Chapter 6
Cumulative Impact Analysis For The 36 Undeveloped Leases (2002 - 2030)

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6 CUMULATIVE IMPACT ANALYSIS FOR THE 36 UNDEVELOPED LEASES (2002-2030)

6.0 INTRODUCTION

As discussed earlier, section 5 provides an analysis of how the Proposed Action will likely affect the resources in or migrating through the study area. The likely effects of the Proposed Action over the near-term future (2002-2006) provide a clear understanding of the contribution of the Proposed Action to the effects of other ongoing activities during this time period. After 2006 no further residual effects associated from the Proposed Action are expected to occur. This section (section 6) provides an analysis of the effects over the near- and long-term future (2002-2030). This timeframe includes the contribution of potential activities on all 36 currently undeveloped leases, through decommissioning.

The assumptions made concerning the near-term foreseeable future activities in and influencing the study area are in sections 5.1.2.1, and 5.1.2.2. The long-term future is based on the MMS developed hypothetical development scenario for the 36 undeveloped leases. This is described in detail in sections 6.1.2, and 6.1.3. Environmental effects on each of the resources are presented in section 6.2.1-6.2.24.

6.1 BACKGROUND INFORMATION FOR IMPACT ANALYSIS

6.1.1 IMPACT CAUSING AGENTS OF THE CUMULATIVE CASE

This section identifies additional impact producing factors (IPF) that are associated with the potential development of the 36 undeveloped leases and any potential future development of existing leases. As discussed in section 5.1.1.1, exploring for, producing, and transporting hydrocarbon resources that could be developed require a complex and interrelated series of operations. The IPF's involving the proposed action delineation drilling activities will not be restated here. However, the effects from those activites and the cumulative activities are considered and discussed in each resource section for the near-term (2002-2006) in section 5.2.1, through 5.2.24, and the long-term (2002-2030) in section 6.2.1 through 6.2.24.

Impact producing factors including past and present activities were already discussed in Section 4.0.1. Tables in Section 6.1.2 and 6.1.3 show the magnitudes of the impact-producing factors that are projected to occur in the various offshore/onshore areas from the potential development of the 36 undeveloped leases in the study area. These quantities are expressed as the total amount generated over the life for the development of the undeveloped leases (2002-2030).

- *Geological and Geophysical Surveys*
- *Development and Production activities (Development activities include the installation of jackets, topsides, pipelines, and drilling. Production activities include bringing the oil and gas to the surface, handling of oil and gas on the platform, and sending the oil and gas to shore).*
- *Vessel and Helicopter Support Activities*
- *Produced Water*
- *Decommissioning*
- *Site Characterization Surveys for OCS Development*
- *Shallow Hazards Surveys*
- *Subsurface Investigation and Testing*
- *Extended Reach Drilling*
- *Pipeline Installation and Abandonment*
- *Crude Oil Tankering*

Table 6.1.1-1. Summary of activities projected for existing and future OCS and state leases (2002-2030).

Activity	Future Activity on Existing OCS Facilities	Future Activity on State Existing Facility[1]	Activity on 36 Undeveloped Leases	Total
Wells Drilled	50	0	50	50+?
Platforms Installed	0	0	5	5
Miles of Pipelines Installed	0	0	130	130
Platforms Removed	23	9	5	37
Crew and Supply Boat Trips	122,416	105,542	4212[2]	232,170
Helicopter Trips	50,264	13,260	41245[2]	104,769

[1] Assumes THUMS platforms are removed in 2010

[2] Gato Canyon Platform would be served at same time as SYU until 2025 and Bonito Platform would be served at same time as Platform Irene through decommissioning.

- *Oil Spills*
- *Fiber Optic Data Tranmission Cables*
- *State Tidelands Projects*
- *Spill Remediation*
- *Point and Nonpoint Source Discharges*
- *Commercial Fishing Activities*
- *Military Operations and Commercial Space Launches*

Table 6.1.1-1 provides a summary of activities projected for existing and future OCS and State leases (2002-2030). Section 4.0.1 presents a detailed discussion of these factors for Past and Present activities and Section 5 discusses those factors as they relate to reasonable foreseeable and future activities (2002-

6.1.2 REASONABLY FORESEEABLE ACTIVITIES (2002-2030)

The projects described in this section include Federal OCS oil and gas projects, State Tidelands oil and gas projects, and other energy and non-energy activities (Military Activities, Commercial Fishing Activities, Crude Oil Tankering, etc.). All of the projects described are located in the vicinity of the Santa Barbara Channel and Santa Maria Basin offshore Santa Barbara County, Ventura County, and San Luis Obispo County. It should be noted that information on many of these projects is limited because they are in the preliminary stages of development.

Two categories of Reasonably Foreseeable activities are examined:

First are activities that are ongoing and expected to continue during the period 2002-2030. Non-point source discharges are included in the category.

Second are oil and gas activities that could occur in the period 2002-2030.

Many of the activities described in this section are the same as in section 5.1.2.2 Reasonably Foreseeable Activities. This section differs from section 5 in that it considers the delineation drilling and additional reasonably foreseeable activities for the period 2002-2006 in addition to all activities that could occur during the 2002-2030 timeframe including: 1) delineation drilling, 2) decommissioning and removal of existing production facilities, and 3) development of the 36 undeveloped leases (see section 6.1.3 Hypothetical Development Scenario For The 36 Undeveloped Leases). Delineation drilling would occur during the 2002-2003 timeframe and was considered in the analysis in chapter 5. However, potential future exploratory and development activities that could occur after all residual effects from the proposed action are gone are considered in this section.

ONGOING ACTIVITIES

ANTICIPATED FUTURE ACTIVITIES ON EXISTING LEASES

Section 4.0.1 describes past and present offshore oil and gas activities in State and Federal waters. Original recoverable reserves and peak production from State and Federal offshore facilities is shown in figure 4.0.1-1. Production on existing State and Federal offshore facilities peaked in approximately 1969 and 1995 respectively and we assume production will continue to decline.

Additional production from new wells would slow the decline of production and is expected to occur over the life of the existing facilities. Table 5.1.2.2-1 shows the number of wells expected to be drilled by field from existing Federal platforms. No new production wells are are expected on State Platforms with the exception of Platform Holly (see State Tidelands below). Discharge volumes are expected to be at or below the levels identifed in table 4.0.1-7. Helicopter and vessel support is assoumed to be at or below the levels identified in table 4.0.1-5.

Operational impacts associated with the development and production of oil and gas resources from these existing facilities have been fully analyzed, mitigated and permitted by applicable Federal, State and local authorities.

The risk of an oil spill from the existing OCS facilities has previously been individually and cumulatively analyzed and reviewed (section 5.1.3). Oil spill response planning as required by MMS has been implemented and is currently in place. Oil spill prevention and response efforts offshore California are coordinated between the MMS and the California Office of Spill Prevention and Response (OSPR). Among other measures, this coordination provides for the sharing of technical expertise in drilling, production, pollution prevention, and other related areas of offshore operations and safety.

There are no scheduled or anticipated oil and gas lease sales scheduled or anticipated in Federal or State waters. Therefore, with no new leasing, once the development of the 36 undeveloped leases occurs, no additional new production platforms would be installed.

DECOMMISSIONING

Over the next 28 years all existing oil and gas platforms in Federal and State waters are expected to be removed (table 4.0.1-5). Some decommissioning has already occurred. For example, the Offshore Storage and Treatment Vessel and Single Anchor Leg Mooring was removed from the Santa Ynez Unit in Federal waters in 1994 and Platforms Hazel, Heidi, Hilda, and Hope were removed from State waters in 1996.

For purposes of analysis in this EIS, we make the following assumptions:

- Platforms will be decommissioned in groups of 3-9 based on age, size, geographic location, and heavy lift vessel (HLV) lifting capability.
- Pipelines will be abandoned in place.
- Platform decommissioning projects will be phased and occur in the following chronological sequence: (1) South Coast (2) Eastern Santa Barbara Channel, (3) Western Santa Barbara Channel and Southern Santa Maria Basin (4) Western Santa Barbara Channel, (5) Southern Santa Maria Basin (6) Northern/ Southem Santa Maria Basin and Gato Canyon (see table 6.1.2-1).
- HLV's spreads (see table 6.1.2-2) will be mobilized from the GOM, North Sea, or Asia. No more than one HLV will be operating at a time. Decommissioning of platforms will be phased to minimize environmental impacts. Associated onshore processing facilities will be decommissioned immediately after the offshore component of the project has been completed.

CRUDE OIL TANKERING

Oil spills resulting from vessel collisions and other marine transportation-related accidents have the potential to cause significant impacts on the marine, coastal, and human environments, and contribute to cumulative environmental impacts. Marine transportation of Alaskan and foreign-import oil is an activity that occurs offshore California. Table 4.0.1-8 shows volume and number of oil tankers offshore California visiting Ports of San Francisco and of Los Angeles/ Long Beach and El Segundo. In 2000, 877 oil tankers visited the ports of Los Angeles/Long Beach and El Segundo. Of these tankers, 192 were United States

Table 6.1.2-1. Platform decommissioning project scenarios.

Project I - South Coast (Los Angeles/Orange County)				
4 OCS Platforms: Eureka, Ellen, Elly, Edith 3 State Tidelands Platforms: Emmy, Eva, Esther	Time-period: Decommissioning could occur between 2010-2015	Project Duration/Scheduling- 230 days	Vessel Spread B	Disposal Site: Long Beach, CA
Project II - Eastern Santa Barbara Channel (Ventura and Santa Barbara County)				
9 OCS Platforms: Hogan, Houchin, A, B, C, Gina, Gilda, Henry, Hillhouse	Time-period: Decommissioning could occur between 2012-2017	Project Duration/Scheduling - 200 days	Vessel Spread A	Disposal Site: Long Beach, CA
Project III - Santa Barbara Channel and Southern Santa Maria Basin (Santa Barbara County)				
7 OCS Platforms: Gail, Grace, Hermosa, Harvest, Hidalgo, Irene, Habitat 1 State Tidelands Platform: Holly	Time-period: Decommissioning could occur between 2015-2020	Project Duration/Scheduling - 400 days	Vessel Spread B	Disposal Site: Portland, OR
Project IV - Western Santa Barbara Channel (Santa Barbara County)				
3 OCS Platforms: Hondo, Harmony, Heritage	Time-period: Decommissioning could occur between 2020-2025	Project Duration/Scheduling - 270 days	Vessel Spread C	Disposal Site: Portland, OR
Project V - Northern/Southern Santa Maria Basin and Gato Canyon (Santa Barbara County)				
5 OCS Platforms (to be constructed)	Time-period: Decommissioning could occur between 2040-2050	Project Duration - 250 days	Vessel Spread B	Disposal Site: Portland, OR

Table 6.1.2-2. Conventional decommissioning vessel spreads.

Derrick Barge	Anchor Handling	Support Vessel	Cargo Barges	Tug Boat(s)	Support Craft
Spread A (for platforms in 50 - 200 foot water depths)					
1 HLV (Derrick Barge Valhalla - 400 ton lift capability)	1 anchor handling tug	1 support vessel	3 cargo barges	2 tugboats	crew boats (use current level) supply boats (use current level) helicopters (use current level)
Spread B (for platforms in 200 - 700 foot water depths)					
1 HLV (Derrick Barge Balder or DB 50 - 4000 ton lift capability)	1 anchor handling tug	1 support vessel	6 cargo barges	4 tugboats	crew boats (use current level) supply boats (use current level) helicopters (use current level)
Spread C (for platforms in 700+ feet of water)					
1 HLV (Derrick Barge Thialf or Saipem 7000: 6600 - 7000 ton lift capability)	1 anchor handling tug	1 support vessel	10 cargo barges	10 tugboats	crew boats (use current level) supply boats (use current level) helicopters (use current level)

flagged oil tankers and 685 were foreign flagged oil tankers (pers. Comm., Reed Crispino, Marine Exchange, March, 2001).

The long-term oil supply outlook for California remains one of declining in-State and Alaska supplies leading to increasing dependence on foreign oil sources, according to the California Energy Commission (CEC) (1999). Since 1989, California refineries have received about half of Alaska's total production. If this trend remains unchanged into the 20-year future, then supply volumes from Alaska to California would decline by 61 percent from current levels. Although it is possible that Alaska production could increase with the opening of new areas for development, no decisions have yet been made. In 1998, the foreign component of California's oil supply represented 16 percent of total supply - triple the amount in 1992 (CEC, 1999).

California refineries receive about half of their total oil supplies by marine tankers. As California petroleum product demand increases and in-State crude oil supplies decline, marine tanker deliveries will increase. Based on the CEC estimates, the rate of import growth varies between 2 to 3 percent per year, while the total demand increases at 1 percent per year (California Energy Commission, 1999).

The CEC (1999) estimates that import of 168 to 257 million more bbls per year are expected by 2017 based on a very gradual decline in California in-state supply. The volume of 168 million bbls translates into the equivalent of about 220 more oil tanker deliveries to California ports per year in 2017, based on the use of medium class size tankers (about 120, 000 dead weight tons). The 257 million barrel estimate means 337 more tanker deliveries per year, about one per day.

MILITARY OPERATIONS AND COMMERCIAL SPACE LAUNCHES

The Point Arguello Unit and Rocky Point Unit leases are located in the Naval Air Warfare Center Weapons Division (NAWCWD) Point Mugu Sea Range (PMSR). The PMSR covers a 36,000 square-mile area offshore San Luis Obispo, Santa Barbara, Ventura, Los Angeles, Orange, and San Diego Counties. The PMSR currently supports test and evaluation of sea, land, and air weapons systems as well as various categories of training activities. The NAWCWD has recently proposed to expand operations in the PMSR and has prepared a Draft Environmental Impact Statement/ Oversea Environmental Impact Statement for the proposal (U.S. Navy, 2000), which provides a detailed discussion of the operations conducted in the PMSR. The operations include missile testing, and training exercises including fleet, amphibious, and special warfare training. The PMSR has been operated by the Department of the Navy for more than 50 years

The Point Arguello and Rocky Point Units are also in the vicinity and operational area of the Western Space and Missile Center (WSMC) at Vandenberg Air Force Base. Space vehicles launched at WSMC fly over various sectors of the project area. During such overflights, the area beneath the flight path may be subject to hazards resulting from falling debris and jettisoned components; but such events are extremely rare.

To minimize potential hazards and conflicts with military operations, the MMS has placed stipulations on the OCS leases in the project area. The stipulations control vessel traffic in designated areas, include "hold-harmless" requirements, and reserve the right

of the United States to suspend offshore operations temporarily for national security reasons. Prior to a vehicle launch, provisions for control of air and marine traffic, stabilization of platform operations, and for personnel shelter and evacuation measures are coordinated by the WSMC, U.S. Coast Guard, MMS, and the platform operators. These measures have proven to be effective in minimizing hazards and conflicts.

COMMERCIAL FISHING ACTIVITIES

Commercial fisheries in the Southern California Bight (SCB) and Santa Maria Basin (SMB) date back to the mid-nineteenth century. Commercial fishing occurs at various locations off the coast of southern and central California. The nearshore waters along the coast from Los Angeles to Monterey counties and the waters just off the Channel Islands contain giant kelp beds that provide habitats for numerous species of commercially important fish and shellfish species. The majority of fish are caught within these areas.

Fishes in the SCB and SMB support important commercial and recreational fisheries; more than 100 species appear in the catches. The commercial landings at ports within the southern and central California account for about 4 percent of the total U.S. catch (approximately 2.7×10^9 kg, or 6×10^9 lb). Los Angeles area ports rank among the top 10 ports in the United States in quantity and value of commercial catch. Recreational fishermen in the SCB and SMB land about 60 percent of the total recreational catch in California. Fishermen on private and commercial passenger vessels account for more than 80 percent of the recreational catch. Recreational landings in the SCB and SMB account for about 5 percent of the total recreational landings in the continental United States

About 64 commercial fish and shellfish species are fished using up to 15 gear types, the most common of which are trawl, drift and set nets, purse seines, traps, and hook-and-line gear. Troll gear, harpoons, and diving are also common in certain areas of the SCB and SMB. Many fishers of the area do not fish for just one species, or use only one gear-type. Most switch fisheries during any given year depending on market demand, prices, harvest regulations, weather conditions, and fish availability. There are twelve major ports between San Diego and Point Sur, California which provide over 1,500 commercial fishing berths for the commercial fleet.

POINT SOURCE DISCHARGES

Only five Publicly-Owned Treatment Works (POTWs), or sewage treatment plants, discharge into either rivers or the Pacific Ocean in San Luis Obispo County. All the dischargers are small, according to EPA criteria (less than 25 million gallons discharged per day [mgd]). The six POTWs that discharge treated effluent to the Santa Barbara Channel are all small dischargers whose effluents are at a mixed primary/secondary level of treatment (SCCWRP, 1996).

There are no other industrial wastewater discharges north of Point Conception. However, several power plants spaced along the coastlines of southern Santa Barbara county, and Ventura and northern Los Angeles Counties, do discharge heated water, and some chlorine is used to prevent fouling of heat exchangers.

NONPOINT SOURCE DISCHARGES

Urban and storm water runoff is the largest source of unregulated pollution to waterways and coastal areas of the United States. Locally, urban and storm runoff results in an increase in health risks to swimmers near storm drains, high concentrations of toxic metals in harbor and ocean sediments, and toxicity to aquatic life.

Storm water runoff from urban areas is a major source of pollution in the coastal waters of the Southern California Bight (SCB). Because runoff is an untreated pollution source, it contains high concentrations of contaminants and is a significant health hazard to humans. The SCB has multiple sources of nutrients, particulates and contaminants that discharge into the coastal ocean, including submerged outfalls, rivers, creeks, storm drains, atmospheric inputs, ocean dumping, and advection (Anderson et al., 1993).

The runoff systems in southern California are different from those in other areas because the flow is mostly confined to the winter months. Over the dry months, contaminants accumulate in the flow systems and are then released as pulses when winter storms strike. During winter storms, these drainage systems release most of the fresh water that flows into the coastal ocean.

GUADALUPE DILUENT SPILL AND REMEDIATION (1998 TO 2003)

The Guadalupe Oil Field site is located on the central coast of California approximately 15 miles south of San Luis Obispo. It is part of the Unocal LeRoy Lease which covers approximately 3,000 acres within the Nipomo Dunes system, a Secretary of the Interior-designated National Natural Landmark. The City of Guadalupe is located approximately three miles east of the site. Oil exploration and production began on the site with the Sand Dune Oil Company in October 1947. Unocal acquired the field in the early 1950s and continued to operate it until March 1990. At its peak, in 1988, there were 215 potential producing wells. The crude oil produced from the site was ex-

tremely viscous, with a density that causes the crude oil to behave like asphalt at ambient conditions. Unocal used several methods to enhance recovery of this heavy crude, including diluent mixing. The term diluent is derived from "dilute" and it refers to any additive (in this case a refined hydrocarbon blend piped into the field from the Santa Maria refinery) that is used to thin the crude. Over time, leaks that developed in the tanks and pipelines used to distribute it around the field, have led to serious contamination of the ground water below the site. Diluent has accumulated in 64 plumes (separate-phase) at the water table in the dune sand aquifer, about 3 to 40 m(10 to 130 feet) down, with some plumes as much as 1.8 m (6 ft thick). Ground water passing through these areas, has become contaminated because some of the diluent dissolves (dissolved-phase) into the water and moves downstream with the ground water flow. This has resulted in ground water contamination beneath much of the site, with a flux towards the Pacific Ocean (to the west) and the Santa Maria River (to the south).

Remedial activities that have already taken place at the Guadalupe Oil Field under emergency permits issued by the County of San Luis Obispo or the Coastal Commission, include installation of a bentonite wall, beach excavation, installation of an High-density polyethylene (HDPE) wall, installation of a sheetpile wall, breaching of the Santa Maria River, installation of a polyvinylchloride (PVC) barrier wall, the removal of a sump, and other work. The technologies that are proposed will be used to either remove the diluent through excavation, bioremediation or pumping, or contain the diluent through physical or hydraulic barriers. Unocal has also proposed to abandon the site. This would include removal of most pipelines from the field, and all surface facility tanks, buildings and other miscellaneous equipment.

AVILA BEACH TANK FARM SPILL AND REMEDIATION (1997 TO 2002)

The community of Avila Beach, California is located on the northern end of San Luis Bay near Point San Luis. The Unocal Avila Terminal facility has been used for petroleum hydrocarbon storage and transfer activities since 1910. Petroleum products, including gasoline, diesel, fuel oil and crude oil, were pumped from the tank farm located on a bluff overlooking the town through a network of underground pipelines beneath Front Street to Avila Beach Drive and over the San Luis Obispo Creek bridge to the Unocal pier. In addition, gasoline and diesel fuel were pumped from tankers to the tank farm for distribution to county consumers. Unocal has spilled petroleum products including: gasoline, diesel and crude oil to soil and ground water beneath the beach, roads, commercial and residential properties of Avila Beach. These spills were reportedly caused by historic leaks from Unocal's pipelines and possibly the tank farm. Five pipelines are currently active, and another 5 to 10 lines are abandoned in place under Front Street. There are no known leaks in the active pipelines at this time. Unocal has not used these pipelines since the summer of 1996.

Unocal's remediation efforts are divided into four main areas of concern: the beach, which is divided into the west and east beaches; under Front Street; north of Front Street, and the intertidal plume. All four areas have underground gasoline-grade, diesel-grade, and crude or residual-grade hydrocarbon contamination. The hydrocarbons are found both above and below ground water, are attached to the soil grains (sand and silt) and within the soil pore spaces. Over 460 soil borings and 70 monitoring wells were taken and analyzed by various agencies. Levels of hydrocarbon contamination exceeded those found to cause cancer, reproductive toxicity, and other acute and chronic health problems.

Legal efforts on the part of local activist groups, joined by the California Attorney General's office, and the Regional Water Quality Control Board, the County of San Luis Obispo produced an agreement that will require Unocal to fully remediate the contamination and rebuild the town and economy of Avila Beach. Unocal's remediation project includes two general aspects: excavation of all petroleum contamination under the beach, Front Street, and all areas where contamination exceeds 100 parts per million, and excavation and removal of the petroleum, and replacement with new, clean soil and nutrients. Monitoring and sampling, including testing of groundwater four times a year will help ensure the project meets State standard.

FIBER OPTIC DATA TRANMISSION CABLES

The timing of fiber optic cable installation is unknown, however the operations are expected to be conducted in the period 2001-2003.

GLOBAL WEST (GLOBAL PHOTON) FIBER OPTIC CABLE PROJECT

Global West is a proposed fiber optic telecommunications project that would link major metropolitan areas along the California coast using buried undersea cable. The cable would contain seven landfalls including San Francisco, Monterey Bay North, Monterey Bay South, San Luis Obispo, Santa Barbara, Manhattan Beach and San Diego. The currently proposed routing of this cable is through a portion of the Sword Unit.

MCI WORLDCOM FIBER OPTIC CABLE PROJECT

The MCI Worldcom fiber optic cable project is proposed to consist of five cables that will be landed at the Montana de Oro State Park landing site. These cables would land through new directional bore pipes constructed adjacent to the AT&T landing. Currently only three of the five cables would be installed, the remaining two to be installed once demand requires.

PAC LANDING CORP (TYCO/GLOBAL CROSSING) FIBER OPTIC CABLE SYSTEM

The proposed PAC Landing Corp fiber optic cable project entails the offshore landing of three cables and consolidation of cables into one line extending to a telecommunications switching facility located in the City of Grover Beach. The telecommunications facility has already been constructed. Three cables would be installed in State waters, two of which would be part of the Pacific Crossing Submarine Cable (**PC-1**) System and the third cable would be part of the Pan-American Crossing Submarine Cable System (**PAC**). The Grover Beach landing site would provide a connection for cable originating in Japan and proceeding to Washington State. The site would also be the Pacific origin of the PAC Cable System, which would proceed to Mexico from Grover Beach.

AT&T CHINA-U.S. CABLE E1 AND CHINA-U.S. CABLE S7 SYSTEMS

The AT&T China/U.S. fiber optic cable project is proposed to consist of two cables that will be landed at the Montana de Oro State Park landing site. The two cables will be housed within the last remaining directional bore pipe constructed by AT&T in 1992. The China-U.S. Cable E1 cable is proposed to follow an alignment that is located north of the AT&T TPC-5 Segment T1 cable. The China-U.S. Cable S7 cable is proposed to follow an alignment located between the AT&T TPC-5 Segment T1 and AT&T HAW-5 cables.

OIL AND GAS ACTIVITIES THAT MAY OCCUR IN THE PERIOD 2002-2030

The following oil and gas activities could occur the period (2002-2030) and include Federal Offshore OCS Projects; Cavern Point Unit Exploration, development of some of the 36 undeveloped leases, Exploration Well OCS-P 0320 #2 Abandonment, Exploration Well OCS-P 0241 #2 Abandonment, and State Tidelands Projects; the Tranquillon Ridge Project, the South Elwood Project, the Cojo Point Project, and the Molino Gas Project.

FEDERAL OFFSHORE OCS PROJECTS

DELINEATION DRILLING (2002-2003)

Delineation drilling activities are described in chapter 2.

CAVERN POINT UNIT EXPLORATION: 2002-2003

Venoco Inc. (Venoco) is the current operator of the Cavern Point Unit. The unit includes Leases OCS-P 0210 and 0527 in the Santa Barbara Channel offshore Ventura County. The Cavern Point Unit is bounded by the Channel Islands National Marine Sanctuary on the south and the producing Santa Clara Unit on the north and east. Up to two exploratory wells are planned to be drilled into the unit from Platform Gail (Santa Clara Unit). Drilling, evaluating, and (if appropriate) abandoning the first well will occur during the third and fourth quarters of 2002 and take approximately 100 days. No construction of either offshore or onshore facilities is proposed. If the exploratory wells find hydrocarbons in the Cavern Point Unit, they will serve as the basis for planning and future evaluation of potential development. According to current scenarios, oil and gas would be transported from Platform Gail via existing pipeline to Platform Grace, then onshore to the Carpinteria facility. Gas also would be transported to shore via existing pipeline.

DEVELOPMENT OF THE 36 UNDEVELOPED LEASES

A hypothetical development scenario for the 36 undeveloped leases is presented in section 6.1.3.

EXPLORATION WELL ABANDONMENT, OCS-P 0320 #2 (2003)

Well OCS-P 0320 #2 was drilled and temporarily abandoned in 1985. Samedan proposes to permanently abandon well OCS-P 0320 #2. The well would be abandoned using the Mobile Offshore Drilling Unit (MODU) used for delineation drilling after the delineation drilling operations have been completed.

Sequence of activities is as follows; 1) the MODU would anchor over the well, 2) the well would be entered and temporary plugs removed, 3) permanent cement plugs would be placed, 4) the wellhead and casing would be removed, and 5) anchors removed and the MODU moved offsite. Samedan estimates 11 days to conduct abandonment activities.

EXPLORATION WELL ABANDONMENT, OCS-P 0241 #2 (2003)

Torch Operating Company (Torch) proposes to permanently abandon well OCS-P 0241 #2. The well was drilled and temporarily abandoned in 1968. The well would be abandoned using a MODU when delineation drilling is completed.

Sequence of activities is as follows; 1) the MODU would anchor over the well, 2) the well would be entered and temporary plugs removed, 3) permanent cement plugs would be placed, 4) the wellhead and casing would be removed, and 5) anchors removed and the MODU moved offsite. It would likely take 11 days to conduct abandonment activities.

STATE TIDELANDS PROJECTS

MOLINO GAS PROJECT (2001 AND 2005)

Molino Energy Company gained approval for the project from the County of Santa Barbara in 1996. The project involves use of ERD technology from an onshore site to recover sweet gas reserves in offshore State Tidelands. The drilling site is located just east of the Gaviota facility. It was initially envisioned that the project could produce up to 60 MMcfd of sales quality sweet gas and up to 1,050 BPD of natural gas liquids (NGL)s over a project life of 20-25 years. The gas would be sold to SoCal Gas and transported directly into the transmission line. The NGLs would initially be trucked to the Gaviota facility and later shipped to the facility via a new pipeline. The ERD wells that have been drilled to date have not been successful and exploratory drilling ceased in 1998.

Benton Oil and Gas Company assumed all project responsibilities in 2001. Benton plans to drill 3-6 exploration wells between 2001 and 2005.

COJO POINT PROJECT (2002-2003)

The County of Santa Barbara has received a preliminary application from Union Oil of California to proceed with the decommissioning of the marine terminal facility and associated oil storage tanks that are no longer in use at Cojo Point. Cojo Point is located along the northern margin of the Santa Barbara Channel, just east of Point Conception. Details regarding the project are not available at this time.

TRANQUILLON RIDGE PROJECT (2003-2030)

Nuevo Energy Company (Nuevo), is seeking approval to develop the Tranquillon Ridge area offshore Point Pedernales in the southern Santa Maria Basin from an existing OCS platform, Platform Irene. Platform Irene is located on Lease OCS P-0441, approximately 6 miles northwest of Point Pedernales. State and local agencies are preparing an Environmental Impact Report (EIR) on the proposed project. The California State Lands Commission's decision on the project will be contingent in part upon the EIR, and its decision to grant a State Tidelands lease for the project.

Current operations at Platform Irene include drilling and production of the Federal Point Pedernales Field, transportation of production via pipeline from offshore to onshore, and oil dehydration and gas processing at the Lompoc processing facility. One well from Platform Irene is producing from Tranquillon Ridge. Processed oil is transported by pipeline to refineries. Liquefied petroleum gas and NGLs are shipped by truck. The Lompoc facility is currently permitted to operate under a County of Santa Barbara FDP. The permitted production and processing capacities are 36,000 BPD oil and 15 MMcfd of gas.

The proposed Tranquillon Ridge Project would involve the drilling of up to 30 Extended Reach Drilling (ERD) wells (22 development wells and 8 utility and re-drills) from Platform Irene into State Tidelands. Total well drilling and completion times are anticipated to range between 60 and 120 days per well. Oil and gas produced by the proposed project would be transported to shore via the existing pipeline system to the Lompoc processing facility.

The Tranquillon Ridge project would extend over approximately 15 years. Nuevo estimates that the project will recover 180-200 MMbbl of oil and 40 Bcf of gas.

6.1.3 HYPOTHETICAL DEVELOPMENT SCENARIO FOR THE 36 UNDEVELOPED LEASES

This scenario was developed for the purpose of cumulative analysis for this EIS and provides assumptions for the analysis of development of the 36 undeveloped leases. The scenario is based on:

- Project Descriptions (**PD's**) provided by Unit Operators(Aera, 2000a, Aera, 2000b, Nuevo, 2000, and Samedan 2000) indicating: 1) where a production platform might be located and, 2) production destinations.
- Operator submitted Rocky Point PD and Revised Development and Production Plans (**DPP's**) for Platforms Hermosa, Harvest, and Hidalgo.
- MMS resource estimates.

- Based on those resource estimates, MMS estimates of platforms, piplines, power cables, onshore facilities characteristics, and other information.
- MMS requirements for site investigation prior to installation of platforms and pipelines.
- MMS requirements for periodic inspections after installation of platforms and pipelines.

Resources from eight leases are planned to be produced from existing POCSR platforms:

- Rocky Point, OCS-P 0452, 0453, Plaforms Harvest, Hermosa, and Hidalgo.
- Sword Unit, OCS-P 0319, 0320, 0322, and 0323A, Hermosa.
- Cavern Point, OCS-P 0210 and 0527, Plaform Gail.

Resources from 28 leases are planned to be produced from five new POCSR platforms:

- Lease OCS-P 0409.
- Lion Rock Unit, OCS-P 0396, 0397, 0402, 0403, 0408, and 0414.
- Point Sal Unit, OCS-P 0415, 0416, 0421, and 0422.
- Purisima Point Unit, OCS-P 0426, 0427, 0432, and 0435.
- Santa Maria Unit, OCS-P 0425, 0430, 0431, 0433, and 0434.
- Bonito Unit Unit,, OCS-P 0443, 0445, 0446, 0449, 0499, and 0500.
- Gato Canyon Unit, OCS-P 0460 and 0464.

SITE CHARACTERIZATION SURVEYS FOR OCS DEVELOPMENT

A Development and Production Plan for a platform must include a complete site investigation program. The site investigation program generally consists of three major phases (30 CFR 250.909):

- Shallow hazards survey to obtain data needed to analyze seafloor and subsurface geologic and manmade hazards
- Geological survey to obtain data of a regional nature concerning the site
- Subsurface investigation and testing to obtain the necessary geotechnical data.

SHALLOW HAZARDS SURVEY

A high-resolution or acoustic-profiling survey is required to obtain information on the conditions existing at and near the surface of the seafloor. A survey is required for proposed production platform sites and proposed pipeline routes. The Pacific OCS Region issues guidance in regional Notice to Lessees and Operators for developing survey strategies capable of detecting and evaluating hazardous conditions that might be in the vicinity of the proposed development site(s).

Table 6.1.3-1 Shallow Hazards Surveys for Development, summarizes the number and timing of shallow hazards surveys by three development areas.

GEOLOGICAL SURVEY

Background geological data is required to provide regional information that can affect the design and siting of a platform or route of a pipeline.

Table 6.1.3-1. Shallow hazards surveys, hypothetical development of the 36 undeveloped leases.

Area	Survey Plans	Platforms		Pipelines		Timeframes
		Number	Survey Area per Platform (mi^2)	Length of Pipeline Corridor (mi)	Area of Pipeline Corridor (mi^2)	
NSMB	1	3	1.2	25	19	2003
Bonito Unit	1	1	1.2	$4\ ^1/_2$	3.4	2004
Gato Canyon Unit	1	1	1.2	$5\ ^1/_3$	4.3	2003

SUBSURFACE INVESTIGATION AND TESTING

A detailed geotechnical evaluation of the platform's foundation is required. For pile supported platforms, such as those likely to be installed in the Pacific OCS Region, this will entail at least one borehole having a minimum depth of the anticipated length of the pile plus a zone of influence to be drilled at the proposed installation site. The regulations at 30 CFR 250.909 provide specific requirements for subsurface investigation and testing for platforms.

In addition, the operator will be required to perform sufficient geological/geotechnical sampling and testing of foundation soils within a proposed pipeline corridor to thoroughly categorize foundation-engineering conditions.

The MMS will review the results of the site investigation program prior to approving a proposed platform site or pipeline route. Based on the review, the operator may be required to verify hazards, archaeological resources or sensitive habitats to ensure safety of personnel and equipment and protection (or avoidance) of archaeological resources, etc. This may require the use of equipment and techniques such as underwater video/photography, hydrocarbon sniffer surveys, diver inspection, current velocity measurements, additional seafloor sampling and/or geologic age dating.

PERIODIC INSPECTIONS

All platforms and pipelines installed in the Pacific OCS Region will be inspected periodically in accordance with applicable regulations and regional Notice to Lessees and Operators. Inspections for platforms could include, but is not limited to, visual, cathodic protection, magnetic particle, or ultrasonic testing.

Routine inspections on pipelines include visual (diver and/or remotely operated vehicle), side scan sonar (**SSS**), and high resolution internal surveys. Pipeline SSS surveys must be conducted at least once every six years.

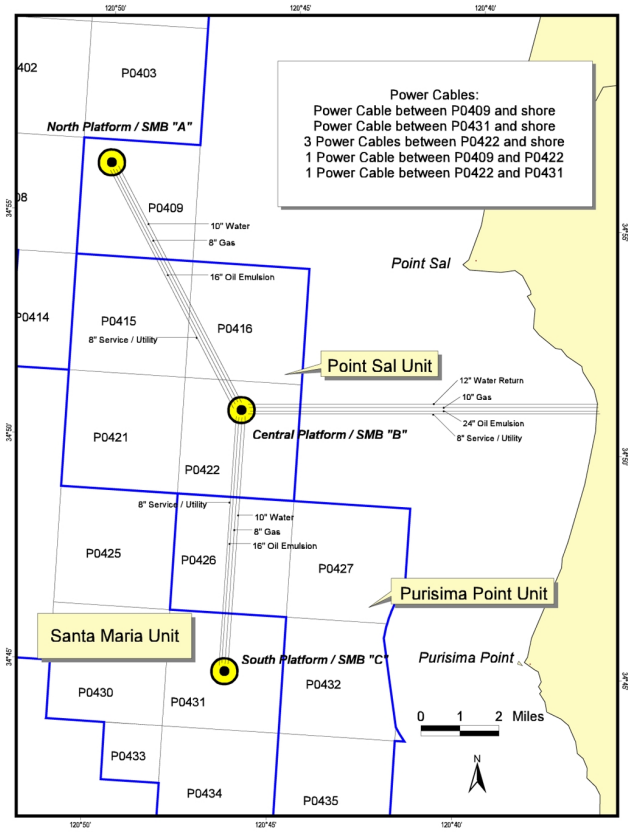

Figure 6.1.3-1. Potential platform, pipeline, and power cable locations, northern Santa Maria Basin units.

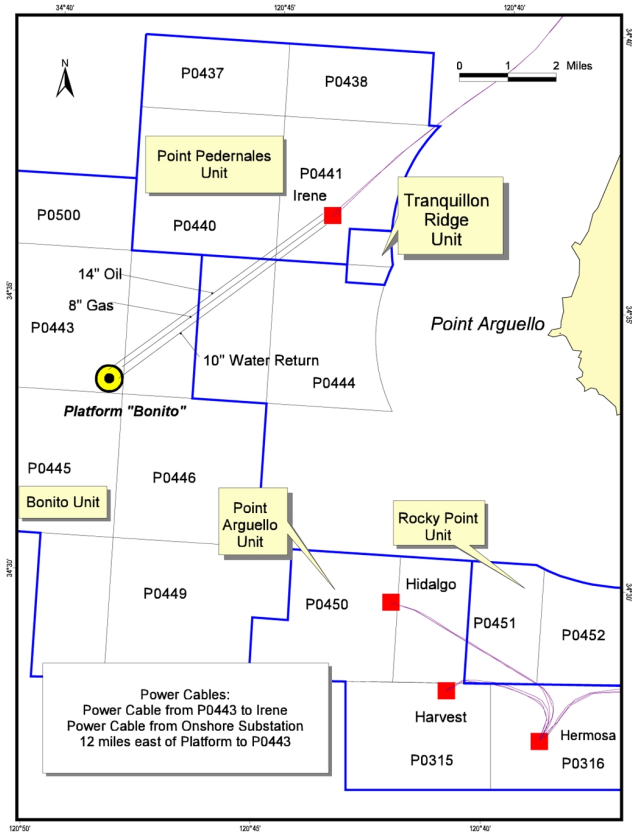

Figure 6.1.3-2. Potential platform, pipeline, and power cable locations, Bonit Unit.

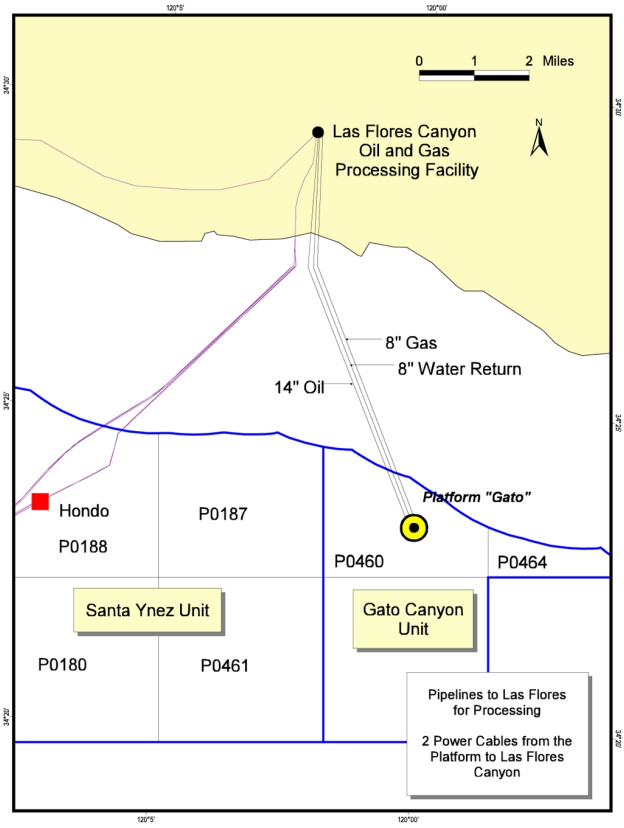

Figure 6.1.3-3. Potential platform, pipeline, and power cable locations, Gato Canyon Unit.

HYPOTHETICAL DEVELOPMENT SCENARIO

The hypothetical development scenario includes development 1) from existing platforms and 2) development that requires new platforms. The Rocky Point Unit would be developed from Platforms Hermosa, Harvest, and Hidalgo. The Sword Unit would be developed from Platform Hermosa. The Cavern Point Unit would be developed from Platform Gail. Five new platforms are estimated to develop most of the remaining 36 undeveloped leases. Three platforms would develop the northern Santa Maria Basin area (figure 6.1.3-1, one would develop the Bonito Unit (figure 6.1.3-2), and one would develop the Gato Canyon Unit (figure 6.1.3-3). Tables 6.1.3-2 and 6.1.3-3 provide scenario estimates of 1) reserves, platforms, pipelines, power cables, and production, 2) dates and length of time for installation, 3) dates for production and decommissioning, 4) pipeline destination, and 5) support activities.

Extended reach drilling technologies would be used to produce the fields efficiently with the minimum number of new facilities. MMS has assumed in this scenario that all new platforms would be conventional fixed platforms similar to existing Pacific OCS facilities and that development activities, processing, and other operations both offshore and onshore would

Table 6.1.3-2. Surface structures, pipelines and power cables, and production offshore Southern California, hypothetical development of the 36 undeveloped leases.

Platforms					Pipelines and Power Cables			Production				
Platform	Operator	Location	Well Slots Production Wells Service Wells Remaining Well Slots	Year To Be Installed	Size, Type, and Number	Year Installed	Onshore Facility (pipeline destination)	Field	Date 1st Production	Peak Production: Oil and Gas		Reserves Expected To Be Developed by Field: oil (MMbbl) gas (Bcf)
										Volume (bbls/day) (MCF/day)	Year	
SMB "A"	AERA	Point Sal	60 45 6 9	2008	16" oil/water 8"gas 10" water return 8" service 2 power cables	3/2008 – 1/2009	To SMB Central	Lease OCS-P 0409, Lion Rock, and Point Sal	2009	35,000 10,500	2016	115 47
SMB "B"			60 49 6 5	2007	24" oil/water 10"gas 12" water return 8" service 3 power cables		Casmalia	Point Sal and Purisima Point	2009	32,000 6,400	2017	118 24
SMB "C"			60 46 6 8	2008	16" oil/water 8"gas 10" water return 8" service 2 power cables		To SMB Central	Santa Maria, and Purisima Point	2009	25,000 5,000	2017	90 18
Bonito	Nuevo	Point Arguello	36 21 6 9	2008	14" oil/water 8"gas 10" water return 2 power cables	4/2009 – 9/2009	To Platform Irene to Lompoc	Bonito and Electra	2010	26,000 13,000	2015	68 34
Rocky Point	Arguello Inc.	Point Arguello	N/A 14 6 N/A	Existing Plaforms Harvest, Hermosa, and Hidalgo	See Table 4.0.1-4	See Table 4.0.1-4	Gaviota	Rocky Point	2002	18,500 5,550	2006	39 11.7
Sword Uses Existing Plaform Hermosa	Samedan	Point Arguello	N/A 10 1 N/A	Existing Plaform Hermosa	See Table 4.0.1-4	See Table 4.0.1-4	Gaviota	Sword	2003	12,500 3,125	2007	29 7.3
Gato Canyon	Samedan	Naples Beach	28 20 4 4	2007	14" oil/water 8"gas 8" water return 2 power cables	11/2007 – 2/2008	Corral Canyon	Gato Canyon	2008	22,500 13,500	2013	77 46
Cavern Point Uses Existing Plaform	Venoco	Anacapa Island	N/A 10 1 N/A	Existing Plaform Gail	N/A	N/A	Carpenteria via Platform Grance	Cavern Point	2003	9,600 8,640	2006	22 20

Table 6.1.3-3. Surface structures offshore Southern California, construction timing, production support activities, and decommissioning timing, hypothetical development of the 36 undeveloped leases.

Platforms			Construction	Production and Support Activities				Decommissioning
Platform Water Depth	Operator	Location Of Nearest Land	Year Installed	Field	Date 1st Production	Helicopter Trips per week with Yearly Total[4]	Crew and Supply Boat Trips with Yearly Total[4]	Estimated Removal Date
SMB North 450 ft.	AERA	Point Sal	2008	Lion Rock and Point Sal	2009	5/day - 1825/yr	3/wk – 156/yr	2024 – 2029
SMB Central 300 ft.			2007	Point Sal, Santa Maria, and Purisima Point	2009			
SMB South 300 ft.			2008	Santa Maria, and Purisima Point	2009			
Bonito 700 ft.	Nuevo	Point Arguello	2008	Bonito and Electra	2010	Existing rates for Arguello Platforms and Irene	Existing rates for Arguello Platforms and Irene	2015-2020 (w/o Tranquillion Ridge Development) 2030-2035 (with Tranquillion Ridge Development)
Rocky Point Existing Plaform Hermosa , Harvest, and Hidalgo	Arguello Inc.	Point Arguello	Existing Plaform Hermosa , Harvest, and Hidalgo	Rocky Point	2002	Existing rates for Arguello Platforms and Irene	Existing rates for Arguello Platforms and Irene	2015-2020
Sword Existing Plaform Hermosa	Samedan	Point Arguello	Existing Plaform Hermosa	Sword	2003	Existing rates for Arguello Platforms and Irene	Existing rates for Arguello Platforms and Irene	2015-2020
Gato Canyon 560 ft.	Samedan	Naples Beach	2007	Gato Canyon	2008	1/day	2-3/ week	2023 - 2028
Cavern Point Existing Plaform Gail	Venoco	Anacapa Island	Existing Plaform Gail	Cavern Point	2003	Existing rates for Platforms Gail	Existiing rates for Platforms Gail	2015-2020

Table 6.1.3-4. Estimates of the number of days required for the phases of construction, hypothetical development of the 36 undeveloped leases.

Platform	Launch Jacket	Drive Piles/ Set Topsides	Install Pipelines	Install Power Cables	Comissioning
Gato	1	153	93	63	214
SMB "B"	1	93	276	123	456
SMB "A"	1	121			335
SMB "C"	1	92			243
Bonito	1	183	92	63	304

be very similar to the existing facilities and operations. These platforms are assumed to have a number of curved conductors to allow for reaching remote targets using extended reach drilling technology. MMS has assumed that gas and oil production would be sour with limited offshore processing. All jackets would most likely be fabricated overseas and require 12-14 months to fabricate and 3 months to loadout and transport to the hypothetical platform location. Topside modules would most likely be fabricated in the Gulf of Mexico. Table 6.1.3-4 provides estimates of the number of days required for the phases of construction for each platform.

All crew and supply boat operations would originate from Port Hueneme or Carpinteria pier. All helicopter operations would originate from either the Santa Maria or the Santa Barbara airports.

Peak production for new facilities may be lower than that attained by existing platforms in the Pacific Region. The new platforms would contain extended reach wells, which, based on industry's current experience, take longer to drill. This fact causes the peak production to occur later in the life of the field, and stretches the peak out so that the actual peak production is lower.

With proper planning, the 5 potential platforms could be installed in a sequential order over a 2-3 year period using a single derrick barge (also called a Heavy Lift Vessel or Crane Vessel) rather than 5 separate derrick barges required if the platforms were installed independently. A derrick barge with a 2999-metric ton (3000-ton) capacity should be adequate to install all the platforms in the scenario described below. The timing of the operation including first production for each facility would have to allow for a coordinated effort for this to be possible. Using the information from the operators' PD's and development and production activity timelines, a coordinated effort of sharing a derrick barge appears possible. We assume all the 5 new platforms would be electrified due to Santa Barbara Air Pollution Control District requirements. We also assume pipelines would be installed using a pipeline lay barge and the power cables would be installed using a power cable vessel. With proper planning it may also be possible for the pipelines and power cables to be installed in a sequential manner sharing the needed pipeline and power cable lay vessels.

SANTA MARIA BASIN DEVELOPMENT

Three platforms would be located in the northern Santa Maria Basin (**NSMB**) area and would be used to recover reserves in the Lion Rock Unit, Purisima Point Unit, Point Sal Unit, and Santa Maria Unit and Lease OCS-P 0409, see figure 6.1.3-1 Platforms names are used as follows:

SMB "A" is the northern Santa Maria Basin platform located on Lease OCS-P 0409.

SMB "B" is the central Santa Maria Basin platform located on Lease OCS-P 0422.

SMB "C" is the southern Santa Maria Basin platform located on Lease OCS-P 0431.

SMB "A"

Reservoirs up to 6.44 km (4 mi) horizontally away could be reached from this platform using current drilling technology. The production from this platform would go by pipelines to SMB "B".

SMB "B"

Reservoirs up to 4.83 km (3 mi) to 6.44 km (4 mi) horizontally away could be reached from this platform using current drilling technology. The production from SMB "A" and SMB "C" would go by pipelines to this central platform and then on to shore.

SMB "C"

Reservoirs up to 4.83 km (3 mi) to 6.44 km (4 mi) horizontally away could be reached from this platform using current drilling technology. The production from this platform would go by pipelines to SMB "B".

The oil emulsion and gas would go to shore in separate pipelines for processing. The processing of the production would be mainly accomplished at the onshore facility. Because of the nature of the crude oil and its high viscosity, pipeline transport of the oil emulsion is predicated on having water content of at least 50% in the pipeline (known as "wet-flow" transport). We estimate that a 61-cm (24-inch oil) emulsion and a 25-cm (10-inch) gas pipeline to the onshore processing facility should be adequate for this purpose.

The OSMB crude is highly viscous, API Gravity 5-15, by industry standards and requires special consideration to optimize transportation and refining. The optimum product of the OSMB crude has not been decided on; refining options continue to be studied and evaluated. At this time, it cannot be definitively said what transportation method(s); pipelines, rail, truck, or a combination of all three, would be used for the OSMB crude from the hypothetical processing facility. As stated in the COOGER study, rail and truck transportation, may be required due to viscosity and delivery limitations of pipelines.

The oil emulsion and gas would be sent to a hypothetical processing facility located in the Casmalia area, similar to the Lompoc Oil and Gas Processing facility, where the oil and gas would be processed for further distribution through local pipelines. There is also the potential for a co-located asphalt facility. All oil would be sold. Some of the gas may be used as fuel on the platform for production operations. Gas may be 1) re-injected at one or more of the NSMB platforms or 2) used at a hypothetical co-located onshore co-generation facility and be returned to the platforms as electrical power, or 3) sold to the gas utility. A combined processing, asphalt, and co-generation facility would be roughly twice the size of the of the Lompoc Oil and Gas Processing facility. Pipelines from the hypothetical processing facility would probably tie into the All American Pipeline system at an existing pump station.

The North County Siting Study (Santa Barbara County, 2000) identifies constraints to the siting of new oil and gas processing facilities. The study identifies a number of potential sites and identifies two sites as a prefered location; Casmalia East or West. For purposes of this analysis the Casmailia East site was chosen as the location of the onshore oil and gas processing facility.

The pipelines from SMB "B" would come onshore through the sandy shoreline associated with the Pt. Sal and Lion Rock area, south of the area with surface outcrops of the Monterey formation and north of the mouth of Shuman Creek. The pipeline would be placed in a ½ mile-wide corridor from the landfall to the Casmalia East site. The northern boundary runs due east to the Casmalia site. The southern boundary of the corridor runs along Pt. Sal Road and maintains a separation from the town of Casmalia, slopes prone to landslides, and Shuman Creek.

Produced water would be treated at the hypothetical oil and gas processing facility and then transported offshore by a 30-cm (12-inch) water return line to the OCS-P 0422 platform for offshore disposal or down-hole injection there or at one of the interconnected platforms. There would also be 25.4 cm (10-inch) produced water pipelines between the platforms. Included are 20.3 cm (8-inch) service/utility pipelines between the platforms and between the OCS-P 0422 platform and shore for additional options and operational flexibility due to the nature of the heavy oil. A 40 by 0.8 km (25 by ½ mile) corridor (4 pipelines for a total of 161 km (100 miles)) of new pipelines that would be needed to complete the offshore portion of the NSMB project (see figure 6.1.3-1).

The three platforms are assumed to be electrified and there would be three power cables from shore to the central platform (**SMB "B"**), one power cable

each from shore to the SMB "A" and SMB "C", and one power cable each between SMB "B" and SMB "A" and SMB "B" and SMB "C".

BONITO UNIT DEVELOPMENT

One platform located on OCS-P 0443 (Platform Bonito) would be used to develop the Bonito Unit area. Reservoirs up to 6.44 km (4 mi) horizontally away could be reached from this platform using current drilling technology. API Gravity of Bonito crude oil is estimated at 11-22. The production from Platform Bonito would go by new pipelines to Platform Irene on Lease OCS-P 0441 where existing J-tubes have previously been installed to accommodate future pipelines. A new 35.5 cm (14-inch) oil pipeline, a new 20.3 cm (8-inch) gas pipeline and a new 25.4 cm (10-inch) water return line between the platforms would be adequate for this purpose. The 3 pipelines would be placed in a 7.2 km by 0.8 km (4 ½ by ½ mile) corridor, with a total of approximately 22.5 km (14 miles) of new pipelines (see figure 6.1.3-2).

At Platform Irene, the Bonito production would be commingled with the Point Pedernales and Tranquillon Ridge production before being sent to shore via Platform Irene's existing pipeline system to the Lompoc Oil and Gas Processing facility. The oil and gas would be dehydrated at the facility using existing capacity. The excess water would either be injected onshore, sent back to Irene for ocean disposal or formation injection at Irene or transported via pipeline to the Bonito Unit for ocean disposal or formation injection. From the Lompoc Oil and Gas Processing facility, the dehydrated oil would be sold to Tosco. The dehydrated gas would go to the Southern California Gas pipeline system. Electric power to the platform would most likely be supplied from an existing substation located onshore approximately 19.3 km (12 miles) northeast of the Bonito Unit. One power cable would be run from Platform Irene to the platform and another power cable would go to the Bonito Unit Platform from the substation.

ROCKY POINT UNIT DEVELOPMENT

The Rocky Point Unit includes Leases OCS-P 0451, 0452, and 0453 in the southern Santa Maria Basin. Twenty development wells, 14 oil wells and 6 service wells, would be drilled from Platforms Harvest, Hermosa, and Hidalgo.Seven wells each would be drilled from Platforms Harvest and Hermosa and six from Platform Hidalgo. The wells would be extended-reach wells with horizontal displacements of 4.6-6.4 km (2.5-3.5 miles). Drilling each well would require 3 to 4 months beginning in 2002.

Oil would be dehydrated and stabilized on the platforms, then sent to the Gaviota facility via the PAPCO pipeline. At Gaviota, the oil would be metered and heated, stored temporarily in the Gaviota Terminal Company storage tanks, then transported via the All-American Pipeline to various refining destinations.

Rocky Point gas would be sweetened on the platforms and used 1) to generate electricity and heat for platform operations, 2) sent to shore to fuel the Gaviota co-generation units, and 3) injected into the Point Arguello Field, the Rocky Point Field or both.

SWORD UNIT DEVELOPMENT

The Sword Unit includes leases OCS-P 0319, 0320, 0323, and 0323A. Samedan Oil Company is the Unit operator. A portion of lease OCS-P 0323 has been relinquished and the remaining lease was redesignated 0323A to reflect the change. Eleven development wells, 10 oil wells and 1 service well would be drilled from Platform, Hermosa, OCS-P 0316. The wells would be extended-reach wells with horizontal displacements of 6.4-8.3 km (3.5-4.5 miles). Drilling each well would require 3 to 4 months beginning in 2002.

Oil would be dehydrated and stabilized on the platforms, then sent to the Gaviota facility via the PAPCO pipeline. At Gaviota, the oil would be metered and heated, stored temporarily in the Gaviota Terminal Company storage tanks, then transported via the All-American Pipeline to various refining destinations.

Sword gas would be sweetened on Platform Hermosa and used 1) to generate electricity and heat for platform operations, 2) sent to shore to fuel the Gaviota co-generation units, and 3) injected into the Point Arguello Field.

GATO CANYON DEVELOPMENT

One platform located on Lease OCS-P 0460 (**Platform Gato**) would be used to develop the Gato Canyon Unit area. Reservoirs up to 4.8 km (3 miles) horizontally away could be reached from this platform using current drilling technology. API Gravity of Gato Canyon crude oil is estimated at 10-26. The jacket be installed starting in 2007. First oil and gas production would be in 2008. Oil production would peak at 22,500 bopd in 2013. Gas production would peak at 13,500 MCFD in 2013. The production from Platform Gato would be sent to shore via 3 new pipelines. A 35.5 cm (14-inch) oil pipeline, an 5.5 cm (8-inch) gas pipeline and an 5.5 cm (8-inch) return pipeline would be adequate. The 3 pipelines would be placed in a 8.8 by 0.8 km (5 $^{1}/_{3}$ by ½ mile) corridor, a total of approximately 25.7 km (16 miles) of new pipelines for the offshore portion of this project (see figure 6.1.3-3).

The oil and gas would be sent to shore to the ExxonMobil operated facilities at Las Flores Canyon. The gas sent to shore would be sour and that there would be limited processing offshore. The pipelines

would run from the platform and transverse State Lease PRC 2991.1 to and landfall through the the existing Exxon SYU pipeline crossings and corridor. New pipelines would be run to Las Flores Canyon. Production from the platform would be processed at Las Flores Canyon using existing capacity and the oil shipped in the All American Pipeline, now owned by Plains All American Pipeline, L.P. The gas would be processed at the Exxon Gas Plant using existing capacity and sold to the Gas Company. The produced water would be treated at the existing water treatment plant at Las Flores Canyon, transported offshore by pipeline and disposed of at the Gato Canyon Unit Platform. The platform is assumed to be electrified and two power cables would be run to the platform from the existing co-generation facility located in Las Flores Canyon.

PIPELINE AND POWER CABLE INSTALLATION

We assume that the pipelines between platforms and platforms to the landfalls (Gato Canyon Unit and Northern Santa Maria Basin) are accomplished with a pipeline lay barge with one pass per pipeline. The number of passes with the lay barge is dependent on the number of pipelines between the inter-connecting platforms and the platform to shore pipelines. The number of pipelines between the platforms is three for Bonito Unit to Irene, three for Gato Canyon Unit to shore and four for NSMB development, both between the platforms and between SMB "B" and shore. Installation of power cables would be completed by reeling the power cable off a power cable vessel into the same corridors as the pipelines. The power cables are connected to the platforms by pulling them through J-tubes at the platform.

CAVERN POINT UNIT DEVELOPMENT

The Cavern Point Unit includes Leases OCS-P 0210 and 0527 north of Santa Rosa Island in the Santa Barbara Channel. Eleven development wells, 10 oil wells and 1 service wells, would be drilled from Platform Gail. The wells would be extended-reach wells with horizontal displacements of 6.4-8.3 km (3.5-4.5 miles). Drilling each well would require 3 to 4 months beginning in 2003. The service would be drilled into the Sockeye Field and would not be an extended reach well.

The oil and gas would be sent to the Carpenteria onshore processing facility via Platform Grace using existing pipelines. The gas sent to shore would be sour and that there would be limited processing offshore. The oil and gas would be processed using existing capacity. Produced water is injected or disposed overboard.

6.2 ENVIRONMENTAL IMPACTS OF DEVELOPMENT OF THE 36 UNDEVELOPED LEASES

6.2.1 CUMULATIVE AIR QUALITY IMPACTS (2002-2030)

Section 6.1 describes the assumptions and lists the projects considered in the cumulative air quality analysis. Cumulative air emission data and assumptions are further documented in Appendix 5.4. The EIS analyzes cumulative impacts in two different time periods: 2002-2006 and 2002-2030. All of the cumulative projects and activities occur in the South Central Coast Air Basin composed of San Luis Obispo, Santa Barbara and Ventura Counties. For this analysis, it is assumed that due to the prevailing onshore wind conditions, the geographic scope for cumulative air quality impacts will be those projects or actions that exist or are pending or approved in the Santa Maria Basin and central Santa Barbara Channel and Southern Santa Barbara County. Major sources of cumulative air quality impacts include emissions from on-going oil and gas activities in Federal and State waters, proposed oil and gas activities, natural petroleum seeps, and offshore shipping and tankering operations.

Section 5.2.1 discuss the major impacting agents associated with past, present and foreseeable activities, including the proposed activities, that result in cumulative contributions to regional air quality during the expected duration of the proposed delineation activities (2002-2006). These include emissions from proposed oil and gas projects, existing oil and gas activities, natural petroleum seeps, and marine shipping and tankering.

The projects discussed in this section include past, present and reasonably foreseeable actions that may produce impacts during the period that the development of the 36 undeveloped leases would likely occur. The temporal period used for this analysis is the years 2002-2030. Two separate scenarios will be evaluated for potential cumulative effects on regional air quality. The first analysis will discuss the cumulative air impacts expected without the development of the 36 undeveloped leases. The second analysis will evaluate the incremental contribution to cumulative air quality impacts associated with the expected development of the leases.

CUMULATIVE AIR QUALITY IMPACTS WITHOUT DEVELOPMENT OF THE 36 UNDEVELOPED LEASES

It is assumed that without development of the 36 undeveloped leases, no new production platforms