additional analyses will be needed at the time of the Commission's review of the coastal development permit application for the restoration project.

At the same time, the staff and SCE are continuing to work with USFWS, Department of Fish and Game, the JPA, and the 22nd Agricultural District to resolve the remaining issues involving the least tern nesting sites. Although the least tern nesting sites are included in the overall plan, they are a previous requirement from a coastal development permit granted to the 22nd Agricultural District (CDP No. 6-84-525), and not a requirement of SCE's SONGS permit.

SCE has moved ahead to develop its Final Plan while recognizing that project revisions may be necessary pending resolution of these issues. The staff will continue to work with SCE to ensure that the plan meets the objectives and standards specified in the permit and to ensure that Coastal

Act issues will be addressed appropriately at the coastal development permit stage of the project. The staff is exploring options such as a Commission workshop to get public input and as much Commission guidance as possible before the plan is finalized.

Wetland Restoration Monitoring

As part of the Commission's technical oversight, monitoring and management responsibilities under Condition D, the contract scientists are conducting pre-restoration monitoring in San Dieguito Lagoon and in other southern California wetlands that may be used as reference sites in post-restoration monitoring. Pre-restoration monitoring includes the collection of baseline physical and biological data on the wetland attributes to be monitored during post-restoration monitoring. Pre-restoration monitoring data on the relationship between elevation, height of tidal inundation and vegetation cover were used to develop a quantitative definition of tidal marsh. This definition is needed to guide wetland planning and to evaluate compliance of the project with the coastal development permit. Pre-restoration data are also required to assess construction-related impacts and changes in the existing wetland following construction. Contract scientists continue to collect pre-restoration data on water quality, invertebrates, and fishes in San Dieguito Lagoon.

In addition, pre-restoration monitoring data are needed to develop sampling designs for postrestoration monitoring that can effectively determine whether the various performance standards have been met, while minimizing any adverse effects of sampling on wetland resources. Contract scientists are determining the appropriate number and spacing of samples required in the postrestoration monitoring program for epibenthic and infaunal invertebrates. Fieldwork for this study, carried out in Tijuana Estuary, Mugu Lagoon, and Carpinteria Salt Marsh, has been completed and the laboratory processing of the samples will be concluded by the end of 2001. Analyses of these data will be done as part of the 2002-2003 work plan. Finally, pre-restoration monitoring is needed to evaluate the suitability of other wetlands as reference sites. The performance of the wetland following construction will be measured using performance standards listed in the coastal development permit for SONGS mitigation. These standards include comparing the performance of various wetland attributes in the restored wetland to that of nearby relatively undisturbed reference wetlands. Contract scientists visited potential reference wetlands with representatives from SCE to examine the types of habitat that will be used to assess the performance of the restored wetland during post-restoration monitoring and assisted consultants for SCE in collecting soil samples from these sites to evaluate whether soil amendments may be required to facilitate the development of healthy salt marsh vegetation in the restored wetland.

C.2. Status of Reef Mitigation

Mitigation Requirement

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

standards specified in the permit. The design of the mitigation reef will be contingent on the results of the experimental reef.

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

Planning and Construction of Experimental Reef

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

The Coastal Commission approved the coastal development permit for the experimental reef on July 15, 1999. The final plan approved by the Coastal Commission is for an experimental artificial reef located off San Clemente, California that tests eight different reef designs that vary in substrate composition (quarry rock or recycled concrete), substrate coverage (17%, 34%, and 67%), and presence of transplanted kelp. All eight reef designs are represented as individual 40 m x 40 m modules that are 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.

The contract scientists hired a local subcontractor (Hydra Marine) to install four permanent 40 m transect lines on each of the 56 modules in the fall of 1999 following the completion of reef construction. These lines are used to mark the areas on each module that are monitored. During this time the contract scientists conducted a national search through the University of California, Santa Barbara for research divers trained in marine biology to assist in carrying out the monitoring plan approved by the Coastal Commission. A team of divers was assembled in January 2000 and the first surveys were begun in March 2000. The monitoring plan specifies that the abundance of giant kelp, macro invertebrates, understory algae, and kelp bed fish, and the area and coverage of hard substrate be surveyed each year in a 2 m wide swath along each of the four permanent transect lines on each of the artificial reef modules. The first year of field surveys

was completed in November 2000 and involved 840 diver days and over 2,000 dives. Contract scientists analyzed the data from these surveys and presented the results of their analyses at a public workshop in San Clemente, California in January 2001 and at a symposium on reef ecology organized by SCE for the 2001 Annual Meeting of the Southern California Academy of Sciences.

Some of the major results seen in analyses of the first year's surveys were:

- (1) The amount of artificial reef material placed on the reef as determined from dive surveys is considerably higher than the intended nominal coverages of 17%, 34% and 67% (averaging about 39%, 62%, and 83%, respectively).
- (2) There has been substantial colonization of giant kelp on all reef designs with a trend for declining density of new kelp with increasing distance from the nearest natural kelp bed (San Mateo Kelp bed).
- (3) There has been relatively poor survivorship of giant kelp transplanted to the artificial reef. It appears that most transplanted kelp was out competed by faster growing kelp that naturally colonized the reef.
- (4) The abundance of invertebrates and understory algae on the artificial reef in the first summer of the experiment tended to increase with the coverage of reef substrate. The total abundance and number of species of invertebrates and understory algae on the artificial reef was generally within the range observed on nearby natural reefs. However, the species composition of invertebrates and algae differed substantially between artificial and natural reefs.
- (5) The species composition and abundance of benthic reef fish on the artificial reef modules in the first summer of the experiment was generally similar to that found on nearby natural reefs. In contrast, water column fish were substantially less abundant and less diverse on the artificial reef compared to the reference reefs. This latter observation was most likely related to a paucity of mature kelp in the water column on the artificial reef compared to the reference reef.

The second year of surveys was begun in March 2001 and is expected to be completed in November 2001. The amount of effort required to conduct the 2001 monitoring surveys has been substantially greater than that required to conduct the 2000 monitoring surveys because the assemblages of plants and animals on the artificial reef have become more developed. In particular, dense colonization by giant kelp on the artificial reef modules more than doubled the amount of time required to complete the 2001 winter/spring kelp survey. Consequently, additional field assistants were hired to complete the second year of monitoring. However, even with the extra employees, the field crew accrued large amounts of unbudgeted compensation time and unused vacation.

To remedy this problem, contract scientists have been analyzing data from the 2000 surveys to evaluate whether the sampling effort can be reduced without substantially compromising the data. These analyses examined the effects of reducing the number of transects sampled per reef

module on statistical power (i.e., the probability of detecting differences among reef designs and locations or between artificial reef modules and the reference reefs). The results showed only small losses in statistical power for surveys of giant kelp, and invertebrates and understory algae when the number of transects sampled per module was reduced from four to two. Additional analyses showed a considerable loss of statistical power when the number of transects sampled per module was further reduced to one. Consequently, the number of transects sampled on each artificial reef module during the summer benthic surveys was reduced from four to two. The summer/fall kelp survey also has been reduced to counting marked individuals and replacing tags in a further attempt to reduce sampling effort.

In addition, contract scientists will discontinue monitoring the fourteen modules used to examine kelp transplanting techniques in future years. The kelp transplant modules were established to: (1) provide a source of kelp in the absence of natural colonization by kelp, and (2) test the feasibility of outplanting kelp as a possible remediation strategy to augment the density of giant kelp on the mitigation reef should it fail to meet the performance standard for kelp. Dense natural colonization of kelp on the experimental reef has eliminated the need for kelp transplants to provide a source of kelp, and the feasibility of transplanting kelp as a remedial measure has been tested and evaluated. Thus this portion of the experiment is complete and, unless the current situation of abundant kelp on the artificial reef suddenly changes, the kelp transplant modules can be eliminated from further sampling without jeopardizing the experiment's ability to evaluate different reef designs and locations.

Contract scientists are continuing to examine the data in search of ways to streamline the monitoring without compromising the integrity of the five year experiment and its ability to provide accurate information on suitable designs and locations for the mitigation reef. Added time and resources gained by reducing the monitoring will allow the contract scientists to perform some of the process studies identified in the management and monitoring plan for the experimental reef that are needed to evaluate fish production and sustainability of reef biota over the long-term. To help free up resources contract scientists have decided not to conduct sonar surveys of the experimental reef during 2002 and 2003 unless severe storms or other potentially reef-altering events (e.g., earthquake) occur during this time, or if changes are discovered in the course of monitoring which would warrant a need to re-assess the footprint of the reef. This decision was based on results from the sonar surveys in 2000 and 2001, which show little change in the amount of emergent hard bottom has occurred on the reef aside from an initial scouring of soft sediments around the modules shortly after construction. It is anticipated that sonar surveys will be done in the fifth and final year of the experiment (i.e., 2004) to evaluate the ability of the different reef designs to meet the performance criteria for hard substrate.

Another way that scientists are considering freeing up time and resources for process studies is to sample a subset of the seven blocks on the experimental reef during 2002 and 2003. Doing so, however, will reduce the sample size of all reef designs and thus reduce the experiment's ability to distinguish differences in performance among reef designs. In addition, deleting a subset of the experiment from years 3 and 4 may hamper both the ability to evaluate temporal and spatial trends in the developing reef biota and the ability to make accurate predictions concerning their sustainability. The issue of sustainability was emphasized in testimony to the Commission by reef experts who argued that even five years was too short of a time frame for evaluating

sustainability of kelp forest communities. Their testimony was based on observations from other artificial reefs in southern California that were initially colonized by kelp, which over time was replaced by long-lived sessile invertebrates. Thus, further reductions in monitoring beyond the reductions included in this work program must be carefully evaluated before the staff would consider whether to implement them.

C.3. Status of Behavioral Barriers

Mitigation Requirement

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

Background

Between 1983 and 1991 the Marine Review Committee found that annual losses of juvenile and adult fish in the cooling water systems of SONGS Units 2 and 3 under normal operations averaged about 20 metric tons. Although the SONGS permit does not specify any criteria for evaluating the effectiveness of these devices, the recommendation of the Marine Review Committee (Section IV–Proposed Findings and Declarations in the SONGS 1991 permit) was that "the techniques" (behavioral barrier devices) "be tested on an experimental basis, and implemented if they reduce impingement by at least 2 metric tons (MT) per year".

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

Compliance to Date

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

In 1994 the staff instructed SCE to conduct a series of laboratory and in-plant experiments to test the behavioral response of fish to lights and sound. (At this time staff also informed SCE that if the experiments indicated that the installed devices would not decrease fish impingement losses by 2 metric tons per year, then compliance with Condition B would be attained without further testing provided the modified heat cleaning treatment (i.e., Fish Chase procedure) was maintained for the operating life of Units 2 and 3.) Pursuant to this instruction, SCE conducted laboratory studies from 1995 to 1997 on the behavioral response of fish to different intensities of light and different frequencies of sound. Results of these experiments indicated that certain species of fish displayed behavioral responses to incandescent light and sound that could be exploited to reduce impingement in the cooling system. However, the use of sonic devices in the plant was determined not to be feasible due to the logistic difficulty and high cost of reproducing in the plant the frequencies and intensities of sound that were needed to elicit a behavioral

response in the laboratory. Staff then instructed SCE to begin in-plant testing using incandescent lights. Installation of the lights in Units 2 and 3 was completed in December 1998 and a three-phased experiment investigating the effect of these lights in reducing fish losses was conducted between February and December 1999. Results from these experiments showed no evidence that using lights in the cooling water systems of Units 2 and 3 would reduce fish impingement losses. Consequently, the Executive Director has determined that the lights and sound devices tested by SCE are not effective as fish behavioral barriers at SONGS.

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

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

The staff received SCE's 2000 Annual Marine Environmental Analysis report in August 2001. The staff has reviewed the report's data and analysis on the fish chase procedure at SONGS and is preparing comments to SCE.

C.4. Status of Hatchery Program

Permit Requirement

In 1992 the Commission required the permittee to contribute \$1.2 million towards the construction of an experimental marine fish hatchery and an evaluation program to determine whether the hatchery is effective at increasing the stock of fish. (Condition F). The permittee paid the initial sum, therefore fulfilling its permit condition.

Department of Fish and Game Hatchery Program

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

A ten member panel, the Ocean Resources Enhancement Advisory Panel (OREAP), assists DFG in establishing policy for the program. Although the permittee provided funding for the hatchery program, the permittee does not take part in it. Instead the program is overseen by DFG and OREAP. Most of the conditions for the hatchery program contained in the permit therefore have

to be met by DFG and OREAP, through a 1994 Memorandum of Agreement (MOA), rather than by the permittee.

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

White sea bass are cultured at the hatchery until they reach a length of about 3 inches. At that time they are transferred to grow-out pens which are maintained throughout southern California by a network of community volunteers. After the fish attain a length of about 10 inches they are released. During calendar year 2000, over 54,300 coded wire-tagged white sea bass were released. There is also an ongoing program to sample wild populations of white sea bass. During 2000, field sampling with gillnets captured 1,695 individual fish, of which 149 were tagged.

The hatchery program includes a research program to investigate genetic issues. Work began in fall 1998 to document the genetic diversity of natural and hatchery-grown populations. During the past two years, there have been recurring problems with water quality at the hatchery. However, the operators believe that those problems have now been solved by installing recirculation systems on all tanks that hold eggs, larval or juvenile fish. The re-circulation systems allow hatchery personnel to sterilize the water in the system and control temperature, two factors that have contributed to heavy mortality in the past. There are currently 39,000 one to two inch fish in culture which will be moved to grow-out facilities in the next few months.

Oversight of the hatchery program is conducted primarily by permanent Coastal Commission staff with minor assistance provided by the contract scientists. Because of other workload, Commission staff has spent only minimal time assessing DFG's work. The focus of the Commission's oversight is to determine the methodology used to assess the effects of the hatchery program on the abundance and population genetics of white sea bass in southern California and to report on the results of such studies.

D. WORK PROGRAM: 2002 AND 2003

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. 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: Stephen Schroeter, Ph.D., marine ecologist, Mark Page, Ph.D., wetlands ecologist (half time), and Daniel Reed, Ph.D., kelp forest ecologist (half-time). A half-time administrator completes the 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, William Murdoch, Ph.D., Professor, UC Santa Barbara, and Peter Raimondi, Ph.D., Associate Professor, UC Santa Cruz.

In addition to the science advisors, 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. The Commission's permanent staff also spend a portion of their time on this program, but their costs are paid by the Commission and are not included in the SONGS budget.

The Commission's contract scientists working on the SONGS mitigation project are hired under a contract with the University of California, Santa Barbara. Based on a comparison of estimated costs from UCSB, other universities, and private consultants, the Commission found that also implementing the field monitoring program 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.

The contract scientists serve as project managers for both the artificial reef experiment and prerestoration monitoring of the wetland. 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. Much of the monitoring will need to be adaptively managed, and continuous interaction between the contract scientists and field assistants is crucial to fulfilling the monitoring tasks for both the wetland restoration and experimental reef.

For example, in the experimental reef monitoring program, the amount of effort required to conduct the 2001 monitoring surveys has been substantially greater than that of 2000 because the assemblages of plants and animals on the artificial reef have become more developed. In particular, dense colonization by giant kelp on the artificial reef modules more than doubled the amount of time required to complete the 2001 winter/spring kelp survey, requiring additional field monitoring personnel. Contract scientists have been analyzing the experimental reef data in search of ways to streamline the monitoring without compromising the integrity of the experiment and its ability to provide accurate information on suitable designs for the mitigation effort.

Consultation with Permittee

Pursuant to the permit conditions, the staff has consulted with SCE on the proposed work program and budget for 2002 and 2003. Several issues were raised, which have been addressed to SCE's satisfaction (see SCE's letters of October 17, 2001 and November 15, 2001, attached).

• The overall cost of the two-year program has been reduced by discontinuing sampling the 14 kelp transplant modules, eliminating the kelp reef sonar surveys in 2002 and 2003, and reducing the amount budgeted for assistance from the Scientific Advisory Panel. (Funds for sonar surveys and additional funds for the Scientific Advisory Panel are contained in a pre-approved contingency fund to be expended in consultation with SCE should circumstances

change.) The budget is efficient and frugal while allowing the contract scientists to be flexible and responsive to changing circumstances.

- The permit authorizes funds for the Science Advisory Panel up to \$100,000 per year with adjustments for increases in the Consumer Price Index. (Over the nine years since the start of the first approved interim budget, the CPI has increased on average by about 3% per year.) The SAP has spent less than its allotted funding in the previous two years. Thus, it appears that a decrease in the SAP's allotment can be accommodated in 2002 and 2003. This decrease for 2002-2003 is in no way intended to change the permit language or the amount authorized. Full spending for the SAP may be needed in the future.
- Wetland pre-restoration monitoring tasks have been clarified in the work program and minor modifications made to reduce costs. The work program details the information needed during the pre-restoration monitoring phase to develop a cost-effective monitoring program and minimize the impacts to wetland resources.
- The cost of each key monitoring program element has been provided for the estimated percentage time and cost anticipated for personnel (excluding the Sr. Administrator, but including the Scientific Advisory Panel). Most supplies, operating expense and travel vary in proportion to percentage times of personnel. (See Figures 1 to 3, at the end of Section E.) Consultants are identified by task in the budget.
- The proceedings of the annual workshop will be summarized in a written report that will be distributed to SCE and all other interested parties. The staff will review the results of SCE's audit currently underway to determine if changes should be made to the work program and budget. Formal transmittal of all data on a quarterly or semi-annual basis as SCE suggested would require additional effort that is not allotted for in the proposed work plan and budget.

D.1. Wetlands

1.1 Wetland Restoration Planning

- a. Consult with the permittee and lead agencies as needed to bring to closure the EIR/S certification process as soon as possible. Attend meetings to provide guidance on issues related to the certification of the EIR/S.
- b. Review the Final Plan. Determine whether the plan meets the permit requirements and evaluate the potential for degradation of existing wetlands and other sensitive habitats. Consult with experts as needed in the fields of hydrology, engineering, and Geographic Information System (GIS) databases. Consult with the resource agencies and other interested parties. Attend meetings to provide guidance on issues related to the completion of the Final Plan (e.g., maintenance and maintenance monitoring responsibilities for the least tern nesting sites).

- c. Verify the accuracy of the acreage estimates for different habitats using the GIS database.
- d. Assist in the preparation of a staff report on the Final Plan.
- e. Assist staff review of a coastal development permit application for the restoration.
- f. Consult with the permittee on the restoration. Attend meetings to ensure that restoration proceeds according to the Final Plan and the coastal development permit, and in a timely manner.
- g. Prepare presentation at annual public workshop that reviews the status of planning and pre-restoration monitoring of the wetland restoration project.
- h. Prepare a written annual report of the proceedings of the annual workshop and distribute it to SCE and other interested parties.
- i. Prepare monthly reports for the Commission on the status of the wetland project.
- j. Respond to requests from SCE and other parties for data and analyses.

1.2 Complete Pre-restoration Monitoring

The Coastal Development Permit for SONGS establishes physical and biological performance standards that must be met by the restored wetland and assigns responsibility to the contract scientists to conduct and oversee all monitoring associated with evaluating the success of the wetland mitigation project. During 2002 and 2003 the contract scientists and their field assistants will collect and analyze pre-restoration monitoring data at San Dieguito Lagoon and appropriate reference sites. Pre-restoration monitoring data are needed to assess construction-related impacts and changes in the existing wetland following construction and to develop sampling designs for post-restoration monitoring that minimize adverse impacts to the wetland while effectively determining whether the various performance standards have been met. In addition, pre-restoration data on the temporal and spatial scales over which densities and number of wetland species vary are essential for designing a cost effective sampling program because they provide much needed information on optimum sample sizes, sampling frequency and sampling locations.

The following tasks will be done to evaluate variability in populations of wetland fish, invertebrates and plants. Information derived from these tasks will be used to design post-restoration monitoring that can cost effectively determine whether the various performance standards have been met while minimizing any adverse effects on wetland resources. A field assistant trained in wetland ecology, a specialist in fish ecology, and undergraduate student helpers will be hired under contract through UCSB to help complete the pre-restoration monitoring. Independent consultants will be retained as needed to assist in aerial photography and the taxonomic identification of wetland fauna.

a. Evaluate the potential (or lack of) for different sampling methods to adversely affect estuarine plant and animal assemblages. This task is needed because sampling in of itself can adversely affect estuarine habitat and species assemblages.

After extensively reviewing the published literature and consulting with estuarine fish biologists contract scientists have concluded that not enough information currently exists to design a post-restoration monitoring program for wetland fish that (1) has minimal adverse impacts to the habitat and species of concern during sampling and (2) permits the concurrent sampling of replicate areas for effective comparison of the abundance and number of species between San Dieguito Lagoon and reference wetlands. While many restoration projects have preceded San Dieguito Lagoon, none have evaluated the extent to which the act of sampling damages wetland resources. Vegetated marsh and channel banks can be greatly impacted during fish sampling, especially with the use of seines. However, these impacts are not discussed in the published literature and tend to be ignored by wetland scientists. Yet, impacts to channels and vegetated marsh from fish sampling may persist for weeks, months or longer with cumulative impacts potentially influencing the development of portions of the wetland over time. It is therefore important to develop sampling methods that minimize impacts to vegetated marsh and channel bank habitats. It is also necessary to determine the extent to which different sampling methods alter the abundance and species number of the very organisms that are being targeted for monitoring so that sampling methods can be altered to minimize these effects (e.g., via reduced sample sizes, or use of nondestructive sampling techniques).

b. Determine the appropriate spatial and temporal scales of sampling during postrestoration monitoring.

Several recent studies have outlined the difficulties of adequately sampling estuarine fishes. Most fish species are highly mobile and variable in their occurrence and relative abundance at nearly all temporal and spatial scales. In addition, the estuarine habitat is heterogeneous and environmental conditions (water depth, current velocity) can change rapidly with tides, affecting spatial patterns of fish abundance over relatively short time scales. Surprisingly, there has been little attempt in previous studies to evaluate the extent to which sampling different sites on different days introduces bias into site comparisons. To be effective, a monitoring program must provide accurate information on the abundance of species in different habitats while minimizing confounding effects of short-term, small-scale variability in fish assemblages. Unfortunately, past studies of estuarine fish assemblages have not employed sampling methods that provide the information on the appropriate spacing and frequency of samples necessary to detect similarity in these assemblages within and across wetlands. This point was raised in a recent review of the Handbook for Restoring Tidal Wetlands, edited by Joy Zedler, in the scientific journal, Limnology and Oceanography (September 2001). This review notes a lack of sufficient discussion on sampling designs and statistical methods in the Handbook that are useful for comparing restored and referenced wetlands.

c. Contrast the effectiveness of different types of sampling gear in estimating species richness and abundance of estuarine fish.

The "catch efficiency" of any given fish sampling gear varies for different species and no one type of gear completely accomplishes the goal of achieving a representative sample for all species. In addition, San Dieguito Lagoon and potential reference sites have tidal and main channels that differ in width, depth, and sediment characteristics that will affect the effectiveness of different types of sampling gear. Pre-restoration monitoring of fishes will contrast the effectiveness of different types and combinations of sampling gear (e.g., seines versus drop nets, gill nets versus enclosures) in estimating abundance and species richness and evaluate the potential (or lack of potential) of these methods for adversely affecting estuarine plant and animal assemblages.

d. Complete analyses on scales of spatial and temporal variation in the species richness and abundance wetland epifaunal and infaunal invertebrates.

Benthic ecologists have recognized the need to determine the scale of spatial variability in studies of wetland invertebrates. The coastal wetlands of southern California contain tidal habitats that can be distinguished coarsely on the basis of topography and inundation regime (e.g., tidal channel versus creek). Within each of these major habitats, variation in elevation, sediment characteristics, organic matter, algal coverage, and other physical and biological factors can lead to gradients and/or the patchy distribution of benthic fauna. Because the spatial scale of patchiness of these animals is not known for southern California wetlands, comparisons of the abundance and species number of marine invertebrates among wetlands using stations spaced too close or too far apart can lead to inaccurate conclusions. For example, replicate stations located close together in tidal channels could miss patches of invertebrates and thus provide information of species number and abundance that is not representative of the study channel as a whole. This error is confounded when comparisons are made across wetlands using data taken at widely separated locations within each wetland. Because of potential variability in the distribution and abundance of invertebrates and the costs of collecting and sorting samples, there is a need to conduct pre-restoration sampling to identify spatial scales at which variation is significant. This information will be used to design the most accurate and cost-effective monitoring program for wetland invertebrates. The invertebrate fauna of wetlands includes many species (e.g., polychaete and oligochaete worms) that form an important forage base for fish and birds. Reliably distinguishing among these species is a pre-requisite for accurately assessing the performance standards of the SONGS permit. A taxonomist with expertise in wetland invertebrates will be consulted to help in the identification of these species.

e. Continue annual low-level aerial photography of San Dieguito Lagoon to monitor changes in cover of vegetation and open space prior to wetland construction. The proportion of total vegetation cover and open space at San Dieguito Lagoon, estimated from aerial photographs, will be verified using ground-surveying techniques.

The aerial photographs will be used to assess compliance with: (1) Minimum Standard 1.3.h. which states that the restoration project "does not result in the loss of existing wetland," and (2) Objective 1.4.e. which states that the "Restoration involves minimum adverse impacts on existing functioning wetlands and other sensitive habitats." In addition, data collected from the photographs will be compared to those collected during ground surveys to determine the extent to which aerial photographs can be used in post-restoration monitoring as a cost-effective means of assessing the biological performance standard pertaining to vegetation.

f. Continue to collect data on water quality at San Dieguito Lagoon, Mugu Lagoon, and Carpinteria Salt Marsh.

Water Quality is one of the long-term physical standards that will be used to measure the performance of the wetland restoration project (Section 3.4, Coastal Commission Adopted Permit Condition A). Water quality parameters such as salinity and oxygen concentration, which are important to the health, abundance, and richness of estuarine biota, are strongly influenced by tidal flushing. Contract scientists will continue collecting baseline data on water quality and tidal height from continuously recording instruments that have been placed in San Dieguito Lagoon and in prospective reference wetlands. Data obtained from these instruments will permit an assessment of construction-related impacts and post-restoration changes to water quality.

- g. Give presentation at annual public workshop on results of pre-restoration monitoring of the wetland mitigation project.
- h. Prepare a written annual report on the proceedings of the annual workshop and distribute it to SCE and other interested parties.
- i. Prepare monthly reports for the Commission on the status of the wetland project.
- j. Respond to requests from SCE and other parties for data and analyses.

1.3 Finalize the Monitoring and Management Plan

The permit requires the preparation of a Monitoring and Management Plan as part of the Commission's oversight and monitoring function. Coastal Commission contract scientists have prepared a draft Monitoring and Management Plan that will be finalized and submitted to the Commission for approval. Specific tasks needed to finalize the Monitoring and Management Plan include:

a. Finalize selection of reference sites for post-restoration monitoring. The permit requires an evaluation of the performance of the restored wetland relative to approximately four reference wetlands. Contract scientists will select relatively undisturbed, natural tidal wetlands within the Southern California Bight that would be appropriate reference sites for the constructed wetlands. Differential GPS (Global Positioning System) will be used to assist in this task. The contract scientists will consult with the permittee and experts in wetland ecology during this selection process.

- b. Finalize selection of criteria to be used for determining compliance of the wetland mitigation project with the performance standards. Contract scientists will continue to review recent literature, evaluate existing data, collect and evaluate additional data, and consult with other experts in wetland ecology and statistics, as needed, to develop and finalize the criteria for assessing similarity between the restored wetland and reference wetlands.
- c. Consult with other experts in wetland ecology and statistics, as needed, to develop and finalize the criteria for assessing similarity between the restored wetland and reference wetlands.
- d. Finalize selection of sampling methods for post-restoration monitoring. Decide on best sampling methods (e.g., seines, trawls, traps), and sampling designs (e.g., frequency of sample collection, number and spacing of samples).
- e. Consult with permittee, resource agencies and other wetland ecology experts on wetland management issues. These issues include dredging for inlet maintenance, dredging for restoration-site maintenance, maintenance and maintenance monitoring of least tern nest sites, control of exotic species, and removing trash.
- f. Submit the Monitoring and Management Plan to the Coastal Commission for approval. The plan will contain details of the sampling designs (methods, spatial and temporal sampling regimes, reference sites, etc.) and a description of the management tasks that are anticipated (e.g. trash removal, control of exotic species).

1.4 Initiate Construction Monitoring

Monitoring will be conducted during wetland construction to: (1) determine whether the work is conducted according to plans, (2) determine whether construction causes adverse impacts to sensitive habitats, and (3) finalize the sampling methodologies for post-restoration monitoring. This may require consultation with experts in hydrology and engineering, and will require the use of differential GPS to determine whether elevations have been constructed to plan.

D.2. Reef

The permit requires that the Commission's contract scientists oversee the monitoring of the artificial reef experiment, analyze and interpret the monitoring data, and provide the Commission and the Executive Director with recommendations for the design of the larger "build out" reef.

During 2002-2003, contract scientists and their field assistants will conduct the following activities to accomplish these tasks.

2.1 Experimental Reef Monitoring

- a. Conduct annual winter/spring surveys of adult giant kelp to assess abundance, size and survival on the artificial reef and natural reference reefs.
- b. Conduct summer surveys of the abundance and species richness of benthic invertebrates and understory algae and of the coverage of hard substrate on the artificial reef and natural reference reefs.
- c. Conduct summer and fall surveys of the abundance, size, and species richness of reef fish near the bottom, midwater and near the surface (i.e., kelp canopy) on the artificial reef and natural reference reefs.
- d. Process field samples in the laboratory.
- e. Conduct maintenance at the artificial and reference reefs to repair/replace broken/ missing stakes, transect lines, and labels that the mark permanent study areas.
- f. Service, repair and replace sampling gear, dive equipment, boats, and vehicles.

2.2 Experimental Reef Process Studies

Deciding upon a design for the mitigation reef using information from the experimental reef entails uncertainties that stem from: (1) the short length of the experiment (five years), which may not provide sufficient time for the development of a mature kelp forest community on a newly constructed reef, and (2) the small size of the experimental modules (0.4 acres) compared to the size of the mitigation reef (150 acres). Moreover, because five years is short relative to the generation times of most kelp forest species (other than giant kelp), there is no guarantee that reef designs that appear successful at the end of the experiment (i.e., meet the performance criteria) will continue to perform successfully in the future. Focused process studies were identified in the Monitoring and Management Plan for the Experimental Reef¹ as a means of reducing uncertainties in decision-making that stem from the small spatial and temporal scales of the experimental reef relative to the mitigation reef.

a. Focused studies will be done to determine how different reef designs affect the recruitment and survival of species known to inhibit the development of a mature kelp forest community.

¹ Monitoring and Management Plan for the SONGS Experimental Kelp Reef, June 1999, approved by the California Coastal Commission July 15, 1999. See staff report entitled Amendment to SONGS Mitigation Program 1998 and 1999 Work Program and Budget: Experimental Reef Monitoring Plan dated June 24, 1999.

One species that has been shown to monopolize space and exclude kelp on artificial reefs is the sea fan, *Muricea* spp. Past studies have shown that events of dense colonization by *Muricea* occur sporadically in the San Clemente region. Because *Muricea* grows slowly it is unlikely to dominate any of the experimental modules even if it had colonized in large numbers during the first year following reef construction. Therefore, transect monitoring may not reveal a *Muricea* "problem" within the five year experiment if one were to exist. To address this concern, studies aimed at *predicting* how the different reef designs will enhance or inhibit *Muricea* will be done. These studies will involve collecting small numbers of immature *Muricea* from nearby natural reefs and transplanting them to various locations on the artificial reef. The objective of this work will be to determine whether the survivorship and growth of juvenile *Muricea* is influenced by the type, size and coverage of hard substrate. This work will be discussed with scientists at the upcoming February 2002 annual review workshop.

b. Focused studies will be done to evaluate the performance of the various reef designs with respect to fish production (a performance criterion for the mitigation reef).

Due to the mobility of fish and the relatively small size and close spacing of the experimental modules, it will be difficult to predict how fish production will be influenced by the different reef designs. One solution to this problem is to measure easily sampled attributes that are correlated with fish growth and reproduction. Currently contract scientists are attempting to estimate somatic production in fish from size frequency data in species having young-of-year that are likely to maintain residence on a single module for several months. Such estimates rely on there being a single strong recruitment pulse in the summer for several species, which to date has not occurred. To supplement this work the feeding activity patterns, of subadult and adult individuals of selected species will be studied to determine the extent to which fish preferentially feed on different reef designs. The idea here is that somatic growth is linked to feeding rates and gut fullness. The extent to which the different reef designs influence fish production can also be assessed by examining the fecundity of species likely to remain on a single module during their adult life (e.g. gobies, clinids, blennies). Adults of these species will be collected prior to parturition and their reproductive condition (gonad mass / somatic mass) will be determined. These studies will be coordinated with those of Dr. Todd Anderson of San Diego State University who has received funding from UC Sea Grant to study fish recruitment, growth and survival on the experimental reef.

2.3 Experimental Reef Data Analyses and Reporting

a. Enter, organize, manage and analyze data collected during the monitoring and process studies and consult with database experts as needed.

- b. Maintain database software and hardware and troubleshoot and remedy any problems that arise.
- c. Use results of most recent analyses to evaluate the sampling protocols of the routine kelp forest monitoring and the experimental designs of the process studies. Make decisions on how to adapt these protocols and experimental designs to improve sampling efficiency without compromising data quality with the intention of attaining the most cost-effective approach to monitoring.
- d. Synthesize data on the monitoring and process studies of the artificial reef experiment and present the results at annual public workshops and at scientific meetings deemed appropriate by the Coastal Commission.
- e. Prepare a written annual report of the proceedings of the annual workshop and distribute it to SCE and other interested parties.
- f. Prepare monthly reports for the Commission on the status of the experimental reef project.
- g. Respond to requests from SCE and other parties for data and analyses.

2.4 Experimental Reef Management and Oversight

- a. Direct the monitoring and process studies described in the monitoring and management plan for the experimental phase of the artificial reef. This involves planning these activities and managing a team of University field assistants (i.e., divers trained in marine biology) to carry them out.
- b. Dive at the artificial reef and nearby reference reefs as needed to assist in data collection, resolve issues that arise in the monitoring and process studies, and conduct site visits to inspect routine and unexpected changes in the physical and biological properties of the artificial reef and natural reference reefs.
- c. Work with University of California administrative staff on project issues pertaining to contracts, payroll, purchasing and personnel.
- d. 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.

D.3. Behavioral Barriers

3.1 Condition Compliance Review

Contract scientists will: (a) review the permittee's annual report on impingement losses, fish chase procedures and efficacy of fish return system, (b) consult with Science Advisory Panel and SCE on issues pertaining to the report, and (c) provide the Executive Director with an annual summary on the status of Condition B and on whether SONGS operations during the previous year were in compliance with it.

D.4. Hatchery

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

4.1 Oversight of the fish hatchery program

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

E. BUDGET: 2002 AND 2003

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 for 1998-1999 and 2000-2001. These work programs focused initially on planning and permit compliance issues. The current (2000-2001) work program also contains the Commission's experimental reef monitoring program in addition to continuing wetland restoration planning, environmental analyses, and pre-restoration monitoring. The status section of this report (see Section C, pp. 6-14) summarizes the recent 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.

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	<u>2,293,162</u>	2,218,693 (projected)
10-YEAR TOTAL	\$6,885,897	\$5,213,283

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

Although there still remains uncertainty around the resolution of the remaining wetland restoration issues, 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 2002 and 2003 work program and budget.

Proposed Budget for 2002 and 2003

The proposed budget for calendar years 2002 and 2003 covers the monitoring and oversight program costs for the Commission's contract scientists, contract field personnel to monitor the wetlands and experimental reef, science advisory panel, consultants, contract administrative support, and operating expense during the two-year budget period. Costs associated with the implementation of the SONGS permit and attributable to permanent Coastal Commission staff work and logistical support (time and expense) are not paid by the permittee and thus are not included in this budget.

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

The funding proposed to cover the monitoring and oversight program costs during the two-year budget period (calendar years 2002 and 2003) is \$2,423,045, as shown below. This budget is about 5% higher than the budget for 2000-2001, due primarily to increases in personnel rates (set by U.C Systemwide Administration) and the addition of a fish ecologist specialist to assist with the wetland pre-restoration monitoring. Narrative budget notes explaining each budget category follow.

A contingency fund is also included for the purposes of conducting sonar surveys of the experimental reef and increasing the time required from the Scientific Advisory Panel, as described above.

Finally, Figures 1 to 3 (following the budget notes) show the approximate costs for labor and materials for the wetland, reef and behavioral barriers tasks. These estimates are based on the percentage time anticipated for each task for the contract staff and Scientific Advisory Panel. Supplies, operating expense, travel and general equipment vary in proportion to the percentage time of the contract personnel. Equipment specific to individual tasks is pro-rated. Consultants

are identified by task in the overall budget and are not included here. Other excluded costs are salaries and audit and administrative and financial processing services.

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non		2002			2003	
	Wetland	Reef	2002 Total	Wetland	Reef	2003 Total
SALARIES ¹						
Core Program Staff (2.5 PY)						
Principal Scientist (1 PY)	50,435	50,434	100,869	53,330	53,330	106,660
Principal Scientist (0.5 PY)	5,412	48,708	54,120	5,752	51,763	57,515
Principal Scientist (0.5 PY)	37,781		37,781	40,640		40,640
Sr. Administrator (0.5 PY)	21,169	14,113	35,282	22,226	14.818	37.044
Reef Monitoring Field Assistants (8 PY)		•	·	•	•	,
Staff Research Associate III (1 PY)		51,370	51,370		53,169	53,169
Staff Research Associate III (1 PY)		51,370	51,370		53,169	53,169
Staff Research Associate I (1 PY)		40,994	40,994		43,905	43,905
Staff Research Associate I (1 PY)		40,994	40,994		43,905	43,905
Staff Research Associate I (1 PY)		40,994	40,994		43,905	43,905
Staff Research Associate I (1 PY)		40,994	40,994		43,905	43,905
Staff Research Associate I (1 PY)		40,994	40,994		43,905	43,905
Staff Research Associate I (1 PY)		38,148	38,148		40,858	40,858
Wetland Monitoring Field Assistants (2.34 PY)			-		,	
Assistant Research Biologist (1 PY)	62,310		62,310	66,675		66,675
Staff Research Associate I (1 PY)	40,994		40,994	43,905		43,905
Assistant I (700 hrs/yr @ \$7.25/hr) (0.34 PY)	6,395		6,395	6,395		6,395
TOTAL SALARIES	224,496	459,113	683,609	238,923	486,632	725,555
BENEFITS ²						
Core Program Staff						
Principal Scientist	11,096	11,095	22,191	11,733	11.732	23,465
Principal Scientist	1,191	10,715	11,906	1,265	11,388	12,653
Principal Scientist	6,045		6.045	6.503	•	6,503
Sr. Administrator	9.803	6.535	16,338	10.292	6.862	17,154
Reef Monitoring Field Assistants	,	•	• • • •	,		,
Staff Research Associate III		9,760	9,760		10,103	10,103
Staff Research Associate III		12,843	12,843		13,293	13,293
Staff Research Associate I		8,608	8,608		9,219	9,219
Staff Research Associate I		8,608	8,608		9,219	9,219
Staff Research Associate I		8,608	8,608		9,219	9,219
Staff Research Associate I		8,608	8,608		9,219	9,219
Staff Research Associate I		8,608	8,608		9,219	9,219
Staff Research Associate I		8,773	8,773		9,397	9,397
Wetland Monitoring Field Assistants						
Assistant Research Biologist	10,593		10,593	11,335		11,335
Staff Research Associate I	11,479		11,479	12,294		12,294
Assistant I	275		275	275		275
TOTAL BENEFITS	50,482	102,761	153,243	53,697	108,870	162,567

2002 and 2003 SONGS PROGRAM BUDGET

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		2002		2003			
	Wetland	Reef	2002 Total	Wetland	Reef	2003 Total	
SCIENTIFIC ADVISORY PANEL ³	25,000	25,000	50,000	25,000	25,000	50,000	
CONSULTANTS AND CONTRACTORS ⁴							
Wetlands Task 1.1b/1.1c: GIS database, final plan Task 1.1b: Hydrology/engineering, final plan Task 1.2d: Invertebrate taxonomic identification Task 1.2e: Aerial photos Task 1.3: Wetland ecologist expert consultations Task 1.4: Hydrology/engineering, const. monitoring	10,000 10,000 2,500 2,000 5,000		10,000 10,000 2,500 2,000 5,000	2,500 2,000 10,000		0 2,500 2,000 0 10,000	
Experimental Reef Task 2.3: GIS database		7,500	7,500		7,500	7,500	
TOTAL CONSULTANTS AND CONTRACTORS	29,500	7,500	37,000	14,500	7,500	22,000	
TRAVEL⁵							
Core program staff Field assistants TOTAL TRAVEL	12,986 2,618 15,604	11,062 8,765 19,827	24,048 11,383 35,431	13,310 2,684 15,994	11,339 8,984 20,323	24,649 11,668 36,317	
OPERATING EXPENSE General expense (SF office) ⁶ General expense (UCSB contract) ⁷ Facilities operations (Carlsbad office) ⁸ Computer technical support, repair & maintenance ⁹ Review workshop ¹⁰ Audit ¹¹ Administrative/financial processing services ¹² TOTAL OPERATING EXPENSE	9,000 13,472 10,749 1,250 1,250 12,000 47,721	6,000 89,949 32,247 1,250 1,250 12,000 142,696	15,000 103,421 42,996 2,500 2,500 0 24,000 190,417	9,225 13,808 11,234 1,250 1,250 4,000 12,000 52,767	6,150 92,198 33,701 1,250 1,250 4,000 12,000 150,549	15,375 106,006 44,935 2,500 2,500 8,000 24,000 203,316	
EQUIPMENT ¹³							
SF office GPS equipment rental (Task 1.3a/1.4) Wetland monitoring 14' inflatable boat (Task 1.2) Wetland boat 25 hp outboard (Task 1.2) Wetland boat trailer (Task 1.2)	900 5,000 5,214 3,763 1,075	600	1,500 5,000 5,214 3,763 1,075	923 5,125	615	1,538 5,125 0 0 0	
Reef dive boat cabins (Task 2.1/2.2) Computer & networking equipment (UCSB, Carlsbad) Misc. equipment for wetland & reef (as needed) TOTAL EQUIPMENT	2,500 5,000 23,452	20,000 2,500 5,000 28,100	20,000 5,000 10,000 51,552	2,563 5,125 1 3,736	2,562 5,125 8,302	0 5,125 10,250 22,038	
TOTAL EXPENSE	416,255	784,997	1,201,252	414,617	807,176	1,221,793	
TWO-YEAR TOTAL FOR 2002 and 2003	\$2,423,045						

CONTINGENCY FUND			
		2002 Total	2003 Total
Scientific Advisory Panel		50,000	50,000
Kelp Reef Sonar Survey (Task 2.1)		58,500	
ANNUAL TOTAL CONTINGENCY FUND		\$108,500	\$50,000
TWO-YEAR TOTAL CONTINGENCY FUND	\$158,500		

BUDGET NOTES:

- 1. Includes salaries and wages for the contract program staff, which includes two scientist positions, administrative support, field assistants for the experimental reef monitoring (8 PY) and field assistants for the wetland pre-restoration monitoring (2.34 PY). All of the current and proposed contract program staff except a half-time administrator are hired under contract with the University of California, Santa Barbara; costs include the University's indirect costs.² The half-time administrator is hired under contract with Simpson & Simpson Business and Personnel Services, the firm that provides financial services for the program. The costs for the Commission's permanent staff that spend a portion of their time on this program are not included here; they are paid by the Commission.
- 2. Includes benefits and employer-paid payroll taxes for contract program staff. Includes the indirect costs for personnel hired under contract to UCSB.
- 3. The Scientific Advisory Panel is a panel of experts established by the Commission pursuant to the permit conditions to provide scientific and technical advice. Expenses cover members' time and travel and are authorized in the permit at \$100,000 per year adjusted annually in accordance with the consumer price index (CPI) applicable to California. CPI adjustments have been made in previous budgets. Based on expenditures in the past two years, staff determined that the originally authorized amount is sufficient. Staff further reduced the amount in the proposed budget and placed the remainder in a pre-approved contingency fund to be expended as needed, in consultation with SCE.
- 4. 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 of \$100-150 per hour.
- 5. 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, with a 2.5% escalator for 2003.
- 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 of \$35,000 per PV for general expense, printing, communications, postage, travel, training and facilities operations, calculated less travel allowance for a total of \$30,000/PY. A 2.5% escalator is applied for 2003.
- 7. Covers annual costs for reef monitoring (NITROX for SCUBA), miscellaneous office, laboratory and field supplies for reef monitoring and wetland pre-restoration monitoring, boat storage and launch fees, annual boat operating expense, annual insurance, registration and license fees for boats and vehicles, annual dive physicals required of each diver, and on-campus communications services for contract staff located at UCSB. A 2.5% escalator is applied for 2003.
- Rented office space in Carlsbad houses one contract scientific staff and contract field assistants for the reef and wetland monitoring 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 2003 where anticipated increases are not yet known.
- 9. Covers annual costs for maintaining the computers used by contract program staff and field assistants, including regular maintenance, repairs, and technical support needed for troubleshooting problems.
- 10. Covers costs for conducting an annual review workshop, excluding costs for consultants who may be requested to attend the workshop. The intent of the review workshop is to determine whether performance standards have been met, whether revisions to the standards are necessary, and whether remedial measures are required. While it is premature to apply these issues to the mitigation projects still in the planning stages, annual status

² 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.

reviews of the mitigation projects, wetland pre-restoration monitoring, and experimental reef monitoring will be conducted for the Commission and the public during the two year budget.

- 11. 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.
- 12. Covers the annual cost of administrative and financial processing services provided by Simpson & Simpson Business and Personnel Services, Inc.
- 13. Covers durable equipment for the experimental reef and wetland pre-restoration monitoring programs, including GPS equipment rental, inflatable boat, motor and trailer for the wetland monitoring, and cabins for the 2 reef dive boats, to be purchased as needed. May also include computers and networking equipment, office equipment (such as fax and copier), and miscellaneous equipment for the reef and wetland monitoring programs.

	1.1		1.2a 1.2b				1.2c		1.2d	
	Time	Cost	Time	Cost	Time	Cost	Time	Cost	Time	Cost
Salaries/Benefits										
PS (1 PY, 50% w)	15%	37,978	3%	7,596	3%	7,596	3%	7,596	3%	7,596
PS (.5 PY, 8% w)	4%	5,448		0		0		0		0
PS (.5 PY, 100% w)	20%	18,194	10%	9,097	5%	4,548	10%	9,097	5%	4,548
ARB (1 PY)		0	25%	37,728	15%	22,637	25%	37,728	10%	15,091
SRAI(1 PY)		0	20%	21,734	10%	10,867	20%	21,734	10%	10,867
SA I (.34 PY)		0	40%	5,336	20%	2,668	30%	4,002		0
SAP	10%	10,000	4%	4,000	2%	2,000	4%	4,000	1%	1,000
Travel		2,686		6,636		3,792		6,004		1,896
Operating expense		4,400		10,870		6,212		9,835		3,106
Equipment GPS rental										
Boat, motor, trailer				2.513		2.513		2.513		2.513
Computer/misc.		1,291		3,189		1,823		2,886		912
TOTAL BY TASK		\$79,997		\$108,699		\$64,656		\$105,395		\$47,529

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Figure 1. Approximate costs for labor and materials for Wetland Tasks.

	1.2e	di 14 anno 19	1.2f 1.2g-				1.3	1.4		
	Time	Cost	Time	Cost	Time	Cost	Time	Cost	Time	Cost
Salaries/Benefits										
PS (1 PY, 50% w)	3%	7,596		0	5%	12,659	15%	37,978		0
PS (.5 PY, 8% w)		0		0		0	4%	5,448		0
PS (.5 PY, 100% w)	10%	9,097		0	10%	9,097	20%	18,194	10%	9,097
ARB (1 PY)	10%	15,091	5%	7,546		0	10%	15,091		0
SRAI(1 PY)	20%	21,734	10%	10,867	10%	10,867		0		0
SA I (.34 PY)		0	10%	1,334		0		0		0
SAP	2%	2,000		. 0		0	20%	20,000	2%	2,000
Travel		2,844		1,580		1,896		3,476		632
Operating expense		4,659		2,588		3,106		5,694		1,035
Equipment										
GPS rental								5,063		5,063
Boat, motor, trailer										
Computer/misc.		1,367		759		912		1,671		304
TOTAL BY TASK		\$64,388		\$24,674		\$38,537		\$112,615		\$18,131

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Figure 2. Approximate costs for labor and materials for Reef Tasks.

	2.1a		2.1b		2.1c		2.1d		2.1e	
Salaries/Benefits	Time	Cost	Time	Cost	Time	Cost	Time	Cost	Time	Cost
PS (1 PY, 50% r)		0		0		0		0		0
PS (.5 PY, 90% r)		0		0		0		0		0
SRA III (1 PY)	15%	18,660	12%	14,928	8%	9,952		0	5%	6,220
SRA III (1 PY)	15%	19,544	12%	15,635	8%	10,423		0	5%	6,515
SRAI(1 PY)	15%	15,409	12%	12,327	8%	8,218	10%	10,273	10%	10,273
SRAI(1 PY)	15%	15,409	12%	12,327	8%	8,218	10%	10,273	10%	10,273
SRAI(1 PY)	15%	15,409	12%	12,327	8%	8,218	10%	10,273	10%	10,273
SRAI(1 PY)	15%	15,409	12%	12,327	8%	8,218	10%	10,273	10%	10,273
SRAI(1 PY)	15%	15,409	12%	12,327	8%	8,218	10%	10,273	10%	10,273
SRAI(1 PY)	15%	14,576	12%	11,661	8%	7,774	10%	9,718	10%	9,718
SAP		0		0		0		0		0
Travel		5,139		4,095		2,730		2,570		2,971
Operating Expense		32,076		25,561		17,040		16,038		18,544
Equipment										
Dive boat cabins		2,500		2,500		2,500		2,500		2,500
Computer/misc.		1,944		1,549		1,033		972		1,124
TOTAL BY TASK		\$171,484		\$137,564		\$92,542		\$83,163		\$98,957
	2.1f		2.2a		2.2b		2.3a		2.3b	

	2.1f		2.2a		2.2b		2.3a		2.3b	
Salaries/Benefits	Time	Cost	Time	Cost	Time	Cost	Time	Cost	Time	Cost
PS (1 PY, 50% r)		0		0		0	9%	22,787		0
PS (.5 PY, 90% r)		0		0		0	18%	24,515		0
SRA III (1 PY)		0	5%	6,220	5%	6,220	35%	43,541	10%	12,440
SRA III (1 PY)		0	5%	6,515	5%	6,515	35%	45,603	10%	13,029
SRA I (1 PY)	5%	5,136	5%	5,136	5%	5,136	30%	30,818		0
SRA I (1 PY)	5%	5,136	5%	5,136	5%	5,136	30%	30,818		0
SRA I (1 PY)	5%	5,136	5%	5,136	5%	5,136	30%	30,818		0
SRA I (1 PY)	5%	5,136	5%	5,136	5%	5,136	30%	30,818		0
SRAI(1 PY)	5%	5,136	5%	5,136	5%	5,136	30%	30,818		0
SRA I (1 PY)	5%	4,859	5%	4,859	5%	4,859	30%	29,153		0
SAP		0		0		0		0		0
Travel		1,285		1,726		1,726		11,844		843
Operating Expense		8,019		10,776		10,776		73,926		5,262
Equipment										
Dive boat cabins		2,500		2,500		2,500				
Computer/misc.		486		653		653		4,480		319
TOTAL BY TASK		\$42,829		\$58,929		\$58,929		\$409,939		\$31,893

	2.3c		2.3d		2.3e		2.3f		2.3g	
Salaries/Benefits	Time	Cost	Time	Cost	Time	Cost	Time	Cost	Time	Cost
PS (1 PY, 50% r)	4%	10,127	4%	10,127	4%	10,127	1%	2,532	1%	2,532
PS (.5 PY, 90% r)	8%	10,896	8%	10,896	8%	10,896	1%	1,362	1%	1,362
SRA III (1 PY)	2%	2,488	2%	2,488		0		0	1%	1,244
SRA III (1 PY)	2%	2,606	2%	2,606		0		0	1%	1,303
SRA I (1 PY)		0		0		0		0		0
SRA I (1 PY)		0		0		0		0		0
SRA I (1 PY)		0		0		0		· 0		0
SRA I (1 PY)		0		0		0		0		0
SRA I (1 PY)		0		0		0		0		0
SRA I (1 PY)		0		0		0		0		0
SAP	10%	10,000	3%	3,000		0		0		0
Travel		683		683		522		80		161
Operating Expense		4,260		4,260		3,258		501		1,002
Equipment Dive boat cabins										
Computer/misc.		258		258		198		30		61
TOTAL BY TASK		\$41,318		\$34,318		\$25,001		\$4,505		\$7,665

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Figure 2 continued. Approximate costs for labor and materials for Reef Tasks.

	2.4a		2.4b		2.4c		2.4d	•	
Salaries/Benefits	Time	Cost	Time	Cost	Time	Cost	Time	Cost	
PS (1 PY, 50% r)	20%	50,637	2%	5,064	1%	2,532	4%	10,127	
PS (.5 PY, 90% r)	30%	40,858	2%	2,724	6%	8,172	8%	10,896	
SRA III (1 PY)		0		0		0		0	
SRA III (1 PY)		0		0		0		0	
SRA I (1 PY)		0		0		0		0	
SRA I (1 PY)		0		0		0		0	
SRA I (1 PY)		0		0		0		0	
SRAI(1 PY)		0		0		0		0	
SRA I (1 PY)		0		0		0		0	
SRA I (1 PY)		0		0		0		0	
SAP		0	2%	2,000		0	35%	35,000	
Travel		2,128		161		281		522	
Operating Expense		13,282		1,002		1,754		3,258	
Equipment Dive boat cabins									
Computer/misc.		805		61	•	106		198	
TOTAL BY TASK		\$107,710		\$11,012		\$12,845	-	\$60,001	

Figure 3. Approximate costs for labor and materials for Behavioral Barriers Task.

	3.1	
<u> </u>	Time	Cost
Salaries/Benefits PS (.5 PY, 2% bb)	2%	2,724
SAP	5%	5,000
TOTAL BY TASK		\$7,724

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October 17, 2001

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CALIFORNIA COASTAL COMMISSION

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

Dear Ms. Hansch:

SUBJECT: SONGS MITIGATION PROGRAM: 2002 AND 2003 TWO-YEAR WORK PROGRAM AND BUDGET

I have reviewed your proposed two-year work program and budget for Commission oversight of the SONGS mitigation program as provided in Coastal Development Permit (CDP) No. 6-81-330A. As I discussed with Ms. Jody Loeffler of your staff, SCE is currently performing a general audit of the Commission's oversight activities, and we appreciate your cooperation in this task. While I would prefer to have the benefit of the audit results before commenting on the proposed work program and budget, I understand that your procedures require you to seek Commission approval of the proposal before year's end. Since our audit results will not be available before then, I have provided comments below based on my general sense of the oversight program. We would appreciate the opportunity, as suggested by Ms. Loeffler, to revisit the 2002-03 work program and budget early next year should our audit produce information that would support changes to the work program or budget adopted by the Commission.

- 1. The cost of the proposed two-year work program, \$2.9 million, is nearly 30% higher than the amount expended by the Commission to date for the past two years of monitoring. Frankly, we expected the amount to decrease slightly, owing to the fact that baseline data for both the reef and wetlands projects have now been collected. We believe the level of effort proposed for the next two years substantially exceeds that actually needed to ensure and verify the success of the wetlands and reef projects. We urge you to critically appraise the individual tasks proposed and affirm that each is truly needed to verify attainment of the mitigation projects with the specific performance criteria mandated by the SONGS CDP. Owing to the sheer magnitude of the proposal, we believe our ratepayers deserve a clear and unambiguous demonstration that the cost is both reasonable and appropriate, as required by the CDP.
- 2. The proposed budget document needs to establish, if only in a general way, the cost of each key monitoring program element. This issue was raised at the public workshop earlier this year, when contract staff was unable to even roughly estimate the cost of sediment monitoring in the wetlands reference sites. Please provide general cost estimates, in labor and materials, for each of the key wetland and reef monitoring elements.

Ms. Susan M. Hansch October 17, 2001 Page 2

3. A valuable element that should be added to the work program is publication of an annual summary report of monitoring results for both the wetlands and reef projects. Proceedings of the annual workshops containing a level of detail sufficient for general public information purposes would be welcome and useful. General cost information as noted above should also be included in this report.

In addition, Edison would value a quarterly or semi-annual transmittal of all data collected by contract scientists as such data is compiled. Our ability to productively collaborate with your team depends on a timely receipt of monitoring data.

4. The bulk of the proposed work program budget covers salaries and contractor work related to monitoring the artificial reef. While the labor rates charged are very reasonable, we believe the proposed overall level of effort dedicated to this task at this particular time is excessive. Now that two years of extensive baseline data have been collected on both the experimental reef and the natural reference reefs, we see little justification for monitoring all 56 reef modules during years 3 and 4. No justification is given for this strategy in your proposed staff report, nor are alternative approaches considered.

We believe a substantially lower reef survey effort is appropriate for years 3 and 4, with possibly a return to a higher effort for year 5, the final monitoring year for the experimental reef. The first two years of monitoring clearly show that all of the experimental reef modules are presently supporting giant kelp at densities that should attain the performance standards specified in the SONGS CDP. The abundance and richness of the invertebrate community still require monitoring, but since these species are slow-growing, intense studies in years 3 and 4 will add little to understanding this element of reef development. The next two years may therefore be the appropriate time to perform limited, special studies as needed to gauge fish and invertebrate productivity, rather than continuing the exhaustive transect surveys which have dominated the monitoring effort up to the present. However, the proposal is silent on such special studies even though contract scientists at this year's public workshop anticipated them.

You must consider reducing the number of experimental reef modules surveyed during years 3 and 4 to the minimum necessary to represent the two substrate types and three densities. The viability of all six module designs is now firmly established. Differences in kelp recruitment between modules near or far from San Mateo Reef have already been documented by two years of monitoring, and the results were as expected. During the coming two years, transect surveys on twelve (12) centrally-located modules representing the six combinations of substrate type and density should provide data adequate for attaining the monitoring program's central goals; comparing productivity on the artificial reef to natural reference reefs and quantifying community composition and kelp density for the six module designs. While from a purely scientific research standpoint it is usually preferable to obtain more rather than less data, research is not the purpose of the work program. Finally, surveys of transplanted kelp and the modules built to support them should be terminated, since transplant development and survivorship have already been determined.

Ms. Susan M. Hansch October 17, 2001 Page 3

5. The proposed work program includes \$117,000 for continuation of side-scan and down-looking sonar surveys of the experimental reef to monitor changes in the reef size and topography. As with continuing extensive transect surveys, we believe this work is unnecessary during years 3 and 4 for the purpose of evaluating reef module attainment of the CDP performance standards. Two years of sonar and diver survey data have already confirmed the stability of the module substrates, regardless of composition or density, and have shown that all module substrate densities exceed their design densities due to limited scour. Additional sonar data would be repetitive, and duplicative of more accurate diver surveys being performed.

A resumption of limited sonar surveys in year 5 may be appropriate to reaffirm findings to date, and more importantly, to potentially validate sonar methods as a cost-effective <u>substitute</u> for diver surveys on the full mitigation reef after year 5. Perhaps a limited sonar survey would be appropriate during the next two years only if the reef is subjected to intense winter storms as were observed in 1983 or 1988.

- 6. The work program proposes several tasks for the wetlands project that appear to be evaluations of basic, established monitoring methods. These tasks include:
 - a. Contrasting effectiveness of different types of sampling gear for estuarine fish
 - b. Determining appropriate spatial and temporal sampling scales for post-restoration monitoring
 - c. Evaluating adverse effects of different sampling methods on flora and fauna
 - d. Evaluating suitability of aerial photography in post-restoration monitoring

The work program proposal needs to include detailed justification for undertaking these studies for the San Dieguito restoration project. Unless these studies are expected to yield new, cost-effective monitoring methods that will <u>replace</u> more costly conventional methods and reduce long-term costs of post-restoration monitoring at San Dieguito, we do not believe the mitigation program should fund them.

The tasks listed above would seem to be basic investigations on scientific research methods that may already have been pursued by the greater community of wetland and estuarine scientists. Many wetland restoration projects have preceded San Dieguito and much research has been published on many aspects of these projects. Information on the above topics should be sought through review of existing literature and collaboration with other wetland scientists, both academic and professional. If aspects of the San Dieguito project are so unique that established assessment methods are inapplicable, or if the current state of scientific knowledge is inadequate to support development of a reasonable monitoring program for San Dieguito, then the work plan proposal should substantiate this view in detail.

7. The work program budget includes \$200,000 for the Scientific Advisory Panel (SAP), which has spent less than 25% of that amount during the previous two years. While the CDP

Ms. Susan M. Hansch October 17, 2001 Page 4

language authorizes SAP support up to \$100,000 per year, it is inappropriate to budget for this level of support in the future considering past expenditures. We request that this amount be reduced to \$25,000 for each of years 2002 and 2003. Certainly, the need for SAP input during the next two years should be less than in the previous two, since monitoring protocols have now been substantially established. We might expect SAP involvement to ramp up again in 2006 when the experimental reef monitoring has concluded and extensive data analyses are required.

I recognize the above comments will require additional discussion. To that end, I propose that Edison and CCC scientists meet as soon as possible to discuss and resolve technical issues, so that you can present a mutually-endorsed work program and budget to the Commission. I will make our Del Mar or Rosemead offices available and assemble our team to meet at your convenience. Thank you for the opportunity to comment on the proposed work program and budget. I look forward to working with you to implement the oversight program for the next two years.

Sincerely,

David W. Kay, D. Env. Project Manager

CC: Ms. Jody Loeffler, Coastal Commission



RECEIVED NOV 1 9 2001 CALIFORNIA COASTAL COMMISSION

November 15, 2001

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

Dear Ms. Hansch:

SUBJECT:SONGS Mitigation Program:
2002 and 2003 Two-Year Work Program and Budget

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

The revised draft reflects the agreements of our telephone discussion of October 26th. I appreciate your efforts to help us contain the costs of Coastal Commission oversight and monitoring of the mitigation projects. I also appreciate your efforts to clearly articulate the specific tasks to be undertaken by your contract scientists, the justification for those tasks and the estimated costs of each.

The proposed work program could cost Southern California Edison and the other SONGS owners up to \$2.42 million over the next two years. However, I am hopeful that continued collaboration between our respective team members will further reduce the cost of the work program as it progresses.

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

Sincerely,

DAVID W. KAY, D. Env. Project Manager

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