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Energy and Ocean Resources
Staff: JJL, SMH—SF
Staff Report: December 19, 2008
Hearing Date: January 7, 2009

STATUS REPORT ON SONGS MITIGATION PROGRAM

Following is a brief status report for the mitigation projects required in Southern California Edison Company's (SCE) coastal development permit for the San Onofre Nuclear Generating Station (SONGS) Units 2 and 3 (permit no. 6-81-330, formerly 183-73). The Commission originally adopted the conditions in 1991 to mitigate the adverse impacts of the power plant on the marine environment. The 1991 conditions (Condition D) 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. In 1993, the Commission added a requirement for the permittee to partially fund construction of an experimental fish hatchery. The Commission has since approved amendments to the conditions in April 1997, October 1998, and October 2005.

Implementation of the mitigation projects is the responsibility of SCE whereas the Commission is responsible for implementing its independent monitoring and technical oversight function. The Commission has operated under approved work programs and budgets for monitoring and oversight for monitoring and oversight since 1993. In November 2007, the Commission unanimously approved the work program and budget for calendar years 2008 and 2009.

Another aspect of the Commission's monitoring and oversight is periodic public review of the performance of the mitigation projects. The staff and contract scientists conducted a public workshop on the findings from the experimental phase of the reef mitigation project in Summer of 2005, followed by public review of the preliminary plan for the mitigation reef at the Commission's August 2006 meeting and review of the final plan and coastal development permit application at the Commission's February 2008 meeting. Public review of the wetland mitigation project occurred in October 2005 at the Commission's hearing on the coastal development permit for the restoration. Additional public review also is part of the Commission's approval of the work programs and budgets. The staff and contract scientists expect to hold a public review workshop on the mitigation projects in 2009.

WETLAND RESTORATION MITIGATION

Mitigation Requirement

Condition A of the permit requires the permittee to create or substantially restore a minimum of 150 acres of wetlands to mitigate for the reduction in the standing stocks of nearshore fishes

caused by the operation of SONGS Units 2 and 3. In April 1997, the Commission revised Condition A to allow up to 35 acres enhancement credit for permanent, continuous tidal maintenance at San Dieguito Lagoon.

Wetland Restoration Planning and Environmental Review

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

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

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

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

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

Steps in Implementing Wetland Restoration

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

In approving the preliminary restoration plan in 1997, the Commission acknowledged and accepted that a small amount of existing wetland would be lost in implementing the overall wetland restoration project at San Dieguito. The Commission had determined that if the Final Plan involves any loss that such loss would be mitigated and an amendment to the SONGS permit would be considered to allow the restoration project to go forward in compliance with the SONGS permit conditions. Thus, on October 12, 2005, the Commission also approved an amendment to SONGS CDP #6-81-330-A4 to revise Standard 1.3.h of Condition A to allow the minimal loss of existing wetlands as "specifically authorized by the Coastal Commission in

Coastal Development Permit No. 6-04-88 for the San Dieguito Wetland Restoration Project Final Restoration Plan."

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

Wetland Restoration Condition Compliance

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

- On August 22, 2006, Commission staff issued the Notice of Acceptance for condition compliance required *prior to issuance of the permit* and issued CDP #6-04-88.

- On September 13, 2006, Commission staff issued the Notice of Acceptance for condition compliance required *prior to commencement of construction*; however, the Notice of Acceptance excluded authority to construct certain plan elements that require compliance with additional site-specific conditions (i.e., least tern nesting habitat, public trails, freshwater runoff treatment ponds, inlet dredging, use of North Beach staging area and beach restoration activities, river bend revetment, a disposal site, and a mitigation site).

- On October 2, 2006, Commission staff issued the Notice of Acceptance for condition compliance required *prior to commencement of construction of segments 1 through 3 of the Coast-to-Crest public trail* (from Jimmy Durante Boulevard along the northern edge of the river to I-5).

- On November 20, 2006, Commission staff issued the Notice of Acceptance for condition compliance required *prior to commencement of construction on disposal site DS32*.

- On November 29, 2006, Commission staff issued the Notice of Acceptance for condition compliance on a revised design and alignment for the temporary construction haul road under Interstate Highway 5.

- On January 29, 2007, Commission staff issued the Notice of Acceptance for condition compliance required *prior to commencement of construction of the Least Tern nesting sites*.

- On February 20, 2007, Commission staff issued the Notice of Acceptance for condition compliance on a revised construction haul road route to Disposal Site 36.

- On November 21, 2007, Commission staff issued the Notice of Acceptance for condition compliance required prior to commencement of construction of the Freshwater Runoff Treatment Ponds and Segments 4 through 8 of the Coast to Crest Trail.

Wetland CDP Amendments

The following permit amendments have been submitted:

1. On August 24, 2006, the Commission issued a non-material amendment to modify special condition #4 to read prior to commencement of construction of the revetment located on the south side of the river east of Jimmy Durante Boulevard rather than prior to issuance of the coastal development permit.

2. On July 10, 2007, the Commission approved an amendment to include in the wetland restoration project the removal of the berm north/northeast of the Grand Avenue Bridge.

3. On August 20, 2007, SCE withdrew an amendment request to build a temporary river crossing.

4. On August 14, 2007, SCE submitted an amendment request to address several changes in the Final Restoration Plan, including changes to restoration module W45, exclusion of the riverbank revetment, and an alternative South Beach access plan. This amendment has not been filed complete.

5. On October 25, 2007, the Commission issued a non-material amendment to modify special condition #8 regarding the mitigation plan for impacts from construction of the trail and freshwater runoff treatment ponds.

6. On February 28, 2008, the Commission issued a non-material amendment to modify the trail crossing under Interstate 5 from open bottom box culverts to bridges.

Wetland Restoration Construction Update

Construction of the wetland restoration project at San Dieguito began in August 2006 and is expected to be completed by the middle of 2010. Construction activities began with the delivery of rock and gravel material for use in constructing the haul roads and berms, the installation of fencing to delineate project boundaries and sensitive habitat, and BMP (best management practice) fencing to contain soils within the project area during rainfall events. Construction proceeded with the installation of haul roads to transport dredge materials to disposal sites, the importation, screening, and stockpiling of rock and sandy clay to create berms and permanent access roads, and the clearing and grubbing of vegetation and debris from project areas to the south of the San Dieguito River and west and east of Interstate 5. Upland topsoil was stripped from the disposal sites and stockpiled, and wetland base soil was removed from excavation areas and stockpiled. Construction of the large subtidal and intertidal basin (44 acres) in Area 2A (Module W1) west of Interstate 5 commenced in December 2006 and was completed with opening to tidal exchange on January 23, 2008.

In April 2007, the construction of wetland habitat commenced in other areas within the restoration site. This included modules on the east side of Interstate 5, both north (Area 3) and south (Area 2B) of the San Dieguito River that will be primarily high and middle salt marsh and

exposed mud flat habitat. Tidal flushing to the restoration site was enhanced through a partial dredging of the inlet on May 7, 2008. Construction to create middle and high marsh has been completed in Area 2A (Modules W2, W2A, W3) adjacent to the San Dieguito River. Excavation and grading, including the construction of tidal creek networks, was recently completed in Area 3 (Modules W4, W16) and these areas were opened to tidal exchange on December 3, 2008. Excavation and grading of Area 2B (Modules W5, W10) is scheduled to be completed in early 2009. Material excavated from the construction site is being deposited in disposal sites within the project area. These disposal sites will be covered with topsoil and hydroseeded to control erosion. Berms that will constrain storm runoff have been completed along the boundary of the effective flow area of the San Dieguito River.

Following excavation and grading, portions of the restoration project will be planted with salt marsh vegetation. This is anticipated to be accomplished in two phases. The first phase, in December 2008 and early 2009, will involve planting selected species in high marsh habitat. The second phase, to be accomplished following full inlet dredging, involves planting cordgrass in the low marsh habitat of Area 2B. Inlet dredging for full tidal exchange is anticipated for May 2009, but may be delayed pending negotiations with North County Transit District (NCTD) to obtain an encroachment permit that would allow dredging at the railroad bridge near the inlet.

Wetland Restoration Monitoring

The SONGS permit also requires independent monitoring by Commission contract scientists to ensure that the restoration work is conducted according to approved plans. To accomplish this task, CCC contract scientists are conducting routine monitoring of construction activities through attendance at briefings, field inspections of work in progress, and consultation with technical experts, as needed. Unplanned construction changes have occurred that involved impacts to existing habitat through changes in the alignment of a haul road, and unforeseen impacts of a disposal site and berm on wetland habitat. Staff administers these changes through condition compliance, where appropriate, and permit amendments as needed. CCC contract scientists have also been involved in supervising independently conducted ground truth surveys to assess agreement between as-built and design topography. SCE and its construction team have been very responsive to the requirements of the permit.

Monitoring Plan and Adaptive Management

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

A Draft Monitoring Plan for the SONGS Wetland Mitigation Program was reviewed by State and Federal agencies and SCE in May 2005. A revised Monitoring Plan was part of the coastal development permit (No. 6-04-88) for the wetland restoration project considered and approved by the Commission on October 12, 2005.

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

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

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

KELP REEF MITIGATION

Mitigation Requirement

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

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

In April 1997, the Commission added the requirement for a payment of $3.6 million to the State's Ocean Resource Enhancement and Hatchery Program (OREHP) to fund a mariculture / marine fish hatchery to provide compensation for resources not replaced by the artificial mitigation reef. The Commission had earlier required, in 1993, SCE to contribute $1.2 million toward construction of an experimental white sea bass fish hatchery. SCE has fully satisfied these requirements; thus, there are no fish hatchery tasks conducted by Commission contract scientists or funded through the Commission's monitoring and oversight program. Permanent Commission staff provides oversight of the Department of Fish and Games' continuing fish hatchery program.

Planning and Construction of Experimental Reef

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

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

Monitoring of Experimental Reef

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

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

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

Mitigation Reef Planning and Permitting

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

On October 3, 2007, SCE submitted its Final Plan and a preliminary CDP application for the mitigation reef. The Commission approved CDP #E-07-010 on February 12, 2008.

Reef Condition Compliance

Following the Commission's approval of the mitigation reef construction permit (CDP #E-07-010), SCE began preparing the final design plan in compliance with the special conditions in CDP #E-07-010. Materials submitted in compliance with the special conditions were reviewed by the Executive Director and found to fulfill the requirements of certain of those conditions, as follows:

- On March 25, 2008, Commission staff accepted the additional GIS data and files requested for the experimental reef modules and the phase 2 mitigation reef polygons.

- On April 14, 2008, Commission staff issued the Notice of Acceptance for condition compliance required *prior to issuance of the permit* and issued CDP #E-07-010.

- On May 16, 2008, Commission staff issued the Notice of Acceptance for condition compliance required *prior to commencement of construction*.

- On August 22, 2008, Commission staff issued the Notice of Acceptance for condition compliance requiring an initial construction audit.

Commission staff and contract scientists are currently reviewing "as built" survey data and SCE's final post-construction report to determine compliance with the reef permit requirements, including bottom coverage requirements.

Reef Construction and Monitoring

Construction of the Phase 2 mitigation reef (also known as Wheeler North Reef, or WNR) began on June 9, 2008 and was completed on September 11, 2008. The Phase 2 reef was designed as 17 polygons ranging in area from 1.35 to 38.88 acres for a total reef area of 152 acres. Approximately 126,000 tons of boulder-size quarry material were used to construct the reef. Quarry boulders obtained from the Pebbly Beach and Empire quarries on Catalina Island and the La Piedra quarry in Ensenada, Mexico were the exclusive construction material. Boulder dimensions averaged 2.3 ft in length, 1.8 ft in width, and 1.4 feet in height. The boulders were hauled to the construction site by barge and precisely cast upon the seafloor within the described boundaries of each polygon in roughly a single-layer. The variation of boulder deposition per polygon ranged from 743 to 987 tons per acre with an average of 829 tons per acre.

The siting of each polygon was based on the historical distributions of giant kelp and multibeam and sub-bottom profiling sonar surveys conducted at the offshore lease site. The acoustical surveys were verified by dive surveys. Additionally, the dive surveys evaluated the biological diversity of the lease area. The design also considered the historical, physical, and biological data collected during previous studies in the area and the results of experimental reef monitoring between 1999 and 2004.

The Phase 2 reef construction achieved the following desired objectives: 1) all polygons were built in close proximity to the San Mateo Kelp Bed; 2) all polygons avoided hard substrate areas; 3) the integrity of the Phase 1 Experimental Reef modules was maintained; 4) navigation channels were provided in response to concerns raised by fisherman; and 5) all constructed reef polygons avoided areas of historical kelp growth as well as areas of special interest to local fisheries.

The SONGS permit (CDP No. 6-81-330) requires that the coverage of quarry rock in the Phase 2 reef be between 42% and 86%. Commission contract scientists were charged with measuring the percentage of the seafloor covered by quarry rock in each polygon. They accomplished this by noting the type of bottom substrate beneath 20 points uniformly distributed in replicate 1m x 1m quadrats. Divers placed quadrats along ninety-two 50-meter long transects oriented east to west at locations that will be repeatedly monitored to determine compliance of all physical and biological performance standards. Five quadrats spaced 10 meters apart were sampled on each transect, beginning at 5 meters and alternating from the north to the south sides of the transect. Additional higher resolution sampling conducted by Commission contract scientists in two of the 17 polygons demonstrated that the estimates of boulder coverage obtained from divers sampling the permanent transects were both accurate and precise.

The 92 permanent transects were distributed among the Phase 2 polygons and Phase 1 modules in proportion to their fractional area of the total acreage of the Phase 1 and 2 reefs combined. Fractional areas of the polygons were calculated using the polygon areas obtained from SCE's multibeam sonar surveys. In this way the sampling effort of boulder percent coverage was scaled to the areas of the different sized polygons. Survey results show that percent cover of the

sea floor covered by quarry boulders ranged between 33.7% to 65.5% on the 17 polygons with an overall average of 40.8% for the entire 152 acre Phase 2 reef, which is below the required range of 42% to 86%. It is important to note that the combined area of the Phase 1 and Phase 2 reefs totaled 174.4 acres, which exceeds the minimum 150 acre requirement in the SONGS CDP. When portions of the 152 acre Phase 2 reef are excluded from consideration the requirement for the minimum area (150 acres) and coverage (42%) are met.

SCE submitted a final construction report on the Phase 2 reef to the CCC on November 4, 2008 This report contains data and analyses on the as-built specifications of the Phase 2 reef. Commission staff are currently analyzing the contents of this report to determine condition compliance.

FISH BEHAVIORAL MITIGATION

Mitigation Requirement

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

Fish Behavioral Mitigation Compliance

The impact studies for the operation of SONGS Units 2 and 3 conducted between 1983 and 1991 found that annual losses of juvenile and adult fish in the cooling water systems under normal operations averaged about 20 metric tons. Although the SONGS permit does not specify any criteria for evaluating the effectiveness of these devices, the Commission accepted the studies' recommendation that "the techniques" (behavioral barrier devices) "be tested on an experimental basis, and implemented if they reduce impingement by at least 2 metric tons (MT) per year", which is equivalent to at least 10% of the average loss due to impingement. (Section IV– Proposed Findings and Declarations in the SONGS 1991 permit)

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

In October 2000, the Commission reviewed the results of the experiments and concluded that no further testing of alternative behavioral barriers should be required at this time, provided that (1) SCE continues to adhere to the operating, monitoring, and reporting procedures for the modified heat cleaning treatments and (2) SCE makes every effort to test and install, if feasible, future technologies or techniques for fish protection if such techniques become accepted industry standards or are required by the Commission in other power plant regulatory actions.

The contract scientists and staff review the annual data and analyses on the fish chase procedure at SONGS. The reports indicate that the fish chase procedure generally has been consistent with the Commission's requirements. However, the Fish Chase Procedure effectiveness relative to

impingement dropped below the 10% target value in both 2004 (4.82%) and 2005 (7.6%). In 2004 the mortality rates associated with the fish chase also failed to meet the standards.

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

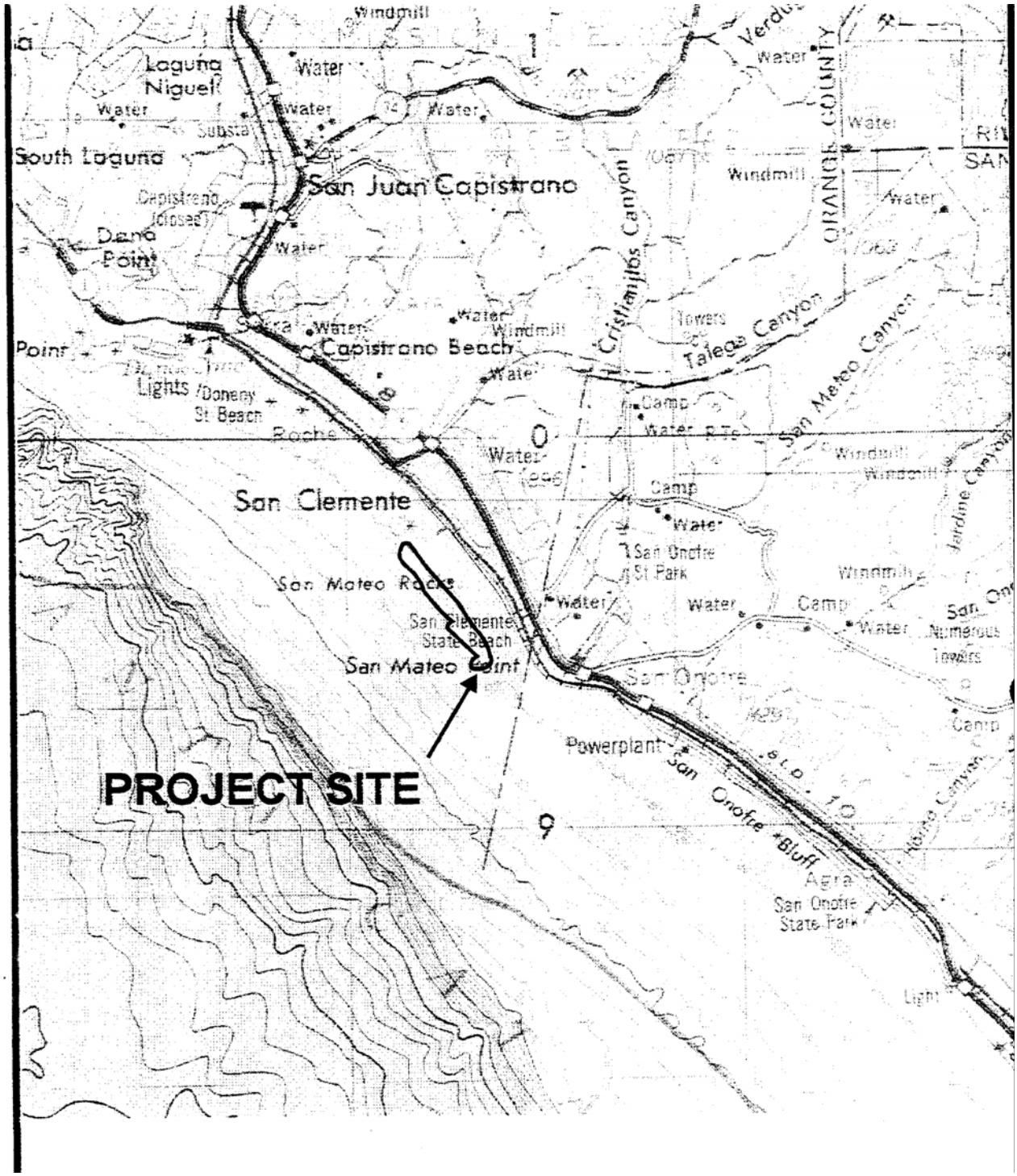
Staff met with SCE on April 23, 2007 to discuss: (1) the current status of impingement levels at SONGS, (2) the need for additional monitoring to more accurately assess impingement levels, and (3) implementation of new technologies that could significantly reduce fish losses. In September 2007, SCE submitted to the Commission its annual report for the year 2006 on SONGS impingement and fish return data. The 2006 data showed that fish impingement losses at SONGS were significantly reduced. SCE attributed this reduction to a shift in the local fish assemblage to species that are less inclined to be impinged by SONGS.

In September 2008, SCE submitted its annual report for the year 2007. Staff and contract scientists are still reviewing the details of the report with SCE, but have concluded that SCE is in compliance with the goals and requirements concerning the behavioral barriers condition for 2007 and that the Fish Chase Procedure was again, as in 2006, extremely effective and impingement was considerably lower than in most years.

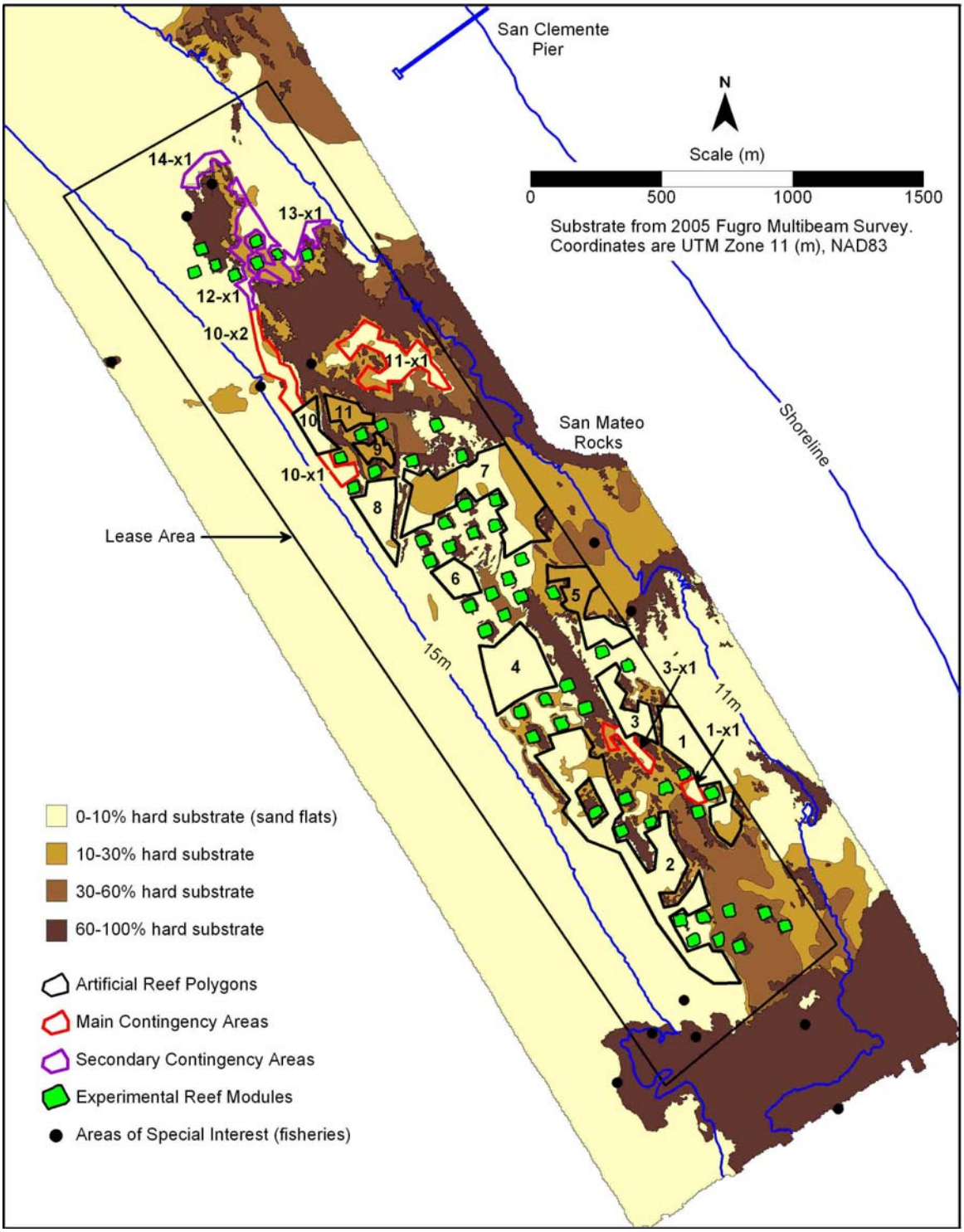
Contract scientists also have been working with SCE to evaluate the adequacy of SCE's current quarterly sampling program in providing reliable estimates of annual fish impingement losses. Prior to 1999 impingement sampling at SONGS was done monthly. The accuracy and precision of the annual estimates obtained from the data collected monthly prior to 1999 will be compared to that of more recent years to determine whether quarterly sampling is sufficient for estimating annual fish impingement losses.

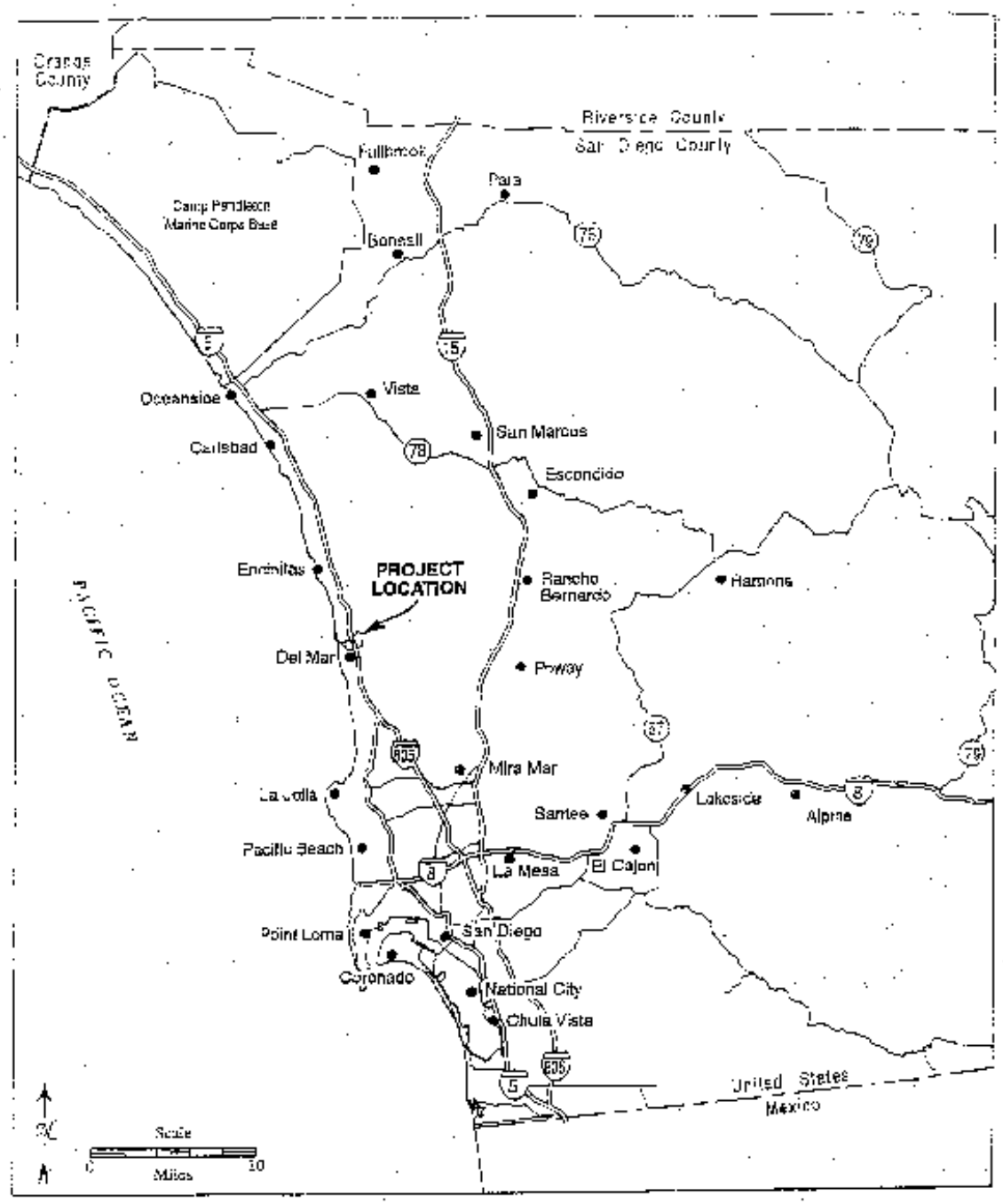
SCE is currently waiting for a federal ruling on water quality that effectively sets the level of fish losses allowed for cooling systems of power plants. Once that ruling has been finalized, SCE will actively work to develop new technologies at SONGS for meeting the more strict standards currently proposed by the federal government. The Commission staff continues to encourage SCE to move forward as quickly as possible to develop and install these new technologies.

Mitigation Reef Project Location Map

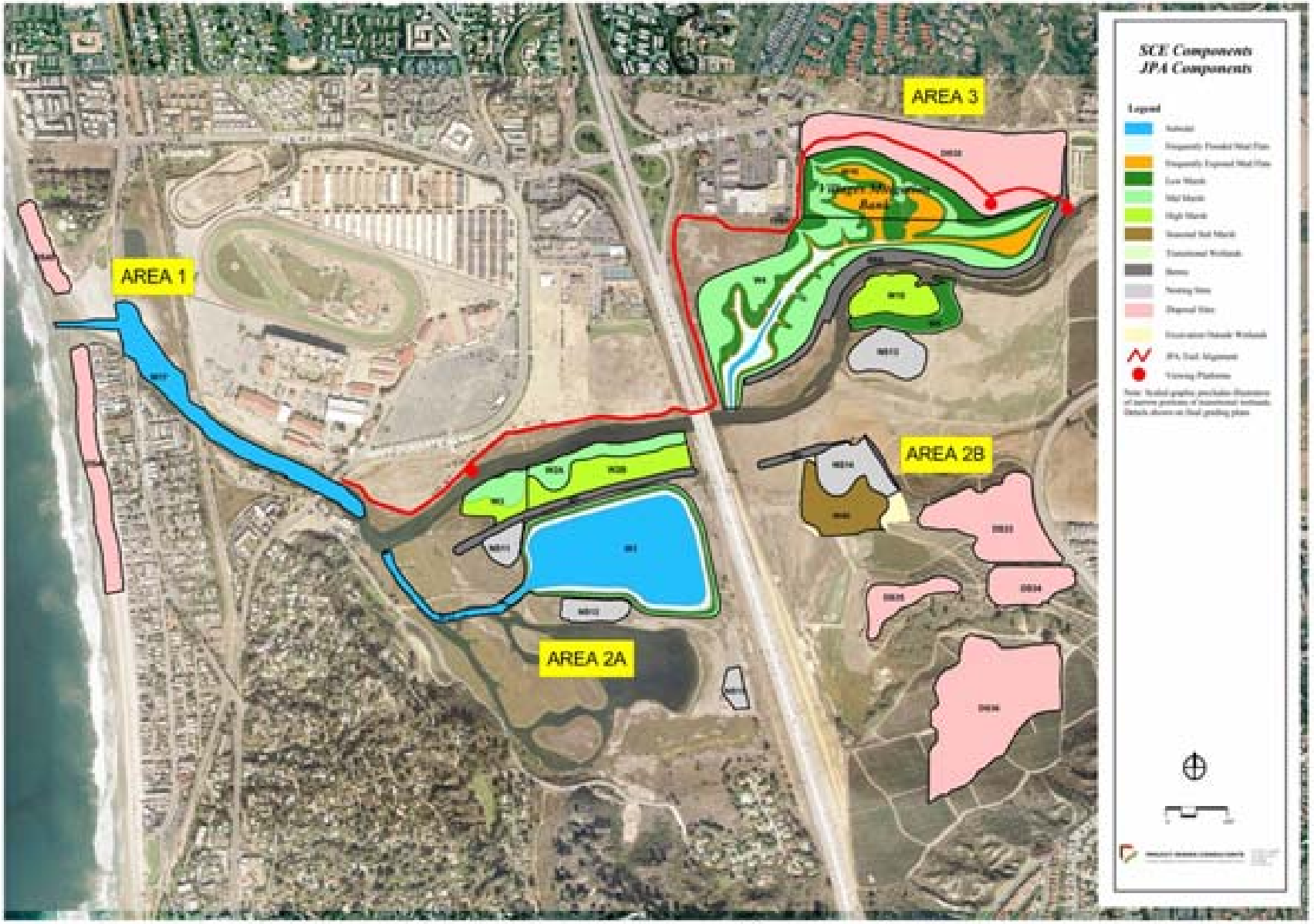


Phase 2 Mitigation Reef (127.6 acres), main contingency areas (22.4 acres), and secondary contingency areas (11.6 acres) overlaid onto a seafloor characterization map.





San Dieguito Wetland Restoration Project Regional Location Map



San Dieguito Wetland Restoration Project

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