Chapter 2
Description of the Proposed Action

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2 DESCRIPTION OF THE PROPOSED ACTION

2.0 PROPOSED ACTION

The Proposed Action consists of 4-5 separate delineation drilling projects. The projects involve using a mobile offshore drilling unit (MODU) that will move from project to project, to sequentially drill wells into four different units. Unitized lands are a group of leases that overlie a common geologic structure of an oil and gas field. Leases are administratively combined into a unit as a means of conserving natural resources, preventing waste, and protecting federal royalty interests. The operator and leases under each unit are summarized in table 2.0-1 Operators, units, and leases.

The units are located in the Santa Maria Basin and Santa Barbara Channel (See figure 1.0-3 Locations of federal OCS oil and gas units offshore California where delineation drilling activities are proposed: Pt. Sal Unit, Purisima Pt. Unit, Bonito Unit, and Gato Canyon Unit).

2.1 DESCRIPTION OF THE PROPOSED ACTION

The operators of the four undeveloped units (listed in table 2.0-1 Operators, units and leases) are preparing to submit revisions to their previously approved Explorations Plans (EP's). The revisions will propose the sequential drilling of 4-5 delineation wells from a semi-submersible MODU. The purpose of a delineation well is to gather additional information about the nature and extent of the hydrocarbon reservoirs in areas already explored. The delineation drilling would occur on units where there have been commercial oil and gas discoveries, and where development could occur in the future. The operators are required to submit revisions to their existing EP's by September 2001[1].

The MMS Pacific OCS Region anticipates receiving revisions to four or five previously approved EP's. The MMS will evaluate each revision as a separate project. Each revision will be evaluated on its own merit, and an approval/modification/disapproval will be issued based on the MMS technical review, the findings of this EIS, and any subsequent analysis pursuant to NEPA.

This proposed activity is similar in content and extent to exploration activities conducted in the Pacific OCS Region in the 1960's through 1980's, except that the technology has vastly improved. Semi-submersible MODU's have been used to drill numerous exploratory and delineation wells offshore California in the past.

Table 2.0-1. Operators, units and leases.

OPERATOR	UNIT	LEASES
Aera Energy LLC	Point Sal Unit	OCS-P 0415 OCS-P 0416 OCS-P 0421 OCS-P 0422
Aera Energy LLC	Purisma Point Unit	OCS-P 0426 OCS-P 0427 OCS-P 0432 OCS-P 0435
Nuevo Energy Company	Bonito Unit	OCS-P 0443 OCS-P 0445 OCS-P 0446 OCS-P 0449 OCS-P 0499 OCS-P 0500
Samedan Oil Corporation	Gato Canyon Unit	OCS-P 0460 OCS-P 0464

[1] In accordance with 30 CFR 250.171 and 250.172, the MMS Pacific OCS Region approved the lease operator's requests for suspension of production and established milestones for the operators to submit revisions to their previously approved EP's by the end of September 2001.

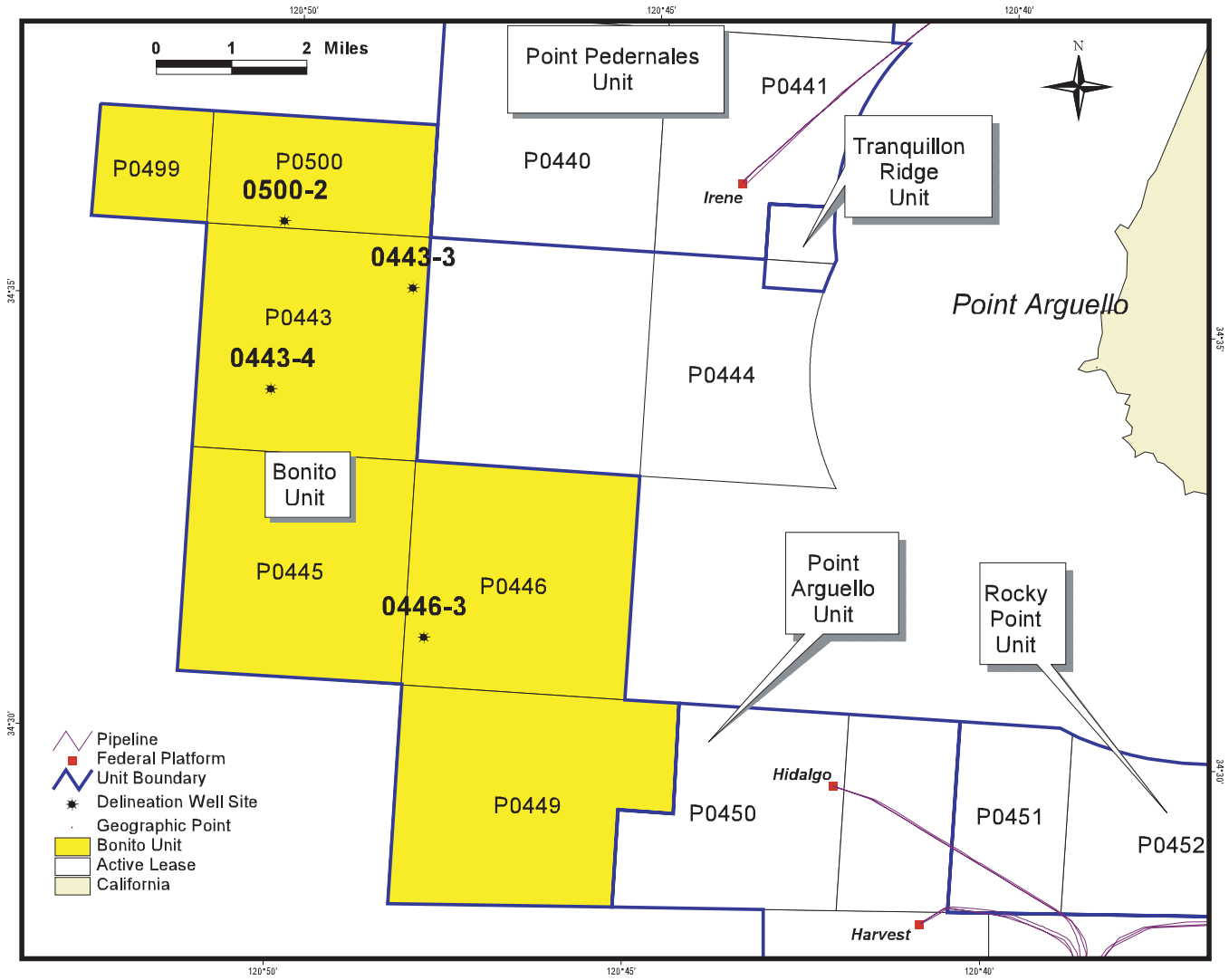

Figure 2.1-1. Bonito Unit proposed well sites.

The final well locations have not yet been determined. With the exception of Gato Canyon, the unit operators are in the process of conducting a detailed interpretation of their subsurface data. A summary of what is being proposed for each unit is given below.

Bonito Unit: One to two delineation wells are being proposed on the Bonito Unit. The operator has identified four possible sites where the well(s) could be drilled. The number of wells was approved with the original EP's; however, the proposed well locations have changed. If approved, drilling on the Bonito Unit is anticipated to commence by May 1, 2002. A map of the proposed well sites is shown in figure 2.1-1 Bonito Unit proposed well sites.

Point Sal Unit: One delineation well is being proposed on the Point Sal Unit. The operator has identified three possible sites where the well could be drilled. All of these sites were approved with the original EP's. The proposed well locations are south of Point Sal. If approved, drilling on the Point Sal Unit is anticipated to commence by November 1, 2002. A map of the proposed well sites is shown in figure 2.1-2 Point Sal Unit proposed well sites.

Purisima Point Unit: One delineation well is being proposed on the Purisima Point Unit. The operator has identified four possible sites where the well(s) could be drilled. All of these sites were approved with the original approved EP's. If revisions are approved, drilling on the Purisima Point Unit is anticipated to commence by February 1, 2003. A map of the proposed well sites is shown in figure 2.1-3 Purisima Point Unit proposed well sites.

Gato Canyon Unit: One delineation well is being proposed on the Gato Canyon Unit. The well was approved with the original EP; however, the proposed well location has changed. If approved, drilling on the Gato Canyon Unit is anticipated to commence by May 1, 2003. A map of the proposed well site is shown in figure 2.1-4 Gato Canyon Unit proposed well site.

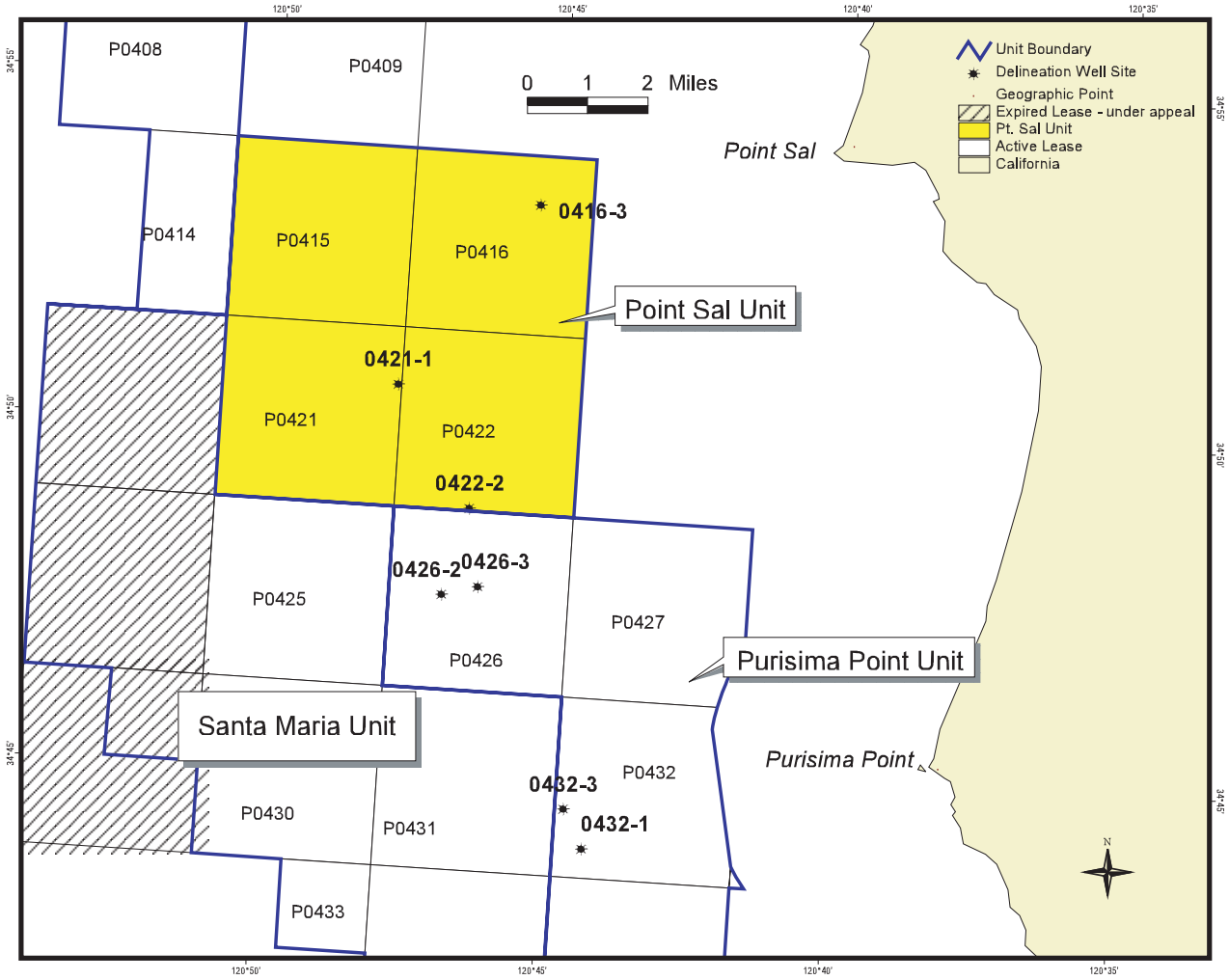

Figure 2.1-2. Point Sal Unit proposed will sites.

The proposed surface location, water depth, and drilling depths for the well sites being considered are summarized in table 2.1-1 Well site information.

2.1.1 OBJECTIVE OF THE PROPOSED ACTIVITY

The objective of drilling the delineation wells is to identify oil and gas characteristics, reservoir characteristics, and reservoir extent in areas where commercial quantities of oil have been found. Data obtained from the delineation drilling will influence the operators' future development strategy for their respective area.

2.1.2 APPROXIMATE TIMEFRAMES FOR CONDUCTING ACTIVITIES

The exploration activities proposed are of temporary duration. The start date for the first and last wells are May 1, 2002 (Bonito Unit) and May 1, 2003 (Gato Canyon), respectively. Each well could take anywhere from 23 to 54 days to drill and 21 to 30 days to test for the quality and quantity of hydrocarbons present in the well. The drilling and associated activities for each well should take 68 to 92 days to complete. The associated activities would include mobilization, setting the anchors and guide base, recovering the casing, abandoning the well, and retrieving the guide bases, risers and anchors. Table 2.1.2-1 Duration of projects, summarizes the time projected to drill each well. The Gantt Chart in figure 2.1.2-1 Timeframes of projects, details the timeframes for each well.

2.1.3 SUMMARY OF PREVIOUS EXPLORATION DECISIONS

For the leases where the delineation wells are proposed, seven EP's have been previously approved by the MMS and granted consistency by the California Coastal Commission according to 15 CFR 930.79. Under those seven exploration plans, 33 wells were approved and 9 wells were actually drilled.

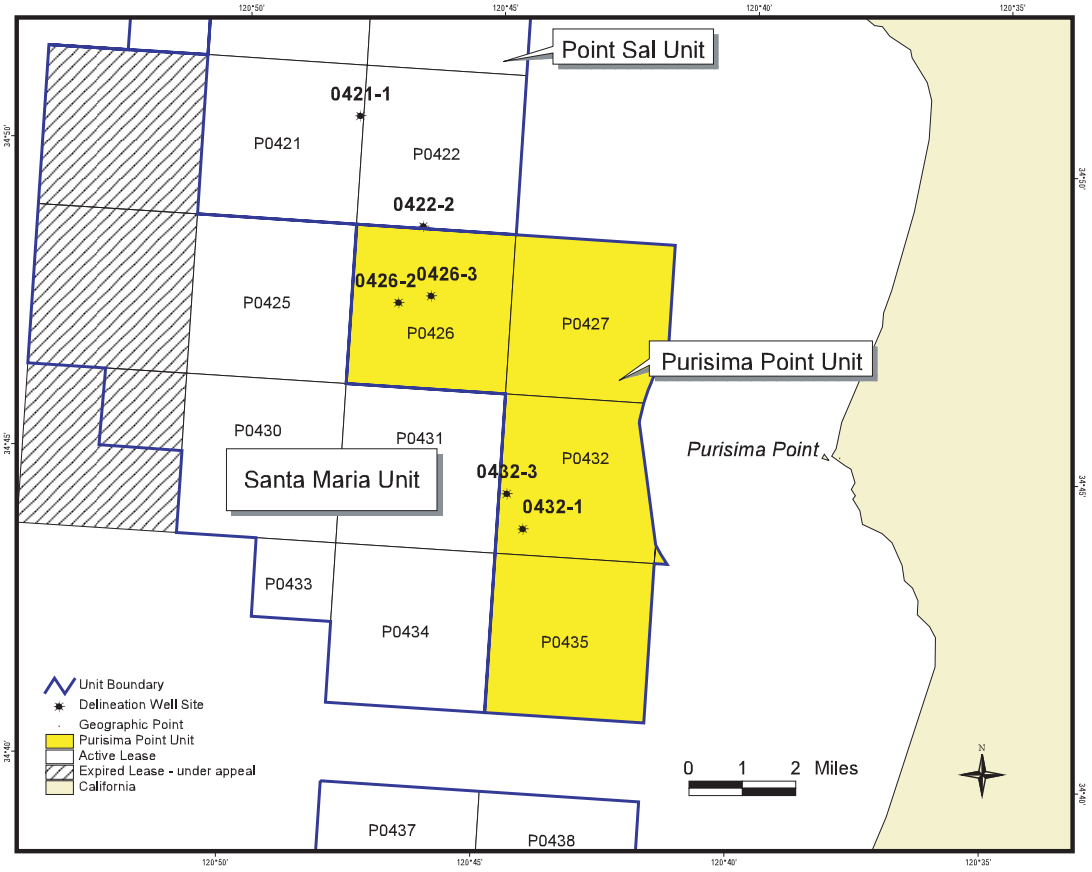

Figure 2.1-3. Purisma Point Unit proposed well site.

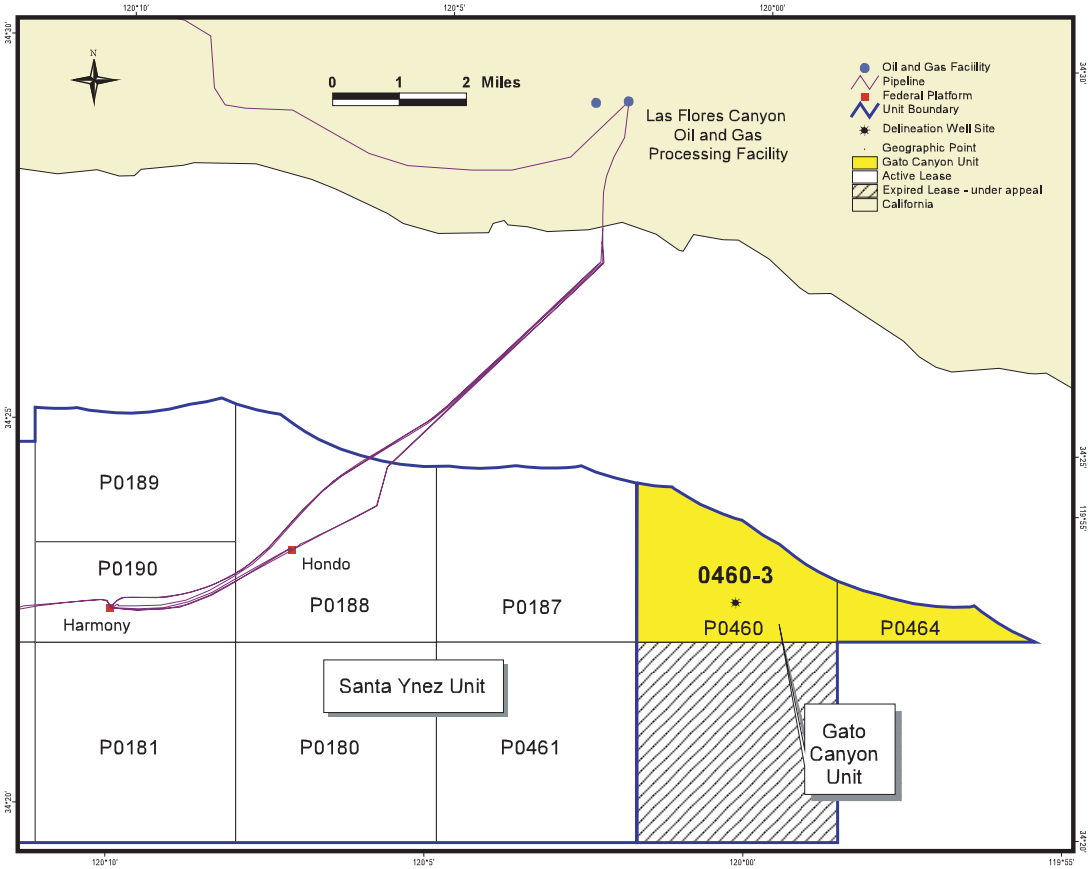

Figure 2.1-4. Gato Canyon Unit proposed well site.

Table 2.1-1. Well site information.

Unit	Well OCS-P	Approved in Original EP	Proposed Well Location (lat/long)	Water Depth (ft)	Vertical Depth (ft)
Point Sal	0416 #3	Yes	34º 53' 15.9"/ 120° 45' 24"	265	7,150
	0422 #2	Yes	34º 48' 50.8"/ 120° 46' 25.8"	305	TBD
	0421 #1	Yes	34º 50' 35.7"/ 120° 47' 45.8"	358	TBD
Purisima Point	0426 #2	Yes	34º 47' 35.2"/ 120° 46' 51.1"	315	TBD
	0426 #3	Yes	34º 47' 43.1"/ 120° 46' 13.2"	299	TBD
	0432 #1	Yes	34º 43' 59.9"/ 120° 44' 12.8"	233	TBD
	0432 #3	Yes	34º 44' 31.1"/ 120° 44' 33.6"	239	TBD
Bonito	0443 #3	Yes*	34º 35' 09.4"/ 120° 48' 18.4"	588	6,000
	0443 #4	Yes*	34º 33' 55.3"/ 120° 50' 13.7"	1,058	5,550
	0446 #3	Yes*	34º 31' 07.6"/ 120° 47' 56.4"	1,156	6,900
	0500 #2	Yes	34º 35' 52.2"/ 120° 50' 08.5"	755	5,600
Gato Canyon	0460 #3	Yes*	34º 22' 58.6"/ 120° 00' 14.6"	755	7,000

* Wells were approved on the lease; however, the current proposed locations are different from the locations approved in the original EP

Table 2.1.2-1. Duration of projects.

Unit	Mobilize and Set Anchors (days)	Drilling (days)	Well Testing (days)	Well Abandonment (days)	Estimated Total (days)
Point Sal	3	48	14	3	68
Purisima Point	3	48	14	3	68
Bonito[1]	3-4	53-54	28	4	88-90
Gato Cyn	4	52	30	6	92

[1]Per Bonito Unit well

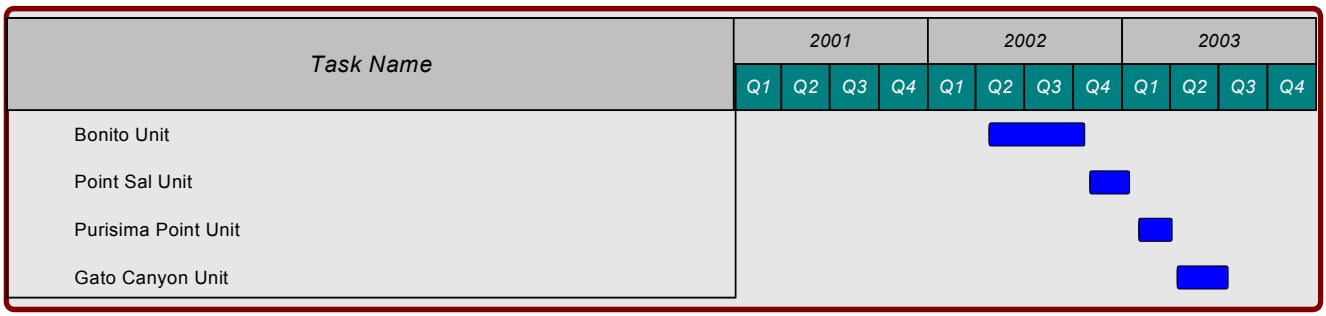

Figure 2.1.2-1. Timeframes of projects.

2.1.4 HOW THE REVISIONS TO THE PREVIOUSLY APPROVED EP'S WILL ADDRESS CHANGES IN TECHNOLOGY SINCE REVIEW OF EARLIER PLANS

In the early and mid-1980's, it was necessary to drill numerous delineation wells to obtain enough information to adequately understand the large-scale features in the subsurface geology. However, advancements in geologic interpretation software over the last fifteen years now allows for the delineation of the reservoirs on the Offshore Santa Maria Basin and the Offshore Santa Barbara Channel to be completed with a minimum number of wells.

With the advancements in computer capacity, interpretation programs can now provide detailed images of the seismic data and the general subsurface geologic character. The more powerful programs can collect and synthesize all data available, be it from wells or seismic, and portray it on one screen. Some programs can display and rotate the entire data set to be viewed at infinite amount of angles. Data can be manipulated in a variety of ways including flattening on a particular horizon to better understand the environment of deposition and/or portrayed in animation so that lateral changes in geology are more evident. These technological advancements discussed above allow for more accurate delineation of the reservoirs, and ultimately their development, with fewer wells than what would have been previously been necessary.

2.2 DESCRIPTION OF THE MOBILE OFFSHORE DRILLING UNIT

2.2.1 SEMI-SUBMERSIBLE RIG

The operators are working toward contracting a single clean Mobile Offshore Drilling Unit (MODU) to drill the delineation wells. A "clean" MODU is equipped with the Best Available Control Technology to significantly reduce emissions below the normal operating level. Having one clean MODU operating offshore California also facilitates phasing of these wells and greatly reduces the cumulative impacts of multiple MODU's operating at the same time offshore Santa Barbara. While the mobilization and demobilization of MODU to and from the Pacific coast is a multi-operator effort, each operator's planned drilling activity is a separate project.

At this time, the operators intend to use a floating semi-submersible rig; however, they have not chosen a specific drilling vessel to do the work. For the purposes of this environmental analysis, the MMS will use a Sedco 700 Series semi-submersible, specifically the Sedco 712 rig, as a "generic" rig (See figure 2.2.1-1 Sedco 712). The Sedco 712 rig is similar to rigs described in the previously approved Exploration Plans and has drilled seven wells in the Pacific OCS Region in the past. Note that, the actual rig used for the planned delineation drilling may be different, including a different contractor.

The Sedco 712 rig is a propulsion assisted semi-submersible drilling vessel capable of drilling to 25,000-feet in water depths of up to 1,600-feet, depending on how it's equipped. Primary equipment on the MODU includes eight 45,000-pound anchors, two 50-ton cranes, and a drill derrick. Two thrusters provide propulsion for the vessel, one in each hull. The thrusters are 2 X 3000 HP.

Operating equipment/machinery on the Sedco 712 rig is electrically driven with primary power supplied by diesel-fired engines. Main power is supplied by three EMD 16-645E9 diesels driving three 2400kW generators. The fuel used will be approved low sulfur diesel fuel. It is proposed that the fuel will be transported from shore by boat and transferred to the lower hulls and deck tanks of the rig.

The fuel capacity of the Sedco 712 rig is 277,914 gallons. Table 2.2.1-1 Fuel usage, summarizes the estimated fuel usage for each drilling project.

2.2.1 NEW OR UNUSUAL TECHNOLOGY

None of the equipment or procedures to be used is new or unusual. The Sedco 700 Series semi-submersible rigs are frequently used for exploration activities around the world and have been used in the Pacific OCS Region in the past to drill exploratory and delineation wells.

Figure 2.2.1-1. Sedco 712.

Table 2.2.1-1. Fuel Usage.

Unit	Total (days)	Estimated Fuel Usage (gallons)
Point Sal	68	250,000
Purisima Point	68	250,000
Bonito[1]	88-90	257,400
Gato Canyon	92	300,678

[1]Per Bonito Unit well

2.2.2 SAFETY SYSTEMS

The principal safety systems are related to blowout prevention, hydrogen sulfide contingency planning, fire-fighting, and evacuation and life-saving.

Blowout Prevention: The MODU will be adequately equipped with the necessary diverter system and blowout prevention (BOP) equipment to maintain complete well control. The diverter system will be in accordance with the MMS regulations 30 CFR 250.409. The Project Descriptions propose an 18" BOP stack with four rams rated at 10,000 psi and two annular preventers rated at 5,000 psi. All BOP's will be tested upon installation, before drilling, after cementing each string of casing, and at least once each week or per the requirements at 30 CFR 250.407. The BOP system and operational procedures are described in detail in the Project Descriptions.

Hydrogen Sulfide (H_2S): The semi-submersible will be equipped with H_2S monitors placed in key areas around the drilling rig, each connected to a central alarm panel in the control room. Numerous self-contained breathing apparatus are located at strategic areas around the rig.

Operations in H_2S areas will be subject to all the requirements of 30 CFR 250.417. Before any operations begin, the operators must have an H_2S Contingency Plan approved by the District Supervisor. A copy will be kept in the field.

Fire Protection: Heat, smoke and/or flame detectors with audible alarms are located at various places on the rig. Each alarm when triggered also gives a visible and audible indication in the control room.

The Sedco 712 rig is equipped with U.S. Coast Guard approved fire fighting equipment. Available equipment includes chemical and foam systems for the heliport, and a CO_2 system for the engine room and paint locker. Hydrants are placed such that at any point on the rig, they are accessible with 50 feet of hose. High-risk areas can be reached from at least two hydrant locations. Over 100 portable extinguishers are placed in strategic locations around the rig. The 700-Series rigs also feature a salt-water deluge system on the drill floor and a water sprinkler system in the crew quarters.

Evacuation: The Sedco 712 rig is equipped with U.S. Coast Guard approved lifeboats, rafts, and lifejackets. These include a 10-person rescue craft, four 50-person survival craft, four 25-person inflatable life rafts, a survival suit for each crewmember (plus 24 at each lifeboat station), and over 200 lifejackets.

2.2.3 ANCHORS AND ANCHOR LOCATIONS

The Sedco 712 rig has a mooring system designed for a maximum of 1,600 feet of water. The rig has eight Nippon model 4500LP 45,000-pound anchors. The rig has eight 4,300-foot-lengths of 3-inch chain on board and has access to an additional eight 1,000-foot segments of spare chain. A 3-inch regular die-locked and "oil rig" welded chain weighs 89.3-pounds/foot in air and 77.6-pounds/foot in water.

Anchors are typically deployed by anchor handling boats. The boats run the anchor chain out to the required length, and the anchors are lowered and set onto the seafloor using a work wire. Marker buoys may be connected by wire rope or chain to provide a surface reference to the sea floor location of an anchor (See figure 2.2.3-1 Typical mooring for floating drilling platforms).

In most cases, the upwind anchor is set first which holds the rig in place while the other anchors are being positioned and set. A typical anchoring procedure involves the placement of the eight anchors - two from each corner of the rig - in a configuration commonly referred to as an eight-point anchoring pattern. Figure 2.2.3-2 Eight-point anchoring pattern, depicts an ideal anchoring pattern in a uniform water depth at all anchor locations.

The anchors are placed at varying distances away from the rig based on water depth. Anchors are typically set between three to seven times the water depth. As the water depth increases, the "water depth/anchor spread" ratio decreases. Some degree of lateral flexibility in anchor placement allows avoidance of potential sea floor obstacles or anomalies such as subsea canyons, slopes, archeological and hard substrate resources, etc.

Table 2.2.3-1. Anchor spread ratio.

Unit	Water Depth (ft)	Anchor Spread (ft)	Ratio
Bonito	1,000	3,000	1:3
Point Sal	265	1,100-1,900	1:4 to 1:7
Purisima Point	265	1,100-1,900	1:4 to 1:7
Gato Canyon	755	2,500-3,500	1:3 to 1:4.5

The key to the correct placement of the anchors is to perform a site-specific mooring analysis once the specific rig is selected and the necessary ocean bottom surveys are conducted. The mooring analysis will factor in any subsea obstructions, obstacles, and hard bottom habitat. The anchors will be set to avoid these areas, and ensure that the anchors are placed in adequate soils to provide the required holding capacity.

It is difficult at this time to speculate how much of the anchor chain will contact the seafloor as it is dependent on several variables. As a rule, it is generally estimated that the length of chain laying on the seafloor could be up to one quarter to one third of the anchor radius. Table 2.2.3-1 Estimated anchor spread ratio, summarizes the predicted anchor spread ratio for each unit.

2.3 GENERIC DRILLING PROGRAM

The following is a general description of activities associated with the delineation drilling. Appendix 2.1 gives a general description of drilling operations from a floating vessel.

2.3.1 PRE-SPUD ACTIVITIES

The semi-submersible rig has two hulls upon which it floats while being towed to the designated location. At the designated location, the hulls are flooded with seawater to submerge them to their drilling position, a depth a little below the water's surface. Anchors will be deployed in their predetermined locations and then tested for proper tension. Typically, the anchor is loaded onto the boat, which then motors away from the rig. As the boat travels toward the anchor location, chain is released to the required length. At a position roughly half way from the rig, the workboat begins to lower the anchor on a work wire while continuing towards the final anchor location. Finally, the anchor is lowered to the seafloor and the appropriate amount of tension is placed on the chain. Surveyors will take the final location fix.

If the anchors do not hold a pretension determined by mooring calculations, tandem or "piggyback" anchors can be used. This is done by attaching the pendant line to the anchor shackle of another anchor and deploying it in a manner similar to the original anchor.

2.3.2 DRILLING OPERATIONS

The operators will proceed with their individual drilling and casing program. A description of drilling operations and a copy of each operator's drilling program are included in Appendices 2.2, 2.3, 2.4 and 2.5.

2.3.2.1 SHALLOW HAZARDS SURVEY

The operators of these Units will be required to conduct shallow hazards surveys to determine the presence or absence of subsurface geologic and manmade hazards. The survey results and hazard analysis must accompany the revisions to the approved Exploration Plan for each proposed well site location.

Hazard analysis is the process of identifying and evaluating conditions that might affect the safety of proposed operations or conditions that might be affected by the proposed operations. The Pacific OCS Region issues guidance in regional Notice to Lessees and Operators for developing survey strategies capable of detecting and evaluating any significant conditions in the vicinity of a proposed drilling site.

2.3.2.2 SHALLOW HOLE CONSIDERATIONS

The MMS requires an analysis of seafloor and subsurface geologic hazards to verify the absence of shallow gas (described in 2.3.2.1). However, there is still the possibility of encountering gas when drilling the first part of an offshore well. Since the hole is shallow, gas can quickly reach the surface. Because of pressure limitations at the casing shoe, it is not advisable to shut in the well if shallow gas is encountered, but rather to divert the gas through a diverter system.

Diverter systems provide a way for wellbore mud to be directed away from the drilling rig. The well is not shut in; instead, flow is diverted a safe distance

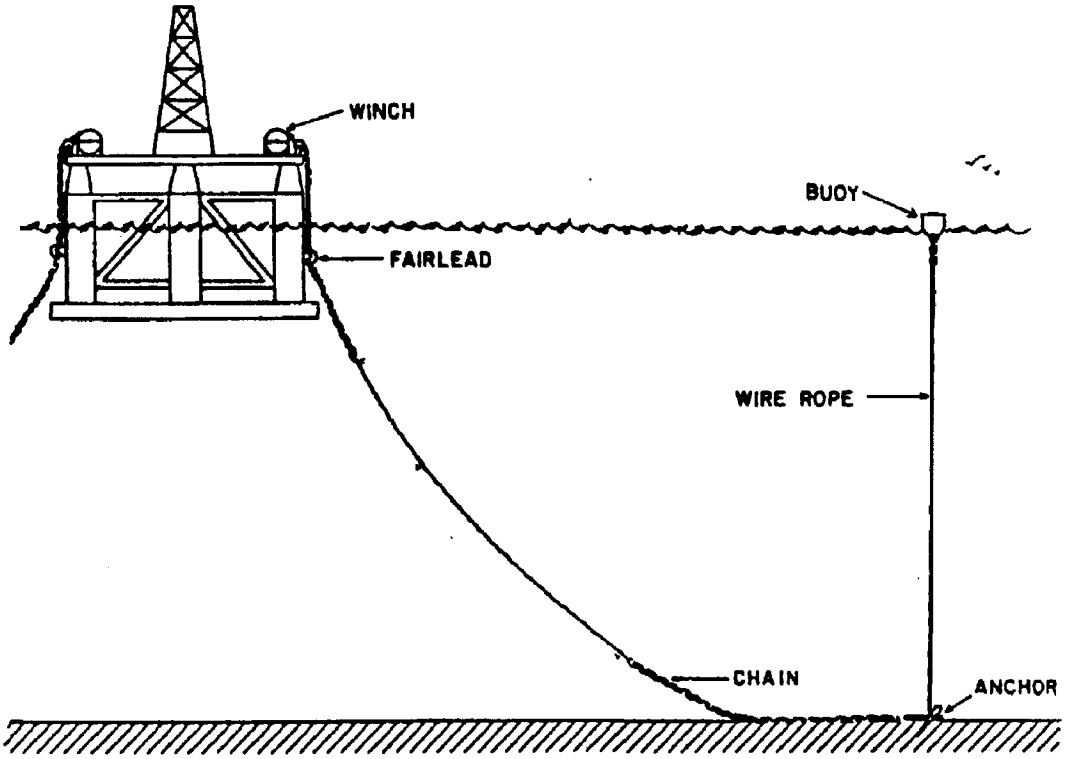

Figure 2.2.3-1. Typical mooring for floating drilling platforms.

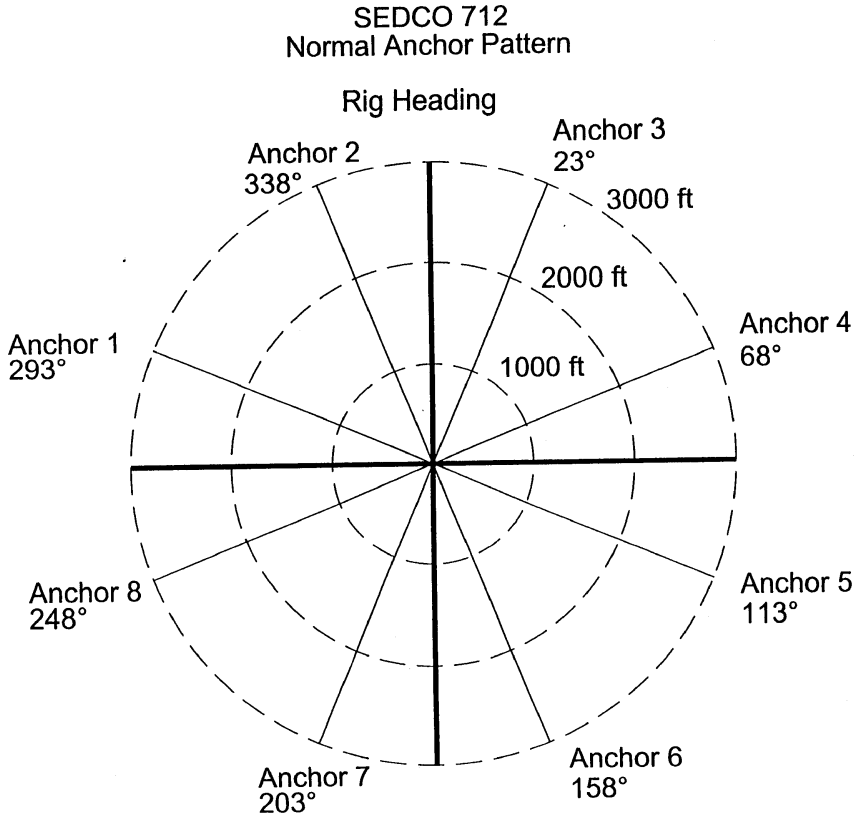

Figure 2.2.3-2. Eight-point anchoring pattern.

from the rig through large-diameter diverter lines. Although diverter systems can vary from rig to rig, the systems must be in compliance with the MMS regulations at 30 CFR 250.409.

2.3.3 DRILLING MUD SYSTEM

Drilling mud is used in the well bore to move drill cuttings to the surface, control formation pressure, maintain borehole stability, prevent formation damage, and cool and lubricate the drill bit and drill pipe. At this time, with actual drilling commencing in May 2002, it is not possible to describe the precise characteristics of the drilling muds to be used. However, the drilling mud will most likely be water-based. Drilling muds typically used to drill wells similar to those proposed here are listed in each project description (Point Sal and Purisima Point: page 4-5; Bonito: page 2-21; and Gato Canyon: pages 4-3 through 4-4).

Water-based drilling fluids (also known as drilling muds), is a fresh or sea water slurry of clay. Oil-based drilling fluids may contain up to 10 percent mineral oil, as well as water, and similar additives. Historical and the in-process National Pollutant Discharge Elimination System (NPDES) permit(s), have allowed the use of generic drilling muds which EPA's research has shown to have low toxicity. Some generic drilling mud compositions contain attapulgite or bentonite, natural organic polymer, barium or iron sulfate, lignosulfonate, lignite and sodium hydroxide, plus several minor additives (NRC, 1983). Any drilling fluid used offshore California can be discharged into the sea, but must be in accordance with the NPDES general permit currently in preparation by the EPA (see section 4.6 of this EIS). Drilling mud may be discharged intermittently during drilling and disposed of in-bulk upon completion of the drilling program. The NPDES permit limitations do not allow for discharge of free oil, oil-based muds, or diesel oil.

2.3.4 DRILL CUTTINGS VOLUME

Drill cuttings are fragmented rock material ranging from clay to pebbles in size and are composed of shale, siltstone, sand, limestone/dolomite and approximately one percent drilling mud. Oil contaminated drill cuttings will be transported to shore via supply boat for disposal at a state approved disposal site. Oil-free and cleaned drill cuttings will be disposed of in accordance with the NPDES permit requirements. Cuttings discharge volumes will be monitored and reported to the EPA. Table 2.3.4-1 Estimated discharge volumes of mud and cuttings, summarizes drill mud and cuttings volumes for each well.

2.3.5 WELL LOGGING

Well logging will be run at the appropriate times to evaluate the formations. To produce a well log, logging tools are lowered into the well on a wireline. The tools are lowered all the way to the bottom and then reeled slowly back up. As the tools come back up the hole, they are able to measure the properties of the formations they pass. The logging tools make a record that resembles a graph. Engineers and geologists study the graphs to determine not only if oil or gas exists, but also how much may be there.

2.3.6 DRILL STEM TESTING PROGRAM

If warranted by well log interpretation, conventional core data, wireline fluid and sidewall sampling, a drill stem test (DST) may be performed. A DST evaluates a well by looking at the downhole pressures. The purpose of these tests is to gain additional reservoir information to determine commercial development of the reservoir. Information such as, but not limited to, reservoir productivity, aerial extent of pro-

Table 2.3.4-1. Estimated discharge volumes of mud and cuttings.

Unit	Total Mud Discharge (bbls)	Total Cuttings Discharge (bbls)
Point Sal	12,250	2,112
Purisima Point	12,250	2,112
Bonito[1]	3,000	1,805
Gato Canyon	3,000[2]	4,270[3]

[1] Per Bonito Unit well

[2] Drilling muds are proposed to be discharged intermittently during drilling and disposed of in bulk upon completion of the drill program. These discharges will likely be in volumes of 30 to 100 barrels per event.

[3] Anticipated average daily cuttings discharge is approximately 750 ft^3 per day while drilling.

ducible hydrocarbons, and reservoir fluid information may be derived from these tests. The drill stem-testing program can vary unit to unit. In general, a DST involves the following:

A tool is set down on the bottom of the hole. A packer seals off the hole below it by expanding when weight is set down on it. A valve is opened, and any formation pressure and fluids present enter the tool. A recorder in the tool makes a graph of the formation pressure. When the test is completed, the packer is released and the tool is retrieved back to the surface.

Since the casings seal off the formations, perforations in the casings must be made in order for the oil or gas to flow into the wellbore for the DST.

Since the type and size of the rig is unknown at this time exact reference to fluid handling is difficult. Generally speaking, initial production from any one-test interval is flowed from the wellhead, through a test header and choke system, through a test separator and into a series of tanks stationed onboard the rig. The number, volume and size of these tanks will not be known until the rig is selected. The fluid (generally an oil/water mix) from the DST will be transferred to a barge through a series of flexible hoses. Table 2.3.6-1 Drill stem test programs, summarizes the anticipated duration and volumes of fluid expected from the DST on each unit. Section 2.6 Barging, describes the barging and offloading operation in detail.

2.3.7 ABANDONMENT PROCEDURES

The proposed wells will be drilled as expendable wells and will be permanently abandoned. A series of cement plugs will be set in the well at several zones according to MMS regulations at 30 CFR 250.702. Drilling mud of sufficient density will be placed between the plugs to prevent fluid migration beneath the ocean floor. Casing will be removed to a depth of at least 15 feet below the mudline (oceanfloor) or to a depth approved by the District Supervisor. The seafloor will be surveyed and cleared of all obstacles.

2.4 SUPPORT VESSELS AND HELICOPTERS

Surface vessels and helicopters will be used to move personnel and supplies to and from the proposed drilling sites. Normal travel routes for the support vessels have been in place since the mid 1980's. Charts showing the routes are held at the Joint Oil Fisheries Liaison Office in Santa Barbara, California.

2.4.1 SURFACE VESSELS

At a minimum, the following vessels will be used directly or in connection with the drilling operations:

One 180-foot class workboat

One 110-foot class crew boat

One standby vessel (most likely a 110-foot class vessel)

One 180-foot class supply boat

One anchor handling boat

2.4.1.1 CREW BOAT

It is expected that one 110-foot class crew boat will be used to support the delineation drilling operations. The boat will likely be stationed in, and operate out of, Port Hueneme or the Carpinteria Pier and will travel through established corridors. Although crew boats may service other area platforms on the same trip, it is assumed for this analysis that crew boats serve the drilling rig exclusively. Table 2.4.1.1-1 Estimated miles traveled for crew boat, summarizes the anticipated crew boat mileage for each drilling project.

Table 2.3.6-1. Drill stem test programs.

Unit	Duration (days)	No. of Zones to be Tested	Total Volume of Fluid (bbls)	Barge Destination	# of Barge Trips
Bonito[1]	28 days/well	5	40,000	Long Beach/ Port Hueneme	1-2
Point Sal	14 days	TBD	52,500	Long Beach	1-2
Purisima Point	14 days	TBD	52,500	Long Beach	1-2
Gato Canyon	30 days	5	6,000-7,000	Long Beach	1

[1]Per Bonito Unit well

2.4.1.2 STANDBY BOAT

A standy boat will be stationed near the MODU at all times during operations. It is anticipated that this boat will be a 110-foot class vessel with a two-man crew. This vessel will not normally leave the drill site, except for emergency situations, and only when another vessel can act as standby. No trips for the standby vessel are planned other than initial mobilization and demobilization.

The primary purpose of this vessel is emergency response in the unlikely event of an oil spill. (For a discussion on the potential for oil spills, see Section 5.1.3.1. Oil Spill Risk Assessment.) Specifications for the standby boat and equipment are as follows:

- 1000 bbls of on-board recovered oil storage
- Two advancing skimmers, capable of open-ocean oil recovery
- One Stationary Skimmer, capable of open-ocean oil recovery
- Communications equipment including fax, cell phones, VHF
- Dual Radar, GPS, Forward Looking Infrared Radar
- 3000-feet of Open Ocean Boom
- Sorbent boom and pads (10 bales each)
- Boom-deployment boat

2.4.1.3 SUPPLY BOATS

It is expected that one 180-foot class supply boat will be used to support the delineation drilling operations. The boat will transport supplies, equipment, and materials to the drilling rig and carry garbage, oil contaminated drill cuttings and formation water, if any, back to shore. The boat will likely be stationed in, and operate out of, Port Hueneme and will travel through established corridors. Table 2.4.1.3-1 Estimated miles traveled for supply boat, summarizes the anticipated supply boat mileage for each drilling project assuming it originates from Point Hueneme.

2.4.1.4 ANCHOR HANDLING BOATS

An anchor handling boat will deploy the anchors. The boats run the anchor and anchor chain out to the required length, and lower the anchor onto the seafloor using a work wire.

2.4.2 HELICOPTERS

Helicopter trips originating from the Santa Barbara Airport will be used as required (Santa Maria airport for Point Sal and Purisima Point). No modifications are proposed for the helicopters. The Sea King, a two-engine helicopter, is expected to best represent the type of helicopters used for this program. Table 2.4.2-1 Estimated flying time for helicopter, summarizes the anticipated helicopter flying time for each drilling project.

2.5 PERSONNEL

It is expected that approximately 140-145 individuals will be directly involved in the proposed drilling activities for each drilling project. Most of the employees will be working with the drilling rig and will stay with the rig. The offshore personnel will typically work shifts of seven days on and seven days off. Service personnel will move to and from the rig as needed. Other than employees of the drilling contractor, the personnel associated with these operations are generally already living and located in Santa Barbara and Ventura Counties.

2.6 BARGING

The oil and associated fluids from the drill stem test (DST) will be stored in a barge brought to the site by tug and moored with the semi-submersible drilling unit. Fluids from a DST generally consist of oil and water, but can also contain drill muds and gas. (For a description of a DST, see Section 2.3.6 Drill Stem Testing Program.) The test fluids will be transferred to an United States Coast Guard (USCG) approved barge that is equipped, capable, and of the appropriate size and draft to safely enter ports along the Cali-

Table 2.4.1.1-1. Estimated miles traveled for crew boat.

Unit	Number of Trips/ Month	Total Miles
Bonito	8	5,712
Gato Canyon	2	350
Purisima Point	6	2,640
Point Sal	6	3,360

Table 2.4.1.3-1. Estimated miles traveled for supply boat.

Unit	Number of Trips/ Month	Total Miles
Bonito	12	7,344
Gato Canyon	8	2,500
Purisima Point	9	3,960
Point Sal	9	5,280

Table 2.4.2-1. Estimated flying time for helicopter.

Unit	No. of Trips/Month	No. of Trips During Drilling Program	No. of Landing-Takeoff Cycles (LTO)[2]	Flying Time Per Roundtrip (hours)	Total Flying Time (hours)
Bonito[1]	30	90	180	1	90
Point Sal	20	50	100	1	50
Purisima Pt.	20	40	80	1	40
Gato Canyon	28	84	168	.5	21
Total:	98	264	528	3.5	201

[1]Per Bonito Unit well

[2]LTO cycles during the program: Half are at the rig and half are at the airport

fornia coast. The barge will operate under applicable USCG laws and regulations. The barge will have an USCG approved oil pollution emergency plan per the regulations at 33 CFR Subchapter O.

A tug and barge system will be used to transport oil from testing the delineation wells. Under Oil Pollution Act of 1990 requirements, barges are required to be double hulled. The barge design and systems will be in compliance with USCG regulations. The test fluids will be transported by barge to the Long Beach/Los Angeles Harbor Complex or Point Hueneme where it will be transferred to an approved refinery, used oil-handling facility, or permitted hazardous waste handling and disposal contractor.

Configurations for offloading the test fluids from the semi-submersible to the barge can vary depending upon the environmental conditions and other design factors. Potential semi-submersible/barge offloading configurations would be either tandem or side-by-side. In tandem offloading, the barge is positioned at a safe distance with its bow generally in line with the semi-submersible's stern. Side-by-side offloading puts the semi-submersible and barge in a parallel orientation.

For this delineation well project, the tandem transfer configuration would most likely be used to offload the oil. Tandem transfer is a commonly used low-pressure crude oil export system, which involves offloading of hydrocarbon from a semi-submersible to a barge moored in-line with the semi-submersible. Compared to the alongside transfer method, the tandem transfer method can be used in harsher environments. The system offers better possibilities for quick disconnection and further separation between the vessels.

The barge can be moored to the semi-submersible by one or more hawsers. Having a tug assisted barge, such as that described in the Project Descriptions will improve the operational safety of the transfer operation.

The tandem transfer method is weather-limited. The actual limiting wave height for mooring and loading operations depends upon the following:

- Distance between the semi-submersible and the barge
- Size of the barge and semi-submersible
- Crosswind and current conditions
- Semi-submersible mooring system
- Maneuvering space at the site
- Barge station-keeping capabilities
- Degree of automation in the hawser and offloading connection

A curtailment plan and accommodations for emergency disconnection of the barge will be provided.

Based on the assumptions used for test production rate estimates, the base-case scenario for this EIS considers the following to be a likely offloading scenario:

- The offloading system would offload approximately 200 to 7500 bbls per day (depending on the Unit) to a barge moored to the semi-submersible. The maximum capacity of the barge(s) would range from 40,000-50,000 bbls.
- Test fluids would be offloaded by the semi-submersible's main cargo pumps through a retractable hose to the loading manifold of the barge. The barge would be moored to the semi-submersible and held in place by a set of its own anchors. The number of anchors will range between 1-4.
- Safety features such as marine breakaway offloading hoses and emergency shut-off valves would be incorporated.
- In accordance with USCG, a detailed design of the offloading assembly and the site-specific offloading procedure would be submitted for approval.

2.6.1 PORT HUENEME OPTION FOR TEST FLUIDS

The Bonito Unit Project Description states that the test fluids associated with the well tests may be taken to Point Hueneme. An alternate destination is the Long Beach/Los Angeles Harbor Complex. The operator anticipates a maximum of 40,000 bbls of test fluids from each well, for a total of 80,000 bbls if two wells are drilled and tested.

Transporting the test fluids to Port Hueneme would translate into an additional 275 trucks coming in and out of the port during the Bonito drilling project for one well, or 550 additional trucks if the second delineation well is drilled. This is based on using a standard tank truck size of 150 bbls (COOGER 1999).

It is also likely that crew and supply boats will operate out of Port Hueneme. It is not known at this time how many truck trips will be required to transport supplies in and out of Port Hueneme during the 4-5 drilling projects.