City of Carlsbad
Office of the City Manager

April 29, 2009

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Mike Monasmith
Siting Project Manager
California Energy Commission
1516 Ninth Street, MS-15
Sacramento, CA 95814

Re: Prior California Coastal Commission Site Analysis for Encina Power Station

Dear Mr. Monasmith:

It remains the City of Carlsbad's position that provisions of the Warren-Alquist Act require the participation of the California Coastal Commission (Coastal) and that Coastal's involvement is critical to maintaining the integrity of the AFC process.

Recently, as part of the City's review of the CECP, the City identified that the Encina Power Station (EPS) site, which includes the proposed location for the CECP, was part of a San Diego Gas & Electric Notice of Intent (NOI) filing in 1989 (89-NOI-1). San Diego Gas & Electric's (SDG&E) NOI indentified five sites, including two coastal locations, EPS in Carlsbad and South Bay in Chula Vista.

San Diego Gas & Electric's NOI
In 1989, San Diego Gas & Electric (SDG&E) proposed to construct a 460 MW combined cycle power plant which included two (2) 150 ft. smokestacks. SDG&E's site location at the EPS was immediately adjacent on the westward side to the proposed CECP. While SDG&E's proposal is essentially the same in size, shape, location and primary fuel source to the CECP, some distinctions should be made. In 1989, SDG&E was required to have a fuel backup. The CECP is not under such conditions. Additionally, at that time, air-cooled technology was not proposed, which necessitated SDG&E's use of once-through cooling. Although the CECP will be air-cooled in part, it is requesting to construct a four million gallon per day desalination plant for facility needs, including cooling.

Coastal Commission Review
Included in the 1989 NOI, and as required by Section 30413 of the Coastal Act, the Coastal Commission evaluated the suitability of the proposed coastal power plant sites using seven criteria. Coastal's analysis and recommendations were approved by the Coastal Commission in September 1990. This report was subsequently submitted to the California Energy Commission and is attached for the Committee's consideration.

Coastal's conclusions regarding the proposed power plant are clearly articulated on page 1 of the Executive Summary:

> *The California Coastal Commission finds that the proposed new power plants at SDG&E's Encina site in Carlsbad and South bay site in Chula Vista would cause significant adverse impacts to Coastal resources. Therefore, as now proposed, the sites are unsuitable locations for new power plants and the projects are inconsistent with the Coastal Act.*

Page 8 of the Executive Summary further states:

> *The Coastal Commission's assessment is that the construction of a new power plant at either Encina or South Bay is inconsistent with the policies of the Coastal Act.*

In the main text of the 1990 report, Coastal identified a number of concerns which are relevant to issues raised regarding the CECP including: visual impacts, air quality, and cumulative impacts.

Coastal's conclusions on the visual impacts of an additional power plant at the EPS site are unmistakable:

> *The Commission finds that, given the size of the proposed structures and the visually prominent nature of the site, the visual impacts of the development are not fully mitigable and that some unmitigable significant impacts to the visual environment are likely to occur. For these reasons, the Commission finds that the impacts resulting from the expansion are not consistent with Section 30251 of the Act. Furthermore, the Commission finds that the cumulative visual impact of the proposed expansion in conjunction with the existing plant is significant and is inconsistent with the Coastal Act (pg. 33).*

Furthermore, Coastal describes the requirement for an analysis of cumulative impacts from not only the project itself, but also past, present, and "probable" future projects:

> *The Coastal Act (Section 30250) and the California Environmental Quality Act (CEQA) require an analysis of not only the direct environmental impact of individual projects, but also the cumulative impacts resulting from each individual project in combination with closely related past, present and "probable" future projects (pg.45).*

And finally, Coastal concludes that:

> *The cumulative impacts to coastal resources from the proposed Encina project and closely related projects are likely to be significant in the following areas: visual impacts, marine biology and air quality (pg. 45).*

Summary
The City continues to advocate for Coastal to be active and engaged in the current CECP proceeding. However, recognizing the numerous similarities between SDG&E's 1989 proposal and the CECP, Coastal's analysis provides meaningful and significant guidance for staff. Coastal's view that siting an additional power plant at the EPS site, which is what the CECP proposes to do, as being "inconsistent" with the Coastal Act is germane to the current discussion and its report clearly identified concerns such as visual and cumulative impacts that are as relevant today as they were twenty years ago.

Respectfully,

Joe Garuba
Municipal Projects Manager

JG:ad

Enclosure

cc: Proof of Service List (Revised 2/18/2009)

CALIFORNIA COASTAL COMMISSION
REPORT TO THE
CALIFORNIA ENERGY COMMISSION

on

San Diego Gas and Electric's Proposal
For a New Power Plant
At Encina or South Bay in San Diego County
(89-NOI-1)

Report Date:	August 31, 1990
Staff:	CP/SF Project Manager Energy and Legal Staff San Diego District
Hearing Date:	September 11, 1990
Commission Action:	Adopted September 11, 1990

EXECUTIVE SUMMARY

The California Coastal Commission finds that the proposed new power plants at SDG&E's Encina site in Carlsbad and South Bay site in Chula Vista would cause significant adverse impacts to coastal resources. Therefore, as now proposed, the sites are unsuitable locations for new power plants and the projects are inconsistent with the Coastal Act.

BACKGROUND: THE COASTAL COMMISSION'S JURISDICTION TO REVIEW POWER PLANTS

This report consists of the California Coastal Commission's (Coastal Commission or "the Commission") preliminary analysis to the California Energy Commission (CEC or Energy Commission) on the suitability of two San Diego County coastal sites for San Diego Gas and Electric's (SDG&E) proposed 460 Megawatt combined cycle power plant. The two possible coastal sites are the sites of existing SDG&E power plants: Encina, in the City of Carlsbad; and South Bay, in the City of Chula Vista.

This preliminary report responds to SDG&E's Notice of Intention to file an Application for Certification for one of five possible sites. The other three alternative sites, all located outside the coastal zone, are Sycamore Canyon, located near Miramar Naval Air Station; Blythe in Riverside County; and Heber, in Imperial County (see Exhibit A).

The permitting authority of the Coastal Commission and other state and local jurisdictions over power plants is preempted by the Energy Commission. The Coastal Commission fills an advisory function on coastal resource issues for power plant siting analyses. Under Section 30413 of the Coastal Act, the Coastal Commission is required to submit findings and recommendations to the Energy Commission on the suitability of a proposed coastal power plant site, using seven criteria that reflect the policies of the Coastal Act. Section 30413(d)(7) also requires the Commission to propose mitigation measures and project modifications that would reduce adverse effects on coastal resources.

The Introduction of this report explains the Energy Commission's power plant review process.

NEED FOR NEW POWER PLANT

The Energy Commission is charged with ensuring that the state has an adequate supply of electricity (Public Resources Code Section 25001). To that end, it must balance the alternative of building new power plants against other alternatives such as conservation, load management, and cogeneration.

The Energy Commission's support for alternatives to power plant construction has reduced load growth on a statewide basis and deferred the need for new power plants. Notwithstanding the success of those efforts, the SDG&E service territory has experienced a substantial growth in demand for electricity in

recent years. The CEC has evaluated that demand as part of its biennial Electricity Report proceeding in 1989 and has found that SDG&E is the only major utility in California that will need a new power plant in the mid-1990's. The CEC found that the other utilities will not need new capacity before the late 1990's.

The Coastal Commission supports the CEC's efforts to meet new energy demand through alternatives such as conservation, load management and cogeneration. In its review of offshore oil and gas development, the Coastal Commission has consistently advocated that the federal government follow such an approach.

COASTAL RESOURCE IMPACTS OF PROPOSED NEW POWER PLANTS

The proposed construction and operation of a new power plant at a coastal site raises the following coastal resources issues: (1) marine resource impacts, (2) public access impacts, (3) visual impacts, (4) consistency with Local Coastal Program, (5) system safety, (6) geologic stability, and (7) air quality impacts.

A general problem in analyzing the potential impacts of the two project site alternatives on coastal resources was a lack of available data. This was particularly problematic in the areas of marine resource impacts and system safety. In areas where data is inconclusive but indicative of a potentially adverse impact, the Commission must err conservatively on the side of coastal resource protection.

This Executive Summary provides a brief description of each site and highlights the major impacts to coastal resources.

THE ENCINA SITE

The existing Encina power plant in the City of Carlsbad is located on a coastal bluff adjacent to Pacific Coast Highway (Carlsbad Boulevard) and Agua Hedionda lagoon. The proposed 460 megawatt plant would be built within the boundaries of the existing plant and would be visible from Pacific Coast Highway, nearby beaches and Interstate 5. The existing Encina power plant draws its cooling water directly from outer Agua Hedionda lagoon. This lagoon water is circulated through the plant to cool the condensers and is then discharged into the ocean through an open channel that stretches across the beach. Agua Hedionda lagoon supports a variety of habitats, including eelgrass and salt marsh, abundant waterfowl, and a unique assemblage of fish. Beds of giant kelp are located offshore of the ocean discharge at Encina.

A new power plant at the Encina site would have the following coastal resource impacts:

- Entrainment & Impingement of Marine Organisms

  At Encina, the available data indicates a substantial ongoing loss of fish larvae and other zooplankton through the plant. A particular concern is that the new power plant would significantly increase the entrainment of species that use the lagoon as nursery habitat, such as the California halibut, and that such an increase would cause significant losses to local

populations. The impact of the loss of fish larvae and zooplankton on the food chain is also a serious concern. The effect of the plant on shorebirds, such as the snowy plover, must be addressed.

o Thermal Plume

At Encina, the heated discharge water, which causes a thermal plume, is released through a channel across the beach into the offshore habitat areas. Giant kelp beds, sandy beach intertidal habitats, and midwater and benthic communities are subjected to thermal stress as a result of the plume.

o Construction Impacts

The proposed plant expansion at Encina would have construction impacts in addition to those impacts resulting from its operation. Many of the construction impacts are short-term and can be mitigated. The construction impacts of most concern to the Commission are: (1) harm to endangered species nesting sites, and (2) turbidity effects to marine habitats. Further information is needed to evaluate these potential impacts. Should endangered species be found on the site, there may be adverse impacts to those species that cannot be mitigated.

o Impacts to Public Access & Recreation

The public heavily uses the sandy beach adjacent to the Encina plant and Agua Hedionda lagoon. The existing across-the-beach discharge channel disrupts the use of the beach and access along it. The new plant may require the expansion of the discharge channel, thereby increasing the disruption to access and recreation.

The proposed new Encina plant could disrupt access to the beach during construction by causing increased traffic and displacing parking. These impacts are mitigable by requiring offsite construction worker parking, a traffic control plan, and by timing construction to coincide with traditionally low periods of public use of the beach.

o Visual Impacts

The visual environment at the Encina site is somewhat degraded by the existing plant, but the new plant would intensify that impact as well as extend the life of the current plant. The new Encina plant would include two 150-foot-high emission stacks and a 75,000-square-foot building, which will further impact views from adjacent beach recreation areas, scenic roadways (Pacific Coast Highway) and vista points. Although the visual impacts of the stacks can be reduced by using appropriate colors, these impacts cannot be fully mitigated.

In addition, views to and along the beachfront are disrupted by the barbed-wire fence that encloses the discharge channel that stretches across the beach. The beach discharge channel is unattractive and would not be removed under SDG&E's proposal.

o Consistency with the Local Coastal Program

At Encina, both the Agua Hedionda Land Use Plan (LUP) and the Encina Specific Plan designate the site as appropriate for power generating facilities. Therefore, the project is consistent with the certified Land Use Plan. However, an amendment to the Specific Plan would be required to include the expansion of the facilities.

o System Safety/Oil Spills

There is an increased risk of oil spills and hazardous materials releases from the proposed Encina project. Oil deliveries to the existing offshore marine terminal (approximately 3,000 feet offshore) would increase to provide a supply of backup fuel for the new Encina unit. Additional hazardous materials would be transported to and handled on site, increasing the risk of accidental releases.

o Geologic Hazards

The principal geologic hazard at Encina is the risk of ground shaking from earthquakes. The Encina site is three miles from the Rose Canyon fault. Portions of the Rose Canyon fault are in the process of being rezoned "active" as defined by the Alquist-Priolo Act of 1972. It is the Commission's understanding that both plants would be designed to specific criteria cited under the Energy Commission's Seismic Zone IV designation. The Energy Commission should review new geologic information on the Rose Canyon fault to determine if the design requirements under Seismic Zone IV would be adequate at Encina.

o Air Quality

The Commission does not have direct regulatory authority over air quality matters for projects that fall within the purview of the California Air Resources Board or a local Air Pollution Control District. Instead, the Coastal Act specifies that developments be consistent with the requirements of those authorities. The San Diego Air Pollution Control District (SDAPCD) is participating in the NOI proceeding. SDG&E has not yet provided the information needed to allow the SDAPCD to determine if the proposed Encina facility complies with SDAPCD standards and if sufficient offsets are available.

THE SOUTH BAY SITE

The existing South Bay power plant is located in the City of Chula Vista on South San Diego Bay. The plant is visible from the entire South Bay and from parts of the City of Chula Vista and Interstate 5. The plant draws its cooling water directly from shallow channels in South San Diego Bay and discharges heated water back into the Bay.

South San Diego Bay is a critical remnant of the once large marine and estuarine wetland system of Southern California. It is a major spawning area for fish and is an important link in the Pacific flyway for migrating birds.

San Diego Bay supports numerous endangered wildlife species including California least terns, Belding's Savannah sparrows, Clapper Rails, and black and green sea turtles.

A new power plant at the South Bay site would have the following coastal resource impacts:

o Entrainment and Impingement of Marine Organisms

At South Bay, the data suggests that three fish (gobies, anchovy and topsmelt), experience extremely high entrainment rates that are compounded by impingement losses. These fish provide important food for water-associated birds including the endangered California least tern. The entrainment losses for invertebrates and phytoplankton is also high and these losses could be causing a significant impact through the food chain in South Bay. These rates would increase should the power plant expansion take place.

o Thermal Plume

At South Bay, the heated discharge water, which causes a thermal plume, is released into a discharge channel, formed by a levee at the south end of the Bay. The biota of the south bay are already stressed due to the naturally elevated temperature in this area. The existing thermal plume causes stress to the nearby eelgrass bed, which is an important component of the south bay ecosystem as it provides refuge, habitat and forage for a variety of species. Intertidal mudflats, midwater communities and salt marsh habitat are also likely to be adversely affected by the thermal plume.

o Construction Impacts

The proposed plant expansion at South Bay would have construction impacts in addition to those impacts resulting from the operation of the expanded plant. Many of the construction impacts are short-term and can be mitigated. The construction impacts of most concern to the Commission are: harm to endangered species nesting sites, and (2) turbidity effects to marine habitats. Further information is needed to evaluate these potential impacts. Should endangered species be found on the site, there may be adverse impacts to those species that cannot be mitigated.

o Impacts to Public Access and Recreation

The proposed new South Bay plant could disrupt access to the South Bay during construction by causing increased traffic and displacing parking. These impacts can be mitigated by requiring offsite construction worker parking, a traffic control plan, and by timing construction to coincide with traditionally low periods of public use of the waterfront.

o Visual Impacts

Although the South Bay waterfront area is already somewhat visually degraded by the existing South Bay plant, the new plant would intensify

that impact as well as extend the life of the current plant. The new South Bay plant would include two new 175-foot-high emission stacks and a 75,000-square-foot building, which will further impact views from all of South Bay and from various areas of the City of Chula Vista. Although the visual impacts of the stacks can be reduced by using appropriate color, these impacts cannot be fully mitigated.

o Consistency with the Local Coastal Program

At South Bay, the project is consistent with the certified LUP, which contains provisions for the continued use and expansion of the site as a power generating facility. However, the Bayfront Specific Plan designates the site "industrial," a designation that does not include power generating facilities. The policies of the LUP are controlling, therefore, the project is consistent with the Local Coastal Program. However, an amendment to the Specific Plan would be required to add power plants to the list of uses allowed at the site.

o Systems Safety/Oil Spills

The proposed South Bay project would increase the risk of oil spills and hazardous waste releases. The number of oil deliveries by tanker through South San Diego Bay to the terminal in National City would increase to provide a supply of back up fuel for the new unit. This presents a greater risk of oil spills that could seriously damage the wetland, eelgrass and shallow water habitats of South Bay. Numerous hazardous materials would be transported to and stored at the site as a result of the project, thereby increasing the risk of accidental releases.

o Geologic Hazards

The principal geologic hazards at the South Bay site are the risks of ground shaking from earthquakes and liquefaction. The South Bay site is two and one half miles from the Rose Canyon fault. Portions of the Rose Canyon fault are in the process of being rezoned "active" as defined by the Alquist-Priolo Act of 1972. It is the Commission's understanding that the South Bay plant would be designed to specific criteria cited under the Energy Commission's Seismic Zone IV designation. The Energy Commission should review new geologic information on the Rose Canyon fault to determine if the design requirements under Seismic Zone IV would be adequate at South Bay.

o Air Quality

The Commission does not have direct regulatory authority over air quality matters for projects that fall within the purview of the California Air Resources Board, or a local Air Pollution Control District. Instead, the Coastal Act specifies that developments be consistent with the requirements of those authorities. The San Diego Air Pollution Control District (SDAPCD) is participating in the NOI proceeding. SDG&E has not yet provided the information needed to allow the SDAPCD to determine if either proposed facility complies with SDAPCD standards and if sufficient offsets are available at either site.

CUMULATIVE IMPACTS FOR BOTH SITES

The Coastal Act and the California Environmental Quality Act require an analysis of the cumulative impacts of projects in combination with closely related past, present and probable future projects. The cumulative impacts of a new power plant at either proposed coastal site are likely to be significant.

At both sites, the existing power plants cause significant adverse impacts to the coastal resources in the vicinity of the plants. The proposed additional units would add cumulatively to those impacts, particularly in regards to visual impacts and marine resources.

At South Bay, SDG&E's proposed power plant augmentation (Unit 3 Augmentation project), which the Energy Commission is currently reviewing in a separate proceeding, would also result in further adverse visual and marine resource impacts. SDG&E must address the cumulative impacts of the Unit 3 Augmentation proposal in conjunction with the proposed combined cycle unit.

MITIGATION FOR BOTH SITES

The Coastal Commission recommends the following mitigation options that the CEC should consider to address impacts to coastal resources:

- Biological Resource Mitigation

  The most protective mitigation approach would be to use a closed cycle cooling system, such as cooling towers or spray ponds. If adequate land is available, spray ponds are less expensive than cooling towers, but would probably have more adverse effects due to drift salt spray.

  Modifications to the discharge systems at both sites could reduce thermal impacts. At South Bay, impacts would be reduced by an ocean discharge. At Encina, an offshore discharge would reduce impacts, as long as the discharge was located far enough away from the kelp beds. However, if the existing discharge systems would be employed, as proposed at both sites, it is infeasible to mitigate the impact of the thermal plume.

  There are few techniques available for reducing entrainment losses. Although reducing the volume of water that flows through the plant would reduce entrainment, this technique would increase the discharge temperature. This temperature change may increase thermal plume impacts (if an offshore discharge is installed at Encina, the effect on thermal plume temperature would not be a concern). Modified traveling screens might also reduce larval mortality, but additional testing is needed to demonstrate the effectiveness of this technique.

  Although the losses from impingement are less substantial than entrainment losses, they are significant. There are numerous techniques available to reduce impingement, including porous dikes, light systems, sonic devices, and barrier systems. These techniques should be explored.

At Encina, it may be possible to reduce turbidity from dredging by scheduling dredging operations for particular tidal cycles or times of the year. Turbidity curtains could be used to protect eelgrass beds during dredging operations and construction. Alternatively, techniques to reduce sedimentation could be employed. Turbidity impacts at South Bay warrant further investigation to determine the extent of the possible impacts and whether mitigation is possible.

For those cumulative marine resource impacts of the proposed combined cycle project in combination with similar projects that cannot be mitigated by any avoidance, minimization, or habitat replacement approaches, the CEC should explore establishing a pilot in-lieu fee mitigation program. In-lieu fees would be required in compensation for all estimated unmitigated cumulative impacts of the cooling system on the marine environment. The fee could be used to enhance marine resources in the area impacted by the power plant.

In addition, the Commission recommends that the Energy Commission consider applying all feasible marine resource mitigation measures retroactively to the existing power plants at Encina and South Bay, to address cumulative impacts.

o Oil Spills/Hazardous Materials Releases

To reduce the risk of oil spills, the use of pipelines should be explored as an alternative means of transporting oil to the sites. A Terminal Operations Manual describing procedures to prevent oil spills, and an Oil Spill Contingency Plan to address oil spill response, should be developed before an Application for Certification (AFC) is approved at either site.

To address the risk of a hazardous materials release, the possible substitution of alternative, less hazardous substances should be investigated. In addition, a Risk Management and Prevention Plan, as required under State law should be prepared prior to the AFC filing.

CONCLUSION

The Coastal Commission's assessment is that the construction of a new power plant at either Encina or South Bay is inconsistent with the policies of the Coastal Act. Furthermore, a substantial amount of additional information must be developed to assess environmental and land use impacts thoroughly at both sites and to expand and refine mitigation measures. The Coastal Commission's assessment, based on available information, is that there would be significant adverse biological and visual impacts from the project that cannot be mitigated.

The Coastal Commission has provided as thorough an assessment as possible given the limited information available and the Commission's staffing constraints. The Commission intends to follow the Energy Commission's NOI and AFC process and as new information becomes available the Commission will submit additional comments and recommendations to the Energy Commission.

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I. INTRODUCTION

San Diego Gas and Electric Company (SDG&E) proposes to construct a 460 megawatt combined cycle power plant. To this end, it has filed a Notice of Intention (NOI) with the California Energy Commission (CEC or Energy Commission) to evaluate the suitability of five possible sites, two of which are in the coastal zone. The purpose of this report is to present the CEC with an analysis and recommendations as to the consistency of these two proposed coastal power plants with the requirements of the Coastal Act.

Both proposed coastal sites involve the expansion of an existing SDG&E power plant; one site is the South Bay facility in Chula Vista, the other is the Encina facility in Carlsbad. The other three possible sites are at inland locations: Blythe; Heber; and Sycamore Canyon, located at Miramar Naval Air Station (see Exhibit A, Proposed Site Alternatives).

Need for New Power Plant

The Energy Commission is charged with ensuring that the state has an adequate supply of electricity (Public Resources Code section 25001). To that end, it must balance the option of building new power plants against other options such as conservation, load management and cogeneration.

The Energy Commission's support for alternatives to power plant construction has reduced load growth on a statewide basis and deferred the need for new power plants. Notwithstanding the success of those efforts, the SDG&E service territory has experienced substantial growth in demand for electricity in recent years. The CEC has evaluated that demand as part of its biennial Electricity Report proceeding in 1989 and has found that SDG&E is the only major utility in California that will need a new power plant in the mid-1990's.

The Commission recommends that the CEC consider the question of whether the load forecast for SDG&E should be revised downward in the current Electricity Report proceeding, thereby deferring the need for new power plant construction in the SDG&E service territory. Two current developments should be considered. First, if Southern California Edison's proposal to merge with SDG&E is approved by the California Public Utilities Commission (CPUC), the need for a large power plant may be deferred. Second, the CPUC has recently adopted a new plan to increase financial incentives for utilities to invest in energy conservation programs. The Commission supports this approach, and suggests that the CEC consider whether this change would allow revision of the date by which a new power plant would be needed to serve SDG&E.

Role of the Coastal Commission in Power Plant Siting

The proposed power plant is exempt from the requirement that a coastal development permit be obtained. The Energy Commission preempts the permitting authority of the Coastal Commission and the cities in which the sites are

located, as well as all other state and local agencies in the review of most thermal power plants with a capacity of 50 megawatts or more.1/ Both the Coastal Act and the Warren-Alquist Act (the Energy Commission's enabling legislation) expressly recognize the Energy Commission's exclusive jurisdiction to approve most power plants (Public Resources Code Sections 25500, 30600). In exercising that jurisdiction, the Energy Commission must expressly consider the findings of the Coastal Commission.

The Energy Commission will pursue a two step process in reviewing SDG&E's proposal to construct the proposed power plant. The first step is called a Notice of Intention (NOI) proceeding. It commenced in Spring of 1990 and will be conducted over a period of approximately 18 months. At the end of the NOI proceeding, the Energy Commission is required to determine whether two or more of the proposed sites would be acceptable for further consideration in an Application for Certification (AFC) proceeding.

The AFC proceeding is the second step of the Energy Commission's review process. It will be conducted over the course of a year or more and will result in a more detailed consideration of a proposed power plant at a particular site. Both types of proceedings are largely conducted using formal, trial-type procedures including cross-examination, sworn testimony and the filing of motions and briefs. The Coastal Act authorizes the Coastal Commission to participate fully in both proceedings (Public Resources Code Section 30413(d), and (e)). The proceedings have been certified by the Resources Agency to be the equivalent of the Environmental Impact Report (FIR) process, thus the Energy Commission does not need to prepare an EIR (Calif. Code of Regs., Title 14, Section 15251(k)).

Purpose of Report

The Coastal Act provides the Coastal Commission with a unique role in the Energy Commission's review process. Section 30413 requires that the Coastal Commission submit a report to the Energy Commission early in the NOI process concerning the Coastal Commission's recommendations on the suitability of proposed coastal sites for power plant construction. Section 30413 requires that the report include recommendations on seven subjects, which are:

1) the compatibility of the proposed site and related facilities with the goal of protecting coastal resources,

2) the degree to which the proposed site and related facilities would conflict with other existing or planned coastal dependent land uses at or near the site,

3) the potential adverse effects that the proposed site and related facilities would have on aesthetic values,

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1/ There is more detailed discussion of the Energy Commission's jurisdiction with respect to the Coastal Commission in Appendix A.

4) the potential adverse environmental effects on fish and wildlife and their habitats,

5) the conformance of the proposed site and related facilities with certified local coastal programs in those jurisdictions which would be affected by any such development,

6) the degree to which the proposed site and related facilities could reasonably be modified so as to mitigate potential adverse effects on coastal resources, minimize conflict with existing or planned coastal-dependent uses at or near the site, and promote the policies of this division, and

7) such other matters as the Commission deems appropriate and necessary to carry out the provisions of this division.

The Energy Commission will consider the recommendations of the Coastal Commission and other state and local agencies at informal hearings in September. The results of those hearings will be a listing of the issues that must be addressed by the parties (including the Coastal Commission, if it chooses to participate) during the formal adjudicatory hearing phase of the NOI process, which will last over the next year. At the end of that phase, the Energy Commission will consider (but not be bound by) the Coastal Commission's recommendations in making its determination of which of the sites proposed in the NOI have greater relative merit. Even if a coastal site is found acceptable, the Energy Commission can only consider an application for certification for a site in the coastal zone when that site has greater relative merit than other acceptable sites in the utility service territory (Public Resources Code section 25516.1). If the Coastal Commission's report includes any recommendations for specific mitigation measures for a power plant at a particular coastal zone location, the Energy Commission must give great weight to those measures in a future AFC proceeding to certify a plant in that location.

Power Plant Siting Study

Section 30413 of the Coastal Act also requires the Commission to designate "those locations within the coastal zone where the location of a [power plant] facility...would prevent the achievement of the objectives of this division." In response to this directive, the Coastal Commission prepared a report titled "Designation of Coastal Zone Areas Where Construction of an Electric Power Plant Would Prevent Achievement of the Objectives of the California Coastal Act of 1976," which was adopted in September 1978, and revised and readopted in 1985. Section 30413 specifically prohibits the designation of sites that are currently used for power plants. Since the Encina and South Bay sites were both developed in the early 1950's, they were not considered for inclusion in the siting study.

The siting study contains a policy statement directing utilities to give priority to potential power plant sites in areas with existing power plants. However, this policy pertains to development of existing versus undeveloped

sites within the coastal zone, and is therefore not relevant to the current NOI proceeding, in which both coastal zone sites involve expansion of existing power plants.

Report Organization

The seven issue areas are addressed in the following report. Several of the issue areas overlap; some of the standards e.g. compatibility with goal of protecting coastal resources, are applicable to several Coastal Act policy areas. For the sake of clarity, the report is organized by subject area rather than by the seven issue areas, with an explanation of how that particular topic relates to the issue areas under Section 30413, and other coastal act policies.

Both the compatibility of the project with the goal of protecting coastal resources, and the potential adverse environmental effects on fish and wildlife and their habitats are addressed in the following sections: marine biology, systems safety and impacts due to construction. The degree to which the proposed site would conflict with other coastal-dependent land uses is addressed in the sections on public access and recreation. The potential adverse effects on aesthetic values is discussed in the section titled visual impacts. A section is devoted to the consistency of the project with the certified local coastal program.

Following a brief description of the overall project and an overview of the five sites, this report is divided into two main sections: an evaluation of the suitability of the Encina site and an evaluation of the suitability of the South Bay site.

II. OVERALL PROJECT DESCRIPTION

The project consists of a combined cycle electric generating station. In a combined cycle plant, exhaust steam from a gas-fired turbine is used to generate electricity in steam turbines. The combined cycle unit would be fueled by natural gas. Number 2 low sulfur fuel oil would be stored on-site as back up fuel, to be used in the event of a natural gas curtailment.

The five sites are all located in Southern California. The two coastal sites are located in San Diego County, at existing SDG&E power plant sites: the Encina plant is in the City of Carlsbad on outer Agua Hedionda Lagoon, located between Interstate 5 and the coast; the South Bay plant is in the City of Chula Vista, at the south end of San Diego Bay, west of Interstate 5. The Sycamore Canyon site is also in San Diego County on Miramar Naval Air Station, about 5 miles northwest of the City of Santee. The two remaining sites are in the desert: the Blythe site is in Riverside County, near the Arizona border, three miles northwest of Palo Verde; the Heber site is located in Imperial County, four miles south of Interstate 8 near the community of Heber. The Heber site is adjacent to an existing SDG&E geothermal power plant.

At the coastal sites, SDG&E proposes a 460 megawatt station, whereas for the inland sites, the generating capacity has not yet been determined, and is likely to exceed 460 megawatts. A principle difference among the sites is in the cooling method used: the coastal sites would use seawater; the inland sites would use a cooling tower. Other differences between the various sites include whether there is an existing power plant on-site and the extent that new gas pipelines and transmission lines would be required. These aspects of the proposals are described below.

The Coastal Power Plant Expansions - Seawater Cooling

From an engineering standpoint, the two coastal sites have many similarities. Both are the sites of existing power plants, and all additions to the plants would be constructed within the existing site boundaries. Both would use existing natural gas pipelines, with only a 425 foot extension required at Encina and a 750 foot extension at South Bay. A key difference is that a new transmission line would be required at the South Bay Plant but not at the Encina Plant. At both sites, a once-through seawater cooling system would be employed, similar to those in use at the existing plants.

At Encina, the existing plant consists of five generating units with a total power generation capacity of 921 megawatts. The plant pumps water from Agua Hedionda Lagoon through a series of intake structures to cool the condensers. Each intake structure includes a "traveling fish screen," designed to filter out large organisms that could damage the condenser. The seawater is heated by the condenser, and then discharged through an open discharge channel across Carlsbad State Beach.

The proposed project would require an expansion of this system. A new intake structure would be built to supply the new units, and the existing discharge

channel would be enlarged. The current maximum rate of intake of cooling water is about 1326 cubic feet per second (cfs). The combined cycle units would add about 351 cfs of additional cooling water, a 27% increase in total intake flow.

Similarly, at South Bay, bay water is used to cool the five unit plant, which has total power generation capacity of 690 megawatts. The water is pumped through an intake channel and through traveling fish screens into the plant; the heated water is discharged back into the bay through an open discharge channel, which is actually a portion of the South Bay separated from the intake area and the rest of the bay by a jetty.

As with Encina, the proposed project would require expanding this system substantially. A new intake structure would be constructed adjacent to the existing intake structures, and a new outfall pipe would be constructed adjacent to the existing outfalls at the head of the discharge channel. The proposed project would pump an additional 351 cfs of bay water, which represents a 38% percent increase over the current maximum rate of 930 cfs.

The Inland Sites - Cooling Towers

The Sycamore Canyon and Blythe sites are currently undeveloped. The Heber site is adjacent to and would use part of SDG&E's Heber Binary Geothermal Power Plant. Each of the inland sites would require construction of new natural gas pipelines to supply fuel to the new plants, and new transmission line facilities.

SDG&E proposes to use wet mechanical cooling towers to cool the proposed plants at the inland sites. At the Blythe and Heber sites, agricultural drainage water would be the source for cooling water, from the Palo Verde Irrigation District for Blythe, and from the Imperial Valley Irrigation District for Heber. Two water sources are under consideration for the Sycamore Canyon site: the Padre Dam Municipal Water District and the City of San Diego reclaimed water pipeline. These proposals would also require the construction of new water pipelines both from the source to the plant, and from the plant to the discharge location. Discharge locations are under evaluation. At Heber, wastewater would either be treated and discharged into the New River via the Beech drain, or injected into a poor quality deep groundwater aquifer. At Sycamore Canyon, a 17.9 mile discharge pipeline would discharge wastewater into the San Diego River Channel.

III. ENCINA SITE

The Encina Power Plant was constructed in 1953-54. Prior to that time Agua Hedionda lagoon was primarily salt marsh and mudflats, with a variable opening to the ocean. During construction of the power plant, the lagoon was dredged and a permanent opening was established to the ocean to provide a sustainable source of cooling water for the power plant.

The lagoon is divided into three basins by constrictions at the railroad and road crossings. The segments are known as the outer, middle and inner lagoons (see Exhibit E-1). The power plant is sited on the south end of the outer lagoon, closest to the ocean. The outer lagoon occupies 66 acres, with an average dredged depth of 15 feet. The middle lagoon occupies approximately 27 acres. The inner lagoon is the largest at 295 acres, with an average depth of eight feet. Approximately 100 acres of mudflats and 100 acres of salt flats and high marsh border the eastward margin of this segment (Bradshaw et al 1976).

The proposed 460 megawatt combined cycle unit would be sited adjacent to and northeast of the existing units, on a bluff currently occupied by storage tanks, overlooking the outer lagoon (see Exhibit E-2). Two 150 foot high emission stacks would be constructed.

The existing plant pumps cooling water from the outer lagoon, and discharges the water into the ocean. The new unit would also utilize this type of cooling system. A new intake structure would be built in the southeast corner of the outer lagoon, in one of the few areas of the shoreline not covered with riprap, near an existing eelgrass bed. A discharge pipe would extend from this same general location across the lagoon to the discharge basin on the west side of the lagoon. The discharge channel, which consists of two large rock jetties across the beach (see Exhibit E-1), would be widened to accommodate the increased flow.

The Commission's analysis of the potential coastal resource impacts of the proposed combined cycle project at Encina, its consistency with the Coastal Act, and possible mitigation techniques, is divided into the following topics: marine resource impacts, construction impacts, impacts to public access and recreation, visual impacts, consistency with the Local Coastal Program, systems safety, geology, air quality and cumulative impacts.

A. MARINE RESOURCE IMPACTS

The Commission must consider the "compatibility of the proposed site and related facilities with the goal of protecting coastal resources", and "the potential adverse environmental effects on fish and wildlife and their habitats" (Section 30413 (d)(1) and (4)) when evaluating a proposed coastal power plant site and making recommendations to the California Energy Commission.

In addition, the Coastal Act requires protection of marine resources and water quality in Sections 30230 and 30231:

> Section 30230. Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.
>
> Section 30231 (in part). The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment...

This section of the report evaluates the effect of the proposed combined cycle power plant on the marine resources at the Encina site, and the consistency of the proposal with the above policies. Topics covered include the impacts of the expansion of the once-through cooling system and the impacts of increased dredging. The impacts associated with the existing plant operation are discussed to provide a baseline, as well as a basis for inferring potential impacts.

This evaluation first requires an understanding of the current marine biological resources at the site that may be affected by the expansion. These resources are identified in the following environmental setting section.

1.0 ENVIRONMENTAL SETTING

The environmental setting for the proposed project at the Encina site consists of Agua Hedionda Lagoon and the offshore marine environment adjacent to the discharge area.

Agua Hedionda Lagoon

Lagoons and bays such as Agua Hedionda support abundant waterfowl and shorebirds and a unique and abundant assemblage of fish. The fish and

wildlife species dependent upon lagoons and bays are experiencing a continuing loss of habitat, as many of these areas along the California coast become developed and degraded. Therefore, the remaining, functioning systems, such as Agua Hedionda, are increasingly rare and critically important habitat.

In the NOI, SDG&E identifies 29 critical and abundant fish species which are expected to use Agua Hedionda Lagoon. Some of these species are resident in such lagoon ecosystems only (e.g. striped mullet, topsmelt, spotted sand bass and slough anchovy), some are seasonal spawners in Southern California lagoons (e.g. jacksmelt, shiner surfperch), and others are species which utilize the lagoon as a nursery area (e.g. kelp bass, white seabass, California halibut). Fish species unique to these lagoon habitats and found in Agua Hedionda Lagoon include arrow goby, cheekspot goby, shadow goby, longjaw mudsucker, and bay pipefish (J. Allen, personal communication). MBC Applied Environmental Sciences (1990), in a recent study comparing open ocean, semi-protected, and bay habitats (represented by Agua Hedionda Lagoon and Anaheim Bay), found fish density to be "about five times greater in the bays than along the coast." The bay fish assemblage mainly consists of many small fish, mostly juveniles of larger species, while the coastal assemblage consists primarily of larger fish.

Little information on the present natural resources of Agua Hedionda Lagoon was provided by SDG&E in the NOI submittal. Consequently, the staff has relied on Bradshaw et al (1976) for information, with some supplementation from other sources.

Associated with the lagoon in 1976 were the following species: fifty-five species of water-associated birds, 47 terrestrial bird species, 27 mammal species, 4 species of amphibians, 5 lizard species and 8 snake species. At that time, a number of endangered species were found at the lagoon. These species included California least terns, which were nesting on the sand flats at the east end of the lagoon, brown pelicans, which were loafing and foraging in the lagoon, and Belding's savannah sparrows, which were nesting in the salt marsh. The most common water-birds were: scaup, bufflehead, surf scoter, and ruddy ducks; red-breasted mergansers; horned, eared and western grebes; California, western, ring-billed, Bonaparte's and Heermann's gulls; Forster's and Caspian terns; double-crested cormorants; and common coots. Twenty-two species of shorebirds were observed. The most abundant of these were snowy plovers, killdeers, black-bellied plovers, dunlins, dowitchers, godwits, sanderlings and sandpipers. Great blue herons, green herons, and black-crowned night herons were also common.

Shorebird censuses conducted at Agua Hedionda Lagoon in August 1989 and April 1990 by the Point Reyes Bird Observatory (PRBO; unpublished data) confirm that many of these shorebird species are still abundant in the lagoon. Others species common in the PRBO census were black-necked stilt, cattle egret, snowy egret, willet, marbled godwit, and semi-palmated plover. Based on a comparison of the PRBO (1990) and Bradshaw et al (1976) data, there appears to be some species which are no longer found in the lagoon, or are now very rare. For instance, in 1976, 52 snowy plover individuals and 20 nests were

observed at the east end of the lagoon (Bradshaw et al, 1976). In 1989-90 no snowy plovers were sighted (PRBO, unpublished data). The NOI, however, states that snowy plovers may occur within the boundaries of the Encina Power Plant due to areas of bare open ground on site. The CEC should not approve an NOI until SDG&E clarifies the status of snowy plover at the power plant and in the lagoon. Nationally, there has been a 20% decline in abundance of this species from 1978 to 1988, and it is a candidate for listing on the federal Endangered Species List (G. Page, PRBO, personal communication).

The lagoon supports extensive stands of eel grass, Zostera marina, and is estimated to contain over 10% of the eelgrass found in southern California (Hoffman, 1986) (see Exhibit E-1). Only two other areas in San Diego County support eel grass stands. Eel grass is an important component of the habitat in marine wetlands, providing refuge for invertebrate and fish species, food for grazers, and attachment substrate for epiphytic algae and invertebrates. Eel grass is also valuable in stabilizing the lagoon bottom and shoreline and in trapping organic nutrients and inorganic material. These actions contribute to the high productivity of the wetland habitat.

The lagoon also supports a diverse benthic community. These communities include mussels, oysters, polychaetes (worms), crustacea (crabs, shrimp, lobster), and echinoderms (sea stars).

The NOI identifies large areas of Sargassum (a floating macroalgae) in the inner and outer lagoons (see Exhibit E-1). There is no discussion in the NOI of the importance of this algae to the lagoon ecosystem. The Energy Commission should not approve an NOI until SDG&E provides information on the ecological importance of this algae, and possible impacts from siting a new unit at Encina.

Offshore Marine Resources

Giant kelp, Macrocystis pyrifera, grows on rocky outcroppings or other hard pack sediments in subtidal ocean waters off the California coast. Kelp beds can be likened to terrestrial forests with giant kelp assuming the role of the dominant trees. Kelp holdfasts, which adhere the plants to the sea floor, are teeming with invertebrates and algae. The fronds of the kelp plants provide shelter to a myriad of fish and other free-swimming organisms. Many species of fish and invertebrates feed directly on the kelp or on species found within the cover of the kelp forest.

Kelp serves a commercially important harvesting industry. The kelp beds offshore of the Encina power plant, along with other beds in adjacent waters make up Bed 6, which the California Department of Fish and Game leases to Kelco for commercial harvest. A healthy acre of kelp has a commercial value between three and ten thousand dollars, and can be harvested two to three times a year (D. Glantz, Kelco personal communication).

There are three separate stands of kelp, encompassing 370 acres, offshore of the Encina site (SDG&E 1981) (see Exhibit E-3). The extent of the kelp beds varies seasonally and from year to year. The position of the beds has been stable over the last twenty years; however, storms and warm water events such as El Nino have had temporary adverse effects on the kelp beds (Kinnetic Labs 1987, Tegner & Dayton 1987, Lockheed 1983).

2.0 IMPACTS TO MARINE RESOURCES FROM THE ONCE-THROUGH COOLING SYSTEM

The existing adverse impacts to the marine environment at the Encina plant site and the potentially increased impacts as a result of the proposed expansion are largely the result of the plant's once-through seawater cooling system. The existing system takes in as much as 1326 cubic feet per second (cfs) of water, through intakes located in the southwest corner of the outer lagoon. Heated water is discharged into a small cooling pond and through a riprap-lined channel that cuts across the adjacent beach into the surf zone (see Exhibit E-1). The proposed project would pump an additional 351 cfs of water at full capacity, increasing the total capacity of the cooling water system by 27% to 1677 cfs. The percent increase based on actual use may be higher.[2/]

Operation of such a cooling system causes impacts in several ways. First, small passively floating aquatic organisms such as fish eggs, larvae and other zooplankton are killed after being pumped through the intake screens, which are designed to prevent debris from entering the plant and clogging the plant's condensers. The term used to refer to this impact is "entrainment." Second, larger aquatic organisms such as juvenile and adult fish are impinged against the screens and killed. This impact is referred to as "impingement." Finally, the heated discharge creates a thermal plume, subjecting aquatic organisms to heat stress. Species populations can be directly affected, suffering increased mortality rates, or slower growth or reproductive rates. Species populations can also be affected indirectly, through such mechanisms as a reduction in food supplies. These adverse effects would all be amplified by the proposed 27% increased in the amount of cooling water pumped into the plant.

[2/] The Commission believes that the NOI may underestimate the increase in cooling water that would be pumped through the plant as a result of the addition of the proposed combined cycle unit. SDG&E bases their estimate of additional operational flows on the percent change in cooling water flow between the existing plant capacity and the proposed additional capacity. However, in practice, the existing Encina units do not operate at full capacity, whereas full capacity is likely to be reached with the proposed project, since the new unit would be the most efficient to operate (E. Jones, SDG&E personal communication). Actual increases are therefore likely to be between 35 and 59 percent based on flow rates of 1351 cfs (1000 cfs existing operating capacity (SDG&E 1987) plus 351 cfs expanded capacity) and existing actual flow rates of 1000 cfs (SDG&E 1987) and 851 cfs (Jenkins and Skelly, 1989).

The discussion of these cooling system impacts to marine resources that follows is divided into two main topics: the entrainment and impingement effects from the inflow of cooling water, and the thermal plume effects from the discharge of cooling water.

2.1 EFFECTS OF INFLOW OF COOLING WATER

This section discusses several aspects of the impacts of entrainment and impingement of marine organisms at the Encina Plant, including: the existing entrainment and impingement impacts, the additional entrainment and impingement impacts from the proposed plant expansion, the inadequacy of the existing data, and mitigation recommendations.

Existing Impacts from Entrainment

There is a substantial ongoing loss of fish larvae and other zooplankton through the intake system of the existing plant. This conclusion is based on the very general information provided in the NOI, responses to CEC data requests, and the Encina Power Plant Cooling Water Intake System Demonstration (316b study; Dec. 1980). For instance, the 316(b) study estimates that 21.7 percent of the fish larvae, and 6.3 percent of the fish eggs were "cropped" by the power plant daily from a "one-day entrainment zone", considered to be the existing area of potential impact. That study was based on one year's data from 1979-1980.

This existing area of potential impact is extensive: it includes the volume of the outer lagoon and a nearshore ocean water volume extending as far as 26 km (16 mi) up coast and 0.8 km down coast along the littoral zone, and 1200 m (4000 ft) seaward near the lagoon mouth (Exhibit E-4). Zooplankton were "cropped" at a lower rate, but for some taxonomic groups the loss was still substantial. The estimated daily loss from the "1-day entrainment zone" was 2.2% for decapods (crab and shrimp larvae) and 1.3% for mysids (opposum shrimp).

Inadequacy of 316(b) Study

However, the Coastal Commission believes that the 316(b) study inadequately assesses the current impacts from entrainment and therefore limits the ability to evaluate potential additional impacts due to increased cooling system flows. The Commission believes that it is likely that there are currently substantial effects on lagoon populations of fish and invertebrates, and thus indirect effects on wildlife populations of the lagoon, and that these would increase with the addition of a new unit. The CEC should not approve an NOI until SDG&E provides reasonable species-specific information on estimated impacts to local populations of both marine and lagoon fish and invertebrates.

The 316(b) data provides an inadequate basis for assessing the impacts from the operation of the existing plant for several reasons. First, the study measured "average" impacts, and the rate of loss would be different for

different species of fish. For some species the rate is undoubtedly significantly higher than the average. The information available to the Commission does not indicate which species are "cropped" at higher levels. Some species of fish are of more concern than others because they are commercially and recreationally valuable (e.g. California halibut), are an important food source for bird species, including endangered least terns (e.g. topsmelt), or are found only or primarily in lagoons (or bays) like Agua Hedionda (e.g. bay blenny and bay pipefish; Allen, 1990).

Second, the 316(b) study does not address the relative impacts on local species populations from the existing power plant (i.e. percentage of species lost per day). The impact to a local species population of daily entrainment loss depends on such factors as the size of the local or "cropped" population and the total loss to that species population. Some of the species populations affected are undoubtedly lagoon species populations, which are likely to be much smaller and of localized distribution. It is clear from the 316(b) study that cooling water is drawn into the plant from the two inner lagoons during ebb tide. For example, the study states that temperature information indicates that "waters entering the cooling water tunnels after an ebb tide are derived mainly from the inner lagoon segments".

Additional Impact Concerns

Another important concern is the existing power plant's entrainment of species that use the lagoon as nursery habitat. California halibut is one of these species. Abundance of juvenile California halibut in Agua Hedionda has been highly variable from year to year, with high density in comparison with other bay systems in some years (J. Allen, 1990). This high year-to-year variability in comparison with other systems might be a result of power plant operation, and this possibility should be explored (S. Kramer, personal communication).

Additional Entrainment Impacts from Increased Inflow

The proposed combined cycle unit would increase these impacts substantially. SDG&E estimates an additional 8 billion zooplankton, 1.5 billion fish eggs, and 0.2 billion fish larvae will be entrained annually with the additional cooling water. As noted above, it is likely that these numbers underestimate the increased impact from the proposed plant. The increase in cooling water inflow may be as high as 59 percent above current levels.

In addition to direct impacts to species populations, the proposed expanded power plant may indirectly impact species that feed on the entrained organisms. In the NOI, SDG&E identifies 29 critical and abundant fish species which are expected to use the lagoon. Of these, 24 species could be affected by loss of larvae, possibly small juveniles, and eggs. If lagoon or nearshore fish or invertebrate populations are impacted by entrainment loss, indirect effects on those species depending on these populations for food are likely. The endangered California Least Tern feeds on small fish, and would be one of the bird species of most concern. The high fish larvae and egg loss due to

entrainment suggests that least tern food supplies may be affected. It is particularly important for least terns to have an abundant supply of small fish near their nests to assure successful fledging and survival of nestlings.

Existing Impacts from Impingement

The 316(b) study identified the following fish species most frequently impinged (by decreasing order of abundance): deepbody anchovy, topsmelt, northern anchovy, queenfish, shiner surfperch, California grunion, walleye surfperch, round stingray, giant kelpfish, white surfperch, slough anchovy, California halibut, and barred sand bass. Thermal treatments (6 hours every 5 weeks) account for 58% of the impingement loss. The study concluded that the average daily power plant removal was 0.02 percent of the estimated standing crop in the study area.

Additional Impingement Impacts from Increased Flow

Based on the number of fish impinged during the 316(b) study (SDG&E, 1980) and a 27% additional cooling water flow through the new unit, SDG&E estimates that 23,255 additional fish per year would be expected to be impinged. This number should be revised upward to reflect realistic operating conditions.

As discussed above for entrainment, the impact to local populations of some of these fish species is likely to be substantially higher. Of particular concern are those species which are primarily lagoon species, or depend on the lagoon during one part of their life cycle (i.e. as juveniles). The combined effect of impingement and entrainment on lagoon topsmelt and anchovy populations is of particular concern, because of their value as food for least terns and other bird species.

Information Needs

The CEC should not approve an NOI until SDG&E clarifies the status of the snowy plover at the power plant and in the lagoon.

SDG&E Proposed Mitigation for Entrainment and Impingement

SDG&E states in the NOI that during operation, entrainment would be mitigated by (1) low through screen velocities, and (2) fine mesh screens. No information is provided regarding how these techniques would be implemented or how effective they are expected to be.

There are substantial uncertainties associated with these mitigation techniques. Low through screen velocities could result in higher temperatures as the water flows through the plant and higher discharge temperatures. This could result in increased adverse thermal plume impacts. Fine mesh screens have been largely unsuccessful in reducing larval entrainment.

Recommended Mitigation for Entrainment

Several mitigation techniques are available to reduce entrainment. The Coastal Commission recommends that the CEC consider the following techniques for reducing entrainment:

- Cooling Towers, cooling ponds or spray ponds. The use of an alternative, closed circulating cooling system would mitigate all of the marine impacts from the proposed once through cooling system. These systems require additional space or land. Cooling ponds require the most land (460 to 1380 acres for the proposed plant) and may not be practical at the Encina site. Spray ponds require much less land (approximately 23 acres) and might be accommodated at the site. An adverse impact from the spray ponds system is that salt spray is deposited on surrounding vegetation. Cooling towers are the least economical of these systems, since they would reduce the efficiency of the plant and are very expensive to build. Cooling towers also cause significant visual impacts due to their height (perhaps 500 feet).

- Modified Traveling Screens. Standard traveling screens are currently used at the Encina plant's existing units (see Exhibit E-5). These screens filter out large organisms, and are periodically rotated and cleaned with spray. The standard traveling screen does not reduce entrainment (or impingement). However, several modifications have been introduced that may reduce these impacts: 1) a smaller mesh screen, 2) low pressure spray, 3) a lip at the lower edge of each screen panel to cushion impacts, 4) continuous rotation and washing of the screen, and 5) a return conduit to return fish to the Bay. Laboratory studies of long-term survivorship of larval species should be conducted before this experimental technique is adopted.

- Reduced Flow. Reducing the amount of water that flows through the plant would partially mitigate entrainment losses by reducing entrainment in proportion to the flow reduction. Variable speed pumps can be used to time the flow reductions to periods of peak larval abundance. A disadvantage of this technique is that if flow is reduced, the temperature of the discharged water would increase (although less water would be discharged).

Recommended Mitigation for Impingement

There are a number of other techniques available for reducing impingement. All of the techniques listed above to mitigate entrainment would also eliminate (cooling towers, cooling ponds or spray ponds) or reduce (modified traveling screens, reduced flow) impingement. The CEC should also consider these techniques for their value in reducing impingement.

In addition, there are a variety of techniques available that involve physical or behavioral barriers at the intake location to prevent the fish from being impinged. None of these techniques is 100% effective. Additional testing and analysis would be necessary to select the appropriate technique, or combination of techniques for the Encina plant. The CEC should consider the following additional techniques to reduce impingement:

- Physical Barriers. Physical barriers reduce impingement by physically blocking fish from entering the intake area. Techniques include barrier systems, a mesh net or rigid screen placed around

the intake in an area where velocities are low; and porous dikes, a stone breakwater constructed around an intake area.

- Behavioral Barriers. Behavioral barriers reduce impingement by diverting fish from the area using behavioral responses. Bubble curtains is a system in which air released at the bottom of the water column creates a curtain of air bubbles in front of an intake. Mercury lights attract fish, and can be used in conjunction with a fish return system (described below). Strobe lights repel fish. Sonic devices can startle fish with high acoustic output.

- Fish Return System. A fish return system, in conjunction with modified traveling screens, (see above) would reduce impingement by returning impinged fish to the lagoon.

Conclusion - Entrainment and Impingement Impacts

The available data suggests that the Encina power plant is causing a substantial entrainment loss of fish larvae, fish eggs and other zooplankton. The impingement of larger fish is also a concern. The impact to local populations of fish and invertebrates from entrainment and impingement has not been assessed and is potentially serious.

The proposed plant expansion at Encina would increase these impacts substantially. Taken cumulatively, these impacts could have adverse effects on the food chain in the Agua Hedionda Lagoon, since many of the entrained species are important components of the food chain. Endangered species, such as the California least tern, could be affected by a reduction in the availability of small fish.

Additional, comprehensive studies are needed to fully assess the extent of the existing impacts and the additional impacts from the expansion. Mitigation techniques to reduce or eliminate these impacts should be explored. However, it appears that the impacts of entrainment are not fully mitigable. Therefore, based on available information, pursuant to Section 30413 of the Coastal Act, the Commission finds that the Encina power plant expansion project is not consistent with Coastal Act Sections 30230 and 30231, which require protection of marine resources.

2.2 EFFECTS OF DISCHARGE OF COOLING WATER

This section discusses several aspects of the existing and proposed impacts from the thermal plume originating from the power plant's cooling system discharge. Discussed are the physical characteristics of the existing and proposed plume, ecological effects from thermal plumes, limitations on existing data regarding ecological effects from the existing thermal plume, and recommendations for further study and mitigation.

Physical Characteristics of the Thermal Plume

The Encina Power Plant uses water from the Agua Hedionda Lagoon to cool the power units in a once-through cooling system. The discharge is pumped back out of the plant through a channel bounded by a pair of jetties. The discharge

channel extends into the surf zone, which is comprised of intertidal sandy beach habitat. The heated water, or thermal effluent, produces a plume of hot water as it extends offshore from the point of discharge; the area it affects is roughly semi-circular in shape. The water nearest the discharge point is the hottest, a maximum of 20 degrees Fahrenheit (F) above the temperature of the ocean, (the ocean temperature is referred to as the ambient temperature). As the plume extends from the point of discharge, it cools in what can roughly be described as concentric rings. The technical term for these concentric rings is isotherm, which refers to the temperature of water at the perimeter of this concentric ring.

A stratification of temperature occurs both by depth and distance from the discharge site. The detrimental effect of the plume is most intense nearest to the point of discharge (where the water is hottest), and in the upper 2 meters of the ocean (the warmer water is less dense and therefore floats above the cooler ocean water). The size of this area varies seasonally with variation in coastal water temperature, level of plant operation and oceanographic events (such as tides, winds, and currents).

Extent of the Existing Plume. The NOI states that the existing plume area extends over an area of 370 acres when the existing plant is operating at 100 percent. (See Exhibit E-6).

Increased Plume Due to Project. The expansion of the Encina plant would increase the size of the thermal plume substantially. SDG&E expects the thermal plume to increase from its present size of 370 acres to 445 acres. This projected increase in area is based on the percentage increase in capacity of flow, and may be an underestimate, as discussed previously in this section.

In addition to increasing the extent or area of the plume, the proposed project will increase the water temperature at any given point inside the plume, even though the temperature may not increase at the discharge location. This temperature increase results from the outward extension of the heated water, which causes any observed point within the current plume to become part of a hotter region of the proposed project plume. Furthermore, any point that is not now in the plume, but would be covered by the expanded plume, will experience a rise in temperature.

Ecological Impacts of Thermal Effluent

The existing thermal plume has several adverse impacts on the marine biota that are certain to be exacerbated by the expansion of the plant. These impacts include effects on the kelp beds located approximately 1500 feet offshore, impacts to invertebrate and plankton communities in the sandy intertidal zone, impacts to Agua Hedionda Lagoon habitat and cumulative ecosystem effects.

Giant Kelp. Giant kelp is damaged by water temperatures above 68 degrees F, and kelp exposed to temperatures above 73 degrees F rapidly lose its ability

to grow and reproduce (Foster & Schiel 1985). The effect of temperature is variable, depending on other factors such as light and nutrient availability (Foster and Schiel 1985). Summer temperatures (August and September) are 68 degrees F in the near shore zone of the Pacific Ocean in San Diego County. The near-surface part of the water column is subject to a greater increase in temperature, and it is here that the major biomass and photosynthetic surfaces of kelp plants are found. Coupling warmer water with low nutrient availability during the summer subjects the kelp to an extremely harsh environment. The low nutrient availability is a result of a decrease in upwelling (upwelling is a oceanographic event that brings colder nutrient-rich water from the ocean floor to the surface). The artificially introduced temperature stratification from the thermal discharge further suppresses upwelling. This occurs because warmer water is less dense and, therefore, stays at the surface, which inhibits the cooler, nutrient rich water from coming to the top.

Evidence from research at sites offshore of the discharge suggests that the kelp beds have been damaged by the thermal plume from the existing Encina power plant. Approximately 14 acres of canopy showed reduced health as a result of Encina Unit 5 beginning operation (SDG&E 1981). This impact significantly increased SDG&E's estimate that two to three acres had been affected prior to to the commencement of operation of Unit 5. Reduced health in this case refers to one or more of the following: fewer stipes per plant, a decrease in plant density, a loss of buoyancy, "black rot," which appears as darkened patches on the fronds, and excessive encrustation by invertebrates.

The addition of the combined cycle project will increase the area and time that kelp is affected by the thermal effluent. The increase in observed impacts from SDG&E's existing power plant from 2-3 acres to 14 acres leads the Commission to expect further cumulative degradation with the addition of the combined cycle project.

Invertebrates and Plankton. Monitoring reports of the existing Encina plant point out a reduction in abundance and diversity of intertidal organisms south of the discharge point out to 150 meters. Based on this decline in invertebrates in the nearshore sandy intertidal area (SDG&E 1981), it is reasonable to expect that the thermal discharge affects canopy invertebrates and mid-water plankton in a similar manner. (Canopy invertebrates were not studied; however, the effect due to temperature should be the same.) According to NOI projections, the size of the sandy intertidal area impacted is expected to increase as a result of the increased discharge of the proposed project.

Lagoon. The proposed project may have adverse thermal impacts on lagoon species, in addition to impacts to the kelp beds and intertidal communities. Such impacts would be caused by an increase to the lagoon water temperature, which would occur when the warmer water of the thermal plume extends north into the lagoon. These impacts include damaging effects on the eel grass (Zostera marina) community which serves as a fish nursery and habitat for important sport and commercial shellfish and fish. These impacts also include warmer water being discharged offshore and a larger volume of water required

to effect the same level of cooling, consequently increasing the impacts to the kelp and intertidal organisms discussed above. This effect would be seasonally variable (based on peak operation of plant or high seasonal tides) and of short term duration (associated with flood tide).

Cumulative Ecosystem Effects of Thermal Plume

Cumulative effects on the kelp beds, invertebrate and plankton communities, and eel grass beds may result in disturbances to species representing higher trophic levels in the marine food chain including larger fish species, marine birds, and marine mammals. A decline in the lower portion of the food chain will eventually be echoed by reductions in numbers at the top of the food chain. Many species of fish feed on tiny invertebrates and plankton. The fish in turn are prey for other species, including endangered species such as the brown pelican (Pelecanus occidentalis) and least tern (Sterna antillarum). Marine mammals and larger fish of commercial and sport fishing value are examples of other top level predators which may be impacted. A study of the inshore Pacific bottlenose dolphin (Tursiops truncatus), population spanning the last ten years has shown an avoidance of the waters near the area of the thermal discharge. The main survey area included the 32 kilometers of coast from the Encina power plant south to the Scripps pier (Defran, personal communication). This avoidance may be associated with a reduction of suitable prey species.

Existing Data Limitations

The SDG&E NOI concludes that the location of the project at Encina will result in marine impacts that are of little or no significance. The NOI conclusion is based on the 1981 316a report which incorporated only one year of post Unit 5 operation data. (The 316a report was done by SDG&E to demonstrate that the thermal discharge had no impact to the balanced indigenous communities. This study is required under the Federal Clean Water Act, in order that a plant be exempted from the best technology available requirement).

The Coastal Commission believes that this conclusion is not supported by sufficient scientific analysis. For example, SDG&E has not conducted an analysis to determine quantitatively the long term effects of the thermal discharge on kelp, which precludes adequately evaluating the full impact of the thermal plume on the kelp beds.

Recommendations for Further Study of Thermal Plume Effects

The Coastal Commission recommends that the CEC consider the following methods of assessing thermal plume impacts to marine biota:

- Before-After-Control-Impact-Paired (BACIP) analysis would be helpful in addressing changes between control and affected sites from one year to another. This method has been used effectively by the Marine Review Committee (MRC) in studying the impacts of San Onofre Nuclear Generating Station (MRC, 1988).

- o Planimeter analysis could be useful in that it allows a quantitative measure of change in areal coverage of the canopy and density of the plants from season to season. This method has been used by California Department of Fish and Game. Although the scale of this analysis may be too great to accurately determine effects of the Encina power plant thermal discharge, this method would be effective in comparing the kelp beds off Encina to other San Diego County kelp beds.

- o Down-looking sonar would be a valuable addition to the monitoring reports, allowing a study of health and density of the bed (MRC 1989).

Finally many potential areas of impact were not addressed at all in the NOI: impacts to the offshore plankton, subtidal sandy bottom, marine birds and mammals, and kelp forest canopy invertebrates. These impact areas should be thoroughly evaluated.

Mitigation Cited in NOI

The NOI states that thermal plume impacts can be reduced by reducing flow volumes or decreasing the temperature of the effluent. However, the NOI does not explain how this could be achieved. The Commission believes that the techniques available to decrease the amount of effluent or the effluent temperature are infeasible or have attendant adverse impacts that outweigh their benefits.

If the proposed power plant capacity is to be maintained, it appears that the only means of reducing the effluent temperature is by increasing the volume of water flowing through the plant. A larger quantity of inflow would both increase entrainment and impingement and would enlarge the area of the thermal plume. Similarly, while the Encina power plant could be designed to take in a reduced level of flow, the consequence would be a warmer thermal plume.

Recommended Mitigation for Thermal Plume Impacts

The Coastal Commission recommends that the CEC consider the following techniques for mitigating thermal impacts:

- o Cooling Towers, Cooling Ponds or Spray Ponds. The use of an alternative, closed circulating cooling system would mitigate all of the marine impacts from the proposed once through cooling system. This mitigation alternative is described in greater detail in the section "Recommended Mitigation for Entrainment."

- o Offshore Discharge. The impact of the thermal discharge on the sandy intertidal community and kelp beds could be eliminated or reduced if the across the beach discharge was replaced with a properly sited offshore discharge. A discharge pipe could either be routed downcoast of the kelp beds or offshore of the beds. The primary consideration in selecting an offshore location should be avoidance

of impact to the kelp beds. A diffuser system could also be incorporated into the discharge pipe to reduce the thermal plume. However, diffusers can result in increased turbidity (MRC, 1989).

Conclusion - Effect of Thermal Discharge

There is evidence that the existing thermal plume at the Encina site is damaging the offshore kelp beds and intertidal sandy beach community. The additional power plant unit is likely to increase these impacts substantially. In addition, the expanded plume may extend into the outer Agua Hedionda Lagoon during peak plant operation and flood tides, and cause adverse impacts to lagoon species, including eel grass. The cumulative effect of impacts to kelp, intertidal and lagoon communities may result in disturbances to species representing higher trophic levels on the food chain. In addition, the cumulative effect of the proposed expansion in conjunction with the effects of the existing plant are likely to be substantial.

The environmental impacts of the thermal plume cannot be fully mitigate unless a closed circulating cooling system is proposed in lieu of the current proposal. An offshore discharge would reduce thermal impacts if it is located far enough away from the kelp beds.

Given the current proposal to use the once-through seawater cooling system and across the beach discharge, and based on the information available, the Commission finds that the thermal impacts of the expansion project are incompatible with the goal of protecting coastal resources (Coastal Act Section 30413(d)(1)), and that the potential adverse environmental effects on fish and wildlife and their habitats are substantial (30413(d)(4)).

3.0 SEDIMENTATION AND DREDGING IMPACTS

Since 1952, SDG&E has maintenanced dredged the outer lagoon approximately every other year. The biennial dredging is necessary to prevent closure of the lagoon inlet due to sedimentation. During dredging activities to remove the annual accumulation of 120,000 cubic yards of sediment from the lagoon, dredged sediments are deposited on the adjacent beach.

There are two main causes of the sedimentation. The first is the decrease in water velocities from what enters the lagoon by the combined action of the flood tide through the lagoon inlet and the power plant effluent, and what moves out of the lagoon through the lagoon outlet with the ebb tide. This decrease leads to an increase in the deposition of sand that is brought into the lagoon from the existing littoral beach during flood tide (more sand is brought in than is taken out). The second reason for sedimentation is the short jetties which serve to keep the mouth of the lagoon open. The jetties do not extend beyond the surf zone, allowing sand that is picked up by the action of waves to be transported into the lagoon. The middle and inner lagoons have not been dredged since the original date though it is suspected that scour holes and sand bars present in both areas are a result of the plant activities.

Proposed Dredging Increases

The proposed combined cycle generator will result in an increase of 349 cubic feet per second in flow through the outer lagoon. This increased flow will further decrease water velocities in the lagoon, thereby increasing the deposition of sediment in the lagoon and increase the volume of sediment deposited offshore of the discharge. The frequency of dredging in the outer lagoon will increase, and may be as frequent as every 9 months (Sonu, Tekmarine, personal communication). Other impacts that may result from the increased flow of the plant include the need to deepen the lagoon and widen the mouth of the lagoon (Sonu, Tekmarine, personal communication).

Dredging Impacts to Marine Biota

The existing dredging operations at Encina affect the marine biota in a number of ways. The increased dredging requirement caused by the proposed plant expansion would increase these effects. The following section describes the adverse impacts from dredging on both the lagoon habitat and on the offshore habitat.

Impacts to Lagoon. The lagoon is a sensitive and important habitat area that could easily be destroyed by large scale dredging operations. Sedimentation and dredging is potentially detrimental to the balanced indigenous communities in the lagoon including eel grass, fish and benthic organisms. Bradshaw et al. (1976) suggested that the decline in eel grass in the outer lagoon was related to an increase in the dredging of this area.

Dredging affects the lagoon bottom through increased turbidity and destruction of the bottom dwelling organisms. Among benthic organisms that may be affected are commercially valuable species of shellfish such as mussels, oysters and clams. There are also many species of polychaetes (worms), crustacea (crabs, shrimps and lobster), echinoderms (sea stars), and fish that could be affected by the increase in turbidity. The commercial mariculture in the lagoon (mussels) is also subject to impacts from increased turbidity. The sediments to be dredged should be tested for contaminants prior to dredging. Contaminated or toxic soils could negatively impact the marine biota and water quality near the dredged area, as well as the biota and water quality in the offshore marine area where the dredged spoils are deposited.

Impacts to Offshore Marine Communities. The kelp beds, sandy intertidal areas, and benthic offshore areas are subject to effects from sedimentation and turbidity resulting from the deposit of dredged spoils along the beach at Encina. The sandy intertidal area where the dredge spoils are deposited may be harmed due to scouring, sedimentation, or burial.

Turbidity and sedimentation offshore may also be caused by the entrainment of beach sand by the thermal discharge. Offshore turbidity and sedimentation could have a substantial impact on the kelp beds. As witnessed by the effect of San Onofre Nuclear Generating Station, turbidity can substantially impair the development of young kelp plants which are susceptible to reduced light levels (Marine Review Committee 1989). In addition, turbidity in the water column may further decrease water quality impact fish and plankton species.

Jenkins and Skelley (1989), in a study reviewing the role of the existing Encina plant in beach erosion and sediment transport along the coast, surmised that the plant had little overall net effect. A representative of the City of Carlsbad indicated that the City will be submitting comments to the CEC challenging the conclusions of this study (R. Ball, personal communication).

Information Needed on Dredging Impacts

The NOI should not be approved until the following information is developed:

- Further study should be done to address the issues of sediment transport and turbidity increase offshore. Studies should measure current velocities and outflow characteristics of the thermal plume. The rate of sedimentation offshore should also be measured. Tests of the bottom sediments in the area to be dredged should be conducted. Mitigation should be provided if tests indicate contaminated sediments.

Recommended Mitigation for Dredging Impacts

The physical destruction of benthic habitat by dredging is an unmitigable impact. However, there are mitigation techniques available that would (1) reduce turbidity from dredging, or (2) reduce sedimentation, and therefore the need for dredging. The CEC should consider the following techniques:

- Turbidity Curtains. These devices are used to protect sensitive habitat such as eelgrass, from turbidity during dredging operations.

- Dredging Schedules. It may be possible to reduce turbidity from dredging by restricting the operations to certain times of the year or tidal cycles.

- Sand Bypass System. A sand bypass system could be used to minimize the flow of sand into the lagoon.

- Modified Lagoon Opening. It may be possible to modify the entrance to the lagoon to reduce sediment transport. An enlarged or deepened entrance would reduce flow velocity and therefore sedimentation, although such modifications could result in other undesirable adverse effects. A reconfigured lagoon opening might also reduce sedimentation.

Conclusion - Dredging Impacts

The current biennial dredging program and the increased dredging requirement that would result from the plant expansion at Encina cause a number of adverse impacts to marine biota. Within the lagoon, benthic organisms are destroyed and turbidity causes impacts to eelgrass and other organisms. Offshore, the deposit of dredged spoils along the beach at Carlsbad causes turbidity and sedimentation, which affects the kelp beds, sandy intertidal areas and benthic offshore areas.

Mitigation is available to reduce dredging impacts, however, it is unlikely to reduce the impacts to a level of insignificance. Therefore, the Commission finds that based on the available information, the proposed dredging would result in unavoidable adverse impacts, inconsistent with Sections 30230 and 30231 of the Coastal Act.

B. CONSTRUCTION IMPACTS

The proposed Encina power plant expansion would have construction related impacts in addition to those impacts resulting from operation of the expanded plant. Several of these construction impacts may significantly affect coastal resources. Plant construction will cause the earth moving, habitat displacement, erosion, noise and other disturbances, which may result in short and long-term impacts to coastal resources. The following section addresses these potential impacts from construction as they affect or conflict with: the overall goal of protecting coastal resources (Coastal Act Section 30413(d)(1)); other coastal dependent land uses (Section 30413(d)(2); and fish and wildlife and their habitats (Section 30413(d)(4)).

Impacts to Endangered Species

Construction of the additions to the Encina plant may have adverse impacts on endangered species in the area. According to the NOI, the least tern may nest within the site area but has not been observed there for the last few years. The snowy plover may use the plant site or surrounding area. Disturbance to either of these species if they nest near the construction area during breeding could be a significant negative impact.

Other birds, such as gulls, terns, and brown pelicans have been observed roosting on buildings on the plant site. These roosting sites would be temporarily disturbed during construction. The San Diego horned lizard, the black-shouldered kite, and the Pacific pocket mouse, all of which are candidate or protected species, are found in the surrounding areas and may use the plant site. According to the NOI, impacts on these species from construction will not be significant because there is little habitat available at the plant site. Other endangered, threatened, or candidate species that may use the area near the plant site include orange throated whiptails, light-footed clapper rails, bank swallows, California gnatcatchers, and Belding's savannah sparrows. There may be impacts from construction noises or increased human activity on species in adjacent areas. In order to address these potential impacts, SDG&E needs to determine whether these species inhabit the site or adjacent areas at any time.

Erosion and Turbidity

Impacts from erosion resulting from construction of the site is another area of potential concern. Diversion of storm water runoff from the site to natural drainage channels during construction could result in erosion. The potential for erosion of soils underlying the site is severe, but the site is predominantly paved and developed, so little natural soil is exposed. Therefore, it does not seem probable that construction activities will cause significant impacts.

Construction of the intake and discharge pipes and placement of the discharge pipe across the lagoon will increase turbidity. Diversion of storm water may result in deposit of sediments into the lagoon. An increase in sediments would result in a need for more dredging, which would increase turbidity. Turbidity reduces the amount of light that reaches the marine plants and can therefore result in lower levels of growth. The short term increases in turbidity may have an adverse impact on eelgrass in the area near the Encina plant, and there may be additional adverse effects if the turbid mixing resuspends toxic sediments. According to the NOI, there would be a permanent loss of some benthic habitat from the increase in turbidity. These possible effects from turbidity on marine biota are discussed in more detail in the section of this report on marine resource impacts.

SDG&E proposes to construct a cofferdam to allow construction on dry land. The cofferdam would reduce turbidity resulting from the construction of the intake and discharge facilities because it would prevent waves from reaching the construction site. Further studies are being conducted by the Energy Commission on this issue, and this information is needed to assess the impacts adequately.

Impacts to Neighboring Land Uses

There will be some minor impacts on neighboring land uses during the period of construction. These impacts include increases in noise, visual impacts, dust generation, ground disturbance, and vehicular traffic increases. SDG&E proposes to use mitigation measures including noise reduction equipment on machinery, site screening and cleanup, dust control measures, temporary erosion control and drainage systems, limited hours of construction, carpooling, and parking offsite for construction workers. These measures should adequately mitigate the impacts.

Recommended Mitigation for Construction Impacts

The Commission recommends that the Energy Commission require all of the mitigation measures for construction impacts that are discussed in the NOI. These measures include: construction of a cofferdam to control turbidity during construction of the intake and discharge structures, noise reduction equipment on machinery, traffic control measures, dust control measures, visual screening, erosion control measures, provision of new perch sites for birds, and dedication of open space areas offsite to replace resources that can not be protected on the site. If endangered species are found on the site, the Commission may determine that it is not possible to adequately mitigate the impacts. The additional information listed below is needed to determine whether the mitigation measures will be adequate. The Commission recommends that the Energy Commission consider the following mitigation measure in addition to those listed in the NOI:

- Construction schedules timed to minimize adverse impacts on benthic communities and other marine resources from construction of the impact and discharge structures.

Additional mitigation measures may be recommended by the Commission if the information provided by SDG&E indicates that the measures they intend to provide are not adequate.

Additional Information

SDG&E must satisfactorily respond to the information requests concerning construction impacts, which include: 1) data on the endangered, threatened, or candidate species that use the site; 2) measures to mitigate the impacts on these species; 3) impacts from the construction of intake and discharge pipes; 4) seasonal patterns of bird and fish use near areas where the intake and outfall pipes will be constructed; 5) impacts to threatened, endangered, or candidate species in the vicinity of the Encina site; 6) mitigation measures proposed for impacts to species that are in the vicinity of the site; 7) the size of permanent loss of benthic habitat; and 8) potential impacts from dredging and dredged spoils disposal. The Commission can not make a determination of the significance of these impacts until it has received all of this information.

Conclusion - Construction Impacts

In summary, more information is needed to assess the extent of impacts from construction. Some of the impacts - erosion, visual impacts, dust, groundwater impacts, and disposal of dredged spoils - are either expected to be minimal or should be adequately mitigated with the measures proposed by SDG&E. The most serious potential impacts from construction are to endangered or threatened birds from harm to their nesting sites and to marine habitats from turbidity. These impacts would be mitigated with construction schedules that avoid times when the most harm would result, and a cofferdam to reduce turbidity. Additional information on the extent and timing of use of the site by various species is needed to evaluate how serious the impacts will be and whether the proposed mitigation measures will be adequate. The California Department of Fish and Game and the U. S. Fish and Wildlife Service should be consulted on this issue. The Commission finds that if endangered species are found on the site and the impacts are not adequately mitigated, the project would be inconsistent with coastal resource protection policies of the Coastal Act.

The Commission recommends that the Energy Commission not approve an NOI that identifies the Encina site as an acceptable site unless further study has been conducted to determine whether any of the above mentioned endangered, threatened, or candidate species inhabit the site or adjacent sites and may be affected by construction impacts. If one or more species use the site or surrounding areas, the NOI should not be approved for this site unless construction schedules and/or locations have been developed that will avoid impacts on these species.

C. IMPACT ON PUBLIC ACCESS AND RECREATION

The proposed expansion project at the Encina site has the potential to affect the public's use and enjoyment of the waterfront in the vicinity of the site. There are two ways that the project may impact public use and enjoyment of the area: through impacts to physical public access and recreational uses in the vicinity of the project site, and through visual impacts to the public's aesthetic enjoyment of the water areas. The following section addresses the proposed expansion project's impacts to public access and recreation. The aesthetic impact of the expansion project are addressed in the subsequent section, Visual Impacts (Section III-D).

Policy Setting

Section 30413(d)(2) of the Act requires the Commission to consider the impacts of power plant construction and expansion upon coastal dependant land uses, including coastal recreational facilities. In addition, sections 30210 through 30214 of the Act requires the protection of public access to coastal areas, and section 30221 seeks to protect oceanfront land that is suitable for recreational use and development.

Existing Public Access and Recreational Uses

The site of the existing Encina facility is a prominent inland bluff overlooking the outer and middle basins of Agua Hedionda Lagoon (see Exhibit E-7). A wide variety of water-related recreational activities occur in the three basins of Agua Hedionda Lagoon and along the ocean shoreline adjacent to the plant.

The middle and inner basins of the lagoon provide the only site of active use of a coastal lagoon in north San Diego county for recreational purposes. The "Whitey's Landing" area of the inner basin is developed as a support area for water skiing, and additional support facilities for water skiing are available in the Bristol Cove area of the inner basin. The inner basin is also a popular windsurfing site. Finally, there is a developed YMCA camp on the western edge of the middle basin which is oriented toward water recreation, including canoeing and sailing.

While active recreational use of the outer basin of the lagoon is limited, due to the continued dredging of the outer basin and due to the presence of a commercial aquaculture facility, there is a small public fishing beach on the western shore of the outer basin. This beach is a very popular fishing spot, and is also used as for parking for surf fishing along the ocean shoreline across Carlsbad Boulevard.

The majority of the ocean shoreline adjacent to the Encina facility to the north and the south is part of state-owned Carlsbad State Beach, a developed beach recreation area. A 1,950 foot long section of the beach immediately adjacent to the plant is owned by SDG&E, but there is a public access easement

across this segment of the beach pursuant to Coastal Development Permit No. A-78-75, issued in December 1975, which authorized the approval of the Unit 5 expansion. As a result, continuous lateral public access is available along the beach, and the beach is heavily utilized.

The importance of these recreational areas is underscored by the relative scarcity of similar recreational areas in the immediate area. With respect to the recreational boating activities in the middle and inner basins of Agua Hedionda Lagoon, similar facilities are not available at any site in north county, with the exception of Oceanside Harbor, about six miles to the north. The nearest areas suitable for recreational boating to the south are located at Mission Bay, about 35 miles to the south. Recreational use of the remaining coastal lagoons of north county is limited primarily to passive recreational uses to protect the scarce and sensitive resources of the lagoons.

Similarly, the sandy beaches of Carlsbad State Beach have become a relatively scarce resource in north San Diego County. As as result of a variety of physical factors including the damming and mining of coastal streams and the construction of the Oceanside Harbor jetties, the beaches of north county have become relatively denuded of sand. The beaches located northerly of Swami's Beach Park, about seven miles southerly of the project site, to approximately the Ponto area of Carlsbad State Beach, about two miles southerly of the project site, have been stripped of sand, and only a cobble sill remains. Sand areas are only found year-round below the high tide line. While some sand does accumulate on the beaches during the relatively low wave-energy summer months, the formerly wide sandy beaches of past years have disappeared.

The beaches adjacent to the Encina Facility, however, have appeared to retain a greater quantity of sand than many of the beaches in the area, particularly the beaches to the south. The retention of sand at this location appears to result from the jetties for the Encina discharge channel functioning as groins. However, since some sand remains deposited downcoast from the jetties, some natural processes augmented by periodic disposal of dredged material may play a part.

At three million visitors per year, beach attendance at the State Beach adjacent to Encina is high relative to other north county beaches. For example, although Ponto Beach has greater parking availability than the beaches nearer Encina, recreational use of the Encina-area beaches is much higher. The high usage in this location is probably attributable to the sandy beach.

Finally, the Agua Hedionda LUP has designated the actual open water areas of the lagoon as "Open Space." In addition, several areas located in the area subject to the LUP have been designated for commercial recreation, including the "Whitey's Landing" area discussed above, or for "Travel Services," which also provides for visitor serving commercial uses. The Travel Services designation has been applied to two large parcels on the south side of the lagoon, adjacent to Interstate 5.

Impacts to Public Access and Recreation from Existing Plant

The existing discharge jetties and channel have a negative impact on physical access along the shoreline adjacent to the plant. The entire discharge area is fenced off with a chain link and barbed wire fence from the rest of the beach for safety reasons. The fenced off area interrupts lateral access along the beach, requiring beach users to use the sidewalk on Carlsbad Boulevard to get around the structure. In addition, the jetty structures raise safety issues for swimmers and surfers, similar to other ocean jetties. The recreational use of the middle and inner basins does not appear to be precluded or directly impacted as a use type by the presence of the facility. The only recreational use of the outer lagoons is sportfishing.

Impacts to Public Access and Recreation from Plant Expansion

The Commission must determine the potential for impacts of the expansion of the Encina site upon these coastal dependant recreational uses. The NOI indicates that the expanded facility will include expansion of the existing ocean outfall and intake structures. Expansion of either the outfall jetty structures or the intake will result in both temporary construction period impacts to beach visitor use, through the storage of construction equipment and materials on or near the beach, and possible permanent impacts resulting from the displacement of sandy beach areas by the expanded structures. Any extension of the intake and outfall structures would also impact the use of open water areas currently used for water oriented recreation activities.

Recreational fishing in the outer basin of the lagoon would also be impacted during the construction of the expanded facility. The NOI indicates that new intake structures will be constructed in the outer lagoon. Although details of the construction methods and areas are not given, it is anticipated that some displacement, even if only temporary, would occur. The expansion should not have direct impacts upon the recreational use of any of the open water areas of the middle or inner lagoon.

Recommended Mitigation

The Commission recommends the following mitigation:

- To mitigate for the impacts resulting from the expansion of the outfall structure, the Energy Commission should consider requiring that the open across the beach discharge channel be replaced with an enclosed outfall structure, which could be installed under the beach, eliminating the public access disruption.

- To mitigate for construction period impacts to recreational fishing and other recreational uses in the area, the Energy Commission should require that the construction be scheduled during periods of low recreational usage.

Conclusion - Public Access and Recreation

While the existing Encina facility is a clearly felt presence in this area, it does not appear to affect the availability of the beach for recreational uses. The beach is well used, as a result of several factors: the availability of beach sand at this particular location, the availability of parking, and the availability of beach support facilities, such as restrooms, showers, etc. The Commission therefore finds that, with the exception of the construction period impacts on recreational fishing and the displacement of sandy beach area potentially resulting from the outfall structure expansion, the proposed expansion will not impact public access.

D. VISUAL IMPACTS

Section 30251 of the Act states, in part:

> The scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural land forms, to be visually compatible with the character surrounding areas, and, where feasible, to restore and enhance visual quality in visually degraded areas.

In addition, Section 30413(d)(3) requires the Commission to consider the impacts of the proposed facility upon the aesthetic values of the area.

Existing Visual Environment

The Encina facility with its 383 foot high stack is the single dominant feature upon the landscape of the Agua Hedionda Lagoon area. The facility is visible not only from beach areas, but from virtually the entire Agua Hedionda Plan area and from outside the coastal zone to the east. Although the coastal lagoons of San Diego County are, generally speaking, areas of great visual interest and sensitivity, Agua Hedionda Lagoon has been visually degraded to some extent by the presence of the Encina Power Plant and associated transmission structures. Views along Carlsbad State Beach are disrupted by the chain link and barbed wire fence that encloses the outfall structure.

The visual interest and importance of the area is reflected by the fact that numerous vista points and scenic roadways are identified in the certified Agua Hedionda segment Land Use Plan (LUP). The LUP designates Carlsbad Boulevard as a scenic roadway, and requires additional landscaping on development adjacent to Carlsbad Blvd. to screen development from the roadway. In addition, the LUP requires additional design criteria for development adjacent to the roadway, although no specific criteria are stated. The Encina site is also visible from Park Drive, which has also been identified in the LUP and the City of Chula Vista General plan as a scenic roadway. Finally, Adams Avenue and El Camino Real are identified as potential scenic corridors in the City's general plan.

The LUP also designates a number of vista points throughout the Agua Hedionda area. The Encina Site is most visible from two unnamed vista points on the north shore of the outer and middle basins, but, due to the size of the 383 foot stack, the Encina structures are visible from all north shore vista points. Views to the ocean are also available from a number of sites on the south shore, including the projected alignment of Cannon Road. Views from sites surrounding the lagoon are protected under Policy 8.4 of the Agua Hedionda LUP, which requires all development to be consistent with the Scenic Preservation Overlay Zone. This overlay zone seeks to protect the scenic qualities of the coastal area through the regulation of signs, landscaping, setbacks, building bulk, etc. Development controls are applied through the special use permit process.

Given the size of the existing structure with its 383 foot stack, and its prominent location near the shoreline, the existing plant has had a significant adverse impact upon the visual environment of this coastal area. The outfall structure, enclosed in a chain-link and barbed wire fence, detracts from the visual enjoyment of the shoreline area.

Visual Impact of Proposed Expansion

The plant expansion would result in the addition of two 150 foot high stack structures, and a 75,000 square foot building. These new structures would increase the massiveness of the facility. While these 150 foot high stack structures and new building would represent only an incremental increase in the level of impact upon the visual resources of the area, the impact will nevertheless be significant.

Recommended Mitigation

The Commission recommends that the Energy Commission consider the following measures, which would partially mitigate the visual impact of the project:

- The application of appropriate landscape screening measures, increased setbacks and the application of appropriate colors and textures to the proposed structures would, to a limited extent, reduce the visual impact of the project.

- Impact avoidance, through lowering the height of the structures, may also reduce the level of impact from some vantage points, and should be evaluated (see information needs, below).

Information Needs

The following information should be provided before an NOI is approved:

- Details on the proposed surface treatment for the power plant stacks. In addition, the effectiveness of surface treatment in reducing visual impacts should be evaluated.

- An analysis of the feasibility of lowering the stack height. The benefits of lowering the stack height should be weighed against the costs in terms of air quality impacts, including a consideration of alternative means of offsetting the air quality impacts.

Conclusion - Visual Impacts

The Commission finds that, given the size of the proposed structures and the visually prominent nature of the site, the visual impacts of the development are not fully mitigable and that some unmitigable significant impacts to the visual environment are likely to occur. For these reasons, the Commission finds that the impacts resulting from the expansion are not consistent with Section 30251 of the Act. Furthermore, the Commission finds that the cumulative visual impact of the proposed expansion in conjunction with the existing plant is significant, and is inconsistent the Coastal Act.

E. CONSISTENCY WITH LOCAL COASTAL PROGRAM

Section 30413(d)(5) of the Coastal Act requires that the Commission consider the consistency of new power plant projects with the certified Local Coastal Program (LCP) for a given area. The site of the combined cycle project is located in an area that is subject to the Agua Hedionda Segment Land Use Plan, the certified Land Use Plan (LUP) for this portion of the City of Carlsbad. Carlsbad submitted implementing ordinances for the Agua Hedionda Segment, which the Commission rejected, indicating that the ordinance could be certified with suggested modifications. Because the City did not accept the modifications, the Commission's approval with suggested modifications has expired (Calif. Code of Regulations, Title 14, Section 13542). Thus the City does not have a certified LCP for this segment. Therefore, the Commission's review of LCP consistency, under section 30413(d)(5) is limited to review of consistency with the certified LUP.

Land Use Plan

The site of the Encina Power Plant, which occupies the entire south shore of Agua Hedionda Lagoon west of the freeway, is designated "U" or "utility" on the land use maps of the certified LUP. The LUP does not contain any specific policies regarding the Encina facility itself. Other undeveloped parcels owned by SDG&E but outside the Encina Power Plant facility are the subject of detailed, specific land use policies in the LUP. In addition, in its approval of the Agua Hedionda LUP, the Commission certified the Encina Specific Plan (Specific Plan #144) along with three amendments.[3/]

The certified LUP included Ordinance No. 9268, creating the P-U (Public Utility) zone, which was created to provide an area for public utility uses. The only uses allowed in the P-U zone are generation and transmission of electrical energy, storage of fuels, agriculture and open space. The Ordinance required the completion of the Specific Plan #144. The Specific Plan, as amended, seeks to regulate the physical development of the Encina site, requiring the identification of all buildings, tanks, transmission facilities or other structures, and regulating lot coverage of the site. In addition, specific minimum landscaping and parking standards are listed in the plan.

3/ In its review of the initial submittal of the Agua Hedionda LUP, the Commission also considered the Specific Plan and three amendments [144(A), 144(B) and 144(C)]. Although there may have been subsequent amendments that do limit expansion, no portion of the Specific Plan or any of the three amendments certified by the Commission contain such provisions. No additional Specific Plan amendment provisions have ever been submitted to the Commission for review and certification.

The proposed expansion of the Encina facility does not appear to conflict with the provisions of Specific Plan #144. Although, due to the specific plan requirement for a detailed site plan of all structures, the plan would have to be amended to include the expanded facilities, neither the Agua Hedionda LUP or the Encina Specific Plan appear to prohibit or further regulate the continued use or expansion of the facility.

Conclusion - Local Coastal Program

Both the Agua Hedionda LUP which includes the Encina Specific Plan, subject to Amendments A, B and C, designate the site as appropriate for power generating facilities. While other actions may have been taken by the City of Carlsbad limiting the development of the site, no such actions have been reviewed by the Commission and are not part of the certified Land Use Plan for the site. Therefore, pursuant to Section 30413(d)(5) of the Coastal Act, the Commission finds that the proposed project is consistent in concept with the use designation in the certified Land Use Plan, but that an amendment to Specific Plan No. 144 would be necessary to include the expanded facilities.[4/]

4/ Section 30515 of the Coastal Act allows that for a person proposing an energy facility development may file a request for an amendment to a certified local coastal program, directly with the Coastal Commission, if the following two conditions exist:

(1) That person has first filed the proposed amendment with the local government, and the local government has not amended the certified local coastal program; and

(2) The purpose of the proposed amendment is to meet public needs of an area greater than that included within such certified local coastal program that had not been anticipated by the person making the request at the time the local coastal program was before the commission for certification.

F. SYSTEM SAFETY

Section 30413 of the Coastal Act states that the Commission must address the compatibility of a proposed power plant site and related facilities with the goal of protecting coastal resources, and must consider the potential adverse environmental effects of a proposed site on fish and wildlife and their habitats. In addition to the addressing direct impacts on coastal resources from the daily operation of the proposed plant, protecting coastal resources involves minimizing the risks of accidents and spills with the potential to cause damage to the coastal environment. This is the area of system safety.

With the expansion of the Encina power plant would come an attendant increase in the potential for accidents at the facility such as oil spills from increased tanker deliveries or releases of hazardous chemicals. The Coastal Act requires that protection against the spillage of crude oil, gas, petroleum products, or hazardous substances be provided in relation to any development or transportation of such materials, and that effective containment and cleanup facilities and procedures be provided for accidental spills that do occur (Section 30232). Furthermore, the Coastal Act requires that maximum public access be provided "consistent with public safety needs" (Section 30210).

The following section of this report addresses the consistency of the proposed power plant expansion with Coastal Act policies on protecting natural resources and public recreational opportunities from spills of oil or hazardous chemicals.

1.0 OIL SPILLS

The proposed project will result in an increased risk of oil spills by requiring additional transfers into the facility via marine tanker.

Fuel Oil Use and Transportation

Although the primary fuel used at the proposed Encina plant would be natural gas, supplied from an existing natural gas pipeline to the site, SDG&E proposes to use distillate No. 2 low sulfur fuel oil as backup fuel. The proposed Encina site includes on-site storage in a new above-ground tank of a 10-day supply (7,000,000 gallons). The NOI states that existing tanker facilities will be used to deliver this fuel to the site, and that there will be no changes to tanker docking facilities "except increased use."

At present, fuel oil is delivered to the Encina plant by marine tanker. The terminal is located approximately 3,000 feet offshore of the existing plant, and consists of a seven-point mooring with a 20" submarine pipeline that connects to storage tanks on shore. According to SDG&E, vessel deliveries have averaged five per year since 1986, and the proposed project would probably increase deliveries by "typically one per year." While this increase appears inconsequential, it represents a 20% increase in tanker deliveries for

the power plant facility. Because of the potential environmental devastation from an oil spill, the Commission is concerned about any increase in tanker traffic.

In addition to deliveries into this facility, SDG&E ships oil out of this terminal to other company facilities. It is not known whether deliveries out of this facility would increase as a result of the proposed project; the Commission has requested information on this issue.[5/] It can take up to two days to unload a vessel at the terminal (up to 500,000 barrels per delivery with a maximum flow of 14,000 barrels per hour).

It is unclear from the NOI and and other SDG&E submittals whether the ocean depth at the offshore marine terminal is 50 or 80 feet. The Commission submitted a request for clarification to SDG&E.[6/] Routine, accurate measurement of the marine terminal depth is essential to assure that sufficient water depth will be available to vessels using the facility.

Potential Impacts from an Oil Spill

The increase in oil deliveries combined with the movement and transfer operations involved in oil movement out of the facility would increase the risk of oil spillage. An oil spill at or near the Encina Marine Terminal could severely impact the biological resources at the Agua Hedionda and Batiquitos Lagoons, offshore kelp beds, and heavily used recreational beaches.

Agua Hedionda Lagoon contains extensive eelgrass beds, which provide protection to juvenile fish and crabs. An aquaculture operation raises mussels and oysters in the outer lagoon near the power plant. Less than four miles south of the marine terminal is Batiquitos Lagoon, over 50 square miles of valuable habitat for migratory shorebirds and ducks. Over 55 bird species, including: Diving ducks, gulls, grebes, pelicans, egrets, herons, terns, and other fish-eating birds use the lagoons for feeding, resting, and nesting. Both the endangered California Least Tern and the Belding's Savannah Sparrow nest in the lagoons, which are part of the complex of coastal wetlands that serve as links in the Pacific Flyway. There is an extensive kelp bed offshore of the Encina plant, as well as commercial and sport fishing for a wide variety of species. (See Section III-A, Marine Resource Impacts, for a more detailed description of the biological resources that could be impacted by an oil spill related to the proposed project.)

5/ California Coastal Commission Data Request No. 33a; response due August 13, 1990.

6/ California Coastal Commission Data Request No. 30; response due August 13, 1990.

An oil spill at or near the Encina terminal could also heavily impact recreational beaches and marinas in the Carlsbad area. These include Carlsbad City Beach, Carlsbad State Beach, and South Carlsbad State Beach, used for swimming, surfing, skin diving, picnicking, camping, and fishing. (For more details on recreational facilities in the proposed project vicinity, see section III-C, Impact on Public Access and Recreation.)

In addition to the threat of a spill at the marine terminal, a spill at the plant itself could result in devastation of the lagoon. The bermed areas around the fuel oil tanks may be drained through a gate valve inside the berm which, when unlocked and opened, drains directly to the lagoon. While there are procedures that are intended to prevent the drainage of oil from bermed areas into the lagoon, such procedures were not adequate to prevent the large oil spill from the Shell Martinez refinery into the adjacent wetland, in 1988.

Recommended Mitigation for Oil Spills Risk

The Commission recommends that the CEC consider the following means of reducing the risk of an oil spill:

- Shipments From The Terminal. The Encina Marine Terminal should not be used to ship out oil that has previously been shipped into the Terminal.

- Alternative Oil Transportation. Alternative methods of oil transportation such as the use of pipeline rather than tankers should be given serious analysis. In this regard, the Coastal Act states that pipeline transport of oil is generally both economically feasible and environmentally preferable to other forms of crude transport (30265).

- Alternative Backup Fuels. The possible alternatives to oil as a backup fuel should be examined. The Energy Commission staff is investigating propane, methanol, ethanol, liquified natural gas (LNG), and other alternatives, and expect to have an alternative fuel report published by early September. Some of these materials, such as LNG, may have other disadvantages in terms of transportation safety.

Informational Needs - Oil Spills

As a condition of filing an Application for Certification for this site, the CEC should require that SDG&E submit detailed information on the ability of the Terminal to prevent and address an oil spill. The Commission staff is available to consult with SDG&E and CEC staff. The CEC should require that SDG&E prepare the following reports:

- Terminal Operations Manual. This manual would describe all operational procedures that attempt to assure the prevention of oil spills. At a minimum, the manual would address water depth at the facility, mooring procedures, availability of tug assistance, and other spill prevention procedures.

- o Oil Spill Contingency Plan. This plan would address the spill containment and cleanup procedures, equipment, training for response with onsite and cooperative equipment, and response to worst case accidents. The plan would address the following aspects of response to oil spills, particularly worst case accidents: notification; cleanup approach and oil characteristics; personnel; command, control, and communications; logistics, training and response drills, waste disposal; and tanker vessel contracts with spill cooperatives.

Conclusion - Oil Spills

Pursuant to Section 30413 of the Coastal Act, the Commission finds that, in the absence of mitigation, the increased risk of oil spills due to the proposed project is inconsistent with the requirements of Coastal Act Section 30230 to protect the marine environment, Section 30232 to protect against oil spills, and Section 30210 to protect recreational opportunities. The Commissions recommends that the Energy Commission require that SDG&E evaluate and provide the mitigation measures described above, and provide the information listed above.

2.0 OTHER HAZARDOUS MATERIALS

The project would increase the transportation and storage of toxic and hazardous materials at the proposed Encina site. Several of these chemicals used at the plant are extremely hazardous, and pose risks to workers, nearby residents, recreational users and wildlife resources if released in sufficient quantities either through transportation accidents or mishaps on the site: ammonia, chlorine, cyclohexylimine, formic acid, sulfuric acid and hydrazine. Most of these chemicals are used in the water treatment process. Ammonia is used in the selective catalytic reduction process.

The NOI cites a worst case scenario of 197 additional truckloads of toxic and hazardous materials to and from the site per year as a result of the proposed project. This population at risk includes 7,712 within 1.5 miles of the site, and 40,889 within 3.1 miles of the site. The site is also immediately west of Interstate 5, and immediately east of heavily used Carlsbad State Beach. This is a substantial population at risk. Though not all of it is in the coastal zone, the Commission believes the CEC should evaluate the risks carefully.

The NOI states:

> Compliance with industry design codes and safety standards will minimize the risk to public health from storage and use of these chemicals.... Toxic and hazardous materials will be stored, handled, and disposed of in accordance with applicable laws, ordinances, regulations, and standards.

Information Needs - Hazardous Materials

While the NOI states that alternatives are available for some of the materials, it claims that these pose similar hazards, are not as effective for

their intended purpose, or are more expensive to use. However, the NOI does not specify which substances were considered or describe the positive and negative attributes of those substances. This information is necessary for a thorough evaluation of the safety of this facility.

For example, alternative, less hazardous substances are available to be used in place of anhydrous ammonia and gaseous chlorine. With aqueous solutions for example, the rate of introduction into the environment is reduced substantially, and solid chlorine would reduce it even more. In addition, engineering systems can reduce the risk of release, or remove the need for these substances. These alternatives should be thoroughly investigated.

Simply following existing laws, ordinances, regulations, and standards may not be adequate mitigation for such adverse impacts. As is the case with oil spills, the Commission does not have enough information to assess adequately the adverse effects that may occur from the proposed project.

Recommended Mitigation - Hazardous Materials Risk

The NOI states that the proposed Encina plant "will develop and implement [a] Risk Management and Prevention Plan and arrange with local emergency agencies for services in the event of an accident or emergency." The Commission recommends that the CEC require preparation of this plan as a condition of filing the AFC for this project.

Conclusion - Hazardous Materials

The Commission finds that additional information is needed to adequately assess the risks of a hazardous materials release. The information needs are outlined above. Furthermore, based on the information available to date, the Commission finds that the project is not consistent with Section 30232 of the Coastal Act.

G. GEOLOGY

Under Section 30253, the Coastal Act states the following:

New development shall:

(1) Minimize risks to life and property in areas of high geologic, flood, and fire hazard.

(2) Assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs.

An analysis of the geologic issues is also required under Section 30413(1) and 30413(7) of the Coastal Act, which require that the Commission consider the compatibility of a proposed Encina power plant site with the goal of protecting coastal resources and other matters as the Commission deems appropriate and necessary to carry out the provisions opf this division, respectively.

Geologic Setting

The subject site is located in erosional remnants of a coastal terrace surface. In the Encinitas-Carlsbad-Oceanside area, three major drainage systems dissect the coastal terraces and terminate in brackish water lagoons. The Encina site is located on the southern side of the Agua Hedionda Lagoon adjacent to its outlet to the Pacific Ocean. Agua Hedionda Creek is the principle drainage course that provides ephemeral fresh water to the lagoon. To the north, Buena Vista Lagoon and Creek are an analogous, but slightly smaller lagoon and drainage system. To the south, a larger drainage basin, drained by San Marcos and Encinitas creeks, terminates in the more extensive Batiquitos Lagoon.

The Encina Power Plant site has been modified by considerable grading that is reflected in the current topography. Topographic relief across the site generally ranges from mean sea level (msl) adjacent to the Agua Hedionda Lagoon along the northern end of the site, to a high approximately 65 feet msl at the southern end of the site. The stratigraphy within 10 km of the site is characterized by Eocene aged marine and nonmarine sediments onlapping a high relief, unconformable, contact with basement rocks of the Santiago Peak Volcanics or granitic rocks of the southern California batholith; by subsequent Pleistocene marine terrace formation and burial by terrestrial deposits; and finally by late Pleistocene and Holocene surficial, lagoonal, and marine terrace deposits.

Within the immediate site area there are five distinct outcrop deposits including fill, Holocene beach deposits, Holocene and Pleistocene estuarine deposits, Pleistocene marine terraces, and Eocene aged sediments of the Santiago formation.

Development of the facilities within much of the site area has included the placement of artificial fill. The fill typically consists of clayey sand and sandy lean clay. Within the site area, the fill ranges from about 5 feet thick up to about 27 feet thick. The richest portions of the fill overlie estuarine deposits.

The Rose Canyon fault zone is the closest major fault zone to the Encina site. This fault zone is geologically complex and is comprised of many structurally related fault segments. The Rose Canyon fault zone trends north-northwesterly to northwesterly and extends on land from La Jolla, south through Rose Canyon, across the mouth of Mission Valley, and continues south through parts of the downtown area, to San Diego Bay and beyond. To the north, the fault extends offshore into La Jolla Bay and trends in a north-northwesterly direction as a series of fault traces that roughly parallel the coastline. The fault traces in the offshore area were mapped by geophysical surveys (Kennedy and Welday, 1980); three subparallel traces have been mapped offshore from the Encina Power Plant at distances of approximately 1.5, 2, and 4.5 miles, respectively. The Rose Canyon fault zone appears to merge with the South Coast Offshore Zone of Deformation (SCOZD) in the area offshore and slightly north of the Carlsbad area.

Geologic Hazards

Following is a brief discussion of potential geologic hazards:

Ground Shaking - The faults that are considered capable of generating large earthquakes and, therefore, would be probable sources of strong ground motion at the site are listed below along with the estimated maximum credible and the maximum probable peak ground accelerations.

Fault Name	Primary Displacement	Estimated Length km (miles)	Distance From Site km (miles)	Maximum Credible Earthquake*
Rose Canyon	Strike-Slip	64 (40)	5 (3)	7.25
Elsinoreea	Strike-slip	310 (193)	39 (24)	7.0
Coronado Banks	Strike-Slip	122 (76)	34 (21))	7.0
San Jacinto	Strike-Slip	262 (163)	77 (48)	7.5
Scozd	Strike-Slip	44 (27)	34 (21)	7.0
San Diego Trough	Strike-slip	106 (66)	47 (29)	6.5

Maximum Credible Peak Ground Acceleration (per CDMG Map Sheet 45) = 0.6 g.
Maximum Probable Peak Ground Acceleration (WCC analysis) = 0.25 g.

*Richter magnitude.

Fault Rupture - There are no faults mapped on or projected across the site based on published maps and previous site geologic investigations. Therefore, the likelihood of fault-generated ground rupture on the site is considered very low.

Liquefaction - Results of previous soil investigations at the site indicate very low susceptibility to seismic-induced soil liquefaction of the above geologic units due to lack of loose, saturated, granular soils.

Landslides - The low to moderate relief of the site topography indicates a low likelihood of large-scale landsliding.

Subsidence - Subsidence resulting from the extraction of fluids, the dissolution of soluble materials, or the collapse of underground cavities is not considered a significant hazard for the Encina site.

Other Geologic Hazards - Other geologic hazards, including cavities, lurching, seiches, tsunamis, or volcanic activity, were not identified and are not considered significant for the Encina site.

Geotechnical Mitigation

As discussed above, the principal geologic hazard of concern at the Encina site is ground shaking due to earthquakes. According to the NOI, the proposed project would be designed in accordance with California Energy Commission Zone 4 requirements. However, this designation may be inadequate, based on new information.

The California Division of Mines and Geology is now in progress of zoning portions of the Rose Canyon fault as "active" as defined by the Alquist-Priolo Act of 1972. Several geotechnical investigations of the Rose Canyon fault have revealed Holocene offset exposed in trench walls. The Encina site is three miles from the Rose Canyon fault. Therefore, the results of these new geotechnical investigations may, in fact, increase the maximum credible earthquake to greater than a magnitude 7.25. It is the Commission's understanding that both of these plants will be designed to specific criteria cited under the Energy Commission's Seismic Zone IV designation. The Energy Commission should contact the Division of Mines and Geology to obtain the latest information on the Rose Canyon fault. Specifically, the Energy Commission should review whether any new geologic information on the Rose Canyon fault would make the design requirements cited under Seismic Zone IV inadequate.

H. AIR QUALITY

Under Section 30413 of the Coastal Act, the proposed Encina power plant must be consistent with the general goal of protecting coastal resources. One aspect of protecting coastal resources involves ensuring that a project will not degrade coastal air quality. The Commission does not have direct regulatory authority over air quality matters for projects within the coastal zone that fall within the purview of the State Air Resources Control Board (State Board), or an air pollution control district. Instead section 30253(3) of the Coastal Act specifies that new development shall "be consistent with requirements imposed by an air pollution control district or the State Air Resources Control Board as to each particular development." The Coastal Act further provides that the State Board and air pollution control districts are the principal public agencies responsible for the establishment of air ambient air quality and emission standards and air pollution control programs (Section 30414(a)), and prohibits the Commission from establishing or modifying any air quality or emission standard, or air pollution control program which has been established by the State Board or by an air pollution control board.

The Warren-Alquist Act and the CEC's regulations require that the San Diego Air Pollution Control District (SDAPCD) submit a report to the CEC during this early phase of the NOI that evaluates whether the proposed power plant expansion projects would comply with all district rules and must incorporate the best available control technology. In addition, the District must make recommendations about any necessary project modifications (Calif. Code of Regs., Title 20, Section 1714.7.). The Air Resources Board is required to review and comment on the District's report, and to indicate whether the proposed projects have a substantial likelihood of complying with applicable air quality requirements. The Energy Commission may not approve an NOI for a site unless it determines that the project will meet applicable qir quality requirements (Calif. Code of Regs., Title 20, Section 1130).

The SDAPCD is participating in the NOI proceeding. SDG&E has not yet provided the information needed to allow the SDAPCD to determine if the proposed facility complies with SDAPCD standards and if sufficient emissions offsets are available.

I. CUMULATIVE IMPACTS ON COASTAL RESOURCES AT ENCINA

The Coastal Act (Section 30250) and the California Environmental Quality Act (CEQA) require an analysis of not only the direct environmental impact of individual projects, but also the cumulative impacts resulting from each individual project in combination with closely related past, present and "probable" future projects.

San Diego Gas and Electric did not originally supply information on cumulative impacts in the NOI documents. The Coastal Commission staff subsequently requested information on the cumulative impacts of the Encina project. On July 31, 1990, SDG&E replied to the information request and stated, "This data request shall not be answered." SDG&E stated that they believe that the evaluation of cumulative impacts is not necessary at the NOI stage. The Commission staff does not agree and intends to file a motion to compel with the Energy Commission stating the importance of this cumulative impact information.

The cumulative impacts to coastal resources from the proposed Encina project and closely related projects are likely to be significant in the following areas: visual impacts, marine biology and air quality. As explained in the air quality Section (Section III-H), the Commission relies upon the San Diego County Air Pollution Control District to address air quality issues for onshore projects. Therefore, this section will focus on the remaining issue areas of marine biology, and visual impacts. Following a discussion of the potential cumulative impacts are several suggestions for mitigation.

Cumulative Visual and Public Access Impacts

The existing Encina Power Plant with its 383-foot-high stack and massive generating facilities substantially degrades the visual quality of the beach and shoreline. The addition of the proposed combined cycle project with its two 150-foot-high stacks will add significantly to the existing impacts. As well, the across-the-beach discharge visually degrades the beach and disrupts full public access and use of the beach. The addition of the new, proposed Encina power plant would extend the size and life of this discharge channel and on a cumulative basis significantly impact beach use and the visual environment.

Mitigation for Cumulative Visual Impacts

It is very difficult to mitigate the visual impacts of the existing or proposed power plant project at the Encina site. The tall emissions stacks are visible at a great distance from the beach and Highway 5. Traditional visual mitigation are ineffective, as with landscaping or setbacks, or infeasible, as with height restrictions (the stack height is dictated by air quality considerations).

The Commission recommends that the CEC explore innovative methods that would reduce the visual impact of the plant. The Commission also recommends that the CEC consider requiring SDG&E to eliminate the across-the-beach discharge.

Cumulative Marine Resource Impacts

As described in this report, the existing Encina power plant causes significant adverse impacts to marine resources in Agua Hedionda lagoon and the adjacent nearshore ocean waters. The once through sea water cooling system causes substantial biotic mortality and disruption of the Agua Hedionda ecosystem by entraining billions of passively floating organisms such as fish larvae, impinging larger organisms against debris screens, and causing thermal stress to a wide range of organisms. All of these impacts would be increased substantially by the proposed combined cycle project. SDG&E must address the cumulative impacts of these and other projects on the marine environment. Further analysis is needed to determine the full extent of these impacts.

Recommended Mitigation for Cumulative Marine Resource Impacts

The Coastal Commission recommends that the CEC explore the following measures to mitigate the cumulative marine biological impacts from the combined cycle project at Encina in combination with similar projects:

- Retrofit Existing Units. One way that the cumulative marine resource impacts of the existing Encina plant could be addressed is by requiring the retrofitting the existing units to reduce biological impacts. A number of possible mechanical techniques for reducing the impacts of entrainment and impingement are discussed in Section III-A of this report, Marine Resources.

- In-Lieu Fee Mitigation For Power Plants. To address cumulative impacts on marine resources, the Coastal Commission recommends that the Energy Commission explore establishing an in-lieu fee mitigation program as a pilot program for the Encina and South Bay Power Plants. If the pilot program proves effective, the Energy Commission could expand the program as appropriate to other coastal and bay power plants in California.

  Based on data from the Marine Review Committee's (MRC) studies on the San Onofre Nuclear Generating Station (SONGS), coastal power plants with once-through seawater cooling systems have been proven to have significant impacts on fish populations. For example, SONGS alone is calculated to reduce the Southern California bight-wide queen fish population by up to 13% (MRC, 1989). Cumulatively, the amount of marine organisms (including larvae) killed by seawater cooled power plants statewide is likely to be quite high.

  The in-lieu fee program would be in addition to any specific impact or preventive mitigation required for a particular power plant. The in-lieu fees would be required for compensation of all estimated cumulative unmitigated impacts. The amount of organisms killed would be estimated by taking the seasonal abundance data per unit of sea water and calculating total loss based on the amount of sea or bay water used by the power plant for cooling.

The actual amount of the fee could be determined by a group of specialists including such agencies as the Department of Fish and Game, National Marine Fisheries Service, State Water Resources Control Board and the Coastal Commission with guidance from university research biologists. The amount would be calculated based on the calculated value of the lost resources after mitigation. These estimates would be derived from data of fish, invertebrate, and larval abundance in the area seasonally.

The in-lieu fee would go into a special fund to be administered by a state agency and used for the purpose of enhancing marine resources in the areas impacted by the power plants. The funds could be used for enhancement projects like marine fish hatcheries, artificial reefs, reduction of non-point source pollution, reduction of siltation into the marine environment, etc.

IV. SOUTH BAY SITE

The South Bay Power Plant began operation in 1960. Additional units were built in 1962, 1964, and the largest in 1972. The plant is situated on the southeast end of San Diego Bay, approximately 14 miles from the ocean entrance, in the city of Chula Vista.

The plant draws water from South San Diego Bay to cool the condensers and discharges the heated water back into the Bay. The intake and discharge channels are actually part of the bay directly adjacent to the plant that was dredged to a depth of approximately -15 ft (mean tide level) during construction of the plant. The channels are separated by a rock jetty, constructed in the early 1960's, that extends out from the plant for about 2,000 yards (see Exhibit SB-1).

This portion of the south bay is shallow, ranging in depth from about 0 ft. to about 8 ft. MLLW (mean lower low water) (MBA, 1990), except in the area of the dredged channels. Tidal flushing is limited here in contrast to the north bay.

South San Diego Bay is relatively undeveloped compared to the north bay. As a result, the remaining sensitive shallow water habitats (less than 6 ft. below MLLW) are concentrated in the south bay. There are approximately 203 acres of intertidal salt marsh, 605 acres of intertidal sand and mudflats and 1,388 acres of shallow subtidal areas in the Bay south of the Sweetwater River Flood Control Channel. These areas comprise 100%, 79%, and 81%, respectively, of these habitat types found in the bay as a whole. Additionally there are 1,250 acres of salt ponds to the south and a riparian habitat along the Otay River (MBA, 1990). Along the northern face of the rock jetty that separates the intake and discharge areas is the Chula Vista Wildlife Reserve, a 58 acre mudflat and marsh area built with dredge spoils as a habitat restoration project in 1977 (Andrecht, 1990). (See Exhibit SB-2).

The proposed combined cycle project would be located south of the existing units, in an area of the site currently occupied by wastewater ponds. Two 175 foot high emissions stacks would be constructed. Construction of new intake and discharge structures would be required, adjacent to the existing structures.

In addition to the combined cycle project, SDG&E is currently proposing to build an augmentation of the South Bay Power Plan in a separate Application for Certification proceeding before the CEC. Referred to as the Unit 3 Augmentation, the project would consist of a gas-fired combustine turbine generator and a heat recovery steam generator that would produce 140 Megawatts of additional capacity. The cumulative impact of this project in combination with the combined cycle project must be addressed.

The Commission's analysis of the potential impacts of this proposed project, its consistency with the Coastal Act, and possible mitigation techniques, is divided into the following topics: marine resource impacts, construction impacts, impacts to public access and recreation, visual impacts, consistency with the Local Coastal Program, systems safety, geology, air quality and cumulative impacts.

A. MARINE RESOURCE IMPACTS

The Commission must consider the "compatibility of the proposed site and related facilities with the goal of protecting coastal resources", and "the potential adverse environmental effects on fish and wildlife and their habitats" (Section 30413 (d)(1) and (4)) when evaluating a proposed coastal power plant site and making recommendations to the California Energy Commission.

In addition, the Coastal Act requires protection of marine resources and water quality in Sections 30230 and 30231:

> Section 30230. Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.
>
> Section 30231 (in part). The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment...

This section of the report evaluates the effects of the proposed combined cycle power plant on the marine resources at the South Bay site, and the consistency of the proposal with the above policies. The impacts associated with the existing plant operation are discussed to provide a baseline, as well as a basis for inferring potential impacts and cumulative effects.

This evaluation first requires an understanding of the current marine biological resources at the site that may be affected by the expansion. These resources are identified in the following environmental setting section.

1.0 ENVIRONMENTAL SETTING

The South Bay Power Plant is located at the southern end of the San Diego Bay estuarine system. The plants and animals that are found in this area are typical of shallow bays and estuaries along the southern California coast. The habitats in these shallow bays and estuaries are all remnants of large ecological systems that originally supported abundant fish and wildlife populations. As such, these shallow bays and estuaries are critical to the remaining fish and wildlife dependent on them. Of the marshes that once bordered San Diego Bay, only 10 percent, or 203 acres, remain. These remaining marshes are located primarily at the Sweetwater and Paradise Marsh

complex, approximately 2 miles north of the South Bay Power Plant, and at the southwest corner of San Diego Bay within about 0.5 miles of the plant (see Exhibit SB-5).

Wildlife Reserve. Located along the northern face of the 6,000-foot long rock jetty that separates the power plant's cooling water intake and discharge channels is the Chula Vista Wildlife Refuge (Exhibit SB-2). Human access to these dikes is restricted. Located to the southwest of the power plant are several salt ponds used for salt production. The shoreline around the refuge, near the northwest corner of the power plant, and along the dikes of the salt ponds support salt marsh vegetation such as cordgrass (Spartina foliosa) and pickleweed (Salicornia virginica). The salt ponds and wildlife refuge provide habitat for a large number of bird species. Some of the species found in the area include the endangered California least tern (Sterna antillarum browni). In 1988, 38 least tern nests were observed on the Chula Vista Wildlife Reserve, and 40 young terns were fledged from these nests. In the past 10 years there have been as many as 95 nests with 35 young fledged, although in some years there has been no successful nesting due to predation (K. Andrecht; Director, Chula Vista Wildlife Reserve; personal communication). Other bird species found at the refuge include black skimmers, gulls, herons, egrets, grebes, cormorants, the endangered brown pelican, ducks, plovers, rails, sandpipers and other shore birds. Belding's savannah sparrows, a species listed as endangered by the state of California, nest in the pickleweed. Some species, such as the terns and rails, use the dikes of the salt ponds as a nesting and breeding area. Other species use the dikes as a roosting site. The proximity of the dikes to the shallow estuarine habitat of the bay and the protection provided from intrusion by humans and predators makes them an ideal site for nesting.

Resident Sea Turtles. A small population of sea turtles currently resides in the area of the discharge channel. In a recent study (Dutton and McDonald, 1990), a total of nine turtles were sighted at any one time. Most of these turtles are black (eastern Pacific green) sea turtles (Chelonia agassizi) but there appears to be at least one green turtle (Chelonia mydas). Black turtles nest in Mexico, and green turtles nest in other areas of the Pacific, most notably Hawaii. Both these species are listed as endangered by the federal government. A sea turtle population has been in the power plant discharge channel since construction of the power plant in the 1960's (Dutton and McDonald, 1990), and was estimated to be approximately 30 animals in the early 1980's (Stinson, 1984). South San Diego Bay is the only area on the west coast of the United States where sea turtles are known to congregate.

The turtles seem to be attracted to the warmer waters of the South Bay and the thermal plume from the power plant in particular. However, Dutton and McDonald (1990) noted that on three occasions during times of high temperatures in the channel, the turtles were not observed there, indicating that at times the water may be too hot for them. (Temperatures reported in the literature to be lethal to sea turtles range from 91.4 to 104 degrees F (Dutton and McDonald, 1990)). However, turtles were recently sighted in the channel by SDG&E personnel when water temperatures were 98 degrees F (D.

McDonald, pers. comm.). The Coastal Commission recommends that additional studies be undertaken to identify the positive and negative effects of the thermal plume on the turtles, and to identify migration patterns and rate of recruitment of young individuals into this population.

Eelgrass Beds. The shallow areas of the Bay that are submerged all or most of the time support populations of eelgrass (Zostera marina) (see Exhibit SB-2). Eelgrass communities provide food and shelter for a large number of juvenile fish and small invertebrates. The fish and invertebrates, in turn, provide a healthy and reliable food source for the birds of the area. The eelgrass itself is also a food source for the turtles.

Mudflats. San Diego Bay contains approximately 766 acres of intertidal mudflat area, most of it in South Bay (see Exhibit SB-2). The South Bay mudflats are very important to migratory and resident shore birds, and have the largest concentrations of shorebirds in San Diego Bay. This areas' shorebird concentration often exceeds any other location in San Diego County (J. Kjelmyr, Point Reyes Bird Observatory). Intertidal mudflats are composed of soft, unconsolidated mud, supporting abundant populations of worms, small crustaceans, snails and bivalves on which the birds feed. The organisms in the mud are dependent upon the water that comes to them on every tidal cycle for food and oxygen. Disturbances to this community would result in adverse effects on the entire food chain of South Bay.

2.0 IMPACTS TO MARINE RESOURCES FROM THE ONCE-THROUGH COOLING SYSTEM

The existing adverse impacts to the marine environment at the South Bay plant site and the potentially increased impacts as a result of the proposed expansion are largely the result of the plant's once through seawater cooling system. The existing system takes in as much as 930 cubic feet per second (cfs) of bay water to cool the plant, and discharges the heated water back into to the Bay through a cooling channel. The proposed project would increase the total cooling water capacity to 1281 cfs, an increase of 38%, according to the NOI. The percent increase based on actual use may be higher[7/].

Operation of such a system causes impacts in several ways. First, small passively floating aquatic organisms such as fish eggs, larvae and other zooplankton are killed after being pumped through the intake screens, which are designed to prevent debris from entering the plant and clogging the

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7/ The Commission believes that the NOI may underestimate the increase in cooling water that would be pumped through the plant, as a result of the additio n of the proposed combined cycle unit. SDG&E bases their estimate of additional operational flows on the percentage change in cooling water flow between the ex isting plant capacity and the proposed additional capacity. However, in practic e, the existing South Bay units do not operate at full capacity, whereas full ca pacity is likely to be reached with the proposed project since the new unit woul d be the most efficient to operate (E. Jones, SDG&E, personal communication).

plant's condensors. The term used to refer to this impact is "entrainment." Second, larger aquatic organisms such as juvenile and adult fish are impinged against the screens and killed. This impact is referred to as "impingement." Finally, the heated discharge creates a thermal plume, subjecting aquatic organisms to heat stress. In addition, the system may affect bay water quality, through turbidity from increased discharge flow levels and through the release of toxic chemicals either in the discharge water, or made bioavailable by disturbance of sediments. Species populations can be directly affected, suffering increased mortality rates, or inhibited growth or reproductive rates. Species populations can also be affected indirectly, through such mechanisms as a reduction in food supplies.

The following discussion of these cooling system impacts to marine resources that follows is divided into three main topics: the entrainment and impingement effects from the inflow of cooling water, the thermal plume effects from the discharge of cooling water, and turbidity impacts.

2.1 EFFECTS OF INFLOW OF COOLING WATER

This section discusses several aspects of the impacts of entrainment and impingement of marine organisms at the South Bay Power Plant, including: the existing entrainment and impingement impacts, the additional entrainment and impingement impacts from the proposed plant expansion, the inadequacy of the existing data, informational needs, and mitigation recommendations.

Entrainment and Impingement - Existing Impacts

Data on the existing plant's entrainment and impingement of biota is useful in inferring likely impacts from increasing the cooling water flow through the plant. In response to a request for a detailed discussion on the likely increases in impingement and entrainment and the likely effects on biological resources, SDG&E provided a copy of a one year study undertaken in 1979 to meet the requirements of Clean Water Act Section 316(b) (SDG&E, 1980; hereafter referred to as the 316(b) study). The study provided baseline data, a review of alternative intake technologies, and an environmental impact assessment of the intake technologies. SDG&E stated that the results of the 316(b) study indicated a "localized effect in South San Diego Bay," from impingement and entrainment, and that "the combined effects of impingement and entrainment losses were insignificant when compared with the source water sources."

The Commission believes that existing impacts from entrainment and impingement are not adequately represented in the 316(b) study and are in fact significant for the following reasons:

1. Available estimates of entrainment losses are very high for some fish species. Three fish species, gobies (a small bottom-dwelling fish), anchovies (mainly slough anchovy and deep-bodied anchovy), and athernids (primarily topsmelt), are entrained at high rates by the plant, according to the 316(b) data. The 316(b) study found that 28%

of San Diego Bay's standing stock of goby larvae may be killed by the plant during the "peak entrainment period" (based on an average removal rate for the study year, the estimate is 12%). The study estimated that the existing units entrain 8% of the bay anchovy population during the peak entrainment period (5% based on average removal rate). Twenty-three percent of the bay atherinids were found to be entrained during peak periods (1% based on average removal rate).

2. Impacts to local populations were not measured. SDG&E's 316(b) study assessed losses of fish and invertebrates from entrainment and impingement in comparision to the standing stock (amount of organisms present at any given time over the study year) of those species found in the "source water body." The study used the entire San Diego Bay as the source water body. This selection may obscure impacts to local populations of species that do not move throughout the Bay. Localized populations of fish and invertebrates in the South Bay area would be entrained or impinged disproportionately to populations found in the northern reaches of the Bay. Therefore, the percentage of impact to any local population would be substantially higher.

3. Estimated entrainment losses of invertebrates are high. SDG&E's 316(b) study also estimated high entrainment losses of some invertebrates. For instance, in May of 1979 the entrainment loss for Acartia spp. adults (an abundant copepod species important to the food chain of shallow bays) was an estimated 16% of the entire South Bay standing stock. The average for all months was 4%. A 16% loss during spring is of concern since these copepods are an important component of the base of the food chain.

4. There is a substantial loss of phytoplankton through the existing power plant, especially in the summer months. Chlorophyll a is an algal photosynthetic pigment used to measure phytoplankton abundance. Concentrations of chorophyll a were found to decrease in the water passing through the existing plant by 88% in summer, and 28% in winter. The NOI states that this indicates "an effect on primary productivity due to entrainment of phytoplankton" in the summer months.

5. High rates of entrainment of fish, invertebrates and phytoplankton (noted above) may currently be affecting the food chain of South Bay. The existing plant's entrainment of fish, invertebrates and phytoplankton may have indirect impacts to species that use those species as a food source. The fish species with high entrainment rates indicated above (gobies, anchovies, and topsmelt) are an

important food source for the endangered California least tern (M. Kenney, USFWS, personal communication). Other terns, other fish-eating birds, and predatory fish, such as the California halibut, also depend on some or all of these species for food.

Anchovies and topsmelt feed primarily on plankton throughout their life, and gobies depend on plankton while in the larval stage. The existing power plant entrainment losses of phytoplankton and zooplankton, particularly in the summer when temperatures and mortality are high, is thus a cause for concern. Phytoplankton is at the base of much of the food chain in aquatic systems such as South Bay, since many of the fish are plankton feeders (e.g. topsmelt, anchovy). Therefore, both indirect entrainment impacts to these fish populations from diminished food availability and direct population losses from entrainment must be considered when assessing existing power plant impacts and extrapolating these to project-related and cumulative impacts to the South Bay ecosystem.

6. The existing effects from impingement could be significant if the impact to local fish populations were thoroughly analyzed. The species found by SDG&E to be most frequently impinged by the existing power plant were round stingray, topsmelt, deepbody anchovy, specklefin midshipman, slough anchovy, and Pacific butterfish (SDG&E 316(b) study, 1980). The study concluded that less than 1% (with a range of 0.03% to 0.96%) of the San Diego Bay populations of these species (with the exception of specklefin midshipman and Pacific butterfish) were affected. It appears that no estimate was made for specklefin midshipman and Pacific butterfish. A loss of 1% Bay-wide could be significant locally if the species individuals did not move throughout the bay and if localized populations were subject to high percent losses. The combined effect of impingement and entrainment on topsmelt and anchovy populations is of particular concern because they serve as valuable food sources for least terns and other bird species.

Entrainment and Impingement Impacts from Increased Inflow

The Commission believes not only that the existing plant has significant entrainment impacts on certain species of fish, invertebrates, and phytoplankton, but that the proposed expansion will result in substantial additional impacts. This belief is based on the nature of the impacts described in the six points above and on the magnitude of the increase in entrainment and impingement. SDG&E estimates the proposed expansion would result in an additional 1.5 billion fish eggs, 0.9 billion fish larvae, and 1 trillion zooplankton entrained with the additional cooling water. SDG&E also estimates that 10,700 additional fish per year would be expected to be impinged and that "mortality due to impingement may be up (to) 100 percent." SDG&E based these estimates on the results of the 316(b) study and on an extrapolation from that study's data for the projected 38 percent increase in cooling water volume for the proposed project.

For example, the species group with the highest estimated loss from entrainment (gobies) would sustain an additional 38 percent loss from the power plant expansion. This loss would translate into 39 percent of the entire San Diego Bay's population being affected at peak entrainment rates,

and 16 percent at average rates (SDG&E 316(b) study, 1980). The estimated percent losses for other species, although lower, are still very significant, particularly when considered in the context of localized, rather than Bay-wide, populations.

Without adequate information on methodology, or information from more than one year, it is difficult to be fully confident of the 316(b) data provided by SDG&E. However, the data on entrainment and impingement loss provided by SDG&E indicate that the present plant is having substantial negative effects on the South Bay ecosystem, and that the potential adverse environmental effects on fish and wildlife and their habitats from an additional unit is substantial.

SDG&E Proposed Mitigation for Entrainment and Impingement

SDG&E states in the NOI that during operation, entrainment would be mitigated by (1) low through screen velocities, and (2) fine mesh screens. No information is provided regarding how these techniques would be implemented or how effective they are expected to be.

There are substantial uncertainties associated with these mitigation techniques. Low through screen velocities could result in higher water temperatures as the water flows through the plant and higher discharge temperatures, which in turn could result in increased adverse thermal plume impacts. Fine mesh screens have been largely unsuccessful in reducing larval entrainment.

Recommended Mitigation for Entrainment

Several mitigation techniques are available to reduce entrainment. The Coastal Commission recommends that the CEC consider the following techniques for reducing entrainment:

- Cooling Towers, cooling ponds or spray ponds. The use of an alternative, closed circulating cooling system would mitigate all of the marine impacts from the proposed once through cooling system. These systems require additional space or land. Cooling ponds require the most land (460 to 1380 acres for the proposed plant) and may not be practical at the South Bay site. Spray ponds require much less land (approximately 23 acres) and might be accomodated at the site. An adverse impact from the spray ponds system is that salt spray is deposited on surrounding vegetation. Cooling towers is the least economical of these systems, since they would reduce the efficiency of the plant and are very expensive to build. Due to their height (perhaps 500 feet), cooling towers also cause significant visual impacts.

- Modified Traveling Screens. Standard traveling screens are currently used at the South Bay plant's existing units. These screens filter out large organisms, and are periodically rotated and cleaned with

spray. The standard traveling screen does not reduce entrainment (or impingement). However, several modifications have been introduced that may reduce these impacts: (1) a smaller mesh screen, (2) low pressure spray, (3) a lip at the lower edge of each screen panel to cushion impacts, and (4) continuous rotation and washing of the screen, and (5) a return conduit to return fish to the Bay. Laboratory studies of long-term survivorship of larval species should be conducted before this experimental technique is adopted.

- Reduced Flow. Reducing the amount of water that flows through the plant would partially mitigate entrainment losses by reducing entrainment in proportion to the flow reduction. Variable speed pumps can be used to time the flow reductions to periods of peak larval abundance. A disadvantage of this technique is that if flow is reduced, the temperature of the discharged water would increase (although less water would be discharged).

Recommended Mitigation for Impingement

There are a number of other techniques available for reducing impingement. All of the techniques listed above to mitigate entrainment, would also eliminate (cooling towers, cooling ponds or spray ponds) or reduce (modified traveling screens, reduced flow) impingement. The CEC should consider these techniques for their value in reducing impingement.

In addition, there are a variety of techniques available that involve physical or behavioral barriers at the intake location to prevent the fish from being impinged. None of these techniques is 100% effective. Additional testing and analysis would be necessary to select the appropriate technique, or combination of techniques for the South Bay plant. The CEC should consider the following additional techniques to reduce impingement:

- Physical Barriers. Physical barriers reduce impingement by physically blocking fish from entering the intake area. Techniques include barrier systems, a mesh net or rigid screen placed around the intake in an area where velocities are low; and porous dikes, a stone breakwater constructed around an intake area.

- Behavioral Barriers. Behavioral barriers reduce impingement by diverting fish from the area using behavioral responses. Bubble curtains is a system in which air released at the bottom of the water column creates a curtain of air bubbles in front of an intake. Mercury lights attract fish, and can be used in conjunction with a fish return system (described below). Strobe lights repel fish. Sonic devices can startle fish with high acoustic output.

- Fish Return System. A fish return system, in conjunction with modified traveling screens (see above) would reduce impingement by returning impinged fish to the Bay.

Conclusion - Entrainment and Impingement Impacts

The South Bay plant currently entrains significant numbers of fish, invertebrates, and plankton. Several fish species are entrained at particularly high rates: gobies, anchovies, and topsmelt. The impingement of larger fish is also a concern. The impact to local populations of fish and invertebrates from entrainment and impingement has not been assessed and is potentially serious.

The proposed expansion of the South Bay power plant would add to the impact of the existing plant. Taken cumulatively, these impacts could have adverse effects on the food chain in the South Bay, since many of the entrained species are important components of the food chain. Endangered species, such as the California least tern, could be affected by a reduction in the availability of small fish.

Additional, comprehensive studies are needed to fully assess the extent of the existing impacts and the additional impacts from the expansion. Mitigation techniques to reduce or eliminate these impacts should be explored. However, it appears that the impacts of entrainment are not fully mitigable. Therefore, based on available information, pursuant to Section 30413 of the Coastal Act, the Commission finds that the project is not consistent with Coastal Act Sections 30230 and 30231, which require protection of marine resources.

2.2 EFFECTS OF DISCHARGE OF COOLING WATER

This section discusses several aspects of the existing and proposed impacts from the thermal plume originating from the South Bay power plant's cooling system. Discussed are the physical characteristics of the plume, including the extent of the existing plume and the extent of the enlarged plume due to the expansion of the South Bay plant, ecological effects from the plume, limitations on existing data regarding the ecological effects from the existing thermal plume, mitigation recommendations, and recommendations for further thermal plume studies.

Physical Characteristics of the Thermal Plume

As the heated water is discharged from the South Bay plant, it mixes with the water in the bay, where it cools as it mixes with bay water. Temperatures in this mixed zone are the hottest at the discharge, with concentric rings, or isotherms, of cooler, yet still heated, water extending outward from the discharge point. The water within this mixing zone is referred to as the thermal plume.

The heated cooling water is discharged from the plant into a discharge channel, a stretch of south San Diego Bay adjacent to the power plant (see Exhibit SB-1). The channel is a segment of Bay that is separated from the rest of the Bay by a dike that extends out from the plant for about 2,000 yards. The channel width varies between 50 feet near the power plant to 1,200

feet at its widest point in the Bay (Ford and Chambers, 1974; NPDES Permit # CA0001368). The channel bottom slopes upward from the point of discharge towards the bay, with the maximum depth being approximately -15 feet (mean tide level) (NPDES Permit # CA0001368).

This channel has been classified by the San Diego Regional Water Quality Control Board as part of the power plant for the purpose of the National Pollution Discharge Elimination System (NPDES) permit (Ford and Chambers, 1974). The effect of that classification is that the Regional Water Board has not considered adverse effects on the biota within the channel to be of any consequence in its review of impacts to the Bay. A study that was done in 1972-73 to comply with the NPDES permit (# CA0001368; order # 85-09) found that there were lower species abundance, lower species diversity and lower species populations in the cooling channel than in an area outside of the influence of the thermal plume (Ford and Chambers, 1974).

SDG&E proposes that the CEC also consider the discharge channel to be part of the power plant rather than part of San Diego Bay. The Coastal Commission recommends that the CEC reject that distinction because such an approach does not fully address thermal impacts to coastal resources. From a biological standpoint, the channel would be considered part of South San Diego Bay. The effects inside of the channel indicate that if water of unnaturally elevated temperatures, resulting from expansion of the plant, spread out further into the bay the adverse effects could be felt in a larger area of the Bay, outside of the channel.

The Extent of the Existing Plume. The existing thermal plume extends well beyond the discharge channel, exceeding the State Water Resources Control Board (SWRCB) standard. The SWRCB defines the extent of a thermal plume in the Bays and Estuaries Plan (SWRCB, 1975), which states, "Thermal discharges in enclosed bays are required to have a temperature of not greater than +4° F above the natural temperature of the receiving water, once the discharged effluent leaves the discharge channel." This boundary of +4° Fahrenheit (F) is known as the +4° F isotherm. According to SWRCB requirements, the South Bay Power Plant is supposed to contain to the discharge channel any waters that are more than +4° F warmer than the receiving water temperature.

Cooling water that is discharged from the plant averages 16.6° F above ambient temperature. According to the monitoring studies conducted in observance of the NPDES permit, the average temperature within the cooling channel in the month of August has been about 90.5° F for the past ten years. Temperatures in the area immediately adjacent to the cooling channel, during the same time period, have ranged from about 84.6° F to 81.8° F, in all cases exceeding the ambient temperature by greater than +4° F. A control (or reference) station about 2 miles to the north has averaged 76.8° F. In contrast, average annual temperatures in South San Diego Bay historically range seasonally from 58° to 79° F outside of the influence of the existing South Bay plant thermal plume (Ford and Chambers, 1974). Comparison of these temperatures shows that the temperature at the control site is at the high end of the general temperature range of the bay waters.

The thermal plume currently extends from 2,400 feet to 9,600 feet north of the end of the L-shaped jetty that separates the intake from the South Bay plant discharge channel (see Exhibit SB-1). The plume also extends in an east-west direction across the entire South Bay at this point (Ford and Chambers, 1973). The area of the plume varies between 491 acres, on flood and high tides, to 683 acres on ebb and low tides, with an average area of 609 acres. The extent of the plume depends upon the stage of the tide, wind speed and direction, and the power plant output (SDG&E, NOI 1989).

Increased Plume Due to Project. The proposed project would increase the size of the existing thermal plume substantially. The proposed increase in the volume of the heated discharge to San Diego Bay from an expanded South Bay plant would proportionally increase the surface area of the bay warmed. SDG&E expects the thermal plume to increase from an average area of 609 acres to an average area of 817 acres at the $+4^{o}$ F isotherm. This projected increase in area is based on the percentage increase in capacity of flow, and may be an underestimate, as discussed previously in this section.

In addition to increasing the extent or area of the plume, the proposed project will increase the water temperature at any given point inside the plume, even though the temperature may not increase at the discharge location. This temperature increase results from the outward extension of the heated water, which causes any observed point within the current plume to become part of a hotter region of the proposed project plume. Furthermore, any point that is not now in the plume, but would be covered by the expanded plume, will experience a rise in temperature.

Impact of Thermal Plume on Marine Resources

San Diego Gas & Electric's most recent year-long study of the effects of the thermal plume on marine biology of the South Bay was done in 1972-73 after the addition of the fourth generating unit. A yearly monitoring program was established after this study was completed. Samples are taken once a year in August at the same locations indicated in the study, but no analysis of this data has been provided.[8] & [9]

The 1972-73 study concluded that the plume had a slight adverse effect on species diversity, species abundance and species numbers in the outer plume area (Ford and Chambers, 1974). In addition, the study found significant adverse effects within the cooling channel. The effects occurred throughout

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[8] California Coastal Commission data request no. 9, response due August 13, 1990.

[9] The value of this yearly monitoring data is limited. The studies have been conducted by different consulting firms over the years and the identification of organisms is inconsistent, making an overall analysis of the monitoring reports difficult. In addition, since August is the only month sampled, the data would be ineffective at indicating what the effects may be to biological communities at other times of the year.

the year but were most severe in late summer and early fall when ambient temperature was generally warmer. During this time the cooling channel had a lower number of species, lower species diversity and lower species abundances than in the control area.

Limitations of 1972-73 Study

The Commission believes that the value of this study is limited, and that the impacts may be of greater significance than indicated. The study itself identified two shortcomings in the statistical analysis used: 1) because of the small number of monitoring stations, the "statistical patterns are somewhat marginal" and 2) the statistical test used detects only relatively large effects i.e. more subtle effects would not be detected (Ford and Chambers, 1974).

Impacts of Enlarged Thermal Plume Due to Plant Expansion

The effect of an enlarged thermal plume would be to extend the adverse thermal effects over a larger portion of the biota in south San Diego Bay, and to possibly extend the period of time organisms are affected. Temperature increases within the thermal plume would also have adverse impacts.

The warmer times of the year would result in the worst effects. If upper lethal limits of temperature are exceeded at this time of year, the affected individuals would die. Some individuals may be able to withstand a pulse of high temperature beyond this upper lethal limit. However, with an enlarged thermal plume, it is possible that the tolerance level of organisms may be exceeded for longer periods of the year, resulting in larger or more widespread adverse effects. The results of the effects may carry over into a cooler portion of the year due to a lag in the replacement time of the organisms lost.

Natural events that cause abnormal rises in ambient temperature have not been factored into the analyses, and a phenomenon such as an El Nino event combined with the effect of the power plant could cause especially severe adverse effects to these populations that would continue to be felt for at least one, and possibly more, breeding seasons.

Indirect Impacts of Increased Plume on Eelgrass Ecosytem

In addition to direct effects on the marine biota, the discharge plume has several indirect impacts. Certain species not included in the studies depend upon some of the species that are adversely affected by the plume for their continued survival. The following section describes potential impacts to the eelgrass ecosystem in the South Bay.

South Bay Eelgrass Beds. Eelgrass (Zostera marina) provides a number of benefits to a shallow, estuarine bay. As a result, adverse effects on the eelgrass beds in the vicinity of the power plant would indirectly impact a wide range of species dependent on eelgrass for survival.

Eelgrass beds sustain a three dimensional space in which many biological interactions take place. The rhizomes and upright turions maintain a stabilizing structure for sediment as well as a baffle area to currents, tending to encourage the settling of fine grained sediment particles that are suspended in the water column. A healthy eelgrass bed will also furnish a refuge for many juvenile finfish and shellfish and a permanent home for other species, such as snails and worms. The older leaf blades are an attachment site for epiphytes which are fed upon by other organisms. Dead and decaying blades supply an excellent source of detritus which is important in nutrient recycling. The refuge of the blades is also used by larger juvenile and adult fish as a forage ground.

Hoffman (1986) documented a two-fold increase in numbers of species as well as number of individuals at sites vegetated with eelgrass as compared to unvegetated sites. Species of fish found in the beds that are important to the sport fishery include shiner surfperch (Cymatogaster aggregata), barred surfperch (Paralabrax nebulifer) and the spotted sandbass (P. maculatofasciatus). There are a number of forage species which are important as well and they include various species of gobies, anchovies, antherinids and the California halibut (Paralichthys californicus).

Populations of eelgrass are located in patches throughout San Diego Bay (Hoffman, 1986) (See Exhibit SB-2). The size of the eelgrass beds vary naturally from year to year, while the general location of the beds normally remains the same. This is due in part to the vegetative growth pattern in eelgrass' life cycle in which the plant creates a "rhizome mat" with which it anchors itself.

The location of the beds in the southernmost end of South San Diego Bay has, however, changed from year to year. A possible explanation is the naturally higher water temperatures at the south end of the bay, which are due to the shallowness of the water and the limited tidal flushing and that are compounded by the thermal discharge from the South Bay power plant. The high temperatures stress the population and cause annual or seasonal variability in eelgrass coverage compared to the more stable beds found in areas of the central and northern parts of the bay (Hoffman, 1986).

Thermal Impacts to Eelgrass from Plant Expansion. The NOI indicates that with the additional thermal discharge the thermal plume will encompass the eelgrass beds in the western and southern portions of this part of the Bay. According to the NOI, the beds would "typically" be exposed to water that is between 4 and 10 ^{o} F above ambient temperatures of 76.8^{o} F. Potential impacts could result from increases in temperature since these beds exist in an environment that is already highly stressed due to the naturally elevated temperatures of the Bay.

Impacts to Endangered Species and Other Species of Concern. Endangered sea turtles are known to inhabit the South Bay. There are at least nine individuals and possibly more living in the area of the discharge (Donna McDonald, Hubbs Sea World Institute). Some of these turtles use eelgrass as a

food source. Any detrimental effect on the eelgrass in the area would force the turtles to range into locations of cooler water which are not suitable to them.

Another endangered species that may be impacted by the adverse effects on eelgrass beds is the California least tern (Sterna antillarum browni). Least turns feed exclusively on fish (Massey, 1977). Fish species on which the terns feed, in decreasing order of importance, are the northern anchovy, topsmelt, various species of surfperch, killifish and mosquitofish. According to Hoffman (1976) the eelgrass beds within San Diego Bay appear to be important to both the anchovy and the topsmelt. Additionally, topsmelt and shiner surfperch use eelgrass as a spawning ground and juveniles of these species use the beds for feeding and refuge until they are large enough to enter the open ocean (Marcus and Kondolf, 1989). There are at least half a dozen other species of tern, which are not endangered, also likely to be affected by a loss of eelgrass in the vicinity of the thermal plume (K. MacDonald, personal communication).

Cumulative Ecosystem Effects. Cumulative effects on the invertebrates and plankton communities and eelgrass beds may result in disturbances to species representing higher trophic levels in the marine food chain, including larger fish species, marine birds, and marine mammals. A decline in the lower portion of the food chain will eventually be echoed by reductions in numbers at the top of the food chain. Many species of fish feed on tiny invertebrates and plankton. The fish in turn are prey for other species, including endangered species such as the brown pelican (Pelecanus occidentalis) and least tern (Sterna antillarum).

Cumulative Impacts of Unit 3 Augmentation on Thermal Plume

SDG&E's proposed Unit 3 Augmentation project would also have impacts on the thermal plume. The NOI states that the area of Bay affected by the plume would increase from 609 to 645 acres. In combination with the combined cycle project, the size of the thermal plume would increase to 848 acres. As stated earlier this number may be an underestimate of the predicted value. The Unit 3 Augmentation project would also increase the temperature at the point of discharge from 16.6 to 17.5 F (NOI, 1990). The CEC should require that all future assessments of the impact of the thermal plume include an evaluation of these cumulative effects.

Additional Concerns About Thermal Plume Impacts

The Coastal Commission has two other major concerns, but does not have enough information to draw conclusions about thermal plume effects in these two areas. The Commission is concerned, first of all, that the thermal plume may be excluding some fish species from habitat that would normally be available to these species. For instance, recent sampling has shown that juvenile California halibut are only half as abundant in San Diego Bay as in Mission Bay (K. MacDonald, Personal Communication). The NOI should not be not be

approved for this site unless SDG&E provides an analysis of temperature preferences and lethal temperatures for fish species found in South Bay, or expected in South Bay.

A second concern is the effect of the thermal plume on salt marsh vegetation. Salt marsh vegetation lines the shoreline in and near the discharge. Belding's savannah sparrows, a California listed endangered species, is found there. Salt marsh vegetation is also important to other endangered species. The NOI should not be approved unless SDG&E provides information on possible effects of the thermal plume on salt marsh vegetation, including specifics on growth, nitrogen fixation, survival and reproduction at the temperatures it is now and will be subject to.

Mitigation Cited in NOI

The NOI states that thermal plume impacts can be reduced by reducing flow volumes or decreasing the temperature of the effluent. However, the NOI does not explain how this could be achieved. The Commission believes that the techniques available to decrease the amount of effluent or the effluent temperature are infeasible or have attendant adverse impacts that outweigh their benefits.

If the proposed power plant capacity is to be maintained, it appears that the only means of reducing the effluent temperature is by increasing the volume of water flowing through the plant. A larger quantity of inflow would both increase entrainment and impingement and would enlarge the area of the thermal plume. Similarly, while the power plant could be designed to take in a reduced level of flow, the consequence would be a warmer thermal plume.

Recommended Mitigation for Thermal Plume Impacts

The Coastal Commission recommends that the CEC consider the following techniques for mitigating the thermal impacts:

- Cooling Towers, Cooling Ponds or Spray Ponds. The use of an alternative, closed circulating cooling system would mitigate all of the marine impacts from the proposed once through cooling system. This mitigation alternative is described in greater detail under the subheading "Recommended Mitigation for Entrainment" earlier in this section.

- Ocean Discharge. The adverse impacts of the thermal plume on the South Bay marine environment would be eliminated if the discharge was routed through a pipeline to the open ocean. Although an ocean discharge is likely to also result in adverse thermal impacts, the impacts are likely to be less severe, since the ocean is better able to assimilate the waste heat.

Conclusion - Thermal Plume

The proposed expansion of the South Bay power plant would add thermal stress to a delicate environment that is already stressed due to the existing power plant. The additional power plant unit would cause the thermal plume to spread over a larger area for a longer period of time. Cumulative thermal impacts from the new power plant unit, together with the existing plants impacts and the impact of the Unit 3 Augmentation project, are a concern that must be addressed.

The environmental impacts of the thermal plume are not fully mitigable unless a closed circulating cooling system is proposed in lieu of the current proposal. An ocean discharge also has merit, but the environmental impacts to the offshore environment would need to be assessed, and the discharge would have to be an adequate distance from kelp beds and hard-bottom habitat.

Given the current proposal to use the once-through seawater cooling system with a discharge into the South Bay, and based on the information available, the Commission finds that the thermal impacts of the expansion project are incompatible with the goal of protecting coastal resources (Coastal Act Section 30413(d)(1)), and that the potential adverse environmental effects on fish and wildlife and their habitats are substantial (30413(d)(4)).

2.3 TURBIDITY

The proposed project would potentially increase the turbidity or cloudiness of the Bay through sediment resuspension. Turbidity can adversely impact organisms by reducing the light penetration and therefore inhibiting photosythesis.

Turbidity could occur from several aspects of the proposed project. A primary source is the increase in the velocity of the discharge. The NOI states that long term impacts of the increase in discharge would include changes in flow and sediment transport regime. In this regard, the South Bay project would increase outflow discharge by about 351 cubic feet per second (cfs). The effect of such an increase in water velocity upon the resuspension of sediments in the area has not been adequately assessed. Potentially, the increase would resuspend sediments in the area of high water velocities and carry them into the Bay, causing a probable increase in turbidity until some state of sediment equilibrium is reached.

Other sources of turbidity from the proposed expansion include runoff flows and erosion near the intake and discharge areas. Runoff flows from drains and other in plant sources, would increase in velocity due to the expansion of the site on land which would increase the amount of impervious area drained. The resulting erosion potential would cause further increases in turbidity since these sources all empty into the discharge channel. Scouring and erosion of the unpaved areas around the discharge and intake structures could also potentially create turbidity.

Impacts of Turbidity on Biota

The adverse effects of resuspending sediments that have built up over the last 20 years could be substantial. For example, the increase in turbidity could adversely effect eelgrass populations in the vicinity of the discharge. Increases in turbidity would have the effect of reducing the amount of light available for the plants to perform photosynthesis. The eelgrass needs to receive light at a high enough intensity to perform photosynthesis, for a minimum number of hours per day, in order to grow and be healthy.

Potential for Resuspension of Toxics

The adverse effects of turbidity on marine biota could be exacerbated by toxics that may have accumulated in these sediments. There are several potential sources of the toxics, including the following: (1) SDG&E has been releasing treated wastewater from the power plant through the discharge, into the South Bay (the NPDES permit states that elevated concentrations of mercury and iron have been detected in the discharge water), (2) one of the intake structures was painted at least once with an antifouling paint which contains tributyl tin (K. MacDonald, personal communication), (3) biocides have been used to try and prevent or control biofouling of intake and cooling systems. If toxics are accumulating, the resuspension of sediments could cause a toxicity reaction on the biota of the surrounding area.

SDG&E Proposed Mitigation

SDG&E proposed to install scour protection along the banks of South San Diego Bay to mitigate turbidity impacts. It is not clear exactly what this protection would consist of, how it would be implemented and whether it would protect the soft mud bottom of the channel.

Information Needed on Turbidity Impacts

The NOI should not be approved until the following information is developed:

- A comprehensive study of the turbidity impacts, including: (1) an analysis of potential scouring areas and depths, (2) a sampling program to determine concentrations and acute and chronic toxicity of accumulated chemicals in sediments subject to scouring, (3) a sediment transport analysis to determine the fate of resuspended sediment, and (4) an analysis of the toxic effects to target organisms subjected to the transported sediments.

- A detailed description of the scour protection measures proposed in the NOI, and the expected efficacy of those measures in reducing turbidity.

Mitigation for Turbidity Impacts

- Turbidity impacts can be mitigated through scour protection or by reducing the velocity of flow. Mitigation techniques to accomplish these objectives often result in adverse environmental impacts themselves. For example, riprap destroys soft-bottom benthic and intertidal habitats. Flow reduction to reduce velocities could increase the temperature of the discharge. The full range of mitigation techniques to address turbidity impacts should be evaluated; the measure that most limits associated adverse environmental impacts should be selected.

Conclusion - Turbidity

The proposed power plant expansion at the South Bay site has the potential to result in increased turbidity, which reduces the amount of light available for photosynthesis. An additional concern is the potential resuspension of toxic chemicals that may have accumulated in the sediments near South Bay. Additional information is needed to assess the full extent of the turbidity impacts.

The Commission finds that for the expansion to be consistent with Coastal Act Sections 30413(d)(1) and (4), the potential turbidity from the project must be thoroughly assessed and mitigated in an environmentally sound manner.

3.0 INFORMATIONAL NEEDS

Substantial amounts of additional information is needed to assess the impact of the South Bay plant expansion on the marine biology of the South Bay. Some of the needed information is described in this section or has been submitted as a data request and will not be repeated here. In addition, the City of Chula Vista's preliminary comments on the NOI include a detailed list of needed data. The Coastal Commission concurs with these data requirements, and recommends that the NOI not be approved until this information is developed.

B. CONSTRUCTION IMPACTS

The proposed South Bay power plant expansion would have construction related impacts in addition to those impacts resulting from operation of the expanded plant. Several of these construction impacts may significantly affect coastal resources. Plant construction will cause earth moving, habitat displacement, erosion, noise and other disturbances, which may result in short and long-term impacts to coastal resources. The following section addresses these potential impacts from construction as they affect or conflict with: the overall goal of protecting coastal resources (Coastal Act Section 30413(d)(1)); other coastal dependent land uses (Section 30413(d)(2); fish and wildlife and their habitats (Section 30413(d)(4)).

Impacts to Endangered Species

Construction of the additions to the South Bay plant may have adverse impacts on three endangered species in the area that may be found on site: the black skimmer, the snowy plover, and the least tern. Although SDG&E has not provided data on the use of the site by these species, it is quite possible that they use the site. South San Diego Bay is one of the major coastal nesting sites on the west coast of North America for several species of terns and Black Skimmer. If one or more of these species use the site, the construction activities could negatively affect their breeding, nesting, foraging, and/or roosting. In order to address these potential impacts, SDG&E needs to determine whether these species inhabit the site at any time.

There could also be some loss during construction of reptiles that use the site, which may include a candidate species, the San Diego horned lizard. The impacts on the reptile population in the area is not expected to be significant, according to SDG&E, but additional information is needed to assess the impacts. Additional information is also needed to assess the impacts to rare, threatened, or endangered plant species.

There may be impacts from construction noises or increased human activity on species in adjacent areas, especially in the Chula Vista Wildlife Reserve. The following threatened, endangered, or candidate wildlife species are known to nest in areas adjacent to the existing plant site: least terns, Belding's savannah sparrows, snowy plovers, light-footed clapper rails, brown pelicans, large-billed savannah sparrows, elegant terns, long-billed curlews, reddish egrets, and San Diego horned lizards, and an endangered plant, the salt marsh bird's beak.

Erosion and Turbidity

Impacts from erosion resulting from construction of the proposed South Bay plant is another area of potential concern. Erosion on the plant site from construction is not expected to be serious and can be adequately mitigated. Erosion from construction of the transmission lines may be of concern in some off-site areas.

Also of concern are potential impacts from increases in turbidity in the vicinity of the intake and discharge pipes during construction. The short term increases in turbidity may have an adverse impact on eelgrass in the South Bay area, and there may be additional adverse effects if the turbid mixing resuspends toxic sediments. According to the NOI, there would be a permanent loss of some benthic habitat from the increase in turbidity. These possible effects from turbidity on marine biota are discussed in more detail in Section IV-A, Marine Resource Impacts. SDG&E proposes to build a cofferdam around the intake and discharge areas to allow construction on dry land. The cofferdam would reduce turbidity in the bay resulting from the construction of the intake and discharge facilities because it would prevent waves from reaching the construction site. Further studies are being conducted by the Energy Commission on this issue, and this information is needed to assess these impacts adequately.

Impacts to Neighboring Land Uses

There will be some minor impacts on neighboring land uses during the period of construction. These impacts include increases in noise, visual impacts, dust generation, ground disturbance, and public access impacts. Public access impacts may result from increases in traffic and from offsite construction material and equipment staging areas. These impacts are discussed in Section IV-B, Impacts on Public Access and Recreation. SDG&E proposes to use mitigation measures including noise reduction equipment on machinery, site screening and cleanup, dust control measures, temporary erosion control and drainage systems, limited hours of construction, carpooling, and parking offsite for construction workers. These measures should adequately mitigate the impacts.

Other Impacts

Construction could have impacts on groundwater beneath the site if dewatering is necessary for deep foundations or utilities. This impact should be short term only and not of major concern.

Removal of soils in the bay would be necessary for construction of the intake and outfall structures. Dredged spoils would be disposed of on land. Soils should be tested for contaminants prior to dredging. Contaminated or toxic soilscould negatively impact the marine biota and water quality near the dredging site, and the biota and water quality in the area of the landfill site.

Recommended Mitigation

The Commission recommends that the Energy Commission require all of the mitigation measures for construction impacts that are discussed in the NOI. These measures include: construction of a cofferdam to control turbidity during construction of the intake and discharge structures, noise reduction equipment on machinery, traffic control measures, dust control measures, visual screening, erosion control measures, provision of new perch sites for

birds, and dedication of open space areas offsite to replace resources that cannot be protected on the site. Mitigation measures for dredging and disposal of contaminated soils may be necessary. If endangered species are found on the site, the Commission may determine that it is not possible to adequately mitigate the impacts. The additional information listed below is needed to determine whether the mitigation measures will be adequate. The Commission recommends that the Energy Commission require the following mitigation measure in addition to those listed in the NOI:

- Construction schedules timed to minimize adverse impacts on benthic communities and other marine resources from construction of the impact and discharge structures.

Additional mitigation measures may be recommended by the Commission if the information provided by SDG&E indicates that the measures they intend to provide are not adequate.

Additional Information

SDG&E must satisfactorily respond to the information requests concerning construction impacts, which include: (1) data on the endangered, threatened, or candidate species that use the site; (2) measures to mitigate the impacts on these species; (3) impacts from the construction of the intake and discharge pipes; (4) seasonal patterns of bird and fish use near areas where the intake and outfall pipes will be constructed; (5) impacts from construction on birds, reptiles and plants on the site; (6) impacts to threatened, endangered, or candidate species in the vicinity of the South Bay site; (7) mitigation measures proposed for impacts to species that are in the vicinity of the site; (8) impacts from construction of transmission lines; (9) the size of permanent loss of benthic habitat; and (10) potential impacts from dredging and dredged spoils disposal.

Conclusion - Construction Impacts

In summary, more information is needed to assess the extent of impacts from construction. Some of the impacts - erosion, visual impacts, dust, groundwater impacts, and disposal of dredged spoils - are either expected to be minimal or should be adequately mitigated with the measures proposed by SDG&E. The most serious potential impacts from construction are to endangered or threatened birds from harm to their nesting sites and to marine habitats from turbidity. These impacts will be mitigated with construction schedules that avoid times when the most harm would result, and a cofferdam to reduce turbidity. Additional information on the extent and timing of use of the site by various species is needed to evaluate how serious the impacts will be and whether the proposed mitigation measures will be adequate. The U. S. Fish and Wildlife Service should be consulted on this issue.

The Commission finds that if endangered species are found on the South Bay site and the impacts are not adequately mitigated, the project would be inconsistent with coastal resource protection policies of the Coastal Act.

Furthermore, the Commission recommends that the Energy Commission not approve an NOI that identifies the South Bay site as an acceptable site unless further study has been conducted to determine whether any of the above mentioned endangered, threatened, or candidate species inhabit the site or adjacent sites and may be affected by construction impacts. If one or more species use the site or surrounding areas, the NOI should not be approved for this site unless construction schedules and/or locations have been developed that will avoid impacts on these species.

C. IMPACTS ON PUBLIC ACCESS AND RECREATION

The proposed South Bay expansion project has the potential to affect the public's use and enjoyment of both the bayfront and the open waters of San Diego Bay in the vicinity of the site. There are two ways that the project may affect the public's use and enjoyment of the area: through impacts to physical public access and recreational uses in the vicinity of the project site, and through visual impacts to the public's aesthetic enjoyment of the water areas. The following section addresses the potential impacts of the expansion project on public access and coastal dependent recreation in the South Bay. The aesthetic impacts of the project are covered in the subsequent section, Visual Impacts (Section IV-D).

Policy Setting

Section 30413(d)(2) of the Coastal Act requires the Commission to consider and make findings regarding the degree to which a proposed power plant site and related facilities would conflict with other coastal-dependent land uses at or near the site, including water-oriented recreation facilities. In addition, Section 30210 of the Act states:

> In carrying out the requirement of Section 4 of Article X of the California Constitution, maximum access, which shall be conspicuously posted, and recreational opportunities shall be provided for all the people consistent with public safety needs and the need to protect public rights, rights of private property owners, and natural resource areas from overuse.

Existing and Planned Public Access and Recreational Uses

The site of the South Bay Power Plant is located immediately to the south of the major public water oriented recreational facilities located in South San Diego Bay (see Exhibit SB-4). These facilities include the Chula Vista Marina, a 552 slip commercial marina, the Marina View Park and associated boat launch ramp, and Bayside Beach, the only sandy beach area on the eastern shore of South San Diego Bay. These facilities are located on lands under the jurisdiction of the San Diego Unified Port District.

The Chula Vista Marina is the only public marina located in San Diego Bay south of the Glorietta Bay Marina in the City of Coronado. The 552 slip marina was recently expanded, and additional dredging to accommodate larger boats occurred in 1989. No additional sites for construction of marinas are currently available in South San Diego Bay, nor are additional sites expected to become available in the future.

Although one marina site was identified on the D Street Fill in the Chula Vista Bayfront Local Coastal Program (LCP), the settlement agreement resulting from Sierra Club v. Marsh has eliminated this potential marina site. As will be discussed in greater detail below, a new LCP is currently being prepared

for the Chula Vista Bayfront. It is not known at this time whether the LCP submittal will propose additional marina facilities. In the recent past, however, the City of Chula Vista has informally proposed construction of a new fill peninsula extending west and north from the existing peninsula that creates the marina, in order to accommodate expanded boat slips and associated facilities without encroaching onto wetland areas. In addition, the current LCP calls for a network of bicycle and pedestrian public access trails along the bayfront area, north of J Street.

The boat launch ramp at Chula Vista Marina is one of three located in South San Diego Bay. The other two boat launch ramps are located at the foot of G Street and in National City at the Port-operated ramp at the foot of Goesno Place.

Impacts to Public Access and Recreation

The proposed expansion of the South Bay facility raises the potential for two types of impacts upon water-oriented recreation in the Chula Vista area: (1) permanent impacts as a result of the siting and operation of the new facility and (2) temporary impacts as a result of construction activities.

Construction of the expanded facility will not have any direct permanent impacts upon public access to these recreational areas. There is sufficient space within the existing South Bay facility to accommodate the proposed expansion without requiring the use of any adjacent lands currently used for public recreational purposes.

Within the context of the Chula Vista Bayfront, however, there does exist the potential for several temporary impacts or impediments to access during construction. First, access from the developed areas of Chula Vista, east of the freeway to the bayfront and its recreational areas is limited to the freeway offramps and underpasses at E Street, G Street, J Street and L Street, with access to the majority of the existing recreational areas provided at J Street. Construction traffic has the potential to displace coastal visitor traffic on the bayfront's limited access routes.

Second, construction material and equipment staging areas have not been identified. If such staging is not limited to the existing South Bay facility, construction staging could also displace access opportunities, including parking, normally available to coastal visitors.

Finally, construction worker's vehicle parking could have the potential for displacing coastal visitor parking. Given the relatively limited improved facilities in the bayfront, only limited parking facilities have been provided. If construction worker parking were to take place in areas currently serving the area's recreational facilities, significant displacement of coastal visitor parking could occur.

Recommended Mitigation

The Commission recommends the following mitigation to address construction period impacts to recreational uses of the waterfront area:

- Construction should be timed to coincide with the traditionally low periods of public use of the waterfront.
- A traffic control plan should be developed to mitigate potential impacts of construction traffic on limited bayfront access routes.
- Offsite construction worker parking should be required, with shuttles to transport workers to and from the site.
- Construction staging areas should be not be sited in areas that would displace coastal access opportunities, including parking.

Conclusion - Public Access and Recreation

The temporary impacts to public access from construction, taken cumulatively, could result in significant adverse impacts to water-oriented recreational opportunities in the Chula Vista area. However, these impacts appear to be mitigable. Therefore, pursuant to Coastal Act Sections 30413 and 30210, the Commission finds that if the mitigation outlined above is followed, the project is unlikely to have significant adverse impacts to public access and recreation.

D. VISUAL IMPACTS

Section 30413(d)(3) of the Act states that the Commission must consider the potential adverse impacts on aesthetic values resulting from the expansion of any power plant. In addition, section 30251 of the Act states, in part:

> The scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural land forms, to be visually compatible with the character surrounding areas, and, where feasible, to restore and enhance visual quality in visually degraded areas. New development in highly scenic areas such as those designated in the California Coastline Preservation and Recreation Plan prepared by the Department of Parks and Recreation and by local government shall be subordinate to the character of its setting.

Existing Visual Environment

The proposed project would be located on the site of an existing 700 MW power plant. The presence of the existing plant has clearly affected the visual environment of the area. The existing power generation units are about 170 feet high, and the site contains numerous storage tanks ranging in size between 30 and 40 feet. Numerous transmission lines and towers are located around the site. An existing berm approximately 12 to 15 feet high surrounds the site, functioning, in part, to screen views of the site from surrounding city streets.

At present, only limited views across the site toward the bay are available from the major coastal access routes that serve the area. Due to the large structures, the presence of the elevated freeway structure and the landscaped berm, the only visual access to the bay from Interstate 5 occurs at limited corridors leading from sites that are elevated above the berm. These occur chiefly in the area of the L Street interchange with Interstate 5.

Visual Impact of Proposed Expansion

The proposed South Bay power plant expansion would require the construction of two 175-foot high stacks, which would represent the major visual impact of the project. In addition, a 75,000 square foot building would be constructed.

Section 30251 of the Act also seeks to protect views along the shoreline of the bay and the visual qualities of the critical viewsheds of recreational areas. The site of the South Bay power plant is visible from all the major recreational areas in the South Bay area, as well as from recreational boating areas in the bay itself. The site is also visible, to a lesser degree, from existing State Park facilities located on the eastern edge of the Silver Strand. Although the site is currently developed with a major power plant facility that is visible from these areas, the expanded plant will result in an incremental increase in the level of visual impact along the shoreline of San Diego Bay and from water oriented recreation occurring in the bay.

Discussion of Visual Impacts

Given the proposed location of the new facilities, there is a significant potential for impacts to the views of the bay from the vicinity of the L Street overcrossing. The proposed facilities appear to be in an area where there is currently a visual corridor across the site from L Street, Interstate 5 and from Bay Boulevard. In addition, the proposed 175 foot high emission stacks conflict with the City of Chula Vista's Local Coastal Program, which specifies a 44 foot height limit along the bayfront, and would therefore require an LCP amendment.

Given the size of the proposed facilities, including the 175 foot stacks, there does not appear to be any meaningful mitigation available that would reduce the impacts below the level of significance. Although shorter stacks could be utilized to reduce the level of the impacts, the proposed stack height is apparently dictated by air quality considerations. While these considerations may outweigh the possible avoidance of visual impacts, there may be alternative ways to mitigate the air quality impacts that would allow for a reduction in the stack height. The entire range of mitigation options should be evaluated.

Additional landscaping would not fully mitigate the impacts of the expansion. Although the Commission previously found that a landscaping program at the South Bay site would mitigate the visual impacts a wastewater treatment tank (A6-88-CHV-555, 1/10/89), the visual impact of the combined cycle project is too great to be significantly reduced with landscaping. In addition, the required landscaping is complete, and additional landscaping may not be practical.

The proposed "neutral" coloration may, to a limited extent, reduce the impacts of the proposed facilities upon the views along the coast and from the open waters of San Diego Bay. However, the visual impact reduction would be minimal.

The proposed expanded transmission facilities also raise the issues of visual impacts. Only the initial 1100 feet of the transmission line corridor is in the coastal zone, and it appears this portion of the transmission facility would not result in significant visual impacts from any major coastal access or recreation areas. However, the potential impacts cannot be fully assessed until the types and locations of the transmission towers is identified.

The cumulative visual effect of this expansion project in combination with both SDG&E's Unit 3 augmentation project, which would also involve visual obstructions, and the visual impact of the existing plant is substantial.

Recommended Mitigation

The Commission recommends that the Energy Commission consider the following measures, which would partially mitigate the visual impact of the project:

- The application of appropriate landscape screening measures, increased setbacks and the application of appropriate colors and textures to the proposed structures would, to a limited extent, reduce the visual impact of the project.

- Impact avoidance, through lowering the height of the structures, may also reduce the level of impact from some vantage points, and should be evaluated (see information needs, below).

Information Needs

The following information should be provided before an NOI is approved:

- Details on the proposed surface treatment for the power plant stacks. In addition, the effectiveness of surface treatment in reducing visual impacts should be evaluated.

- An analysis of the feasibility of lowering the stack height. The benefits of lowering the stack height should be weighed against the costs in terms of air quality impacts, including a consideration of alternative means of offsetting the air quality impacts.

Conclusion - Visual Impacts

Given the size of the proposed structures, the visual impacts of the development at South Bay do not appear to be fully mitigable and some unmitigable significant impacts to the visual environment are likely to occur.

Therefore, pursuant to Coastal Act Section 30413, the Commission finds that the project does not adequately protect views to and along the ocean, as required by Section 30251. Furthermore, the Commission finds that the cumulative visual impact of the proposed expansion in conjunction with the existing plant is significant, and is inconsistent with the Coastal Act.

E. CONSISTENCY WITH LOCAL COASTAL PROGRAM

Section 30413(d)(5) of the Coastal Act requires that energy facilities conform to the policies of the certified Local Coastal Program for a given area. In the case of the City of Chula Vista, the Commission has certified the City's Bayfront Local Coastal Program, consisting of a land use plan (LUP) and the Bayfront Specific Plan, which serves as the implementing ordinances for the Bayfront area.10/

Although the Coastal Act requires that the implementation program component of the LCP be consistent with the policies of the certified LUP, some discrepancies exist between the LUP and Specific Plan for the Chula Vista Bayfront. While the LUP permits the continued use and expansion of the South Bay facility, the Specific Plan does not allow for such expansion.

Land Use Plan

The site of the proposed expansion is designated "Industrial" in the certified LUP. In the text of the LUP, the following statements regarding permitted industrial land uses is made:

> 1. Industrial. The industrial land uses are confined to an area generally south of G Street, plus the inland parcel east of I-5. Existing uses will be permitted to continue and expand. Allocation: 270 acres (34.2%).

The LUP goes on to state that it is anticipated the SDG&E facility will remain in operation on a permanent basis.

Bayfront Specific Plan

Although the site is also identified as "Industrial: General" on the Bayfront Specific Plan Land Use Controls map, this designation does not appear to incorporate power generation facilities. As part of the text of the Specific Plan, a listing of permitted uses is included. The list of uses permitted in the "Industrial: General" designation does not include power plants. In addition, Appendix A of the Specific Plan provides the City's Administrative

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10/ In addition to the those LCP designations and policies that have had the benefit of Coastal Commission review and certification, the City of Chula Vista has taken other recent actions relative to the South Bay Power Plant site. On August 29, 1989, the City Council approved an interim ordinance directing staff to prepare further environmental review related to the appropriate land use designation for the property. The ordinance also declared a moratorium on all land use approvals on the property. In order to be included in the certified LCP, the interim ordinance, moratorium and/or any general plan or specific plan amendments concerning the land use designations of the South Bay site must be submitted to the Commission as LCP amendments.

Guidelines for its use classification system. According to the Administrative Guidelines, "Power Plants (steam, fossil)" are allowed in areas designated for Civic use types to which the subcategory designation of "Utility and Vehicular" have been applied.

Section 30513 of the Coastal Act provides the standard for review of implementation programs. Pursuant to Section 30513, implementation programs must conform to the policies of the certified LUP for a given area. Although it was not identified at the time of the Commission's review of the resubmittal of the Chula Vista Bayfront LCP, it is clear that the Bayfront Specific Plan's designation of the South Bay Power Plant as "Industrial: General" (as that use is defined) does not fully conform to the policies of the certified Land Use Plan. As stated above, the LUP clearly calls for the continued use and expansion of the site as a power plant, despite the existing plant's apparent non-conformity with the definition of industrial uses.

Given the requirements of Section 30513 of the Act, the Commission finds that the policies of the Land Use Plan are controlling. The LUP policies with respect to the continued use and expansion of the site are clear, despite the apparent contradiction contained in the Specific Plan.

Conclusion - Local Coastal Program

Section 30413(d)(5) of the Coastal Act requires that the Commission consider the consistency of new power plant projects with the certified local coastal program for a given area. Although there are contradictory policies in the LCP for the Chula Vista Bayfront, the proposed power plant expansion is consistent with the applicable designations contained in the certified LUP. The LUP also contains specific provisions allowing the continued use and expansion of the site as a power generating facility. Since the LUP is the controlling document, the Commission finds that the proposed expansion is consistent with the LCP, despite the apparent inconsistencies with the Specific Plan designations of the site. However, an amendment to the Specific Plan would be required to add power plants to the uses approved at the site.11/

11/ Section 30515 of the Coastal Act allows that for a person proposing an energy facility development may file a request for an amendment to a certified local coastal program, directly with the Coastal Commission, if the following two conditions exist:

(1) That person has first filed the proposed amendment with the local government, and the local government has not amended the certified local coastal program; and

(2) The purpose of the proposed amendment is to meet public needs of an area greater than that included within such certified local coastal program that had not been anticipated by the person making the request at the time the local coastal program was before the commission for certification.

F. SYSTEM SAFETY

Section 30413 of the Coastal Act states that the Commission must address the compatibility of a proposed power plant site and related facilities with the goal of protecting coastal resources, and must consider the potential adverse environmental effects of a proposed site on fish and wildlife and their habitats. In addition to addressing direct impacts on coastal resources from the daily operation of the proposed plant, protecting coastal resources involves minimizing the risks of accidents and spills with the potential to cause damage to the coastal environment. This is the area of system safety.

With the expansion of the South Bay power plant would come an attendant increase in the potential for accidents at the facility such as oil spills from increased tanker deliveries or releases of hazardous chemicals. The Coastal Act requires that protection against the spillage of crude oil, gas, petroleum products, or hazardous substances be provided in relation to any development or transportation of such materials, and that effective containment and cleanup facilities and procedures be provided for accidental spills that do occur (Section 30232). Furthermore, the Coastal Act requires that maximum public access be provided "consistent with public safety needs" (Section 30210).

The following section of this report addresses the consistency of the proposed power plant expansion with the Commission's policies on protecting natural resources and public recreational opportunities from spills of oil or hazardous chemicals, and from plant related safety hazards such as the electromagnetic field associated with the new transmission line.

1.0 OIL SPILLS

The proposed project will result in an increased risk of oil spills by requiring additional transfers into the facility via marine tanker and then by pipeline.

Fuel Oil Use and Transportation

Although the primary fuel used at the proposed South Bay plant would be natural gas, supplied from an existing natural gas pipeline to the site, SDG&E proposes to use distillate No. 2 low sulfur fuel oil as backup fuel. The proposed South Bay site includes on-site storage in an existing above-ground tank of a 12-day supply (8,400,000 gallons). The NOI states that "The existing tanker delivery facilities will be used for the new plant." No additional details on fuel delivery are provided in the NOI.[12/]

12/ California Coastal Commission Data Requests No. 31, response due August 13, 1990 and No. 59, response due October 5, 1990.

At present, fuel oil is delivered to the Chula Vista site by marine tanker offloading to a pipeline located at the National City Marine Terminal (Twenty-Fourth Street Terminal), operated by the San Diego Port District. From there the fuel oil is piped to a SDG&E storage facility at 28th Street and Quay, and thence to the existing SDG&E power plant in Chula Vista. The 28th Street storage facility, located on land leased from the Port District, contains 13,000,000 gallons of storage capacity (one 125,000 barrel tank, one 170,000 barrel tank, and a displacement tank).

It is not known how many additional tanker trips a year would result from the proposed project at the South Bay site.[13/] However, SDG&E states that at the Encina power plant site, the alternate proposed coastal site for the combined cycle project, tanker calls would increase from five to six per year. While this increase appears inconsequential, it represents a 20% increase in tanker deliveries for the power plant facility. Because of the potential environmental impacts from an oil spill, the Commission is concerned about any increase in tanker traffic. Furthermore, SDG&E proposes to store 1.4 million gallons more backup fuel at South Bay than at Encina, so the increase in tanker calls for the South Bay site may be higher than that cited for Encina. In addition, SDG&E's proposed Unit 3 Augmentation project may also require additional oil deliveries to the site. The cumulative impact of increased deliveries for both projects must be considered.

In addition to deliveries into this facility, SDG&E transports, by tanker or barge, oil out of this terminal to other company facilities or to other entities to which it sells oil. It is not known whether deliveries out of this facility will increase as a result of the proposed project.[14/] Operating procedures and containment and cleanup plans are not known at this time and, therefore, cannot be assessed.

Potential Impacts from an Oil Spill

An oil spill at or near the National City Marine Terminal could severely damage the biological resources at the Sweetwater Marsh Refuge, the Chula Vista Wildlife Reserve, as well as in the entire shallow water, marsh, and mud flat habitats of the southern section of San Diego Bay. These areas, which are extremely vulnerable to the effects of oil spills because of the relatively inefficient tidal flushing of the shallow south bay, are highly valuable fish and wildlife habitat. In addition to being a stop for migratory birds on the Pacific Flyway, the area at risk supports the largest number of shore birds in San Diego County and numerous nesting areas, including those of endangered species. (See Marine Resources section IV-A for a more detailed description of the resources that could be impacted by an oil spill related to the proposed project.)

[13/] California Coastal Commission Data Request No. 34, response due August 13, 1990.

[14/] California Coastal Commission Data Request No. 33a, response due August 13, 1990.

An oil spill at or near the National City terminal could also heavily impact recreational facilities in the South San Diego Bay area. These include the Chula Vista Marina, the Marina View Park and associated boat launch ramp, and Bayside beach. (For more details on recreational facilities in the proposed project vicinity, see section IV-C, "Impact on Public Access and Recreation".)

Recommended Mitigation for Oil Spill Risk

The Commission recommends that the CEC consider the following means of reducing the risk of an oil spill:

- Shipments From Terminal. The National City Marine Terminal should not be used to ship out oil that has previously been shipped in.

- Alternative Oil Transportation. Alternative methods of oil transportation for the South Bay site such as the use of pipeline rather than tankers should be given serious analysis. In this regard, the Coastal Act states that pipeline transport of oil is generally both economically feasible and environmentally preferable to other forms of crude transport (30265).

- Alternative Backup Fuels. The possible alternatives to oil as a backup fuel at the South Bay site should be examined. The Energy Commission staff is investigating propane, methanol, ethanol, liquified natural gas (LNG), and other alternatives, and expect to have an alternative fuel report published by early September. Some of these materials such as LNG may have other disadvantages in terms of transportation safety.

Informational Needs - Oil Spills

The Commission's ability to assess the potential impacts of an oil spill at the site is hindered by a lack of information on the present and proposed use of the National City Marine Terminal. The following information should be provided:

- A physical description of the National City Marine Terminal, a description of oil spill procedures and equipment, and data on the present as well as future frequency and types of use of the facility.

As a condition of filing an Application for Certification for this site, the CEC should require that SDG&E provide detailed information on the ability of the Terminal to prevent and address an oil spill should be prepared. The Coastal Commission staff would be available to consult with the CEC staff and SDG&E regarding the details of such plans and information. The CEC should require that SDG&E prepare the following reports:

- Terminal Operations Manual. This manual would describe all operational procedures that attempt to assure the prevention of oil spills. At a minimum, the manual would address water depth at the facility, mooring procedures, availability of tug assistance, and other spill prevention procedures.

- Oil Spill Contingency Plan. This plan would address the spill containment and cleanup procedures, equipment, training for response with onsite and cooperative equipment, and response to worst case accidents. The plan would address the following aspects of response to oil spills, particularly worst case accidents: notification; cleanup approach and oil characteristics; personnel; command, control, and communications; logistics, training and response drills, waste disposal; and tanker vessel contracts with spill cooperatives.

Conclusion - Oil Spill Risk

Based on the information available, the Commission finds that the increased risk of oil spills due to the proposed project is inconsistent with the requirements of Coastal Act Section 30230 to protect the marine environment, Section 30232 to protect against oil spills, and Section 30210 to protect recreational opportunities.

2.0 OTHER HAZARDOUS MATERIALS

The project would increase the transportation to and storage of hazardous materials at the proposed South Bay site. Several of these chemicals used at the plant are extremely hazardous, and pose risks to workers, nearby residents, recreational users and wildlife resources if released in sufficient quantities either through transportation accidents or mishaps on the site: ammonia, chlorine, cyclohexylimine, formic acid, sulfuric acid and hydazine. Most of these chemicals are used in the water treatment process. Ammonia is used in the selective catalytic reduction process. The NOI cites a worst case scenario of 197 truckloads of hazardous materials to and from each site per year as a result of this project. This population at risk includes 31,540 within 1.5 miles of the site, and 109,491 within 3.1 miles of the site. Additionally, the site is also immediately west of Interstate 5. This is a substantial population at risk. While not all of it is in the coastal zone, the Commission believes the CEC should evaluate the risks carefully.

The NOI states:

> Compliance with industry design codes and safety standards will minimize the risk to public health from storage and use of these chemicals.... Toxic and hazardous materials will be stored, handled, and disposed of in accordance with applicable laws, ordinances, regulations, and standards.

Informational Needs - Hazardous Materials

While the NOI states that alternatives are available for some of the materials, it claims that these pose similar hazards, are not as effective for their intended purpose, or are more expensive to use. However, the NOI does not specify which substances were considered or describe the positive and negative attributes of those substances. This information is necessary for a thorough evaluation of the safety of this facility.

For example, alternative, less hazardous substances are available to be used in place of anhydrous ammonia and gaseous chlorine. With aqueous solutions for example, the rate of introduction into the environment is reduced substantially, and solid chlorine would reduce it even more. In addition, engineering systems can reduce the risk of release, or remove the need for these substances. These alternatives should be thoroughly investigated.

The Coastal Act requires that possible adverse impacts be mitigated to the maximum extent feasible. Simply following existing laws, ordinances, regulations, and standards may not be adequate mitigation for such adverse impacts. As is the case with oil spills, the Commission does not have enough information to assess adequately the adverse effects that may occur from the proposed project.

Recommended Mitigation for Hazardous Materials Risk

The NOI states that the proposed South Bay plant "will develop and implement [a] Risk Management and Prevention Plan and arrange with local emergency agencies for services in the event of an accident or emergency." The Commission recommends that the CEC require preparation of this plan as a condition of filing the AFC for this project.

Conclusion - Hazardous Materials Risk

The Commission finds that additional information is needed to assess the risks of a hazardous materials release, and that based on the information available, the project is not consistent with Section 30232 of the Coastal Act.

3.0 IMPACTS OF TRANSMISSION LINE ELECTROMAGNETIC FIELDS

SDG&E proposes 20 miles of new transmission lines and 16 miles of reconstruction of existing lines in conjunction with this project. Eleven hundred feet of the new line is in the coastal zone. An emerging area of concern is the adverse effects on human health of exposure to electromagnetic fields associated with transmission lines. Although the majority of the new transmission line is outside the coastal zone, and is therefore best addressed by the CEC, the Commission is concerned with potential health effects of these lines should the lines affect public access areas, and believes that the issue merits attention.

SDG&E addressed concerns voiced by the City of Carlsbad on this issue with the assertion that "the scientific community in general...all agree there is no health-based rationale for establishing standards or taking aggressive action limiting exposure." However, EPA, after a two-year analysis of studies exploring a possible connection between cancer and extremely low frequency electromagnetic fields (such as those that emanate from transmission lines), concluded that a growing body of data now shows a consistent pattern that suggests a causal link (June 1990). This potential impact merits further investigation.

Information Needs - Electromagnetic Field Impact

The following information should be provided prior to approval of the NOI:

- An assessment of the proximity of the proposed transmission line corridor to existing and planned coastal public access and recreational facilities, the potential risk to users of these areas from exposure to electromagnetic fields, and an assessment of the feasibility of mitigating any impacts.

G. GEOLOGY

Under Section 30253, the Coastal Act states the following:

New development shall:

(1) Minimize risks to life and property in areas of high geologic, flood, and fire hazard.

(2) Assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs.

An analysis of the geologic issues is also required under Section 30413(1) and 30413(7) of the Coastal Act, which require that the Commission consider the compatibility of a proposed South Bay power plant site with the goal of protecting coastal resources and other matters as the Commission deems appropriate and necessary to carry out the provisions of this division, respectively.

Geologic Setting

The South Bay site lies in an area of low relief within the Coastal Plain adjacent to San Diego Bay. Based on early topographic maps of the area, the project area appears to lie slightly to the east of the historical high tide line. The stratigraphy of the site consists of compacted fill, tertiary and quaternary-aged marine and nonmarine deposits that rest upon metamorphic and granitic rock. Studies indicate that most of the site is covered by a thin veneer of compacted fill. The Rose Canyon fault zone is the closest major fault zone to the site which trends north-northwest to northwest and extends on land generally through parts of the downtown area, to San Diego Bay, and beyond to the south. The Silver Strand fault, one of the longer and more continuous faults within the Rose Canyon fault zone, is mapped in the offshore area about 2.5 miles from the South Bay site. This fault is considered a significant trace of the Rose Canyon fault zone and capable of generating the maximum credible earthquake for the South Bay site.

Within the southern portion of San Diego Bay, there are several relatively short, apparently discontinuous faults that trend roughly north-northwest. The nearest of these faults is mapped about 0.5 miles northwest of the site.

To the east of the site, the La Nacion fault zone is mapped as a series of subparallel, north-trending faults that extend from the US-Mexico border to the Mission Valley area. The Sweetwater fault is the most westerly fault within this zone and is mapped about 5.0 km (3 miles) east of the site. The La Nacion fault zone is considered a secondary, extensional feature of the Rose Canyon fault zone.

Other significant nearby faults include the Elsinore fault to the east, the San Diego Trough, San Clemente, and Coronado Faults to the west, and the Calabasas and San Miguel faults to the south.

No faults have been mapped on or projecting into the subject site.

Geologic Hazards

Following is a brief discussion of potential geologic hazards:

Ground Shaking - The faults that are considered capable of generating large earthquakes and, therefore, would be probable sources of strong ground motion at the site are listed below along with the estimated maximum credible and the maximum probable peak ground accelerations.

Fault Name	Primary Displacement	Estimated Length km (miles)	Distance From Site km (miles)	Maximum Credible Earthquake*
Rose Canyon	Strike-Slip	110 (68)	4 (2.5)	7.25
La Nacion	Normal	25 (16)	7 (4.5)	6.25
Coronado Banks	Strike-Slip	122 (76)	13 (8.0)	7.25
San Diego Trough	Strike-Slip	106 (66)	38 (24.0)	6.75
Elsinore	Strike-Slip	310 (193)	71 (44)	7.5

Maximum Credible Peak Ground Acceleration (per CDMG Map Sheet 45) = 0.6 g.
Maximum Probable Peak Ground Acceleration (WCC analysis) = 0.25 g.

*Richter magnitude.

Fault Rupture - According to surveys that indicate a lack of faults in the immediate site area, both on land and the nearby bay area, fault ground surface rupture is a low likelihood geologic hazard for the South Bay site.

Liquefaction - The clean granular soils below the ground water table may be susceptible to liquefaction when subjected to moderate or strong ground shaking.

Subsidence - Subsidence resulting from the extraction of fluids, the dissolution of soluble materials, or the collapse of underground cavities is not considered a significant hazard for the site.

Other geologic hazards - Other geologic hazards, including cavities, lurching, seiches, tsunamis, or volcanic activity, were not identified and are not considered significant for the South Bay site.

Geotechnical Mitigations

As noted above, the principal geologic concerns at the the South Bay site are groundshaking and liquefaction from earthquakes. According to the NOI the

proposed project would be designed in accordance with California Energy Commission Zone 4 requirements. However, this designation may be inadequate, based on new information.

The California Division of Mines and Geology is now in the process of zoning portions of the Rose Canyon fault as "active" as defined by the Alquist-Priolo Act of 1972. Several geotechnical investigations of the Rose Canyon fault have revealed Holocene offset exposed in trench walls. The South Bay site is two and one half miles from the Rose Canyon fault. Therefore, the results of these new geotechnical investigations may, in fact, increase the maximum credible earthquake to greater than a magnitude 7.25. It is the Commission's understanding that both of these plants will be designed to specific criteria under the Energy Commission's Seismic Zone IV designation. The Energy Commission should contact the Division of Mines and Geology to obtain the latest information on the Rose Canyon fault. Specifically, the Energy Commission should review whether any new geologic information on the Rose Canyon fault would make the design requirements cited under Seismic Zone IV inadequate.

H. AIR QUALITY

Under Section 30413 of the Coastal Act, the proposed South Bay power plant must be consistent with the general goal of protecting coastal resources. One aspect of protecting coastal resources involves ensuring that a project will not degrade coastal air quality. The Commission does not have direct regulatory authority over air quality matters for projects within the coastal zone that fall within the purview of the State Air Resources Control Board (State Board), or an air pollution control district. Instead section 30253(3) of the Coastal Act specifies that new development shall "be consistent with requirements imposed by an air pollution control district or the State Air Resources Control Board as to each particular development." The Coastal Act further provides that the State Board and air pollution control districts are the principal public agencies responsible for the establishment of air ambient air quality and emission standards and air pollution control programs (Section 30414(a)), and prohibits the Commission from establishing or modifying any air quality or emission standard, or air pollution control program which has been established by the State Board or by an air pollution control board.

The Warren-Alquist Act and the CEC's regulations require that the San Diego Air Pollution Control District submit a report to the CEC during this early phase of the NOI that evaluates whether the proposed power plant expansion projects would comply with all district rules and would incorporate the best available control technology. In addition, the District must make recommendations about any necessary project modifications (Calif. Code of Regs., Title 20, Section 1714.7.). The Air Resources Board is required to review and comment on the District's report, and to indicate whether the proposed projects have a substantial likelihood of complying with applicable air quality requirements. The Energy Commission may not approve an NOI for a site unless it determines that the project will meet applicable qir quality requirements (Calif. Code of Regs., Title 20, Section 1130).

The San Diego Air Pollution Control District (SDAPCD) is participating in the NOI proceeding. SDG&E has not yet provided the information needed to allow the SDAPCD to determine if the proposed facility complies with SDAPCD standards and if sufficient emissions offsets are available.

I. CUMULATIVE IMPACTS ON COASTAL RESOURCES AT SOUTH BAY

The Coastal Act (Section 30250) and the California Environmental Quality Act (CEQA) require an analysis of not only the direct environmental impact of individual projects, but also the cumulative impacts resulting from each individual project in combination with closely related past, present and "probable" future projects.

San Diego Gas and Electric did not originally supply information on cumulative impacts in the NOI documents. The Coastal Commission staff and the City of Chula Vista subsequently requested information on the cumulative impacts of the proposed South Bay plant. On July 31, 1990, SDG&E replied to the information request and stated, "This data request shall not be answered." SDG&E stated that they believe that the evaluation of cumulative impacts is not necessary at the NOI stage. The Commission staff does not agree and intends to file a motion to compel with the Energy Commission stating the importance of this cumulative impact information at the NOI stage.

The issue of cumulative impacts is particularly important at the South Bay site. In addition to the impacts of the existing 690 Megawatt power plant, the combined cycle project must be evaluated in conjunction with SDG&E's proposed Unit 3 Augmentation project (See the South Bay Introduction for a brief description of this project).

The cumulative impacts to the South Bay coastal resources from the proposed project and closely related projects are likely to be significant in the following areas: visual impacts, marine biology and air quality. As explained in the air quality section (Section IV-H), the Commission relies upon the San Diego County Air Pollution Control District to address air quality issues for onshore projects. Therefore, this section will focus on the remaining issue areas of marine biology, and visual impacts. Following a discussion of the potential cumulative impacts are several suggestions for mitigation.

Cumulative Visual Impacts

The existing South Bay Power Plant with its 170 foot high power generation facilities, which are not enclosed in a building, substantially degrades the visual quality of the bayfront, contributing to the industrial character of this part of the South Bay. The addition of the proposed combined cycle project with its two 175 foot high stacks and a 75,000 square foot building to house the generators will add significantly to the existing impacts. The Unit 3 Augmentation project would further degrade the visual quality of the bayfront, adding additional generators and an additional emission stack. Taken cumulatively, the impacts of these projects is severe.

Mitigation for Cumulative Visual Impacts

It is very difficult to mitigate the visual impacts of the existing or proposed power plant projects at the South Bay site. The tall emissions stacks are visible at a great distance. Traditional visual mitigation are ineffective, as with landscaping or setbacks, or infeasible, as with height restrictions (unless the air quality impacts caused by lowering the stack height can be otherwise mitigated).

The Commission recommends that the CEC explore innovative methods that would reduce the visual impact of the plant.

Cumulative Marine Resource Impacts

As described in this report, the existing South Bay power plant causes significant adverse impacts to marine resources in South San Diego Bay. The once through sea water cooling system causes substantial biotic mortality and disruption of the South Bay ecosystem by entraining billions of passively floating organisms such as fish larvae, impinging larger organisms against debris screens, and causing thermal stress to a wide range of organisms. All of these impacts would be increased substantially by the proposed combined cycle project. The Unit 3 augmentation project would further increase the thermal impacts. SDG&E must address the cumulative impacts of these and other projects on the marine environment. Further analysis is needed to determine the full extent of these impacts.

Recommended Mitigation for Cumulative Marine Resource Impacts

The Coastal Commission recommends that the CEC explore the following measures to mitigate the cumulative marine biological impacts from the combined cycle project at South Bay in combination with similar projects, including the existing South Bay plant and the proposed Unit 3 Augmentation:

- Retrofit Existing Units. One way that the cumulative marine resource impacts of the existing South Bay plant could be addressed is by requiring the retrofitting the existing units to reduce biological impacts. A number of possible mechanical techniques for reducing the impacts of entrainment and impingement are discussed in Section IV-A of this report, Marine Resources. Similarly, one of the mitigation options discussed in the Marine Resource Section for reducing thermal impacts from the combined cycle project, an offshore discharge, would also address the cumulative impacts of the existing South Bay plant and Unit 3 Augmentation project.

- In-Lieu Fee Mitigation For Power Plants. The Coastal Commission recommends that the Energy Commission explore establishing an in-lieu fee mitigation program as a pilot program for the Encina and South Bay Power Plants. If the pilot program proves effective, the Energy Commission could expand the program as appropriate to other coastal and bay power plants in California.

Based on data from the Marine Review Committee's (MRC) studies on the San Onofre Nuclear Generating Station (SONGS), coastal power plants with once-through seawater cooling systems have been proven to have significant impacts on fish populations. For example, SONGS alone is calculated to reduce the Southern California bight-wide queen fish population by up to 13% (MRC, 1989). Cumulatively, the amount of marine organisms (including larvae) killed by seawater cooled power plants statewide is likely to be quite high.

The in-lieu fee program would be in addition to any specific impact or preventive mitigation required for a particular power plant. The in-lieu fees would be required for compensation of all estimated cumulative unmitigated impacts. The amount of organisms killed would be estimated by taking the seasonal abundance data per unit of sea water and calculating total loss based on the amount of sea or bay water used by the power plant for cooling.

The actual amount of the fee could be determined by a group of specialists including such agencies as the Department of Fish and Game, National Marine Fisheries Service, State Water Resources Control Board and the Coastal Commission with guidance from university research biologists. The amount would be calculated based on the calculated value of the lost resources after mitigation. These estimates would be derived from data of fish, invertebrate, and larval abundance in the area seasonally.

The in-lieu fee would go into a special fund to be administered by a state agency and used for the purpose of enhancing marine resources in the areas impacted by the power plants. The funds could be used for enhancement projects like marine fish hatcheries, artificial reefs, reduction of non-point source pollution, reduction of siltation into the marine environment, etc.

V. REFERENCES

Allen, J. 1990. Personal communication. MBC Applied Environmental Sciences, Costa Mesa. CA.

Ambrose, R.F. 1990. Personal communication. Consulting Research Scientist, University of California, Santa Barbara, Marine Science Institute.

Andrecht, K. 1990. Personal communication, Director, Chula Vista Wildlife Reserve, CA.

Andrecht, K.L. and T.E. Firle. 1987. Development of a coastal marsh in south San Diego Bay: the Chula Vista wildlife reserve. Presented at the Association of Environmental Professionals Annual Conference, San Diego, California, April 23-26, 1987. 17pp.

Biebl, R. and C. P. McRoy. 1971. Plasmatic resistance and rate of respiration and photosynthesis of Zostera marina at different salinities and temperatures. Marine Biology. Vol.8:48-56.

Bradshaw, J.; Browning, B.; Smith, K.; Speth, J. 1976. The Natural Resources of Agua Hedionda Lagoon. Coastal Wetland Series #16, Office of Biological Services, U.S. Fish and Wildlife Service.

California Regional Water Quality Control Board San Diego Region. 1989. Waste discharge requirements for San Diego Gas and Electric Company, South Bay power plant, San Diego County, Order No. 85-09, NPDES permit No. CA0001368, December.

DeFran, R.H. 1990. Personal communication. Department of Psychology, San Diego State University.

Dutton, P.; and McDonald, D. 1990. Status of sea turtles in San Diego Bay: 1989-1990 final report. Sea World Research Institute Technical Report #90-225, June 30, 1990.

Ford, R.F.; Chambers, R.L. 1974. Thermal distribution and biological studies of the south bay power plant. Volume 5A-5C, Environmental Engineering Laboratory, California State University, San Diego, California.

Ford, R.F. and R.L. Chambers. 1973. Thermal distribution and biological studies of the south bay power plant. Volume 4A, Environmental Engineering Laboratory, California State University, San Diego, California, May.

Foster, M.; Schiel, D.R. 1985. The ecology of giant kelp forests in California: a community profile. U.S. Fish Wildl. Serv. Biol. Rep. 85(7.2). 152 pp.

Glantz, D. 1990. Personal communication. Kelco. San Diego, CA.

Hoffman, R. S. 1986. Fishery utilization of Eelgrass (Zostera marina) beds and non-vegetated shallow water areas in San Diego Bay. National Marine Fisheries Service Southwest Region, Administrative Report SWR-86-4.

Jenkins, S.A.; Skelley, D.W. 1989. An evaluation of the coastal data base pertaining to seawater diversion at the Encina power plant Carlsbad, CA. S10 Reference Series, Scripps Institution of Oceanography, Univ. of Cal.

Jones, E. 1990. Personal communication, Engineer, SDG&E.

Kennedy, M. 1990. Personal communication, United States Fish and Wildlife Service.

Kinnetic Laboratories Inc. 1987. Encina semi-annual receiving water monitoring study; prepared for SDG&E.

Kjelmyr, J. 1990. Personal communication, Point Reyes Bird Observatory, CA.

Kramer, S. 1990. Personal communication, Southwest Fisheries, National Marine Fisheries Service, La Jolla, CA.

Lockheed Ocean Systems. 1983. Semi-annual Report, Offshore Monitoring Program, Encina power plant. June-July 1983, prepared for San Diego Gas and Electric Company, July 1983.

MacDonald, K. 1990. Personal communication, michael Brandman and Associates, San Diego, CA.

Marcus, L.; Kondolf, A. 1989. The coastal wetlands of San Diego county. California State Coastal Conservancy.

Marine Review Committee (MRC). 1990. Final Technical Report H. Mitigation. Report to the California Coastal Commission.

Marine Review Committee (MRC). 1989. Final Report of the Marine Review Committee to the California Coastal Commission.

Marine Review Committee (MRC). 1989. Final Technical Report K. Giant Kelp. Report to the California Coastal Commission.

Marine Review Committee (MRC). 1988. Interim Technical Report 2. Sampling design and analytical procedures (BACIP). Report submitted to the California Coastal Commission.

Massey, B.W. 1980. California Least Tern recovery plan, dated April 2, 1980. Prepared by the U.S. Fish and Wildlife Service, Region 1, Portland, Oregon, in cooperation with the recovery team.

MBC Applied Environmental Sciences. 1990. Distribution of juvenile California halibut (Paralichthys californicus) in bay and coastal habitats of Los Angeles, Orange and San Diego Counties in 1989. Prepared for Southern California Edison Company, Rosemead CA. MBC Applied Environmental Sciences, Costa Mesa, CA report no. 90RD09, 74pp.

McDonald, D. 1990. Personal communication, Hubbs Sea World Research Institute, San Diego, CA.

Michael Brandman Associates. 1989. South San Diego Bay Enhancement Plan. Prepared for San Diego Unified Port District and California State Coastal Conservancy. 4 Volumes.

Page, G. 1990. Personal communication, Point Reyes Bird Observatory, CA.

Point Reyes Bird Observatory. 1990. Unpublished data.

Rasmussen, E. 1977. The wasting disease of eelgrass (Zostera marina) and its effects on environmental factors and fauna. In, Seagrass ecosystems. A scientific perspective, edited by C.P. McRoy & C. Helfferich, Marcel Dekker, Inc., New York, 1-52.

San Diego Gas & Electric. 1987. Results of performance tests for circulation water pumps at Encina power plant, Carlsbad, CA. prepared by WESTEC Services Inc.

San Diego Gas & Electric. 1981. Encina power plant Unit 5 cooling discharge; Section 316(a) of the federal water pollution control act of 1972. Demonstration Summary.

San Diego Gas & Electric. 1980. Encina power plant Unit 5 cooling discharge; Section 316(b) of the federal water pollution control act of 1972. Demonstration Summary.

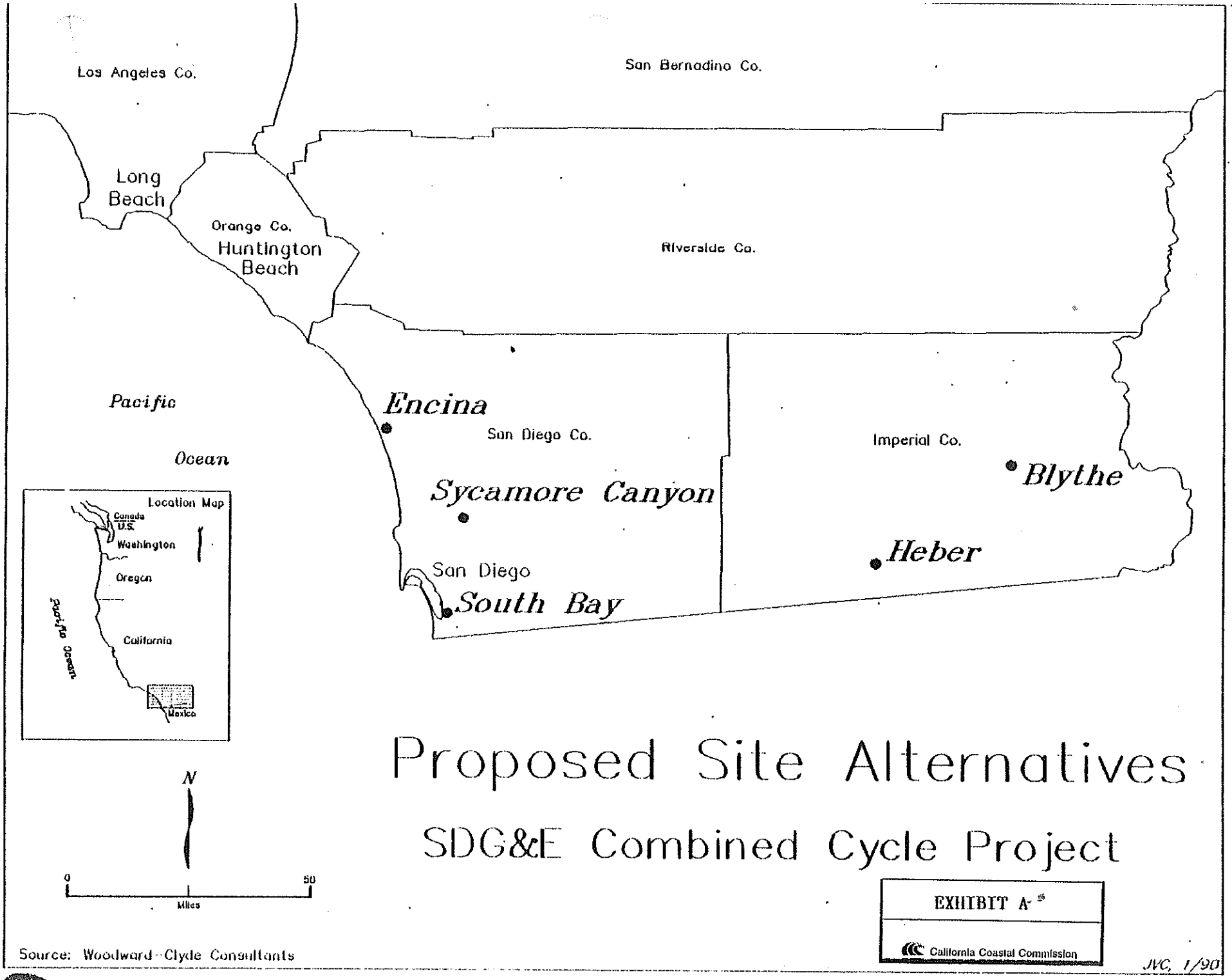
San Diego Gas & Electric. 1980. South Bay Power Plant Cooling Water Intake System Demonstration, December, 1980.

Sonu, Choule. 1990. Personal communication. TekMarine Inc., Los Angeles, CA.

State Water Resources Control Board. Water quality control plan for control of temperature in the coastal and interstate waters and enclosed bays and estuaries of California. September. 1975.

Stinson, M.L. 1984. Biology of sea turtles in San Diego Bay, California, and in the northeastern Pacific Ocean. Master's Thesis, San Diego State University. 578 pp.

Tegner, M.J.; Dayton, P.K. 1987. El Nino effects on southern California Kelp forest communities. Advn. in Ecol. Res. 17: 243-359.



Proposed Site Alternatives

SDG&E Combined Cycle Project

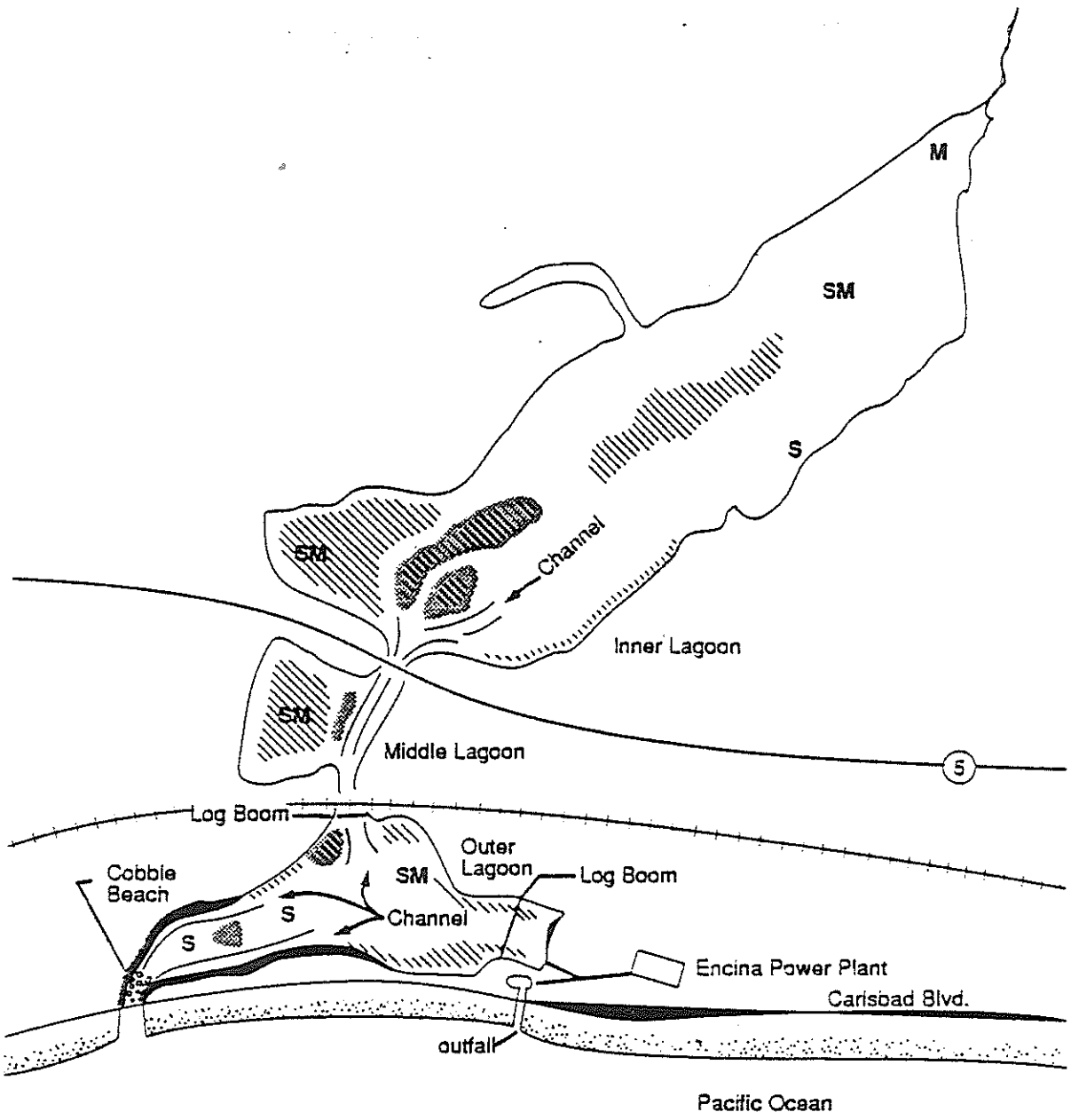
EXHIBIT A

California Coastal Commission

JVC, 1/90

Source: Woodward-Clyde Consultants

California Coastal Commission
Cartography Section



Not to Scale

LEGEND

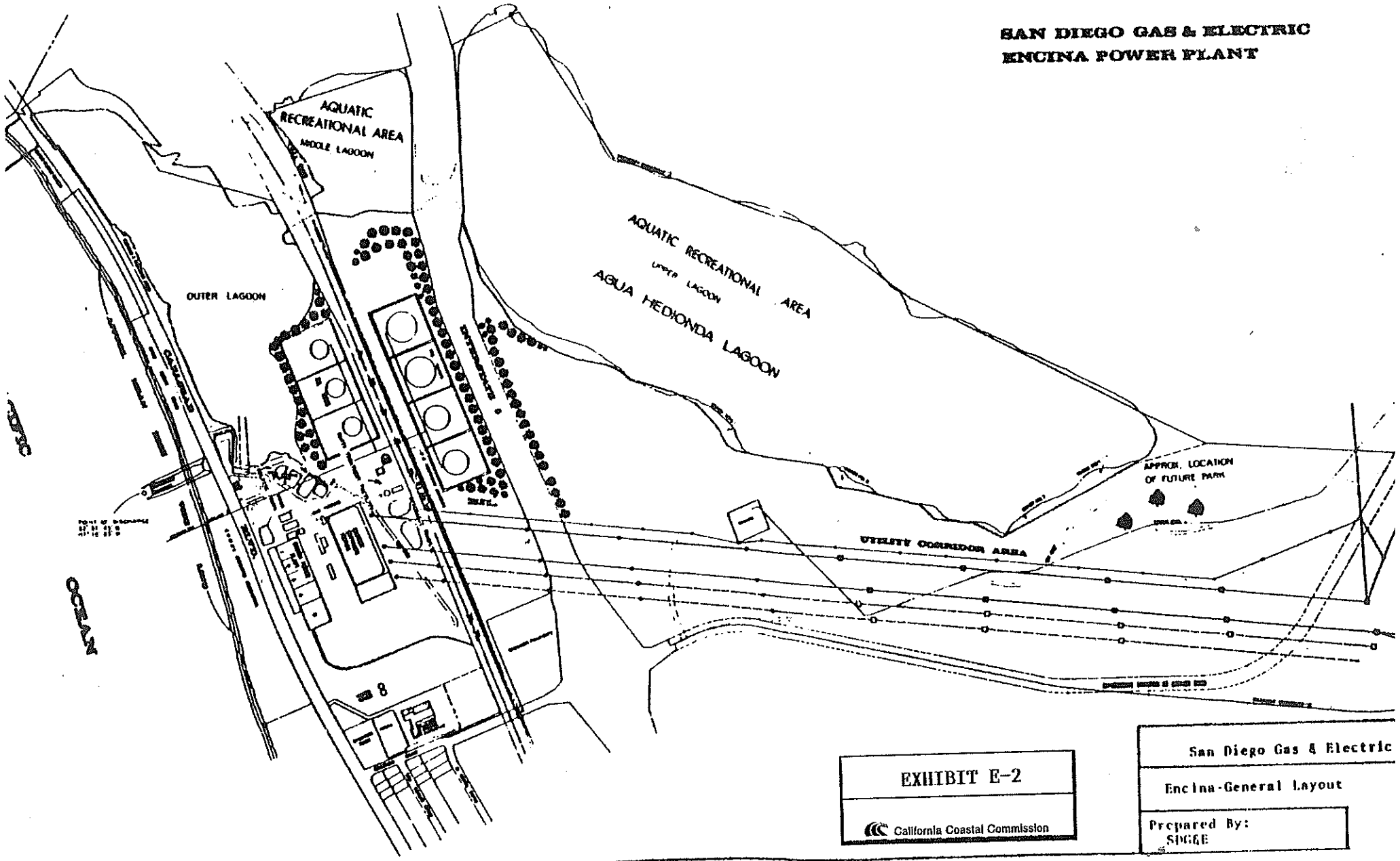
- Eelgrass Beds
- Sargassum
- Shallow Shoal Area
- S — Sand
- M — Mud
- SM — Sandy Mud

EXHIBIT E-1

California Coastal Commission

Date: November 10, 1989		Combined Cycle NOI Project	Rev. No. 0
Project No. 8910232A	San Diego Gas & Electric	LOCATION OF MARINE VEGETATION AND SUBSTRATE TYPES IN AGUA HEDIONDA	
Woodward-Clyde Consultants			

Note: Map is for illustrative purposes only. The Coastal Commission is not adopting or endorsing any of the boundaries shown.



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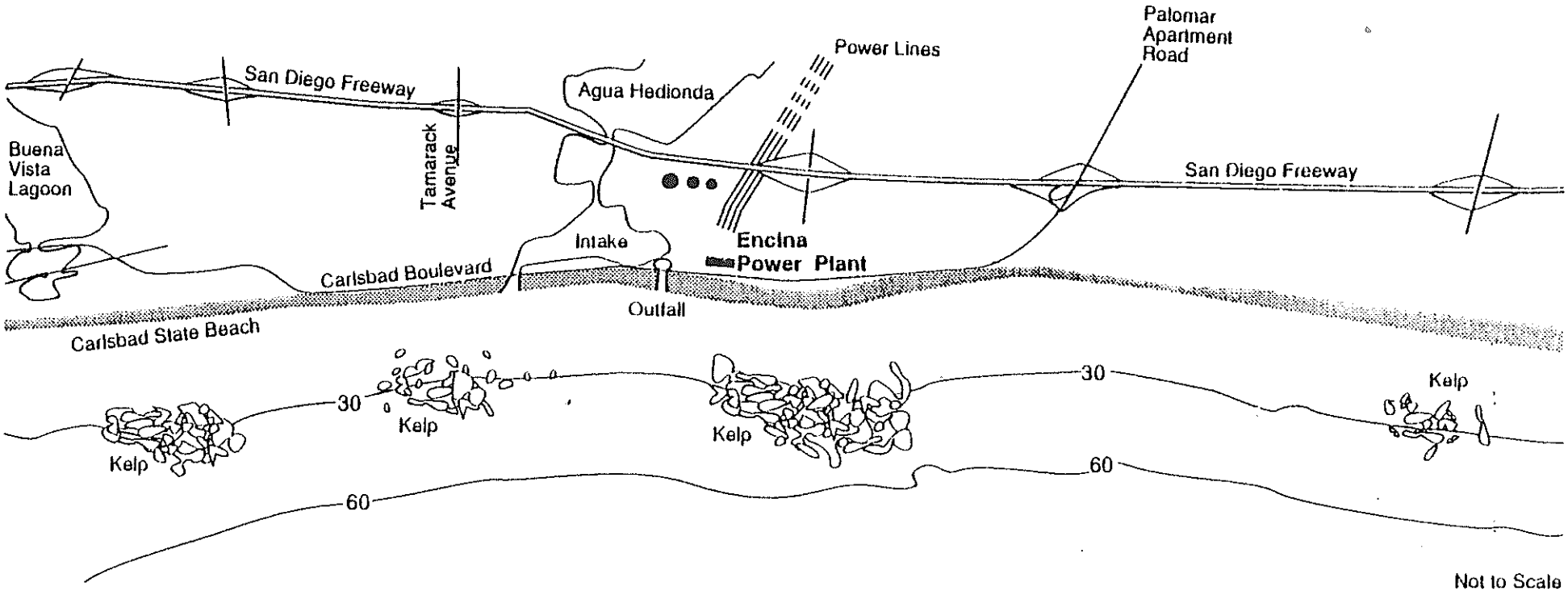
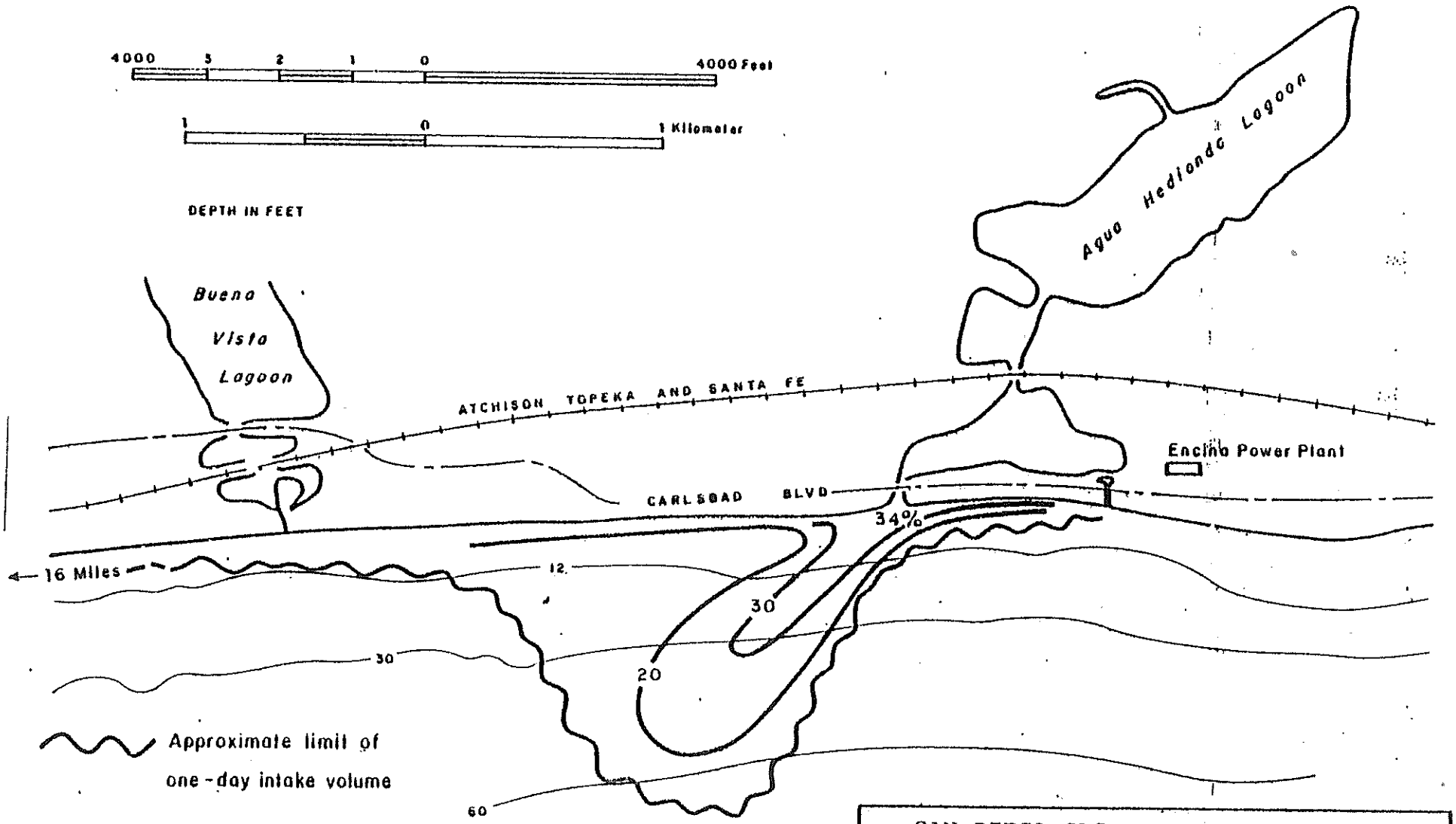


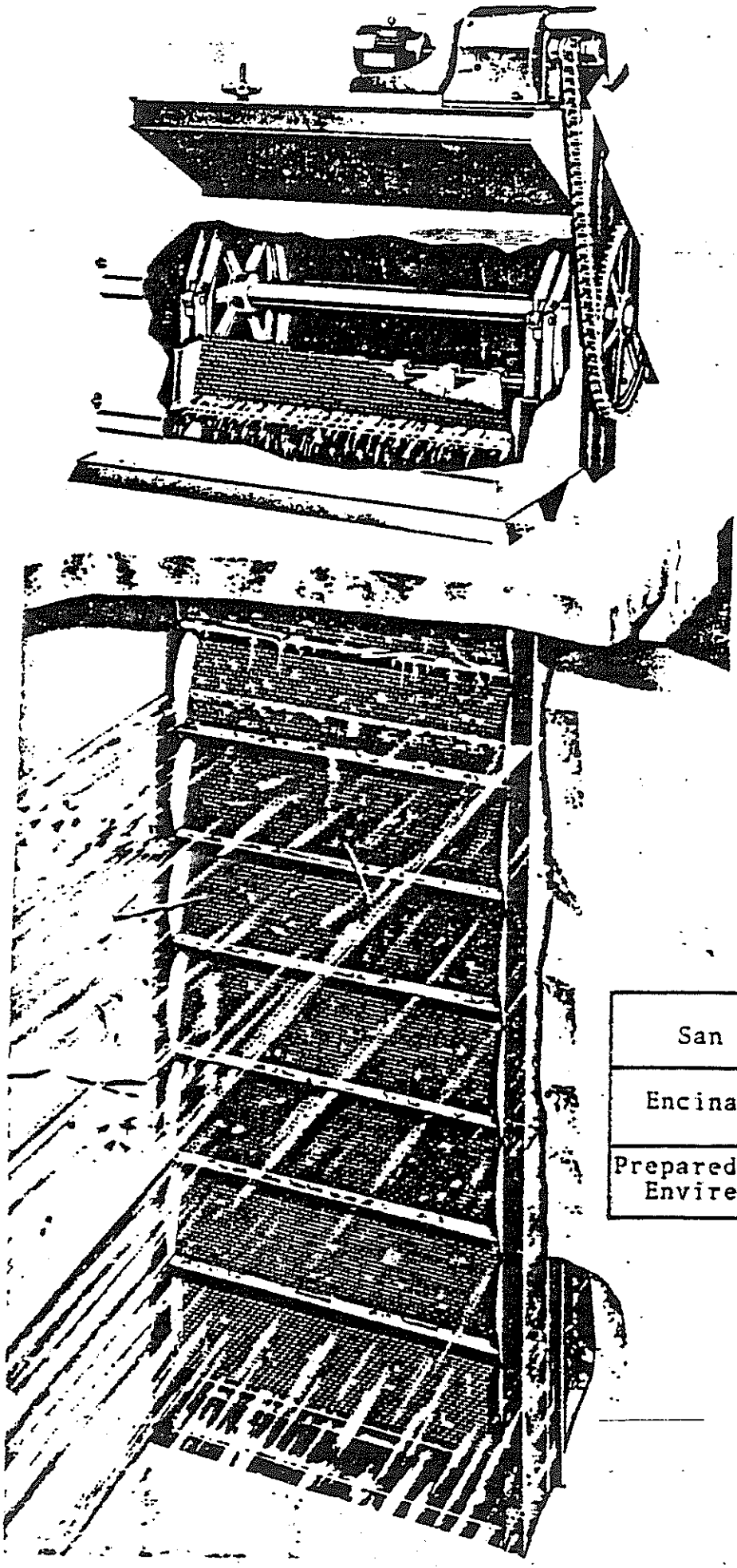
EXHIBIT E-3	Date: November 10, 1989	Combined Cycle NOI Project	Rev. No. 0
California Coastal Commission	Project No. 8910232A — San Diego Gas & Electric	LOCATION OF SURFACE KELP CANOPIES IN RELATION TO ENCINA POWER PLANT	
	Woodward-Clyde Consultants		

Note: Map is for illustrative purposes only. The Coastal Commission is not adopting or endorsing any of the boundaries shown.



SAN DIEGO GAS & ELECTRIC COMPANY	
EXHIBIT E-4	Offshore entrainment probability Encina Power Plant - August 1, 1980
California Coastal Commission	PREPARED BY: WOODWARD-CLYDE CONSULTANTS

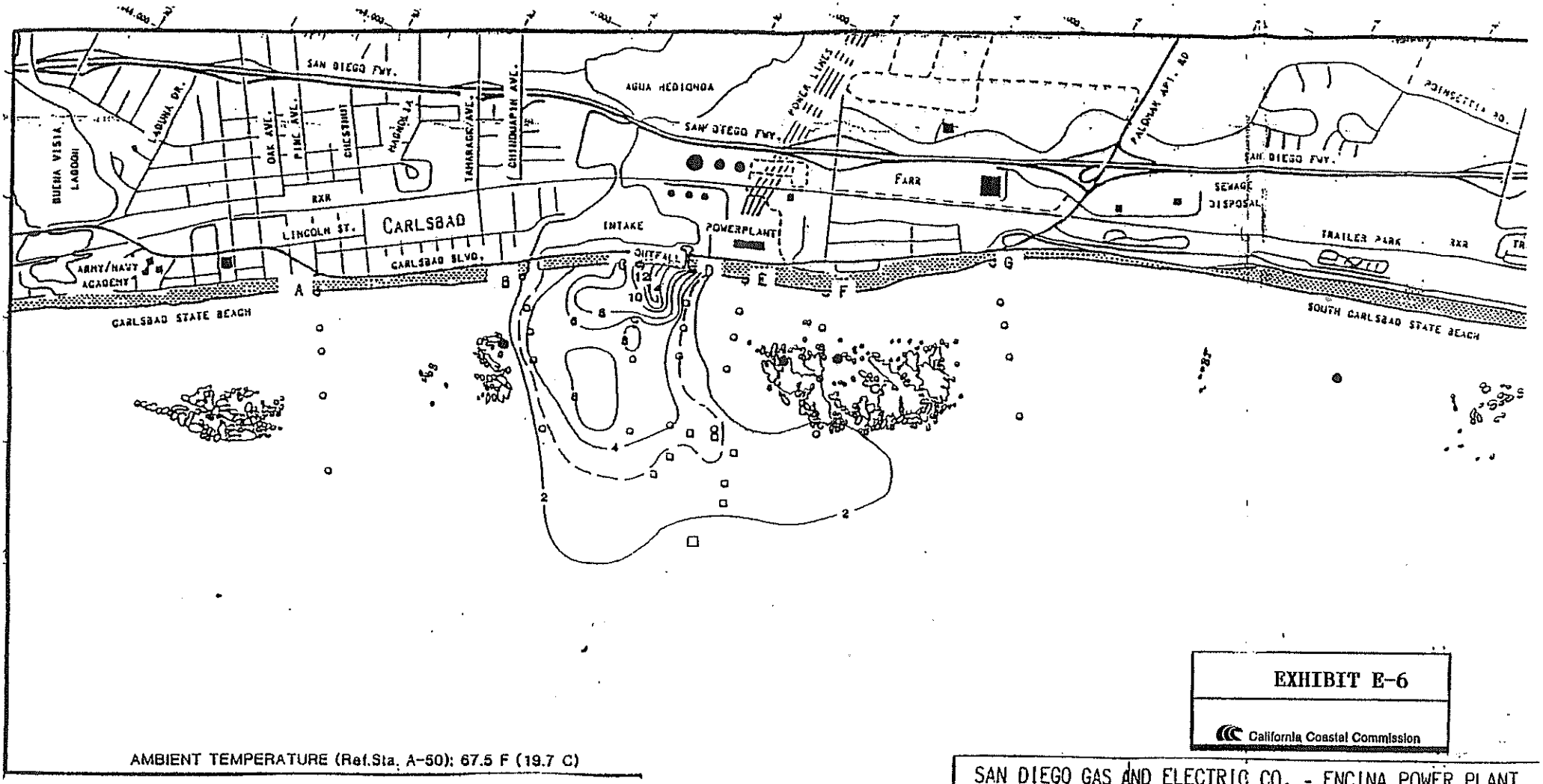
Note: Map is for illustrative purposes only. The Coastal Commission is not adopting or endorsing any of the boundaries shown.



San Diego Gas & Electric	
Encina Traveling Water Screen	
Prepared By: Envirex	

EXHIBIT E-5

California Coastal Commission



AMBIENT TEMPERATURE (Ref.Sta. A-50): 67.5 F (19.7 C)

Figure 2-4 Thermal Plume Map, 1505-1615

- Surface Kelp Canopy

EXHIBIT E-6

California Coastal Commission

SAN DIEGO GAS AND ELECTRIC CO. - ENCINA POWER PLANT
SEMI-ANNUAL MONITORING STUDY

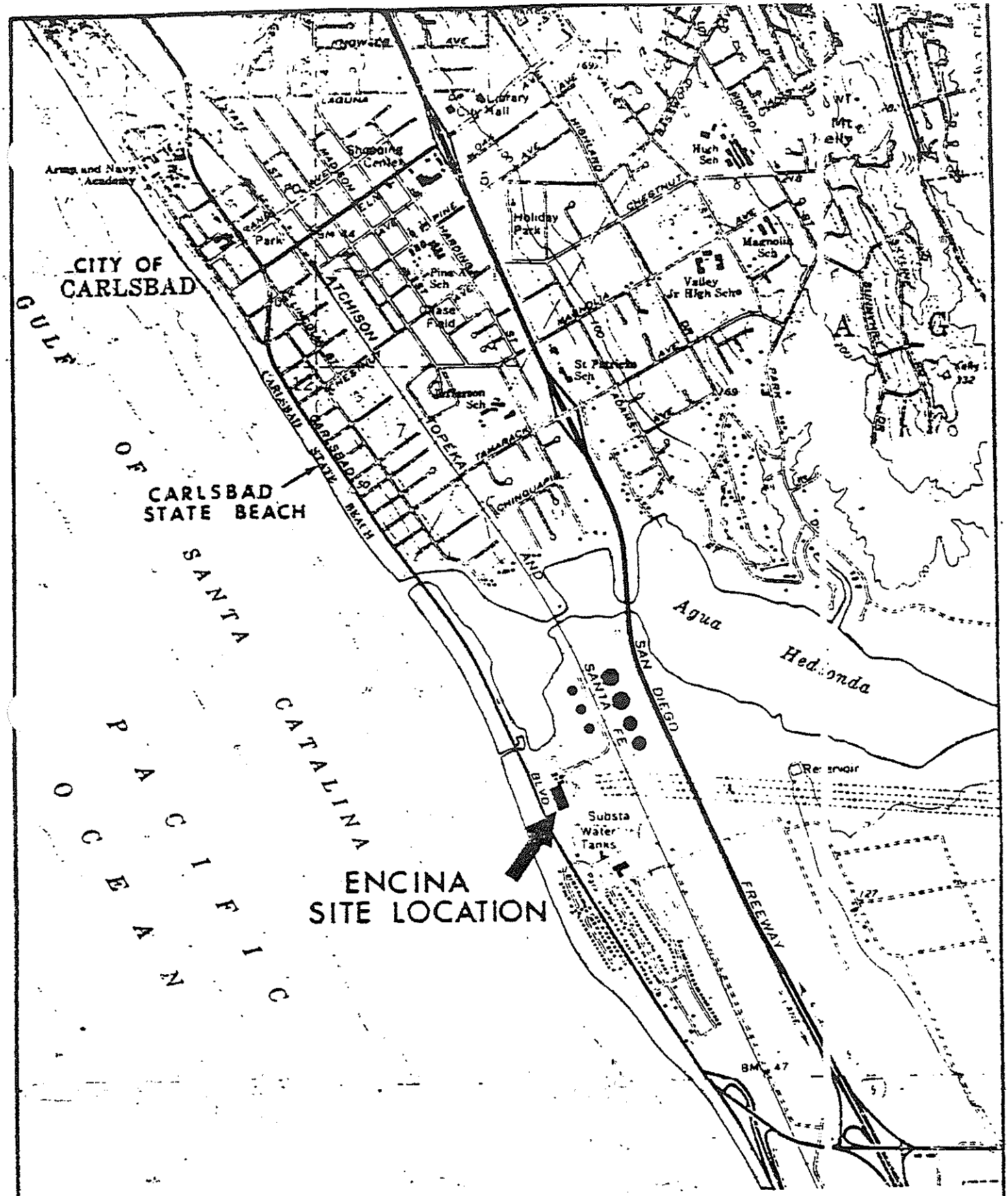
SCALE: 1:24,000 | Drawn by: RVW

DATE: 9/15/89

THERMAL PLUME
Isotherm Contours Are 2 F Above Ambient Temp. (Ref. Sta. A-50)
Dashed Contour is 2 C Above Ambient Temp.

© ecoscan | Survey # 3

Note: Map is for illustrative purposes only. The Coastal Commission is not adopting or endorsing any of the boundaries shown.



San Diego Gas & Electric	
Encina Plant Location	
EXHIBIT E-7	
California Coastal Commission	
Prepared By: SDG&E	

372

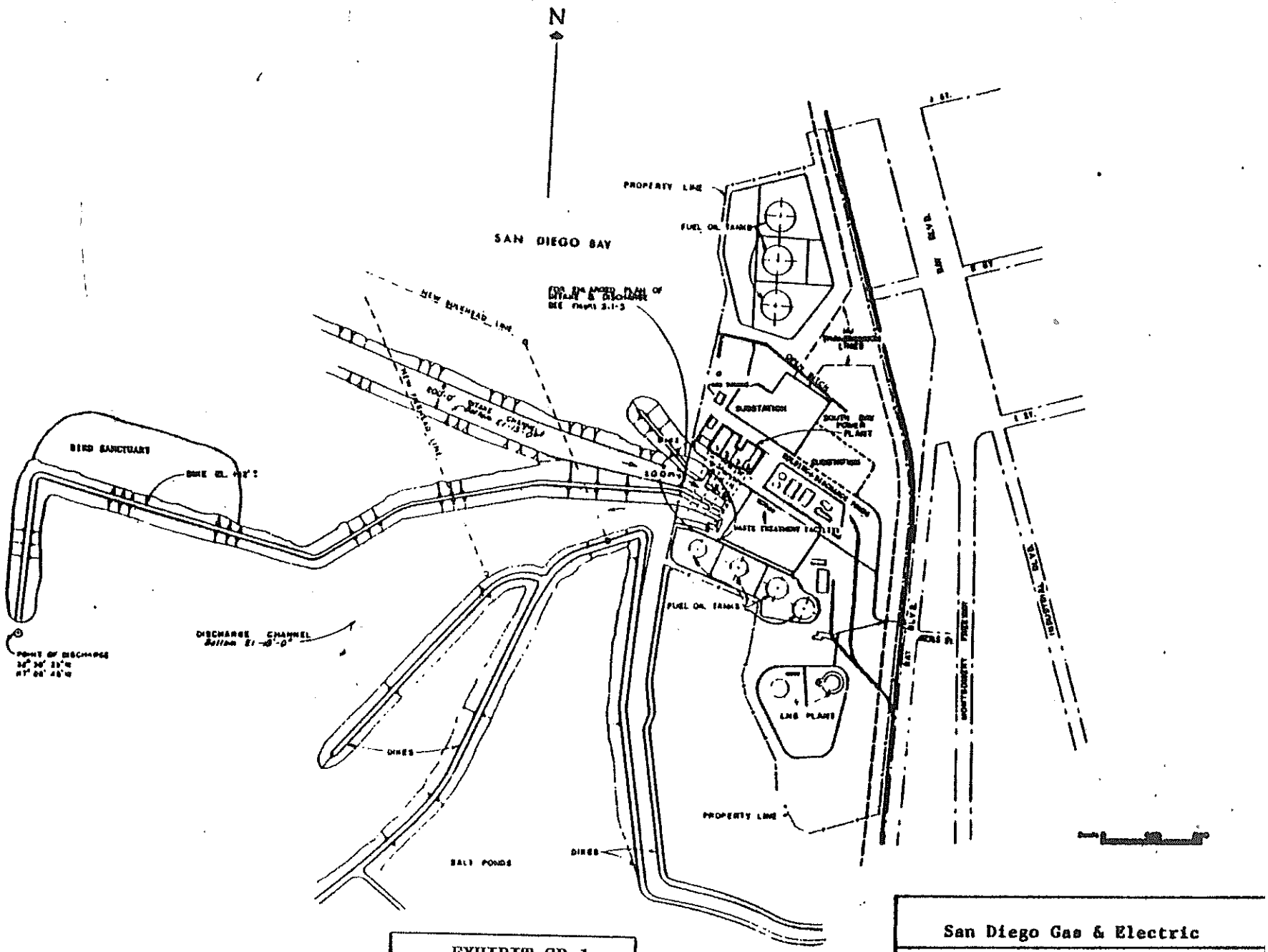


EXHIBIT SB-1

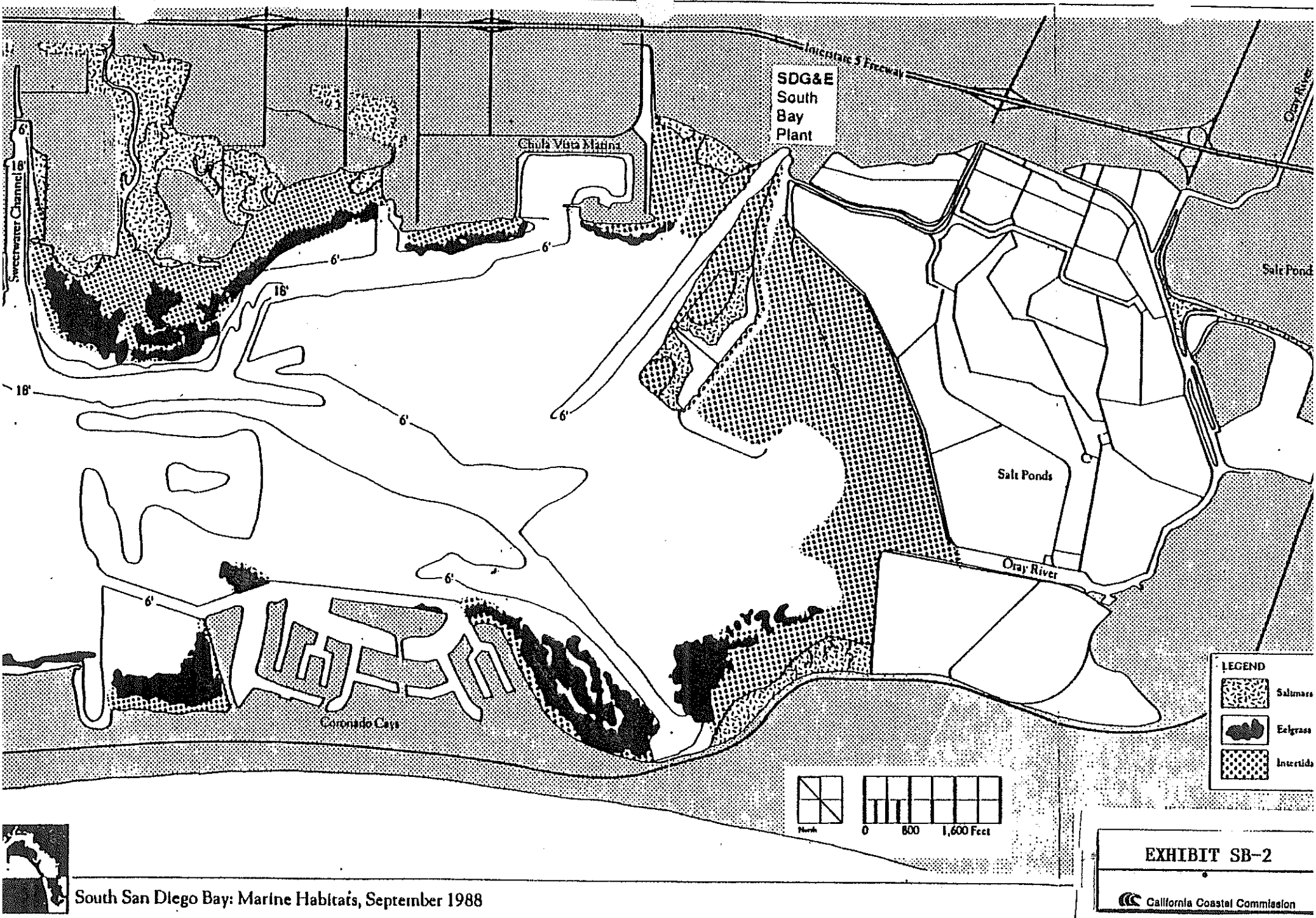
California Coastal Commission

San Diego Gas & Electric

General Layout of South Bay

Prepared By: Pioneer Service & Engineering

Note: Map is for illustrative purposes only. The Coastal Commission is not adopting or endorsing any of the boundaries shown.

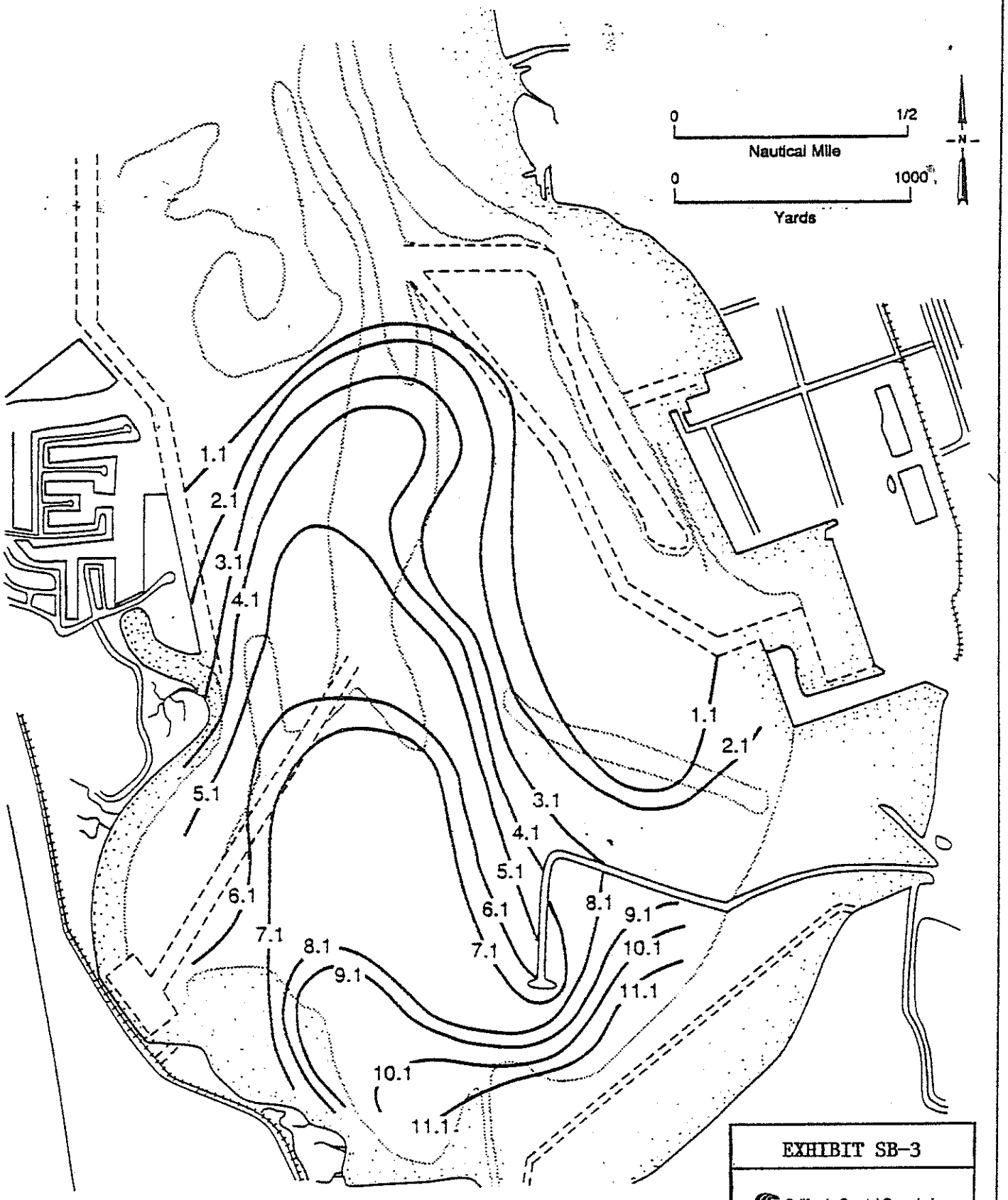


South San Diego Bay: Marine Habitats, September 1988

EXHIBIT SB-2

California Coastal Commission

ote: Map is for illustrative purposes only. The Coastal Commission is not adopting or endorsing any of the boundaries shown.



Surveyed Dec. 20,1972

ate: November 10, 1989		Combined Cycle NOI Project	Rev. No. 0
Project No. 8910232	San Diego Gas & Electric	TYPICAL THERMAL DISCHARGE PLUME, PROPOSED SOUTH BAY PLANT	
Woodward-Clyde Consultants			

Note: Map is for illustrative purposes only. The Coastal Commission is not adopting or endorsing any of the boundaries shown.

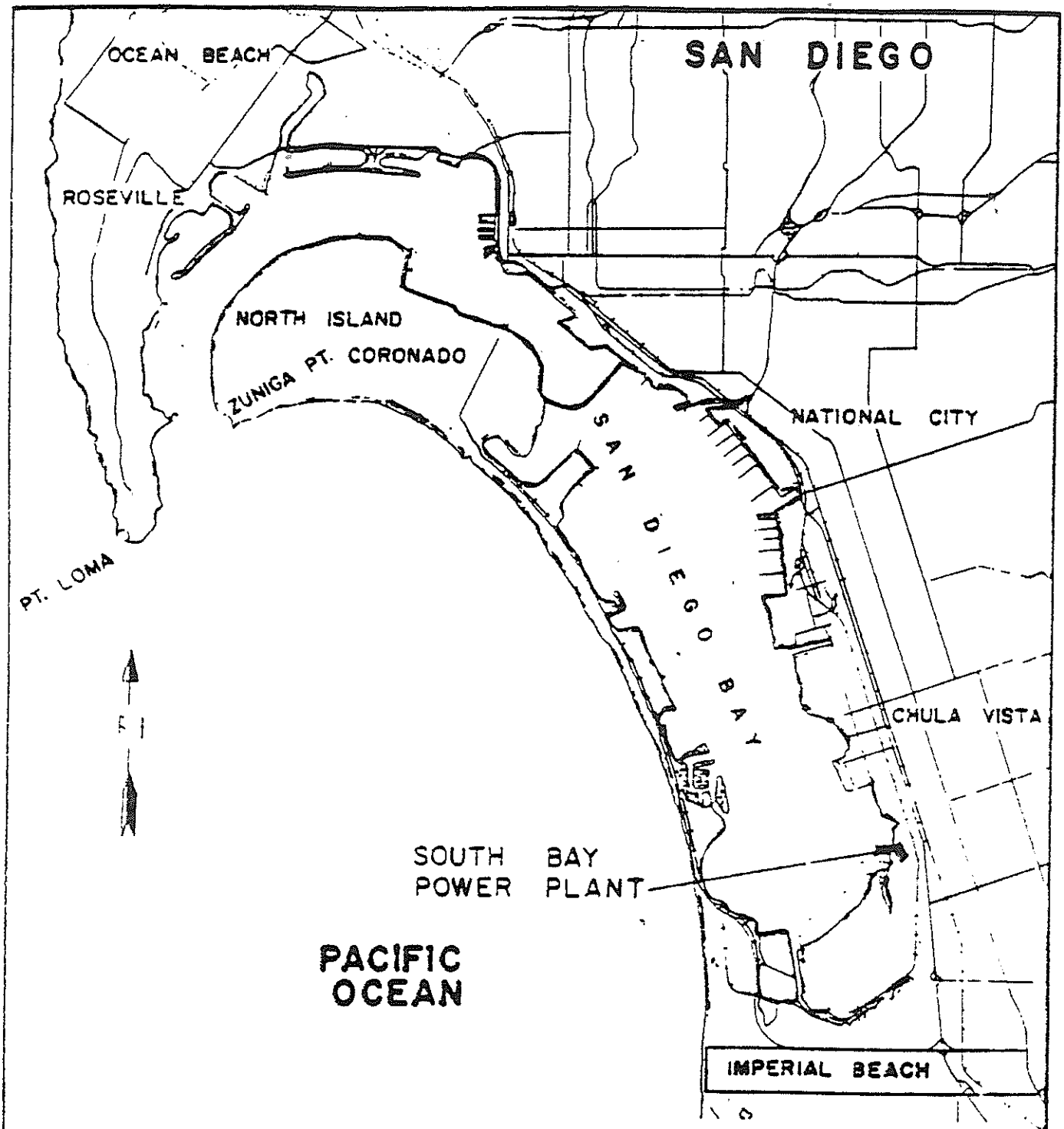


EXHIBIT SB-4

California Coastal Commission

0' 10,000' 20,000'

SCALE

San Diego Gas & Electric

Location of South Bay With Respect to San Diego Bay

Prepared by: Pioneer Service & Engineering

STATE OF CALIFORNIA—THE RESOURCES AGENCY GEORGE DEUKMEJIAN, *Governor*

CALIFORNIA COASTAL COMMISSION
631 HOWARD STREET, 4TH FLOOR
SAN FRANCISCO, CA 94105-3973
543-8555
Hearing Impaired/TDD (415) 896-1825

May 23, 1990

Commissioner David L. Malcolm
625 Third Avenue
Chula Vista, CA 92010

Dear Commissioner Malcolm:

I am responding to your request at the May meeting for an explanation of the Coastal Commission's role in power plant siting. I understand that you expressed a particular interest in the Commission's role with respect to the two power plants proposed in Chula Vista, which are the subject of separate proceedings at the Energy Commission.

Background

San Diego Gas and Electric (SDG&E) has submitted a Notice of Intent (NOI) to the Energy Commission which indicates, pursuant to Public Resources Code section 25113 SDG&E's intention to file a future application for a combined cycle power plant, fueled by natural gas with a capacity of approximately 460 megawatts. The Energy Commission's NOI process will evaluate 5 sites, one of which is in Chula Vista at the existing South Bay Power Plant. SDG&E has also submitted an Application for Certification (AFC) to the Energy Commission for a second power plant project. That project is a 140 megawatt expansion of the existing South Bay Power Plant in Chula Vista.

The Coastal Commission's role with respect to both power plant proposals is limited to providing advice to the Energy Commission, because that Commission has exclusive jurisdiction over thermal power plants of 50 megawatts or greater.1/ The Energy Commission preempts the jurisdiction of all other state and local agencies (including the Coastal Commission)

1/ There are limited exceptions to the general premise that the Energy Commission preempts the Coastal Commission's permitting jurisdiction over new thermal power plants and power plant expansions. Some exceptions are:

- power plants with a capacity of below 50 megawatts. (See Public Resources Code section 25120.)

- power plants granted a Small Power Plant Exemption by the Energy Commission, under Public Resources Code section 25541. Such an exemption may only be granted for power plant projects of between 50

APPENDIX A

California Coastal Commission

when it certifies a new or expanded power plant pursuant to Public Resources Code section 25500. In relevant part, section 25500 provides:

> In accordance with the provisions of this division, the [Energy] commission shall have the exclusive power to certify all [thermal power plant] sites and related facilities in the state, whether a new site and related facility or a change or addition to an existing facility. The issuance of a certificate by the [Energy] commission shall be in lieu of any permit, certificate, or similar document required by any state, local or regional agency, or federal agency to the extent permitted by federal law, for such use of the site and related facilities, and shall supersede any applicable statute, ordinance, or regulation of any state, local, or regional agency, or federal agency to the extent permitted by federal law . . . .

The Coastal Act expressly recognizes the Energy Commission's exclusive jurisdiction over most power plant projects. Section 30600(a) exempts projects subject to section 25500 (which is quoted above) from the general requirement that any person who wishes to undertake a development in the coastal zone must obtain a coastal development permit. Section 30413(d) provides that the Coastal Commission shall participate in the Energy Commission's siting proceedings whenever a power plant is proposed in the coastal zone.

The Coastal Commission's Role in the NOI Process.

The Energy Commission will evaluate SDG&E's 5 proposed sites during the NOI process. It will determine whether two or more of those sites would be acceptable for future consideration in an Application for Certification proceeding.

The Coastal Commission is required to submit a report during the NOI process to the Energy Commission on the suitability of the proposed coastal zone sites. The report must address a number of subject areas, pursuant to Public Resources Code section 30413(b). Those subject areas are:

> and 100 megawatts. (Public Resources Code section 25541; Calif Code of Regs., Title 20, section 1936.)
>
> - transmission line development beyond the location of the "point of junction with [the] interconnected transmission system", which is the limit of the Energy Commission's certification jurisdiction over the transmission line. (Public Resources Code sections 25107, 25110, and 25500, 60 Ops. Cal. Atty. Gen. 239.).

Of the three exceptions noted, only the last is potentially applicable to the two projects proposed by SDG&E. In the event that SDG&E proposes any transmission line development beyond the point of interconnection in the coastal zone, the utility would be required to obtain a coastal development permit, unless the development constitutes repair or maintenance under Public Resources section 30610(d). (See also section 13252(a)(3) of Title 14 of the California Code of Regulations.)

(1) The compatibility of the proposed site and related facilities with the goal of protecting coastal resources.

(2) The degree to which the proposed site and related facilities would conflict with other existing or planned coastal-dependent land uses at or near the site.

(3) The potential adverse effects that the proposed site and related facilities would have on aesthetic values.

(4) The potential adverse environmental effects on fish and wildlife and their habitats.

(5) The conformance of the proposed site and related facilities with certified local coastal programs in those jurisdictions which would be affected by any such development.

(6) The degree to which the proposed site and related facilities could reasonable be modified so as to mitigate potential adverse effects on coastal resources, minimize conflict with existing or planned coastal-dependent uses at or near the site, and promote the policies of this division.

(7) Such other matters as the commission deems appropriate and necessary to carry out the provisions of this division.

Section 30413 provides that the Coastal Commission shall submit the report to the Energy Commission prior to the time that the Energy Commission completes its preliminary report on the issues presented in the NOI. (Public Resources Code section 30413(d).) The Energy Commission staff has requested that the Commission submit a report that addresses those subjects by August 6, 1990. They have indicated that the Coastal Commission may elect to submit further analysis in early to mid-1991, when the formal adjudicatory hearing process occurs. The Energy Commission will include the Coastal Commission's comments in the final report it will produce at the end of the NOI process. (Public Resources Code section 25514(b).)

The Energy Commission will consider (but will not be bound by) the Coastal Commission's recommendations in making its determination of which of the sites proposed in an NOI have greater relative merit. If the Energy Commission approves the NOI, SDG&E would not have approval to commence construction of a power plant. That approval can only be obtained through the Application for Certification (AFC) process.[2/]

[2/] Regardless of what the Coastal Commission has recommended in the NOI proceeding, if the Energy Commission has approved a site in the coastal zone as one of the two (or more) sites of greater relative merit in its decision on the NOI, the Energy Commission may not accept an AFC for a project at the coastal site unless the Energy Commission determines that the approved coastal site has greater relative merit than the other approved site(s). (Public Resources Code section 25516.1.)

The Coastal Commission's Role in the AFC Process

The Coastal Commission's role with respect to the AFC for SDG&E's currently proposed 140 megawatt power plant expansion in Chula Vista would be similar to that discussed above with respect to the NOI.[3/] The major difference is that the Coastal Commission is not required to submit a report to the Energy Commission. The Coastal Commission is nevertheless authorized, "at its discretion, to participate fully" in the proceeding pursuant to section 30413(e). (See also Public Resources Code section 25519(d).) The proceeding will commence soon and will be conducted using formal trial-type procedures. The Energy Commission will consider, but is not bound by the Coastal Commission's recommendations in making its determination whether to approve an AFC for the South Bay Power Plant expansion.[4/] If the AFC is approved, SDG&E will have approval to construct the power plant.

Conclusion

I hope that this letter explains the Coastal Commission's role in power plant siting.

Very truly yours,

Dorothy F. Dickey

DOROTHY F. DICKEY
Deputy Chief Counsel

3/ That project does not require a separate NOI because Public Resources Code section 25540.6 exempts various types of power plant projects from the NOI process. The two exemptions that are apparently relevant to SDG&E's proposal are those for modification of an existing facility, (subsection (b)) and for a power plant that demonstrates technologies not previously built or operated on a commercial scale (subsection (e)). Because an NOI is not required to precede the AFC for the South Bay Power Plant expansion, the limitation concerning coastal sites which is discussed in footnote 2 is not applicable.

4/ Public Resources Code section 30413(b) requires that the Coastal Commission designate specific locations in the coastal zone in which siting of a thermal power plant would be objectionable. The designated locations may not include "specific locations that are presently used for such facilities and reasonable expansion thereof"; thus the site proposed by SDG&E (an existing power plant site) was not so designated. In the event that a utility proposes a project on a site that has been designated by the Coastal Commission, the Energy Commission would be prohibited from approving an AFC for that site unless the Energy Commission makes specific findings. (Public Resources Code section 25526(a).) Those findings are that the proposed power plant "is not inconsistent with the primary uses of such land and that there will be no substantial adverse environmental effects and ... the approval of any public agency having ownership or control of such land is obtained."

STATE OF CALIFORNIA—THE RESOURCES AGENCY GEORGE DEUKMEJIAN, Governor

CALIFORNIA COASTAL COMMISSION
631 HOWARD STREET, 4TH FLOOR
SAN FRANCISCO, CA 94105-3973
(415) 543-8555
Hearing Impaired/TDD (415) 396-1825

June 8, 1990

Commissioner David L. Malcolm
625 Third Avenue
Chula Vista, CA 92010

Dear Commissioner Malcolm:

I am writing to let you know that several sentences were omitted from my letter of May 23, 1990. That letter concerned the Coastal Commission's role in the Energy Commission's power plant siting proceedings. One type of proceeding is called a Notice of Intent (NOI) proceeding, which is used to determine whether two or more sites would be acceptable for future consideration in an Application for Certification (AFC) proceeding. The second type is the AFC proceeding, which is used to determine whether or not to grant approval to construct and operate a proposed power plant. The two proceedings are generally sequential, but many power plants have been statutorily exempted from the NOI process.1/

My letter stated that the Energy Commission will consider, but will not be bound by the Coastal Commission's recommendations in making its determination of which of the sites proposed in San Diego Gas and Electric's (SDG&E) NOI have greater relative merit. The letter should have noted that any recommendations made by the Coastal Commission during the NOI on mitigation measures must be given greater weight in a future AFC proceeding. Thus, if the Energy Commission selects a site in the coastal zone as one of the preferred sites, and if SDG&E submits an AFC for the project at the coastal site, the Energy Commission will be required to incorporate into its decision on the AFC any recommendations that the Coastal Commission may make during the NOI process on specific measures that could make the proposed 460 megawatt project consistent with the Coastal Act. (Public Resources Code section 25523(b).) The statute provides that the Energy Commission need not follow the Coastal Commission's recommendations in the event that the Energy Commission finds in its decision on the AFC that the measures previously suggested by the Coastal Commission in the NOI proceeding would either "result in greater adverse effect on the environment or . . . would not be feasible."

Very truly yours,

Dorothy F. Dickey

DOROTHY F. DICKEY
Deputy Chief Counsel

1/ See footnote 3 of my May 23, 1990 letter.

04781(7)

STATE OF CALIFORNIA—THE RESOURCES AGENCY GEORGE DEUKMEJIAN, Governor

CALIFORNIA COASTAL COMMISSION
631 HOWARD STREET, 4TH FLOOR
SAN FRANCISCO, CA 94105-3973
(415) 543-8555
Hearing Impaired/TDD (415) 896-1825

May 23, 1990

Commissioner David L. Malcolm
625 Third Avenue
Chula Vista, CA 92010

Dear Commissioner Malcolm:

I am responding to your request at the May meeting for an explanation of the Coastal Commission's role in power plant siting. I understand that you expressed a particular interest in the Commission's role with respect to the two power plants proposed in Chula Vista, which are the subject of separate proceedings at the Energy Commission.

Background

San Diego Gas and Electric (SDG&E) has submitted a Notice of Intent (NOI) to the Energy Commission which indicates, pursuant to Public Resources Code section 25113 SDG&E's intention to file a future application for a combined cycle power plant, fueled by natural gas with a capacity of approximately 460 megawatts. The Energy Commission's NOI process will evaluate 5 sites, one of which is in Chula Vista at the existing South Bay Power Plant. SDG&E has also submitted an Application for Certification (AFC) to the Energy Commission for a second power plant project. That project is a 140 megawatt expansion of the existing South Bay Power Plant in Chula Vista.

The Coastal Commission's role with respect to both power plant proposals is limited to providing advice to the Energy Commission, because that Commission has exclusive jurisdiction over thermal power plants of 50 megawatts or greater.1/ The Energy Commission preempts the jurisdiction of all other state and local agencies (including the Coastal Commission)

1/ There are limited exceptions to the general premise that the Energy Commission preempts the Coastal Commission's permitting jurisdiction over new thermal power plants and power plant expansions. Some exceptions are:

- power plants with a capacity of below 50 megawatts. (See Public Resources Code section 25120.)

- power plants granted a Small Power Plant Exemption by the Energy Commission, under Public Resources Code section 25541. Such an exemption may only be granted for power plant projects of between 50

when it certifies a new or expanded power plant pursuant to Public Resources Code section 25500. In relevant part, section 25500 provides:

> In accordance with the provisions of this division, the [Energy] commission shall have the exclusive power to certify all [thermal power plant] sites and related facilities in the state, whether a new site and related facility or a change or addition to an existing facility. The issuance of a certificate by the [Energy] commission shall be in lieu of any permit, certificate, or similar document required by any state, local or regional agency, or federal agency to the extent permitted by federal law, for such use of the site and related facilities, and shall supersede any applicable statute, ordinance, or regulation of any state, local, or regional agency, or federal agency to the extent permitted by federal law . . . .

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The Coastal Commission's Role in the NOI Process.

The Energy Commission will evaluate SDG&E's 5 proposed sites during the NOI process. It will determine whether two or more of those sites would be acceptable for future consideration in an Application for Certification proceeding.

The Coastal Commission is required to submit a report during the NOI process to the Energy Commission on the suitability of the proposed coastal zone sites. The report must address a number of subject areas, pursuant to Public Resources Code section 30413(b). Those subject areas are:

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(1) The compatibility of the proposed site and related facilities with the goal of protecting coastal resources.

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(5) The conformance of the proposed site and related facilities with certified local coastal programs in those jurisdictions which would be affected by any such development.

(6) The degree to which the proposed site and related facilities could reasonable be modified so as to mitigate potential adverse effects on coastal resources, minimize conflict with existing or planned coastal-dependent uses at or near the site, and promote the policies of this division.

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Very truly yours,

DOROTHY F. DICKEY
Deputy Chief Counsel

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4/ Public Resources Code section 30413(b) requires that the Coastal Commission designate specific locations in the coastal zone in which siting of a thermal power plant would be objectionable. The designated locations may not include "specific locations that are presently used for such facilities and reasonable expansion thereof"; thus the site proposed by SDG&E (an existing power plant site) was not so designated. In the event that a utility proposes a project on a site that has been designated by the Coastal Commission, the Energy Commission would be prohibited from approving an AFC for that site unless the Energy Commission makes specific findings. (Public Resources Code section 25526(a).) Those findings are that the proposed power plant "is not inconsistent with the primary uses of such land and that there will be no substantial adverse environmental effects and ... the approval of any public agency having ownership or control of such land is obtained."

CALIFORNIA COASTAL ACT

SECTION 30413

REGARDING POWER PLANT SITING

Section 30413.

(a) In addition to the provisions set forth in subdivision (f) of Section 30241, and in Sections 25302, 25500, 25507, 25508, 25510, 25514, 25516.1, 25523, and 25526, the provisions of this section shall apply to the commission and the State Energy Resources Conservation and Development Commission with respect to matters within the statutory responsibility of the latter.

(b) The commission shall, prior to January 1, 1978, and after one or more public hearings, designate those specific locations within the coastal zone where the location of a facility as defined in Section 25110 would prevent the achievement of the objectives of this division; provided, however, that specific locations that are presently used for such facilities and reasonable expansion thereof shall not be so designated. Each such designation shall include a description of the boundaries of such locations, the objectives of this division which would be so affected, and detailed findings concerning the significant adverse impacts that would result from development of a facility in the designated area. The commission shall consider the conclusions, if any, reached by the State Energy Resources Conservation and Development Commission in its most recently promulgated comprehensive report issued pursuant to Section 25309. The commission shall transmit a copy of its report prepared pursuant to this subdivision to the State Energy Resources Conservation and Development Commission.

(c) The commission, after it completes its initial designations in 1978, shall, prior to January 1, 1980, and once every two years thereafter, revise and update the designations specified in subdivision (b) of this section. Such revisions shall be effective on January 1, 1980, or on January 1 of the first even-numbered year following adoption of the revisions. The provisions of subdivision (b) of this section shall not apply to any sites and related facilities specified in any notice of intention to file an application for certification filed with the State Energy Resources Conservation and Development Commission pursuant to Section 25502 prior to designation of additional locations made by the commission pursuant to this subdivision.

APPENDIX B

California Coastal Commission

(d) Whenever the State Energy Resources Conservation and Development Commission exercises its siting authority and undertakes proceedings pursuant to the provisions of Chapter 6 (commencing with Section 25500) of Division 15 with respect to any thermal powerplant or transmission line to be located, in whole or in part, within the coastal zone, the commission shall participate in such proceedings and shall receive from the State Energy Resources Conservation and Development Commission any notice of intention to file an application for certification of a site and related facilities within the coastal zone. The commission shall analyze each notice of intent and shall, prior to completion of the preliminary report required by Section 25510, forward to the State Energy Resources Conservation and Development Commission a written report on the suitability of the proposed site and related facilities specified in such notice of intent. The commission's report shall contain a consideration of, and findings regarding, all of the following:

(1) The compatibility of the proposed site and related facilities with the goal of protecting coastal resources.

(2) The degree to which the proposed site and related facilities would conflict with other existing or planned coastal-dependent land uses at or near the site.

(3) The potential adverse effects that the proposed site and related facilities would have on aesthetic values.

(4) The potential adverse environmental effects on fish and wildlife and their habitats.

(5) The conformance of the proposed site and related facilities with certified local coastal programs in those jurisdictions which would be affected by any such development.

(6) The degree to which the proposed site and related facilities could reasonably be modified so as to mitigate potential adverse effects on coastal resources, minimize conflict with existing or planned coastal-dependent uses at or near the site, and promote the policies of this division.

(7) Such other matters as the commission deems appropriate and necessary to carry out the provisions of this division.

(e) The commission may, at its discretion, participate fully in other proceedings conducted by the State Energy Resources Conservation and Development Commission pursuant to its powerplant siting authority. In the event the commission participates in any public hearings held by the State Energy Resources Conservation and Development Commission, it shall be afforded full opportunity to present evidence and examine and cross-examine witnesses.

(f) The State Energy Resources Conservation and Development Commission shall forward a copy of all reports it distributes pursuant to Section 25302 and 25306 to the commission and the commission shall, with respect to any report that relates to the coastal zone or coastal zone resources, comment on such reports, and shall in its comments include a discussion of the desirability of particular areas within the coastal zone as designated in such reports for potential power plant development. The commission may propose alternate areas for powerplant development within the coastal zone and shall provide detailed findings to support the suggested alternatives.

(Amended by Ch. 1013 and Ch. 1075, Stats. 1978.)

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT
COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
1-800-822-6228 – WWW.ENERGY.CA.GOV

APPLICATION FOR CERTIFICATION
FOR THE *CARLSBAD ENERGY CENTER PROJECT*

Docket No. 07-AFC-6

PROOF OF SERVICE
(Revised 2/18/2009)

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*indicates change

DECLARATION OF SERVICE

I, Andrea Dykes, declare that on April 29, 2009, I served and filed copies of the attached document. The original document, filed with the Docket Unit, is accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at: **[http://www.energy.ca.gov/sitingcases/carlsbad/index.html]**. The document has been sent to both the other parties in this proceeding (as shown on the Proof of Service* list) and to the Commission's Docket Unit, in the following manner:

(*Check all that Apply*)

For service to all other parties:

__X__ sent electronically to all email addresses on the Proof of Service list;

_____ by personal delivery or by depositing in the United States mail at Sacramento, California with first-class postage thereon fully prepaid and addressed as provided on the Proof of Service list above to those addresses **NOT** marked "email preferred."

AND

For filing with the Energy Commission:

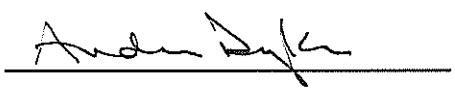
__X__ **sending an original paper copy and one electronic copy, mailed and emailed respectively, to the address below (preferred method);**

OR

_____ depositing in the mail an original and 12 paper copies, as follows:

CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 07-AFC-6
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.state.ca.us

I declare under penalty of perjury that the foregoing is true and correct.



*indicates change