MINUTE ITEM
This Calendar Item No. C33
was approved as Minute Item
No. 33 by the State Lands
Commission by a vote of 3
to 0 at its 4-28-93
meeting.

CALENDAR ITEM

C33

A 37

S 33

04/28/93
PRC 163
PRC 425
PRC 426
PRC E-392
PRC 3033
PRC 3413
W 40585
Planck
Walker
Hamilton

CERTIFY ENVIRONMENTAL IMPACT REPORT AND
AUTHORIZE IMPLEMENTATION AND OPERATION OF A
COOPERATIVE WATERFLOOD PROGRAM,
HUNTINGTON BEACH OFFSHORE FIELD,
ORANGE COUNTY

LESSEES:

Shell Western E&P, Inc.
West Coast Production Division
P. O. Box 11164
Bakersfield, California 93389

Union Oil of California
Mr. Randy Shipley
9645 S. Santa Fe Springs Road
Santa Fe Springs, California 90670

AREA, TYPE LAND AND LOCATION:

State oil and gas leases PRC 163, PRC E-392, PRC 425, PRC 426, PRC 3303 and PRC 3413 are located in the offshore area of the Huntington Beach Oil Field in Orange County. Oil and gas production facilities for the offshore area of the Huntington Beach Oil Field are located: (1) onshore east of Pacific Coast Highway (PCH) and north of the intersection of Golden West Street and PCH, and (2) offshore on Platforms "Emmy" and "Eva".

CALENDAR PAGE	305
MINUTE PAGE	647

BACKGROUND:

Shell Western E&P, Inc. (SWEPI) is the lessee of leases PRC 163, PRC E-392, PRC 425 and PRC 426 and is the operator of Platform Emmy (located on PRC 425). Union Oil Company of California (Unocal) is the lessee of leases PRC 3033 and PRC 3413 and is the operator of Platform Eva (located on PRC 3033). SWEPI and Unocal propose to implement and operate jointly a secondary recovery waterflood program involving the Upper Main Zone reservoir of the Huntington Beach Oil Field. The program requires the injection of water into the reservoir to drive an estimated 45 million additional barrels of oil to producing wells. It is expected that the State will receive an additional $20 million in royalty over the life of the project. No expansion of the onshore facilities or the offshore platforms is required for this program. An environmental impact report was prepared for this project.

ENVIRONMENTAL REVIEW:

As Lead Agency, the Commission, acting through its staff, determined that an Environmental Impact Report (EIR) was required for the proposed secondary recovery waterflood program.

The draft EIR (SCH 93021004) was prepared by the consulting firm of Continental Shelf Associates, Inc. and copies were circulated for review and comment to Responsible and Trustee Agencies, and the public. As part of the public review process, the Commission's staff held a public hearing on March 8, 1993 in Long Beach, for the purpose of receiving comments on the draft EIR. A finalizing addendum, responding to all comments received on the draft, was prepared and constitutes, in conjunction with the draft, the Final EIR for the SWEPI/Unocal Huntington Beach Upper Main Zone Cooperative Waterflood Project. The Final EIR was mailed to all the individuals, groups and governmental agencies that received and commented on the draft EIR.

The waterflood program will result in impacts addressed by the attached findings (see Exhibit "B") made in conformance with the CEQA. While most impacts are mitigated to a level of insignificance, some impacts cannot be totally eliminated, and the Commission will have to adopt the Statement of Overriding Considerations attached hereto as Exhibit "C".

STATUTORY AND OTHER REFERENCES:

A. P.R.C.: Div. 6, Parts 1 and 2; Div. 13.

B. Cal. Code Regs.: Title 3, Div. 3; Title 14, Div. 6.

AB 884:

05/27/93.

OTHER PERTINENT INFORMATION:

1. This activity involves lands identified as possessing significant environmental values pursuant to P.R.C. 6370, et seq. These lands are identified in the SLC "Inventory of Unconveyed State School Lands and Tide and Submerged Lands Possessing Significant Environmental Values" as parcel 19-062-000, the Pacific Ocean. Areas of concern for this region include fisheries, endangered species, habitat and recreational values. Each of these concerns is discussed in detail in the EIR prepared for this project.

   The use category for this parcel is "C", Multiple Use. The project is compatible with this use. While the Inventory was published in December, 1975, major units of the proposed project are significantly older. The original leases for these parcels issued in 1938, and the two oil platforms, Emmy and Eva, were built in 1962 and 1964, respectively. Extensive biological monitoring required when the platforms were installed and continuing today have indicated no adverse effects to date. Mitigations incorporated into the project and the proposed Mitigation Monitoring Plan (See Exhibit D) will reduce most of the project's potential impacts to a level of insignificance. The remaining low probability potential impacts have been addressed in the proposed CEQA Findings (See Exhibit B) and Statement of Overriding Considerations (See Exhibit C).

   Based on the staff's consultation with the persons nominating this parcel and through the CEQA process, it is the staff's opinion that the project, as mitigated, is consistent with its use classification.

2. Pursuant to the Commission's delegation of authority and the State CEQA Guidelines (14 Cal. Code Regs. 15025), the staff has caused to be prepared an EIR identified as EIR No. 611, State Clearinghouse No. 93021004. Such EIR was prepared and circulated for public review pursuant to the provisions of the CEQA.

   Findings made in conformance with Section 15091 of the State CEQA Guidelines are contained in Exhibit "B" attached hereto.

3. A Statement of Overriding Considerations made in conformance with Section 15093 of the State CEQA Guidelines is contained in Exhibit "C", attached hereto.

EXHIBITS:

A. Location Map
B. California Environmental Quality Act Findings
C. Statement of Overriding Considerations
D. Mitigation Monitoring Plan

IT IS RECOMMENDED THAT THE COMMISSION:

1. CERTIFY THAT AN EIR, NO. 611, STATE CLEARINGHOUSE NO. 93021004, WAS PREPARED FOR THIS PROJECT PURSUANT TO THE PROVISIONS OF THE CEQA AND THAT THE COMMISSION HAS REVIEWED AND CONSIDERED THE INFORMATION CONTAINED THEREIN.

2. ADOPT THE FINDINGS MADE IN CONFORMANCE WITH SECTION 15091 OF THE STATE CEQA GUIDELINES, AS CONTAINED IN EXHIBIT "B", ATTACHED HERETO.

3. ADOPT THE STATEMENT OF OVERRIDING CONSIDERATIONS MADE IN CONFORMANCE WITH SECTION 15093 OF THE STATE CEQA GUIDELINES, AS CONTAINED IN EXHIBIT "C", ATTACHED HERETO.

4. ADOPT THE MITIGATION MONITORING PLAN FOR THE PROJECT, AS CONTAINED IN EXHIBIT "D", ATTACHED HERETO TO ENSURE COMPLIANCE WITH THE REQUIRED MITIGATION MEASURES.

5. FIND THAT THIS ACTIVITY IS CONSISTENT WITH THE USE CLASSIFICATION DESIGNATED FOR THE LAND PURSUANT TO P.R.C. 6370, ET SEQ.

6. APPROVE THE IMPLEMENTATION AND OPERATION OF A COOPERATIVE WATERFLOOD PROGRAM FOR STATE OIL AND GAS LEASES PRC 163, PRC E-392, PRC 425, PRC 426, PRC 3033 AND PRC 3413, HUNTINGTON BEACH OIL FIELD, OFFSHORE AREA, UNDER MAIN ZONE, AS MITIGATED IN ACCORDANCE WITH THE FINAL EIR NO. 611, STATE CLEARINGHOUSE NO. 93021004, AND THE WATERFLOOD PROGRAM ON FILE IN THE OFFICE OF THE COMMISSION AND BY REFERENCE MADE A PART HEREOF.

PRC 163 PRC 425 PRC 426 PRC E-392
PRC 3033 PRC 3413 W 40585

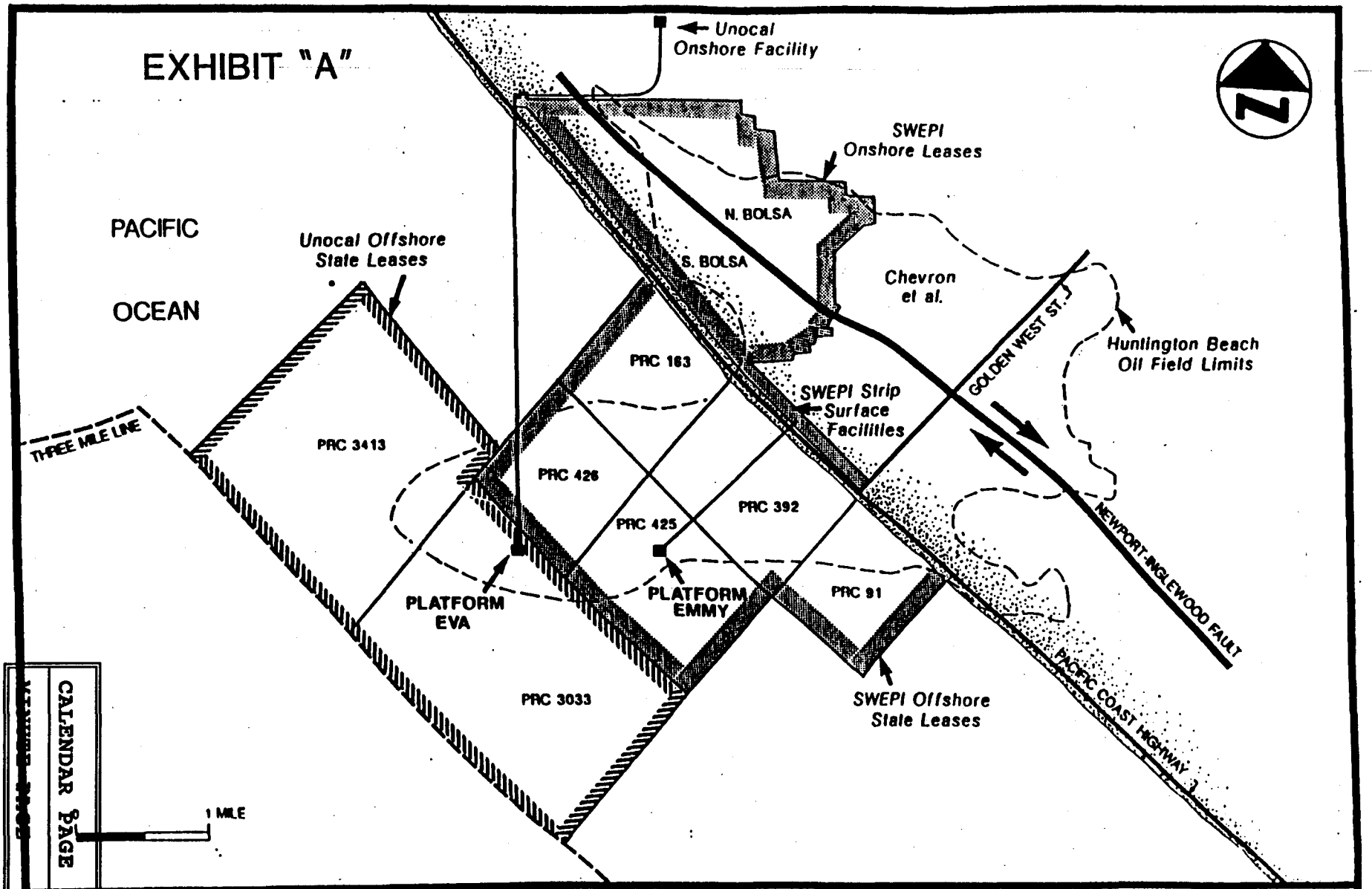

Figure ES.1. Location of offshore and onshore leases held by Shell Western Exploration & Production Inc. and Union Oil Company of California off Huntington Beach (Adapted from: Chambers Group, Inc., 1991).

CALENDAR PAGE 305.5
EXHIBIT PAGE 550

EXHIBIT B

SWEPI/UNOCAL HUNTINGTON BEACH UPPER MAIN ZONE COOPERATIVE WATERFLOOD PROJECT

CEQA FINDINGS

Herein are presented the findings made by the State of California State Lands Commission on the proposed SWEPI/Unocal Cooperative Waterflood Project Environmental Impact Report (EIR), pursuant to Section 15091, Title 14, California Administrative Code. All significant impacts (i.e., Class I and II; see Finalizing Addendum to the Draft EIR, Executive Summary Tables ES.3, ES.4, and ES.7) of the proposed project, as identified in the EIR, are summarized within the 18 findings outlined on the following pages.

CEQA findings have been numbered and the associated impacts have been organized by resource affected (e.g., air quality, geology, marine biology, system safety, water quality). CEQA findings have also been separated on the basis of whether the impact arose from routine, project-related activities (i.e., CEQA Finding Nos. 1 through 10) or accident or upset (i.e., CEQA Finding Nos. 11 through 18).

For each significant impact and pursuant to Section 15091, a finding has been made of one or more of the following, as appropriate:

a) Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant environmental effect as identified in the completed environmental impact report (i.e., Draft EIR and Finalizing Addendum).

b) Such changes or alterations are within the responsibility and jurisdiction of another public agency and such changes have been adopted by such other agency, or can and should be adopted by such other agency.

Finding b) appears whenever a separate agency has jurisdiction (e.g., partial, in conjunction with the SLC) over select aspects of the proposed project. Accordingly, these agencies would have the responsibility to adopt, implement, and enforce the mitigation outlined in this findings determination.

A Statement of Overriding Considerations, as required by Sections 15092 and 15093, Title 14, California Administrative Code, is attached as Exhibit C. Such Statement applies to all impacts which, even after the adoption of the maximum

feasible mitigation measures, cannot be reduced to a level of insignificance.

Following each finding, the facts supporting that finding are summarized in narrative form. Where appropriate, specific mitigation measures are noted, consistent with their description in Section 5 (Mitigation Monitoring Plan, or MMP) of the EIR. The MMP will be overseen by the Commission.

Pursuant to Section 21081.6 of the Public Resources Code, the SLC (or the appropriate public agency) should adopt a reporting or monitoring program which identifies and tracks changes to the project which it has required or mitigation measures which were adopted. The program should be designed to ensure compliance. The Mitigation Monitoring Plan is attached as Exhibit D.

ROUTINE, PROJECT-RELATED ACTIVITIES

CEQA FINDING NO. 1.

MARINE BIOLOGY: Support vessel activity, all phases

Impact: Collision between a support vessel and a resident or migrating marine mammal.

Finding:

a) Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant environmental effect as identified in the completed environmental impact report (i.e., Draft EIR and Finalizing Addendum).

b) Such changes or alterations are within the responsibility and jurisdiction of another public agency and such changes have been adopted by such other agency, or can and should be adopted by such other agency (California Department of Fish and Game, US Fish and Wildlife Service).

Mitigation: Mitigation Monitoring Plan #1.

FACTS SUPPORTING THE FINDING:

All marine mammals are protected against harassment, injury, or taking by the Marine Mammal Protection Act of 1972. Additional protection is afforded to listed endangered species by the Endangered Species Act of 1973.

Of the 31 cetacean species present in Southern California waters, the most numerous and/or commonly encountered whale species within the San Pedro Basin region (including nearshore coastal waters and the project area) are the Pilot Whale, Bottlenose Dolphin, Common Dolphin, Dall's Porpoise, Risso's Dolphin, Pacific White-Sided Dolphin, and Northern Right Whale Dolphin, listed in descending order of abundance (Bonnell et al., 1980). Sightings of California Gray Whale and Minke Whale were also noted. Five of these species were present year-round in the San Pedro Basin region (i.e., exceptions include Northern Right Whale Dolphin and Risso's Dolphin), accounting for 85-99% of all the cetaceans observed in the area, depending upon the season. Amongst the baleen whales, the California Gray Whale and Minke Whale were sighted during several seasons. No Endangered cetacean species are expected in the project area.

Six pinniped (seals, sea lions) species have been recorded in southern California waters, including four species of eared seals (Otariidae) and two earless seal species (Phocidae). Otariidae are represented by Guadalupe Fur Seal (*Arctocephalus townsendi*), Northern Fur Seal (*Callorhinus ursinus*), Steller Sea Lion (*Eumetopias jubatus*), and California Sea Lion (*Zalophus californianus*). Two species of earless seals (Phocidae) live and breed within the Southern California Bight--Northern Elephant Seal and Pacific Harbor Seal. Among the otarid species noted, only the California Sea Lion is recorded for the project area. California Sea Lions are known to occasionally haul out in Los Angeles Harbor and have been sighted in the harbor area (USACOE and LAHD, 1992). California Sea Lions may be expected to occur in the project area, and at times may use mooring buoys as haul-out sites. Neither of the two phocid species are expected within the project area.

The increased boat traffic associated with drilling will increase the risk of collision with resident or migratory marine mammals. Prior risk assessments (e.g., National Marine Fisheries Service Biological Opinion, Santa Ynez Unit development) note that the probability of such a collision is low. Should a collision occur resulting in serious injury or death, however, it would be considered a significant impact in light of the protected status of marine mammals.

Available mitigation measures, including the training of vessel operators to recognize and avoid migratory (e.g., Gray Whale) and resident marine mammals, will serve only to reduce the probability of a collision. Marine mammals most susceptible to collisions would be resting pinnipeds and Gray Whale, which reportedly display a relative indifference to vessel traffic. Other cetaceans appear to actively avoid or chase and bow ride transiting vessels; vessel noise through the water is usually more than enough warning to avoid collision. However, should a collision occur between a marine mammal and a support vessel, impacts will be significant and not mitigable to insignificant levels (Class I).

SUMMARY: Class I impact; trained crew avoidance will decrease, but not eliminate, the probability of a collision.

CEQA FINDING NO. 2.

GEOLOGY: Operation

Impact: Landward recession of beaches and increased potential for flooding and wave damage, due to subsidence.

Finding: a) Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant environmental effect as identified in the completed environmental impact report (i.e., Draft EIR and Finalizing Addendum).

Mitigation: Mitigation Monitoring Plan #8.

FACTS SUPPORTING THE FINDING:

Subsidence has been identified in the Huntington Beach Oil Field over the past 40 years (Westec Services, Inc., 1987). According to Westec Services, Inc. (1987), the major subsidence occurred in the upland area of the old field; a maximum subsidence of 30 in was recorded in 1972 in the vicinity of Olive and Golden West Streets.

Subsidence in oil fields is attributed to compaction of subsurface rocks when fluids are withdrawn from subsurface reservoirs. According to SLC (1976b) and Westec Services, Inc. (1987), if pore-fluid pressures are monitored and controlled by a pressure-maintenance program, no further significant subsidence should occur. However, onshore waterflooding began in 1964 (Chambers Group, Inc., 1991), and Aminoil Inc., one of the former owners of the Huntington Beach offshore leases, began a pilot waterflood on offshore parcels PRCs 163 and 392 in early 1979. As of September 1991, about 24 million barrels of water have been injected (Chambers Group, Inc., 1991). According to EDAW Inc. (1979), the waterflooding reduced the rate of subsidence from about 2 inches/year (8 mm/year) to about 0.5 inch/year (2 mm/year).

Compilation of subsidence records over a 10-year period by the Orange County Environmental Management Agency (1987) showed that the Huntington Beach field has continued to subside; from 1976 to 1986, a maximum subsidence of greater that 0.8 ft (about 1 inch/year) has been recorded at a benchmark near Golden West Street and Pacific Coast Highway, which is onshore of SWEPI's offshore parcel PRC 392. Monitoring of subsidence along Pacific Coast Highway

within the oil field ceased in 1986. Further, no data are available concerning the amount or extent of offshore subsidence. More fluids appear to be removed than injected into the Huntington Beach Oil Field, a situation which should result in a voidage problem.

The actual or potential surface effects of differential subsidence must be viewed as a geologic hazard (Barrows, 1974). Coastal regions at or slightly above sea level, such as the Huntington-Newport Beach region, may be seriously affected as a result of subsidence. In the event of subsidence 1) the beach may recede landward as a portion subsides below sea level, and 2) the region will be prone to flooding and wave damage during periods of storm or high tide. Horizontal surface movements that accompany differential subsidence can create additional problems (Barrows, 1974). The effects range from damage to structures through misalignment of supports or piles to the rupturing or kinking of pipelines. Subsidence impacts are classified as Class II.

Subsidence in response to petroleum withdrawal has been documented in many of the oil fields along the Newport-Inglewood structural trend. Subsidence across the onshore portion of the Huntington Beach Oil Field along the Pacific Coast Highway has continued at a rate of about an inch/year from 1976 to 1986, even after initiation of onshore waterflooding in 1964.

Although proper pressurization of oil and gas reservoirs by the waterflood program should minimize the effect of subsidence, a program to monitor subsidence at the platforms, such as periodic leveling surveys, is recommended. Such leveling information for the project area will allow for knowledgeable decisions regarding adjustments to the waterflood program (e.g., increasing waterflooding to decrease subsidence; reducing waterflooding to eliminate rebound).

SUMMARY: Class II impact. Implementation of subsidence monitoring (e.g., periodic leveling surveys) recommended.

CEQA FINDING NO. 3.

GEOLOGY: Operation

Impact: Possible ground rupture and release of hydrocarbons from formations or production-associated infrastructure, due to seismicity.

Finding:

a) Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant environmental effect as identified in the completed environmental impact report (i.e., Draft EIR and Finalizing Addendum).

b) Such changes or alterations are within the responsibility and jurisdiction of another public agency and such changes have been adopted by such other agency, or can and should be adopted by such other agency (Division of Oil and Gas).

Mitigation: Mitigation Monitoring Plan #9.

FACTS SUPPORTING THE FINDING:

Prior to 1961, seismicity within the Huntington Beach Oil Field was low, with maximum magnitudes in the 3+ range; two earthquakes of magnitude 5+ located offshore within a mile of the field were aftershocks of the 1933 Long Beach earthquake. Between October and November of 1961, a series of tremors occurred within the vicinity of the field, many of them with magnitudes between 3 and 5. Listed hypocenters were at depths of about 1 to 6 mi (2 to 10 km), with many at about 3 to 4 mi (6 to 7 km). Although it is possible that the tremors may be subsidence-induced, the depths of the hypocenters suggest that they were probably fault-induced earthquakes.

Active faults can pose a potential hazard to offshore operations. Faults are considered active where they offset young (Quaternary) sediments in regions where sedimentation has been essentially continuous, where they offset the seafloor, or where they have a historic record of earthquake activity or movement. Active faults are potentially hazardous because of possible ground rupture and they may act as conduits along which pressurized, subsurface fluids can reach the surface. Injection or withdrawal of fluids may also reactivate deeper faults

thought to be dormant and withdrawal of fluids may cause subsidence.

Definitions of active faults vary from those with very long recurrence intervals (50,000 years) to those with only historic surface displacements; thus faults may be inactive for thousands of years, then suddenly generate earthquakes (Westec Services, Inc., 1987). According to Westec Services, Inc. (1987), faults with historic rupture and associated earthquakes, and faults with geologic or geomorphic evidence of Holocene (past 11,000 years) movement are considered active and therefore capable of generating earthquakes. Seismicity impacts are classified as Class I.

The Newport-Inglewood Fault Zone has been shown to be an active en echelon system; numerous earthquake epicenters have occurred along or adjacent to the zone, including the 1933 Long Beach earthquake (M_L=6.3). From a geologic standpoint, the offshore structure lies within and apparently resembles structures of the Torrance-Wilmington fold and thrust belt.

The following mitigation measures are recommended:

1) a program to monitor seismicity and associated ground acceleration within the waterflood site, based on periodic review of seismic data from: a) the existing onshore seismic network administered by the California Institute of Technology and the University of Southern California; and b) the anticipated deployment of ocean bottom seismographs in the OCS Beta Field;

2) compliance with existing regulations and performance of good oil field practices;

3) pressure sensors and shut off valves to be used to minimize the effects of possible pipeline breakage from fault rupture;

4) reservoir pressures should be maintained;

5) implementation of a special well casing program, subject to approval by the SLC and DOG, when drilling through known fault planes in order to resist or minimize the effect of fault rupture; and

6) the fault patterns in the area surrounding the site should be mapped to determine the relationship of faults at the site with the major regional fault trends (i.e., THUMS-Huntington Beach fault).

SUMMARY: Class I impact. Project design and existing facilities have been engineered and constructed to meet or exceed current industry standards.

Although proposed mitigation measures will reduce the potential impacts associated with a limited, seismicity-related release of hydrocarbons, significant residual impacts are expected.

CEQA FINDING NO. 4.

GEOLOGY: Operation

Impact: Possible ground rupture and release of hydrocarbons from formations or production-associated infrastructure, due to induced seismicity.

Finding:

a) Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant environmental effect as identified in the completed environmental impact report (i.e., Draft EIR and Finalizing Addendum).

b) Such changes or alterations are within the responsibility and jurisdiction of another public agency and such changes have been adopted by such other agency, or can and should be adopted by such other agency (Division of Oil and Gas).

Mitigation: Mitigation Monitoring Plan #8, 10.

FACTS SUPPORTING THE FINDING:

Induced seismicity is a potential problem that may be encountered during waterflooding. According to Hamilton et al. (1969), fluid injection appears to have caused earthquakes in at least two locations. The injection of water into a 12,000-ft-deep (3,660 m) well at the Rocky Mountain Arsenal northeast of Denver (CO) is generally considered to have initiated the earthquake sequence that began there in 1962 (Healy et al., 1968). Three of these had magnitudes greater that 5 and resulted in minor damage. The probable cause of the earthquakes was weakening of rock through increased pore pressure, which allowed natural rock stresses to be released (Barrows, 1974). Another situation that appears similar to that in Denver was subsequently recognized by Healy et al. (1968) in the oil field near Rangely (CO). The earthquakes there occurred in areas of high-pressure gradients generated by injection of water for purposes of secondary recovery.

The potential for earthquake-induced seismicity is difficult to evaluate, since there does not appear to be any documented cases within southern California. Even for the Wilmington Oil Field, which is an area where waterflooding actually caused uplift (USACOE and LAHD, 1992), no anomalous seismicity was reported.

Given the questionable occurrence of induced seismicity in southern California, impacts associated with induced seismicity are classified as Class II.

Recommended mitigation measures include:

1) implementation of a program to monitor seismicity and associated ground acceleration in the vicinity of the waterflood site, based on periodic review of seismic data from: a) the existing onshore seismic network administered by the California Institute of Technology and the University of Southern California; and b) the anticipated deployment of ocean bottom seismographs in the OCS Beta Field;

2) maintenance and monitoring of reservoir pressure during the waterflood program;

3) implementation of a special well casing program, subject to approval by the SLC and DOG, when drilling through known fault planes in order to resist or minimize the effect of fault rupture;

4) maintenance of pressure sensors and shutoff valves to minimize the effect of possible pipeline breakage from fault rupture; and

5) compliance with existing regulations and performance of good oil-field practices.

SUMMARY: Class II impact, given the questionable occurrence of induced seismicity. Project design and existing facilities have been engineered and constructed to meet or exceed current industry standards.

CEQA FINDING NO. 5.

AIR QUALITY: Support vessel activity during Platform Emmy drilling

Impact: Exceedance of the SCAQMD significance threshold for NO_x and ROC.

Finding:

a) Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant environmental effect as identified in the completed environmental impact report (i.e., Draft EIR and Finalizing Addendum).

b) Such changes or alterations are within the responsibility and jurisdiction of another public agency and such changes have been adopted by such other agency, or can and should be adopted by such other agency (California Air Resources Board; South Coast Air Quality Management District).

Mitigation: Mitigation Monitoring Plan #11.

FACTS SUPPORTING THE FINDING:

Both the State and Federal governments have established air quality standards for ozone, CO, NO_2, SO_2, PM_{10} (particles less than ten microns in size), and lead. California standards are more stringent than the Federal standards, particularly for PM_{10} and SO_2. California has also set standards for sulfate, visibility, hydrogen sulfide, and vinyl chloride.

For purposes of monitoring, reporting, and air quality analysis, the South Coast Air Quality Management District (SCAQMD) has divided the Basin into a series of source receptor areas, each distinguished by the location of a unique monitoring station. The monitoring station in each receptor area is equipped to sample and record pollutants of concern for that locale. Not all pollutants are monitored at each receptor-area station. A summary of the Basin-wide ambient air quality in 1991, based on SCAQMD (1992), is as follows:

Lead - All areas met Federal and State standards.

Sulfur Dioxide - All areas met Federal and State standards.

Sulfate - All areas met State standards; no Federal standards currently exist.

Nitrogen Dioxide - The Federal standard was exceeded at one Los Angeles County location (Pomona) with the annual average concentration at 3% greater than the standard. The State standard was exceeded at five Los Angeles County locations. The highest concentration recorded was 48% above the standard (Los Angeles).

Carbon Monoxide - Exceedances of the State and Federal standards were limited to about one-fourth of the Basin, with the highest concentrations in central Los Angeles County. At the most affected receptor area (Lynwood), the State standard was exceeded on 41 days. The highest concentration recorded was 83% greater than the Federal standard at that location.

PM_{10} - State standards were exceeded in all areas and Federal standards were exceeded in many areas. The highest 24-hr average concentration was recorded in the Southeast Desert Air Basin (Indio) and was 6.8 times the State 24-hr standard and 2.3 times the Federal 24-hr standard. The highest annual average concentrations recorded in the Basin (Rubidoux) were more than twice the State standard and more than 1.5 times the Federal annual standard.

Ozone - State and Federal standards were recorded in all areas. The most affected locations exceeded the State standard on 148 days (Crestline) and the Federal standard on 91 days (Redlands and Glendora). The maximum concentration recorded in the Basin (Glendora) was more than three times the State standard and 2.5 times the Federal standard.

In calculating the emission impacts for the platform drilling option, it was determined that a worst-case daily emission scenario will be experienced either at the initiation or at the end of drilling. On the worst-case day, Platform Emmy will receive drilling supplies via a work boat delivery. Platform Eva will receive an initial visit from a supply boat. In addition, each platform will undergo a crew boat-supported shift change and will receive an additional load of supplies by supply boat.

Exceedance of the SCAQMD significance thresholds for NO_x and ROC associated with support vessel activity (during platform drilling) is a Class II impact.

The mitigation measures proposed may be implemented for a fixed term in order to mitigate the temporary emission increases caused by the project activities. There are four general areas of mitigation that may be implemented, including 1)

activity management; 2) emission offsets; 3) mitigation fees; and 4) pollutant-specific mitigation techniques.

Activity Management

Mitigable Impact: Short-term project emissions that contribute to or exacerbate an air quality standard violation or episode.

Project Modification: Delay, cancel, or postpone scheduled emission-generating project activities such as support-vessel trips.

Method of Implementation: The applicants should submit a vessel-activity management plan to the SLC or it's designated enforcement agent for Platforms Eva and Emmy. A similar activity management and curtailment plan was prepared for construction activities for the Exxon Santa Ynez Unit development project in response to the Santa Barbara County Resource Management Department Land Use Permit Condition XII-5 and the APCD Authority to Construct Permit No. 5651, Permit Condition 49. The plan for the waterflood project should clearly define an existing vessel-traffic schedule for each platform and proposed additional daily vessel runs to each platform to support project activities. Applicants shall rely as much as possible on established support-vessel traffic for personnel and cargo transport. The plan should describe scenarios when the use of existing vessel trips would be infeasible and the use of an added project boat run becomes necessary. In the event a Stage III alert is called by the SCAQMD, the applicants will implement the vessel activity management plan. The plan should address the degree of severity of the steps that will be taken to delay, postpone, or cancel scheduled project emission generating activities such as tug-, crew-, or supply-boat visits should an air quality alert be called. This schedule should extend for the life of the drilling program on both platforms and for the full extent of the deck and equipment installation on Platform Eva.

Timing: The Plan shall be submitted to and approved by the SLC or it's designated enforcement agent prior to beginning project activities.

Emission Offsets

Mitigable Impact: Project emission increases from mobile and stationary sources.

Project Modification: Project emissions will be offset on a minimum 1:1 ratio.

Method of Implementation: Since construction of new facilities is not proposed for the project, no SCAQMD permit action is anticipated. Therefore,

the applicants shall enter into a legally binding contract (e.g., Memorandum of Agreement) with the SLC or it's designated enforcement agent, in which the applicants incorporate into the contract the source and quantity of sufficient bona fide ERCs to offset project emissions. Should the owner of the ERC equipment be an entity other than the applicant, the contract shall include a separate agreement between the applicants and the ERC owner to shutdown or modify the equipment. This shutdown or modification shall be conducted under a valid SCAQMD permit modification, if applicable. Emission reduction credits must be real, quantifiable, enforceable, surplus (as defined by the EPA), and secured to the project in compliance with provisions of the SCAQMD Rules and Regulations. The SLC shall verify these ERC's and inspect the affected equipment to substantiate that measures to convert the equipment into an ERC source have been conducted.

Timing: Modifications to permits issued by the SCAQMD must be issued to establish ERC amounts, where applicable, and any offset agreement(s) consummated prior to the beginning of project activities.

Mitigation Fee

Mitigable Impact: Project emission increases from mobile and stationary sources.

Project Modification: None.

Method of Implementation: The applicants shall enter into a legally binding contract (e.g., Memorandum of Agreement) between the SLC and the applicants, by which an agreed upon mitigation fee is paid by the applicants to the SLC or to a designated third party (e.g., SCAQMD) to fund an existing program, field demonstration, or study, which will result in emission reductions to mitigate some or all project emission increases. Though the mitigation-fee-funded program or study may result in emission reductions which extend beyond the fixed timeframe of the waterflood project, only emission reductions that occur simultaneously with the project emission increases should be considered in deeming this measure as an appropriate mitigation. Mitigation fee programs have been successfully implemented in other geographic areas of California. For example, mitigation fees from the Chevron Pt. Arguello Project (Santa Barbara County) were used to conduct a crew and supply boat emissions reduction study (SBAPCD, 1987). At present, a project demonstrating the viability of the use of compressed natural gas (as a clean fuel for crew and supply boats) is underway, funded by mitigation fees from the Exxon Santa Ynez Project (Santa Barbara County). Further, a California Air Resources Board document reports that mitigation fee programs have been implemented in the Lake Tahoe air basin, the San Joaquin Valley air basin, and in Ventura County (California Air Resources

Board, 1990).

Timing: The mitigation fee may be applied to existing air quality enhancement programs. Any mitigation fee agreement and any supplemental negotiations with third parties (such as SCAQMD) must be concluded prior to project start-up.

Implement Diesel Engine and Combustion Modification to Reduce NO_x Emissions

Mitigable Impact: NO_x emission increases from supply boats.

Project Modification: None.

Method of Implementation: Supply boats that presently service the project platforms possess only turbocharging and air intake intercooling modifications. Additional NO_x emission reductions would be realized through implementation of 4° engine-timing retard (a 25% reduction from the uncontrolled condition) or 4° engine-timing retard and enhanced engine air-intake intercooling (a 40% reduction from the uncontrolled condition) (SBAPCD, 1987).

Timing: Engine modifications must be conducted and verified by the SLC or it's designated enforcement agent prior to the use of such boats for project activities. These vessels will be dedicated to the project. Boats with the control scheme described above may be substituted during the course of the project with the approval of the SLC or it's designated enforcement agent.

SUMMARY: Class II impact. Through implementation of project activity management, marine-vessel engine modifications, and emission offsets, these project emission impacts may be mitigated to insignificant levels.

CEQA FINDING NO. 6.

AIR QUALITY: Support vessel activity associated with the jack-up rig (option) operations at Platform Emmy.

Impact: Exceedance of the SCAQMD significance threshold for NO_x, ROC, CO, SO_2, and particulates.

Finding:

a) Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant environmental effect as identified in the completed environmental impact report (i.e., Draft EIR and Finalizing Addendum).

b) Such changes or alterations are within the responsibility and jurisdiction of another public agency and such changes have been adopted by such other agency, or can and should be adopted by such other agency (California Air Resources Board; South Coast Air Quality Management District).

Mitigation: Mitigation Monitoring Plan #11.

FACTS SUPPORTING THE FINDING:

See air quality background discussion in CEQA Finding No. 5.

An option for the well-drilling program at Platform Emmy includes the use of a portable jack-up drill rig instead of on-platform drilling capabilities. The various rig components on this type of rig are normally powered by diesel generators. However, for this project, electrical power for the jack-up rig will be supplied via a transformer tied into the existing subsea electrical line from the mainland to Platform Emmy. Existing jack-up rig diesel generators will only be used for standby emergency power, a scenario not considered in this emission analysis. Electrical grid power demand was assumed to be equal to the power demand of on-platform drilling equipment.

Additional emissions will result from 1) the transport of the jack-up rig to and from Platform Emmy by tug boats; and 2) the positioning of the rig to access all four corners of Emmy's jacket (i.e., initial positioning, three subsequent repositionings). It was assumed the jack-up rig will originate from and return to

the Santa Barbara Channel area.

Rig transport to Platform Emmy will require two 4,800-hp tug boats. During the course of the drilling program, these two tug boats will return to the platform three times from the Port of Long Beach for jack-up rig repositioning.

Daily worst-case emission scenarios for the jack-up rig option were projected to occur during one of the three repositioning activities. It was assumed the two tugs will operate for a 24-hour period during repositioning, with half the time in the idle mode and half the time in a maneuver mode. In addition to the tug activity, it was assumed that normal project-related crew and supply boat activity (as portrayed in the platform drilling phase description) will be conducted.

Exceedance of the SCAQMD significance thresholds for NO_x, ROC, CO, SO_2, and particulates associated with support vessel activity (jack-up rig option) is a Class II impact.

The mitigation measures proposed may be implemented for a fixed term in order to mitigate the temporary emission increases caused by the project activities. There are four general areas of mitigation that may be implemented, including 1) activity management; 2) emission offsets; 3) mitigation fees; and 4) pollutant-specific mitigation techniques. The specifics of each mitigation are outlined in CEQA Finding No. 5.

SUMMARY: Class II impact. Through implementation of project activity management, marine-vessel engine modifications, and emission offsets, these project emission impacts may be mitigated to insignificant levels.

CEQA FINDING NO. 7.

AIR QUALITY: Support vessel activity associated with Platform Eva deck expansion

Impact: Exceedance of the SCAQMD significance threshold for NOx.

Finding:

a) Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant environmental effect as identified in the completed environmental impact report (i.e., Draft EIR and Finalizing Addendum).

b) Such changes or alterations are within the responsibility and jurisdiction of another public agency and such changes have been adopted by such other agency, or can and should be adopted by such other agency (California Air Resources Board; South Coast Air Quality Management District).

Mitigation: Mitigation Monitoring Plan #11.

FACTS SUPPORTING THE FINDING:

See air quality background discussion in CEQA Finding No. 5.

An 1,800-hp work boat similar to the *Tampa Sea Horse* will be used to transport the deck expansion material and construction equipment to Platform Eva from the Port of Long Beach. Mobilization and demobilization of the rigging and welding equipment is estimated to take three round trips; transport of deck expansion units will take six round trips.

Transportation of construction crews and small supplies will normally use the scheduled crew-boat runs from the Seal Beach pier to Platform Eva, a distance of 6 miles for a one-way run time of 20 minutes. On days that a large crew is required, an additional run of a crew boat (similar to the *Geerd Tide*) may be required. On the assumption that an additional crew boat run will be required during half the construction period, approximately 80 additional crew-boat runs beyond the normally scheduled runs are estimated to be required.

Worst-case daily emissions will result from one delivery of construction material

or deck expansion material by work boat. In addition, an extra crew-boat run, over and above the regularly scheduled run, will be needed.

Exceedance of the SCAQMD significance threshold for NO_x associated with support vessel activity (Platform Eva deck expansion) is a Class II impact.

The mitigation measures proposed may be implemented for a fixed term in order to mitigate the temporary emission increases caused by the project activities. There are four general areas of mitigation that may be implemented, including 1) activity management; 2) emission offsets; 3) mitigation fees; and 4) pollutant-specific mitigation techniques. The specifics of each mitigation are outlined in CEQA Finding No. 5.

SUMMARY: Class II impact. Through implementation of project activity management, marine-vessel engine modifications, and emission offsets, these project emission impacts may be mitigated to insignificant levels.

CEQA FINDING NO. 8.

AIR QUALITY: Support vessel activity associated with Platform Eva production equipment installation

Impact: Exceedance of the SCAQMD significance threshold for NO_x.

Finding:

a) Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant environmental effect as identified in the completed environmental impact report (i.e., Draft EIR and Finalizing Addendum).

b) Such changes or alterations are within the responsibility and jurisdiction of another public agency and such changes have been adopted by such other agency, or can and should be adopted by such other agency (California Air Resources Board; South Coast Air Quality Management District).

Mitigation: Mitigation Monitoring Plan #11.

FACTS SUPPORTING THE FINDING:

See air quality background discussion in CEQA Finding No. 5.

An 1,800-hp work boat similar to the *Tampa Sea Horse* will be used to transport most of the production, utility, and construction equipment from the Port of Long Beach to Platform Eva. A derrick barge towed and maneuvered by a large tug boat (powered by two 2,150-hp main engines) and a small tug boat (powered by two 1,200-hp main engines) may be used to transport and set the power building, which cannot be lifted with the platform crane. For purposes of analysis, it has been assumed that the entire derrick operation will take a full 24-hour day with the tugs running in the maneuver mode (50% load) the entire time and the barge generator set operating for one hour for the building lift. Mobilization and demobilization of the rigging and welding equipment has been estimated to take four round trips with the work boat. The transport of the production and utility equipment and piping spools is estimated to take approximately 12 round trips with the work boat and two round trips with derrick barge.

Transportation of the installation crews and small supplies will use the regularly

scheduled crew-boat runs from Seal Beach pier. No additional project crew boat runs are anticipated.

It has been estimated that worst-case daily emissions will occur on the day of the power building lift, where one project-related supply-boat visit for transporting equipment or supplies and one platform visit from the derrick barge will be scheduled. Since the crew boat visits are currently operating, no added emissions for this activity have been considered in this analysis.

Exceedance of the SCAQMD significance threshold for NO_x associated with support vessel activity (Platform Eva process equipment installation) is a Class II impact.

The mitigation measures proposed may be implemented for a fixed term in order to mitigate the temporary emission increases caused by the project activities. There are four general areas of mitigation that may be implemented, including 1) activity management; 2) emission offsets; 3) mitigation fees; and 4) pollutant-specific mitigation techniques. The specifics of each mitigation are outlined in CEQA Finding No. 5.

SUMMARY: Class II impact. Through implementation of project activity management, marine-vessel engine modifications, and emission offsets, these project emission impacts may be mitigated to insignificant levels.

CEQA FINDING NO. 9.

AIR QUALITY: Support vessel activity associated with Platform Eva production equipment installation

Impact: Exceedance of the SCAQMD significance threshold for ROC, CO, and particulates.

Finding:

a) Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant environmental effect as identified in the completed environmental impact report (i.e., Draft EIR and Finalizing Addendum).

b) Such changes or alterations are within the responsibility and jurisdiction of another public agency and such changes have been adopted by such other agency, or can and should be adopted by such other agency (California Air Resources Board; South Coast Air Quality Management District).

Mitigation: Mitigation Monitoring Plan #11.

FACTS SUPPORTING THE FINDING:

See air quality background discussion in CEQA Finding No. 5.

An 1,800-hp work boat similar to the *Tampa Sea Horse* will be used to transport most of the production, utility, and construction equipment from the Port of Long Beach to Platform Eva. A derrick barge towed and maneuvered by a large tug boat (powered by two 2,150-hp main engines) and a small tug boat (powered by two 1,200-hp main engines) may be used to transport and set the power building, which cannot be lifted with the platform crane. For purposes of analysis, it has been assumed that the entire derrick operation will take a full 24-hour day with the tugs running in the maneuver mode (50% load) the entire time and the barge generator set operating for one hour for the building lift. Mobilization and demobilization of the rigging and welding equipment has been estimated to take four round trips with the work boat. The transport of the production and utility equipment and piping spools is estimated to take approximately 12 round trips with the work boat and two round trips with derrick barge.

Transportation of the installation crews and small supplies will use the regularly scheduled crew-boat runs from Seal Beach pier. No additional project crew boat runs are anticipated.

It has been estimated that worst-case daily emissions will occur on the day of the power building lift, where one project-related supply-boat visit for transporting equipment or supplies and one platform visit from the derrick barge will be scheduled. Since the crew boat visits are currently operating, no added emissions for this activity have been considered in this analysis.

Exceedance of the SCAQMD significance threshold for ROC, CO, and particulates associated with support vessel activity (Platform Eva process equipment installation) is a Class II impact.

The mitigation measures proposed may be implemented for a fixed term in order to mitigate the temporary emission increases caused by the project activities. There are three general areas of mitigation that may be implemented, including 1) activity management; 2) emission offsets; and 3) mitigation fees. The specifics of each mitigation are outlined in CEQA Finding No. 5.

SUMMARY: Class II impact. Through implementation of project activity management, marine-vessel engine modifications, and emission offsets, these project emission impacts may be mitigated to insignificant levels.

CEQA FINDING NO. 10.

AIR QUALITY: All project phases

Impact: NO_x and ROC emissions will contribute to existing ozone non-attainment status.

Finding:

a) Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant environmental effect as identified in the completed environmental impact report (i.e., Draft EIR and Finalizing Addendum).

b) Such changes or alterations are within the responsibility and jurisdiction of another public agency and such changes have been adopted by such other agency, or can and should be adopted by such other agency (California Air Resources Board; South Coast Air Quality Management District).

Mitigation: Mitigation Monitoring Plan #11.

FACTS SUPPORTING THE FINDING:

In addition to the phase-specific impacts noted previously (CEQA Finding Nos. 5 through 8), NO_x and ROC emissions from the project will contribute to existing ozone non-attainment status for the South Coast region. This is a Class II impact.

The mitigation measures proposed may be implemented for a fixed term in order to mitigate the temporary emission increases caused by the project activities. There are four general areas of mitigation that may be implemented, including 1) activity management; 2) emission offsets; 3) mitigation fees; and 4) pollutant-specific mitigation techniques. The specifics of each mitigation are outlined in CEQA Finding No. 5.

SUMMARY: Class II impact. Through implementation of project activity management, marine-vessel engine modifications, and emission offsets, these project emission impacts may be mitigated to insignificant levels.

NO TEXT THIS PAGE

ACCIDENTS/UPSETS

CEQA FINDING NO. 11.

MARINE BIOLOGY: Oil spill; See CEQA Finding No. 16.

Impact: Smothering and death of sandy beach and rocky shoreline communities from an oil spill.

Finding:

a) Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant environmental effect as identified in the completed environmental impact report (i.e., Draft EIR and Finalizing Addendum).

b) Such changes or alterations are within the responsibility and jurisdiction of another public agency and such changes have been adopted by such other agency, or can and should be adopted by such other agency (US Coast Guard, California Department of Fish and Game).

Mitigation: Mitigation Monitoring Plan #3, 4.

FACTS SUPPORTING THE FINDING:

Between Long Beach Harbor and Newport Beach, the intertidal habitats include sandy beach and rocky intertidal/rip rap. If an oil spill were to reach shore, intertidal biota could experience significant impacts not mitigable to insignificant levels (Class I impact). There is no indication that intertidal biota are particularly sensitive to petroleum hydrocarbons (to a greater extent than subtidal organisms, for example). However, when spill oil reaches the intertidal, it becomes concentrated in a narrow zone along the shoreline, and because of the shallow water depth, hydrocarbon concentrations in the water column can reach toxic levels. Thus, intertidal biota may be exposed to higher concentrations of oil for a longer period than most other marine organisms. Impacts of spilled oil upon intertidal biota are attributable to both physical smothering, particularly of sessile organisms such as barnacles and bivalves, and hydrocarbon toxicity.

The likely severity and duration of impacts on intertidal organisms is, in part, a function of the biological and geomorphologic characteristics of the habitat. Gundlach and Hayes (1978) developed a system for ranking the oil spill sensitivity of coastal habitats on the basis of potential residence times of spilled oil.

Habitats with a low energy regime (e.g., salt marshes, sheltered tidal flats, sheltered rocky coasts) are characterized by large biological populations, high oil residence times, and high sensitivity to spilled oil. Recovery of these areas from a spill may occur over a period of several years. Gravel beaches and mixed sand/gravel beaches generally have relatively small biological populations, but oil reaching these habitats is resistant to cleaning because of sediment penetration.

Shoreline types inshore of the project area consist of sandy beaches with limited areas of rocky intertidal/riprap. There are also marshes and mudflats within several bays inshore of the immediate project area; those located some distance away could conceivably receive significant impacts from an oil spill (see CEQA Finding No. 15).

After the 1969 Santa Barbara Channel oil spill, effects upon certain rocky intertidal organisms were noted. Impacts included smothering of barnacles (*Chthalamus fissus*), mortality of surfgrass (*Phyllospadix torreyi*) and algae (*Hesperophycus harveyanus*), and reduced reproduction in the stalked barnacle *Pollicipes polymerus* (Straughan, 1971). There may have been impacts on other intertidal biota, but the impact assessment was hampered by a lack of complete baseline (pre-spill) data and the confounding influence of natural oil seepage and heavy rains and flooding at the time of the spill (Straughan, 1971). Affected intertidal areas appeared to have recovered within about one year following the spill (Straughan, 1971).

Appropriate mitigation measures include: 1) assuring the availability of adequate containment and cleanup plans, equipment, and crews; 2) use of booms, skimmers, and other mechanical means to contain and clean up oil; 3) use of adequate safety mechanisms; 4) prepositioning of oil spill equipment; and 5) conduct of or involvement in frequent safety drills (e.g., routine and unannounced oil spill drills).

SUMMARY: Class I impact. No residual impact if mitigation measures are completely effective and oil does not reach the shoreline; otherwise, residual impact would range from significant to adverse.

CEQA FINDING NO. 12.

MARINE BIOLOGY: Oil spill; See CEQA Finding No. 16.

Impact: Lethal and sublethal effects on benthic infauna and epifauna from oil that reaches the seafloor.

Finding:

a) Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant environmental effect as identified in the completed environmental impact report (i.e., Draft EIR and Finalizing Addendum).

b) Such changes or alterations are within the responsibility and jurisdiction of another public agency and such changes have been adopted by such other agency, or can and should be adopted by such other agency (US Coast Guard, California Department of Fish and Game).

Mitigation: Mitigation Monitoring Plan # 3, 4.

FACTS SUPPORTING THE FINDING:

Spilled petroleum that does not evaporate or wash ashore or that is not recovered by mechanical means is eventually incorporated into bottom sediments. Oil may reach the benthos through the formation of nonbuoyant oil residues, adsorption onto particulate matter, or through incorporation into the pelagic food chain and subsequent egestion and sinking of fecal pellets. In general, the oil undergoes extensive modification before sedimentation occurs (Jordan and Payne, 1980).

In contrast to oil in the water column, which is rapidly diluted and dispersed, oil that is incorporated into sediments may become a chronic pollution source. Sediment hydrocarbons become available to benthic organisms through ingestion and/or incorporation across gill membranes. For some organisms that lack the ability to metabolize hydrocarbons, concentrations can be reached in the tissues that may kill the organism or produce sublethal effects.

Adsorption onto particulate matter is probably a major pathway for transport of spilled oil to the benthos (Jordan and Payne, 1980). Hence, the amount of oil deposited on the seafloor following a spill will vary in relation to the nature and

quantity of suspended particulate matter in the water column as well as water depth and current velocity. For example, large amounts of oil that reached the benthos following the 1969 Santa Barbara Channel oil spill and a platform blowout in the Gulf of Mexico were attributed to the interaction of the oil with sediment-rich river plumes (Kolpack, 1971; McAuliffe et al., 1975). Extensive oil-sediment interaction observed during the AMOCO CADIZ spill off the Brittany coast resulted in the sinking of much of the oil (Hess, 1978). High concentrations of suspended particulates were also suspected to contribute to the sinking of oil and accumulations in bottom sediments in the vicinity of the spill sites following the TSESIS spill in the Baltic Sea (Boehm et al., 1980) and the IXTOC I blowout in the Gulf of Mexico (Boehm and Fiest, 1980).

The nature and severity of oil spill impacts upon benthic communities can be expected to vary in relation to the degree of weathering of the oil. Oil that sinks before it has weathered significantly will contain appreciable percentages of toxic hydrocarbons that may be accumulated by benthic organisms, resulting in mortalities. Highly weathered oil, though not of as much concern from the standpoint of toxicity, would be of particular concern in relation to smothering of sessile biota associated with hard-bottom areas. In general the potential impacts of spilled oil on benthic communities are evaluated as significant and not mitigable to insignificant levels (Class I impact).

Appropriate mitigation measures include: 1) assuring the availability of adequate containment and cleanup plans, equipment, and crews; 2) use of booms, skimmers, and other mechanical means to contain and clean up oil; 3) use of adequate safety mechanisms; 4) prepositioning of oil spill equipment; and 5) conduct of or involvement in frequent safety drills (e.g., routine and unannounced oil spill drills).

Appropriate mitigation measures include: 1) assuring the availability of adequate containment and cleanup plans, equipment, and crews; 2) use of booms, skimmers, and other mechanical means to contain and clean up oil; 3) use of adequate safety mechanisms; 4) prepositioning of oil spill equipment; and 5) conduct of or involvement in frequent safety drills (e.g., routine and unannounced oil spill drills).

SUMMARY: Class I impact. No residual impact if mitigation measures are completely effective; otherwise, residual impact would range from significant to insignificant, short- to long-term, and local to regional.

CEQA FINDING NO. 13.

MARINE BIOLOGY: Oil spill; See CEQA Finding No. 16.

Impact: Lethal and sublethal effects to marine mammals by coating or ingestion of oil.

Finding:

a) Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant environmental effect as identified in the completed environmental impact report (i.e., Draft EIR and Finalizing Addendum).

b) Such changes or alterations are within the responsibility and jurisdiction of another public agency and such changes have been adopted by such other agency, or can and should be adopted by such other agency (US Coast Guard, California Department of Fish and Game).

Mitigation: Mitigation Monitoring Plan # 3, 4.

FACTS SUPPORTING THE FINDING:

See background discussion in CEQA Finding No. 1.

Marine mammals that could be potentially affected by an oil spill from the proposed project location include cetaceans and pinnipeds. Marine mammals unable to avoid contact with oil could suffer from mechanical fouling, inhalation, or ingestion problems that could result in sublethal or lethal effects. Reviews of the effects of oil on marine mammals have been provided by Geraci and St. Aubin (1982, 1985), Englehardt (1983), and the NRC (1985). A risk analysis model for marine mammals of the Southern California Bight has been presented by Ford (1985).

Seals have the ability to detect and avoid oil slicks (USDOI, MMS, 1983). However, Cowell (1979) found that breeding male and female seals swam through oil to reach rookery beaches during the breeding season. Davis and Anderson (1976) found no measurable differences in the growth and mortality of oiled and unoiled Grey Seal pups. LeBoeuf (1971) reported similar results on oiled and unoiled Elephant Seal pups during the Santa Barbara blowout. In fact, no deaths

to any marine mammals could be linked to the 1969 Santa Barbara oil spill (Brownell, 1971; Geraci and Smith, 1977). Geraci and Smith (1977) reported that surface contact with oil has a much greater impact on seals than absorption of the petroleum. Controlled experiments in which seals were exposed to floating oil resulted in reversible eye damage. Due to the relatively close proximity of the project area to foraging areas of California sea lions, a catastrophic release of oil could come ashore, thereby exposing adults and subadults (including pups) to potentially long term lethal and sublethal effects (significant impact not mitigable to an insignificant level--Class I). Onshore clean-up activities would also be extremely disruptive, resulting in significant, not mitigable impacts (Class I) in the short term.

Secondary impacts to seals could result from human response activities following a spill. DeLong (1975) found that seals disturbed on San Miguel Island retreated into the sea and did not return for one to several days. Such impacts could be significant behavioral disturbances during the breeding season (Davis and Anderson, 1976).

It is unlikely that oil spills will substantially threaten cetaceans. A massive oil spill could result in mechanical fouling of the baleen, oil toxicity from ingestion, respiratory difficulties, and irritation of the eyes, skin, and mucous membranes. However, unless a cetacean were absolutely confined within an oil spill area, it would sustain only minor impacts from oil contact and would generally recover from these effects (USDOI, MMS, 1983). Some observations suggest that cetaceans either avoid surfacing in oil slicks or change their respiratory pattern by taking shorter breaths and staying submerged longer when traveling through oil slicks. However, other observations suggest that some cetaceans may not actively avoid oil-covered waters (NRC, 1985). Oil does not tend to cling to and foul cetacean skin as it does with the pelage of other marine mammals. Studies indicate that the levels of oil fouling by skin contact and accidental ingestion would not reach toxic levels and any irritation would likely be only temporary (Geraci and St. Aubin, 1982; USDOI, MMS, 1983). The only baleen whale likely to transit the area in significant numbers is the Gray Whale; mechanical fouling of the baleen resulting in feeding interruption is not a major concern because Gray Whale do not generally feed during their migration.

Because different marine mammal species exhibit varying susceptibilities (acute and chronic) to oil contact and ingestion, varying thermoregulatory responses, and differing degrees of avoidance behavior, the severity of impacts necessarily varies among species. Under conditions where a catastrophic oil release occurs, California Sea Lions could realize locally significant impacts (Class I) in the long term. These impacts could be partially mitigated with proper outfitting and positioning of containment and clean-up equipment, sufficient notification time and response capability, and adequate equipment effectiveness.

Appropriate mitigation measures include: 1) assuring the availability of adequate containment and cleanup plans, equipment, and crews; 2) use of booms, skimmers, and other mechanical means to contain and clean up oil; 3) use of adequate safety mechanisms; 4) prepositioning of oil spill equipment; and 5) conduct of or involvement in frequent safety drills (e.g., routine and unannounced oil spill drills).

SUMMARY: Class I impact. No residual impact if mitigation measures are completely effective, however, oceanographic conditions and other factors may limit containment and cleanup effectiveness.

CEQA FINDING NO. 14.

MARINE BIOLOGY: Oil spill; See CEQA Finding No. 16.

Impact: Coating of marine birds by oil (leading to mortality and/or reduced hatching success) and sublethal stress attributed to ingestion or coating by oil.

Finding:

a) Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant environmental effect as identified in the completed environmental impact report (i.e., Draft EIR and Finalizing Addendum).

b) Such changes or alterations are within the responsibility and jurisdiction of another public agency and such changes have been adopted by such other agency, or can and should be adopted by such other agency (US Coast Guard, California Department of Fish and Game).

Mitigation: Mitigation Monitoring Plan # 3, 4

FACTS SUPPORTING THE FINDING:

Brown Pelican and California Least Tern, two species of endangered marine avifauna, can be expected to suffer some mortality in the event of a spill. As offshore foragers, Brown Pelican and Least Tern are highly susceptible to oil ingestion and fouling due to contact with an oil slick. Effects of oil contamination on the Brown Pelican population could be significant because the population is still recovering from the effects of DDT contamination, the species is sensitive to disturbance, and the breeding success of the species is highly variable. The California Least Tern, as a coastal inhabitant, has realized a reduction in population numbers primarily because of urbanization and/or accelerated coastal development and associated loss of suitable habitat. It is very unlikely that a spill could reach the tern's terminal island habitat (see CEQA Finding No. 15). Similarly, the resting or nesting habitats of other endangered avifauna are unlikely to be oiled, however, the foraging habitat (e.g., nearshore coastal waters) will likely be affected. Impacts of these endangered or threatened species arising from oil contamination would be significant and not mitigable to an insignificant level (Class I), long term, and of regional magnitude to the affected species.

Appropriate mitigation measures include: 1) assuring the availability of adequate containment and cleanup plans, equipment, and crews; 2) use of booms, skimmers, and other mechanical means to contain and clean up oil; 3) use of adequate safety mechanisms; 4) prepositioning of oil spill equipment; and 5) conduct of or involvement in frequent safety drills (e.g., routine and unannounced oil spill drills).

SUMMARY: Class I impact. No residual impact if mitigation measures are completely effective; otherwise, residual impact would be significant to resident and migrant species via habitat contamination and fouling.

CEQA FINDING NO. 15.

MARINE BIOLOGY: Oil spill; See CEQA Finding No. 16.

Impact: Loss of primary and secondary productivity in sensitive habitats; loss of nesting, rearing, and feeding habitats for birds; loss of spawning and rearing habitats for fishes and invertebrates from an oil spill.

Finding:

a) Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant environmental effect as identified in the completed environmental impact report (i.e., Draft EIR and Finalizing Addendum).

b) Such changes or alterations are within the responsibility and jurisdiction of another public agency and such changes have been adopted by such other agency, or can and should be adopted by such other agency (US Coast Guard, California Department of Fish and Game.

Mitigation: Mitigation Monitoring Plan # 3, 4.

FACTS SUPPORTING THE FINDING:

Nearby wetland areas have been designated by Federal, State, and/or local agencies as unique environments. Several salt water marsh areas are also present in this region. The sensitive habitats classification is intended to encompass State- and Federal-designated areas designed to protect marine or marine-related resources. Four categories designated by the State as being of special concern include: 1) ecological reserves; 2) marine life refuges; 3) ecological preserves; and 4) area(s) of special biological significance.

The sensitive habitats between the Long Beach Harbor entrance and Newport Beach, reflecting coastal zone segments inshore of the project area, includes: 1) the Los Angeles-Long Beach Harbor complex, including Terminal Island, site of California's largest population of least terns, a Federal- and State-listed endangered species; 2) Seal Beach National Wildlife Refuge, a 1,200-acre salt marsh and tidal channel area within upper Anaheim Bay (including portions of the U.S. Naval Weapons Station, Seal Beach), providing habitat for four

endangered bird species, including the California Least Tern, California Brown Pelican, Light-footed Clapper Rail, and Belding's Savannah Sparrow; 3) Bolsa Chica Ecological Reserve, a 300-acre parcel located in upper Bolsa Bay which provides habitat for over 150 species of avifauna, including five species listed as endangered (California least tern, Light-footed Clapper Rail, California Brown Pelican, and Belding's Savannah Sparrow); 4) Bolsa Chica Beach State Park, a six-mile long stretch of sandy beach backed by low bluffs along the Park's southern extent which is utilized by California grunion (*Leuresthes tenuis*) for spawning; 5) Huntington Beach City and State Beaches and adjacent Huntington Beach wetlands, nesting and/or foraging habitat for two endangered avifaunal species (California Least Tern, Belding's Savannah Sparrow); and 6) Upper Newport Bay Ecological Reserve, an estuarine and mudflat wilderness reserve and regional park on 1,565 acres of wetlands and waterways in upper Newport Bay.

An oil spill (see CEQA Finding No. 16) could potentially affect unique and sensitive habitats in the San Pedro Bay and Los Angeles-Long Beach Harbor area, depending upon the size of the spill and the wind and wave conditions present. Results of the oil spill trajectory analysis indicate that oil could reach shore within 6 h in the vicinity of Huntington Beach. The most likely area of shore impacts extends between Long Beach Harbor and Newport Beach area which includes Seal Beach National Wildlife Refuge, Bolsa Chica Ecological Reserve, Huntington Beach State Park, and Upper Newport Bay Ecological Reserve. With the exception of the Huntington Beach State Park, these sensitive habitats lie in sheltered, protected upper bay or wetland areas that should be protected via booming at harbor or bay entrances.

The California Least Tern, as a coastal inhabitant, has realized a reduction in population numbers primarily because of urbanization and/or accelerated coastal development and associated loss of suitable habitat. It is very unlikely that a spill could reach the Tern's Terminal Island habitat. Similarly, the resting or nesting habitats of other endangered avifauna are unlikely to be oiled, however, the foraging habitat (e.g., nearshore coastal waters) will likely be affected (see CEQA Finding No. 14). Impacts of these endangered or threatened species arising from oil contamination would be significant and not mitigable to an insignificant level (Class I), long term, and of regional magnitude to the affected species.

Appropriate mitigation measures include: 1) assuring the availability of adequate containment and cleanup plans, equipment, and crews; 2) use of booms, skimmers, and other mechanical means to contain and clean up oil; 3) use of adequate safety mechanisms; 4) prepositioning of oil spill equipment; and 5) conduct of or involvement in frequent safety drills (e.g., routine and unannounced oil spill drills).

SUMMARY: Class I impact. No residual impact if mitigation measures are

completely effective; otherwise, significant impacts will be realized as oil enters embayments and tidal wetland areas.

CEQA FINDING NO. 16.

SYSTEM SAFETY: Routine tankering in Long Beach-Los Angeles Harbor area

Impact: Collision of a tanker with Platform Eva or Platform Emmy, resulting in an oil spill of $\leq$ 2,000 bbl.

Finding:

a) Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant environmental effect as identified in the completed environmental impact report (i.e., Draft EIR and Finalizing Addendum).

b) Such changes or alterations are within the responsibility and jurisdiction of another public agency and such changes have been adopted by such other agency, or can and should be adopted by such other agency (US Coast Guard, California Department of Fish and Game).

Mitigation: Mitigation Monitoring Plan # 3, 4.

FACTS SUPPORTING THE FINDING:

Accident potential has taken into consideration the activities outlined for each platform. The severity and likelihood of the accidents have been assessed based on historical experience with accidents at similar types of facilities. Accidents, postulated with the intent of examining the spectrum of risks associated with each platform and the waterflood project, are called "design basis accidents" or DBAs.

The waterflood project encompasses modifications to Platform Eva and additional drilling from both Platforms Emmy and Eva. The DBAs associated with the existing platforms are to be discussed initially, providing the basis for determining the impact of the waterflood project on these DBAs. It should be noted that the existing system, consisting of Platform Eva, Platform Emmy, the wet oil and gas pipelines, and other associated pipelines and facilities, operates under conditions that are perceived to be safe and acceptable. The waterflood project entails several additional activities that may increase the existing level of risk associated with platform operation.

Design Basis Accident 03: Collision of a Tanker with Platform Eva or Platform Emmy

Background: This accident assumes that the collision of a tanker with either platform would result in the rupture of the tanker compartments, as well as the rupture of the platform vessels, piping, riser, and the pipelines. Rupture of large internal oil tanks or multiple tank ruptures are possible, but the likelihood of such events are estimated to be extremely low.

Severity: The consequence of this accident is assumed to be a 2,000 bbl spill. This amount of spill would fall in the category of **Severe**. It should be noted that injuries to vessel and platform personnel would be possible. However, no injury to the public would be expected.

Likelihood: The vessel traffic lanes through which most tankers pass are located approximately 10 miles distal to the platforms. All tanker traffic should avoid the platforms since they are well marked (with lights and navigational aids) and their positions will be marked on marine navigational charts. Accidents could occur due to one or more factors such as poor visibility, bad weather, faulty shipboard equipment, and piloting errors. Previous environmental documents (Arthur D. Little, Inc., 1984; USDOI, MMS, 1984; URS Corporation, 1986; Chambers Group, Inc., 1986) have estimated that the likelihood of a platform collision is on the order of one occurrence in 100 to 10,000 years. This likelihood falls in the category of **Unlikely**.

Appropriate mitigation measures include: 1) assuring the availability of adequate containment and cleanup plans, equipment, and crews; 2) use of booms, skimmers, and other mechanical means to contain and clean up oil; 3) use of adequate safety mechanisms; 4) prepositioning of oil spill equipment; and 5) conduct of or involvement in frequent safety drills (e.g., routine and unannounced oil spill drills). Contingency plans for drilling and operation phases should also be submitted to the SLC for approval to supplement existing OSCPs for each platform. Cleanup equipment employed must be the most effective available given the current state of pollution control and removal (i.e., within the bounds of research and development), pursuant to 2 CCR §2140(a).

SUMMARY: Class I impact. Significant residual impacts are expected for large spills.

CEQA FINDING NO. 17.

SYSTEM SAFETY: Routine production activity

Impact: Rupture of sour gas pipeline near shore

Finding:

a) Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant environmental effect as identified in the completed environmental impact report (i.e., Draft EIR and Finalizing Addendum).

b) Such changes or alterations are within the responsibility and jurisdiction of another public agency and such changes have been adopted by such other agency, or can and should be adopted by such other agency (Division of Oil and Gas).

Mitigation: Mitigation Monitoring Plan # 5.

FACTS SUPPORTING THE FINDING:

See background discussion of Design Basis Accidents in CEQA Finding No. 16.

<u>Design Basis Accident 11: Rupture of Sour Gas Pipeline Near Shore</u>

Background: The likelihood of an offshore pipeline failure has been determined through an analysis of four prior environmental documents (i.e., EIRs, EIR/EISs). The overall likelihood of pipeline failure is estimated to be 1.0×10^{-3} occurrences per mile of pipeline per year. It has been assumed that the probabilities of a small spill (i.e., <250 bbls) and a large spill (i.e., >250 bbls) are 85% and 15%, respectively.

It should be noted that the likelihood of a release of oil from a break in the subsea pipeline may vary along the length of the pipeline for a number of reasons:

1) Near the platform, the possibility exists for heavy items dropped from the platform or a supply boat to damage the pipeline. The pressure in the pipeline is also at its highest near the platform. Since the

pipeline is at its deepest near the platform, loss through a leak or rupture could be the smallest as buoyancy of the oil in the pipe would tend to keep it in the more elevated portions of the pipe.

2) In the interval between the safety zone around the platform and the point where the pipeline becomes buried to traverse the surf zone, the possibility of anchor damage from vessels exists. Over that portion of the offshore pipeline which is buried, the possibility of anchor damage does not exist.

3) As the pipeline nears shore, the pressure is lower, due both to the distance from the pump and the increase in elevation. The possibility of pipeline damage due to beach erosion and undermining from storms exists near the shoreline.

4) The likelihood of a leak due to corrosion is approximately equal along the subsea length of the pipeline, with the possible exception of the point at which the pipeline is welded to the pipeline riser. Leaks due to corrosion near the platform are much more likely to be detected rapidly by visual means due to the presence of platform personnel.

Since available data are not adequate to calculate probabilities of subsea pipeline leaks for specific portions of the pipelines, the likelihood of a leak was assumed to be uniform throughout the pipeline length.

Existing environmental documents (e.g., EIRs) also provide historical data on the likelihood of oil spills and spill amounts. There are many factors that affect the amount of oil that can leak from a pipeline (e.g., pipeline length, diameter, pressure, slope, SCADA design, etc.). The amounts of gas and oil which could be released from offshore pipeline breaks also depend upon the depth of water at the break, the volume within the pipe, the pressure in the pipe, and the time taken to shut down flow through the pipe. In general, any significant break in the pipeline will trigger an automatic shutdown within a few minutes.

Severity: The severity of this accident is dependent on the location of the pipe break. It has been assumed that the break occurs near the beach and the duration of the release is in the order of a few minutes. Therefore, the severity is in the category of **Severe**, because injury or loss of life among small number of the public using the beach or nearby areas is a reasonable expectation.

Likelihood: The likelihood of occurrence of offshore pipeline breaks is estimated to be **Unlikely**. The likelihood of occurrence of large leaks from ruptures is less than that of small leaks, but the differences are generally insufficient to change the category of likelihood of occurrence.

In some cases, it is not possible to mitigate the DBA to an insignificant level. However, mitigation measures may still reduce the probability of the DBA occurring, but not to the virtually impossible category.

Recommended mitigation measures include: 1) oil spill contingency planning; and 2) operational safety inspection and oversight.

Contingency plans for drilling and operation phases will be submitted to the SLC for approval to supplement existing OSCPs for each platform. Cleanup equipment employed must be the most effective available given the current state of pollution control and removal (i.e., within the bounds of research and development, pursuant to 2 CCR §2140(a).

The following are suggested mitigation measures applicable to operational safety and regulatory oversight: 1) prior to construction and start-up, SWEPI and Unocal should prepare detailed Safety Inspection, Maintenance, and Quality Assurance programs for all onshore and offshore facilities; the plans should include, but not be limited to, regular maintenance and safety inspections, corrosion monitoring and leak detection; 2) Platform Emmy and Eva facility personnel should be trained in the extent to which hazardous concentrations of poisonous and flammable gases could be generated from various types of facility accidents and in the extent to which such hazardous concentrations could contaminate nearby areas frequented by the public; the Emergency Response Plans should incorporate procedures for personally alerting the public in nearby areas when accidents that generate poisonous gases, and could cause potential injuries occur; 3) maintenance and testing of sensor systems which activate alarms and/or other types of warnings in the presence of flammable gases; and 4) SWEPI supervisory control and data acquisition system (SCADA) proposed by SWEPI and Unocal should incorporate state-of-the-art leak detection methods.

SUMMARY: Class I impact. For large gas releases, residual impact would be significant.

CEQA FINDING NO. 18.

WATER QUALITY: Oil spill; See CEQA Finding No. 16.

Impact: Increased turbidity, reduced light penetration and gas exchange, increased biological oxygen demand and chemical oxygen demand

Finding:

a) Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant environmental effect as identified in the completed environmental impact report (i.e., Draft EIR and Finalizing Addendum).

b) Such changes or alterations are within the responsibility and jurisdiction of another public agency and such changes have been adopted by such other agency, or can and should be adopted by such other agency (US Coast Guard, California Department of Fish and Game).

Mitigation: Mitigation Monitoring Plan # 3, 4.

FACTS SUPPORTING THE FINDING:

The description of the existing water quality environment includes discussion of physical oceanography which influences the dynamics of the project area and the water quality and sediment chemistry parameters which may be affected by the proposed project. The fate of oil spilled into the waters adjacent to either of the platforms will be determined by the overall transport energy at the site. Factors which could affect the dispersion, weathering, settling rate, and deposition of oil include currents, tides, wind, upwelling, and local storm events. Water quality parameters which may be affected by an oil spill include dissolved oxygen (DO), pH, light transparency, plankton, nutrients, and hydrocarbon and trace metal levels in seawater and sediments. Of primary concern are standard water column characteristics such as clarity and dissolved oxygen concentration, as well as concentrations of potentially toxic petroleum hydrocarbons.

Oil spill impacts on water quality were evaluated by reviewing pertinent literature concerning field and laboratory studies of petroleum in the marine environment.

Examples of pertinent literature include the compendium of reports assessing oil spill impacts resulting from the 1969 Santa Barbara Channel blowout (Kolpack, 1971), reviews by Jordan and Payne (1980) and the NRC (1985), and recent reviews (e.g., Applied Technology, Inc. and Continental Shelf Associates, Inc., 1990). The fate of spilled oil, including water column processes, was also reviewed.

Impacts were considered significant if a spill would probably result in a large, persistent departure from baseline conditions. A large departure from baseline conditions refers to one sufficient to affect use of the water by marine biota and/or humans. An impact was considered persistent if the altered conditions would not be reversed by natural dispersive processes within a period of a few hours to a day. All significant impacts were categorized as Class I because there is no certainty that the proposed oil spill mitigation measures would be completely effective in all circumstances.

Spilled oil may produce several different types of water quality impacts. Surface slicks could produce reductions in light penetration and gas exchange. Oxygen concentrations in subsurface waters could be reduced as a result of the decreased exchange with the atmosphere. The spilled oil may increase water column turbidity, biological oxygen demand (BOD), and chemical oxygen demand (COD). Toxic hydrocarbons may be released into the water column and sediments. Weathering of surface oil slicks could produce tar balls, which may eventually be widely dispersed in the water column and sediments and ingested by marine pelagic and benthic biota with adverse effects.

Water column effects, such as turbidity, reduced light penetration and gas exchange, and increased BOD and COD would persist in the area of an oil spill for various lengths of time depending on the size of the spill, the physical and chemical characteristics of the oil, and the action of various physical, chemical, and biological dispersive and degradative processes. Substantial departures from baseline conditions would be expected within the area affected by a large spill (>1,000 bbls). Although a surface slick could be dispersed within hours of release under sufficiently severe physical conditions, the impact could as easily persist for longer periods. The impact is categorized as Class I (significant impact not mitigable to insignificant levels).

Appropriate mitigation measures include: 1) assuring the availability of adequate containment and cleanup plans, equipment, and crews; 2) use of booms, skimmers, and other mechanical means to contain and clean up oil; 3) use of adequate safety mechanisms; 4) prepositioning of oil spill equipment; and 5) conduct of or involvement in frequent safety drills (e.g., routine and unannounced oil spill drills).
SUMMARY: Class I impact. Mitigation efforts would localize the impacts.

SWEPI/Unocal Cooperative Waterflood Project

CEQA FINDING NO. 19.

SYSTEM SAFETY AND RELIABILITY: Platform modification and operation.

Impact: There is a potential risk of injury to workers during platform modification, operation and abandonment.

Finding:

a) Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant environmental effect as identified in the completed environmental impact report (i.e., Draft EIR and Finalizing Addendum).

b) Such changes or alterations are within the responsibility and jurisdiction of another public agency and such changes have been adopted by such other agency, or can and should be adopted by such other agency (Cal. OSHA).

Mitigation: Mitigation Monitoring Plan # 2, 6, 7.

FACTS SUPPORTING THE FINDING:

Both during the platform modification and abandonment phases of this project, and during normal platform operations, workers are exposed to the hazards typical of heavy construction. Because the platform modification work will be undertaken during normal operations, some additional safety precautions are required.

The number and type of accidents for such projects have been analyzed for similar projects, and the likelihood of an accident is approximately one per evey hundred person-years, and the results are classified as minor.

Regulations of the California Division of Occupational Safety and Health apply to these projects, and inspections by both the Division of Oil and Gas and the State Lands Commission enforce these regulations.

SUMMARY: Class I impact. Mitigation efforts would localize the impacts.

EXHIBIT C

STATEMENT OF OVERRIDING CONSIDERATIONS

The SWEPI/Unocal Huntington Beach Upper Main Zone Cooperative Waterflood project could have potentially significant impacts on the environment due to accidental spills, seismic activity or supply vessel collisions with marine mammals. While the probability of these impacts is very slight, the potential for such impacts cannot be eliminated completely. Each of these impacts has been analyzed in the EIR prepared for this project.

Many mitigation measures covering training, safety equipment, spill prevention equipment and project design features have been incorporated into this project to reduce potential significant impacts to the environment (See the CEQA Findings, Attachment B). These measures, and the Mitigation Monitoring Plan (Attachment D), substantially lessen or eliminate the environmental impacts which could result from the proposed project. However, for a few of the potential impacts, there are no feasible mitigation measures which would totally reduce the impacts to a level of insignificance.

The risk of seismic events is unavoidable in the southern California region, and while design features incorporated into the project can reduce the risk of seismic related accidental releases of oil, the potential for impacts cannot be completely eliminated. There is also a very slight possibility that a vessel-platform collision could release some oil, and mitigations incorporated into the Mitigation Monitoring Plan cannot reduce this risk to zero.

The proposed project is consistent with both national and state economic and energy policy goals, as it increases the production of domestic crude oil, does not create any new oil processing facilities and does not require additional tankering of crude oil. All the crude produced by the proposed project will be processed at existing facilities. The wells to be drilled from existing platforms and the continued operation of the field will: 1) provide additional state revenues at a time of projected losses of revenue from other sources with substantial adverse effects on State funded social, educational and environmental programs; and, 2) provide for continued employment in the region.

The State Lands Commission has considered the benefits and the nature and extent of the potential impacts of the proposed project as described in the EIR for the SWEPI/Unocal Huntington Beach Upper Main Zone Cooperative Waterflood Project and as discussed in Attachment B of this Calendar Item. From this review, the Commission Finds that, in balancing the project's benefits against its unavoidable environmental risks, the benefits outweigh the level of environmental risks which would remain after the application of all feasible mitigation measures discussed in the EIR.

EXHIBIT D

MITIGATION MONITORING PLAN

This Mitigation Monitoring Plan (MMP) has been prepared for the SWEPI/Unocal Huntington Beach Upper Main Zone Cooperative Waterflood Project. The following mitigation measures are considered viable measures available to reduce potentially significant impacts associated with the proposed waterflood project. The SLC, in conjunction with other appropriate agencies as shown below, will ensure the implementation of the required mitigation.

The applicants are responsible for full implementation of all mitigation measures adopted within the project EIR as prescribed by the SLC. MMP measures will be implemented to such an extent as to render the project impacts to a level below the thresholds of significance outlined in the EIR.

The SLC, or its designated MMP enforcement agency, shall be responsible for administering the appropriate provisions of this MMP and initiating enforcement action, should that become necessary.

MARINE BIOLOGY

1. Impact: Collision between a support vessel and resident or migrating marine mammal.

   CEQA Finding: Number 1.

   Mitigation: Boat operators and crew will be educated as to marine mammal life history and behavior. Crews will also be trained in avoidance (recognition of migratory seasons, identification of various resident or migratory species) to further diminish the probability of an accident.

   Monitoring: Staff of the State Lands Commission will determine that the required training has been given to crew and supply boat operators.

SYSTEM SAFETY AND RELIABILITY

2. Impact: Potential risk of worker injury during structural upgrade and deck modification on platforms.

   CEQA Finding: Number 19.

   Mitigation: Strict adherence to appropriate existing health and safety plans will reduce the risk of injury to the workers involved in the safety

plans will be prepared prior to the start of work, and daily health and safety meetings will be continued to remind workers of the hazards associated with the project.

Monitoring: Staff of the State Lands Commission will verify that Health and Safety Plans are in existence and current, and will ensure that the daily meetings are held.

3. Impact: Potential blowout associated with drilling activities could lead to accidental release of oil.

CEQA Finding: Numbers 11, 12, 13, 14, 15, 16 and 18

Mitigation: Blowout prevention equipment will be installed on all wellheads to control pressure in the annular casing and the drill pipe during drilling operations. This equipment will be maintained according to SLC standards at all times.

Monitoring: State Lands inspection staff will ensure that the proper equipment is installed prior to each drilling operation, and that it is properly maintained and tested.

4. Impact: In the event of a blowout (see above) or vessel accident, there is a possibility of oil spillage.

CEQA Finding: Numbers 11, 12, 13, 14, 15, 16, and 18.

Mitigation: The applicants will prepare oil spill prevention and mitigation plans for SLC approval, and will maintain containment and clean-up equipment on the platforms.

Monitoring: Staff of the State Lands Commission will review and approve oil spill contingency plans prior to the applicants beginning work, and will inspect both platforms to ensure that all required materials and equipment are present and in working order.

5. Impact: There is a slight potential for fire, explosion or toxic release associated with the operation of the project.

CEQA Finding: Number 17.

Mitigation:

a) Prior to installation of new production facilities, a hazard and operability (HAZOP) study should be conducted.

b) Additional monitoring equipment to detect toxic gases and a

warning system will be installed.

Monitoring: Staff of the State Lands Commission will review the HAZOP study and will ensure all appropriate equipment is installed on the platforms.

6. Impact: Potential risk of injury to workers during platform abandonment.

CEQA Finding: Number 19.

Mitigation: Strict adherence to appropriate existing health and safety plans will reduce the risk of injury to the workers involved. Health and safety plans will be prepared prior to the start of work, and daily health and safety meetings will be continued to remind workers of the hazards associated with the project.

Monitoring: Staff of the State Lands Commission will verify that Health and Safety Plans are in existence and current, and will ensure that the daily meetings are held.

7. Impact: Potential accidents during the transportation of men and equipment to the platforms.

CEQA Finding: Number 19.

Mitigation: Transportation will be carried out during periods where potential natural hazards such as fog and strong winds do not exist or are at a minimum. Procedures will be established to obtain weather advisories prior to making trips to the platforms.

Monitoring: Weather advisories are provided by the National Weather Service, and staff of the State Lands Commission will ensure that procedures are in place to obtain the advisories at the appropriate times.

GEOLOGY

8. Impact: There is a potential for subsidence associated with petroleum withdrawal.

CEQA Finding: Numbers 2 and 4.

Mitigation: Proper pressurization of oil and gas reservoirs by the waterflood program proposed should minimize the effect of subsidence, although this continues to be a problem in the nearby Newport-Inglewood area. A program to monitor subsidence, such as periodic leveling surveys should be implemented.

Monitoring: Inspection staff from the State Lands Commission will ensure that baseline leveling surveys are completed prior to waterflood operations, and will continue such surveys until it can be established that subsidence does not pose a hazard to platform operation.

9. Impact: Seismicity-induced impacts (fracture, liquefaction, shaking) on platforms could affect the safety of project personnel.

CEQA Finding: Number 3.

Mitigation: Implementation of the following six measures:

a) Implementation of a program to monitor seismicity and associated ground accelerations within the waterflood site utilizing the existing onshore seismograph network and data from offshore deployments (e.g., OCS Beta field).

b) Compliance with existing regulations and good oil field practices.

c) Maintenance of pressure sensors and shut off valves to minimize the effects of possible pipeline breakage due to fault rupture.

d) Maintenance of reservoir pressure.

e) A special well casing program approved by the SLC when drilling through known fault planes.

f) The fault patterns in the area surrounding the site should be mapped.

Monitoring: The staff of the State Lands Commission will ensure that the drilling is done properly with regard to known faults, and will review the maps to be prepared by the applicants. The staff, in conjunction with USC staff, will review records from the existing USC seismic monitoring network as necessary to ensure that seismic activity is within expected ranges.

10. Impact: There is a potential for the waterflood to induce some low level of seismic activity.

CEQA Finding: Number 4.

Mitigation: Implementation of the following five measures:

a) Implementation of a program to monitor seismicity and associated ground accelerations within the waterflood site utilizing the existing onshore seismograph network and data from offshore deployments (e.g., OCS Beta field).

b) Compliance with existing regulations and good oil field practices.

c) Maintenance of pressure sensors and shut off valves to minimize the effects of possible pipeline breakage due to fault rupture.

d) Maintain and monitor proper reservoir pressure by controlling the rate of waterflood.

e) The fault patterns in the area surrounding the site should be mapped.

Monitoring: The State Lands Commission staff will inspect the valve and sensor system to ensure that it is properly designed and maintained. Drilling records and other field data will be monitored to ensure field pressures are within acceptable limits. In conjunction with USC, the staff will monitor seismic records to ensure that the waterflood operations do not generate additional seismic activity.

AIR QUALITY

11. Impact: Short term project emissions that contribute to or exacerbate an air quality standard violation or episode.

CEQA Finding: Numbers 5, 6, 7, 8, 9 and 10.

Mitigation: The applicants will submit a vessel activity management plan that provides for the reduction of vessel traffic during periods of poor air quality.

Monitoring: The staff of the State Lands Commission will review the proposed plan for adequacy of design and implementation. On an on-going basis, the staff of the State Lands Commission will verify that only emergency vessel traffic operates during periods when the SCAQMD has declared Stage III alerts.

5.0 MITIGATION MONITORING PLAN

This Mitigation Monitoring Plan (MMP) has been prepared for the SWEPI/Unocal Huntington Beach Cooperative Waterflood Project. The following mitigation measures are considered as viable measures available to reduce significant impacts associated with the proposed waterflood project. The SLC, in conjunction with the appropriate regulatory agencies, will determine the required mitigation measures.

The applicants are responsible for full implementation of mitigation measures adopted within the project EIR as prescribed by the SLC. MMP measures will be implemented to such an extent as to render the project impacts to a level below the thresholds of significance outlined in this EIR.

The SLC, or its designated MMP enforcement agency, shall be responsible for administering the appropriate provisions of this MMP and initiating enforcement action, should that become necessary.

5.1 MARINE BIOLOGY

5.1.1 Trained Crew Avoidance

Mitigable Impact: Collision between a support vessel and resident or migrating marine mammal.

Project Modification: None.

Method of Implementation: Boat operators and crew should be educated as to marine mammal life history and behavior. Trained crew avoidance (e.g., recognition of migratory seasons; ability to identify various resident or migrant marine mammals species) is recommended to further diminish the probability of such an accident.

Timing: Training programs should begin immediately upon project approval.

5.2 SYSTEM SAFETY AND RELIABILITY

5.2.1 Structural Upgrade/Deck Modification

Mitigable Impact: Potential risk of injury to workers.

Project Modification: None.

Method of Implementation: Strict adherence to appropriate and existing health and safety plans will reduce the risk of injury to the workers involved in the structural upgrading/deck modification phases of the project. Daily health and safety meetings should be continued to remind the workers of the hazards associated with the project. In addition, tail gate meetings must be held each day to discuss possible potential unforeseen hazards.

Timing: Health and safety plans must be prepared prior to the start of work and implemented for the duration of the project and during routine inspections and maintenance activities.

5.2.2 Drilling

Mitigable Impact: Potential blowout associated with drilling activities.

Project Modification: None.

Method of Implementation: Install blowout preventor equipment at the wellhead for the purpose of controlling pressure in the annular casing and the drill pipe during drilling operations. The drilling operation must be stopped to assess the blowout.

Timing: The preventor equipment must be installed at the beginning of the drilling operations and remain there for the duration of the drilling activities.

5.2.3 Operation

Mitigable Impact: Potential fire, explosion and toxic release.

Project Modification: None.

Method of Implementation: The following mitigation measures are recommended:

- Prior to the installation of new production facilities, a hazard and operability (HAZOP) study should be conducted.
- Install additional monitoring equipment to detect toxic gases and warning system to inform the workers, operators and management.

Timing: The HAZOP study should be conducted prior to the installation of the equipment and any additional monitoring and warning equipment should be installed prior to the start of operations.

5.2.4 Abandonment

Mitigable Impact: Potential risk of injury to workers.

Project Modification: None.

Method of Implementation: Strict adherence to appropriate health and safety plans will reduce the risk of injury to the workers involved throughout the abandonment phase. Daily health and safety meetings must be held to remind the workers of the hazards associated with the abandonment project. In addition, tail gate meetings must be held each day to discuss possible potential unforeseen hazards.

Timing: The health and safety plans must be prepared prior to the start of the abandonment phase and implemented for the duration of abandonment activities.

CALENDAR PAGE 305. 61
MINUTE PAGE 708

W 40585

5.2.5 Transportation

Mitigable Impact: Potential accidents during transportation of men and equipment to the platforms.

Project Modification: None.

Method of Implementation: Transportation should be implemented during periods where potential natural hazards such as fog and strong winds do not exist or are at a minimum. A procedure should be established to obtain weather reports prior to the trips to or from the platforms.

Timing: Prior to the start of the project, the procedure should be established and implemented. Duration of this mitigation measure should extend through the life of the project.

5.3 GEOLOGY

5.3.1 Subsidence

Mitigable Impact: Potential subsidence associated with petroleum withdrawal.

Project Modification: None.

Method of Implementation: Although proper pressurization of oil and gas reservoirs by the waterflood program should minimize the effect of subsidence, subsidence continues to be a problem in fields along the Newport-Inglewood fault zone. Along with proper pressurization, a program to monitor subsidence at the platforms, such as periodic leveling surveys, is recommended.

Timing: Proper pressurization of the field should begin as soon as the waterflooding begins. Monitoring subsidence should begin prior to waterflooding in order to establish an appropriate baseline for an annual monitoring program. Monitoring should continue until it can be established that subsidence does not pose a hazard to platform operation.

5.3.2 Seismicity

Mitigable Impact: Seismicity-induced impacts (e.g., liquefaction, shaking) on structures and equipment and the safety of project personnel.

Project Modification: None.

Method of Implementation: The following mitigation measures are recommended:

- Implementation of a program to monitor seismicity and associated ground acceleration within the waterflood site utilizing the existing onshore seismograph network and data from offshore deployments (e.g., OCS Beta Field).
- Compliance with existing regulations and performance of good oil field practices.

CALENDAR PAGE	305.62
MINUTE PAGE	709

- Maintenance of pressure sensors and shut off valves to minimize the effects of possible pipeline breakage from fault rupture.
- Reservoir pressures should be maintained.
- A special well casing program should be implemented (e.g., bell-pack casing program) when drilling through known fault planes to resist or minimize the effect of fault rupture.
- The fault patterns in the area surrounding the site should be mapped to determine the relationship of faults at the site with the major regional fault trends.

Timing: Items such as the special fault-resistant well casing program and pressure sensors should either be built into the waterflood system, or should be established at the initiation of waterflooding (i.e., within the concept of good oil field practice). However, seismic monitoring should be established prior to initiation of waterflooding in order to better define the amount of seismic activity along the Huntington Beach segment of the Newport-Inglewood fault zone. A high-resolution seismic reflection survey of the target area would better serve the waterflood project if done prior to waterflooding. Completion of the survey and interpretation of survey results should allow for the identification and avoidance of potentially active faults which may prove hazardous to drilling.

5.3.3 Induced Seismicity

Mitigable Impact: Possible induced seismicity associated with waterflood activities.

Project Modification: None.

Method of Implementation: Recommended mitigation measures include:

- Implementation of a program to monitor seismicity and associated ground acceleration in the vicinity of the waterflood site utilizing the existing seismograph network and data from offshore deployments (e.g., OCS Beta Field).
- Maintain and monitor proper pressurization of oil and gas reservoirs via the waterflood program.
- Well casings should be designed to resist or minimize the effect of possible fault rupture or earthcracks.
- Compliance with existing regulations and performance of good oil field practices.
- Pressure sensors and shutoff valves should be used to minimize the effect of possible pipeline breakage from fault rupture.

CALENDAR PAGE	305.63
MINUTE PAGE	710

W 40585

Timing: The mitigation measures cited above should either be built into the system (e.g., pressure sensors and shutoff valves) or should be in effect at the initiation of waterflooding (e.g., compliance with good oil field practices). However, seismic monitoring should be implemented prior to start up of the waterflood program in order to establish background seismicity. Seismicity should be monitored afterwards to determine any change in frequency of earthquakes during waterflooding. If the rate of seismicity appears to be rapidly increasing, the waterflooding may be adjusted and deployment of similar devices (e.g., ocean bottom seismographs, accelerometers) in the field should be undertaken.

5.4 AIR QUALITY

5.4.1 Activity Management

Mitigable Impact: Short term project emissions that contribute to or exacerbate an air quality standard violation or episode.

Project Modification: Delay, cancel, or postpone scheduled emission-generating project activities such as support-vessel trips.

Method of Implementation: The applicants should submit a vessel-activity management plan to the SLC or it's designated enforcement agent for Platforms Eva and Emmy. A similar activity management and curtailment plan was prepared for construction activities for the Exxon Santa Ynez Unit development project in response to the Santa Barbara County Resource Management Department Land Use Permit Condition XII-5 and the APCD Authority to Construct Permit No. 5651, Permit Condition 49. The plan for the waterflood project should clearly define an existing vessel-traffic schedule for each platform and proposed additional daily vessel runs to each platform to support project activities. Applicants shall rely as much as possible on established support-vessel traffic for personnel and cargo transport. The plan should describe scenarios when the use of existing vessel trips would be infeasible and the use of an added project boat run becomes necessary. Prior to the start of each project workday, the plan shall commit the applicants to contact the SCAQMD to ascertain the projected status as to predicted air quality violations in the Basin that day. The plan should address the degree of severity of the steps that will be taken to delay, postpone, or cancel scheduled project emission generating activities such as tug-, crew-, or supply-boat visits should an air quality standard violation, a health advisory, or an episode be predicted. This schedule should extend for the life of the drilling program on both platforms and for the full extent of the deck and equipment installation on Platform Eva.

Timing: The Plan shall be submitted to and approved by the SLC or it's designated enforcement agent prior to beginning project activities.

CALENDAR PAGE	305.64
MINUTE PAGE	711

W 40585

5.4.2 Emission Offsets

Mitigable Impact: Project emission increases from mobile and stationary sources.

Project Modification: Project emissions will be offset on a minimum 1:1 ratio.

Method of Implementation: Since construction of new facilities is not proposed for the project, no SCAQMD permit action is anticipated. Therefore, the applicants shall enter into a legally binding contract (e.g., Memorandum of Agreement) with the SLC or it's designated enforcement agent, in which the applicants incorporate into the contract the source and quantity of sufficient bona fide ERCs to offset project emissions. Should the owner of the ERC equipment be an entity other than the applicant, the contract shall include a separate agreement between the applicants and the ERC owner to shutdown or modify the equipment. This shutdown or modification shall be conducted under a valid SCAQMD permit modification, if applicable. Emission reduction credits must be real, quantifiable, enforceable, surplus (as defined by the EPA), and secured to the project in compliance with provisions of the SCAQMD Rules and Regulations. The SLC shall verify these ERC's and inspect the affected equipment to substantiate that measures to convert the equipment into an ERC source have been conducted.

Timing: Modifications to permits issued by the SCAQMD must be issued to establish ERC amounts, where applicable, and any offset agreement(s) consummated prior to the beginning of project activities.

5.4.3 Mitigation Fee

Mitigable Impact: Project emission increases from mobile and stationary sources.

Project Modification: None.

Method of Implementation: The applicants shall enter into a legally binding contract (e.g., Memorandum of Agreement) between the SLC and the applicants, by which an agreed upon mitigation fee is paid by the applicants to the SLC or to a designated third party (e.g., SCAQMD) to fund an existing program, field demonstration, or study, which will result in emission reductions to mitigate some or all project emission increases. Though the mitigation-fee-funded program or study may result in emission reductions which extend beyond the fixed timeframe of the waterflood project, only emission reductions that occur simultaneously with the project emission increases should be considered in deeming this measure as an appropriate mitigation. Mitigation fee programs have been successfully implemented in other geographic areas of California. For example, mitigation fees from the Chevron Pt. Arguello Project (Santa Barbara County) were used to conduct a crew and supply boat emissions reduction study (SBAPCD, 1987). At present, a project demonstrating the viability of the use of compressed natural gas (as a clean fuel for crew and supply boats) is underway, funded by mitigation fees from the Exxon Santa Ynez Project (Santa Barbara County). Further, a California Air Resources Board document reports that mitigation fee programs have been implemented in the Lake Tahoe air basin, the San Joaquin Valley air basin, and in Ventura County (California Air Resources Board, 1990).

Timing: The mitigation fee may be applied to existing air quality enhancement programs. Any mitigation fee agreement and any supplemental negotiations with third parties (such as SCAQMD) must be concluded prior to project start-up.

5.4.4 Implement Diesel Engine and Combustion Modification to Reduce NO_x Emissions

Mitigable Impact: NO_x emission increases from supply boats.

Project Modification: None.

Method of Implementation: Supply boats that presently service the project platforms possess only turbocharging and air intake intercooling modifications. Additional NO_x emission reductions would be realized through implementation of 4° engine-timing retard (a 25% reduction from the uncontrolled condition) or 4° engine-timing retard and enhanced engine air-intake intercooling (a 40% reduction from the uncontrolled condition). (SBAPCD, 1987).

Timing: Engine modifications must be conducted and verified by the SLC or it's designated enforcement agent prior to the use of such boats for project activities. These vessels will be dedicated to the project. Boats with the control scheme described above may be substituted during the course of the project with the approval of the SLC or it's designated enforcement agent.

5.5 MARINE WATER QUALITY

No Class II impacts were noted during the impact assessment phase of the marine water quality analysis.

CALENDAR PAGE 305. 66
MINUTE PAGE 713