

UNITED STATES  
DEPARTMENT OF THE INTERIOR

FINAL  
ENVIRONMENTAL STATEMENT  
VOLUME 3 OF 3

OIL AND GAS DEVELOPMENT  
IN THE SANTA BARBARA CHANNEL  
OUTER CONTINENTAL SHELF OFF CALIFORNIA



PREPARED BY THE  
UNITED STATES GEOLOGICAL SURVEY  
DEPARTMENT OF THE INTERIOR

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(Director)

CONVERSION FACTORS FOR READER INFORMATION

Gravity in degrees API ( $^{\circ}$ API) =  $\frac{141.5}{\text{Sp. gr.}} - 131.5$       Example:  
Water =  $10^{\circ}$  API

1 nautical or geographical mile = 6,076.12 feet = 1,852.00 meters

1 statute mile = 5,280 feet = 1,609.35 meters

1 knot = 1 nautical mile per hour = 1.151 statute miles per hour  
= 1.69 feet per second (ft/sec)

1 cubic meter = 264.2 U. S. gallons = 35.31 cubic feet

1 cubic foot = 7.48 U. S. gallons

1 oilfield barrel = 42 U. S. gallons = 159 liters

Parts per million (ppm) = milligrams per liter (mg/L)

Parts per thousand (ppt) = milligrams per milliliter (mg/mL)  
= grams/liter (g/L)

1 grain = 0.064798918 grams

1 grain per gallon (gpg) = 17.118 milligrams/liter (mg/L)  
= 17.118 parts per million (ppm)

1 metric ton (M ton) = 1,000 kilograms = 2,204.62 pounds avoirdupois

1 U. S. standard pound avoirdupois = 453.592 grams

1 kilogram = 2.205 U. S. standard pounds avoirdupois

Weight of fresh water at  $4^{\circ}$  C = 62.43 pounds per cubic foot  
= 8.346 pounds per gallon

Average specific gravity of sea water = 1.025

Average weight of sea water at  $4^{\circ}$  C = 63.99 pounds per cubic foot  
= 8.555 pounds per gallon

1 megawatt (MW) = 1,000,000 watts (W) = 1,340 horsepower (hp)

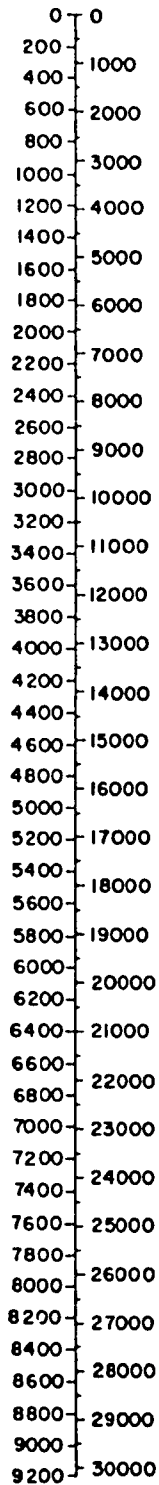
1 British Thermal Unit (BTU) = heat required to raise the  
temperature of one pound of water at its maximum density  $1^{\circ}$  F.

1 horsepower (hp) = 42.418 BTU per minute = 746 watts

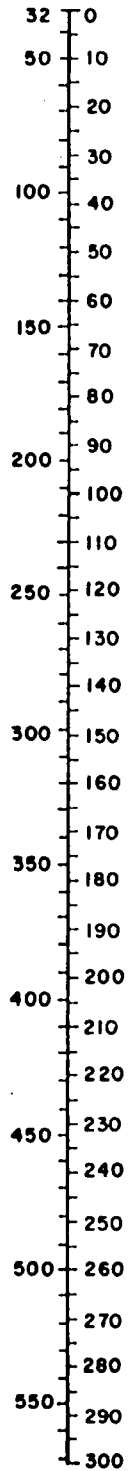
1 kilowatt-hour (kwh) = 1,000 watt-hours (wh)  
= 1.341 horsepower-hours (hph)  
= 3,413 BTU

# CONVERSIONS

DEPTH  
meters feet



TEMPERATURE  
degrees Fahrenheit degrees Celsius



OIL GRAVITY  
°API specific gravity @ 60°F

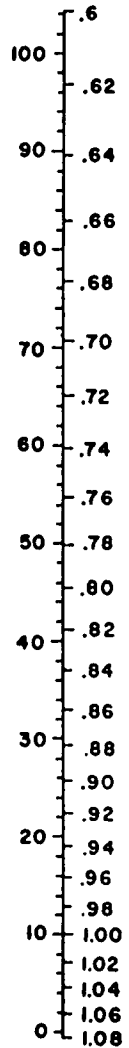


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#### IV. MITIGATING MEASURES

##### A. General Mitigations Related to OCS Oil and Gas Operations and Facilities

###### 1. Regulations

All Santa Barbara Channel OCS oil and gas operations would comply with applicable regulations of county, State, and Federal agencies including, but not limited to, the U. S. Geological Survey, the U. S. Environmental Protection Agency, the U. S. Army Corps of Engineers, the U. S. Coast Guard, the California State Lands Commission and Division of Oil and Gas, the Regional Water Quality Control Board, and appropriate State, regional, and county air pollution control agencies depending on jurisdiction. The State and counties would have jurisdiction, for example, over portions of pipeline on State land and onshore facilities that process OCS production.

Under the provisions of the Outer Continental Shelf Lands Act (43 U.S.C. secs 1331-1343) and the Supreme Court's decision (U. S. v. California 381 U. S. 139 (1965)), the subsoil and the seabed of the Outer Continental Shelf more than three miles seaward from shores of the United States appertain to the United States and are subject to its jurisdiction and control. Since enactment of the National Environmental Policy Act of 1969 on January 1, 1970 (42 U.S.C. secs. 4321-4347), oil and gas lease sales on the Outer Continental Shelf have been made subject to the NEPA review (environmental impact statement) process. The Secretary of the

through the bureau of Land Management, is authorized, under the provisions of section 8 of the OCS Lands Act, to grant oil and gas leases to the highest responsible qualified bidder by competitive sealed bid procedures. By the terms of the lease, the lessee is granted the exclusive right to drill for, produce, and sell oil and gas (except helium) from deposits underlying the leased areas and to construct and maintain platforms and other necessary structures within the leased area. A copy of a standard OCS lease form is included at the end of this section as appendix IV-1.

After the leases are issued by the Bureau of Land Management, Department of the Interior, oil and gas operations are administered by the Department of the Interior through the Geological Survey. Appropriate national operating regulations (30 CFR 250) were first issued in 1954, and supplemented by regional regulations, known as OCS Orders, for the Pacific Region. The regulations (30 CFR 250.34) also provide that the Geological Survey is authorized to approve permits to drill in order for the lessee to enjoy the rights granted by the lease.

a. U. S. Geological Survey

The Geological Survey Regulations governing Outer Continental Shelf (OCS) oil and gas operations in the Santa Barbara Channel are contained in Part 250, Title 30, Code of Federal Regulations. These Regulations are further implemented by Pacific Area OCS Orders Nos. 1 through 12.

After the Platform A spill of January 28, 1969, the Geological Survey OCS Regulations were revised effective August 22, 1969, and the latest revision of the Pacific Area OCS Orders was effective May 1, 1975. The net effect of the changes that have been made in these latest revisions has been to define more clearly the responsibility of lessees to conduct safe operations and authority of the supervisor to regulate operations, to exercise tight control over drilling, production, and waste disposal, and to require equipment fully adequate for the safe conduct of operations.

b. Department of Transportation

(1) U. S. Coast Guard

The OCS Lands Act delegates to the Coast Guard the authority to promulgate and enforce regulations covering warning devices, safety equipment, and other matters related to the promotion of safety of life and property on fixed OCS platforms and drilling vessels. The implementing regulations for this delegation are contained in Title 33 of the Code of Federal Regulations, Part 67 and Sub-chapter N. Parts 140 to 147. Other Coast Guard regulations cover safety equipment on all types of offshore facilities and boats, specific personnel licensing procedures, minimum manning levels for ships and boats, and prohibit the discharge of pollutants from all vessels.<sup>1</sup>

(2) Office of Pipeline Safety

The Department of Transportation is authorized under the Natural Gas Pipeline Safety Act of 1968 (49 U.S.C. secs. 1671, et seq.)

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1

The Coast Guard's responsibility as to oil spill containment and clean-up is discussed under the heading "Contingency Plans" in this section. A memorandum of understanding between the U. S. Geological Survey and the U. S. Coast Guard is also discussed under this heading.

to establish gas pipeline safety standards for transportation of gas and for pipeline facilities. The standards apply to the design, installation, inspection, testing, construction, extension, operation, replacement, and maintenance of pipeline facilities. Gathering, transmission or distribution by pipeline or storage in or affecting interstate or foreign commerce is included in the meaning of transportation of gas. The Secretary of Transportation is authorized to advise, assist and cooperate with other Federal departments in the planning and development of the standards and in methods for inspecting and testing to determine compliance with the standards. Regulations implementing the Department's authority are found at 49 CFR Parts 192 and 195.

c. Regulation of Waste Water Discharged into the Santa Barbara Channel OCS Waters

See section II.G.2.d.(3) for a description of the present waste discharges resulting from the five existing OCS Santa Barbara Channel platforms. The presently existing standards for oil and gas operation related discharges into OCS waters are cited in this section in the OCS Order discussion (see the excerpts from OCS Orders 7 and 8); however, it should be pointed out that these requirements and standards could be substantially changed in the future. The OCS Orders are continuously evolving and the sections governing waste water disposal requirements are presently under consideration for revision. Also contributing to the likelihood that waste water disposal requirements will be continuously revised as deemed necessary in the future, are certain sections of the Federal Water Pollution Control Act Amendments of 1972 applicable to some aspects of OCS discharges resulting from oil and gas operations.

d. Environmental Protection Agency

The Environmental Protection Agency as administrator of certain sections of the Federal Water Pollution Control Act as amended in 1972 have responsibilities and jurisdiction for certain aspects of OCS oil and gas operations waste disposal programs. (See the following subsection for further discussion of the Federal Water Pollution Control Act Amendments of 1972.) By memorandum of April 13, 1973, to the Environmental Protection Agency, the Department of the Interior suggested that the feasibility of a memorandum of understanding between the two agencies be considered in order to facilitate the administration of the 1972 amended act as it applies to discharges arising from OCS lease operations and to minimize any redundancy of efforts by the Geological Survey and the Environmental Protection Agency.

(1) The Federal Water Pollution Control Act Amendments of 1972

The Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. §§ 1251-1376 (Supplement III, 1973) (hereinafter, the Act) makes the discharge of any pollutant by any person, except in compliance with certain sections of the Act, unlawful. To carry out the objectives of the Act, there shall be achieved not later than July 1, 1977, effluent limitations for point sources which shall require the application of the best practicable control technology currently available. A National Pollutant Discharge Elimination System (hereinafter, NPDES) is created by section 402 and made applicable to discharges into the territorial sea, the waters of the contiguous zone, or the oceans by section 403. Permits for such discharges will be issued by the Administrator (Environmental Protection Agency) in compliance with guidelines to be promulgated by him. Prior to promulgation of such guidelines, permits may be issued if the Administrator determines it to be in the public interest. While the NPDES appears to

apply to fixed platforms and structures, it does not apply to (1) the addition of any pollutant to the waters of the contiguous zone or the ocean from any vessel or floating craft, except drill ships, or (2) water, gas, or other material which is injected into a well to facilitate production of oil or gas, or water derived in association with oil or gas production and disposed of in a well, if the well used either to facilitate production or for disposal purposes is approved by authority of the State in which the well is located, and if such State determines that such injection or disposal will not result in the degradation of ground or surface water resources. Regulations governing the NPDES may be found at 40 CFR, Part 125, 38 F.R. 13528 (1973) and the guidelines issued pursuant to section 403(c) of the Act may be found at 40 CFR, Part 227, 38 F.R. 12872 (1973).

To assist in administering the Act the Administrator is authorized by section 501(b) to utilize the officers and employees of any other agency of the United States (with the consent of the head of such agency). By memorandum of April 13, 1973, to the Environmental Protection Agency (EPA), the Department of the Interior suggested that the feasibility of a memorandum of understanding between the two agencies be considered in order to facilitate the administration of the NPDES as it applies to discharges arising from OCS lease operations and to minimize any redundancy of efforts by the Geological Survey and the Environmental Protection Agency.

The Federal Water Pollution Control Act Amendments of 1972 (33 U.S.C. §§ 1251 - 1376 (Supplement III, 1973)) requires that the States adopt and enforce certain guidelines and standards, subject to the Environmental Protection Agency (EPA) approval, within a given time for certain things to be accomplished.

In early 1975, standards, regulations, and enforcement responsibilities under the FWPCA Amendments of 1972 should become better defined and established by EPA and the U. S. Geological Survey for OCS produced waste water discharges. The Environmental Protection Agency (EPA) prepared a "Draft Development Document for Effluent Limitations Guidelines and New Source Performance Standards for the Oil and Gas Extraction Point Source Category" (October 1974). This is a draft document, subject to changes resulting from comments received, which presents the findings of an extensive study of the oil and gas extraction industry for the purposes of developing effluent limitation guidelines and pre-treatment standards for the industry to implement Sections 304, 306 and 307 of the FWPCA of 1972 (PL 92-500). Supporting data and rationale for the development of proposed effluent limitation guidelines and standards of performance are contained in this development document.

In late 1974, EPA issued Santa Barbara Channel OCS platform operators draft permits to discharge treated produced waste water into Federal OCS waters. These are draft permits and the stipulations and conditions are subject to change.

In the Federal Register, Vol. 40, No. 179 (September 15, 1975) the Environmental Protection Agency published interim final effluent limitations and guidelines for existing discharge sources by establishing 40 CFR Part 435. Portions of this interim final rule making (Subpart B) is applicable to the discharge of produced waste water (and other waste) into OCS waters. In Subpart B, the oil and grease maximum for any one day is 72 ppm and the average daily values for 30 consecutive days shall not exceed 48 ppm.



(2) State of California and U. S. Geological Survey  
Responsibilities as to Ocean Waste Discharges  
Arising from Oil and Gas Operations

According to the Environmental Protection Agency (EPA), under section 402 of the Federal Water Pollution Control Act (FWPCA), permits are authorized to be issued by the Administrator (EPA). However, a State may develop and submit to the Administrator (EPA) a program for the issuance of permits for waste discharge into waters within its jurisdiction. Approval of a State program by the Administrator (EPA) does not confer upon the State the authority which the FWPCA grants the Administrator (EPA) with respect to the issuance of permits for discharge into the contiguous zone and the ocean.

If a platform is located within the territorial waters of the State of California, a State permit would be required. If, however, the platform is located beyond the 3-mile limit (as would be any platforms installed as a means of furthering Santa Barbara Channel OCS production) application must be made to the Administrator (EPA) for a permit to discharge into waters at the platform and the U. S. Geological Survey would enforce such permit requirements. OCS operators will have to comply with the applicable/waste discharge regulations existing at the time production begins. Those regulations might rule out certain types of discharge or they might have effluent characteristics specifications which would be economically infeasible for certain production operations. Should this be the case, the operator would be required to propose an alternative disposal method such as subsurface injection, which would also be under stringent regulations.

e. Corps of Engineers, United States Army

The OCS Lands Act provides that the authority of the Secretary of the Army to prevent obstruction to navigation in the navigable waters of the United States is extended to structures located in the OCS. The Corps of Engineers implements this delegated authority by issuing navigational permits for exploration drilling vessels and fixed and mobile

platforms. In issuing these permits, the Corps only considers those hazards related to navigation and national defense.

f. Other Agencies

The California State Lands Commission is responsible for California tidelands to their boundary with Federal waters. The California Division of Oil and Gas reviews proposals for underground water disposal to insure that potable water sources will not be adversely affected. The waste water disposal by onshore subsurface injection (i.e., as proposed for the Santa Ynez Unit onshore treating and storage facility) would be in accordance with Section 502(6)(B) of the Federal Water Pollution Control Act (1972 amendment), and subject to approval by the California State Division of Oil and Gas. The State of California and the Counties of Santa Barbara and Ventura have each established air quality regulations for facilities within their jurisdiction. The U. S. Bureau of Land Management is responsible for the administration and issuance of OCS leases, and under the National Environmental Policy Act of 1969 is responsible for the assessment of foreseeable environmental impacts that could result from the development of mineral deposits on the public lands. The U. S. Bureau of Sport Fisheries and Wildlife is responsible for the conservation and management of fish and wildlife resources and can provide advice and assistance on biological, chemical, and physical factors affecting these resources. National Marine Fisheries Service has similar responsibilities by law in the marine and estuarine areas. The Geological Survey cooperates with the Sport Fisheries and Wildlife and the National Marine Fisheries Service in helping to minimize harm to fish and wildlife resources.<sup>1</sup> Numerous other agencies

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<sup>1</sup> A memorandum of understanding exists between the U.S. Geological Survey, the U.S. Bureau of Land Management, and the U.S. Bureau of Sport Fisheries and Wildlife as to the regulation of geophysical operations involving explosives.

regulate various aspects of the proposed development including construction and operation of the product transportation units; occupational health and safety; pipeline and marine berth design and operation; and emissions from internal combustion engines. Anyone wishing to obtain detailed information on specific regulations applicable to a particular part of this proposal should contact the appropriate agency.

Inasmuch as the Geological Survey regulations, and more specifically the Pacific Area OCS Orders, cover the basic OCS oil and gas operations they will be briefly described here and referred to throughout this Environmental Impact Statement.<sup>1</sup>

g. Pacific Area OCS Orders

The twelve Pacific Area OCS Orders are the field level implementation of the authority delegated to the Secretary of the Interior by the Outer Continental Shelf Lands Act of 1953. The authority for each OCS Order is a subpart of Part 250 of Title 30 of the Code of Federal Regulations. These orders are issued by the Pacific Area Supervisor, with prior approval of the Chief, Conservation Division, U. S. Geological Survey. The field-level enforcement of these OCS Orders is performed by the Santa Barbara District Engineer and his staff.

The present Pacific Area OCS Orders evolved from the earliest issued orders dated March 31, 1965. Additional OCS Orders will be prepared and issued and the existing orders are revised as the need occurs. Several existing OCS Orders are presently undergoing revision and new orders

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<sup>1</sup> These regulations (Part 250, Title 30, Code of Federal Regulations) and the Pacific Area OCS Orders may be obtained from the U. S. Geological Survey, Oil and Gas Operations, Pacific Area, 7744 Federal Building, 300 North Los Angeles Street, Los Angeles, California 90012.

are being prepared by the Geological Survey.

OCS Order No. 1

OCS Order No. 1, entitled "MARKING OF WELLS, PLATFORMS, AND FIXED STRUCTURES," covers the identification of wells and structures as required by the Geological Survey. With respect to structures, this order specifies that the identification be of a size and so located as to be legible from either the surface of the water or the air. There are additional requirements that all structures be equipped with navigational aids but these are Coast Guard requirements covered by their regulations (33 CFR, Subchapter N. Parts 140 to 147).

OCS Order No. 2

OCS Order No. 2 presents an example of constant review of OCS Orders. Currently OCS Order No. 2 is in its second major revision and was printed in the Federal Register, Vol. 40, No. 222, November 17, 1975. It should become effective April 1, 1976, barring any other major changes. After an OCS Order is published in the Federal Register, comments are accepted from interested parties prior to its finalization.

In general, the draft OCS Order No. 2, "DRILLING PROCEDURES", covers requirements for well casing and cementing, blowout prevention, mud programs, supervision and training, direction surveys, hydrogen sulfide control, critical operations, and curtailment plans.

Well casing and cementing requirements indicate casing setting depths and how the casing is to be driven or set.

Blowout prevention and mud programs are spelled out in detail in OCS Order

No. 2 to aid prevention of well blowout and encourage safety of personnel.

Prescription of directional survey frequencies for each portion of drilling activity is provided to assure bottom hole locations for safe, efficient, and authorized operations.

In the revised OCS Order No. 2, hydrogen sulfide detection and control requirements are spelled out in detail.

At all times, from when drilling operations are initiated until the well's completion or abandonment, OCS Order No. 2 requires maintenance of rig floor surveillance by a member of the drilling crew or the supervisor. Training program requirements include well control and abnormal pressure detection methods. Also required in the order are weekly blowout prevention drills. Written verification of compliance with Order provisions is required to be filed with the District Engineer. OCS Order No. 2 requires filing of critical operations and curtailment plans with the District Engineer for approval. Minimum critical operation and guidelines for curtailment plans are provided in the Order.

### OCS Order No. 3

OCS Order No. 3, "PLUGGING AND ABANDONMENT OF WELLS," spells out in detail the plugging, with cement or mud, that must be done for either a permanent or temporary abandonment. A permanent abandonment requires the placement of a top cement plug and various other plugs across all oil, gas, and fresh water zones so as to prevent the migration of formation fluids from one zone to another. All casing, wellhead equipment, and anchor piling must be removed to a depth of at least five feet below the ocean floor.

#### OCS Order No. 4

Entitled "SUSPENSIONS AND DETERMINATION OF WELL PRODUCIBILITY," OCS Order No. 4 established the criteria for determining whether a well is capable of producing oil or gas in paying quantities. It is significant because establishing producibility of at least one well on a lease permits extension of the primary term of the lease. This is the only OCS Order that has no relationship to safety and environmental protection.

#### OCS Order No. 5

OCS Order No. 5, "INSTALLATION OF SUBSURFACE SAFETY DEVICE," is completely related to safety and environmental protection. A subsurface safety device is a valve installed in the tubing of a well, at some distance below the mudline, which closes and shuts the well in if abnormal producing conditions develop. There are two basic types: (1) direct-controlled, which depends upon an increase in velocity or pressure differential across the valve to cause it to close or (2) surface-controlled, which is a spring-loaded, normally closed valve that is held open by the application of pressure from the surface. Industry and the U. S. Geological Survey consider that surface-controlled valves are more dependable than direct-controlled valves. In the Pacific Area, the use of surface-controlled subsurface safety devices became mandatory not later than one year after the effective date of the current OCS Orders, or on June 1, 1972. Actually, this requirement did not create a major problem because Santa Barbara Channel OCS operators had only about a dozen direct-controlled valves in use at the time of the effective date of the OCS Orders. These few valves have been changed to surface-controlled valves.

To insure safety, or security, subsequent OCS Orders require that a primary control system be backed up by secondary and in some cases even tertiary

systems. The subsurface safety valve system backup is provided as follows: First, the safety valve is backed up by automatic wellhead valves. Then, as production moves downstream from the wellhead, there is additional backup. Production vessels and surge tanks are equipped with high-low level and pressure shut-in sensors. Shipping pumps, for moving production to shore, are similarly equipped. In the Pacific Area an electronic system is in operation that compares input to a pipeline that serves several platforms with receipts onshore. The system maintains a continuous short-term and long-term readout of this comparison at the onshore facility. If a differential exists between these readouts, and exceeds a preset value, an alarm sounds and emergency action is taken. When this system was originally installed, it was tested by simulating a leak of one barrel per minute (through a bypass) on a pipeline carrying 58 barrels per minute and the system responded immediately. A leak of 1.4 percent of the flow rate can be immediately detected. Thus, for a production rate of 40,000 barrels per day a leak of more than 24 barrels per hour would be quickly detected.

Additional safety devices are installed within the surface pressure system that maintains the subsurface safety valves in the open position. This pressure control system is an integral part of the platform shut-in system. It can be activated manually, automatically, locally, or remotely. Fusible links are placed at strategic points in the pressure control lines which, if melted, dissipate pressure and activate all valves in the system.

OCS Order No. 6

OCS Order No. 6, "PROCEDURE FOR COMPLETION OF OIL AND GAS WELLS," addresses itself to the pressure specifications and testing of wellhead equipment and the procedure for multiple tubingless completions.

OCS Order No. 7

The title of OCS Order No. 7 is "POLLUTION AND WASTE DISPOSAL."<sup>1</sup> This Order is of major importance. It covers the full gamut of pollution control from prevention to removal. With respect to prevention, it specifies the appropriate manner in which liquid and solid wastes may be disposed.<sup>2</sup> Additionally, it requires that all production facilities be operated and maintained in a manner necessary to prevent pollution and that both operator and non-operator personnel be informed and instructed in equipment operation for the prevention of pollution. As a preventive measure, it requires that all drilling and production facilities be inspected periodically by the operator for potential sources of pollution (Geological Survey personnel also perform frequent inspections and tests). If pollution does occur, the Order sets forth a reporting procedure for notifying appropriate persons and agencies and requires that immediate corrective action be taken. Additionally, it requires that pollution control equipment be readily available to all operations. This equipment may be maintained on the particular facility or, at the discretion of the Area Supervisor, may be land based.

Over the past few years, several nonprofit organizations have been formed along the Pacific Coast, for pollution control and removal.<sup>3</sup>

Excerpts from OCS Order No. 7 are reproduced on the following three pages.

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- <sup>1</sup> OCS Order No. 7 has been printed as a poster notice and this notice must be posted in a conspicuous place on all OCS drilling vessels, platforms, and related crew and supply boats.
  - <sup>2</sup> The disposal of produced wastewater and sewage is covered by the provisions of OCS Order No. 8. However, the Geological Survey plans to move all provisions on waste disposal to OCS Order No. 7.
  - <sup>3</sup> Oil Spill Contingency Plans will be discussed later in this section.



1. Pollution Prevention. In the conduct of all oil and gas operations, the operator shall not pollute land or water. The operator shall comply with the following pollution prevention requirements.

A. Liquid Disposal.

(1) The disposal of produced waste water and sewage shall be in accordance with the provisions of OCS Order No. 8.

(2) Oil shall not be disposed of into ocean waters.

(3) Liquid waste materials containing substances which may be harmful to aquatic life or wildlife, or injurious in any manner to life or property, shall be treated to avoid disposal of harmful substances into the ocean waters.

(4) Drilling mud containing oil or toxic substances shall not be disposed of into the ocean waters.

B. Solid Waste Disposal.

(1) Drill cuttings, sand, and other solids containing oil shall not be disposed of into the ocean waters.

(2) Mud containers and other solid waste materials shall be transported to shore for disposal.

C. Production Facilities.

(1) All production facilities, such as separators, tanks, treaters, and other equipment, shall be operated and maintained at all times in a manner necessary to prevent pollution.

- (2) *The operator's personnel shall be thoroughly instructed in the techniques of equipment maintenance and operation for the prevention of pollution. Non-operator personnel shall be informed in writing, prior to executing contracts, of the operator's obligations to prevent pollution.*

2. Inspections and Reports. *The operator shall comply with the following pollution inspection and reporting requirements and operators shall comply with such instructions or orders as are issued by the Supervisor for the control or removal of pollutants:*

A. Pollution Inspections.

- (1) *Manned drilling and production facilities shall be inspected daily to determine if pollution is occurring. Such maintenance or repairs as are necessary to prevent pollution of ocean waters shall be immediately undertaken and performed.*
- (2) *Unattended facilities, including those equipped with remote control and monitoring systems, shall be inspected at intervals as prescribed by the District Engineer and necessary maintenance or repairs immediately made thereto.*

B. Pollution Reports.

- (1) *All spills or leakage of oil and liquid pollutants shall be reported orally without delay to the District Engineer and the Coast Guard and shall be followed by a written report to the District Engineer showing the cause, size of spill, and action taken.*
- (2) *All spills or leakage of oil and liquid pollutants of a substantial size or quantity and those of any size or quantity which cannot be immediately controlled, shall be reported orally without delay to the Supervisor, the District Engineer, the Coast Guard, and the Regional Director, Environmental Protection Agency.*
- (3) *Operators shall notify each other upon observation of equipment malfunction or pollution resulting from another's operation.*

3. Control and Removal.

- A. Corrective Action. Immediate corrective action shall be taken in all cases where pollution has occurred. Each operator shall have an emergency plan for initiating corrective action to control and remove pollution and such plan shall be filed with the Supervisor. Corrective action taken under the plan shall be subject to modification when directed by the Supervisor.
- B. Equipment. Standby pollution control equipment shall be maintained at each operation or shall be immediately available to each operator at an onshore location. This equipment shall include, but need not be limited to, containment booms, skimming apparatus, and chemical dispersants and shall be available prior to the commencement of operations. This equipment shall be the most effective available resulting from the current state of pollution control and removal research and development efforts. The equipment shall be regularly inspected and maintained in good condition for use. The equipment and the location of land bases shall be approved by the Supervisor. Chemical dispersants shall not be used without prior approval of the Supervisor. The operator shall notify the Supervisor of the location at which such equipment is located for operations conducted on each lease. All changes in location and equipment maintained at each location shall be approved by the Supervisor.

OCS Order No. 8

OCS Order No. 8 "APPROVAL PROCEDURE FOR INSTALLATION AND OPERATION OF PLATFORMS, FIXED AND MOBILE STRUCTURES, AND ARTIFICIAL ISLANDS," is quite lengthy, totaling a little over 12 pages. In part, it covers general design and non-design features, the manner in which the application for installation must be filed, and a requirement that the detailed structural design plans be certified by a registered professional engineer. Also, it covers safety and pollution control equipment and procedures for welding practices.

Various backup systems as applied to production handling facilities were mentioned under OCS Order No. 5, and one example was given. Much of the detail of these systems is set forth in OCS Order No. 8. In the part covering welding practices and procedures, the requirements are relatively general in nature, touching only on the highlights of safe welding precautions. The main thrust of this part of the Order is to minimize all welding and burning on any structure. To this end, the policy according to the regulations is: if it can be done onshore, do it there and haul it out to the structure; if it must be done on the structure, it should be done in a pressurized welding room, but, if this proves impossible, use backup measures to insure safety. These backup measures consist of the appointment of one or more persons designated as "fire watch" dressed in distinctive attire and equipped, at a minimum, with a portable gas detector and fire extinguishers.

Although waste disposal is for the most part dealt with in OCS Order No. 7, a portion of OCS Order No. 8 addresses itself to the disposal of produced waste water and sewage. This portion of OCS Order No. 8 will be moved to OCS Order No. 7 in the near future.

Excerpts from OCS Order No. 8 are reproduced on the following three pages.

- (3) *Curbs, gutters, and drains shall be constructed and maintained in good condition in all deck areas in a manner necessary to collect all contaminants, unless drip pans or equivalent are placed under equipment and piped to a sump which will automatically maintain the oil at a level sufficient to prevent discharge of oil into the ocean waters. Alternate methods to obtain the same results may be approved by the Supervisor. These systems shall not permit spilled oil to flow into the wellhead area.*
- (4) *An auxiliary electrical power supply shall be installed to provide emergency power capable of operating all electrical equipment required to maintain safety of operation in the event the primary electrical power supply fails.*
- (5) *The following requirements shall apply to the handling and disposal of all produced waste water discharged into the ocean waters overlying the submerged lands of the OCS. The disposal of waste water other than into these waters shall be approved by the Supervisor.*
  - (a) *Water discharged shall not create conditions which will adversely affect the public health or the use of the waters for the propagation of aquatic life, recreation, navigation, or other legitimate uses.*
  - (b) *Waste water disposal systems shall be designed and maintained to reduce the oil content of the disposed water to not more than fifty ppm. An effluent sampling station shall be located at a point prior to discharge into the receiving waters where a representative sample of the treated effluent can be obtained. On one day each month the effluent shall be sampled hourly for 8 hours and the following determinations shall be made on the composite sample: suspended solids, settleable solids, pH, total oil and grease content, and volume of sample obtained. Also the temperature of each hourly sample shall be recorded. All*

samples shall be taken and all analyses for oil and grease content shall be performed in accordance with the latest edition of "Standard Methods for the Examination of Water and Wastewater", published by the American Public Health Association, Inc. The Supervisor may approve different methods for determination of oil and grease content if the method to be used is indicated to be reliable. A written report of the results shall be furnished to the Regional Office monthly. The report shall contain dates, time and location of sample, volumes of waste discharge on the date of sampling in barrels per day, and the results of the specific analysis and physical observations. A visual inspection of the appearance of the receiving waters in the discharge area shall be made daily and the results recorded and included in the monthly report.

- (6) A firefighting system shall be installed and maintained in an operating condition in accordance with the following:
  - (a) A fixed automatic water spray system shall be installed in all wellhead areas. These systems shall be installed in accordance with the current edition of National Fire Protection Association's Pamphlet No. 15.
  - (b) A firewater system of rigid pipe with fire hose stations shall be installed and may include a fixed water spray system. Such a system shall be installed in a manner necessary to provide needed protection in areas where production handling equipment is located. A firefighting system using chemicals may be considered for installation in certain areas in lieu of a firewater system in that area, if determined by the Supervisor to provide equivalent fire protection control.
  - (c) Pumps for the firewater systems shall be test-operated weekly. A record of the tests shall be maintained on a structure in the field and submitted semi-annually to the District Office. An alternate fuel or power source shall be installed to provide continued pump operation during platform shutdown unless an alternate firefighting system is provided.

- (d) *Portable fire extinguishers shall be located in the living quarters and in other strategic areas.*
  - (e) *A diagram of the firefighting system showing the location of all equipment shall be posted in a prominent place on the structure and a copy submitted to the District Office.*
- (7) *An automatic gas detector and alarm system shall be installed and maintained in an operating condition in accordance with the following:*
- (a) *Gas detection systems shall be installed in all enclosed areas containing gas handling facilities or equipment and in other enclosed areas which are classified as hazardous areas as defined in API RP 500 A and B and the current edition of the National Electric Code.*
  - (b) *All gas detection systems shall be capable of continuously monitoring for the presence of combustible gas in the areas in which the detection devices are located.*
  - (c) *The central control shall be capable of giving an alarm at a point not higher than 60 percent of the lower explosive limit.*
  - (d) *The central control shall automatically activate shut-in sequences and emergency equipment at a point not higher than 90% of the lower explosive limit.*
- (9) *Sewage disposal systems shall be installed and maintained in satisfactory operating condition in all cases where sewage is discharged into the ocean waters. Sewage is defined as human body wastes and the wastes from toilets and other receptacles intended to receive or retain body wastes. Following sewage treatment, the effluent shall contain 50 ppm or less of biochemical oxygen demand (BOD), 150 ppm or less of suspended solids, and shall have a minimum chlorine residual of 1.0 mg/liter after a minimum retention time of fifteen minutes. Sewage treatment records shall be maintained and made available for inspection upon request. The records shall reflect the results of monthly tests. These tests shall include determination of BOD, suspended solids, and chlorine residual.*

OCS Order No. 9

OCS Order No. 9 is entitled "APPROVAL PROCEDURES FOR PIPELINES". This title is somewhat misleading in that it covers more than approval procedures. It covers general design, application procedure for installation, and a completion report of the actual installation, including testing. Under general design, there are requirements for safety devices which function to protect the line as well as minimize pollution in the event that damage or failure occurs. Also, there are operating procedures directed toward protection, inspection, and maintenance of the line throughout its lifetime. The metering system which provides a continuous comparison of the input to a line at a structure, or structures, with deliveries onshore, was mentioned under OCS Order No. 5. This metering system is a general design requirement of OCS Order No. 9.

Order No. 9 does not apply to common-carrier pipelines except where one is connected to or crosses a platform. In this sense, the pipelines which are being referred to are the gathering lines or flow lines used to move production to an onshore processing facility. In the Pacific Area, the production as it leaves a platform is not in a saleable condition. It is treated at the onshore facility to a saleable condition after which it passes a "point of sale" and is no longer under the jurisdiction of the Geological Survey.

The Area Oil and Gas Supervisor is authorized to grant easements or rights-of-way and to approve the installation of gathering lines or flow lines. He is not authorized to take these same actions for



common carrier pipelines. This authority is vested in the Bureau of Land Management. Excerpts from OCS Order No. 9 follows.

- (1) All oil and gas pipelines leaving a structure receiving production from the structure shall be equipped with a high-low pressure sensor to shut in the wells on the structure.
  - (2) All oil and gas pipelines delivering production to either offshore or onshore production facilities, or both, shall be equipped with an automatic shut-in valve, at or near the receiving facility, connected to an automatic and a remote shut-in system.
  - (3) All oil and gas pipelines coming onto a structure or delivering production to an onshore facility shall be equipped with a check valve or a quick-operating manual valve, as approved by the Supervisor, at or near the structure or facility to control backflow.
  - (4) All oil and gas pipelines crossing a structure which do not deliver production to the structure, but which may or may not receive production from the structure, shall be equipped with sensors to activate an automatic shut-in valve to be located in the upstream portion of the pipeline at or near the structure to avoid uncontrolled flow at the structure. This automatic shut-in valve shall be connected to either the structure automatic and remote shut-in system or to an independent remote shut-in system.
  - (5) All oil pumps and gas compressors shall be equipped with high-low pressure shut-in devices.
  - (6) All oil pipelines shall have a metering system to provide a continuous volumetric comparison of input to the line at the structure, or structures, with deliveries onshore. The system shall include an alarm system and shall be of adequate sensitivity to detect significant variations between input and discharge volumes. In lieu of the foregoing, any system capable of detecting small leaks in the pipeline may be substituted with the approval of the Supervisor.
- B. All oil and gas and other pipelines shall be protected from loss of metal that would endanger the strength and safety of the lines by methods such as protective coatings or cathodic protection.

- C. All oil and gas and other pipelines shall be installed and maintained to be compatible with trawling operations and other uses.
  - D. All oil and gas and other pipelines shall be hydrostatically tested to 1.25 times the designed working pressure for a minimum of 2 hours prior to placing the line in service.
  - E. All oil and gas pipelines shall be maintained in good operating condition at all times and the ocean surface above the pipeline shall be inspected a minimum of once each week for indication of leakage using aircraft, floating equipment or other means. Records of these inspections including the date, methods, and results of each inspection shall be maintained by the operator and submitted to the District Engineer annually by April 1. The operator shall immediately notify the District Engineer of any pipeline leak and within one week shall submit a report to him with respect to the cause, effect, and remedial action taken.
  - F. All oil and gas and other pipelines shall be designed and maintained for protection against water currents, storm scouring, soft bottoms, and other environmental factors.
  - G. An external inspection of all pipelines by side scan sonar or other means acceptable to the Supervisor shall be made at least once each year to identify all exposed portions of pipelines. All exposed portions of pipelines shall then be inspected in detail by photographic or other means acceptable to the Supervisor to determine if any hazards exist to the line or other users of the area. If a hazard is found to exist, appropriate corrective action shall be taken. Records of these inspections including the date, methods, and results of each inspection, shall be maintained by the operator and submitted to the District Engineer when the records become available.
2. Application. The operator shall submit in duplicate the following to the District Engineer for forwarding and approval by the Supervisor:
- A. Drawing on a plat or plats showing the major features and other pertinent data including: (1) water depth, (2) route, (3) location, (4) length, (5) connecting facilities, (6) size, and (7) burial depth, if buried.

OCS Order No. 10

OCS Order No. 10, "DRILLING OF TWIN CORE HOLES," was of major significance during the years immediately preceding the February 6, 1968 lease sale in the Santa Barbara Channel. It allowed twinning of State-permitted core holes which had been drilled, under State jurisdiction, in the disputed area of the Santa Barbara Channel, following a 1965 Supreme Court decision that established the areas of State and Federal jurisdiction. Under this twin-coring program, 53 twin core holes were drilled, thus permitting a freer exchange of information among the potential bidders at the Santa Barbara Channel lease sale. Order No. 10 is still effective and authorizes the drilling of twin core holes on the unleased lands of the Outer Continental Shelf off the coast of southern California. However, it appears unlikely that there will be any such action in the near future.

OCS Order No. 11

OCS Order No. 11 entitled "OIL AND GAS PRODUCTION RATES, PREVENTION OF WASTE, AND PROTECTION OF CORRELATIVE RIGHTS," provides for the prevention of waste and conservation of the natural resources of the Outer Continental Shelf, the protection of correlative rights and is applicable to all oil and gas wells on Federal leases in the Outer Continental Shelf of the Pacific area.

Methods to establish oil and gas production rates are spelled out in OCS Order No. 11 and covers establishing, increasing, decreasing, conditions for cancellation, and justification for continuance by quarterly well test. The Order requires operators to submit plans and to initiate enhanced oil and gas recovery operations.

The Order prescribes balancing periods to establish continuous production

at the well's maximum production rate or the reservoir's maximum efficient rate. Provisions for mandatory balancing is provided for in OCS Order No. 11.

Provisions for flaring and venting are included in the Order to minimize waste and due considerations for economics and safety. An application for approval must include all appropriate engineering, geologic, economic data showing premature abandonment of oil and gas production or curtailment of lease development, and a comparison of additional oil and gas that would not be recovered should the application to flare or vent be rejected.

The Order requires well completions, enabling maximum efficient recovery control. Requirements are given for competitive reservoirs providing for definitions, development and production plans, and possible unitization. In the interest of conservation, the Conservation Manager can require unitization. Well testing requirements include provisions for type, frequency, and reporting.

OCS Order No. 11 includes provisions enabling the Conservation Manager to call conferences on his own initiative or at the request of interested parties. The Order requires copies of decisions be given to all interested parties and situations for appeals are provided for.

#### OCS Order No. 12

OCS Order No. 12 was established due to Public Law 90-23 "Public Information Act" requiring identifiable agency records be made available for inspection. It specifies which records may be available, and provides for appeals to the Solicitor of the Department of the Interior. Rules included in this order may result in increased production of oil and gas by making available useful information. OCS Order No. 12 enables dissemination of information in a fair, orderly manner and still keeping confidentiality of privileged documents.

h. Policies and Recommendations of the California Coastal Zone Conservation Commission on Petroleum Development

As noted earlier (section I.F.2.a.) the California legislature has two years, December 1975 through 1977, to act upon these policies and recommendations, and subsequently concurrence by the Department of Commerce is required for Federal status. Additionally local implementation plans are recommended by the Commission, and are to be completed within three years after California State adoption of the Plan (California Coastal Zone Conservation Commission, 1975).

The following policies specific to petroleum development are reproduced from p. 123-127 of the Plan. The USGS, along with numerous other agencies and entities commented on the Preliminary Coastal Plan through regular channels.

## Policies

**81. Basic Policy for Offshore Petroleum Development.** New offshore oil and gas development shall be permitted if:

- The Federal Government (for Federal Outer Continental Shelf lands) or the State Energy Commission, State Lands Commission, coastal agency, and other appropriate State agencies (for offshore State lands) have clearly identified development of the offshore petroleum resource as: (1) an integral and high-priority part of a comprehensive, balanced national energy conservation and development program that gives consideration to full-scale energy conservation programs, alternative energy source development, and short- and long-term resource availability; or (2) a necessary energy source for California and Petroleum Administration for Defense District V (PAD V, consisting of California, Arizona, Nevada, Oregon, Washington, Alaska, and Hawaii), considering energy conservation and alternative energy sources development measures and also considering the anticipated inflow to California and PAD V of oil and other forms of energy from all other sources (e.g., onshore oil production, Alaska North Slope oil and gas production, production

in other regions of Alaska, and foreign oil and gas imports) and California's projected capacities to refine and store the anticipated inflow of oil from these sources; and

- The coastal agency has determined that the possible impacts on coastal marine, air, and onshore resources resulting from offshore petroleum development are acceptable under the policies set forth in the Coastal Plan.

**82. Recommendation to Separate Permit Review of Petroleum Exploration Phase and Development/Production Phase.** In order that, prior to a decision whether to grant private companies the right to develop and produce publicly owned offshore and onshore petroleum resources in the coastal zone, as much data as possible can be acquired about the resources, their value, and the offshore and onshore environmental impacts of production, it is recommended that the present system for leasing State lands for oil and gas production be changed to separate permit review of the exploration phase from the development/production phase, as follows:

- a. **Exploratory Phase.** Exploratory drilling on a lease shall proceed only after (1) the State Lands Commission has prepared an environ-

mental impact report (EIR) on the exploratory phase activities; (2) the coastal agency has issued a permit for the exploratory phase activities; and (3) the State Lands Commission has approved an exploration program.

**b. Development and Production Phase.** Development and production shall proceed only after (1) the State Lands Commission has prepared an EIR on all aspects of the development and production phase; (2) the Energy Commission has made a formal finding of need for the oil and gas resources discovered during exploration; (3) the coastal agency has reviewed the Energy Commission's finding of need, evaluated the environmental and land use planning aspects of the development and production phase, and has issued a permit; (4) the Energy Commission, if it is given statewide authority for siting offshore and onshore oil and gas production activities and facilities (as recommended in Policy 76), has issued its certification; and (5) the State Lands Commission has approved a development and production program. The EIR on the development and production phase shall include one-, five-, and 10-year plans for development, production, and all related offshore and onshore development, including platforms, submerged production systems, pipelines, separation, treatment, and storage facilities, refineries, harbor facilities, and tanker terminals anticipated. It shall also describe the economic, environmental, and aesthetic impact on the immediate area and the entire coastal zone of offshore and onshore facilities and operations, including all transportation and distribution facilities, and all measures to mitigate any environmental hazards of onshore and offshore activities, including alternatives to the anticipated facilities, programs for containment and recovery of potential oil spills, and improvements in marine traffic lanes, navigational equipment, and traffic control. To the extent such information is not provided in the EIR, the coastal agency shall require that it be submitted during the coastal permit review. Following submission of an application for development and production that includes complete and adequate information about the resource and all proposed activities and facilities, a decision shall be rendered within a defined period of time, to be set by the Legislature. It is recommended that the Legislature also give full consideration to possible alterations in other aspects of leasing that may be complementary to the proposed separation of the exploration and pro-

duction decisions, including alternative forms of bidding that could reduce the size of cash bonus bids; government sponsorship of or participation in exploration; and appropriate compensation for any company denied the right to produce discovered petroleum reserves.

**c. If the Leasing System Is Not Changed.** If the present leasing system is not changed as recommended above, the EIR preparation and permit review process proposed above for the development and production phase shall be applied for all phases prior to granting permission for exploration.

**83. Criteria for Siting and Design of Petroleum Facilities.** On publicly or privately owned lands in the coastal zone, offshore and onshore drilling and production and related facilities shall be permitted where, in addition to the standards set forth in Policy 11, all of the following criteria are met. Compliance shall be required by the coastal agency as a condition of any required coastal permit, by the State Lands Commission as a condition of a lease on State-owned lands, and by the Division of Oil and Gas.

- a. Use Best Well Sites.** Proposed well sites shall be the least environmentally hazardous and aesthetically disruptive sites feasible.
- b. Assure Geologic Safety.** The geologic characteristics of proposed well sites shall be adequately evaluated and determined to be consistent with safe drilling and production.
- c. Consolidate Drilling, Production, and Processing Sites.** Petroleum-related facilities and operations shall be consolidated (i.e., drilling, production, separation facilities, and support sites shall be unitized — developed and operated as a unit by a single company or group of companies for the benefit of all interested companies — or shall be shared) to the maximum extent feasible and legally permissible, unless such consolidation will have adverse environmental consequences and will not significantly reduce the number of producing wells, support facilities, or sites required to produce the reservoir economically and with minimal environmental impacts. Unitization negotiations shall be entered into by all operators covering one producing structure, and unitization of a new offshore field shall be carried out before commercial production is initiated. The unitization or consolidation requirements shall apply to (1) all types of offshore platforms; (2) submerged production systems; (3) onshore drilling and

production facilities; (4) pipelines; (5) separation, treatment, and storage facilities; (6) transfer terminals related to petroleum production; (7) rights-of-way for transporting produced oil and gas; (8) equipment lay-down areas; and (9) port facilities to supply and service offshore platforms.

**d. Use Submerged Systems Where Feasible and Environmentally Safe.** Subsea completion of wells and submerged production systems shall be used where environmentally safe, as demonstrated through adequate testing of equipment by industry, observed by the appropriate government agencies, and where technically and economically feasible. Where oil platforms or islands would have a substantial adverse environmental effect, including degradation of aesthetic values, no offshore drilling shall be permitted unless and until subsea completions or submerged production systems are demonstrated to be environmentally safe.

**e. Platforms Preferred Over Islands; Minimize Impact of Platforms.** Where subsea drilling, completion, or production is found to be infeasible or environmentally unsafe, thereby making platforms or islands necessary to development of the resource, or where platforms are necessary to service subsea systems, the following criteria shall apply:

- Platforms shall be preferred over islands wherever safety considerations permit.
- The number of offshore platforms shall be minimized by using each platform to drill as many wells, and/or to service as many subsea completion and production systems, as is technically and economically feasible.
- The design of the platforms or islands shall be consistent with the general design criteria of the Coastal Plan and shall be subject to review and approval by the immediately landward local governments as well as by the coastal agency and State Lands Commission.
- The waters surrounding new platforms or islands shall be open to sport fishing, diving, and boating, consistent with boating safety rules and practices.
- If an island is determined to be needed, multi-purpose public interest uses, including small-boat landing piers and amenity public recreation areas, scientific and educational facilities (e.g., marine biology, oceanography and meteorology research stations), Coast Guard or U.S. Weather Service station, or aquaculture operations, shall be incorporated

into the project to the extent technically and economically feasible and consistent with public safety and other policies of the Coastal Plan.

- All water that contacts working surfaces of oil islands (including rain runoff) shall be contained and not allowed to drain in an untreated state into the ocean. Treatment shall be adequate to remove essentially all petroleum or unnatural amounts of chemical residues from the estimated maximum amounts of runoff water.
- Platforms or islands shall not be sited where a hazard to vessel traffic might result from the facility or related operations. Platforms shall not be permitted until a navigational safety system for coastal waters is in effect, in accordance with Policy 119.

**f. Minimize Impact of Petroleum Facilities**

**Onshore.** Drilling, production, and support facilities onshore, including separation and treatment plants, pipelines, transfer terminals, storage facilities, and equipment lay-down areas, shall be designed and located to minimize their adverse environmental impacts consistent with recovery of the resource. Where such onshore development would result in substantial impacts on the resources of the coastal zone, it shall be permitted only where there is a need for the project (as specified in Policy 81), where feasible alternatives would have a greater adverse environmental impact, and technology that would substantially reduce such impacts will not be available in the immediate future (e.g., new technology for carrying out subsea production, oil and gas separation, storage, and natural gas liquefaction that might reduce the need for large onshore facilities).

**g. Prevent Subsidence; Reinject Oil Field Brines.**

Liquid and gas extraction projects that could cause or contribute to subsidence hazard (where there is a potential for significant present or future damage to property or environment) shall be prohibited; such existing operations shall be stopped, unless it is determined that there is no reasonable alternative. In such cases, the best available techniques for minimizing or preventing land subsidence shall be utilized. Lease or unit operators constructing new facilities shall reinject all oil field brines into oil producing zones unless injection into other subsurface zones will reduce environmental risks. Exceptions to reinjection will be granted only after approval by the appro-

appropriate agencies (including the Regional Water Quality Control Board) of detailed plans adequately providing for the elimination of petroleum odors and all potential fresh water or ocean water quality problems. Monitoring programs to record land surface and nearshore ocean floor movements shall be continued in all areas of subsidence problems and shall be initiated in locations of new large-scale fluid extraction on land or nearshore before operations begin. Such monitoring shall continue during and after liquid and gas extraction operations until surface conditions have stabilized. Costs of monitoring and mitigation programs shall be borne by liquid and gas extraction operations, overseen by an appropriate State agency.

**84. Recommendations for Increasing Oil Recovery Efficiency.** It is recommended that the Legislature (1) enact legislation to require the California Division of Oil and Gas and the State Lands Commission to regulate petroleum completion and production for individual wells, including setting maximum efficient rates of production, as analogous government agencies do in other major oil-producing states; and (2) adopt a resolution calling for the Federal Energy Administration to encourage primary, secondary, and tertiary production from existing wells.

**85. Recommendation for Disclosing Exploration and Production Data.** To improve the information base for State energy planning and to encourage exploratory activities, thereby encouraging possible petroleum discovery and production both onshore (where petroleum activities are environmentally preferable) and offshore, it is recommended that the Legislature require all original exploratory and production data from surveys or drilling of wells (including all logs, complete well histories, cores, drilling cutting, water samples, chemical analyses, pressure and temperature measurements, etc., but excluding proprietary interpretive information) on publicly or privately owned California lands to be submitted within 60 days after finishing to the Division of Oil and Gas, with appropriate assurances of strict confidentiality, and to be made public information one year after submittal, except that where such public disclosure would result in severe inequity to a well operator, year-to-year extensions of confidentiality may be granted by the Division of Oil and Gas. The Energy Commission and the State Lands Commission shall be allowed access to all such data on a confidential basis for the purposes of energy resource development planning.

**86. Recommendations for Avoiding Adverse Impacts of Federal OCS Petroleum Development.** It is recommended that the Governor, the Legislature, the California congressional delegation, and all concerned State agencies seek agreement from the Department of Interior and other Federal authorities that Federal Outer Continental Shelf (OCS) leases will be approved by the Department of Interior only if the following conditions are met:

- a. **Demonstration of Need.** Need for Federal OCS development off California shall be clearly determined as required in Policy 81.
- b. **Develop and Disclose Long-Term Plans.** One-, five-, and ten-year plans for petroleum production and all related development as described above in Policy 82, and their impacts on the California coast, shall be fully developed and disclosed. It is recommended that the present leasing system be changed to separate pre-production exploration from the decision to develop and produce on a lease, in order that data about the OCS resource, its value, and the offshore and onshore environmental and planning implications of developing and producing the resource can be accumulated prior to a decision as to whether private companies should be given the right to produce.
- c. **Provide for Public Review.** Opportunities for effective review of proposed OCS exploration and development plans shall be provided for the general public, interested units of State, regional, and local government, and other segments of the communities most immediately affected by OCS development activities.
- d. **Prevent Drainage of State Petroleum Sanctuaries.** The leases in question shall be sufficiently separated from the State petroleum sanctuaries to prevent drainage of oil and gas reservoirs that may lie partially on State submerged lands.
- e. **Establish Stringent Safety Standards.** Petroleum production under Federal jurisdiction off the California coast shall be made subject to safety standards at least as stringent as those for production on State-regulated offshore areas, including those contained in the California Division of Oil and Gas regulations and the manual of procedures of the State Lands Division and standards set forth in Coastal Plan policies. (See especially Policies 11, 83, and 119.)
- f. **Evaluate Unitization or Consolidation Possibilities.** The possibility of unitization or consolidation of all operations and facilities both offshore and onshore shall be fully evaluated and required where feasible, as described in Policy 83(c) for California operations.



**g. Consider Use of Subsea Systems.** The possibility of use of submerged drilling, completion, and production systems that have been adequately tested to meet rigid environmental safety standards shall be fully evaluated as a partial alternative to platforms and required where technically and economically feasible, except where use of platforms would not cause any significant adverse aesthetic or other environmental impact.

**h. Some OCS Revenues Should Go to States.**

It is recommended that the Federal government provide funds to California and to other coastal states prior to leasing, with the funds to be reimbursed either through a fee related to production volumes, or by making available a portion of its revenues from OCS lease sales or production royalties, or by granting funds from some other source, to assist the State and local governments in (1) planning for and overcoming or mitigating any adverse impact of this production (e.g., planning for transportation terminals, additional refineries, pipelines, sepa-

ration, treatment, and storage facilities, and other support facilities in a way that minimizes environmental impacts); and (2) purchasing land for recreation or providing other amenities along the coast to help offset the impact of OCS development.

**i. Designate Sanctuaries in Certain Areas.**

Sites and tracts shall be designated as Federal petroleum resource sanctuaries (1) if they are unusually subject to the risk of oil spills due to geological seismic disturbance; or (2) if they offer unusual coastal aesthetic assets or the local economy is particularly dependent upon the protection of coastal aesthetic assets. Portions of the Santa Barbara Channel, Monterey Bay, Santa Monica Bay, and San Pedro Bay would appear to be candidates for sanctuary status.

**j. Compatibility with Coastal Plan Policies.**

Federal OCS development and related activities shall be compatible with all other policies set forth in the Coastal Plan.

2. Inspection Programs and Approval Requirements -  
U. S. Geological Survey

To see that the Geological Survey Regulations and OCS Orders are fully observed, a comprehensive inspection system has been developed. OCS operators must receive approval before commencing any work. Operators are required to submit a notice and detailed description of all work they desire to perform. All applications to drill are submitted to the District Engineer, and are thoroughly reviewed and analyzed prior to approval or recommendation for approval to the Supervisor. Simple procedures such as removing, servicing, or replacing a sub-surface valve, modifying a header, flowline, or other piping, also require approval. Each procedure or application is reviewed by a petroleum engineer. If necessary, the program is either discussed with the operator or additional information is requested and reviewed prior to approval. The objective in this requirement for advanced approval is to insure that no operation is conducted without thorough planning for safety, conservation, and protection of the environment, and to determine that all operations meet the requirements established by the revised regulations and OCS Orders.

Santa Barbara Channel OCS operation inspections are performed by the Santa Barbara District office. Before the January 28, 1969 Platform A spill, one petroleum engineer and one engineering technician were assigned to the Santa Barbara District. The Santa Babara District staff presently/consists of three (February 1976) petroleum engineers and eight engineering technicians. The engineering technicians spend nearly full time in the field. The Assistant District Engineer divides his time between the office and the field and the District

Engineer spends most of his time in the office. The eight engineering technicians spend an average of 300 man-hours per week inspecting operations in the Santa Barbara Channel, where currently there are five OCS platforms and two onshore facilities receiving production from the platforms. At present two floating drilling vessels operate in the Santa Barbara Channel; except for brief intervals, no more than two floating drilling vessels have operated at the same time. The ratio of Santa Barbara District personnel to the number of Santa Barbara Channel operations has permitted the Geological Survey to scrutinize closely all operations. In addition to this detailed field supervision provided by the Santa Barbara District, the Pacific Area office, the Western Region office, and the Geological Survey headquarters also closely follow and direct the Santa Barbara Channel operations.

a. On-Site Inspections

All operations, regardless of the activity, receive regular on-site inspection for compliance with the regulations and OCS Orders. Operations in the Dos Cuadras field (Platform Hillhouse, Lease OCS-P 0240, and Platforms A and B, Lease OCS-P 0241) are inspected daily. The inspector is on the facility for an 8-hour period, randomly observing various operations, testing equipment, and checking for pollution. The production and drilling decks are checked at least three times during this inspection period. Conversation with operating and contract personnel has proven to be a worthwhile means of being alerted to potential hazards and the need to replace or modify existing equipment. Platforms Hogan and Houchin, Lease OCS-P 0166 are inspected at least once a week. Critical operations are observed regardless of what time of day or night they occur.

Two onshore processing facilities handle all of the Federal OCS lease fluid and gas production. The production from Lease OCS-P 0166 is processed at the Phillips La Conchita plant and production from Leases OCS-P 0240 and OCS-P 0241 is processed at the Mobil Sea Cliff plant; both plants are near Rincon Point. These two plants are inspected weekly. Also Lease Automatic Custody Transfer (LACT) meter provings are regularly monitored at these two onshore facilities.

If a floating drilling vessel or drilling unit has not been in service for some time or if a drilling unit is new to the area, a

detailed inspection is performed to insure conformance with regulations and OCS Orders, before commencement of drilling operations. These predrilling inspections are comprehensive and often require several days to complete. After a well has been spudded and normal drilling is in progress, drilling inspections are performed at least weekly. It is not uncommon to make daily drilling inspections at certain wells. Again, all critical phases of drilling operation are observed whatever time during the day or night they may occur. Critical phases include, but are not limited to, casing-cementing operations, casing and blowout equipment pressure tests, line-lap pressure tests, wireline work, drill-stem formation tests, and any other tests or operations not considered to be routine.

When a well is either abandoned or suspended, a Geological Survey inspector witnesses the setting of all required cement plugs, the cutting off of the several casing strings below the sea floor, and the removal of all subsea equipment.

b. Semi-Annual Inspections and Enforcement Procedures

In addition to the daily and weekly inspections, and the observation of all critical operations, each onshore and offshore facility is subjected to a 6-month inspection. During this comprehensive test, an inspection team tests each safety device and piece of equipment as required by the OCS Orders. If the device or equipment malfunctions, it must be repaired or replaced. During a typical inspection, approximately 650 items are tested at a facility. All malfunctioning equipment and incidents of noncompliance

(INC) must be immediately corrected by the operator. Normally these detailed inspections require 2 weeks for the inspection team to inspect one onshore or offshore facility.

Following is a tabulation of INC's that were issued for Santa Barbara Channel Platforms A and B, lease OCS-P 0240 during seven semi-annual inspections.

<u>Inspection Date</u>	<u>Platform A</u>	<u>Platform B</u>
March 1974	5	8
Sept. 1973	8	7
March 1972	35	10
Dec. 1972	44	30
June 1972	35	26
Jan. 1972	15	10
June 1971	122	113

The June 1971 semi-annual inspection was the first of this type detailed inspection. It must be kept in mind that for example the 5 incidents of noncompliance (INC's) issued for Platform A during the March 1974 inspection were minor in nature and resulted from the testing of approximately 2,400 items (there are thousands of potential INC's).

c. Other Inspections

In addition to inspecting and witnessing operations, beach walks are frequently made to check for oil pollution. Fixed-wing aircraft and helicopter flights are made (normally biweekly) to check for oil pollution and to chart the natural oil seepage. Also, boat surveys are made in immediate areas of operation and many points in the Santa Barbara Channel to check for oil pollution. These beach walks and aerial and boat surveillances cover an area from Point Conception to Port Hueneme.

The testing of new oil-spill containment and cleanup equipment in the Santa

Barbara Channel is frequently witnessed.

Also inspected are the areas utilized by various oil companies and Clean Seas, Inc., for storing booms, skimmers, pumps, barges, and other oil-spill containment and cleanup equipment.

### 3. Enforcement

The enforcement policy is intended to reduce the frequency of noncompliance with lease requirements that may lead to loss of life, loss of property and resources, or damage to the environment. In 1971 new and more detailed standardized inspection procedures were established for OCS operations. The requirements in the OCS Orders and Regulations were expressed as a check list of specific items relating to safety equipment and procedures. The items reflect the existence of potentially hazardous conditions if the specified equipment is missing or not operable, or specified procedures are not followed. This compilation of items is titled "List of Potential Items of Noncompliance and Enforcement Action," and referred to as the (PINC) list. The Santa Barbara District has prepared a PINC list, consisting of approximately 2,400 items, for each platform and onshore facility.

During the inspection of drilling and production operations, depending on the hazard presented toward safety or pollution, either a written warning is given that allows the operator 7 days to correct the incident of non-compliance (INC), or a shut-in order is issued. The shut-in order may be applied only to the equipment affected by the incident of noncompliance (INC), such as a particular piece of production equipment or a producing zone, or to the entire drilling rig, production platform, or onshore facility. To date, in the Santa Barbara Channel, incidents of noncompliance have been

minor in nature, requiring only a warning that corrections be made within 7 days. The operators have never failed to comply within the 7-day limit except on a few occasions whereby the operator acquired an extension of several days from the Geological Survey.

There have been a few cases where the operator was required to immediately bypass a particular piece of equipment until it was repaired or replaced and in certain instances this in turn necessitated that production be temporarily cut back or that drilling be temporarily interrupted.

Additional penalties for noncompliance are specified in sec. 5(a)(2) of the Outer Continental Shelf Lands Act (43 U.S.C. sec. 1334(a)(2)). "Any person who knowingly and willfully violates any rule or regulation prescribed by the Secretary for the prevention of waste, the conservation of natural resources, or the protection of correlative rights shall be deemed guilty of a misdemeanor and punishable by a fine of not more than \$2,000 or by imprisonment, and each day of the violation shall be deemed a separate offense." Also sec. 5(b)(1) and (2) provide for cancellation by notice of nonproducing and producing leases subject to judicial review or appropriate judicial proceedings.

#### 4. Contingency Plans

Oil spills occasionally occur as a result of natural disasters, equipment failure, or human error. For this reason OCS Order No. 7 sets forth a reporting procedure for notifying appropriate persons and agencies and requires that immediate corrective action be taken.<sup>1</sup> Additionally, it requires that all OCS operators have an approved spill contingency plan

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<sup>1</sup> Earlier in this section OCS Order No. 7 was discussed and excerpts were included.

which includes spill cleanup and containment equipment. This pollution control equipment may be maintained on the particular facility or, at the discretion of the Area Supervisor, may be land based. The operators in the Santa Barbara Channel have pooled resources and formed Clean Seas, Incorporated, to supplement their individual spill cleanup contingency plans. Additionally, there is the National Contingency Plan which in turn requires Regional Contingency Plans.

a. Organizations Formed by Companies for Spill Containment and Removal

During the past 5 years, organizations have been formed, along the Pacific Coast, for pollution control; these function in the manner of fire stations. These organizations are of two basic types: (1) a nonprofit corporation which has its own equipment; or (2) a cooperative organization which has contracted for the use of local, privately owned equipment.

The Washington State Oil Spill Cooperative operates off the State of Washington. Although this organization covers all of the coast of Washington, its primary area of interest is Puget Sound. The Oregon State Oil Spill Cooperative is headquartered in Portland. It has been organized to contain and remove any oil spillage on either the coastline or rivers of Oregon. A small cooperative has been formed at Eureka, California, and operates off the northern California coast. In the San Francisco area, a corporation known as Clean Bay, Incorporated has been founded. In the Santa Barbara Channel, some 15 State and Federal lease operators have formed a nonprofit corporation called Clean Seas, Incorporated. In the Los



Angeles-Long Beach-San Diego area, there is a cooperative group known as P.I.C.E., which is an acronym for Petroleum Industry Coastal Emergency Cooperative (recently changed to "Clean Coastal Waters"). These six cooperative groups provide complete coverage of the Pacific Coast between the Canadian Mexico borders. In addition, similar type groups are presently being formed in Alaska, Canada, and Hawaii. These nine organizations are referred to as the "Pacific Basin Oil Spill Cleanup Organizations."

Inasmuch as Clean Seas, Incorporated, is the emergency cooperative that covers the Santa Barbara Channel, it will be discussed in more detail.

b. Clean Seas, Incorporated

Clean Seas, Incorporated, (CSI), is comprised of 15 oil companies operating in the Santa Barbara Channel Area. The membership agreement allows the member companies involved to supplement their individual contingency plans by using all, or any part of, the CSI organization. CSI is also available to nonmembers and government agencies such as the Coast Guard, the Environmental Protection Agency, and the Navy for combating oil spills related to nonmembers.

The managers of the Pacific Basin Oil Spill Cleanup Organizations meet in planning sessions approximately every 3 months. One beneficial product of these meetings is a mutual assistance agreement, involving Clean Seas, Inc., Clean Bay, Inc., and the other clean-up

organizations, providing Clean Seas, Incorporated, with considerable back-up equipment to support its own inventory. Provisions can be made for the rapid transportation of this equipment by Coast Guard C-130 aircraft or helicopter. The Coast Guard and Navy also have spill containment and clean-up equipment that will be made available for spill situations meriting such action. Following is an inventory of CSI basic equipment on hand as of November 1975.

(1) Inventory of Equipment and Materials-Status  
as of November 1975

(a) Containment

● 2,000' Bottom-Tension Boom:

This is a heavy duty, open ocean containment boom with 4' x 13' floats and 8' curtain, extending 3-1/2' above water line and 4-1/2' below water line. Usually stored on land and deployed from beach; requiring 24 hours for 1,000' length if unassembled. At the present time Clean Seas Incorporated is working on an assembled mode storage on land.

Capability:

Will contain oil in 6-8 foot significant waves and winds to 25 knots at currents up to 1-1/4 knots.

● 1,600' Vikoma Seapack and Seaboom

2 units

For very fast response to oil spills, the VIKOMA Seapack with 1,600' of Seaboom has been purchased. Seapack is based on a 23 foot hull and contains 1,600' of Seaboom connected at one end to a diesel driven fan and ducted propeller water pump. The VIKOMA Seapack unit can be transported by road trailer, towed by a small vessel or carried on a workboat or tanker. It could also be transported by aircraft.

Capability:

Experience in the English Channel and by the Swedish Coast Guard over the past several years indicated this boom can be on a scene and deployed in less than an hour. It is effective in preventing spread of oil in significant waves up to 6 feet and winds of 20 to 25 knots. In the mode in which this boom is used, there is little or no current across boom which could cause loss of oil due to

underflow. CSI exercises with this boom would parallel the Swedish Coast Guard's response and deployment time. Response is the major factor. Deployment is instantaneously accomplished on arrival at the site, 10-12 minutes.

- Harbor Protection Booms:

- 2,000 feet medium duty boom (16" x 12" skirt - Kepner Sea Curtain) for harbor protection.
- 2,000 feet light duty boom (8" x 12" skirt - Kepner Sea Curtain) for secondary harbor protection.
- 1,210 feet Goodyear Sea Sentury medium duty boom 12-1/2" x 24", without fence in 55 foot sections) for harbor protection.
- 1,000 feet Expandi medium duty oil boom (12" x 18" skirt). This boom may be used for offshore rapid deployment for containment as well as harbor protection.

(b) Recovery

- CSI Skimmer System:

One (1) CSI Skimmer System consisting of 45' x 17' x 6' catamaran-type adjustable weir skimmer barge, two 240' lengths of 30" Kepner Sea Curtain Boom, a 2,000 GPM pumping system and two (2) 100 barrel oil-water, separation tanks. For fast response, the skimmer with boom on board is anchored in Santa Barbara Harbor.

Capability:

This system is capable of recovering all grades of oil from light to bunker C at rates up to 2,000 GPM plus some debris and sorbent material in moderate sea states. Modification to this skimmer will eliminate the necessity of the tanks by installing a pump onboard and a 5,000 gallon floating storage bag.

- Sea Dragon:

One (1) Sea Dragon Skimmer System consisting of a 45' x 26' x 8' catamaran-type barge equipped with a liquid oil recovery system and a conveyor system for recovery of sorbent and debris, two 240' lengths of 30" Kepner Sea Curtain Boom and hydraulic system driven by a Niesen power package. The skimmer barge is anchored in Santa Barbara Harbor.

Capability:

This system is capable of recovering all grades of oil from light to bunker C at rates up to 150 GPM plus large amounts of debris and sorbent material in moderate sea states.

- Mark-II Skimmer:

Two (2) Mark-II Skimmers, 14' x 30' weir type are available in Carpinteria Yard. These may be used, one on each side of a vessel or may be used singularly with a vessel. Recovery system can be either an 80-barrel, skid mounted vacuum tank or compressed air driven Wilden pumps and 100 bbl. oil-water separation tanks, all of which are available.

Capability:

These are very simple skimmers and may be used in a number of ways to solve the particular problem at hand. All grades of oil from light to bunker C can be recovered plus small amounts of debris. Fluid recovery rates from 50 GPM to 200 GPM are available. These skimmers are limited to light winds and light sea states. Trailers capable of carrying these skimmers on the highway have been constructed. Also, one of these skimmers has been equipped with an O/B motor, self-contained pump and 1,200 gallon floating storage bag.

- Work Boat:

One (1) 19' Larson skiff with 125 HP Johnson motor kept in Santa Barbara Harbor for use as work boat around skimmers and barge.  
One (1) 14' Valco Skiff with 15 HP O/B kept in CSI's Carpinteria Yard.

- Truck:

One (1) 2 1/2-tone used to tow Vikoma Seapack, boats, haul boom, absorbents, etc.

- Compressor:

One (1) Gardner-Denver 600 cfm rotary, diesel engine driven, wheel mounted compressor stored in Carpinteria Yard. Usually used with air tools and to drive the Exxon Floating Weir skimmers, Acme skimmers or the Wilden pumps.

- Lines, Hoses, Tools:

Complete set of all necessary sizes of nylon and polypropylene lines for deploying and towing booms and skimmers. Hoses of 2", 3" and 6" size for skimmers, all fitted with Camlock fittings. Air hoses for compressor. Complete sets of tools for all equipment.

- Radio Communications System:

A complete, clear channel, radio system on 40.04-48.62 MHz., provides solid communication throughout the CSI area of interest. This system consists of:

1 base station in Santa Barbara office  
1 base station in Carpinteria Warehouse  
1 portable base station  
1 repeater on Santa Ynez Peak  
1 mobile unit in Manager's car  
14 portable Handie-Talkie Units

- Oil Mop MK-11-9:

One (1) MK-11-9 Oil Mop System consisting of a two-wheel trailer, Oil Mop Machine, Tail Pulleys and 400' of 9" Mop. Stored at CSI's Carpinteria Yard.

Capability:

This system is primarily used in protected waters, will recover all grades of oil. Maximum capacity 100 bbls/hr.

- 40' Enclosed Trailer Vans:

Two (2) Trailers stocked with booms, absorbents, small skimmer, miscellaneous cleanup equipment. Will be stored in CSI's Carpinteria Yard at this time.

- Exxon Floating Weir Skimmers:

Three (3) Floating Weir Skimmers, compressed air driven Acme-type pump, are available in Carpinteria Yard. These were designed to collect oil concentrated in the B-T Boom area and work best in thick concentrations of oil. Also, ideal for recovery of oil in harbor areas and quiet waters.

Capability:

These skimmers will handle light to fairly heavy oil with no debris in 2-3 foot waves. Fluid recovery rates are up to 300 GPM for each skimmer.

- One (1) Acme 39T

Gasoline or air driven pump, available in Carpinteria Storage Yard. This pump is designed to collect oil in somewhat heavy concentration. Ideal for harbor areas. Will recover oil in open ocean in light seas. Fluid recovery rates up to 340 GPM. Light in weight can be handled by two men.

One (1) Acme 51T

Same as above and will recover oil in open ocean in light to moderate seas.

- Tide-Mar VII Barge:

One (1) 641-ton tank barge, Tide-Mar VII, for collecting oil picked up by skimmers as they work in an oil spill. This is a 160'x39'x13'

ocean-going barge with 10 tanks, capacity of 7,840 barrels, and six diesel engine driven pumps. Presently moored in the harbor at Port Hueneme, California.

- Air Driven Pumps:

Two (2) M15 Wilden double diaphragm pumps.

- Floating Storage Bags:

(For interim storage awaiting transfer)

2 - 5,000-gallon Kepner Floating Storage Bags

2 - 1,200-gallon Kepner Floating Storage Bags

(c) Miscellaneous

- Absorbents and Chemicals:

A large inventory of absorbents, including, Conwed: sweeps, blankets, booms, rugs; 3-M: sweeps, sheets and booms, and Dow Imbibers: bags and blankets, also, smaller quantities of Oil Herder, are kept in the Carpinteria Warehouse. Additional quantities are available as "back-up" from warehouses in the Los Angeles area.

c. National Oil and Hazardous Substances Pollution Contingency Plan

The National Oil and Hazardous Substances Pollution Contingency Plan was developed pursuant to the provisions of the Federal Water Pollution Control Act as amended. Section 11(c)(2) of that statute authorizes the President to prepare and publish such a plan. The National Contingency Plan was developed by the Council on Environmental Quality (CEQ) in June 1970, and revised in August 1971. The revised National Contingency Plan, after publication in the Federal Register (36 F.R. 162, August 20, 1971, p. 16215 et seq.), and amended on September 9, 1972 and December 21 1972, became the required national procedure for response to spills of oil and hazardous material. A new National Contingency Plan has been prepared by CEQ and published in the Federal Register (38 F.R. 155, Part II, August 13, 1973). This new Plan supersedes the one set forth in the Federal Register of August 20, 1971 (36 F.R. 16215) as amended on September 9, 1972 and December 21, 1972. The new National Contingency Plan has been prepared

in conjunction with the National Response Team in light of both operating experience under the 1971 Plan and new requirements contained in Public Law 92-500.

The plan is effective for all United States navigable waters, their tributaries, and adjoining shorelines. This includes inland rivers, the Great Lakes, coastal territorial waters, the contiguous zone, and high seas where there exists a threat to U. S. waters, shore-face, or shelf-bottom.

Implementation of the objectives of the National Contingency Plan requires that a nationwide net of detailed regional contingency plans be developed. The U. S. Department of Transportation (Coast Guard) is responsible for regional plans for coastal waters and the Environmental Protection Agency (EPA) is responsible for regional plans for inland waters.<sup>1</sup> The regional plan covering the Santa Barbara Channel waters will be discussed in detail inasmuch as it is the plan likely to be involved should a spill result from Santa Barbara Channel operations.

d. Region Nine Multi-Agency Oil and Hazardous Materials Pollution Contingency Plan

The Region Nine Contingency Plan, prepared by the Coast Guard, is effective for coastal waters within the Standard Federal Administrative Region Nine, which is the area of California, Hawaii, Guam, American Samoa and the U. S. Trust Territory of the Pacific Islands. The Region Nine Contingency Plan was issued by the Commander, Twelfth Coast Guard District, December 1970 and revised December 1971.

This plan provides for a pattern of coordinated and integrated response by departments and agencies of the Federal Government to protect the environment from damaging effects of spills. It also promotes the coordination and direction of Federal, State, and local response systems and encourages the development of local government and private capabilities to handle spills. The Region Nine Contingency Plan provides for and describes the functions of a Regional Response Team (RRT) and an on-Scene Coordinator (OSC).

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<sup>1</sup>The Coast Guard and the Environmental Protection Agency have an agreement as to geographic areas of responsibility relating to coastal waters and inland waters.

The roles of the RRT and the OSC as related to spills resulting from oil and gas operations will be further discussed later in this section.

Region Nine is divided into sub-regions and zones for pollution planning purposes. Therefore the Region Nine Contingency Plan contains five appendices, one for each sub-region. The California Sub-region is divided into two zones, southern California (includes the Santa Barbara Channel) and northern California. The Appendix for California (Appendix I) is divided into two sections. The five appendices, one for each State and Territory are listed below:

- Appendix I - California (Sub-region one)
  - Zone One Section - southern California (includes Santa Barbara Channel)<sup>1</sup>
  - Zone Two Section - northern California
- Appendix II - Hawaii (Sub-region Two)
- Appendix III - American Samoa (Sub-region Three)
- Appendix IV - Territory of Guam (Sub-region Four)
- Appendix V - The Trust Territories of the Pacific Islands (Sub-region Five)

There are three Coast Guard districts within Region Nine: the Eleventh headquarters in Long Beach which is responsible for Appendix I, zone one; the Twelfth headquarters in San Francisco

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<sup>1</sup> Appendix I, Sub-region One, Zone One Section contains detailed, specific data that would be applicable to a Santa Barbara Channel spill.



which is responsible for Appendix I, zone two; and the Fourteenth Coast Guard District, Honolulu, which is responsible for Appendices II, III, IV, and V.

For Sub-region One, zone one (the Southern California zone including the Santa Barbara Channel) the pre-designated On-Scene Coordinator (OSC) is the Commander, Eleventh Coast Guard District. In order to more effectively coordinate cleanup activities and to expeditiously establish and maintain liaison with local communities, the Commander, Eleventh Coast Guard District has delegated the responsibility of OSC as follows:

- Captain of the Port, San Diego - for waters adjacent to San Diego County.
- Captain of the Port, Los Angeles/Long Beach - for waters adjacent to Los Angeles and Orange Counties.
- Commander, Coast Guard Group Santa Barbara - for waters adjacent to Santa Barbara and Ventura Counties (the Santa Barbara Channel area)

The Eleventh Coast Guard District, with the help of State and Federal agencies such as the California Department of Fish and and the Bureau of Sports Fisheries & Wildlife, has compiled hundreds of pages of data for the southern California area, to aid the OSC in advising and making decisions during an oil-spill emergency. These data consist of such information as: coastline characteristics (shore and shoreline, accesses, outfall and inlets, beach usage, property owners controlling beach access, etc.), critical water uses,

marine biological factors, meteorological and climatological factors, oceanographic factors (i.e., current patterns, water characteristics). A portion of these data are physically incorporated into the Regional Contingency Plan; the remainder are on file and readily available. These data would be used to predict the movement of an oil spill and to determine the order of priority for protection and clean-up of certain areas.

(1) Regional Response Team and On-Scene Coordinator Functions

In the event of a spill originating from an oil and gas operation, the spiller is responsible for combating the spill. The Coast Guard OSC is to determine pertinent facts about the particular spill and give advice and assistance. If it is determined by the OSC and the RRT that the spiller is not capable of, or is not willing to, adequately combat the spill, the OSC will take over control of the operation and become the On-Scene Commander rather than On-Scene Coordinator.

The Commanders of the Coast Guard Districts are responsible for chairing the regular RRT meetings and activating the RRT in the event of a spill situation meriting such action. The RRT consists of regional representatives of the primary and selected advising agencies, as appropriate. Twice in 1972, the RRT Chairman has arranged simulated oil spills (one in the San Francisco Bay and one in the Santa Barbara Channel) to determine how the RRT and private concerns, such as oil companies and Clean Seas, Inc., would respond. These practices pointed out the need for more efficient communication and coordination between Federal agencies, State agencies, and private organizations such as Clean Seas, Inc. Appropriate private organizations are frequently invited.

to attend the regular RRT meetings. The Coast Guard and Navy are Government members of the RRT with capability to supply oil-spill-combating equipment, and will do so for spills originating from oil and gas operations if the situation justifies such action.

The RRT advises the OSC during time of emergency and performs review and advisory functions relative to the regional plan. Additionally the RRT helps to determine if and when the On-Scene Coordinator should take over a spill-combating operation. The OSC is to fully inform and coordinate closely with the RRT to ensure the maximum effectiveness of the Federal effort to protect the natural resources and the environment from pollution damage.

(2) U. S. Geological Survey and U. S. Coast Guard Responsibilities

A memorandum of understanding between the Departments of the Interior and Transportation outlines the respective responsibilities of the Geological Survey and the Coast Guard as to spills originating from oil and gas operations. It spells out that the Geological Survey is responsible for the coordination and direction of measures to abate the source of pollution. The Coast Guard is responsible for containment and removal operations.

In 1973 it was determined that the Geological Survey and Coast Guard areas of responsibilities should be more specifically covered in the Regional Contingency Plan. A section (designated as Tab J) has been added to Appendix I of the Region Nine Contingency Plan,

describing the respective areas of responsibility and jurisdiction. Whereas the above-mentioned memorandum of understanding covers OCS oil and gas operations, the Tab J section, included in the Regional Contingency Plan, additionally covers the responsibilities of the California State Division of Oil and Gas and the Coast Guard as to spills originating from oil and gas operations in State waters.

This Tab J section points out that abatement activities have priority over containment and removal operations. It also points out that the use of dispersants and other chemicals must be in accordance with Annex X of the Region Nine Contingency Plan.

e. California Oil Spill Disaster Contingency Plan

The State of California has developed the California Oil Spill Contingency Plan. This State Plan is similar to the National and Regional Contingency Plans but has been written from the standpoint of the State of California and the State agencies. It was framed in such a way as to serve as an extension of the Federal Plans. It provides also for the State's response organizations to act, whether or not Federal forces are activated. The State Contingency Plan provides for a State Operating Authority (SOA), and the SOA is charged with the responsibility and delegated authority for planning and directing the coordinated overall operations for all State and local government agencies engaged in helping to combat a spill. The SOA coordinates these operations with Federal agencies and private organizations and regularly participates

in the Regional Response Team meetings. The SOA, under the leadership of the Federal On-Scene Coordinator, directs the State and local government agency oil spill response operations. The State Oil Spill Contingency was revised March 1974.

#### 5. Status of Oil Spill Containment and Cleanup Technology

Government, industry, and universities have pursued multi-million dollar research programs since the 1969 Platform A, Santa Barbara Channel oil spill to improve procedures and equipment to effectively deal with offshore oil spills. To date, however, no system or equipment has been developed which is completely effective in controlling and removing pollution under all weather and sea conditions. Development of improved systems is being continued at an accelerated level and the state of the art is improving rapidly.

As a result of the Platform A blowout and the resulting subsequent pollution, the California State Lands Commission, in February 1969 revoked all existing exploration drilling permits and imposed a moratorium on all new drilling on existing State offshore leases. The basis for the moratorium, according to the State Lands Commission, was "the lagging state of technology in providing reliable oil containment and recovery techniques and devices." Due to advancing state of the art, on December 11, 1973, the State Lands Commission lifted the five year moratorium. The three member commission unanimously adopted a staff report indicating the oil industry has developed safety equipment and procedures that minimize the possibility of a major spill occurring and provide for effective clean-up in the event of a spill. The lifting of the moratorium permitted drilling to be resumed on a lease-by-lease basis from existing facilities but does not include blanket approval of exploration drilling from floating drilling vessels, or the issuing of new leases.

In subsection IV.A.4., the National, regional, State, and industry oil spill contingency plans were described and their relationship to each other was discussed. It was also pointed out that simulated oil spill situations had been arranged so that all concerned were required to respond accordingly. A detailed inventory of Clean Seas, Inc. equipment (and capabilities) is included in this section.

At the State Lands Commission hearings in Santa Barbara on September 20-21, 1973, the Coast Guard made a presentation on their research and development of a light-weight containment barrier that can be mobilized and deployed anywhere in the United States within four hours. This boom has contained soybean oil in seas approaching its effective design containment limit of five-foot seas. At the presentation the Coast Guard stated that they have people whose full-time job is dedicated to containment and removal technology and they mentioned that the Navy, Environmental Protection Agency, and industry are also deeply involved in the same type of research and development.

A presentation on the state-of-the-art of oil containment and recovery devices was made by the Western Oil and Gas Association at the State Lands Commission hearings and Exxon made a similar presentation at the Santa Ynez Unit hearings in Santa Barbara on October 2-4, 1973. Exxon described its Bottom-Tension (B-T) containment boom which is the strongest such boom available today. Exxon stated that the boom had not been tested on the equivalent of the Santa Barbara Channel Platform A spill during a storm but that the B-T boom had, however, contained natural seep oil in six-to eight-foot seas. The ability of the B-T boom to operate and contain oil in at least six- to eight-foot seas allows the boom to be used in about 94 percent of Santa Barbara Channel sea conditions, and is approaching the limit that men can stay out and work safely. Table II-6 which presents information on the frequency of waves of

various heights and periods in the Santa Barbara Channel, shows that waves of six feet or greater heights can occur in all months of the year with minimum frequency of occurrence in July and August.

Each boom (the B-T and Coast Guard boom) serves a definite purpose. The B-T boom provides three and one-half feet of freeboard (above the water) and four and one-half feet of barrier below the water. The Coast Guard boom was designed for quick deployment and provides 21 inches of freeboard and 27 inches of draft. The two booms are designed on a similar principle although the B-T boom is obviously designed for containment and survivability in more severe sea states than the air transportable Coast Guard boom.

6. Mitigating Factors Involving the Relationship of Potential Activities to Shipping

The main shipping lanes leading northward from Long Beach, California, traverse the Santa Barbara Channel (see plate I). The traffic lane scheme provides for a one-mile-wide traffic lane for each northbound or southbound ship, with a two-mile zone of separation between the lanes. By mutual agreement between the Coast Guard, the Corps of Engineers, and the shipping and oil industries, islands or fixed structures (fixed oil and gas platforms) must be located at least one-half mile from the boundary of the sea lanes.

The past record (no platform-vessel collisions off the west coast) considered along with the present regulations, modern equipment, and the potential platform location areas, is the basis for the Geological Survey's concluding that the probability of a collision between a major ocean-going vessel and Santa Barbara Channel platforms is remote.

Several witnesses at the Santa Ynez Unit public hearings expressed concern about the possibility of a vessel-platform collision because of the bad weather conditions "off Point Conception;" one individual pointed out that Point Conception historically was a center of marine disasters. However, it is important to realize that weather conditions "off Point Conception" are not indicative of the conditions in the general Santa Barbara Channel area. Also review of present traffic patterns should be made and consideration given to establishing areas of further control to minimize the chance of collision. Generally, visibility will be adequate to permit safe navigation. During periods of low visibility the existence of modern radar and adequate bridge attention should preclude the danger of collision.

7. Mitigating Factors Involving the Relationship of Potential Activities to Missile Overflights

Vandenburg Air Force Base on occasion launches missiles that pass over parts of the Santa Barbara Channel area. These overflights are limited primarily to the extreme western part of the area.

In October 1968, a detailed impact analysis was completed by Com-Consultants, Inc., for the Western Oil and Gas Association, et al. The probability of platform damage resulting from missile overflight was determined to be extremely low for all areas considered in the analysis. Com-Consultants concluded that any construction design of protective shelters would probably be based upon subjective rather than objective engineering criteria.

Prior to the February 1968 OCS Santa Barbara Channel lease sale, no quantitative analysis had been made to determine the effect of missile debris resulting from flight termination upon petroleum operations in the Santa Barbara Channel. Therefore, the oil companies were presented with "hold harmless" or "unconditional evacuate" lease stipulations as a part of certain



Santa Barbara Channel OCS leases. Certain of the Santa Barbara Channel leases contain one or the other, or both of the two stipulations quoted below:

Stipulation 1.

*The lessee, recognizing that mineral explorations and exploitation and recovery operations on the leased areas of tide and submerged lands can impede tactical military operations, hereby recognizes and agrees that the United States reserves and has the right to temporarily suspend operations of the lessee under this lease in the interests of national security requirements. Such temporary suspension of operations, including the evacuation of personnel, will come into effect upon the order of Air Force Western Test Range Safety Officer, or higher authority, that national security interests necessitates such action. It is understood that any temporary suspension of operations ordered by said official may not exceed seventy-two hours, however, any suspension may be extended by order of the Secretary of Defense. During such periods equipment may remain in place.*

Stipulation 2.

*The lessee assumes all risk of damage or injury to any person or persons who are the agents, employees or invitees of the lessee, its agents, sub-contractors or any independent contractor doing business with the lessee in connection with any activities being performed by the lessee on the leased premises, and of any damage to any property of the lessee, its agents, employees, invitees, sub-contractors or independent contractors doing business with the lessee and which occurs on the leased premises, and which injury to such person or property occurs by reason of the activities of any agency of the United States Government being conducted as a part of or in connection with the programs and activities of the Air Force Western Test Range, whether such injury or damage is caused in whole or in part by any act or omission, regardless of negligence or fault, of the United States or its contractors, or any of their officers, agents or employees, and whether or not based upon any concept of strict or absolute liability or otherwise; and the lessee agrees to indemnify and save harmless the United States against, and to defend at its own expense, all such claims for loss, damage or injury sustained by the lessee, its agents, employees, invitees, sub-contractors or any independent contractors doing business with the lessee in connection with its activities on the leased premises, or their agents or employees, which such claims may arise by reason of injury or damage occurring in connection with the programs and activities of the said Air Force Western Test Range, whether the same be caused in whole or in part, by the negligence or fault of the United States or its contractors or any of their officers, agents and employees, or based upon any concept of strict liability or otherwise.*

The following leases require Stipulations 1 and 2: OCS-P 0168, 0169, 0170, 0171, 0172, 0173, 0174, 0175, 0176, 0177, 0178, 0179, 0182, 0183, 0184, 0185, 0193, 0194, 0195, 0196 and 0197.

The following leases require only Stipulation 2: OCS-P 0180, 0181, 0187, 0188, 0189, 0190, 0191, 0192, 0200, 0201, 0206, 0211, 0212 and 0213.

Santa Barbara Channel oil and gas operations must be coordinated with all military (Navy and Air Force) activity in the area. This mutual cooperation and coordination relationship has been successful with ongoing oil and gas, and military activities.

#### 8. Studies on OCS Management and Operating Practices

The purpose of this section is to describe studies recently completed and in progress. All of these studies efforts are directly related to improvement of OCS management practices, operating procedures, and data bases. These studies and research efforts, by identifying problem areas, gaps, weaknesses, and prescribing preventive or corrective measures, fulfill an invaluable role for achieving the goal of reducing or eliminating potential hazards to human life and to the environment.

##### a. OCS Studies Analyzed by U. S. Geological Survey Work Group

The U. S. Geological Survey Conservation Division contracted with the National Aeronautics and Space Administration (NASA)<sup>1</sup>, the Marine

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<sup>1</sup> NASA, "Applicability of NASA Contract Quality Management and Failure Mode Effect Analysis Procedures to the USGS Outer Continental Shelf Oil and Gas Lease Management Program," November 1971.

Board of the National Academy of Engineering<sup>1</sup>, and an internal System Laboratory Group of the Water Resources Division of the Geological Survey<sup>2</sup>, to study its Outer Continental Shelf management and operating practices. These studies, initiated to obtain impartial and objective opinions and financed by the USGS Conservation Division, identified weaknesses in OCS operating regulations and procedures and recommended remedial measures. An analysis of the results of these studies was completed by a special Work Group of the U. S. Geological Survey in May, 1973, and a report on OCS safety and pollution control was issued. Implementation has commenced on all 15 recommendations made by the Work Group in its report. This initial Work Group report, dated May 1973, has been supplemented by a later report, Supplement No. 1, dated May 1974. The supplemental report (appendix IV-2) is for the purpose of considering recommendations from yet a later study, "Energy under the Ocean" (University of Oklahoma Report).

The Council on Environmental Quality (CEQ) performed a study, and prepared a report to the President of the United States on the environmental impacts of oil and gas operations on the Atlantic OCS and the Gulf of Alaska (April 1974). The Geological Survey has prepared a work group report, dated November 4, 1974, titled "Supplement No. 2 to Report of the Work Group on OCS Safety and Pollution Control, May 1973" (appendix IV-3).

These later studies and responding supplemental Work Group reports Numbers 1 and 2 are discussed in subsections IV.A.8.b., c., d. and e, which follow

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<sup>1</sup> Marine Board, National Academy of Engineering, "Outer Continental Shelf Resource Development Safety: A Review of Technology and Regulation for the Systematic Minimization of Environmental Intrusion from Petroleum Products", December 1972.

<sup>2</sup> USGS, "Outer Continental Shelf Lease Management Study", May 1972.

immediately the presentation below of the status of implementing the original 15 recommendations resulting from the initial studies. In many cases, the recommendations resulting from the later "Energy under the Ocean" study and the "CEQ Oil and Gas Operations Impact" study were variations to the original 15 recommendations discussed below. Therefore, the Work Group supplemental reports Numbers 1 and 2, in considering these later recommendations, modified, added to, and improved on the 15 original recommendations.

- Implementation Status of the Original Fifteen Recommendations

The U. S. Geological Survey, Gulf of Mexico Area, is taking the lead responsibility for implementation of several of these recommendations. The Pacific Area is developing portions of the recommendations and is in the process of developing and revising OCS Orders. Pacific Area engineers are spending a part of their time in the Gulf of Mexico Area in coordinating these activities of the two Area offices. Inasmuch as the progress of the Pacific Area is related to the progress of the Gulf of Mexico Area, activities of both Areas are described.

As of December 1975, the status of implementation actions were as follows (modification of these implementation actions as required by additional recommendations contained in Supplements 1 and 2, see appendices IV-2 and IV-3, are under way):

Recommendation No. 1. Failure Reporting and Corrective Action

Action Taken: OCS Order No. 5 for the Gulf of Mexico has been revised and now requires operators to submit quarterly failure-analysis reports on subsurface safety devices. The Geological Survey is developing procedures for closed loop failure reporting and corrective action system which will include all critical platform safety components. The output from these systems will be computerized and will be analyzed by the safety review committee.

The Pacific Area has been furnished the Gulf of Mexico Area revised OCS Order No. 5 for consideration and adaptation to the Pacific Area. The Pacific Area OCS Order No. 5 presently requires surface-controlled subsurface safety devices.

Recommendation No. 2. Accident Investigation and Reporting

Action Taken: The legality of publishing investigation reports of major accidents has been affirmed by the Solicitor's Office of the Department of the Interior. The Regional offices of the Geological Survey are developing accident investigation reporting procedures which are more responsive to cause and effect relationships. The Pacific Area has performed a study on the advisability of statistics of accidents per man-hours worked by companies and reviewed all forms used in

accident reporting.

Recommendation No. 3. Information Exchange

Action Taken: A "Safety Alert" system has been initiated in the Pacific Area and Gulf of Mexico Area. With this system, operators are advised of accidents occurring during OCS drilling and producing operations to let industry know immediately of its own mistakes and malfunctions so that improvements can be made where applicable. An information dissemination system will be designed to provide industry with the results of the failure reporting and corrective action systems, accident investigations, inspections, and other potential hazard elements.

Recommendation No. 4. Research and Development

Action Taken: A cooperative committee on offshore safety and anti-pollution research was formed in conjunction with the American Petroleum Institute (API). The purpose of the committee was to determine the research and development efforts being undertaken by industry and Government in this area; determine specific needs for additional efforts; and to contract research and development in areas where industry response was lacking or unsatisfactory.

The committee was involved with the following projects:

a) Sand probe

- b) Orifice Coefficient program
- c) Oil detection and removal

The committee disbanded, but the Geological Survey is sponsoring the following projects:

- a) Pipeline behavior study
- b) Shallow high pressure gas zone research
- c) Mississippi River Delta Project.

Recommendation No. 5. Standards and Specifications

Action Taken: The cooperative committee on offshore safety and anti-pollution standards function was to establish standards and specifications for safety and anti-pollution equipment. The first project undertaken by the committee was a recommended practice for design, installation and operations of subsurface safety valves. The final copies of these standards are available from API. In connection with this, a facility for testing of subsurface safety valves was constructed and is operated by an independent research institute.

With regards to existing devices, the Offshore Safety and Anti-Pollution Committee (OSAPE) reported that the procedures and requirements set forth in API Spec. 14-A and RP 14-B will enable the industry to identify problem areas and improve the reliability of subsurface safety valves (SSV's). Specifically API 14-A requires

SSV performance and functional testing, manufacturer quality assurance programs, and operator-manufacturer analysis. API RP 14-B and 14-B(S) provide updated installation and maintenance procedures in addition to an accurate computer program for sizing subsurface controlled subsurface safety valves. The OSAPE Committee felt that the areas identified by industry for additional SSSV research such as operational reliability, performance testing, design analysis and sizing, and seating and control hardware will be addressed in API 14-A and 14-B. In addition, the two API research projects on SSSV orifice coefficients and sand erosion are of highest priority and will also help establish better SSSV sizing calculations and improve SSSV reliability. In summary, the OSAPE Committee does not feel that additional research on existing SSSV equipment should be initiated until SSSV performance data generated from the use of API 14-A and 14-B has been gathered and analyzed and the two previously mentioned research projects have been completed.

API RP 14C, a recommended practice for Analysis, Design, Installation and Testing of Basic Surface Safety Systems on Offshore Production Platforms, was the third document published by API.

Pacific Area and Gulf of Mexico Area engineers



participated in the committee meetings.

The joint API-GS committee was disbanded. The following additional standards have or will be issued by the API Committee:

API Spec. 14D - Wellhead Surface Safety Valves

API RP 14E - Design and Installation of Production Platform Piping Systems

The following API documents are being formulated:

API RP 14F - Electrical Systems on Offshore Production Platforms

API RP 14G - Fire Control Systems on Offshore Production Systems

The following appeared in the Federal Register Vol. 40, No. 25, Tuesday, December 30, 1975:

#### OUTER CONTINENTAL SHELF

Procedures for the Development of OCS Standards

Pursuant to Supplement No. 2, November 1974, to the Geological Survey, "Report of the Work Group on OCS Safety and Pollution Control," May 1973, the Geological Survey hereby gives notice that the following procedures have been established for the development of specific safety and pollution-prevention standards for equipment and procedures used during drilling and producing operations on oil and gas leases issued on the Outer Continental Shelf:

1. Identify needs for new or modified standards and establish priorities.
2. Publish a notice in the *Federal Register* of intent to prepare specific standards requesting input and assistance.

3. Prepare drafts of new, updated, and revised standards by one or a combination of the following methods:
  - A. By use of input derived from step 2. above.
  - B. By use of available in-house expertise.
  - C. By arrangement with ANSI, ASME, ASTM, API, or other organizations who prepare standards.
4. Publish draft standards in the *Federal Register* for comments.
5. Consider the comments received, publish the final standards in the *Federal Register*, and incorporate them in an appropriate OCS Order by reference.

Specific environmental hazards and problems that are characteristic of different areas of the OCS shall be taken into account when incorporating standards into OCS Orders.

Recommendation No. 6. System Analysis

Action Taken: System analyses were performed on 13 installations in the Gulf of Mexico under two Geological Survey contracts. These studies are currently being evaluated with the objective of possible adoption into the lease management program in connection with the work being done in this area by the committee on standards and specifications.

A grant has been given to Rice University whereby they will draft a standard on systems design analysis. This grant has a completion date of December 31, 1975. Forthcoming from this draft standard will be a draft of a proposed OCS Order on Systems Design Analysis.

Exxon, in its effort to provide an environmentally and functionally safe system for the Pacific Area, Santa Barbara Channel, Santa Ynez Unit, contracted with General Electric to make a Functional Systems Analysis (Hazard Analysis) of the initial Hondo Field development. The study looked in detail at the offshore production facilities, the pipelines to shore, and the alternate offshore storage and terminal system from the viewpoint of safety to personnel and oil in water pollution.

The study concludes that of 2,400 functional components studied, only 28 were in need of additional analysis and with suggested design improvements would render the systems very safe.

It was also concluded that for a facility of its size and complexity, the proposed Santa Ynez Unit facilities had minimal problems when compared to similar facilities studied by General Electric in the Gulf of Mexico.

Volume 1 of The Functional Systems Analysis for the initial Santa Ynez Unit, Hondo Field development was submitted to the U. S. Geological Survey.

Recommendation No. 7. Engineering Documentation

Action Taken: This recommendation has been fully implemented in the Pacific Area to the extent that all of the recommended documentation is in each operator's

field office. Similar documentation is in the U. S. Geological Survey Area and District offices except for parts lists and specifications for all functioning components. The current Pacific Area OCS Order No. 8 requires this information to a large degree although, in some cases, the particular items recommended for documentation are not specifically addressed. Thorough inspection practices have assisted in accomplishing this implementation. However, the Pacific Area will review the Gulf of Mexico revised OCS Order No. 8, when completed, for consideration and possible adaptation to the Pacific Area.

Recommendation No. 8. Wearout Prevention

Action Taken: The proposed revision of Gulf of Mexico Area OCS Order No. 8 includes an erosion control program. This is also the subject of one of the research and development committee's projects. The Pacific Area will review the Gulf of Mexico Area OCS Order No. 8, when completed, for adaptation of the erosion control section to the Pacific Area.

Recommendation No. 9. Training

Action Taken: The committee formed in conjunction with the API on offshore safety and anti-pollution training and motivation outlined the training needed for personnel working offshore, setting up training programs, and establishing a time framework for

accomplishing this. Documents API RPT-1 and RPT-2 for training and certification of operator personnel were established by the committee. The Geological Survey is establishing a more formalized training program for their own personnel and have plans for developing a training course in OCS Orders and regulations for presentation to the industry. The Pacific Area has made a study for formal training available on the Pacific Coast. Training programs will be coordinated with the Gulf of Mexico Area.

During April 1974, Geological Survey technicians from the Gulf Coast and Santa Barbara Channel attended training courses consisting of ten sessions. Each session covered a different subject and was conducted by a different instructor with appropriate expertise. The basic course objective was to improve pollution prevention and control. During 1975 the Geological Survey OCS personnel attended numerous technical courses of various types.

Recommendation No. 10. Motivation Program

Action Taken: The API and oil industry are taking the lead in developing a motivation program. The joint committee with API published API Bulletin T-5 Employee Programs for Safety and Prevention of Pollution in Offshore Operations.

Recommendation No. 11. Lease Management Program

Action Taken: Additional personnel have been hired for the Pacific Area and Gulf of Mexico Area OCS offices. The areas of responsibilities and goals of the individual organizational units are being developed. Also under development, is a system for incorporating reports from other program areas into an annual review. The pollution report form has been revised and is required for use by the operators in the proposed revision of OCS Order No. 7.

Recommendation No. 12. Inspection Procedures

Action Taken: Data processing equipment has been installed in the Gulf of Mexico Area office. Inspection checklists are being updated to keep current with OCS Orders. Special inspections are conducted bi-monthly as data gathering exercises. Consistent enforcement policy is being applied in each OCS area. Computerized data files regarding inspections, platforms, and accidents have been established and are used as input for the safety review committee.

The Pacific Area has reviewed formalized inspection procedures for the Gulf of Mexico Area and fully

implemented similar enforcement inspection procedures.

Recommendation No. 13. OCS Order Development Procedures

Action Taken: The Geological Survey has developed formalized procedures for the evaluation and revision of existing OCS Orders and the development of new OCS Orders. Proposed new and revised Orders are to be published in the *Federal Register* for public comment prior to their adoption.

Recommendation No. 14. Standardization of Pollution Report Form

Action Taken: The Pacific Area has reviewed the Gulf of Mexico Area proposed form and has submitted suggestions and comments.

Recommendation No. 15. Safety and Advisory Committees

Action Taken: The industry has established a committee on OCS Safety in both the Pacific and Gulf of Mexico Areas. The Area offices have designated personnel to form systems analysis review committees to meet on a regular basis. These committees have had their initial meetings and will continue meeting monthly to review prior accidents and accident reports and discuss implementation of safety programs.

The Review Committee on Safety of Outer Continental Shelf Petroleum Operations, under the auspices of the Marine Board, National Academy of Engineers, was established in July 1973 to serve as a third-party audit of the OCS procedures and operations and to review state-of-the-art technologies.

This committee established at the request of the Geological Survey, composed of experts not regularly employed by industry or the Government, has issued four reports to the Geological Survey.

In its First Report to the United States Geological Survey (USGS), issued in March 1974, the Review Committee addressed five areas: (1) standards and specifications; (2) applicability of systems analyses techniques to offshore gas and oil operations; (3) the safety alert system of the USGS; (4) a proposed revision to OCS Order No. 8 (Approval Procedure for Installation and Operation of Platforms, Fixed and Mobile Structures, and Artificial Islands) to include caisson-like structures; and (5) a preliminary look at environmental baselines in support of offshore oil and gas operations.

The Second Report, issued in June, 1974), focused on three issues: (1) policy and program planning by the USGS for the assurance of safety and pollution control in OCS petroleum operations; (2) implementation actions and priorities established



by the USGS on the basis of safety study recommendations; and (3) application of systems analysis techniques to offshore oil and gas operations.

The Third Report, issued in March 1975, addressed three topics: (1) standards developed for OCS operations; (2) inspection strategies for use in the OCS; and (3) methods for determining the condition of existing pipelines.

The Fourth Report, issued in August 1975, concerns three areas: (1) industry influence in the process by which the USGS establishes new and revised regulations; (2) expansion of USGS procedures for the development of new and revised standards for OCS operations; and, (3) a problem oriented method of conducting impact studies to ensure the protection of the environment in areas of offshore petroleum operations.

Members of the Review Committee have been selected on the basis of their experience and expertise in technologies important to the study of safe OCS petroleum operations. Review Committee members are listed below.

#### MEMBERSHIP

George F. Mechlin, Chairman  
Vice-President, Research & Development  
Westinghouse Electric Corporation

Kermit E. Brown  
Head & Halliburton Professor  
Petroleum Engineering Department  
The University of Tulsa

Kenneth O. Emery  
Marine Geologist and Senior Scientist  
Woods Hole Oceanographic Institution

Ben Clifford Gerwick, Jr.  
Professor of Civil Engineering  
University of California

Murray F. Hawkins, Jr.  
Head, Petroleum Engineering Department  
Louisiana State University

B. J. Livesay  
Director, Ocean Mining Laboratory  
Kennecott Exploration, Inc.

Robert J. Menzies  
Professor of Oceanography  
Florida State University

W. F. Searle, Jr.  
President  
Searle Consultants

Dale M. Straughan  
Assistant Professor of Biology  
University of Southern California

Elmer P. Wheaton  
Vice-President & General Manager, ret.  
Lockheed Missiles & Space Company

See Appendices IV-2 and IV-3 for a discussion of additional recommendations adopted from the various recent studies (recommendations 16, 17, 18, and 19).

b. OCS Technology Assessment Group Study - University of Oklahoma

A comprehensive report on a technology assessment of oil and gas operations on the U. S. Outer Continental Shelf was published by an inter-disciplinary research team from the Science and Public Policy

Program at the University of Oklahoma.<sup>1</sup> The independent analysis, funded by the National Science Foundation, was conducted over a 20-month period beginning in September 1971.

The principal conclusions of the study are: (1) that existing OCS technologies are adequate for continued oil and gas operations; (2) that more sharply defined concerns for safety and environmental protection continue to pose a challenge to OCS management even though technologies responsive to these new concerns are gradually evolving; (3) that in the past, participation in the management of OCS oil and gas operations was limited to the Department of the Interior and the petroleum industry and that this relatively closed management system was initially unable to sense and respond quickly to a changing social climate. Interested groups and Federal agencies representing concerns such as environmental conservation are now participating in the management system primarily through the impact statement process required by NEPA. These new participants are demanding changes from past patterns of operations; and (4) most of the new demands being made on OCS technologies are well within state-of-the-art. The necessary information modifications in the physical technologies required by a changing social climate can be met. Although the application of stringent environmental and safety criteria pose problems, the industry has or can develop the required physical technologies and procedures.

"Supplement No. 1, dated May 1974, to the Report of the Work Group on OCS Safety and Pollution Control, May 1973, U. S. Geological Survey", was

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<sup>1</sup>The Technology Assessment Group, Science and Public Policy Program, University of Oklahoma, Energy Under the Oceans: A Technology Assessment of Outer Continental Shelf Oil and Gas Operations, University of Oklahoma Press, September 1973.

prepared in order to consider and discuss the recommendations in this new Oklahoma study. The Oklahoma report is compatible with the three previous reports and many of the respective recommendations are the same or similar, but the Oklahoma report goes much further than any of the other three. In-depth considerations of Government management and jurisdiction are unique to the Oklahoma study as is its plan for OCS development. Supplement No. 1, including an appendix to the Geological Survey Work Group report, responds to the recommendations of this Oklahoma report.

c. Supplement No. 1 to the Geological Survey Work Group Report

The entire Supplemental No. 1 Report is reproduced and presented in appendix IV-2 at the end of this section.

d. Council on Environmental Quality OCS Oil and Gas Operations Environmental Report for the Atlantic OCS and the Gulf of Alaska - April 1974

The Council on Environmental Quality (CEQ) performed a study and prepared a report for the President of the United States on the environmental impacts of oil and gas operations on the Atlantic OCS and the Gulf of Alaska. Numerous agencies contributed to this report, including the Environmental Protection Agency and Geological Survey.

The Department of the Interior is presently considering the CEQ recommendations in this report. Many of the recommendations are identical or similar to those that resulted from the previously discussed studies and reports. Therefore, certain CEQ recommendations are already at various stages of implementation. The Geological Survey has prepared a work group report dated November 4, 1974, titled Supplement No. 2 to the Work Group on OCS Safety and Pollution Control. This report is a response to the pertinent recommendations of the report to the President by CEQ.

e. Supplement No. 2 to the Report of the Work Group on  
OCS Safety and Pollution Control

The entire Supplement No. 2 Report is reproduced and presented in appendix IV-3 at the end of this section.

f. General Accounting Office (GAO) Study and Report

In addition to the above studies and reports, the General Accounting Office issued a report at the request of the Conservation and Natural Resources Subcommittee of the Committee on Government Operations, House of Representatives.<sup>1</sup> This study, like those mentioned above, presents a critical review of OCS regulatory and inspection procedures and includes recommendations designed to achieve more effective capability and procedures. In a letter dated August 3, 1973, from Secretary Morton to Mr. Henry S. Reuss, Chairman of the Conservation and Natural Resources Subcommittee, it is pointed out that the recommendations contained in the GAO report which have not already been implemented are being implemented as part of the Work Group's recommendations as a result of the NASA, Marine Board, National Academy of Engineers, and other studies. As noted in the GAO report itself, most of the deficiencies identified by GAO have already been recognized by the Geological Survey through its own studies and studies undertaken on its behalf by NASA and others, and steps have already been taken or are underway to remedy them. Many of the recommendations contained in the GAO report were also made in the studies discussed above. Nevertheless, the following actions specifically respond to the GAO report:

- Inspectors are instructed to apply prescribed enforcement actions for violations of OCS Orders unless deviations have been authorized and properly documented for each case by the Chief, Conservation Division, Geological Survey.
- The inspection staff is to be increased and the number of inspections, both scheduled and unannounced, have been increased. This applies mostly to the Gulf of Mexico Area for GAO reported that it was the Gulf of Mexico Area that needed to increase inspection frequency.

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<sup>1</sup> General Accounting Office, "Improved Inspection and Regulation Could Reduce the Possibility of Oil Spills on the Outer Continental Shelf", Report No. B-146333, June 29, 1973.

- Inspections include workover and remedial operations as well as drilling, producing, and abandonment operations.
- Work groups have been formed to study the feasibility of requiring operators to submit a preventive maintenance schedule and to perform scheduled inspections and report results in a specified format.
- Geological Survey is working with industry and with the API in an attempt to set standards and requirements for training personnel. Geological Survey personnel would participate in this training. In the meantime, Conservation Managers have been instructed to initiate formalized training in inspection procedures.
- Plans are being adopted to limit the conditions under which multiple operations may be conducted for a single platform.

Several speakers at the Public Hearing on the Santa Ynez Unit Plan of Operations, Draft Environmental Statement, made reference to the portion of this GAO report that indicated the U. S. Geological Survey had discovered 76 violations in connection with Santa Barbara Channel operations in fiscal year 1972. These were violations listed in the two U. S. Geological Survey semi-annual inspection reports for the five OCS Santa Barbara Channel platforms. The GAO analysis of U. S. Geological Survey records showed that the lessees took more than seven days to correct 19 of these violations and that the remaining 57 violations were corrected in less than seven days.

As a result of the GAO recommendations, renewed emphasis has been put on requiring that violations be corrected within seven days. The Geological Survey has stated that if a violation is of the type which creates an immediate threat to the environment, the involved well or wells will be shut-in.

In order to keep the 76 violations in proper perspective, one must consider two things: (1) the majority of these violations involved minor technical matters which would have no bearing on the safety of operations in relation to potential immediate harm to the environment, and (2) the U. S. Geological Survey Santa Barbara District conducted rigorous inspection programs which involved checking and testing literally thousands of items.

GAO pointed out that the 76 violations included 12 instances in which subsurface safety devices leaked during tests and that subsurface safety devices play an important role in environmental protection. However, the GAO report did not explain a very important aspect of U. S. Geological Survey subsurface device test procedure policy. The Geological Survey issued the operators written warnings if a subsurface device was not bubble tight during testing. Therefore, the 12 subsurface device violations listed in the inspection reports does not indicate that the tests detected serious leaks. A subsurface device that does not prove to be bubble tight is not considered a serious condition and does not represent an immediate hazard to the environment.

The 76 violations are remarkably few, considering their nature and that thousands of items were checked and tested under the U. S. Geological Survey inspection program.

g. Bureau of Land Management Study Groups

Because of the wide variation in scientific opinions on the effects of oil spills and because of a general lack of concrete evidence for either damage or lack of damage, the Department of Interior has authorized the Bureau of Land Management to evaluate, on a continuing basis, the effects of oil spills from offshore oil and gas exploration and production in OCS waters. These studies will be conducted by teams of about 20 people including marine biologists, oceanographers, pipeline engineers and other personnel with specialized expertise. They will initiate studies and compile data concerning the short and long term impact of oil spills on marine biota, as well as the environmental effects of produced waste water discharge, drill cuttings, drilling mud and pipeline construction. These



study groups are assembled in the Gulf Coast, East and West Coast, and the Gulf of Alaska areas.

9. Memoranda of Understanding

Several of the recent OCS management reports, including the CEQ Report, have made recommendations that call for the Geological Survey to develop memoranda of understanding on OCS safety and pollution control with the Department of Labor (in accordance with the Occupational Safety and Health Act--OSHA) on inspection and enforcement; with the Bureau of Land Management and the Office of Pipeline Safety on pipelines; and with the Environmental Protection Agency on discharge standards.

Steps have been taken by the Geological Survey toward the development of the above-mentioned memoranda of understanding.

10. Mitigating Factors Related to the Detrimental Effects of Oil Spills in the Santa Barbara Channel

The possibility of a major oil spill resulting from further development of the Santa Barbara Channel certainly cannot be categorically ruled out. It should be noted that oil and gas operations had been conducted in the Santa Barbara Channel for 77 years before the first major oil pollution incident (the Platform A spill).

a. Long-Term Impact

Certain recent studies suggest the long-term impact may be minor in many cases. Published conclusions of investigations express varying opinions; however, all are in agreement that the extent of impacts, both short-term and long-term, depends upon the circumstances of the spill. Certain studies made after the Santa Barbara oil spill concluded that damage to the biota was not widespread, that the number of species affected was limited and that the area was recovering.

b. Effect of Different Types of Oil

Most of the crude oil that would be produced would probably be a low-gravity viscous type and certain studies suggest that this type crude oil would be less damaging to the environment than, for example, No. 6 fuel oils and middle distillates (No. 2 oils and diesel fuel oil). Although there are conflicting opinions, many authorities believe crude oil from the Santa Barbara Channel in general, would be easier to contain and recover than higher gravity crude oils, and therefore, in the event of a spill, less detrimental to the environment.

c. Animals with Tolerance to Oil

Studies have suggested that the animals that are native to the Santa Barbara Channel region, because of their exposure to natural oil seepage over hundreds of years, have developed a greater tolerance than similar species in other areas. (See Straughan, 1970, p. 411 for one presentation of this hypothesis).

d. Natural Assimilation of Crude Oil

Studies have indicated that oil-oxidizing bacteria are most abundant where seep oil is present. Because of natural oil seeps in the Santa Barbara Channel, natural assimilation of crude oil may take place more rapidly than in areas where natural oil seeps do not occur.

B. Mitigations Related to the Specific Phases and Components of Potential Activities

Many of the mitigating factors related to specific components and phases associated with potential activities are covered in section I, and the regulations, inspection, and enforcement procedures have been discussed in the general mitigation portion of this section.

1. Specific Proposals Require Geological Survey Approval

Geological Survey approval would be required prior to the installation and operation of all individual facilities. Prior to acting on such applications, each proposal would be carefully reviewed in light of this channel-wide statement supplemented by site specific information and any subsequent technological advances, experience from current operations, and additional data collection. If deemed necessary the Geological Survey would under its existing regulations proceed with a full environmental analysis of the specific proposal and thereon base a determination as to the need for an additional environmental impact statement.

Secretarial Order No. 2974 dated April 30, 1975, concerning inter-bureau coordination in the OCS minerals program, enables the Geological Survey to obtain expert advice from Fish and Wildlife Service and the Bureau of Land Management relating to OCS oil and gas operations with respect to environmental protection. This order requires the Geological Survey to consult with and receive recommendations from these agencies prior to:

- issuance of draft OCS Order, approval of exploratory drilling plans, and plans of development,
- granting the right to use or easements to lessees to construct and maintain platforms, fixed structures, artificial islands and pipelines on areas of the OCS, and
- approval of installation of platforms, fixed structures, artificial islands and pipelines.

The Geological Survey's Area Oil and Gas Supervisor, Los Angeles, plans to issue Notices to Lessees and Operators spelling out the minimum requirements for protecting archeological and biological resources, relating to OCS oil and gas operations. The Supervisor has sent letters to various Federal and State agencies (October 1975) requesting recommendations and suggestions as to minimum requirements for conducting archeological and biological surveys. A draft of these Notices to Lessees and Operators should be in the Federal Register by June 1976 for public comment.

## 2. Well-Control Training Programs for Operating Personnel

Uncontrolled well flow would be further mitigated by personnel training and operating practices. Daily functional tests would be conducted on the blowout preventers and weekly pressure tests would be made. Blowout preventer drills, which familiarize crews with proper procedures and make sure they respond properly, would be conducted daily until the crews are proficient. After that, weekly drills would be conducted. If a slow response were found, more frequent drills would be conducted until the response was satisfactory.

In addition, key supervisory personnel of both operator and the drilling contractor would receive extensive well-control training at special facilities such as the Saticoy Well Control Training Facility located in the Saticoy Field near Ventura, California. This mile-deep practice well is equipped with storage tanks, a pump, control manifold, and a full array of pressure gages and controls, modeling the diverse equipment that is used on actual wells to prevent a blowout. These training facilities would be utilized to provide actual practice in controlling a simulated "well kick". Training sessions would also include classroom instruction in the detection and handling of abnormal well conditions. Through August of 1973, approximately 250 men from eight different oil companies and drilling firms active in the Santa Barbara Channel area had used the Saticoy facility.

## 3. Platform Beautification Studies

Studies have been conducted to develop platform beautification techniques. These range from camouflage of the structure to techniques that accentuate the platform but in a modified form which may be more pleasing to the viewer. Screening may be accomplished by the use of panels and configurations to change the shape or clarity of the structure's

silhouette. Another method uses sea water sprayed from the upper levels of the structure. Natural light from behind the platform causes the spray to appear as a white screen on bright days and to reflect the natural sky color in more typical hazy weather. Under certain light conditions the screened platform becomes less visible and tends to disappear from view.

Work is continuing on the development of practical and effective platform beautification techniques. However, the U. S. Coast Guard has expressed concern that camouflaging techniques could increase the hazard to navigation and this would have to be a prime consideration in platform beautification studies.

#### 4. Platform Removal

Platforms are designed for removal after their operational life. Following the depletion of all producing zones developed from a platform, wells would be plugged and abandoned. Well conductors would be cut below the mudline and removed; drilling and production equipment would be dismantled and removed; and the deck units would be removed. All piling would be cut below the mudline, and the jacket legs and buoyancy tanks would be deballasted until the jacket floated. The jacket would then be removed and the site restored in accordance with permit requirements.

#### 5. Non-Use of Polychlorinated Biphenyl (PCB) Liquids

Review of Gulf Coast OCS lease sale environmental impact statements expressed a great deal of concern about polychlorinated biphenyl liquids inasmuch as any PCB's escaping into the environment would constitute a serious hazard. PCB's are not used on any of the existing Santa Barbara Channel OCS platforms nor would any future platforms use them.

## 6. Subsurface Safety Valves

All Santa Barbara Channel subsurface safety valves would be the surface-controlled type as required by the Pacific Area OCS Orders of June 1, 1971. Excessive sand production, detrimental to these valves, is not expected to be a serious problem in Santa Barbara Channel potential field areas. For these reasons the Geological Survey places increased reliance on the performance of Santa Barbara Channel subsurface safety valves.

It is recognized that certain Gulf Coast incidents reflect a poor subsurface valve performance record. However, these were the old-type velocity actuated valves and were in an area known for excessive sand production problems. A few velocity actuated subsurface valves that were in the Santa Barbara Channel were replaced with the surface controlled valves several years ago. (See sections I.D.6.d. and IV.B.6. for further discussion on subsurface safety valves.)

## 7. Subsidence

### a. Subsidence Potential

Subsidence of the ground surface can occur when oil and gas are withdrawn from their reservoirs. (See section II.B.7.h.) Subsidence has been recognized over a number of producing oil and gas fields throughout the country, and although the conditions in each are different, the greatest amounts of subsidence seem to be associated with fields where production is from stratigraphic zones containing compactable strata -- strata susceptible to compaction when pore fluid pressures are reduced. The consequences of this compaction include: 1) lowering of surface elevations, 2) centripetally directed horizontal displacement of surface points, and 3) faulting (Yerkes and Castle, 1969). The faulting may break the ground

surface or be entirely subsurface, and at least two unequivocal examples of seismicity associated with faulting of this origin have been documented (Yerkes and Castle, 1975).

The best known example of subsidence in California occurs over the Wilmington oil field, where the chief hazard from subsidence was the threat to onshore areas, including commercial and military installations, from inundation by the sea. By 1958, the situation was no longer amenable to control by the expensive remedial works of the sort undertaken since 1941, and the California Legislature passed the Subsidence Control Act for the purpose of arresting land subsidence through repressuring by water injection (Huey, 1964). The subsequent water injection program was successful in reducing the rates of subsidence, and by 1974 the State Oil and Gas Supervisor could report that: "...from August 1973 to August 1974 general rebound conditions (were indicated), although slight subsidence occurred over the central harbor area in Long Beach." (State Oil and Gas Supervisor, 1975). This suggests that maintenance of reservoir pressures through fluid injection can provide an effective countermeasure to the surface displacements. Fluid injection, however, has a potential for triggering seismic events (Raleigh, Healy, and Bredehoeft, 1972) under some conditions, and should be undertaken only with great care and forethought (McCulloh, 1969, p. 45, 46; see also section II.B.7.h. of this report).

General lowering of surface elevation, such as would be noticed by a rise in water level on platform legs, would probably not pose a significant hazard to a platform unless the amount of subsidence were so large as to threaten inundation.

The seismic events so far recorded in association with both fluid withdrawal



and injection in oil-field areas have been relatively small (generally less than magnitude 4), and the associated seismic shaking probably poses little hazard to well-designed and well-built structures.

In general, subsidence and its associated effects probably present little direct environmental hazard to OCS production that cannot be readily detected at an early stage and countered by prompt remedial action.

b. Subsidence Detection Program

Some of the Pliocene reservoir strata of the Dos Cuadras and Carpinteria fields probably include compactable beds. As the degree to which these beds may compact is not now established, three present OCS platforms (A, B, and Hillhouse) are instrumented and monitored to measure any subsidence that might occur. Although the instruments have been in operation since 1971, no change in relative elevations has been recorded. In other parts of the Channel, the greatest production potential now known is in the Santa Ynez Unit, where the reservoir rocks consist of older (Miocene), better compacted strata, and the porosity from which hydrocarbon production is expected to be greatest consists largely of fractures in silicious shale, chert, and dolomite. The potential for subsidence over such a field appears relatively slight, however, as there has been little direct measurement over fields having this type of dominant porosity, it seems only prudent to recommend that a systematic subsidence-detection program should accompany production.

The present detection program in the Dos Cuadras OCS field reflects Geological Survey policy that it is best to anticipate possible subsidence so that, if it does occur, early detection will permit a remedial course of action to stop or minimize any potential for hazard. To measure differential

subsidence at any one platform, benchmarks were established on each corner of the three platforms in the Dos Cuadras field. Any tilting of the platform would be measured by periodic resurvey of the benchmarks. To determine changes in elevation of an entire platform, recording tide gages were installed at each. (According to Lewis and Lewis Offshore, Inc., offshore surveyors of Ventura, a 60-day study can provide an accuracy of  $\pm 0.1$  foot and a one-year study could provide an accuracy of  $\pm 0.05$  foot, when compared with a suitable standard station.) Although the U. S. Coast and Geodetic Survey tide station on Rincon Island may be of questionable value as an absolute standard, because it lies atop another producing oil field and may be subject to subsidence from those operations, any relative change of elevation among the instrumented platforms would be readily recognized and measured to within small tolerances. As a check on computed results, several tidal datum planes can be computed from the data recorded by the tide gages: 1) daily highs and lows, 2) mean high water, 3) mean low water, 4) mean higher high water, 5) mean lower low water, 6) mean tide level, 7) diurnal high water inequality, and 8) diurnal low water inequality. The tide gages have been in operation since October 1, 1971, during which time there has been no measurable change in relative elevation of the three platforms. If deemed necessary, the Geological Survey could require this same type of subsidence detection program for any future platforms.

#### 8. Dos Cuadras Field Seismometer Array

The Geological Survey installed an array of seven seismographs on the sea floor in the vicinity of the Dos Cuadras field. The spacing and location of the instruments is designed to locate and identify the foci of small, shallow earthquakes in the vicinity of the producing reservoir, that might occur in association with fluid injection operations, and

distinguish those from the regional tectonic seismic activity. The installation of this small seismometer array over the Dos Cuadras field was completed in December 1975 and, therefore, has been in operation only a brief time. This may be the first and only sea floor array now operating in the world.

#### 9. Archeological and Historic

The identification and evaluation of potential cultural resources and artifacts will be by qualified professionals. The opinion of the State Historic Preservation Officer and the Secretary of the Interior will be sought in determination of eligibility for inclusion in the National Register of Historic Places. All resources determined to be eligible for inclusion in the National Register of Historic Places are protected by the Historic Preservation Act of 1966 (Public Law 89-665, 80 Stat. 915) and are subject to Section 106 of this act. The procedures set forth in Title 36 CFR 800 should be followed and documented in these cases.

OCS operations must be conducted so as to protect archeological resources in accordance with the Historical Preservation Act and Executive Order 11593 (Protection and Enhancement of the Cultural Environment).

The Geological Survey Office in Los Angeles is presently preparing a Notice to Lessees and Operators that will specify certain requirements for the conducting of archeological surveys. The Geological Survey, Los Angeles Office, requested comments and recommendations as to reasonable and practical requirements for the conducting of such archeological surveys, by letter dated October 29, 1975, sent to: The Bureau of Land Management, U. S. Fish and Wildlife Service, the Office of Archeology and Historic Preservation, National Park Service, Interagency Archeological Services,

and to the Directors of the State Parks of California, Washington and Oregon. As of January 1976, the Geological Survey has not received all responses. A draft Notice to Lessees should be in the *Federal Register* by June 1976 for public comment.

10. Platform Seismic Design Criteria

Existing and presently proposed platforms on Federal leases in the Santa Barbara Channel have all been designed in accordance with the best technology for seismic design and structural analysis available, at the time of their initiation. In view of the continuing developments in the fields of earthquake seismology and seismic design, and the need to establish platform criteria in other areas and concern, the USGS has reconsidered its earlier intent to establish a multi-disciplinary panel of experts to review the seismic design of platforms. The needs as presently seen go far beyond seismic design. As a result the Geological Survey is in an advanced stage of negotiations and arrangements for the first steps in establishing a system of third-party certification of platform design and for the development of various design criteria for OCS platforms and other facilities. In essence, the system is expected to be somewhat similar to the present British system now employed for the North Sea development. A consulting firm will develop an overall plan for the certification of platform design, and will, among other requirements, identify design criteria and practices for OCS developments, related to differing regional conditions.

11. Programs of Research Aimed at Reducing the Potential for Adverse Impact from Certain Geologic Events

Section II.B.7 of this report summarizes the geologic conditions and events that have a potential for hazard to oilfield development and production facilities, and a consequent potential for hazard to the environment of the channel region. Programs of research aimed at reducing the potential for adverse impact from particular geologic events could accompany development and production of petroleum resources, and should have the same general objectives as those enumerated by Alfors and others (1973) in their recommendations for reducing geologic hazards losses in California:

1. Avoid or prevent damage (adverse impact) from future events by assessing the nature and location of probable events, taking steps to control those events, and guiding human activities away from hazardous areas in which it is not feasible to correct the hazards.
2. Minimize unavoidable or unpreventable losses (adverse impact) by requiring thorough analysis of the geologic environment prior to design, then provide safe design, construction, and maintenance practices by adequate codes and ordinances.
3. Take emergency action to save lives and property (and prevent adverse impact) during or immediately following any particular disastrous event.
4. Take longer-range recovery action following a particular event to study its lessons, reestablish normal life, and rebuild.

To meet these objectives in the Santa Barbara Channel region, ongoing research programs should continue; some need to be expanded or accelerated, and others should be initiated.

For the purpose of reducing earthquake hazards and concomittant adverse environmental impact, a continuing, coordinated research program should accompany petroleum exploration, development, and production. As an example, a comprehensive program to delineate the active faults in the Santa Barbara Channel could provide a more detailed seismic risk zoning

and, perhaps, a capability to predict the location and timing of specific large earthquakes. Such a program would require augmentation of the present seismograph network, onshore and offshore geological and geophysical investigations, and geodetic measurements, much like the following:

- 1) Installation and operation of a denser seismograph network (e.g., 100 stations spaced about 5 miles -8 km- apart).
- 2) Controlled seismic explosions to investigate the crustal structure.
- 3) Detailed acoustic profiles (tracks spaced 0.2 miles -0.3 km- apart), and field geologic mapping on land.
- 4) Geodetic strain measurements.
- 5) In-situ stress measurements.

Because detailed geologic and seismologic data can only be accumulated over many years, and for maximum benefit, such a program should take advantage of the considerable "lead time" following any decision to proceed with development plans, and should be implemented no later than the time of that decision. Detailed seismic monitoring of oilfield production, as initiated for the Dos Cuadras field, is also necessary to avoid triggering small earthquakes which may cause oil spills (as discussed in section II.B.6.h.). The cost of such programs would be a very small percentage of the potential value of the petroleum reserves, and could be largely or completely amortized if it prevented only one major oil spill.

## 12. Other Environmental Research

- Ecological Baseline and Monitoring Studies

In October 1972 NOAA sponsored a workshop at the Santa Catalina Marine Biological Laboratory of the University of Southern California to develop strategies for a national program in marine pollution monitoring. In May 1974 the National Bureau of Standards held a second workshop in marine pollution monitoring in Gaithersburg, Maryland. This second workshop developed the monitoring program as a pilot project of the Integrated Global Oceanic Station System (IGOSS) under the United Nations. This program proposes a global network of marine pollution measurements from ships, coastal stations, and various other platforms by scientists of many nations. The objective of the program would be long term, large scale monitoring of various forms, primarily hydrocarbons, of marine pollution.

In 1974, in response to Senate National Ocean Policy Study hearings, a committee was formed to coordinate baseline studies which pertain to oil and gas development on the Outer Continental Shelves.

Participants were the Bureau of Land Management, the National Oceanic and Atmospheric Administration, the Environmental Protection Agency, the U. S. Geological Survey, the Fish and Wildlife Service, and the National Ocean Policy Study. Department of the Interior baseline studies involve three sequential levels of effort: (1) an inventory and analysis of existing environmental and socioeconomic data; (2) special field studies to fill short-term non-recurring data gaps pointed out in the first phase; and (3) continuing ecological baseline and monitoring studies in existing fields and pipeline corridors. Studies of southern California have been described by the Department of the Interior OCS Lease Sale 35, FES, Vol. I, p. 21-24.

Also in 1974, the Assembly Select Committee on Coastal Zone Resources of the California Legislature held hearings regarding offshore drilling, including environmental baseline data required to permit an accurate assessment and measurement of any changes which may occur in the environment as a result of OCS oil and gas development activities. One committee recommendation was:

"State and Federal governments should cooperate in the conduct of environmental baseline studies in any offshore area for which development leases are being sought before such leases are issued. The studies should be conducted by a governmental agency with expertise in marine sciences, such as the National Oceanic and Atmospheric Administration, and should be subjected to independent review. Such studies should be carried out on a continuing basis after oil and gas development proceeds in order to enhance the accuracy and usefulness of the information for application in future offshore oil and gas management decision." (California Legislature, 1974, Report on Hearings)

Environmental studies relating to offshore petroleum operations were reviewed by the National Research Council, assembly of Engineering, Marine Board.<sup>1</sup>

"The review Committee concludes that regulatory agencies can more efficiently apply their resources in a combined effort of monitoring, field assessment, and research and development so that the most pertinent data can be collected and evaluated and can be used in a predictive capacity for determining the potential effect of future petroleum development on the environment.

"The Review Committee examined the responsibility of regulatory agencies for controlling offshore industrial development and establishing the necessary restraints to protect the environment from significant adverse effects or permanent damage resulting from petroleum operations in offshore and related areas. The Review Committee also examined the application of resources by regulatory agencies in conducting environmental impact studies.

"...A problem-oriented approach to the collection and assessment of the environmental data by regulatory agencies...challenges the current practice by regulatory agencies of conducting widespread, lengthy, and sometimes duplicative studies prior to offshore oil operations, for the purpose of gaining a dynamic understanding of

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<sup>1</sup>August 1975, in fourth report of the review committee on safety of Outer Continental Shelf petroleum operations to the United States Geological Survey: work supported by Contract N00014-67-A0244-002 between the Office of Naval Research and the National Academy of Sciences.



the entire marine ecosystem. Unless such far-reaching studies are indicated by a singular type of facility or by special environmental problems at a particular location where petroleum will be extracted, they fall more appropriately within the responsibility of other government agencies assigned to the function of basic research or directly involved with the study of the marine environment."

Baseline studies and monitoring programs have been suggested by several agencies. The Sale 35 FES, and a variety of recent documents, presentations, and testimony of various Bureau of Land Management and Department of Interior officials before Congressional Committees demonstrates clearly a commitment to follow baseline data collection programs and studies in new frontier OCS areas with monitoring programs continuing through exploration and development activities.

- Bureau of Sport Fisheries and Wildlife

Research is being conducted on the status (populations, immediate problems) of the California condor, light-footed clapper rail, California least tern, the black rail, and (in cooperation with the California Department of Fish and Game) the California brown pelican. All species are either endangered or thought to be threatened. Goleta Slough, Carpinteria Marsh and Mugu Lagoon are among the mainland study locations for water-associated birds.

- National Marine Fisheries Service

The agency is cooperating in the California Cooperative Oceanic Fisheries Investigation in 1) performing bioassays of anchovy food supply, and 2) performing studies of anchovy larvae stock and recruitment. Independent work is conducted at San Miguel Island on marine mammals, primarily population and breeding studies on fur seals and sea lions.

- California Department of Fish and Game

The Department, in addition to specific studies, participates in the California Cooperative Oceanographic Fisheries Investigations (CalCOFI). Other participants in the CalCOFI program include Scripps Institution of Oceanography (SIO), which performs oceanographic data collection and analysis, and National Marine Fisheries Service, listed separately. The primary CalCOFI role of the Department is in assessing fish populations and distributions. The Department also participates or is delegated responsibility in a variety of governmental studies, programs, and regulatory functions.

- Southern California Coastal Water Research Project (SCCWRP)

The Project is chartered to comprehensive studies of the Southern California Bight, which includes the Santa Barbara Channel. A three-year comprehensive report was published in 1973. Other technical studies and reports are in progress. Originally and presently funded by five local government agencies, additional Environmental Protection Agency grants have been awarded. The 25 scientists are organized into the divisions of biology, chemistry, and engineering. Two of numerous studies under way are: 1) "Quantitative Response Characteristics of Demersal Fish and Benthic Invertebrate Communities," and 2) "A Synoptic Survey of Chlorinated Hydrocarbon Inputs to the Southern California Bight."

- Universities, Colleges and Academic Institutions

The University of California system and the University of Southern California are among the many academic institutions utilizing the resources of the entire Santa Barbara Channel area for research and instruction. Research results appear in journals, technical reports and thesis format. Studies are too numerous and varied to list. Those related

to oil production include tolerance of organisms to oil pollution, effects of oil and detergents on survival of species and recolonization of intertidal substrates, thermal effects of oil pollution in the upper intertidal zone, and long-term and sublethal effects of exposure to oil.

- Ocean Dischargers

Dischargers (municipal, industrial) are required to monitor their operations (sample and analyze--physical, chemical, bacteriological). Data is submitted to appropriate regulatory agencies. This data of voluminous proportions enables compliance with regulations, but is usually not published.

The USGS has contacted various State and Federal agencies as to their requirements for minimum requirements for biological surveys to determine impacts of oil and gas operations. The agencies contacted (including U. S. Fish and Wildlife Service, U. S. National Marine Fisheries Service, California Department of Fish and Game, and Oregon Department of Fish and Wildlife) specified various surveys. Also, EPA has performed and contracted produced waste water impact studies.

- Study of Oil, Tar, and Gas Seeps

The California State Lands Commission has contracted with University of Southern California scientists to conduct a 14-month study of oil, gas, and tar seeps in the Santa Barbara Channel. The scope of work includes location of seeps, determination of causes, and an attempt to find means of sealing or minimizing the seepage. The study period is July 1974 through August 1975.

### 13. Air Quality Impacts

#### a. Marine Tanker Loading Terminal Air Emissions

Measures to mitigate air emissions from tanker loading activity will be taken wherever possible. Methods of decreasing combustion products generated would include minimization of unnecessary operation of ship's engines and auxiliaries during loading. Also, consumption of low sulphur fuel oil will decrease impacts from combustion products.

Loading procedures can also significantly affect generation of ullage vapor emissions. Fill pipe locations close (within several inches) to the bottom of tanks decrease turbulence of incoming fluids and resultant generation of volatile hydrocarbon gases. Avoidance where possible or safe, of topping off hold tanks will also decrease vapor discharge to the air because the most hydrocarbon rich portion of generated vapors tends to be within a few feet of the fluid surface and are the last to be displaced when filling.

#### b. Onshore Treating Facilities Emissions

Mitigation of air emissions from onshore processing facilities will occur by a variety of means.

All processes will be closed to the atmosphere and no emissions other than disposal by sweet gas flare incineration of certain waste tail gases and occasional emergency flare burning will occur. The relatively small quantities of combustion gases and their composition and minimization are reviewed in the Onshore Facilities Air Impacts discussion.

APPENDIX IV-1

Form 3380-1  
(February 1966)  
(formerly 4-1255)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

OIL AND GAS LEASE OF SUBMERGED LANDS  
UNDER THE OUTER CONTINENTAL SHELF LANDS ACT

Office	
Serial Number	
Cash Bonus	
Rental Rate	
Minimum Royalty Rate	Royalty Rate

This indenture of lease entered into and effective as of \_\_\_\_\_, by and between the United States of America, hereinafter called the Lessor, by the Director, Bureau of Land Management, and

hereinafter called the Lessee, under, pursuant, and subject to the terms and provisions of the Outer Continental Shelf Lands Act of August 7, 1953 (67 Stat. 462; 43 U.S.C., Sec. 1331, *et seq.*), hereinafter referred to as the Act, and to all lawful and reasonable regulations of the Secretary of the Interior (hereinafter referred to as the Secretary) when not inconsistent with any express and specific provisions herein, which are made a part hereof:

WITNESSETH:

Sec. 1. Rights of Lessee. That the Lessor, in consideration of a cash bonus and of the rents and royalties to be paid, and the conditions and covenants to be observed as herein set forth, does hereby grant and lease to the Lessee the exclusive right and privilege to drill for, mine, extract, remove and dispose of all oil and gas deposits except helium gas in or under the following-described area of the Outer Continental Shelf (as that term is defined in the Act):

containing \_\_\_\_\_ acres, more or less (hereinafter referred to as the leased area), together with:

(a) the nonexclusive right to conduct within the leased area geological and geophysical explorations which are not unduly harmful to aquatic life;

(b) the right to drill water wells within the leased area and use free of cost, and to dispose of, water produced from such wells; and

(c) the right to construct or erect and to maintain within the leased area all artificial islands, platforms, fixed or floating structures, sea walls, docks, dredged channels and spaces, buildings, plants, telegraph or telephone lines and cables, pipelines, reservoirs, tanks, pumping stations, and other works and structures necessary or convenient to the full enjoyment of the rights granted by this lease, for a period of 5 years and as long thereafter as oil or gas may be produced from the leased area in paying quantities, or drilling or well reworking operations, as approved by the Secretary, are conducted thereon; subject to any unitization or pooling agreement heretofore or hereafter approved by the Secretary which affects the leased area or any part thereof, the provisions of such agree-

ments to govern the leased area or part thereof subject thereto where inconsistent with the terms of this lease.

Sec. 2. Obligations of Lessee. In consideration of the foregoing, the Lessee agrees:

(a) *Rentals and royalties.* (1) To pay rentals and royalties as follows:

*Rentals.* To pay the Lessor on or before the first day of each lease year commencing prior to a discovery of oil or gas on the leased area, a rental of \_\_\_\_\_ per acre or fraction thereof.

*Minimum royalty.* To pay the Lessor in lieu of rental at the expiration of each lease year commencing after discovery a minimum royalty of \_\_\_\_\_ per acre or fraction thereof or, if there is production, the difference between the actual royalty paid during the year and the prescribed minimum royalty, if the actual royalty paid is less than the minimum royalty.

*Royalty on production.* To pay the Lessor a royalty of \_\_\_\_\_ percent in amount or value of production

saved, removed, or sold from leased area. Gas of all kinds (except helium and gas used for purposes of production from and operations upon the leased area or unavoidably lost) is subject to royalty.

(2) It is expressly agreed that the Secretary may establish reasonable minimum values for purposes of computing royalty on products obtained from this lease, due consideration being given to the highest price paid for a part or for a majority of production of like quality in the same field, or area, to the price received by the Lessee, to posted prices, and to other relevant matters. Each such determination shall be made only after due notice to the Lessee and a reasonable opportunity has been afforded the Lessee to be heard.

(3) When paid in value, such royalties on production shall be due and payable monthly on the last day of the month next following the month in which the production is obtained. When paid in production, such royalties shall be delivered at pipeline connections or intanks provided by the Lessee. Such deliveries shall be made at reasonable times and intervals and, at the Lessee's option, shall be effected either (i) on or immediately adjacent to the leased area, without cost to the Lessor, or (ii) at a more convenient point closer to shore or on shore, in which event the Lessee shall be entitled to reimbursement for the reasonable cost of transporting the royalty substance to such delivery point. The Lessee shall not be required to provide storage for royalty taken in kind in excess of tankage required when royalty is paid in value. When payments are made in production the Lessee shall not be held liable for the loss or destruction of royalty oil or other liquid products in storage from causes over which the Lessee has no control.

(4) Rentals or minimum royalties may be reduced and royalties on the entire leasehold or any deposit, tract, or portion thereof segregated for royalty purposes may be reduced if the Secretary finds that, for the purpose of increasing the ultimate recovery of oil or gas and in the interest of conservation of natural resources, it is necessary, in his judgment, to do so in order to promote development, or because the lease cannot be successfully operated under the terms fixed herein.

(b) *Bonds.* To maintain at all times the bond required prior to the issuance of this lease and to furnish such additional security as may be required by the Lessor if, after operations or production have begun, the Lessor deems such additional security to be necessary.

(c) *Cooperative or unit plan.* Within 30 days after demand, to subscribe to and to operate under such reasonable cooperative or unit plan for the development and operation of the area, field, or pool, or part thereof, embracing lands included herein as the Secretary may determine to be practicable and necessary or advisable in the interest of conservation which plan shall adequately protect the rights of all parties in interest, including the United States.

(d) *Wells.* (1) To drill and produce such wells as are necessary to protect the Lessor from loss by reason of production on other properties or, in lieu thereof, with the consent of the oil and gas supervisor, to pay a

sum determined by the supervisor as adequate to compensate the Lessor for failure to drill and produce any such well. In the event that this lease is not being maintained in force by other production of oil or gas in paying quantities or by other approved drilling or reworking operations, such payments shall be considered as the equivalent of production in paying quantities for all purposes of this lease.

(2) After due notice in writing, to drill and produce such other wells as the Secretary may reasonably require in order that the leased area or any part thereof may be properly and timely developed and produced in accordance with good operating practice.

(3) At the election of the Lessee, to drill and produce other wells in conformity with any system of well spacing or production allotments affecting the area, field, or pool in which the leased area or any part thereof is situated, which is authorized or sanctioned by applicable law or by the Secretary.

(e) *Payments.* To make all payments to the Lessor by check, bank draft or money order payable as indicated herein unless otherwise provided by regulations or by direction of the Secretary. Rental, royalties, and other payments shall be made payable to the United States Geological Survey and tendered to the Oil and Gas Supervisor, *except* that filing charges, bonuses, and first year's rental shall be made payable to the Bureau of Land Management and remitted to the Manager of the appropriate field office of that Bureau.

(f) *Contracts for disposal of products.* To file with the Oil and Gas Supervisor, Geological Survey, not later than 30 days after the effective date thereof, copies of all contracts for the disposal of lease products; provided that the Supervisor may relieve the Lessee of this requirement, in which event the contracts shall be made available for inspection by the Supervisor upon his request. Nothing in any such contract or in any approval thereof by the Supervisor shall be construed or accepted as modifying any of the provisions of this lease, including, but not limited to, provisions relating to gas waste, taking royalty in kind, and the method of computing royalties due as based on a minimum valuation and in accordance with the regulations applicable to this lease.

(g) *Statements, plats, and reports.* At such times and in such form as the Lessor may prescribe, to furnish detailed statements and reports showing the amounts and quality of all products saved, removed, and sold from the leased area, the proceeds therefrom, and the amount used for production purposes or unavoidably lost; also a plat showing development work and improvements on or with regard to the leased area.

(h) *Inspection.* To keep open at all reasonable times for the inspection of any duly authorized representative of the Lessor, the leased area and all wells, improvements, machinery and fixtures thereon and all books, accounts, and records relative to operations and surveys or investigations on or with regard to the leased area or under the lease.

(i) *Diligence.* To exercise reasonable diligence in

drilling and producing the wells herein provided for; to carry on all operations in accordance with approved methods and practices including those provided in the operating and conservation regulations for the Outer Continental Shelf; to remove all structures when no longer required for operations under the lease to sufficient depth beneath the surface of the waters to prevent them from being a hazard to navigation; to carry out at expense of the Lessee all lawful and reasonable orders of the Lessor relative to the matters in this paragraph, and that on failure of the Lessee so to do the Lessor shall have the right to enter on the property and to accomplish the purpose of such orders at the Lessee's cost: *Provided*, That the Lessee shall not be held responsible for delays or casualties occasioned by causes beyond the Lessee's control.

(j) *Freedom of purchase.* To accord all workmen and employees directly engaged in any of the operations under this lease complete freedom of purchase.

(k) *Equal Opportunity clause.* During the performance of this contract the lessee agrees as follows:

(1) The lessee will not discriminate against any employee or applicant for employment because of race, creed, color, or national origin. The lessee will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, creed, color, or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The lessee agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the contracting officer setting forth the provisions of this nondiscrimination clause.

(2) The lessee will, in all solicitations or advertisements for employees placed by or on behalf of the lessee, state that all qualified applicants will receive consideration for employment without regard to race, creed, color, or national origin.

(3) The lessee will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the agency contracting officer, advising the labor union or workers' representative of the lessee's commitments under Section 202 of Executive Order No. 11246 of September 24, 1965, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(4) The lessee will comply with all provisions of Executive Order No. 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

(5) The lessee will furnish all information and reports required by Executive Order No. 11246 of September 24, 1965, and by the rules, regulations, and orders of the Secretary of Labor, or pursuant

thereto, and will permit access to his books, records, and accounts by the contracting agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(6) In the event of the lessee's noncompliance with the nondiscrimination clauses of this contract or with any of such rules, regulations, or orders, this contract may be cancelled, terminated or suspended in whole or in part and the lessee may be declared ineligible for further Government contracts in accordance with procedures authorized in Executive Order No. 11246 of September 24, 1965, and such other sanctions may be imposed and remedies involved as provided in Executive Order No. 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(7) The lessee will include the provisions of Paragraphs (1) through (7) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order No. 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The lessee will take such action with respect to any subcontract or purchase order as the contracting agency may direct as a means of enforcing such provisions including sanctions for noncompliance: *Provided, however*, That in the event the lessee becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the contracting agency, the lessee may request the United States to enter into such litigation to protect the interests of the United States.

(l) *Assignment of lease.* To file for approval with the Bureau of Land Management, within 90 days from the date of final execution, any instrument of transfer of this lease, or any interest therein, including assignments of record title, operating agreements, and subleases. Carried working interests, overriding royalty interests, or payments out of production, may be created or transferred without requirement for filing or approval. Instruments required to be filed shall take effect upon approval as of the first day of the lease month following the date of filing unless at the request of the parties an earlier date is specified in such approval.

**Sec. 3. Reservations to Lessor.** The Lessor reserves:

(a) *Geological and geophysical exploration; rights-of-way.* The right to authorize the conduct of geological and geophysical exploration in the leased area which does not interfere with or endanger actual operations under this lease, and the right to grant such easements or rights-of-way upon, through, or in the leased area as may be necessary or appropriate to the working of other lands containing the deposits described in the Act, and to the treatment and shipment of products thereof by or under authority of the United States, its Lessees or Permittees, and for other public purposes, subject to the

provisions of Section 5(c) of the Act where they are applicable and to all lawful and reasonable regulations and conditions prescribed by the Secretary thereunder.

(b) *Leases of sulfur and other mineral.* The right to grant sulfur leases and leases of any mineral other than oil, gas, and sulfur within the leased area or any part thereof, subject to the provisions of Section 8(c), 8(d), and 8(e) of the Act and all lawful and reasonable regulations prescribed by the Secretary thereunder; *Provided*, That no such sulfur lease or lease of other mineral shall authorize or permit the Lessee thereunder unreasonably to interfere with or endanger operations under this lease.

(c) *Purchase of production.* In time of war, or when the President of the United States shall so prescribe, the right of first refusal to purchase at the market price all or any portion of the oil or gas produced from the leased area, as provided in Section 12(b) of the Act.

(d) *Taking of royalties.* All rights, pursuant to clause (3) of Section 8(b) of the Act, to take royalties in the amount or value of production.

(e) *Fissionable materials.* All uranium, thorium, and all other materials determined pursuant to paragraph (1) of subsection (b) of Section 5 of the Atomic Energy Act of 1946, as amended, to be peculiarly essential to the production of fissionable materials, contained, in whatever concentration, in deposits in the subsoil or seabed of the leased area or any part thereof, as provided in Section 12(e) of the Act.

(f) *Helium.* Pursuant to Section 12(f) of the Act, the ownership and the right to extract helium from all gas produced under this lease, subject to such rules and regulations as shall be prescribed by the Secretary.

(g) *Suspension of operations during war or national emergency.* Upon recommendation of the Secretary of Defense, during a state of war or national emergency declared by the Congress or President of the United States after August 7, 1953, the authority of the Secretary to suspend any or all operations under this lease, as provided in Section 12(c) of the Act: *Provided*, That just compensation shall be paid by the Lessor to the Lessee.

(h) *Restriction of exploration and operations.* The right, as provided in Section 12(d) of the Act, to restrict from exploration and operations the leased area or any part thereof which may be designated by and through the Secretary of Defense, with the approval of the President, as, or as part of, an area of the Outer Continental Shelf needed for national defense; and so long as such designation remains in effect no exploration or operations may be conducted on the surface of the leased area or the part thereof included within the designation except with the concurrence of the Secretary of Defense; and if operations or production under this lease within any such restricted area shall be suspended, any payments of rentals, minimum royalty, and royalty prescribed by this lease likewise shall be suspended during such period of suspension of operations and production, and the term of this lease shall be extended by adding thereto any such suspension period, and the Lessor shall be liable to the Lessee

for such compensation as is required to be paid under the Constitution of the United States.

**Sec. 4. Directional drilling.** This lease may be maintained in force by directional wells drilled under the leased area from surface locations on adjacent or adjoining lands not covered by this lease. In such circumstances, drilling shall be considered to have been commenced on the leased area when drilling is commenced on the adjacent or adjoining land for the purpose of directionally drilling under the leased area, and production of oil or gas from the leased area through any directional well surfaced on adjacent or adjoining land or drilling or reworking of any such directional well shall be considered production or drilling or reworking operations (as the case may be) on the leased area for all purposes of this lease. Nothing contained in this paragraph is intended or shall be construed as granting to the Lessee any leasehold interests, licenses, easements, or other rights in or with respect to any such adjacent or adjoining land in addition to any such leasehold interests, licenses, easements, or other rights which the Lessee may have lawfully acquired under the Act or from the Lessor or others.

**Sec. 5. Surrender and termination of lease.** The Lessee may surrender this entire lease or any officially designated subdivision of the leased area by filing with the Bureau of Land Management, a written relinquishment, in *triplicate*, which shall be effective as of the date of filing, subject to the continued obligation of the Lessee and his surety to make payment of all accrued rentals and royalties and to abandon all wells on the area to be relinquished to the satisfaction of the Oil and Gas Supervisor.

**Sec. 6. Removal of property on termination of lease.** Upon the expiration of this lease, or the earlier termination thereof as herein provided, the Lessee shall within a period of 1 year thereafter remove from the premises all structures, machinery, equipment, tools, and materials other than improvements needed for producing wells or for drilling or producing on other leases and other property permitted by the Lessor to be maintained on the area.

**Sec. 7. Remedies in case of default.** (a) Whenever the Lessee fails to comply with any of the provisions of the Act or this lease or the applicable regulations in force and effect on the date of issuance of this lease, the lease shall be subject to cancellation as follows:

(1) *Cancellation of nonproducing lease.* If, at the time of such default, no well is producing, or is capable of producing, oil or gas in paying quantities from the leased area, whether such well be drilled from a surface location within the leased area or be directionally drilled from a surface location on adjacent or adjoining lands, this lease may be cancelled by the Secretary (subject to the right of judicial review as provided in Section 8(j) of the Act) if such default con-



tinues for the period of 30 days after mailing of notice by registered letter to the Lessee at the Lessee's record post office address.

(2) *Cancellation of producing lease.* If, at the time of such default, any well is producing, or is capable of producing, oil or gas in paying quantities from the leased area, whether such well be drilled from a surface location within the leased area or be directionally drilled from a surface location on adjacent or adjoining lands, this lease may be cancelled by an appropriate proceeding in any United States district court having jurisdiction under the provisions of Section 4(b) of the Act if such default continues for the period of 30 days after mailing of notice by registered letter to the Lessee at the Lessee's record post office address.

(b) *Other remedies.* If any such default continues for the period of 30 days after mailing of notice by registered letter to the Lessee at the Lessee's record post office address, the Lessor may then exercise any legal or equitable remedy which the Lessor may have; however, the remedy of cancellation of this lease may be exercised only under the conditions and subject to the limitations set out above in paragraph (a) of this Section, or pursuant to Section 8(i) of the Act.

(c) *Effect of waiver of default.* A waiver of any particular default shall not prevent the cancellation of

this lease or the exercise of any other remedy the Lessor may have by reason of any other cause or for the same cause occurring at any other time.

**Sec. 8. Heirs and successors in interest.** Each obligation hereunder shall extend to and be binding upon, and every benefit hereof shall inure to, the heirs, executors, administrators, successors, or assigns of the respective parties hereto.

**Sec. 9. Unlawful interest.** No Member of, or Delegate to, Congress, or Resident Commissioner, after his election or appointment, or either before or after he has qualified, and during his continuance in office, and no officer, agent, or employee of the Department of the Interior, except as provided in 43 CFR 7.4(a) (1), shall be admitted to any share or part in this lease or derive any benefit that may arise therefrom; and the provisions of Section 3741 of the Revised Statutes (41 U.S.C. Sec. 22), as amended, and Sections 431, 432, and 433 of Title 18 of the United States Code, relating to contracts made or entered into, or accepted by or on behalf of the United States, form a part of this lease so far as the same may be applicable.

THE UNITED STATES OF AMERICA

\_\_\_\_\_  
(Signature of Lessee)

By \_\_\_\_\_  
(Authorized Officer)

\_\_\_\_\_  
(Signature of Lessee)

\_\_\_\_\_  
(Title)

\_\_\_\_\_  
(Signature of Lessee)

\_\_\_\_\_  
(Date)

\_\_\_\_\_  
(Signature of Lessee)

*If this lease is executed by a corporation, it must bear the corporate seal*

GPO 855-238

APPENDIX IV-2

Supplement No. 1

to

REPORT OF THE WORK GROUP ON OCS SAFETY AND POLLUTION CONTROL, MAY 1973

U. S. Geological Survey

Work Group Members:

A. Dewey Acuff  
J. R. Balsley  
Henry W. Coulter  
B. F. Grossling  
Hubert Risser  
W. A. Radlinski, Chairman

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## Foreword

This supplement is a response to recommendations of the report, Energy Under the Oceans, a technology assessment of Outer Continental Shelf oil and gas operations, published in November 1973, by the University of Oklahoma Press. The report is the result of a study conducted by an interdisciplinary research team, headed by Dr. Don E. Kash and Dr. Irvin L. White, University of Oklahoma, and funded by the National Science Foundation.

Responses are made to only those recommendations which pertain to safety and pollution control and over which the U. S. Geological Survey has some control or responsibility. The Work Group which prepared this supplement consisted of the same members who prepared the May, 1973, report responding to recommendations of three earlier studies conducted at the request of the Survey--one by a team of NASA Specialists, one by a group of USGS Systems Analysts, and one by a panel of the Marine Board, National Academy of Engineering.

The Chairman reviewed the University of Oklahoma report at an NSF critique on September 7, 1973, and at an NSF-RANN Symposium on November 19, 1973. The latter review is included as an appendix.

## RESPONSE TO RECOMMENDATIONS OF "ENERGY UNDER THE OCEANS"

(A Supplement to the May 1973 Report of the  
Work Group on OCS Safety and Pollution Control)

U. S. Geological Survey

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The report, Energy Under the Oceans, contains 39 recommendations concerning oil and gas operations on the Outer Continental Shelf. In responding to these recommendations, the U. S. Geological Survey Work Group on OCS Safety and Pollution Control placed them in four categories as follows:

- I. Recommendations Over Which the USGS Has No Control
- II. Recommendations Already Implemented or in Progress
- III. Recommendations Calling for Modifications of Earlier Responses
- IV. New Recommendations

### I. RECOMMENDATIONS OVER WHICH THE USGS HAS NO CONTROL

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This category includes OU recommendations which the USGS cannot implement because of lack of authority or responsibility, or which are specifically addressed to other organizations. No response is made to these by the Work Group. There are 25 recommendations in this category--Nos. 1-7, 9-16, 20, 21, 23-26, 29, 34, 36, and 37. Additionally, OU Recommendation No. 8 calls for a continuation of the present separation of functions and responsibilities between USGS and BLM and, therefore, requires no response from the Work Group. It further recommends a comprehensive plan for OCS development, but the increments of the plan are covered in the other OU recommendations and the applicable ones are addressed individually below.

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1/ A Technology Assessment of Outer Continental Shelf Oil and Gas Operations prepared by an interdisciplinary research team under the aegis of the Science and Public Policy Program at the University of Oklahoma, 1973, funded by the National Science Foundation.

2/ OU--University of Oklahoma

## II. RECOMMENDATIONS ALREADY IMPLEMENTED OR IN PROGRESS

In the second category of OU recommendations are four (Nos. 27, 28, 30, and 35) that are nearly identical to recommendations made in earlier studies. The Work Group has already responded to these in its report of May, 1973, and implementation actions are in progress. Included are:

OU 27. *Standards.* USGS should establish equipment requirements in terms of the objectives to be achieved. While these requirements should include detailed performance standards for all pieces of equipment affecting safety and environment, design specifications should not be allowed to act as a deterrent to technological development. The presently used fines and orders for suspension of operations are generally adequate. Detailed standards will require equipment suppliers to establish quality-control procedures. (Chapter VI)

- Agree. See Work Group Recommendation No. 5 (May 1973 report).

The first project undertaken by an API Committee formed in response to this recommendation was the development of a recommended practice for design, installation, and operation of subsurface safety valve systems (API RP 14B), and specifications for subsurface safety valves (API Std. 14A). These have now been published. A facility for testing of subsurface safety valves is being constructed in Houston, Texas, and will be operated by an independent research institute. A committee is being formed to conduct quality assurance inspections of subsurface safety valve manufacturers. The manufacturers must comply with the quality assurance program as set forth in the specifications for subsurface safety valves in order to be able to use the API monogram on their valves.

Additional projects undertaken by the Committee include: recommended practice for the design, installation, and operation of offshore platform basic surface safety systems (draft standards have been issued); specifications for surface safety valves and actuators; and a recommended practice for platform piping system design. As in the case with subsurface safety valves, quality assurance programs for other equipment items will be initiated as appropriate.

The American Petroleum Institute, the American Society for Testing Materials, the American Society of Mechanical

Engineers, the National Association of Corrosion Engineers, and other similar organizations, as appropriate, will be requested to develop needed standards. USGS representatives will participate in these efforts. Standards developed by these organizations, and appropriate existing standards now referenced in OCS orders, will be submitted to the American National Standards Institute (ANSI) for development, also with USGS participation, and for ANSI approval as national voluntary consensus standards.

OU 28. Failure Reporting. USGS should establish improved reporting and systematic analysis procedures for failures, malfunctions, and equipment defects, as well as issue appropriate notices and warnings.

- Agree. See Work Group Recommendations Nos. 1, 2, and 3 (May 1973 report).

The USGS is in the process of developing a Failure Reporting and Corrective Action System with a target completion date of June 1974. A "Safety Alert" system for immediate notification of all operators of failures and accidents was established in September 1972.

OU 30. Review Technology. USGS should appoint an independent and representative committee of experts to review state-of-the-art in OCS technologies periodically and recommend desirable changes in equipment and performance standards. (Chapter VI)

- Agree. See Work Group Recommendation No. 15 (May 1973 report). Such a committee was established in July 1973, under the aegis of the Marine Board of the National Academy of Engineering. Its emphasis is on technologies related to safety and pollution control.

OU 35. Industry Cooperation. USGS should actively promote greater industry cooperation in the development of safety, accident prevention, and environmental protection technologies. Industry should be assured that cooperation in these designated areas will not be subject to anti-trust action. This could be accomplished by having the Anti-Trust Division of the Department of Justice issue guidelines for cooperative efforts or by having the Division give opinions on specific proposals. (Chapter VI)

- Agree. See Work Group Recommendations Nos. 4, 5, and 10 (May 1973 report). Three cooperative committees with

API were established in September 1972--Offshore Safety and Anti-Pollution Equipment Standards; Offshore Safety and Anti-Pollution Research; and offshore Safety and Anti-Pollution Training and Motivation. All are active. The Department of Justice, by letter of November 29, 1972, stated that "it would not violate the antitrust laws for the Geological Survey to disseminate lessee-filed reports relating to the breakdown of safety and anti-pollution control equipment to all lessees operating on the OCS."

### III. RECOMMENDATIONS CALLING FOR MODIFICATIONS OF EARLIER RESPONSES

In the third category of OU recommendations are six (Nos. 18, 19, 31, 32, 33, and 39) that are similar to recommendations already made by the Work Group but call for some additional responses. The Work Group's responses to these are as follows:

- OU 18. OCS Orders: Coverage. All design specifications and regulations for which USGS has administrative responsibility, including those resulting from interagency agreements, should be detailed in OCS orders for each USGS area. OCS orders should be a detailed composite of the regulations and criteria under which oil and gas operations are to be carried out. Such a composite would inform both industry and the interested public of operational standards. (Chapter VI)
- OU 19. OCS Orders: Preparation. All OCS orders should be reviewed in advance by committees representing both industry and other interested parties selected by the Chief of the Conservation Division of USGS. At present, preparation of OCS orders involves industry participation. For example, in the Gulf Coast area, proposed orders are reviewed by the Offshore Operators Committee. Broadening the range of reviewers should assure sensitivity to a wide set of social concerns at the immediate management level. Placing selection in the Conservation Division in Washington should provide access to the best informed people in organizations such as the national environmental interest groups. (Chapter VI)
- With respect to the OU Recommendation No. 18, the Work Group agreed with and responded to all aspects, except it did not specifically address the matter of interagency agreements. It does so in the revised recommendation given below (paragraph d.).



With respect to OU Recommendation No. 19, the Work Group agrees that broadening the range of reviewers is desirable, and further concludes that proposed Orders should be made available to all interested organizations on an equal basis. It may be necessary during the drafting stage to consult with individuals, from industry or elsewhere, on specific aspects of proposed Orders in their capacity as individual experts on certain specialized requirements. Proposed Orders, however, should not be made available to industry or other groups prior to their publication in the Federal Register.

Accordingly, Work Group Recommendation No. 13 (May 1973 report) is revised as follows to respond to OU Recommendations 18 and 19 (additions and changes are underlined):

WORK GROUP RECOMMENDATION NO. 13 (Revised)

- a. Formalized procedures of the type outlined in the NASA recommendation should be established for development and revision of OCS Orders.
- b. In general, OCS Orders should specify the objectives to be achieved, with standards for achievement included by reference.
- c. The Work Group agrees with the NAE recommendations that 1) there should be continuation and refinement of the current practice of requiring submission of plans of applicants in terms of equipment and including personnel qualifications and training procedures; and 2) that regulations should take into account on a continuing basis the results of the analysis of information resulting from accident evaluation, as well as consideration of natural environmental hazards.
- d. All memoranda of understanding and interagency agreements concerning management of OCS petroleum activities should be made available in a single document, and appropriate references made in OCS Orders.
- e. The Conservation Division should adopt the following procedures for the development of new and revised OCS Orders:
  - (1) Announce in the Federal Register its intention to prepare a new or revised Order and solicit comments and recommendations.

- (2) Prepare a draft of the Order and publish it in the Federal Register for comment.

Steps (1) and (2) may in some cases be concurrent.

- (3) After receipt of comments, Division personnel may meet with interested organizations or consult with individual experts on the various requirements of the Order.
- (4) Revise the draft Order, if appropriate, to take into account the information developed from steps (2) and (3).
- (5) If the revision is extensive or significant, republish the Order in the Federal Register as a redraft for further comment. Otherwise, publish it in the Federal Register as a final Order with an effective date.

#### IMPLEMENTATION ACTION REQUIRED

The Conservation Division should prepare written procedures outlining the step-by-step actions to be followed in the formulation of OCS Orders for all areas and should assemble and make available all applicable memoranda of understanding and interagency agreements.

- OU 31. *Government R&D.* USGS should undertake an expanded research, development, and testing program as necessary to insure optimal regulation and rapid development of new equipment and procedures. So far as possible, this work should be contracted with organizations outside the R&D system of the petroleum industry. This will help to insure that USGS and OCS operators maintain continuing effective communications with other technological communities. (Chapter VI)
- OU 39. *Inadequate Components.* USGS should immediately compile a list similar to the following one (given on pages 259 and 260 of the OU report), and each year publish a summary review of the progress achieved in correcting weaknesses. This review should continue until the identification system previously recommended is operational. The physical technologies with weaknesses fall into three categories: need to be developed, need to be improved, and need to be deployed. (Chapter VI)

- Concerning R&D, the thrust of the Work Group's Recommendation No. 4 (May 1973 report) was to encourage industry to conduct the necessary R&D because of its operational responsibility for safety and pollution prevention. Accordingly, the approach was to establish an API-USGS R&D Committee to encourage industry in this activity. A list of pertinent R&D projects in progress is being completed together with a list of those needs that require new or improved development. Nevertheless, the USGS should have capability for R&D development. Therefore, the Work Group further recommended that in those cases where industry does not respond to R&D needs, the USGS will contract for the required work.

The Work Group agrees with the second part of OU's Recommendation No. 31--to contract for R&D with organizations outside the petroleum industry to insure effective communications with other technological communities--and responds to this proposal in its revised Recommendation No. 4 given below.

With respect to OU's Recommendation No. 39, implementation of the Work Group Recommendations Nos. 1, 2c, 3, 4, and 6 (May 1973 report) will provide a basis for compiling a list of inadequate components as well as promotion of R&D for corrective actions. The Work Group did not in its earlier recommendations address the desirability of publishing an annual summary review of progress being made towards correcting the weaknesses. It agrees, however, that this should be done.

Accordingly, to respond to OU's Recommendations Nos. 31 and 39 the Work Group revises its Recommendation No. 4 (May 1973 report) as follows (additions and changes are underlined):

#### WORK GROUP RECOMMENDATION NO. 4 (Revised)

- a. The USGS, in cooperation with the API or other appropriate organizations, should establish a program to encourage and promote research and development in safety and anti-pollution equipment and systems. Current and completed research and development should be taken into account in the determination of specific needs. Such needs should be communicated to industry

through API or other appropriate organizations, and issued by USGS as an annual summary report. For those needs where there is no response from industry, or the response is unsatisfactory, the USGS should contract for the required work, utilizing, when appropriate, organizations outside the usual petroleum industry R&D establishments to perform such research. (See also Recommendation No. 8a.)

- b. With specific reference to the NAE recommendations, the Work Group recommends:
- (1) The promotion of industry consensus standards should be effected through a cooperative arrangement with API (see Work Group Recommendation No. 5).
  - (2) Requests should be made to NOAA, USCG, and EPA to sponsor programs to study the effects of various amounts of crude oil intrusion into the marine environment, taking into account site variables.
  - (3) The recommendation to undertake quantitative studies of the effectiveness of methods for cleaning up oil from the marine environment should be referred to the U. S. Coast Guard.
  - (4) The development and testing of damage-limiting and fail-safe systems in the area of damage control, fire-fighting, and well control should be an item for follow-up under cooperative arrangements with API, or other appropriate organizations.
- c. Industry should be encouraged to grant reasonable access to patented safety and pollution control devices and systems to offshore operators.

#### IMPLEMENTATION ACTION REQUIRED

The Conservation Division should identify those physical technologies and operational

methods in need of R&D, which have a significant impact on safety and pollution control, and for which industry R&D efforts are considered inadequate or lacking. As these are identified, the Division should prepare a plan for contracting with organizations outside the petroleum industry, but giving consideration to R&D work which could be carried out by the Government itself. The plan should include recommendations for the funding of such R&D work.

The Conservation Division should also establish which organizations, other than API, could be considered for assistance in the R&D efforts of the USGS, and their participation utilized when appropriate.

OU 32. *Personnel Standards.* USGS should develop uniform standards and certification requirements for personnel who perform inspection and test functions. (Chapter VI)

OU 33. *Personnel Training.* USGS should develop a program to establish improved and standardized training and procedures for operating personnel. This program should utilize the expertise of organizations and individuals such as behavioral scientists who specialize in training. (Chapter VI)

- Work Group Recommendation No. 9 (May 1973 report) does not preclude the development of standards and requirements for personnel who perform inspection and test functions. However, Recommendation No. 9 should be amended to identify this specific need. Likewise, the desirability of utilizing training specialists should be addressed. Accordingly, Work Group Recommendation No. 9 (May 1973 report) is changed as follows (additions and changes are underlined):

WORK GROUP RECOMMENDATION NO. 9 (Revised)

- a. The USGS, working with industry through API, should set standards and requirements for training of personnel, to include, but not be limited to, the following:

- (1) A requirement that all operator or third party personnel, who perform

inspection and test functions related to safety and pollution control, be formally trained and qualified.

- (2) A requirement for minimum training in safety and pollution prevention and control for all company and contractor personnel, including identification and proper use of safety equipment, emergency procedures, and first aid.
  - (3) A requirement that appropriate company and contractor field personnel be briefed on USGS regulations and orders.
- b. Standards and requirements for such training should be specified in OCS Orders and a certification, by the operator, of compliance should become a prerequisite for inspecting, testing, and for certain permits and operational work. A system for updating and auditing such training should be developed. Appropriate credit should be given for pertinent experience.
  - c. The expertise of organizations and individuals who specialize in training should be utilized in the development of standards and requirements for training.
  - d. USGS field supervisory and inspection personnel should be required to participate in training courses appropriate to their responsibilities.

(The "third party" inspectors referred to in a.(1) above could be someone in the employ of the operator who is not responsible for the operations he is inspecting and who reports directly to management, or someone who is an employee of an outside firm with which the operator or group of operators contract for inspection services.)

#### IMPLEMENTATION ACTION REQUIRED

Arrangements have been made with API for a joint effort to develop the necessary standards and specifications for training of industry personnel. The Conservation Division should pursue this effort and revise OCS Orders accordingly.

Requirements for appropriate training of USGS personnel should be included in the Division Manual.

The Conservation Division should arrange for briefing programs on USGS regulations and orders.

#### IV. NEW RECOMMENDATIONS

The final category of OU recommendations include three (Nos. 17, 22, and 38) that are essentially different from those considered by the Work Group. These are discussed in the text that follows.

OU 17. USGS Management. *With limited exceptions, post-lease sale management of OCS oil and gas operations should be concentrated in USGS. The objective of this concentration of management is to eliminate gaps and overlaps and establish clear-cut responsibility. Such concentration will also assure that management decisions conform to the development plan laid out in the hierarchy of impact statements. Any impact statements triggered by post-lease sale activities should be the responsibility of USGS and be subsidiary to the lease sale statement. Where necessary, transfer of operational responsibility to USGS should be accomplished by inter-agency agreements. In summary, then, the USGS should continue to administer all of its present post-lease activities plus the following: (Chapter IX)*

- The Work Group agrees that the USGS should continue to administer all of its present post-lease activities. Comments on OU Recommendations 17a. through 17d. follow.

OU 17a. OSHA. *By agreement between Labor and Interior, OCS responsibilities assigned to the Department of Labor by the Occupational Safety and Health Act (OSHA) should be administered by USGS. The standards themselves should be developed by Labor with the advice of USGS and the Department of Health, Education, and Welfare (HEW). Such an arrangement will increase the effective day-to-day administration of the OSHA standards since USGS is already equipped to inspect OCS facilities. Further, these safety*

and health concerns are intimately tied to equipment design and operational procedures that are already a USGS responsibility. As a final advantage, this approach relieves industry of an additional layer of inspectors.

- The Work Group agrees. A draft of a Memorandum of Understanding was completed in March 1974 but questions of statutory authority and responsibility are as yet unresolved.

#### WORK GROUP RECOMMENDATION NO. 16

A Memorandum of Understanding between the USGS and OSHA should continue to be sought.

#### IMPLEMENTATION ACTION REQUIRED

The Conservation Division should continue to take the lead in negotiating a Memorandum of Understanding between OSHA and the USGS.  
/See section IV.A.9. "Memoranda of Understanding"7

OU 17b. Environmental Administration. USGS should be responsible for enforcing all environmental quality standards applicable to OCS oil and gas operations. Where necessary, agency responsibilities should be clearly defined in inter-agency agreements between Interior, Transportation, and EPA.

- Enforcement authorities are usually assigned by statutes. However, various inspection and monitoring activities upon which enforcement actions are based can sometimes be shared or delegated. Accordingly, current efforts towards finalizing various Memoranda of Understanding to clearly define the respective functions, scope of activities and responsibilities among the agencies involved in various aspects of environmental protection on the OCS should be expedited, and the results publicized for the guidance of all concerned. The Work Group addresses specific items in this regard in its Recommendations Nos. 13 (Revised), 16, and 17 of this report.



OU 17c. Rights-of-Way. By formal agreement between BLM and USGS, BLM should issue rights-of-way for common carrier pipelines only upon recommendation of the USGS. This will assure that coordination exists between common carrier lines and the gathering lines presently regulated by USGS. Such authority will allow USGS to insure that pipeline development conforms to the plans developed in the impact statements. Present responsibility for pipelines is fragmented, and some agencies are incapable of meeting their regulatory responsibilities.

OU 17d. Pipelines. By formal agreement between the Office of Pipeline Safety (OPS) and Interior, USGS should be designated as responsible for enforcing design and performance standards for offshore pipelines which are now under OPS jurisdiction. The standards, however, should be jointly formulated by OPS and USGS. USGS presently exercises such authority over gathering lines.

- Activities for the development of Memoranda of Understanding between USGS, BLM, and OPS in accordance with the intent of OU Recommendations 17c. and d. have been underway for some time. The principal delaying factors have been the need for reviews of the respective pipeline administering activities, including legal reviews, to clarify the statutory authorities and responsibilities of USGS, BLM, and OPS.

Current draft proposals of Memoranda of Understanding between USGS and BLM provide for USGS review, prior to final action by BLM, of all rights-of-way applications to install common carrier type pipelines pursuant to 43 CFR 2883. The reviews by USGS would focus on the technical aspects of OCS pipeline design, installation, maintenance and operation in accordance with appropriate regulations and standards designed for safety and environmental protection, and to avoid undue interference with other uses of the OCS and its superjacent waters. The USGS, in cooperation with BLM, will continue efforts to formulate an agreement with OPS whereby OPS safety standards developed for OCS pipelines may be enforced by the USGS.

WORK GROUP RECOMMENDATION NO. 17

- a. A Memorandum of Understanding between USGS and BLM should be developed whereby BLM approval of pipeline rights-of-way applications will require a determination by USGS of the adequacy of the application with respect to design, installation, maintenance and operation.
- b. A Memorandum of Understanding between USGS, BLM, and OPS should be formulated whereby the USGS will enforce OPS safety standards, jointly developed by OPS and USGS, for OCS pipelines.

IMPLEMENTATION ACTION REQUIRED

The Conservation Division should continue efforts to formulate a Memorandum of Understanding between the USGS and BLM concerning pipeline rights-of-way and a Memorandum of Understanding between USGS, BLM, and OPS for the enforcement of safety standards for pipelines.

/See section IV.A.9 "Memoranda of Understanding"/

OU 17e. Gas Reserves. By formal agreement between the Federal Power Commission (FPC) and Interior, USGS should be required to provide estimates of recoverable gas reserves to be served by proposed new gas lines. Attached to the estimates should be an assessment of how the line will fit into the development plan established in the impact statements. Additionally, USGS should be available to FPC for consultation on all questions concerning lines. The purpose is to assist FPC in approving new pipelines so that they conform to the development plan established in the impact statements.

- Estimates of recoverable gas reserves to be served by proposed new gas lines are the responsibility of FPC, but the USGS has cooperated with the FPC when requested and is available for assistance and consultation.

OU 22. Apply FWPCA to OCS. The FWPCA Amendments of 1972 should be amended specifically to apply discharge provisions to the OCS. Under this arrangement,

*EPA would establish the standards, but as recommended earlier, USGS would have enforcement responsibility. There is no apparent reason why the general principle of a separate agency to set environmental standards should not be applicable to the OCS. Such a separation provides an additional check and increased public credibility in this sensitive area. (Chapter X)*

- The OU recommendation implies that the pollutant discharge provisions of the Federal Water Pollution Control Act (FWPCA) Amendments of 1972 are not applicable to OCS lease operations. This is contrary to the memorandum opinion of January 30, 1973, of the Assistant Solicitor, International Marine Minerals, Department of the Interior. The Assistant Solicitor's opinion was that discharges of pollutants from OCS structures are subject to the National Pollutant Discharge System established by the 1972 FWPCA Amendments. The applicable paragraph of the opinion states:

"It should be noted that the Administrator, Environmental Protection Agency, is given broad discretionary and regulatory authority in implementing and administering the provisions of this legislation. In particular, your attention is invited to section 501(b) authorizing the Administrator to utilize the officers and employees of any other agency of the United States (with the consent of the head of such agency) to assist in carrying out the purposes of the Act. In these circumstances, it is recommended that you contact appropriate EPA officials regarding the possibility of an agreement under which the expertise of Geological Survey officials would be utilized in the administration of the National Pollutant Discharge System in its application to discharges arising from OCS lease operations."

Accordingly, the USGS has initiated discussions with EPA to consider the feasibility of a Memorandum of Understanding to minimize a redundancy of efforts and to utilize the expertise of USGS field personnel in the administration of the National Pollutant Discharge System with respect to OCS lease operations.

WORK GROUP RECOMMENDATION NO. 18

- The USGS and EPA should continue to pursue their discussions leading to the joint development of discharge standards for the OCS and a Memorandum of Understanding calling for enforcement by the USGS.

IMPLEMENTATION ACTION REQUIRED

The Conservation Division should pursue efforts to develop a Memorandum of Understanding between USGS and EPA for the formulation and enforcement of pollutant discharge standards.

OU 38. *Subsea Production Systems.* USGS should encourage early development and use of subsea production systems. Parallel to this, efforts should be made to formulate those specifications and regulations necessary to insure safe operation of subsea production systems. (Chapter VI)

- Subsea production systems represent one of many relatively new and advanced systems and technologies presently under development and in limited use which, of course, should be encouraged. USGS solicits briefings and demonstrations by the developers of such systems, and provides advice on requirements and design features. Specifications and regulations necessary to insure safe operations of subsea production systems can be formulated by implementation of Work Group Recommendations Nos. 5, 6, and 13 (May 1973 report).

WORK GROUP RECOMMENDATION NO. 19

- a. The USGS should make a special effort to become acquainted with all subsea production systems under development and in use.
- b. Industry should be encouraged to speed up development and testing of such systems. USGS personnel should be observers of such tests.

- c. If it is determined that subsea production systems are preferable from an environmental standpoint, their use should be encouraged.
- d. The cooperative USGS-API committee on standards should sponsor the preparation of standards and specifications of the safety and pollution control aspects of subsea production systems at the earliest appropriate time.
- e. Concurrent with development and testing, USGS should begin the preparation of OCS Orders covering the use of subsea production systems.

#### IMPLEMENTATION ACTION REQUIRED

The Conservation Division should actively pursue each of the items in Recommendation No. 19.

/See section I.D.6. for updated discussion on the status of subsea production systems/

An Evaluation of "Energy Under the Oceans"--A Report of Study Conducted by the Technology Assessment Group, Science and Public Policy Program, the University of Oklahoma, August 1973<sup>1/</sup>

By W. A. Radlinski, Associate Director  
U. S. Geological Survey

The technology assessment of Outer Continental Shelf (OCS) oil and gas operations made by a research team under the aegis of the Science and Public Policy Program, University of Oklahoma, is of special significance to the U. S. Geological Survey (USGS). We have the responsibility for the issuance of exploration permits and the supervision of operations authorized by leases on the OCS. And, it is our job to see that this work is done in accordance with the law--safely, without damage to the environment, and in keeping with optimum conservation practices.

The Survey's responsibility involves the management of over 1100 leases and nearly 2000 OCS platforms in the Gulf and 5 in the Santa Barbara Channel. These include over 6,200 wells and 10,000 well completions. Over 800 requests for permits to drill were processed in the past year. Platforms in the Gulf are as far as 98 miles from shore and are in water depths to 373 feet. The area of drilling and producing operations covers approximately 40,000 square miles. In the Santa Barbara Channel the platforms are about six miles from shore and are in waters up to 191 feet.

We also collect royalties from production at the rate of 16 2/3%. Last fiscal year this amounted to \$360 million. Production in Fiscal Year 1973 amounted to 446 million barrels of crude oil and natural gas liquids, and 3 trillion cubic feet of marketed gas, with a total value of over \$2 billion.

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<sup>1/</sup>Prepared for the NSF-RANN Energy, Environment, and Productivity Symposium, November 19, 1973, Washington, D.C..

Accident reduction, pollution control, and environmental protection involve a number of factors, each of which contribute to an overall strategy.

These include:

- Stringent regulations insuring (but not limited to)
  - good systems designs and construction,
  - redundant safety systems,
  - training of personnel,
  - accident and equipment failure reporting,
  - and corrective action procedures.

There are currently 12 OCS Orders covering the Gulf of Mexico area and 10 for the Pacific Area (Santa Barbara Channel), the only two areas where OCS operations are now being conducted.

Other elements of our strategy are:

- An effective inspection program
- Safety motivation of operators and employees
- Research and development
- Third-party review of our policies and procedures
- Environmental assessments.

It is with these elements in mind, and with regard for problems of the future that can result from an acceleration of lease sales into new areas, deeper waters, and different environments, that I comment now on the Oklahoma report.

Overall it's a very good report. We welcome it at the Geological Survey and we intend to respond to each of the applicable recommendations.

In fact, we have already responded to many of them as a result of implementation plans we developed in response to recommendations of three earlier reports--one by a study team from NASA, another an in-house study by a team of USGS systems analysts, and the third by a panel of the Marine Board, National Academy of Engineering. A report of these plans is available from the USGS.

All four of the reports are compatible and many of the respective recommendations are the same, but the Oklahoma report goes much further than any of the other three. In-depth considerations of Government management and jurisdictions are unique to the Oklahoma study, as is its plan for OCS development. The recommendations from these sections will contribute importantly to "rational OCS policy making" and to "optimal resources development," to quote objectives from the purpose of the study.

Of the 12 recommendations under "Management of Technologies," 9 are aimed directly at the Survey and 3 at industry. Of the 22 recommendations on "General Policy and Management," 10 involve the Survey. And all of the items listed under the recommendation for "Specific Technologies" directly affect the success of our lease management responsibilities.

Referring now to the category on Management of Technologies, herewith is the status, in brief, on the 9 recommendations applicable to the Survey:

Standards -- Standards for the critical items of equipment are being developed under a joint API-USGS committee arrangement which involves OOC and WOGA.



These will be submitted to ANSI or other appropriate standards-setting organizations for review, and included in OCS Orders by reference. Quality control procedures for manufacturers are included.

Failure Reporting -- As announced in our press release of June 14, 1973, we intend to establish a failure reporting and corrective action system. A "safety-alert" system for immediate reporting to all lessees of equipment malfunctions, accidents or near accidents is already in effect.

Review Technology -- A Review Committee under the auspices of the Marine Board, National Academy of Engineering has already been established to serve as a third-party audit of our procedures and operations and to review state-of-the-art technologies.

Personnel Training -- A joint API-USGS committee is already working at establishing curricula and training requirements for operating personnel. We are also establishing formal training requirements for our inspectors.

Industry Cooperation -- The joint API-USGS committee on training is also developing programs for safety motivation. We have already gotten a Department of Justice opinion that information exchange in the interest of safety and environmental protection is not in violation of Anti-Trust Laws.

Subsea Production Systems -- The first OCS proposal for a subsea production system (i.e., more than one well) is presented in a draft Environmental Impact Statement now being aired publicly for the development of the Santa Ynez unit in the Santa Barbara Channel.

There are, of course, some conclusions and recommendations in the report with which we do not agree, and we are aware of disagreements by others, both pro and con. But this is to be expected from a 380-page report of a study as comprehensive as this one was. Disagreements are, of course, healthy, for they prompt dialogue and help bring out the facts. But in some cases, they have been presented out of context in support of an extreme position, either to discredit the entire report or as a basis for condemnation of all OCS development. It is important to recognize the overall objective of the study--to insure that development of the OCS is optimal in a broad social sense--and to recognize that individual recommendations are made in the context of improving, not condemning, OCS development. This is the way we in the Geological Survey are viewing it, and I feel certain this was the intent of the Assessment Group.

Our reasons for not agreeing with three of the recommendations in the Management of Technologies part of the report are as follows:

Accident Investigation -- We have not established a board similar to the National Transportation Board to investigate OCS accidents. Our present practice is to have all accidents

investigated by Survey personnel in accordance with fixed procedures. Major accident reports will be submitted to our Review Committee (mentioned earlier) for review. While we consider this procedure adequate for the present, we will give further consideration to the establishment of a separate board. We do intend that all reports of major accidents will be made public.

Personnel Standards -- We have not yet concluded that certification of company personnel is a viable procedure for insuring performance. Our present objectives are to establish required standards for training or experience before allowing operations to proceed. Certification, per se, involves numerous problems of establishing certification authorities, updating, employee union regulations, and State laws. We feel that training and experience standards may serve the purpose effectively.

Government R&D -- We have not established an in-house research, development, and testing program for a very practical reason--no funds. But that's not the total reason. We should have some capability for research, but we feel that the ultimate responsibility for safety and pollution prevention rests with industry. Accordingly, our approach was to establish an American Petroleum Institute (API)-USGS R&D committee to encourage industry in this activity. A list of pertinent R&D items under

investigation is being completed together with a list of those items that require new or improved development. We have informed industry that in those cases where they do not respond to R&D needs, the Government will undertake the work. But even so, public funds will need to be provided.

Concerning findings of other parts of the study -- the publication of a list of "Inadequate Components," called for in the recommendation under "Specific Technologies," will be a natural result of our aforementioned failure reporting and corrective action system. Further, these results will provide information to an established research committee to identify items for research and development. The lists of components to be developed, improved, and deployed will be passed on to the R&D committee and to a Standards Committee which is currently very active. The latter committee, by the way, has already drafted detailed standards for improved downhole safety devices which are currently being reviewed. Sand probe development and standards are high on the list of priorities.

Finally, I shall comment on the "General Policy and Management" part of the report. While we agree that promotion and regulation functions should remain divided between the Bureau of Land Management (BLM) and USGS to provide a continuous checking mechanism, we do not agree that the Survey should take the lead in preparing programmatic environmental impact statements. Programmatic concerns should remain the responsibility of BLM or the Council on Environmental Quality, as is the case in the environmental assessment of the Atlantic and Gulf of Alaska OCS. We, as well as National

Oceanic and Atmospheric Administration and many others, provide the geologic, geophysical, seismic, and other environmental data and analyses that are necessary for a full environmental impact assessment. I believe this procedure complies better with the intent, if not the organizational structure, of the study recommendations. The question of sufficiency of data is, of course, a budget problem.

Concerning the matter of concentration in the USGS of all management responsibilities on the OCS, we are currently working with the Office of Pipeline Safety to specify our respective roles. We have had meetings with the Occupational Safety and Health Administration along the same lines; we are developing understandings with the Environmental Protection Agency, and we do support the Federal Power Commission in providing estimates of recoverable gas reserves.

Lastly, by a recent policy decision, we are now publishing all new and revised OCS Orders in the Federal Register for public comment.

There have been numerous studies, reports, meetings, symposia, and legal actions concerning the development of the OCS. Several are in progress and many more will come. And this is as it should be--on the one side we have a need for the vast mineral resources that lie beneath the ocean floor, and on the other side there is a grave concern over the effects that the exploitation of these resources will have on the environment and hence our future well-being. The significance of the offshore to our national well-being, especially in these times of critical energy shortages, is clear when one realizes that over 11% of the total U.S. oil production and 13% of the gas production came from the OCS in the past year;

that this production is confined to a very small portion of those OCS areas which have petroleum potential; and that discovery and development will hopefully be accelerated as a result of tripling the offerings to three one-million acre lease sales per year.

The Oklahoma report has gone a long way in identifying means of improving development in this important area, and we commend both NSF-RANN and the University of Oklahoma on the study.

Supplement No. 2

to

REPORT OF THE WORK GROUP ON OCS SAFETY AND POLLUTION CONTROL, MAY 1973

U. S. Geological Survey

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November 1974

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## Foreword

This supplement to the U. S. Geological Survey report of the Work Group on OCS Safety and Pollution Control, May 1973, is a response to the pertinent recommendations of the report to the President by the Council on Environmental Quality (CEQ), entitled, OCS Oil and Gas - An Environmental Assessment, April 1974.<sup>1/</sup> The CEQ report is the result of a study of the environmental impact of oil and gas production on the Atlantic Outer Continental Shelf and in the Gulf of Alaska.

It is not the purpose of this supplement to present a review of the report. Instead, there are given herein responses to specific recommendations concerning OCS safety and pollution control as they pertain to the responsibilities of the U. S. Geological Survey for OCS lease management. Such recommendations are made in Chapters 8 and 9 of the CEQ report.

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<sup>1/</sup> Supplement No. 1, May 1974, is a response to the recommendations of "Energy Under the Oceans," November 1973, University of Oklahoma Press.

RESPONSE TO RECOMMENDATIONS OF "OCS OIL AND GAS -  
AN ENVIRONMENTAL ASSESSMENT"

(A Supplement to the May 1973 Report of the  
Work Group on OCS Safety and Pollution Control)

U.S. Geological Survey

The report to the President by the Council on Environmental Quality (CEQ), April 1974, entitled OCS Oil and Gas - An Environmental Assessment, contains 19 recommendations on safety and pollution control which affect responsibilities of the U.S. Geological Survey (USGS).

Eleven of the CEQ recommendations are similar to recommendations made previously in reports of studies made by a team of NASA specialists; by a panel of the Marine Board, National Academy of Engineering; by a team of USGS systems analysts; or by an interdisciplinary research team under the aegis of the University of Oklahoma. The USGS Work Group has already responded to these in its previous reports, and implementation is either complete or in progress. The CEQ recommendations in this category are listed in the first section of this supplement, as well as two which call for measures that are already established practices.

In the second section of this supplement, the Work Group has responded to six CEQ recommendations which are similar to pre-existing recommendations but call for a modification of the Work Group's response.

For ready reference, the following are the categories of recommendations previously adopted by the Work Group:

1. Failure Reporting and Corrective Action
2. Accident Investigation and Reporting
3. Information Exchange
4. Research and Development (Revised)
5. Standards and Specifications
6. Systems Analysis
7. Engineering Documentation
8. Wearout Prevention
9. Training and Certification (Revised)
10. Motivation Program
11. Lease Management Program
12. Inspection Procedures
13. OCS Order Development (Revised)

14. Standardization of Forms
15. Safety and Advisory Committees
16. Memorandum of Understanding with OSHA
17. Memoranda of Understanding on Pipelines
18. Memorandum of Understanding on Discharge Standards
19. Subsea Production Systems

Categories 1-15 are covered in the May 1973 report of the Work Group. Categories 16-19 are in Supplement No. 1, which also contains further responses to those shown as (Revised).

The CEQ report includes, in Chapter 1, a "Statement of Principles" to which "the Federal Government must be guided and committed in choosing areas to lease and in administering environmentally safe offshore operations." These are included in the appendix of this supplement for ready reference.

Certainly the USGS must be guided by and committed to the applicable principles (as interpreted in Chapter 1) in administering its responsibilities with respect to OCS lease management.

While the Work Group believes that these principles are being followed by the USGS, it recommends that the Conservation Division issue a reprint of CEQ Chapter 1 to all USGS personnel concerned with OCS lease management as a reminder, and as a specific statement of pertinent policies and practices.

#### I. RECOMMENDATIONS OF THE CEQ REPORT ALREADY IMPLEMENTED OR IN PROGRESS

Responses to the following CEQ recommendations are made in the Report of the Work Group on OCS Safety and Pollution Control, May 1973, and Supplement No. 1, May 1974:

CEQ 1<sup>1/</sup> *The continuing search for better technology must build upon an improved understanding of the role of human factors in equipment design and must be coupled with thorough training of the equipment operators. The Council recommends that human factors engineering be employed to the fullest extent in the design of OCS oil and gas equipment. The Department of the Interior should review proposed designs for facilities to be used in new OCS areas and encourage the incorporation of man-machine engineering principles. (See Work Group Recommendation No. 6).*

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1/ The numbering of CEQ Recommendations corresponds to the order in which they appear in Chapter 1 of the April 1974 report.

- CEQ 2. *Training programs may not be required for all types of jobs, but certainly for the most critical, curriculum standardization and personnel certification should be required. The Council recommends that the Department of the Interior establish minimum Federal standards for critical OCS operator personnel and certify or provide for appropriate accreditation of the training programs. (See Work Group Recommendation No. 9).*
- CEQ 3. *Rapid, accurate measurement of downhole pressure appears important in improving the ability to maintain well control and to reduce the possibility of blowouts. The Council recommends that the Department of the Interior determine which technologies could improve the measurement of the formation pressure near the drill bit and incorporate them into the OCS orders. (See Work Group Recommendation No. 4, Revised. This will be one of several items included in the list of items for Research and Development.).*
- CEQ 5. *The Council recommends that the Department of the Interior, in coordination with the Environmental Protection Agency, develop more detailed guidelines for the disposal of drilling muds, drill cuttings, and other materials, considering fully the results of the Bureau of Land Management monitoring studies of ocean disposal of these materials in new OCS areas. (See Work Group Recommendation No. 18).*
- CEQ 7. *The Council recommends that subsea production equipment be used in new OCS areas where it would provide a higher degree of environmental protection and reduce conflict between oil and gas operations and competing uses of the ocean. (See Work Group Recommendation No. 19).*
- CEQ 8. *The Council recommends that the Department of the Interior develop detailed performance requirements for surface-actuated subsurface safety valves and require their use on all production wells in new OCS areas where technically feasible. The Department should encourage the development of such valves with higher pressure ratings and with improved reliability of operation over the life of the devices. (See Work Group Recommendation No. 5, revised in Chapter II of this supplement).*

- CEQ 9. *In undeveloped areas like the Atlantic and Gulf of Alaska OCS, environmental loadings of oil and other materials should be kept at the lowest levels possible at least until environmental baseline studies such as those recently initiated by the Bureau of Land Management determine the environmental risk from such materials. The Council recommends that the Department of the Interior and the Environmental Protection Agency, in cooperation, establish effluent standards for waste water discharge from OCS drilling, production, and associated operations. Strong consideration should be given to requiring installation of the best commercially available control technology for oil-water separation in new OCS areas. (See Work Group Recommendation No. 18).*
- CEQ 12. *The Council recommends that the Departments of the Interior and Transportation develop detailed performance requirements for OCS pipeline protection and undertake the development of pipeline integrity monitors to detect incipient failures in OCS pipelines. (See Work Group Recommendation No. 17).*
- CEQ 13. *The Council recommends that the Department of the Interior, in cooperation with other Federal agencies and the affected States, undertake advanced planning for pipeline corridor siting as soon as the location of potentially producing OCS areas is known and designate corridors which avoid or minimize, to the maximum extent possible, intrusion into environmentally sensitive areas in the marine and coastal regions of new OCS areas. (See Work Group Recommendation No. 17).*
- CEQ 16. *The Council recommends that the Federal Government and industry continue efforts to improve oil spill containment and cleanup. The Council recommends further that the Departments of the Interior and Commerce and the Environmental Protection Agency cooperatively consider the identification of critical environmental regions in new OCS areas and the incorporation of appropriate measures into the National Oil and Hazardous Substances Pollution Contingency Plan. (See Work Group Recommendation No. 4. The lead responsibility for improving oil spill containment and cleanup technology rests with agencies other than the USGS. The USGS does, however, participate in the identification of critical environmental areas [see Work Group response to CEQ Recommendations Nos. 4, 6, and 15] and will continue to participate in the interagency development of Pollution Contingency Plans.).*

- CEQ 25. *The Council recommends that, in order to deter violations of OCS orders rather than simply shortening the time that operators take to correct noncompliance, the Secretary of the Interior propose sanctions requiring fixed shutin periods and administrative fines as enforcement measures. (See Work Group Recommendation No. 12 revised in Chapter II of this supplement.).*

Additionally, the following CEQ recommendations have already been implemented:

- CEQ 17. *The Council recommends that States affected by new OCS development strengthen their coastal zone management programs by developing special technical expertise on all phases of OCS development and its onshore and offshore impacts. Such augmented State coastal zone management agencies should attempt to ensure that State interests and regulatory authorities are fully coordinated with Federal OCS technical and management activities. Federal agencies should make every effort to cooperate with State coastal zone management agencies on an ongoing basis and at all stages of the management process. (It is an established policy to cooperate with coastal State organizations wherever possible.).*
- CEQ 23. *The Council recommends that the Department of the Interior in consultation with other appropriate Federal agencies, determine the kinds of information and analyses necessary for adequate assessment of environmental factors at all stages of leasing and development. The Department should take measures to obtain such information, including acquisition and analysis of high-resolution, near-surface seismic reflection data for the purpose of determining the nature and magnitude of geologic hazards prior to tract selection. (The Department of the Interior sponsors an interagency OCS Research Management Advisory Board to oversee the program of pre-operational benchmark data collections on the OCS necessary for an adequate assessment of environmental factors. The acquisition and analysis of high-resolution, near-surface seismic reflection data for the purpose of determining the nature and magnitude of geologic hazards prior to tract selection has been established as a standard procedure.).*

## II. RECOMMENDATIONS CALLING FOR MODIFICATION OF EARLIER RESPONSES

This Chapter includes those CEQ recommendations which have prompted the Work Group to modify some of its earlier recommendations. The CEQ recommendations are shown in italics, followed by a brief discussion and a revision of the pertinent Work Group recommendation. The changes in the recommendation are underlined. Implementation actions, additional to those in the May 1973 report and Supplement No. 1, May 1974, are also given.

- CEQ 4. *Serious consideration must be given to postponing leasing in an OCS region where oil cannot be safely produced and safely transported to markets because of significant threats of earthquakes, tsunamis, and severe storms. The Council recommends that the Departments of the Interior and Transportation coordinate their evaluation and approval procedures for drilling platforms for new OCS areas. They should prepare detailed performance requirements for such platforms, considering fully the natural hazards in these areas.*
- CEQ 6. *The Council recommends that the Department of the Interior develop and incorporate in OCS orders detailed performance requirements for production platforms and associated equipment to be used in new OCS areas, with full consideration of natural hazards. The Department should develop in-house capability, or should contract with a qualified independent firm, to evaluate the adequacy of the proposed designs to guarantee structural integrity subject to natural and manmade forces.*
- CEQ 15. *Decisions on offshore oil storage in the Atlantic and Gulf of Alaska OCS must fully consider the potential impacts of severe storm and seismic conditions. The Council recommends that the Departments of the Interior and Transportation develop detailed performance standards for offshore storage facilities and incorporate them into OCS orders for the new areas.*
- General requirements for the design submission and approval of fixed and mobile platforms are given in OCS Order No. 8. This Order does not, however, give detailed performance requirements specific to different OCS areas.

Environmental studies to identify hazards are now a part of the OCS leasing program. Agencies, such as the USGS, NOAA, EPA, and BLM, contribute to these studies. Hazards identified by these studies, by Environmental Impact Statements, and by the inter-agency OCS Research Advisory Board should be taken into account when specifying requirements in OCS Orders. Accordingly, Work Group Recommendation No. 13, Revised (May 1973 report and Supplement No. 1, May 1974) is further revised as follows:

**WORK GROUP RECOMMENDATION NO. 13 (Second Revision)**

- a. Formalized procedures of the type outlined in the NASA recommendation should be established for development and revision of OCS Orders.
- b. In general, OCS Orders should specify the objectives to be achieved, with standards for achievement included by reference.

- c. The Work Group agrees with the NAE recommendations that (1) there should be continuation and refinement of the current practice of requiring submission of plans of applicants in terms of equipment and including personnel qualifications and training procedures; and (2) that regulations should take into account on a continuing basis the results of the analysis of information resulting from accident evaluation, as well as consideration of natural environmental hazards.
- d. All memoranda of understanding and interagency agreements concerning management of OCS petroleum activities should be made available in a single document, and appropriate references made in OCS Orders.
- e. The Conservation Division should adopt the following procedures for the development of new and revised OCS Orders:

- (1) Announce in the Federal Register its intention to prepare a new or revised Order and solicit comments and recommendations.

- (2) Prepare a draft of the Order and publish it in the Federal Register for comment.

Steps (1) and (2) may in some cases be concurrent.

- (3) After receipt of comments, Division personnel may meet with interested organizations or consult with individual experts on the various requirements of the Order.

- (4) Revise the draft Order, if appropriate, to take into account the information developed from steps (2) and (3).

- (5) If the revision is extensive or significant, republish the Order in the Federal Register as a redraft for further comment. Otherwise, publish it in the Federal Register as a final Order with an effective date.

- f. The USGS, in coordination with DOT and other Federal agencies having pertinent expertise or jurisdiction, should develop detailed performance requirements for fixed and mobile platforms and fixed and mobile offshore storage facilities, taking into account specific environmental hazards and problems that are characteristic of different regions of the OCS.



IMPLEMENTATION ACTION REQUIRED (additional to those in the  
May 1973 report and in Supplement No. 1, May 1974)

The Division should strengthen its in-house and contract capability for the development of platform performance requirements and design review, and coordinate as appropriate with DOT and other Federal agencies having pertinent expertise or jurisdiction. The Division should also coordinate its evaluation and approval procedures for such platforms and storage facilities with DOT.

CEQ 10. *The Council recommends that the Department of the Interior develop detailed performance requirements for safety practices for well workover and servicing operations on production platforms and incorporate them in OCS orders for the new areas. The Department should consider regulations encouraging the use of improved technology to minimize the threat of blowouts during workover and service operations.*

- A similar recommendation for specific attention to well workover and completion operations was made in the NAE report, but the Work Group limited its Recommendation No. 5 to equipment. Additionally, in the development of OCS Orders for different areas, attention should be directed to environmental hazards and problems that are characteristic of the specific OCS area.

The Work Group believes that the USGS should adopt new procedures that would formalize the participation of all interested parties in the development of standards. This would broaden Work Group Recommendation No. 5 which was made in response to the recommendations of the NASA study team and the panel of the Marine Board, NAE, which called for the USGS to work with API in the development of standards. This does not preclude the continuation of work on the part of API for the development of "industry consensus standards."

Accordingly, Work Group Recommendation No. 5 (May 1973 report) is revised as follows:

WORK GROUP RECOMMENDATION NO. 5 (Revised)

The USGS should identify needs for additional or more specific standards for safety and antipollution equipment and for hazardous operations such as well workovers, servicing, and

completions. The standards should include performance requirements for hazardous operations and for the operational testing of the equipment in the marine environment. The USGS should establish the in-house capability to develop standards but should make use of recognized standards organizations such as ANSI, ASME, ASTM, and API, as appropriate. Interested labor, environmental, governmental, and industrial organizations, as well as the general public should be given the opportunity to assist in the preparation, to review, and to comment on proposed standards before they are adopted. Standards adopted by the USGS should be published and incorporated in OCS Orders. Specific environmental hazards and problems that are characteristic of different areas of the OCS should be taken into account when incorporating standards into OCS Orders. (See also Work Group Recommendations Nos. 4 and 13 Revised.)

IMPLEMENTATION ACTION REQUIRED (Additional to those in the  
May 1973 report)

The Conservation Division should adopt the following procedures for the development of standards:

1. Identify needs for new or modified standards, and establish priorities.
2. Publish a notice in the Federal Register of intent to prepare specific standards, requesting input and assistance.
3. Prepare drafts of new, updated, or revised standards by one or a combination of the following methods:
  - o By use of input derived from step 2 above.
  - o By use of available in-house expertise.
  - o By arrangement with ANSI, ASME, ASTM, API, or other organizations who prepare standards.
4. Publish draft standards in the Federal Register for comments.
5. Consider the comments received, publish the final standards in the Federal Register, and incorporate them in an appropriate OCS Order by reference.

The necessary staff to accomplish this program should be requested. Additionally, the Conservation Division should negotiate arrangements with ANSI for an ongoing program of standards development that would involve organizations which prepare standards and permit public and other participation, and publish a notification of these arrangements in the Federal Register.

CEQ 11. *The Council recommends that the Departments of the Interior and Transportation and the Environmental Protection Agency develop and implement a common reporting system for all accidents associated with OCS operations. This improved system should provide complete unambiguous reporting, with special attention to the analysis of cause-effect relationships.*

- The Work Group agrees with the CEQ recommendation that the agencies with responsibilities for offshore petroleum operations should report accident statistics in compatible formats so that statistical analyses of composite figures may be performed. That part of the CEQ recommendation which refers to unambiguous reporting and analysis of cause-effect relationships has already been addressed by the Work Group in its Recommendations Nos. 1 and 2.

Accordingly, Work Group Recommendation No. 2 (May 1973 report) is revised as follows:

WORK GROUP RECOMMENDATION NO. 2 (Revised)

- a. Reports of major accidents stemming from the current USGS procedure for investigation of accidents should be made available to the public promptly.
- b. Work Group Recommendation No. 3, calling for a system for disseminating information concerning equipment failures and accidents, should include a means for the public to have access to the information.
- c. Analyses of causes of major oil spills should be made a part of the accident investigation procedure and, if required, by additional follow-up studies. Results of all such analyses should be provided to the Review Committee (see Work Group Recommendation No. 15).
- d. Results of accident investigations, in addition to being made available to the public, should be provided to the Review Committee for possible further analyses.
- e. The USGS accident reporting system should be modified in conjunction with DOT and EPA to insure compatible formats so that statistical analyses of composite figures may be performed.

IMPLEMENTATION ACTION REQUIRED (additional to those in May 1973 report)

Liaison should be established with the DOT and EPA to determine what modifications to the systems used by the agencies will be necessary to provide a comprehensive basis for adequate analyses.

CEQ 26. *The Council recommends that the Department of the Interior determine the frequency and type of inspections necessary to verify compliance during all phases of OCS operations. It should establish inspection teams and procedures in light of those determinations and the scale of OCS development in various regions. State agencies should be invited to participate in these inspection efforts. In addition, the Department should establish a formal training program for the inspection staff.*

- Work Group Recommendation No. 12 (May 1973 report) takes into account inspection frequency, strategy, and policy. While the Work Group agrees that personnel requirements for inspectors should be based on inspection strategies, it did not address this point specifically in its earlier response.

The Solicitor has informally advised the USGS that personnel from a State agency cannot assume the responsibility of the Federal Government for assuring compliance with the OCS Lands Act. The Work Group agrees, however, that in the absence of legal constraints it would be desirable to include representatives from coastal States in certain inspections.

Work Group Recommendation No. 9, Revised (Supplement No. 1, May 1974) responds to the need for a training program for the inspection staff.

Accordingly, in response to CEQ Recommendation No. 26, Work Group Recommendation No. 12 (May 1973 report) is revised as follows:

WORK GROUP RECOMMENDATION NO. 12 (Revised)

- a. The USGS should incorporate into its inspection program all of the NASA recommendations (a. through e. above) and LMS recommendations 1, 2, 3, and 5 above. Punitive fixed-period shutins (LMS recommendation No. 4 above) are not permissible under existing legislation, nor are they considered advisable.

- b. OCS Orders should include requirements for lessees to conduct inspections on a scheduled basis and report the results in a specified format to the USGS.
- c. The USGS should explore the feasibility of third-party inspections as an alternative or supplement to lessee inspections.
- d. The USGS should invite representatives from interested State agencies to become familiar with Federal inspection procedures. USGS should also request an opinion from the Solicitor on the extent of possible participation by State employees in OCS inspections, and respond accordingly with invitations to the States to participate, as appropriate.
- e. The PINC system of inspection should be periodically reviewed to determine how it should be modified and improved.
- f. The USGS should formalize inspection strategies and policies, including optimum frequencies of inspections, and emphasize improvement of methods for evaluating inspection results. These results should be used in determining the number of inspectors required.
- g. The USGS should continue to evaluate procedures for inspection and enforcement to insure the application of rigorous and uniform practices in light of new requirements and past experiences.

IMPLEMENTATION ACTION REQUIRED (additional to those in  
May 1973 report)

A Solicitor's opinion on the extent of State participation in OCS inspections should be requested.

Statement of Principles<sup>1/</sup>

for

Choosing areas to lease and in administering  
environmentally safe offshore operations

- Exploration and development of the OCS must take place under a policy which puts very high priority on environmental protection.
- The location and phasing of OCS leasing should be designed to achieve the energy supply objectives of the leasing program at minimum environmental risk.
- The best commercially available technology must be used to minimize environmental risks in new OCS areas.
- Regulatory authorities available to Federal agencies must be fully implemented and requirements strictly enforced to minimize environmental risks in new OCS areas.
- Planning at all phases of OCS oil and gas operations must respect the dynamic relationship between initial Federal leasing decisions and subsequent State and local community action. The States and the communities affected must be given complete information as early as possible so that planning can precede and channel the inevitable development pressures. Experience must be continuously integrated into the management process.
- The interested public must be given the opportunity to participate and play a major advisory role in the Federal management and regulation of the OCS.

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<sup>1/</sup> From the report to the President by the Council on Environmental Quality, entitled "OCS Oil and Gas - An Environmental Assessment," April 1974.

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## V. UNAVOIDABLE ADVERSE ENVIRONMENTAL EFFECTS

Unavoidable adverse effects that might result from oil and gas activities on Federal OCS lands in the Santa Barbara Channel are as follows:

### A. Oil Pollution Effects on Marine Environment

Information presented in section III shows that small intermittent or continuous oil discharges (normally less than 25 ppm oil in produced waste water discharge) and small inadvertent recurrent oil spills probably would occur, and occasional major spills might occur from such activities. Research on long-term effects of oil spills on the marine environment is underway and studies of the effects of oil spills in the Santa Barbara Channel and elsewhere have been summarized in several reports. However, the studies have varied in procedure, the extent and composition of the products spilled have differed, and the natural and physical conditions have varied. The magnitude of impact of a spill is directly related to the volume and duration of pollution and the physical conditions under which it occurs. The severity of impact also depends upon the types and quantities of vulnerable wildlife present.

The effects of oil spills on the environment, some of which are discussed in section III of this statement, although controversial among experts, seem to indicate that damage to the natural system from spills of crude oil has been less severe than that resulting from spills of more highly refined fuels. Regardless of the nature of the oil, however, the normal "health" of the ecosystems is disrupted and some balance is lost during the period of recovery.

#### 1. Marine and Marine-Associated Birds and Mammals

In the event of an oil spill, the severity of the impact on wildlife is dependent upon the quantity and type of oil, the abundance and species present, migratory patterns, stage of breeding and rearing of young,

seasonal factors, meteorological and oceanographic conditions, and other variables.

Many birds and mammals of the open ocean avoid oil to some degree. During the 1969 Santa Barbara oil spill they were observed moving away from the slick itself.

a. Birds

Aquatic-related bird species in the Santa Barbara Channel region that were most affected in the 1969 oil spill were those that swim at the surface, such as cormorants, loons and grebes. An estimated 3,600 to 6,800 birds, mainly loons and grebes, died as a result of the 1969 spill from Platform A. At that time techniques for treating the affected birds were inadequate and the survival rate was low. Since then survival rates of 41 to 50 percent have been recorded in 1973 (section III.L.6.). This increase was directly related to improved techniques. The bird population around Santa Barbara has recovered from the effects of the 1969 spill. Rare and endangered species in the Channel area include the California least tern (*Sterna albifrons browni*), which uses the beach areas for nesting; and the resident California brown pelican (*Pelecanus occidentalis californicus*). The brown pelican uses the offshore waters for feeding and nests on Anacapa and Santa Cruz Islands.

b. Mammals

Marine-associated mammals of the Channel include whales, dolphins, sea lions, and elephant seals. Sea lion and elephant seal rookeries on the Santa Barbara Channel Islands would be susceptible to severe impact should a major spill reach the rookeries before pups were weaned, a

period when there would be a greater possibility of oil ingestion.

Reports on the impact of the 1969 Santa Barbara Channel spill generally do not attribute the death of marine mammals to the oil spill, but the direct and indirect effects of oil have not been completely investigated.

## 2. Benthic Organisms

Patterns of crude oil dispersion offshore are similar regardless of the source (see section III.L.1.) In the Santa Barbara Channel, benthic organisms of the intertidal zone would be most affected if oil were washed upon the shore. Tide-pool animals would be affected to a lesser degree. Benthic organisms of the subtidal and bathyal zones would be least affected. No rare or endangered benthic species should be affected. Due to the mitigating measures for the operational phase (see section IV), the potential for major impacts on benthic organisms is minor.

## 3. Bottom Sediments

The major potential impact on bottom sediments would be the formation of tarballs (a mixture of higher density oil components and sediments). These generally are formed and deposited at some distance from the site of the spill. Unlike natural tar seeps on land, spilled oil would not cover or blanket the bottom sediments, or bear resemblance to the vents of natural tar seeps offshore. A cumulative effect on bottom sediments would be an increase in tarballs which have been found on beaches, in deep basins, and floating in the open ocean.

## 4. Beaches and Shoreline Recreation

The most serious impact on beaches and shoreline recreation would be the remote possibility of an uncontained minor or major oil spill reaching the nearshore and beach areas. The magnitude of the impact, until

cleanup is completed, could range from "objectionable" to "severe recreational loss," the latter costing several thousand dollars in recreation lost and operator cleanup. If pollution incidents occurred during periods of heavy visitor use, loss of recreational enjoyment and use and the loss in economic benefit to the vicinity could be substantial.

Spilled oil would have a direct adverse impact on local inhabitants, because it fouls boats, temporarily pollutes recreation areas, and curtails the tourist industry. Water sports, such as surfing, swimming, diving, spearfishing, underwater photography, fishing, boating, and water skiing would be directly affected by an oil spill. Other marine-related activities such as beachcombing, shell hunting, seascape painting, shoreline nature study, camping, and sunbathing would be unattractive during cleanup operations.

#### B. Construction and Operation Effects

Construction of platforms, submerged production systems, and the pipelines necessary to move produced oil and gas from the offshore production facilities to storage and treatment facilities, and the disposal of washed cuttings during drilling operations would have a minor and short-lived adverse impact on nearby flora and fauna.

##### 1. Wildlife Along Pipeline Routes and Near Onshore Facilities

Pipeline and utility installation would temporarily disrupt the natural habitat; however, it should recover within a short period of time. Onshore facilities would represent a longer term land commitment; eventually, however, the land would be returned as nearly possible to its natural status or to a higher land use.

Not all species are affected to the same degree by human activity.

Oil and brine spills, potential but unlikely, could disturb the nearby wild-life population; however, eventual recovery would be expected.

## 2. Benthic Organisms

During the constructional phase, any platform, pipeline, near-shore loading terminal, offshore storage terminal, or submerged production system should have a short-term impact, ranging from negligible to moderate, on the benthic organisms. The duration of this impact is estimated to range from 2 months to several years depending on specific community composition. The most significant of these operations could be burial of pipeline portions by blasting, jetting or covering with rip-rap along a narrow corridor from the intertidal zone to the outer edge of a kelp bed if present. The benthic environment would return to a condition similar to that before construction. An artificial habitat would be constructed.

## 3. Bottom Sediments

The effects of the possible levels of development on bottom sediments alone are anticipated to be minimal. During the construction phase, (for example, platform, pipeline, nearshore loading terminal, and/or offshore storage and loading system), the microrelief of the ocean floor would be changed. Turbidity would be increased temporarily. Rip-rap could have a local effect on sediment transport dependent upon water depth. A few square yards of sediment could be covered if a single leg mooring system were built. Drill cuttings and displaced sediment would have neither beneficial nor detrimental effects. Compared to naturally occurring onshore-offshore and longshore sediment transport volume, the sediment displacement would be minimal.

During the post-operational phase, temporary minor disturbance would occur if

bottom and sub-bottom components were removed. There would be no significant long-term effects on sediments.

#### 4. Beaches and Shoreline Recreation

##### a. Construction Phase

The beaches or coastline in the Channel region would be impacted upon on an intermittent and temporary basis during the construction phase of the facilities. During this time, a pipeline may be buried near-shore (to 200 feet water depth) and onshore at the beach. Increased water turbidity would result. Increased noise and exhaust vapors would be produced.

An onshore construction site would produce increased background noise, fumes or exhaust vapors, and possibly increased siltation during and shortly after construction. See section III.LL.1.b. for construction air impacts.

##### b. Operation Phase

Offshore marine loading terminals, platforms, and associated vessel movements would be partly visible to beach visitors, some of whom might find them aesthetically objectionable.

##### C. Compatibility of Commercial Fishing

All offshore structures interfere to a degree with commercial fishing. This conflict is most intense in shallow areas. The structures themselves would occupy a minor area of ocean bottom, but trawling gear could be entangled if trawlers approached too closely to them. If several structures were clustered moderately close to each other, they could render the entire area within the cluster unusable for trawling, although this is not likely.

Commercial fishing is carried on in the Santa Barbara Channel with a steady

volume of trawler activity. Methods of commercial fishing other than trawling are largely unaffected by offshore structures or pipelines.

Otter boards, weighing from 500 to 800 pounds each, have rounded edges designed to allow the boards (and net) to "hop" or slide over smooth underwater obstacles. Most trawling is done in deep water although a sea-bottom pipeline connection at the 300-foot water depth could possibly snag nets. The location of pipeline connectors would be public knowledge, and this information could be plotted on marine charts and the area could be avoided by local trawlermen. Damage, in the form of fraying or minor tears, might result if nets should contact barnacles growing on the pipelines, although this is expected to be no more serious than present net contacts with barnacles on rocks.

Pipelines could serve as traps for trawling equipment if gaps or scoured areas opened *under* them. Under these conditions, otter boards could ride under pipes and wedge firmly, instead of smoothly sliding across them. If this occurred, a net might be severely damaged or lost, especially if towlines between the trawler and the net failed. Most fishermen indicated that such a loss could normally be avoided by reversing power and "backing the net off the pipeline," but it was generally conceded that adverse weather conditions, or other unforeseen factors, could make this course of action difficult.

#### D. Relationship to Shipping Traffic

Very little, if any, interference would occur between platforms and ships that are utilizing established shipping lanes. The possibility of a major seagoing vessel colliding with a platform is considered remote as most offshore facilities would be located several miles from the shipping

lanes and the platforms would be equipped in accordance with Coast Guard regulations.

E. Effect on Truck Traffic

Truck traffic on local highways would be increased with the increased chance of accidents, some additional noise, and slightly increased air pollution. See section III.LL.1.b. for construction traffic air impacts.

F. Archeological and Cultural Resources

Adverse effects on historic and archeological resources will occur if ground-disturbing construction or drilling cannot be designed to avoid cultural resources identified by previous surveys. If such relocation cannot be accomplished, then destruction of sites constitutes an adverse effect to the extent that scientific salvage, or salvage excavation, destroys the context, making the context unavailable for future study. Study may be accomplished prior to salvage excavation.

G. Debris

Adverse impacts of debris from various sources can be summarized as follows:

- Metal objects may be lost off platforms, barges, and boats and sink to the bottom causing damage to commercial fishing trawling nets. Side-scan sonar records indicate that a variety of sunken objects is present on the floor of the Santa Barbara Channel. The net increase in sunken debris due to the proposed activities should have little additional impact.
- Small boats can be damaged by collision with large, heavy, floating materials, and a small percentage increase might be



expected from petroleum-related activities. Also, floating rope and sheeting could foul the screws of motor vessels and boats.

- All floating debris, including litter, constitutes an aesthetic impact, especially when floating in nearshore areas or stranded on beaches.

## H. On-Land Impacts

Construction of onshore facilities would change the local topography and would have a small, but long-lasting, effect on runoff of surface water. Natural slopes might be changed by cutting and filling; stream channels could possibly be confined to buried conduits. Increased industrial activities might enter rural areas, thus occupying a small amount of land potentially suitable for other uses.

### I. Air Pollution

Volatile hydrocarbons and other gases would be generated and released to the atmosphere from the following activities: development of wells, treatment of produced fluids, transportation to market of produced minerals, and exhaust gas generation from internal combustion engines on drill rigs, construction equipment, service boats, and motor vehicles. The overall impact of the planned development on air quality should be small. However, an OCS oil spill or a well blowing out of control, ignited or unignited, could contribute air pollution in varying degrees. See section III.LL. for air quality impacts.

### J. Water Pollution

Offshore facility activity would result in the introduction of pollutants into the marine realm such as treated sewage, minor amounts of trash and garbage, drilling mud, produced waste water, and potential small

recurrent oil spills.

Moderate to severe degradation would occur in the event of an accidental oil spill. A major oil spill would result in several impacts on the water quality of the Santa Barbara Channel. These include: (1) a reduction of sunlight; (2) a decrease in the concentration of dissolved oxygen of the surface waters under the oil spill; and (3) an increase of hydrocarbon concentrations in water adjacent to the spilled oil.

K. Impact on Humans

Two unavoidable adverse impacts would affect some people in the vicinity of a proposed project. One stems from the visual impact of the platforms and other marine facilities; the other, which is closely related, stems from the overall increase in industrial activity. Some people would object to the very presence of the platforms and other facilities because they decrease their aesthetic enjoyment of an uncluttered marine vista. Some would object to the increase in truck and car traffic, the increase in noise levels, and other nuisances attendant to the industrial facilities.

Potential threat to human safety would, for the most part, be limited to the workers either on the platforms or at the onshore treating and storage facilities.

The impact on social services and increased demand placed on local government agencies would be small. (See section III.N. "Socioeconomic Impacts")

VI. RELATIONSHIPS BETWEEN LOCAL SHORT-TERM USE AND  
MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The principle short-term use of the Santa Barbara Channel OCS would be for extraction of oil and gas from those leases that have proven reserves of oil and gas, and exploration for additional reserves on other leases. This mineral extraction would diminish the oil and gas reserves of the Santa Barbara Channel.

The long-term effects of oil spillage cannot be assessed until reliable data become available which will permit the analysis of overall biologic effects caused by a gradual buildup of oil-derived pollutants in the marine environment. The additional stress from any form of pollution which the ecosystem can absorb is finite, but at present the bounds of these limitations are not known, and their possible effect on long-term marine productivity cannot be completely projected. Among pollutants derived from petroleum breakdown are aromatic compounds such as toluene and benzene that are toxic on contact. Other aromatic compounds, including those with carcinogenic properties, are potentially dangerous if ingested, although some organisms are able to purge themselves rapidly or metabolize the compounds into nontoxic substances and excrete them. It has been hypothesized that these might be concentrated through the marine food web, but evidence is not conclusive (see section III). However, these lighter more toxic fractions are more quickly dispersed and evaporated, and the heavy fractions that remain longer, such as tar, are less toxic and in certain instances are physiologically inert. The regulations under which further development would occur are the most stringent ever promulgated. With strict enforcement of these regulations and their further development, the possibility of adverse effects from the proposed action should be less than from similar actions in the past. At present, offshore oil production accounts for two percent of oil pollution to oceans.

The cumulative effect of structures on multiple uses in offshore areas where more and more structures are required as OCS production increases is also one of concern. The cumulative nature of structures as obstacles to commercial shipping and commercial fishing activities represents a use conflict that can be controlled through proper planning and coordination with appropriate Federal and State agencies and private industry. Some leveling out in the number of platforms and the number and total length of pipelines would be expected as more and more areas go out of production. Some platforms would be removed and some additional capacity would become available in existing pipelines to carry products from new areas.

The intrusion of man-made structures into areas where few or none exists is another matter of environmental concern. However, individual developments would have a relatively short life (about 30 to 40 years) and would be removed when mineral extraction was completed. The extraction of oil and gas would create additional wealth that eventually would be distributed in various proportions among the workers, the unit operators, the Federal Government, and local governments. How this wealth were used would have both a short-term and a long-term effect on the environment of the Santa Barbara region.

No long-term, direct adverse impact, such as scarred terrain, would remain except possibly in the area of the treatment facilities, and these areas could be landscaped and re-seeded with native plants and shrubs.

Destruction of archeological and historical remains that cannot be avoided or retrieved in project design constitutes a cumulative adverse effect. Cumulative effect of this destruction is increased by the loss of such resources for study in future years when techniques of archeological study are improved. Recovery of submerged remains, if present in impacted areas,

may offset in part the long-term destructive effects of the sea; the relative importance of such effects is not known since there has not been intensive and systematic study of submerged historic and archeological remains.

Short-term effects would result in the event of minor or major oil spills.

The local short-term use of the marine and shore environments for oil and gas production should have little adverse effect on other uses, either for the short or long term.

## VII. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The purpose of this section is to set forth those resources that would be consumed and those that would be altered irreversibly and irretrievably by additional development of oil and gas resources in the Santa Barbara Channel OCS.

Further development of the Santa Barbara Channel OCS could involve commitment of a significant part of the area's oil and gas resources. Minor amounts of water supply, air, other mineral resources, and wildlife including fish probably would be committed (lost). The natural appearance of very small amounts of land area would be altered to some degree by onshore facilities. An irretrievable commitment of some construction materials would result: presumably mainly subocean-floor casing, cement, and chemicals. Some construction materials, mainly steel, might have salvage value and be retrieved after production is completed. The extent of these commitments and an assessment of their environmental impacts have been previously discussed.

### A. Mineral Resources

Further development would permit extraction of producible oil, gas, and associated materials, including sulfur. This development could result in production estimated to range from 1 to 2 billion barrels of oil and 530 to 970 billion cubic feet of gas.

### B. Fish and Wildlife Resources

An irreversible or irretrievable commitment of fish, fowl and other wildlife resources and habitats would occur in the area of a massive oil spill. Recurrent low levels of oil pollution may result in a degree of harm to some biota. At present, offshore drilling and production operations account for two percent of oil pollution to oceans. The full significance

of such low level oil pollution cannot be assessed because of the presence of numerous natural oil and gas seeps, the total amount of such pollution cannot be foreseen, and the long-term effect on most species is not presently known.

C. Archeological and Historical Resources

Destruction of archeological and historical resources, should it occur, constitutes an irretrievable adverse effect. These remains whether onshore or offshore are a non-renewable resource, and the primary source of information for analyzing them is their context -- the relationships between artifacts, their surrounding deposits, and the original environment.

VIII. ALTERNATIVES TO THE FURTHER DEVELOPMENT OF OIL AND GAS RESOURCES OF THE OCS PORTIONS OF THE SANTA BARBARA CHANNEL

The preceding sections of this statement describe the methods that could be utilized for exploration and development of oil and gas resources thought to be in the Channel area.

Future OCS oil and gas production within the Santa Barbara Channel may be accomplished by implementation of any of the various levels of development activity as described in the preface and section I, or a combination of the various levels. The estimated levels of oil and gas production and related facility requirements are given in section I, tables I-1 and I-2. The potential impacts associated with the various related implementing activities are identified and evaluated in section III.

The major physical impacts that may result from offshore oil and gas operations are those resulting from (a) large discrete oil spill incidents, such as the Platform A blowout of 1969, and (b) small, but vastly more numerous, chronic additions of hydrocarbons to the marine environment. The latter may occur not only from the OCS petroleum industry operations directly, but much is also contributed from onshore discharge of airborne and liquid effluents including municipal sewerage, shipping and pleasure craft operations, and from the many natural oil and gas seeps from the Channel floor and shoreline areas which have been known throughout the recorded history of the region.

Sections III.K. 1 through 3 have discussed and documented the known oil spill history of offshore activities, and take note of the applicability and reliability of the data presented. It is not possible to relate the data there presented to potential spills and impacts resulting from OCS activities in the Santa Barbara Channel, due to a lack of reasonable comparability of conditions at the time and place the specified incidents occurred and the



present or future conditions and activities that may take place in the Channel area. The data from section III.K. 1 through 4 are useful and instructive only in the most general sense. Thus, in the following discussions the probability of either large or chronic small spill occurrences cannot be usefully discussed at each appropriate point in the text. Clearly, the greater the intensity of activity, and the more widespread oil and gas activity becomes in the Channel, the greater the possibility for major spills, and the larger the increment of small chronic pollution must become. The magnitude and importance of such increased possibility and increment, however, is speculative. (See section III.K.4.)

In summary, the several possible future levels of OCS oil and gas development are:

- Proceed with development and production on existing producing leaseholds
  - Carpinteria Offshore
  - Dos Cuadras Offshore
- Development of existing leaseholds with discoveries, not presently developed

- Pitas Point Unit Potential Field Area
- Hueneme Offshore Potential Field Area
- Santa Clara Unit Potential Field Area
- (development of the Santa Ynez Unit, Hondo Potential Field Area was authorized on August 16, 1974)

- Exploration of leaseholds, without discoveries, and subsequent development in the event economically recoverable reserves are proven
- Offering additional lands for lease, exploration, and development

The Administration's proposal for the establishment of a National Energy Reserve encompassed the Federal Ecological Preserve and the Federal Buffer Zone established in 1969. The Secretary has not revoked the orders establishing these two areas at this writing (January, 1976), thus their withdrawn status continues. The remaining lands proposed for inclusion in the National Energy Reserve returned to their pre-proposal status when the 93d Congress adjourned without passage thereof. Thus, the following discussions of Alternatives C, D, and E, exclude the Preserve and Buffer Zone but do encompass other areas of the once proposed National Energy Reserve as appropriate.

A. No Action

The viability of this general alternative, and its potential impacts, differs considerably with respect to the various Federal actions related to the identified possible levels of future development in the Channel, including the one specific proposal for Federal approval action now pending. The alternative of "no action" as it relates to the various potential levels of future or further development is discussed below in the context of each such level.

## B. Operational Alternatives

In the course of further development of oil and gas production in the Santa Barbara Channel, the receipt of a variety of proposed plans of development and individual proposed permitting actions on existing leases must be anticipated by the Geological Survey. In considering such proposals, it will be necessary for the Survey to consider all possible technologic or operational alternatives; for example, the installation of fixed-leg platforms versus seafloor completion systems; onshore treating and storage facilities versus offshore treating and storage facilities; crude oil transport by onshore pipeline versus marine barge or tanker transport; and many others. This environmental statement has discussed and examined all such major aspects of possible oil and gas operations. The Geologic Survey will fully examine and assess all proposals on a case-by-case basis to assure that approval is given only to those viable and acceptable technical and operational options which provide due regard for the environment, with the state of the art in mind. The regulations of the Geological Survey and the Department of the Interior provide for full analysis of potential environmental effects of proposed actions, and for the determination as to the need for preparation of further environmental impact statements under the provisions of the National Environmental Policy Act.

## C. Authorize Full Development on Existing Producing Leases

### 1. No Action

Pursuant to implied covenants of both the OCS Lands Act and the existing lease agreements, the Secretary is obligated to respond to a legitimate application to conduct operations on a valid lease providing all terms and conditions thereunder have been met. His response may be approved as proposed, rejection on various legitimate grounds, approval in part and rejection in part, approval subject to such additional conditions and

requirements as he may impose under the law, or deferral of decision, based on proper grounds as described below. Accordingly, the alternative of "no action" by the Secretary is not tenable with respect to legitimate operations which may be proposed in the future on leases existing at this writing. "No action" would equate to maintaining the status quo, and the constraints and impacts would be the same as stated in "C.3.", below.

## 2. Defer Action

The Secretary may defer final action on a proposal with proper grounds. These could include but not be limited to the need and time required for:

- a. Modification of the proposal to correct administrative or technologic deficiencies,
- b. re-design to reduce or avoid environmental impact
- c. acquisition of additional data to provide an improved basis for technical or environmental evaluation
- d. further evaluation of the proposal and/or alternatives

The principal effect of deferring action on a proposal would be a comparatively short-term delay in the imposition of all related impacts of the proposal-- both adverse and beneficial as previously described in section III of this Statement.

## 3. Prevent Further Development of Existing Producing Leases

The only alternatives to allowing full development of existing producing leases are preventing such development or imposing additional conditions and restrictions on the operations. The several apparent means of preventing full development are discussed below.

If prevention of further and full development of producing leases were accomplished, substantial quantities of oil and gas, known to be present,

would be left in place and not recovered for use, because maximum potential recovery cannot be effected from existing production facilities. Following shut-down of present operations when economic and technologic limits of recovery are reached, there will be a redistribution of resources in response to conditions then existing within the reservoirs now being produced. Such redistribution could effectively reduce the quantities ultimately recoverable from the fields at some future time, should such an effort be made, compared to the quantities recoverable under present reservoir conditions and production.

To replace the resources foregone by this alternative course of action, other comparable quantities of energy would be required to meet national needs. The development of other energy sources, and the related impacts, are discussed on later pages.

a. Suspension of Operations

The full development of existing producing leases could be delayed by suspension of operations. If such action were taken, there would be no additional increment of environmental impact on the Channel area, and it would continue in its present condition, as further modified by natural processes and the continuation of all existing activity and uses.

The authority of the Secretary of the Interior to suspend operations on existing leases has already been utilized and future suspensions for reasonable periods, with proper grounds, could be imposed. However, the Secretary does not possess authority under present circumstances to suspend operations to the extent that a *de facto* cancellation of a lease would result. The matter has been sufficiently tested in the Federal Courts to clearly establish such a course of action (*de facto* cancellation) as not viable, hence unworthy of

further consideration as a reasonable alternative for the Secretary.

b. Refuse to Approve Future Applications for Developmental Actions

Refusal by the Secretary of the Interior to approve future applications to conduct various oil and gas activities on existing leases would have no additional increment of environmental impact on the Channel area, and it would continue in its present condition, as further modified by natural processes and the continuation of all existing activity and uses. The Secretary may reject and refuse to approve any individual proposed activity if it does not meet the prescriptions of applicable law and regulations under his authority, including the potential for environmental impact that could be reduced or avoided by adoption of a significantly different designed course of action by the lessee (operator). However, the Secretary does not possess authority under the present circumstances to refuse approval of such applications on the leases to the extent that a *de facto* cancellation of the leases would result. Should the Secretary nonetheless initiate such a course of action, litigation by one or more of the lessees would likely ensue, and the impacts would be similar to those described under the following subsections. As a reasonable alternative course of action by the Secretary this option is not sufficiently viable to warrant further analysis.

c. Cancel the Leases

The Secretary does not possess authority under the present circumstances to unilaterally cancel the leases except on the grounds defined therein (Appendix IV-1; Section 7 of the lease terms--"Remedies in case of default"). The authority to cancel on other grounds would likely require Congressional authorization for such action as well as for the requisite funds for compensation of the lessees as may be necessary. Since withdrawal

of support for proposed legislation in 1973, the Administration has not re-entered a request for such legislation and the Congress has not re-initiated or considered such action. The possibility of such actions is a matter for further consideration by the Administration and the Congress in the light of this environmental statement and myriad other relevant non-environmental concerns. Such legislative proposals have been initiated by the Administration and/or the Congress in recent years in several other instances, but such legislation has never reached the voting stage. Should such legislation be proposed, it could encompass all or some of the presently producing leases. Should such cancellation be legislated on other than the prescribed grounds, under present circumstances it would appear certain that litigation by one or more of the present lessees would follow. The ultimate effects would be several, and would relate directly to the litigatory actions taken, the decision thereof, and the time required for resolution.

Present production could be interrupted temporarily or terminated completely, as could further exploration and full development of producing leases.

To the extent that oil and gas from existing producing leases was curtailed or halted, alternative sources of energy would be required and these are discussed on later pages.

The time required to replace the energy source foregone could range from scant to a number of years, depending on the specific alternative(s) selected and their state of production.

The direct monetary cost of such litigation to all parties involved could range from comparatively modest sums to billions of dollars.

Indirect costs to producer, government, and consumer occasioned by contract abrogation, delay in replacement or substitution, displacement of employees,

loss of governmental taxes and royalties, loss of employment income, etc., would be substantial in the aggregate.

Environmental effects on the Channel area could range from accelerated removal of all sources of physical and aesthetic impacts and significant adverse socio-economic impact resulting from termination of OCS activity, to increased adverse impacts on the physical environmental and aesthetic considerations, and altered socio-economic effects, by court-directed authorization of full development of existing producing leases.

In the event that Congressional authorization to cancel all or some of the existing producing leases should issue, the possibility of court-directed authorizations for full enjoyment of lease-rights would presumably be remote.

d. Federal Acquisition of the Leases

The outstanding leasehold interests could be acquired by the Secretary. The ability to acquire the leasehold interests is not granted under existing relevant statutes and would require Congressional authorization for such action as well as for the requisite funds for compensation of the lessees. To date the Administration has not requested such action of, and the Congress has not initiated or considered such legislation and the possibility thereof is thus moot. The major effects of such Congressional authorization would be quite similar to those of unilateral cancellation of the leases by the Secretary as previously discussed.

4. Allow Full Development of Selected Producing Areas

The implementation of this alternative would require full



development of selected areas of producing leaseholds, based upon a balancing of non-environmental concerns against the anticipated adverse environmental consequences. Further development would be allowed only on those producing leaseholds, or portions thereof, with the lowest anticipated adverse environmental consequences and the greatest net benefits to accrue therefrom. Adoption of this alternative would result in minimizing adverse effects through a reduction of area in which impacting activities could take place.

This alternative constitutes a selective application of the alternative "Prevent Further Development of Existing Producing Leases," and the previous discussion pertaining to that alternative concerning possible litigation and the need for authorizing legislation is relevant to the consideration of this alternative. In addition, the development of leaseholds or parts thereof, selected solely on the basis of lowest potential adverse environmental effects could readily result in development that would not permit maximum recovery of oil or gas resources. This would be contrary to the enhancement of long-term productivity and the principles of conservation embodied in the legislation authorizing the leasing of these lands for the purposes described.

5. Impose Additional Special Terms and Conditions to Further Mitigate Environmental Damage

This alternative constitutes the only practical method by which the adverse environmental impact of oil and gas operations on existing leases could be further minimized when and if any future applications are offered for approval, and simultaneously maximize the conservation and full development of the resources. The terms and conditions of the existing producing leases and those attendant to issuance of subsequent permits and

authorizations required under existing regulations, and the Federal supervision which will be imposed thereunder, are discussed in section IV under the heading "Mitigating Measures" and other portions of this statement. To the extent that environmental evaluation demonstrated the need, additional terms and conditions of approval would be written to further protect the environment on a case-by-case basis for each future application.

D. Authorize Full Development on Existing Leases Not Presently Developed

1. No Action

Pursuant to implied covenants of both the OCS Lands Act and the existing lease agreements, the Secretary is obligated to respond to a legitimate application to conduct operations on a valid lease providing all terms and conditions thereunder have been met. His response may be approval as proposed, rejection on various legitimate grounds, approval in part and rejection in part, approval subject to such additional conditions and requirements as he may impose under the law, or deferral of decision, based on proper grounds, as described below. Accordingly, and as previously discussed, the alternative of "no action" by the Secretary is not tenable with respect to legitimate operations which may be proposed in the future on leases existing at this writing. "No action" would equate to maintaining the status quo, and the constraints and impacts would be the same as stated in "D.3.", below.

2. Defer Action

The Secretary may defer final action on a proposal with proper grounds. These could include but not be limited to the need and time required for:

- a. Modification of the proposal to correct administrative or technologic deficiencies,

- b. re-design to reduce or avoid environmental impact
- c. acquisition of additional data to provide an improved basis for technical or environmental evaluation
- d. further evaluation of the proposal and/or alternatives

The principal effect of deferring action on a proposal would be a comparatively short-term delay in the imposition of all related impacts of the proposal-- both adverse and beneficial, as previously described in section III of this statement.

### 3. Prevent Further Development of Existing Leases

The only alternatives to allowing full development of existing leases are preventing such development or imposing additional conditions and restrictions on the operations. The several apparent means of preventing full development are discussed below.

If prevention of exploration and full development of existing but not producing leases were accomplished, substantial quantities of oil and gas, thought to be present, would be left in place and not recovered for use.

To replace the resources foregone by this alternative course of action, other comparable quantities of energy would be required to meet national needs. The development of other energy sources, and the related impacts, are discussed on later pages.

#### a. Suspension of Operations

The exploration and full development of existing, but not producing, leases could be delayed by suspension of operations. If such action were taken, there would be no additional increment of environmental impact on the Channel area, and it would continue in its present condition, as further modified by natural processes and the continuation of all existing activity and uses.

The authority of the Secretary of the Interior to suspend operations on existing leases has already been utilized and future suspensions for reasonable periods, with proper grounds, could be imposed. However, the Secretary does not possess authority under present circumstances to suspend operations to the extent that a *de facto* cancellation of a lease would result. The Secretary may reject and refuse to approve any individual proposed activity if it does not meet the prescriptions of applicable law and regulations under his authority, including the potential for environmental impact that could be reduced or avoided by adoption of a significantly different designed course of action by the lessee (operator).

b. Refuse to Approve Future Applications for Exploration and/or Developmental Actions

Refusal by the Secretary of the Interior to approve future applications to conduct various oil and gas activities on existing leases would have no additional increment of environmental impact on the Channel area, and it would continue in its present condition, modified by the continuation of other existing activity and uses. The Secretary may reject and refuse to approve any individual proposed activity if it does not meet the prescriptions of applicable law and regulations under his authority, including the potential for environmental impact that could be reduced or avoided by adoption of a significantly different designed course of action by the lessee (operator). However, the Secretary does not possess authority under the present circumstances to refuse approval of such applications on the leases to the extent that a *de facto* cancellation of the leases would result. Should the Secretary nonetheless initiate such a course of action, litigation by one or more of the lessees would likely ensue and the impacts would be similar to those described under the following subsection. As a reasonable alternative course of action by the Secretary, this option is not sufficiently viable to warrant further analysis.

c. Cancel the Leases

The Secretary does not possess authority under the present circumstances to unilaterally cancel the leases except on the grounds defined

therein (Appendix IV-1; Section 7 of the lease terms--"Remedies in case of default"). The authority to cancel on other grounds would likely require Congressional authorization for such action as well as for the requisite funds for compensation of the lessees as may be necessary. Since withdrawal of support for proposed legislation in 1973, the Administration has not re-entered a request for such legislation and the Congress has not re-initiated or considered such action. The possibility of such actions is a matter for further consideration by the Administration and the Congress in the light of this environmental statement and myriad other relevant non-environmental concerns. Such legislative proposals have been initiated by the Administration and/or the Congress in recent years in several other instances, but such legislation has never reached the voting stage. Should such legislation be proposed, it could encompass all or some of the existing but not/<sup>developed</sup> leases. However, should such cancellation be legislated, under present circumstances it would appear certain that litigation by one or more of the present lessees would follow. The ultimate effects would be several, and would relate directly to the litigatory actions taken, the decision thereof, and the time required for resolution.

Exploration and potential production could be interrupted temporarily or terminated completely.

To the extent that development and production of oil and gas from existing leases is possible and could be curtailed by lease cancellation, alternative sources of energy would be required and these are discussed on later pages.

The time required to replace the energy source foregone could range from scant to a number of years, depending on the specific alternative(s) selected and their state of production.

The direct monetary cost of such action to all parties involved could range from comparatively modest sums to many millions of dollars.

Indirect costs to producer, government, and consumer occasioned by contract abrogation, delay in replacement or substitution, displacement of employees, loss of governmental taxes and royalties, loss of employment income, etc., would be substantial in the aggregate.

Environmental effects on the Channel area could range from limiting of all sources of physical and aesthetic impacts to present production facilities and significant adverse socio-economic impact resulting from a leveling off of OCS activity, to increased adverse impacts on the physical environmental and aesthetic considerations and likely altered socio-economic effects by court-directed authorization of full development of existing leases.

In the event that Congressional authorization to cancel all or some of the existing but undeveloped leases, the possibility of court-directed authorizations for full enjoyment of lease-rights would presumably be remote.

d. Federal Acquisition of the Leases

The outstanding leasehold interests could be acquired by the Secretary. The ability to acquire the leasehold interests is not granted under existing relevant statutes and would require Congressional authorization for such action as well as for the requisite funds for compensation of the lessees. To date the Administration has not requested such action of, and the Congress has not initiated or considered such Channel-wide legislation, and the possibility thereof is conjectural. The major effects

of such Congressional authorization would be quite similar to those of unilateral cancellation of the leases by the Secretary as previously discussed.

4. Allow Exploration and Development of Selected Areas Now under Lease

The implementation of this alternative would require exploration and full development of selected areas of existing leaseholds, based upon a balancing of non-environmental concerns against the anticipated adverse environmental consequences. Such activities would be allowed only on those leaseholds, or portions thereof, with the lowest anticipated adverse environmental consequences and the greatest net benefits to accrue therefrom. Adoption of this alternative would result in minimizing adverse effects through a reduction of area in which impacting activities could take place. This alternative constitutes a selective application of the alternative "Prevent Further Development of Existing Producing Leases," and the previous discussion pertaining to that alternative concerning possible litigation and the need for authorizing legislation is relevant to the consideration of this alternative. In addition, the development of leaseholds, or part thereof, selected solely on the basis of lowest potential adverse environmental effects could readily result in development that would not permit maximum recovery of oil or gas resources. This would be contrary to the enhancement of long-term productivity and the principles of conservation embodied in the legislation authorizing the leasing of these lands for the purposes described.

5. Impose Additional Special Terms and Conditions to Further Mitigate Environmental Damage

This alternative constitutes the only practical method by which the adverse environmental impact of oil and gas operations on existing leases could be further minimized when and if any future applications are offered for

approval, and simultaneously maximizing the conservation and full development of the resources. The terms and conditions of the existing leases and those attendant to issuance of subsequent permits and authorizations required under existing regulations, and the Federal supervision which will be imposed thereunder, are discussed in section IV under the heading "Mitigating Measures" and other portions of this statement. Environmental analyses would be made of all such future applications, and such analyses and possible subsequent environmental impact statements would consider and identify the need for additional conditions of approval that would further mitigate potential adverse impact of the action proposed.

E. Lease, Explore and Develop Presently Unleased Areas

1. No Action

Under existing law, any action to offer additional OCS lands in the Channel for leasing is a matter of the Secretary's discretion. If no further offerings are made, the existing and established impacts of OCS oil and gas operations in the Channel would continue through the life of existing approved operations, and they would be increased incrementally as described herein to the extent that further exploration, development and production operations on now existing leases were proposed and approved.

As of January 31, 1976, the Department of Interior Proposed OCS Planning Schedule of possible lease sales through Calendar 1978, does not include the Santa Barbara Channel. (Final Environmental Statement, General Lease Sale, Offshore Southern California, 8/75, p. 10, Vol. 4)



2. Hold Future Lease Sales of Presently  
Unrestricted Areas of the Channel OCS

Should the Secretary determine that the potential oil and gas resources of presently unleased areas of the Santa Barbara Channel OCS are such that, on balance of all appropriate considerations, they may warrant leasing and development, the established preleasing and lease sale activities of the Department would be initiated. These activities are well documented in formal regulations (43 CFR 3300) and in previous Environmental Statements covering various lease sale activities (for example see Section I, DOI FES 5-68, Lease Sale No. 35, General Lease Sale Offshore Southern California, dated August, 1975). Briefly, the Departmental activities are as follows:

1. Study of available data by USGS and BLM resulting in delineation of general areas likely to be productive.
  2. Issuance of a formal call for nominations from industry for specific tracts to be offered within the area of the proposed sale, and nominations of tracts or areas to be excluded from the sale by any interested party.
- Geophysical and/or Geological exploration by industry.

3. Receipt of nominations, study, and tract selection.
4. Preparation and issuance of EIS on proposed lease sale by BLM.
5. Public Sale of leases of designated tracts by sealed bid.
6. Receipt and action by DOI on various applications for exploration and development by lessees.

Excluding the unleased Federal Buffer Zone (34,000 acres), and the Federal Ecological Preserve (21,000 acres), the present document has indicated (tables I-1 and I-2) that it is likely that most of the significant oil and gas resources in the Channel OCS, from known producing horizons of the region, have already been found; that some exploration for deeper producing horizons is underway, demonstrating to a degree some industry confidence that such sources may be found; and that future exploration and technology will likely permit sale and utilization of tracts in increasingly deeper-water areas. If leased, explored, and developed, these lands may yield 40-150 million barrels of oil, and could require the following additional facilities and their proportional contribution to the impacts on the Channel:

The maximum future additional activities are estimated to include (table I-1):

1-3	Platforms
0-3	Submerged seafloor systems
5-20	Miles of pipeline to shore
0-1	Treating and Storage facilities onshore
15-20	Exploratory Wells
20-80	Development wells

Specific potential impacts of each such facility has been identified previously in section III of this document.

Should the Secretary decide to hold further lease sales, the established leasing procedure will include comprehensive environmental analysis and determination of the need for additional environmental impact statements prior to holding such sales. That process would also include the development and analysis of specific alternatives to each potential sale, much as those in the Department's environmental statement, FES-75-65, Lease Sale 35, off Southern California.

### 3. The Federal Buffer Zone

The Buffer Zone to the Federal Ecological Preserve was established on March 21, 1969 by the Secretary of the Interior (Plate 1). This area, contiguous to and seaward of the Federal Ecological Preserve, consists of several tracts (34,000 acres) for which no bids were received during the Santa Barbara Channel lease sale of February, 1968. This indicates the buffer zone area is thought to have a low oil and gas resource potential. These lands were ordered withheld from leasing by the Secretary as an adjunct to the Federal Ecological Preserve (34 F.R. 5655-5656, March 26, 1969). All persons were called upon to conduct their activities in the area in a manner that would help to protect and preserve the values of the area for scientific study, recreation, and other similar uses for the benefit and enjoyment of all.

The Secretary has several apparent courses of future action with respect to the Federal Buffer Zone:

- Take No Action
- Rescind the 1969 order and make the lands again available for leasing.

a. No Action

If no action were taken by the Secretary to evacuate the order establishing the Federal Buffer Zone, the Zone would continue in its present condition for the purposes already stated, as the Zone may be affected by all authorized usage and by activities in other Channel areas.

b. Rescind the Order and Make the Lands  
Again Available for Leasing

The authority of the Secretary to promulgate such an order for withdrawal specifically includes the authority to subsequently rescind or otherwise nullify such an order (Executive Order 10355, May 26, 1952, section 1 (a)). There presently is no proposal, either from the Department of the Interior, or any other party, to rescind the existing withdrawal and cancel the action establishing the Buffer Zone.

However, should the Secretary ultimately determine that the potential oil and gas resources within the present Buffer Zone are such that, on balance of all appropriate considerations, they warrant leasing and development, the established preleasing and lease sale of the activities of the Department would be initiated as defined by regulations (43 CFR 3300). The environmental impacts resulting from such an action would be related to the amount of exploration and development activity that subsequently occurred. Such activities could result in additional production of oil and gas and require additional oil and gas facilities such as platforms, pipelines and onshore treating and storage facilities.

Specific potential impacts of each such facility has been identified previously in section III of this document. Such action would allow OCS oil and gas activities to proceed in closer proximity to the shoreline, thus increasing the chance of spilled oil to reach shore, should a spill occur. In addition to generating a proportional increment of physical and socioeconomic impacts, the opening of the Buffer Zone to leasing and subsequent exploration and possible development would almost certainly generate a significant adverse aesthetic impact on some segment of the residents and public, and substantial opposition and controversy locally.

#### 4. The Federal Ecological Preserve

The Federal Ecological Preserve was established July 27, 1967 by the Secretary of the Interior prior to the 1968 Santa Barbara Channel OCS lease sale (Plate 1). This area of some 21,000 acres consists of lands of the OCS extending approximately 2 miles seaward of the Santa Barbara Oil Sanctuary, which was established by the California State Legislature in December 1955 (section 6871.2, California Public Resources Code). The Secretary's action (34 FR 5655-5656, March 26, 1969) withdrew these OCS lands from all forms of disposition, including mineral leasing, and reserved their use for scientific, recreational, and other similar uses as an ecological preserve. A part of this area is along a trend of existing producing horizons and has a high oil and gas resource potential.

The present document (section I, Table I-1 footnote) has indicated that the Federal Ecological Preserve possibly contains a significant proportion of potential resources of the unleased area yet undiscovered from known producing horizons in the Santa Barbara Channel OCS.

The Secretary has several apparent courses of future action with respect to the Federal Ecological Preserve:

- Take No Action
- Rescind the 1969 Order and make these lands again available for leasing.

a. No Action

If no action were taken by the Secretary to evacuate the order establishing the Federal Ecological Preserve, the Preserve would continue in its present condition for the purposes already stated, as the Preserve may be affected by all authorized usage and by activities in other Channel areas.

b. Rescind the Order and Make the Lands Again Available for Leasing

The authority of the Secretary to promulgate such an order for withdrawal specifically includes the authority to subsequently rescind or otherwise nullify such an order (Executive Order 10355, May 26, 1952, section 1(a)). There presently is no proposal, either from the Department of the Interior, or any other party, to rescind the existing withdrawal and cancel the action establishing the Federal Ecological Preserve.

However, should the Secretary ultimately determine that the potential oil and gas resources within the present Federal Ecological Preserve are such that, on balance of all appropriate considerations, they warrant leasing and

development, the established preleasing and lease sale of the activities of the Department would be initiated as defined by regulations (43 CFR 3300). The environmental impacts resulting from such an action would be related to the amount of exploration and development activity that subsequently occurred. Such activities could result in an estimated 40 to 150 million barrels of oil and from 20 to 70 billion cu/ft of gas (table I-2 footnote). Attendant facilities could include an estimated (table I-1 footnote):

- 1-3 Platforms
- 0-1 Onshore facilities
- 0-3 Submerged production systems
- 5-20 Miles of pipeline to shore
- 5-20 Exploratory wells
- 20-80 Development wells

Specific potential impacts of each such facility has been identified previously in section III of this document. Such action would allow OCS oil and gas activities to proceed in closer proximity to the shoreline, thus increasing the chance of spilled oil to reach shore, should a spill occur. In addition to generating a proportional increment of physical and socio-economic impacts, the opening of the Federal Ecological Preserve to leasing and subsequent exploration and possible development would almost certainly generate a significant adverse aesthetic impact on some segment of the residents and public and substantial opposition and controversy locally.

A further potential series of impacts could subsequently result from the State allowing oil and gas operations to take place in the Santa Barbara

Oil Sanctuary, in the interest of protecting potential State oil and gas resources in the Sanctuary from drainage by possible discoveries and subsequent development on the adjacent Federal lands. The activities in State waters that might ensue are not presently quantifiable with any degree of realism due to the lack of modern, or even old (pre-1955) exploratory data in the area. However, any such exploration and development would result in the same kinds of activity, with the same kinds and magnitudes of impact generally, inasmuch as State regulatory requirements are quite similar to those of the Federal agencies concerned.

F. Establishment of a Federal Energy Reserve

Portions of the leased areas with discoveries, leased areas without discoveries and unleased areas of the Santa Barbara Channel OCS, including the Federal Ecological Preserve and Buffer Zone, were within the National Energy Reserve proposed by the Administration but not enacted into legislation by the 93rd Congress (Plate I). (S. 1951 and H. R. 7500.) This legislation is presented as appendix VIII-1 at the end of this section. However, most of the known discovery areas as of February 1976, are completely outside of the proposed National Energy Reserve.

The 93rd Congress adjourned without taking action on any of the legislation proposed (pages ii-16-ii-17; section I, pp.11-14). As indicated in the Preface of this document the Administration withdrew support of all such proposed legislation and requested that no Congressional action be taken until the present environmental statement had been prepared. No proposal for establishment of a "National Energy Reserve" in the Santa Barbara Channel presently exists before Congress, and the possibility that Congress would initiate and pass such legislation is speculative at best. The history of previous proposals and resulting litigation is summarized in



section I, as noted above. The status of the 35 existing leases proposed for inclusion in the proposed Reserve, and on which all operations had been ordered suspended by the Secretary, as of July 8, 1974, reverted to that of any other valid existing oil and gas lease on the Federal OCS, as a result of litigation entitled Gulf Oil Corporation, et al. v. Rogers, C. B. Morton, et al., Civil Number 71-1669-FCW as consolidated with Mobil Oil Corporation, et al. v. Rogers C. B. Morton, et al., Civil Number 73-1302-FCW, U.S.D.C., C. D. Calif., decided on May 8, 1974. That is, the 35 leases are no longer under valid suspension orders and are subject to exploration and development under the terms of the contract (lease). Although the proposed legislation was not passed, the status of the Federal Ecological Preserve and the Federal Buffer Zone remains unchanged, and their designation as such remains in effect. The proposed legislation included these two areas, but the Secretary has not revoked the establishing order of March 21, 1969.

Unleased areas within the previously proposed National Energy Reserve (Plate I), excepting unleased areas within the Federal Buffer Zone and the Federal Ecological Preserve, are technically as available for leasing as any other tracts on the Channel OCS.

Existing leases within the previously proposed National Energy Reserve encompassing known discoveries (Plate I) are subject to further exploration and development, subject only to the same requirements as any other existing valid lease.

With respect to these lands, within the previously proposed National Energy Reserve, the Secretary has several possible courses of action:

- Take no further action
- Resubmit proposed legislation to the

Congress, unchanged.

- Submit a new proposal for establishment of a National Energy Reserve but with a new mix and/or selection of lands to be included.

1. No Action

There being no existing legal requirement for the same, the Secretary may, at his discretion, take no further formal action to initiate establishment of a "National Energy Reserve" on the Santa Barbara Channel OCS. Should he elect to take no further action, the following activities and related environmental impacts could ensue:

- Applications for exploration of all existing leases in the National Energy Reserve area, must be anticipated, some of which may result in discoveries of oil and gas, and subsequent applications for development and production facilities. Such facility requirements could include part of the following estimates for all leased areas without discoveries (Tables I-1, I-2):<sup>1</sup>

1-4	Platforms
0-1	Onshore treating and storage facility
0-4	Submerged production facilities
0-1	Pipelines to shore (5 to 30 miles)
15-60	Exploratory Wells
20-100	Development Wells

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<sup>1</sup> The facility and reserve estimates presented here are those for the leased areas without discoveries (tables I-1 and I-2) however, a portion of the Pitas Point Discovery area is within the formerly proposed National Energy Reserve.

Potential production could be all or part of an estimated 40-200 million barrels of oil and 20-100 billion cu/ft natural gas. Of the 36 leased areas of the OCS, without discoveries, and on which no exploratory wells have been drilled, 22 leases were included in the previously proposed National Energy Reserve. (Fig. I-2 and Plate I).

- The single valid lease with an existing discovery (Pitas Point Unit, Plate I) will require additional Exploration before development and production can be contemplated. This potential field could involve two platforms, supporting submerged production facilities, associated pipelines, and use of an existing onshore treating and storage facility.
- The several unleased tracts of the previously proposed National Energy Reserve are available for leasing under this alternative (Plate I). To the extent that they constitute part of the unleased area considered as viable leasing area (Tables I-1 and I-2), a proportional part of the estimated facilities which could be required for exploration and development, and related potential impacts, must be considered likely to follow if the areas are leased.

2. Resubmit Proposed Legislation, Unchanged,  
to the Congress for Consideration

Should the Secretary decide to resubmit his proposed legislation (see Appendix VIII-1 at the end of this section), in view of recent court decisions it is assumed that simultaneous action to halt all operations on the 35 existing leases would not take place. Subsequent to

those decisions in 1974, the Geological Survey has terminated the suspension of operations and approved the initial plan of operations for exploration drilling on the Oak Ridge Unit which was included in the 35 leases formerly proposed for inclusion in a National Energy Reserve.

The initial plan includes the drilling of two exploratory wells to evaluate the geologic structure in the Unit area. The Geological Survey has approved an application to drill and the Unit Operator plans to commence drilling in March 1976.

Passage of the legislation (if resubmitted) would have the following environmental effects:

- It would substantially reduce the potential for impacts of OCS oil and gas operations to the existing environmental and recreational qualities of a large segment of the Channel and the four Channel Islands. Such legislation would offer further protection of the Santa Barbara coastal area from spills occurring on the Channel OCS, by substantially enlarging the area in which Federal oil and gas development is precluded.
  
- It would open Naval Petroleum Reserve No. 4, on the Arctic North Slope of Alaska, to exploration under Federal auspices, with all attendant environmental impacts in a totally different but possibly more fragile environment than the Channel OCS.

- It would preclude development and utilization of a known discovery of oil and gas (the Pitas Point Unit), and it would preclude discovery, development, and utilization of potential resources in a significant part of the Channel OCS. Alternative sources of energy would have to be found and developed, with attendant environmental impacts which may be greater or lesser than those anticipated in further Channel development.
- It would preclude the environmental impacts which could result from allowing exploration, development and production activities in the Channel area.

Should the Congress not pass the legislation, the various tracts of area would once again revert to their present status. Previous discussion of potential oil and gas activities on these tracts, and related impacts need not be repeated here.

3. Submit New Proposed Legislation for Establishment of a National Energy Reserve but with a Different Selection of Lands to be Encompassed.

The Secretary could propose legislation for establishment of a National Energy Reserve in the Channel which encompassed a different selection of tracts from those proposed to the 93rd Congress. The basis for a new selection would flow from a different basic rationale for proposing such a Reserve; it could range from reasons much more specific than the original, to something much more general. The possible combinations of tracts to be included could conceivably range from a single tract, to only the Federal Ecological Preserve, to the entire OCS of the Channel.

The legal and operational status of various segments of the Channel OCS, their general potential for oil and gas development, the kinds and estimated amounts of impacting activities involved in each such level of development, and the magnitude of environmental impacts of each such activity, have been previously identified in this document. The possible combinations of rationale and tract selection that might be encompassed in a new Energy Reserve in the Channel are too numerous and speculative to warrant further attempt at specificity here as to possible environmental consequences of each.

The Secretary's decision in the matter of a National Energy Reserve in the Santa Barbara Channel is now speculative in any event. His decisions in the future will involve a balancing of the environmental consequences as described herein as well as a number of other factors including, but not limited to, national energy need and security, balance of trade, national energy self-sufficiency, and national and local economy.

G. Alternative Sources of Energy

Should further oil and gas development of the Santa Barbara Channel be prevented in whole or in part, a potential source of domestic energy would be lost and according to the National Energy Policy Act, alternative energy sources should be considered. The extent of alternative sources of energy which would be needed to replace the potential sources from the Santa Barbara Channel is dependent upon both the type of administrative decision and the results of exploration and development, if permitted. Complete information can be gained only by these operations.

In light of the present energy situation and the United States' self-sufficiency goals, it is questionable whether substitution of any one energy alternative is a viable alternative to any environmentally acceptable operation that would result in increased energy from a domestic source. In the President's message to the Congress transmitting the budget for Fiscal Year 1975 (February 4, 1974), he stated:

*"The 1975 budget reflects a comprehensive national energy policy to deal with current shortages and provides funds to initiate the Federal position of Project Independence, an accelerated private and governmental effort to reestablish our capability for self-sufficiency in energy by 1980."*

In order to attain this goal, usage of all environmentally acceptable domestically-produced energy forms is required. In compliance with the National Environmental Policy Act of 1969, and to insure completeness of this statement, energy alternatives have been both incorporated by reference as described below and also discussed in the text.

A full consideration of the impact which would result from development of alternative sources or a reduction of energy consumption is found in the United States Department of the Interior's "Energy Alternatives and Their Related Impacts." All of the discussion contained therein concerning the environmental impact of the development of alternative sources which would help meet national energy demands is specifically incorporated herein by reference. Copies of that document may be obtained from the Assistant Director of Minerals Management, Bureau of Land Management, 18th and C Streets, N.W., Washington, D. C. 20240.

Reading copies are available in the Bureau of Land Management Office, 7663 Federal Building, 300 North Los Angeles Street, Los Angeles, California 90012. An expanded version is in preparation by the University of Oklahoma under contract from the Council on Environmental Quality with funding support by the Bureau of Land Management (BLM), Environmental Protection Agency, Federal Power Commission, and Federal Energy Administration. Its title will be "Methodology and Documentation for Consistent Analysis of Energy Alternatives for Environmental Impact Statements." It is slated for completion in spring 1975.

The U. S. Department of Interior's "Energy Alternatives and Their Related Impacts" is a complete detailed study of long-term optional energy sources and of energy conservation. As a supplement to this incorporated by reference



alternative study, a brief discussion of the optional energy sources that appear to have the most potential in the relatively near future is included within the text of this statement.

Modifications have been made to render the discussion applicable to the Santa Barbara Channel OCS and to the potential levels of development within the Channel area. Also, a nuclear energy alternative section has been added and minor editorial and technical changes were made.

Table VIII-1 following provides units and energy source conversions for the various potential oil and gas development levels considered for the Channel. Definitions of the various levels of development appear in table I-2.

The following is a list of energy sources or actions which might be employed as substitutes to OCS oil and gas should further Santa Barbara Channel potential development be prevented or severely limited:

1. Energy conservation
2. Conventional oil and gas supplies
3. Coal
4. Synthetic sources of oil and gas
5. Hydroelectric power
6. Nuclear power
7. Solar energy
8. Energy imports
9. Other energy sources
10. Combination of alternatives

Each of the items is discussed briefly in the pages that follow.

Table VIII-1.--ENERGY NEEDED FROM OTHER SOURCES TO REPLACE THE ESTIMATED OIL AND GAS PRODUCTION FROM VARIOUS POTENTIAL LEVELS OF SANTA BARBARA CHANNEL OCS DEVELOPMENT

1. Btu equivalents <sup>1</sup> in trillions of Btu's			
<u>Level 1</u> <sup>2</sup>	(a) Oil - 200 to 300 million barrels	1,160	to 1,740
	(b) Gas - 100 to 150 billion ft <sup>3</sup>	<u>103</u>	to <u>155</u>
	Total	1,263	to 1,895
<u>Level 2</u>	(a) Oil - 780 to 1,300 million barrels	4,520	to 7,550
	(b) Gas - 390 to 650 billion ft <sup>3</sup>	<u>402</u>	to <u>670</u>
	Total	4,922	to 8,220
<u>Level 3</u>	(a) Oil - 40 to 200 million barrels	233	to 1,160
	(b) Gas - 20 to 100 billion ft <sup>3</sup>	<u>21</u>	to <u>103</u>
	Total	254	to 1,263
<u>Level 4</u>	(a) Oil - 40 to 150 million barrels	232	to 870
	(b) Gas - 20 to 70 billion ft <sup>3</sup>	<u>21</u>	to <u>72</u>
	Total	253	to 942
<hr/>			
<u>Total of areas included in Levels 1, 2, 3, &amp; 4</u>			
	(a) Oil - 1,060 to 1,950 million barrels	6,145	to 11,320
	(b) Gas - 530 to 970 billion ft <sup>3</sup>	<u>547</u>	to <u>1,000</u>
	Total	6,692	to 12,320
<hr/>			

(All footnotes appear on the last page of this table)

2. Oil equivalents in millions of barrels

<u>Level 1</u>	(a) Oil equivalents to replace oil production from the Channel	200	to	300
	(b) Oil equivalents to replace gas production from the Channel	<u>18</u>	to	<u>27</u>
	Total	218	to	327
<u>Level 2</u>	(a) Oil equivalents to replace oil production from the Channel	780	to	1,300
	(b) Oil equivalents to replace gas production from the Channel	<u>70</u>	to	<u>116</u>
	Total	850	to	1,416
<u>Level 3</u>	(a) Oil equivalents to replace oil production from the Channel	40	to	200
	(b) Oil equivalents to replace gas production from the Channel	<u>3.6</u>	to	<u>17.8</u>
	Total	43.6	to	217.8
<u>Level 4</u>	(a) Oil equivalents to replace oil production from the Channel	40	to	150
	(b) Oil equivalents to replace gas production from the Channel	<u>3.6</u>	to	<u>12.5</u>
	Total	43.6	to	162.5

Total of areas included in Levels 1, 2, 3, & 4

	(a) Oil equivalents to replace oil production from the Channel	1,060.0	to	1,950.0
	(b) Oil equivalents to replace gas production from the Channel	<u>95.2</u>	to	<u>173.3</u>
	Total	1,155.2	to	2,123.3
3.	Gas equivalents in billions of ft <sup>3</sup> of gas			
<u>Level 1</u>	(a) Gas equivalents to replace oil production from the Channel	1,120	to	1,690
	(b) Gas equivalents to replace gas production from the Channel	<u>100</u>	to	<u>150</u>
	Total	1,220	to	1,840
<u>Level 2</u>	(a) Gas equivalents to replace oil production from the Channel	4,370	to	7,300
	(b) Gas equivalents to replace gas production from the Channel	<u>390</u>	to	<u>650</u>
	Total	4,760	to	7,950
<u>Level 3</u>	(a) Gas equivalents to replace oil production from the Channel	224	to	1,120
	(b) Gas equivalents to replace gas production from the Channel	<u>20</u>	to	<u>100</u>
	Total	244	to	1,220

<u>Level 4</u>	(a) Gas equivalents to replace oil production from the Channel	224	to	840
	(b) Gas equivalents to replace gas production from the Channel	<u>20</u>	to	<u>70</u>
	Total	244	to	910

Total of areas included in Levels 1, 2, 3, & 4

	(a) Gas equivalents to replace oil production from the Channel	5,938	to	10,950
	(b) Gas equivalents to replace gas production from the Channel	<u>530</u>	to	<u>970</u>
	Total	6,468	to	11,920

4. Coal equivalents in millions of short tons

<u>Level 1</u>	(a) Coal equivalents to replace oil production from the Channel	48.40	to	72.60
	(b) Coal equivalents to replace gas production from the Channel	<u>4.36</u>	to	<u>6.55</u>
	Total	52.76	to	79.15

<u>Level 2</u>	(a) Coal equivalents to replace oil production from the Channel	189.00	to	315.00
	(b) Coal equivalents to replace gas production from the Channel	<u>16.95</u>	to	<u>28.10</u>
	Total	205.95	to	343.1

<u>Level 3</u>	(a) Coal equivalents to replace oil production from the Channel	9.6	to	48.2
	(b) Coal equivalents to replace gas production from the Channel	<u>0.9</u>	to	<u>4.3</u>
	Total	10.5	to	52.5
<u>Level 4</u>	(a) Coal equivalents to replace oil production from the Channel	9.7	to	36.3
	(b) Coal equivalents to replace gas production from the Channel	<u>0.9</u>	to	<u>3.0</u>
	Total	10.6	to	39.3
<u>Total of areas included in Levels 1, 2, 3, &amp; 4</u>				
	(a) Coal equivalents to replace oil production from the Channel	256.7	to	472.1
	(b) Coal equivalents to replace gas production from the Channel	<u>23.1</u>	to	<u>41.9</u>
	Total	279.8	to	514.0
5. Electrical equivalents in millions of megawatts hours				
<u>Level 1</u>	(a) Electrical equivalents to replace oil production from the Channel			
	(i) for end use <sup>3</sup>	220.0	to	330.0
	(ii) for electrical generation <sup>4</sup>	136.0	to	204.0

(b) Electrical equivalents to replace gas production from the Channel			
(i) for end use	19.8	to	29.4
(ii) for electrical generation	12.2	to	18.1
(i) Total for end use	239.8	to	359.4
(ii) Total for electrical generation	148.2	to	222.1

Level 2

(a) Electrical equivalents to replace oil production from the Channel			
(i) for end use	865.0	to	1,420.0
(ii) for electrical generation	532.0	to	888.0
(b) Electrical equivalents to replace gas production from the Channel			
(i) for end use	77.1	to	127.0
(ii) for electrical generation	47.4	to	79.0
(i) Total for end use	942.1	to	1,547.0
(ii) Total for electrical generation	579.4	to	967.0

Level 3

(a) Electrical equivalents to replace oil production from the Channel			
(i) for end use	43.8	to	220.0
(ii) for electrical generation	26.7	to	135.5

	(b) Electrical equivalents to replace gas production from the Channel		
	(i) for end use	3.9	to 19.6
	(ii) for electrical generation	2.4	to 12.2
	(i) Total for end use	47.7	239.6
	(ii) Total for electrical generation	29.1	to 147.7
<u>Level 4</u>	(a) Electrical equivalents to replace oil production from the Channel		
	(i) for end use	44.1	to 165
	(ii) for electrical generation	27.3	to 102
	(b) Electrical equivalents to replace gas production from the Channel		
	(i) for end use	4.0	to 13.8
	(ii) for electrical generation	2.4	to 8.6
	(i) Total for end use	48.1	to 178.8
	(ii) Total for electrical generation	29.7	to 110.6



Total of areas included in Levels 1, 2, 3 & 4

(a)	Electrical equivalents to replace oil production from the Channel		
(i)	for end use	1,172.9	to 2,135.0
(ii)	for electrical generation	722	to 1,329.5
(b)	Electrical equivalents to replace gas production from the Channel		
(i)	for end use	104.8	to 189.8
(ii)	for electrical generation	64.4	to 117.9
(i)	Total for end use	1,277.7	to 2,324.8
(ii)	Total for electrical generation	786.4	to 1,447.4

6. Slightly enriched uranium fuel equivalents in short tons

<u>Level 1</u>	(a)	Uranium equivalents to replace oil production from the Channel		
	(i)	for end use	992.0	to 1,490.0
	(ii)	for electrical generation <sup>5</sup>	610.0	to 917.0
	(b)	Uranium equivalents to replace gas production from the Channel		
	(i)	for end use	87.5	to 1,345.0
	(ii)	for electrical generation	55.1	to 82.8
	(i)	Total for end use	1,079.5	to 2,835.0
	(ii)	Total for electrical generation	665.1	to 999.8

<u>Level 2</u>	(a) Uranium equivalents to replace oil production from the Channel		
	(i) for end use	3,880.0	to 6,460.0
	(ii) for electrical generation	2,390.0	to 3,980.0
	(b) Uranium equivalents to replace gas production from the Channel		
	(i) for end use	348.0	to 576.0
	(ii) for electrical generation	214.0	to 355.0
	(i) Total for end use	4,228.0	to 7,036.0
	(ii) Total for electrical generation	2,604.0	to 4,335.0
<u>Level 3</u>	(a) Uranium equivalents to replace oil production from the Channel		
	(i) for end use	195.0	to 987.0
	(ii) for electrical generation	121.0	to 608.0
	(b) Uranium equivalents to replace gas production from Channel		
	(i) for end use	17.7	to 88.5
	(ii) for electrical generation	10.9	to 54.3
	(i) Total for end use	212.7	to 1,075.5
	(ii) Total for electrical generation	131.9	to 662.3

<u>Level 4</u>	(a) Uranium equivalents to replace oil production from Channel			
	(i) for end use	198	to	750
	(ii) for electrical generation	122	to	460
	(b) Uranium equivalents to replace gas production from Channel			
	(i) for end use	17.7	to	62.0
	(ii) for electrical generation	10.9	to	38.1
	(i) Total for end use	215.7	to	812.0
	(ii) Total for electrical generation	132.9	to	498.1
Total of areas included in Levels, 1, 2, 3, & 4				
	(a) Uranium equivalents to replace oil production from Channel			
	(i) for end use	5,265.0	to	9,687.0
	(ii) for electrical generation	3,243.0	to	5,965.0
	(b) Uranium equivalents to replace gas production from Channel			
	(i) for end use	470.9	to	2,071.5
	(ii) for electrical generation	290.9	to	530.2
	(i) Total for end use	5,735.9	to	11,758.5
	(ii) Total for electrical generation	3,533.9	to	6,495.2

- 1 Conversion factors used:
  - 1 barrel of oil =  $5.8 \times 10^6$  Btu
  - 1 cubic foot of natural gas = 1,032 Btu
  - 1 cubic foot of natural gas =  $1.78 \times 10^{-4}$  barrel oil
  - 1 barrel of oil =  $5.62 \times 10^3$  cubic feet of natural gas
  - 1 ton of coal =  $24 \times 10^6$  Btu
  - 1 pound of slightly enriched uranium fuel =  $1.2 \times 10^9$  Btu based upon a 3.5% fission factor
  - 1 kilowatt hour = 3,412 Btu at the theoretical conversion rate of other energy forms to electricity at 100% efficiency
- 2 Refer to table I-2 for identification of potential levels
- 3 Based on a 65% average efficiency of end use of oil and gas (such as oil and gas heating) and a plant load factor of 80%
- 4 Efficiency of fossil fuel electricity generation was assumed to be 40%
- 5 Efficiency of nuclear fuel electricity generation was assumed to be 33%

## 1. Energy Conservation

Vigorous energy conservation is an alternative that warrants serious consideration. The Project Independence Report of the Federal Energy Administration claims that energy conservation alone can reduce energy demand growth by 0.7 to 1.2 percent depending on the world price of oil. Aside from these savings, it is now widely recognized that wasteful consumption habits impose social costs such as pollution and an inequitable distribution of fuel, that can no longer be afforded.

The residential and commercial sectors of the economy are often characterized as inefficient energy consumers. In the next 30 years, their share of total energy use is expected to increase from 32 to 39 percent in the State of California alone. Inadequate insulation, inefficient heating and cooling systems, poorly designed appliances, and excessive lighting are often noticed in these sectors. To achieve reductions in consumption beyond those induced by fuel price increases could require new standards on products and buildings, and/or subsidies and incentives. These incentives could impose standards for improved thermal efficiency in existing homes and offices and minimum thermal standards for new homes and offices.

Excessive consumption is also evident in the industrial sector where energy inefficient work schedules, poorly maintained equipment, use of equipment with extremely low heat transfer efficiencies, and failure to recycle heat and waste materials are all commonplace. Estimated energy savings of between 10 and 30 percent may be available in this sector of the economy.

Transportation of people and goods accounts for approximately 25 percent of nationwide energy use and nearly 35 percent in California. Energy inefficiency in the transportation sector varies directly with automobile usage.

Automobiles, which account for 90 percent of all passenger movement in the nation, use more than twice as much energy per passenger mile as buses. Moreover, the average car carries only 1.3 passengers. Using short and mid-term conservation measures such as consumer education, lower speed limits, rate and service improvements on public transit and rail freight transit, energy savings of 15-25 percent might be possible. For example, the California Department of Transportation has estimated that a three percent reduction in fuel consumption in 1974 resulted from the lower speed limit on California highways.

Other policies to encourage fuel conservation in transportation could include standards for more efficient new autos and incentives to reduce miles traveled. An important new development in the fuel economy area could be the modification of the standard internal combustion engine. Although such an engine is now in the advanced stages of development, further study by automotive engineers, industry, and concerned Federal agencies is necessary before an acceptable engine may be approved.

Significant energy savings are clearly possible through accelerated conservation efforts. The Project Independence Report estimates that conservation alone could result in a 2.2 million barrel per day reduction in petroleum demand by 1985. These savings will be necessary in order to achieve the goals of energy self-sufficiency.

California Coastal Zone  
Conservation Commission Energy Conservation Policy

The California Coastal Zone Commission has recommended a number of energy conservation policies in its preliminary Coastal Plan. They are presented below by policy number.

121. Restructure Utility Rates to Encourage Conservation. Utility rates should be restructured to encourage energy conservation and peak load demand reduction. The California Public Utilities Commission (CPUC) should revise rate structures to more accurately reflect the actual costs of production and transmission of a customer's gas and electricity. The State Energy Commission should assist the CPUC in the revisions as soon as it is able to do so. (E-p2)

122. Reduce Energy Consumption Statewide and in Coastal Developments.

Non-essential consumption of energy should be reduced statewide, thereby reducing the adverse environmental impact of energy supply facilities on the coastal zone. (E-p4)

a. Statewide Energy Conservation Measures Recommended. The energy conservation standards contained in Policies 123 through 126 below clearly should be applied statewide and are therefore recommended to the State Energy Resources Conservation and Development Commission ("State Energy Commission") for its consideration in developing statewide energy conservation measures in fulfillment of its legislative mandate. (E-p4)

b. Coastal Energy Conservation Standards May Also be Applied. If, for any reason, a significant energy conservation program is not in effect statewide by January 1, 1977, then the standards set forth in Policies 123 through 126 below, or any improvement upon them recommended or enacted by the Energy Commission, shall be applied by the coastal agency to all development proposed within the agency's jurisdiction. Until that time, the application of such standards should be required to the maximum extent feasible in any development as a

contribution to energy efficiency and resource conservation. (E-p4)

123. Reduce Consumption of Electricity for Lighting. Unnecessary lighting in new or substantially remodeled residential, commercial, institutional, or industrial development shall be reduced through State Energy Commission action (or by the coastal agency within its jurisdiction--see Policy 122) in the following ways. (E-p5)

- a. Regulate Lighting Levels. Lighting shall not exceed 2.3 watts (2.5 volt-amperes) per square foot except in instances where higher levels are shown to be necessary for high visual acuity tasks and public health and safety.
- b. Allow Only Efficient Lamps and Luminaires. Only efficient lamps and luminaires, as defined in the proposed Standard 90-F of the American Society of Heating, Ventilating, Refrigeration, and Air Conditioning Engineers (ASHRAE), shall be allowed.
- c. Provide for Selective On-Off Light Switching. In large office buildings, light switches shall be provided so that portions of the building, including portions of each floor, receiving adequate natural light, or not in use, can be switched off selectively.
- d. Use HPS Street Lighting. New street and highway lighting luminaires shall be of the high pressure sodium (HPS) type, or an approved alternative type equal in energy efficiency, unless there are environmental, aesthetic, or public safety reasons for utilizing a different type of light source. (E-p5) Consideration should be given to establishment of a capital improvement fund, by passage of a State bond issue or by other appropriate State funding, for the conversion



of existing State, county, and municipal incandescent or mercury vapor type street and highway lighting to high pressure sodium (HPS) type or equivalent. Conversion should take place as quickly as possible given the financial resources available and manufacturing and installation capacity. Funds expended could be repaid from energy cost savings resulting from the conversion. (E-p9d) Other appropriate energy-conserving devices (e.g., astronomical clocks that eliminate lighting during daylight) and designs shall also be incorporated in all new public lighting systems. (E-p5)

e. Ban Lighted Advertising or Ornamental Signs. Proposed new advertising or ornamental signs, whether on business sites or off, shall not be electrically lighted, except that businesses shall be allowed on-site lighted identification signs containing only the name, address, and major project or service of the business, and these signs shall be illuminated during darkness only when the business is open to the public. (Incorporation of such standards in local sign ordinances, as prescribed in Policy 58, should be considered.)

f. Minimize Building and Facade Lighting. Building and facade lighting, exclusive of signs, shall be no greater than 1,000 watts or 2 percent of the total interior lighting load of the building, whichever is greater. On-site signs and facade lighting shall be included in the project's energy budget. (E-p5)

124. Reduce Consumption of Electricity for Heating and Cooling.

Unnecessary use of electricity for heating, cooling, and ventilating in new or substantially remodeled residential, commercial, institutional, or industrial developments shall be reduced through State Energy Commission

action (or by the coastal agency within its jurisdiction--see Policy 122) in the following ways. (E-p6)

- a. Restrict Electric Resistance Heating. No electric resistance heating (water or space) shall be allowed unless: (1) an effective solar delivery system and/or natural gas service are not available or adequate for meeting energy requirements; (2) electrical heating is needed for medical, health, or public safety reasons; (3) some other unusually high requirement for clean heat exists; or (4) a back-up system for solar heating and cooling systems is required.
  
- b. Build to Reduce Air Conditioning Needs. Air conditioning needs shall be reduced by: (1) incorporating either mature planting, exterior architectural shading projections, or reflecting and/or insulating glass or exterior solar screens to shade or protect windows receiving direct sunlight in warm climates; (2) incorporating operable sash and vents in all exterior rooms for which ventilation is required by the local building code, and making such sash and vents weather-tight by use of weather-stripping; and (3) having variable thermostats for areas with different air conditioning requirements.
  
- c. Use Best Available Air Conditioning Technology. An air conditioning design using the best practical available technology with low-level or no electricity consumption shall be required. New conventional compressive refrigeration air conditioning shall be permitted only if an applicant can demonstrate that the life cycle costs of the conventional system are substantially less than the lowest cost alternative system available. The demonstration shall include a comparison of the conventional and potential alternative schemes, including electric

energy consumption, cooling output, and life cycle cost, together with outline specifications and sketch plans to scale for both the conventional and alternative systems. The comparison shall be submitted and signed by a California registered engineer. (Alternatives may include cooling systems based on evaporative cooling, solar cooling, nocturnal radiation, absorption refrigeration, heat pumps, rock bed regenerators, and coolness storage, among others.) (E-p6)

(See the section on Alternative Energy Sources.)

125. Reduce Wasteful Consumption of Natural Gas in Pilot Lights and Gas Flames.

Wasteful use of natural gas in new or substantially remodeled residential, commercial, institutional, or industrial developments shall be reduced through State Energy Commission action (or by the coastal agency within its jurisdiction--see Policy 122) in the following ways. (E-p7)

a. Use Intermittent Electrical Ignition Systems or Other Means.

Intermittent electric ignition systems or other acceptable means shall be used in lieu of gas pilot lights in all residential, commercial, or industrial equipment (with the exception of water heater gas pilots) installed in proposed new construction or additions to existing structures unless it can be conclusively demonstrated that the gas pilot device: (1) has a substantially lower life cycle cost than an electric ignition or other alternative system, computed at prime interest rates; (2) that for particular equipment, the gas pilot light is more energy efficient than available alternatives; or (3) that public health or safety necessitates the use of pilots.

b. Ban Open Gas Flames. Open gas flames for advertising, promotional, or decorative purposes shall not be allowed in proposed new industrial,

commercial, or residential construction or additions. This applies to both exterior and interior installations. (E-p7)

126. Establish Energy Budgets for New Developments. An energy budget code should be formulated, to be applied statewide by the Energy Commission to all new or substantially remodeled residential, commercial, institutional, and industrial developments. (E-p8)

- a. Proposed Energy Budget Code Criteria. The code should set required energy budget performance levels for a range of building types, sizes, occupancies, projected levels of intensity of use, and locations. The energy budget shall state the energy inputs and outputs of the proposed building or other development in BTU's per cubic foot or in watts per square foot; and shall give the extreme mean heat loss/gain of all buildings in peak heating and cooling seasons. All proposals for enclosed developments shall include outline specifications for the following: microclimate description of the building site; microclimate modifiers such as planting; total building exterior cladding material; building insulation; building thermal inertia and energy storage capability; major building energy using and controlling equipment such as for lighting, heating, ventilating, and air conditioning.
- b. Projects Requiring Energy Budget Analysis. An energy budget, including outline specifications, shall be required for residential developments of four or more dwelling units, or commercial or industrial projects of 5,000 square feet of floor area or more. It shall be signed by a California registered engineer or certified architect. Proposed light commercial structures of less

than 2,700 square feet may be exempted from the specific standards without submitting an energy system analysis, provided a California registered engineer or certified architect states in writing that the specific proposed design would be expected to meet or have a lower annual energy consumption than the minimum established performance for the project type. Consideration should also be given to developing an exemption procedure for single family homes that would permit administration of energy conservation measures through local building codes without necessitating undue cost in the preparation of energy budgets.

c. Projects Meeting Budget Standard Exempt from Specification Requirements

A proposed building or development that meets the required energy budget performance level set in the energy budget code, as shown through an energy system analysis, shall be exempt from such specification criteria as those described in Policies 123 through 125. (E-p8)

d. Research and Training Needed. To facilitate development and implementation of an energy budget code statewide, detailed research should be undertaken to define energy code standards, and a State-financed program of in-service training for building inspectors to administer the energy budget should be instituted. (E-p9)

e. Interim Budget Code for Coastal Developments. If the Energy Commission has not made substantial progress toward development of an energy budget code by January 1, 1977, the coastal agency shall consider adoption of an interim budget code, to be applied

to all development proposed within the agency's jurisdiction. Such an interim code might be submitted by a responsible professional organization to the coastal agency for public hearing and possible adoption. If adopted, the energy budget code would be implemented through the coastal permit process in the same manner set forth above. Until January 1, 1977, the development and application of energy budgets should be encouraged as a contribution to energy efficiency and resource conservation. (E-p8)

127. Implement Other Energy Conservation Measures Statewide. The State Energy Commission and the State Legislature should, as part of a comprehensive statewide energy conservation program, implement certain other conservation measures statewide, as follows:

- a. Tax Heavier, Less-Efficient Autos. Tax legislation should be enacted that encourages the use of lighter automobiles with smaller engines and increased energy efficiencies. (E-p9b)
- b. Discourage Inefficient Appliances. Legislation should be enacted requiring that (1) all appliances sold in California meet specified energy efficiency standards, and (2) all appliances be clearly labeled with energy efficiency or energy consumption information. (E-p9c)
- c. Improved Energy Use Standards of Existing Buildings. A long-range phased program for improving the energy use standards of existing buildings in California, including replacing energy inefficient equipment, should be devised and implemented. Special loans and/or tax incentives should be considered to assist in upgrading insulation, and incorporating low or non-fuel-using technologies that

involve higher capital costs. (E-p9a)

### Environmental Impacts

The environmental impacts of a vigorous energy conservation program will be primarily beneficial in terms of fuel/energy consumed. The exact nature and magnitude of these impacts will depend on whether there is a net reduction in energy use or whether the reduction is accomplished through technological change and substitutions. For the former, the net impacts will simply be that there are fewer pollutants of all kinds unleashed. As an example, the 2.2 million bbl/day savings by 1985 mentioned above would result in a diminishment of various pollutants by the following amounts.<sup>1</sup>

CO - 4 lbs/1,000 gals = 189 tons/day  
Hydrocarbons - 3 lbs/1,000 gals = 142 tons/day  
Particulates - 23 lbs/1,000 gals = 1,088 tons/day  
NO<sub>x</sub> - 60 lbs/1,000 gals = 2,838 tons/day  
SO<sub>2</sub> - 157 lbs/1,000 gals = 7,426 tons/day

If however, energy conservation is achieved by technological change or substitution, the net reductions will be those above, less the incremental pollutants from other sources, as well as any new pollutants which might arise from these other sources.

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<sup>1</sup>HUD Contract #H2026R - "Research Evaluation of a System of Natural Air Conditioning."

## 2. Conventional Oil and Gas Supplies

Large quantities of oil still remain in the United States. The U.S. Geological Survey estimates that undiscovered recoverable resources of 135-270 billion barrels of oil are located onshore. This figure, however, is an estimate of the nation's total petroleum resource base and is not an indication of the oil supply that will be available for future consumption. The term "proved reserves" refers to those volumes of petroleum liquids that are known from drilling and are economically producible at current prices with current levels of technology. The Project Independence Report uses the American Petroleum Institute's latest (Jan. 1, 1974) annual figure on proved reserves, 35.3 billion barrels. In addition to these reserves, T. A. Hendricks, W. C. Mallory, and associates of the USGS claim that an additional 25 to 45 billion barrels of petroleum liquids could be added to proved reserves through extensions, revisions, and discoveries of new pools in known fields.

Despite the magnitude of the proved reserve estimate, domestic oil production is almost certain to continue its decline from the peak production rate attained in 1970. All of the 12 oil production forecasts discussed in the Project Independence Blueprint claimed that, in the next few years, the petroleum production decline would continue in the United States. Most of these same forecasts predict increasing domestic production by the late 1970's but only under the most favorable conditions in terms of prices, regulation, and environmental constraints.

Much of the domestic oil reserve is recoverable through secondary and tertiary extraction techniques. However, the oil that is attainable in this manner is in many cases "old" and hence subject to price controls. These controls have diminished the incentive for using these sophisticated and expensive recovery methods.

To substitute directly for the potential development for the Santa Barbara Channel, onshore oil production would have to provide an additional 1,060 million to 1,950 million barrels and onshore gas production would have to provide additionally 530 billion to 970 billion cubic feet. This substitution would entail environmental impacts such as land subsidence, soil sterilization, and disruption to existing land use patterns. Equipment failure, human error, and blowouts may also impair environmental quality. Moreover, poor well construction and oil spills can result in ground and surface water pollution.



a. Deregulation of the Wellhead Price of Natural Gas

The regulated price of natural gas has often been cited as an important cause of the meager supply of domestic gas. Eliminating the price ceiling on natural gas could have an inflationary impact though it would encourage development of native gas reserves and thus help reduce foreign dependence. With regard to the inflation issue, the lack of natural gas supplies causes increased consumption of expensive alternatives; the average price of natural gas after deregulation may well be less than these alternative supplies. In any case, domestic supplies of natural gas have to exist and have to be accessible. The OCS is believed to be one of the most prospective areas for natural gas development.

b. Nuclear Stimulation of Gas Formations

Nuclear stimulation, an experimental method of fracturing low permeability gas reservoirs otherwise incapable of sustaining commercial production, has the potential to add materially to U.S. recoverable gas reserves. The Atomic Energy Commission is conducting research and development of nuclear explosives and techniques for utilizing the effects of multiple nuclear explosives to recover natural gas locked in tight geologic formations. Such gas cannot now be produced economically by conventional methods. Most reserves which are amenable to nuclear stimulation lie in thick, deep reservoirs of very low natural permeability located in the Rocky Mountain area.

The Federal Power Commission has estimated that total yearly gas production by 1985 from the Uinta, Piceance, and Green River Basin fields using nuclear stimulation from 110 to 200 wells would be 812 to 1,939 billion cubic feet.<sup>1</sup>

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<sup>1</sup> Federal Power Commission, April 1973, Natural Gas Technology Task Force for the Technical Advisory Committee of the Natural Gas Survey by the Federal Power Commission, p. II-7.

Environmental effects of nuclear stimulation to increase natural gas production from tight reservoirs are related to radioactivity and seismic disturbance, both of which concern the surface or subsurface, leaving atmospheric contamination or disturbance unlikely. The depth of the gas formations of interest throughout the Rocky Mountain area is such that the probability of releasing any appreciable amounts of radiation to the atmosphere at detonation time is considered negligible. Most of the radioactivity produced by the explosives will remain underground, trapped in the resolidified rock near the bottom of the chimney or attached to the rock surfaces in the chimney.

Project design would consider mobile waters and assure that chimneys remain isolated from them. Methods are being developed to dispose of water produced with the gas and containing low levels of tritium. The potential environmental impacts of nuclear stimulation of a single well or several wells in small geographic areas have been evaluated by the AEC, for example, for the Rio Blanco and Wagon Wheel Projects. Extrapolation to more extensive development relates to frequency and size of explosives and changes in the local environment. The possibility that residual stress from a number of detonations might accumulate and present an earthquake stimulation hazard requires continued appraisal during future nuclear stimulation projects.

### 3. Coal

Coal is the most abundant energy resource in the United States. Coal deposits underlying nearly 460,000 square miles in 37 states constitute one-quarter of the known world supply and account for 80 percent of our proven fuel reserves. Proven reserves of coal contain 125 times the energy consumed in 1970.

To replace the energy from the potential development of the Santa Barbara Channel 279.8 million to 514.0 million tons of coal would be necessary. Though domestic reserves could easily provide this quantity, serious limitations to coal development exist. In many uses, coal is an imperfect substitute for oil or natural gas. In many other cases, coal use is restricted by government constraints, limited availability of low sulfur deposits, inadequate mining, conversion, and pollution abatement technology, and the hazardous environmental impacts associated with coal extraction and electricity generated from coal. Coal production is also threatened by the unique set of labor problems associated with mining and new strict standards for coal mine safety.

Although U.S. coal resources are very large, there is some geographic dislocation. Most of our coal is found west of the Mississippi River far from the concentrated industrial areas of the east and far west. Also, much of the western coal is in arid or semi-arid areas where scarcity of water could constrain development.

The portion of the demonstrated reserve base that is available for use depends on whether the coal deposit can legally be mined, and if it can, whether it is suited for underground or surface mining. Surface mines may recover up to 90% of the coal in a given mine; underground mines 50 to 60% using room and pillar methods.

Public concern over dangerous underground mine conditions inspired the Federal Coal Mining Health and Safety Act of 1969. This legislation has improved underground mining conditions and therefore has reduced the occupational hazards confronted by many coal miners. This Act has also increased the costs of underground coal mining - an important side effect

since most of the nation's coal reserves can be recovered only by underground mining. Additionally, the Mining Health and Safety Act has given strip mining a competitive advantage over underground mining because strip mining is far less hazardous than underground mining and is subject to fewer of the provisions and regulations of the Act.

The advent of new, strict air quality regulations has diminished the attractiveness of coal. One-third of the domestic coal reserve does not meet the low-sulfur requirement. The two-thirds of this reserve that is environmentally acceptable is located mainly in the Rocky Mountain States and is generally of lower BTU value than eastern coals. The cost of transporting Rocky Mountain coal to population centers of the eastern or western United States adds significantly to its price, putting much of it at a competitive disadvantage with other energy sources.

#### 4. Synthetic Sources of Oil and Gas

##### a. Oil Shale

The nation's vast oil shale resources have not in the past been considered as part of the domestic energy supply because of the ready availability of low cost oil and gas. Current needs, however, may necessitate rapid development of this fossil fuel.

Oil shale can be processed after its extraction using a surface technique, or, in place (in-situ) processing can be conducted. As with coal, oil shale may be extracted using underground mines or surface techniques (i.e., strip mining).

The Green River Formation covering parts of Colorado, Utah, and Wyoming contains the most abundant concentration of oil shale in the nation. Approximately 600 billion barrels of oil are believed to be deposited in

this location. Oil shale development does pose serious environmental risks however. With surface or conventional underground mining, it is very difficult to dispose of the huge quantities of spent shale which occupy a larger volume than before the oil was extracted. Inducing revegetation in an area where oil shale has been developed is a difficult task often taking in excess of ten years. The in-place processing alternative avoids many of these environmental hazards but disturbance of underground aquifers and contamination of ground waters are side-effects of both development techniques.

Commercial development of the Green River Formation would require significant quantities of water. However, the Colorado-Utah-Wyoming area is low on water supplies. Hence, another obstacle to oil shale development is posed.

The list of impediments does not end here. The Green River Formation is sparsely settled. Oil shale development will cause major changes in existing land uses and thus have social and economic repercussions in an area traditionally devoid of large scale industry. Because the Colorado oil shale lands have some of the largest migratory deer and elk herds in the world, impacts on the regional wildlife are expected.

Roads, mining plant sites, waste disposal areas, and utility line corridors will disrupt the land's vegetative cover and intensify sediment loads in the area's streams. Disposing of the huge volume of waste water containing dissolved inorganic and organic compounds without degrading natural ground waters will severely strain the region's already scarce water resources. Oil shale mining will raise noise pollution levels and the attendant particulate emissions will lower ambient air quality.

b. Synthetic Natural Gas and Oil

Liquifying and gasifying coal in commercial quantities is another target of current energy research. Synthetic natural oil is the end product of coal liquefaction while gasification produces synthetic natural gas. Of the two methods, researchers have devoted more effort to gasification because of the high costs encountered in producing synthetic natural oil. Natural gas can also be synthesized from petroleum. Such gas has been produced commercially in Europe and some forty plants are planned for the United States.

High costs and the elementary level of technology have impeded synthetic natural gas and oil development. Pilot plants have been operating domestically but commercial production levels have not been achieved. The role of synthetic natural gas and oil in the nation's future energy supply will depend on environmental standards, the effects of new health and safety standards on coal mining and the availability of water.

Several environmental problems are associated with coal gasification and liquefaction. The ecological side-effects of extracting coal are major problems because coal is the raw material for both processes. Moreover, these processes cause water, air, and noise pollution.

According to Dr. Thomas A. Henri (Bureau of Mines, USDI), a typical coal gasification plant will produce 250 million cf/d of pipeline gas, consume six to 10 million tons of coal annually, use about 6,000 gallons of water per minute, and have capital costs (including coal mine development) of over \$400 million. Synthetic oil and natural gas would have to supply 6,692 trillion to 12,320 trillion BTU's in order to substitute for the oil and gas from potential Santa Barbara Channel development. If the substitution

involved synthetic oil only then 1,155.2 million to 2,123.3 million barrels would have to be produced. Complete substitution by coal gasification would require 6,468 billion to 11,920 billion cubic feet assuming approximate BTU heating value equivalence for natural and synthetic fuels.

Complete substitution by coal gasification would require 4 to 7 250-billion BTU's per day coal gasification plants assuming a 20 year production period for the Channel, and would require 400 to 700 million tons of coal. At an estimated \$250 million for each gasification plant, these plants would cost \$1.0 billion to \$1.75 billion (because of the present lack of a commercial synthetic gas industry and the uncertainty of the related economics and technology, SNG production projections are uncertain.)

The gross comparison involved in the above analysis is somewhat misleading because perfect substitutability between synthetic gas and oil production and OCS production is not possible. The difference in longevity between a producing OCS field and a coal gasification plant requires consideration. Total Channel production of 6,692 trillion to 12,320 trillion BTU's would be spread over about a 20-year period while economic life of coal gasification plants proposed as alternatives may be as long as 75 to 100 years.

Environmental impacts associated with coal conversion processes would largely be those which are associated with the required mining of coal. In addition, plant construction would require about 200 acres per plant. Large quantities of water for the conversion would be needed and large quantities of devolatilized coal, called char, would be burned or gasified. Sulfur and nitrogen oxides, bottom ash and fly-ash emissions would result. Water quality would be affected and waste solids disposal could cause surface water contamination problems. Noise will occur but would not likely be a problem

beyond the plant property lines.

## 5. Hydroelectric Power

The energy captured from falling water is termed hydropower. This falling water, regulated and controlled by human technology, is used to drive turbines and thus produce electrical energy. The engineering problems in converting hydropower to electrical energy were mastered early and many of the major hydroelectric sites operating today were developed in the early 1950's. The Pacific Northwest region and California are served by hydroelectric power to a greater extent than most other regions of the nation because of the wet climate and favorable topography.

Theoretically, increased domestic reliance on hydropower is currently possible. The undeveloped potential for hydroelectric generation in the lower 48 States alone is about 93,000 MW (FPC, 1972). If that potential were developed fully then hydropower could supply nearly 8% of the current domestic energy demand, (FPC, 1972). Yet most energy supply forecasts envision a relative decline in hydropower's future contribution to domestic energy needs. This paradox stems from the following conditions:

- The sites with the greatest productive capacity and the lowest development costs have already been exploited.
- Hydroelectric power imposes substantial land use conflicts and environmental side-effects.
- The dams and reservoirs required by hydropower development have very high capital costs.
- The amount of energy that can be produced via hydropower varies with the seasons.



- Manipulation of reservoir storage capacity is constrained by water use and flood control considerations.

In consequence of the above factors, an important future application of hydropower in California, and across the entire Nation, will be "pumped storage" hydroelectric projects. Pumped storage uses the excess energy generated by nuclear or fossil fuel plants to pump water from a lower reservoir to a higher one. During periods of peak electricity use, the previously pumped water is allowed to fall from the upper reservoir through a generating unit to the lower reservoir thus producing the electricity required during the period of elevated demand. Pumped storage has at least 2 advantages:

1. It optionally utilizes the excess energy of conventional electricity plants and thus improves their efficiency.
2. It makes available the most economical supply of peak quantities of electricity during periods of accelerated demand.

The quantity of hydroelectric energy needed to substitute for the oil and gas from the potential OCS development in the Channel depends on whether the oil and gas is used directly for purposes such as heating or if it is burned to produce electricity, an indirect use. Since direct use is more efficient, substitution in this instance would require a larger quantity of hydroelectric energy versus the case where oil and gas were burned to produce electricity.

To substitute for end uses, 1,277.7 million megawatt hours to 2,324.8 million megawatt hours of hydroelectric energy would be needed. To substitute for the electricity which could be generated by the oil and gas, 786.4 million megawatt hours to 1,447.4 million megawatt hours would be needed.

Several constraints limit future hydropower development and its feasibility as an alternative to fossil fuels. Hydropower cannot be substituted for oil and gas in transportation uses or in industrial uses that depend on the unique properties of oil and gas. Land use priorities may inhibit development of the few potential hydro sites east of the Mountain states.

Furthermore, few dams are built solely for hydroelectric power generation. Irrigation, navigation, municipal and industrial uses, and flood control are frequently more important than and not fully compatible with power production needs. Since hydropower is most often used to service peak loads, other energy sources must be relied on for base power loads.

Construction of a hydroelectric dam represents an irreversible commitment of the land resources beneath the dam and lake. Flooding eliminates wildlife habitat and prevents other uses such as agriculture, mining, and free-flowing river recreation.

Hydroelectric projects do not consume fuel and do not cause air pollution. However, use of streams for power may displace recreational and other uses. Water released from reservoirs during summer months may change ambient water temperature and lower the oxygen content of the river downstream, adversely affecting indigenous fish. Fluctuating reservoir releases during peak load operation may also adversely affect fisheries and downstream recreation.

Fish may die if exposed to nitrogen supersaturated water. Nitrogen supersaturation results at a dam when excess water escapes from the draining reservoir. High nitrogen levels in the Columbia and Snake River pose a threat to the salmon and steelhead resources of these rivers.

## 6. Nuclear Power

The predominant nuclear system used in the U.S. is the uranium dioxide fueled, light water moderated and cooled nuclear power plant. Research and development is being directed toward other types of reactors, notably the breeder reactor and fusion reactors.

Installed nuclear capacity as of June 1974 was 28,000 MW. At that time, nuclear power generated about 6 percent of the Nation's electricity. However, about half of the electrical power capacity now under construction is nuclear powered. Nuclear power development has encountered delays in licensing and siting, environmental constraints, and manufacturing and technical problems. Future capacity will be influenced by the availability of plant sites, plant licensing considerations, environmental factors, nuclear fuel costs, rate of development of the breeder and fusion reactors, and capital costs. In order to meet future uranium requirements, an increase in exploratory activity will be necessary.

The nuclear capacity required to generate electricity to substitute for potential Santa Barbara Channel OCS Development is shown below for two cases:

- all of the potential Channel development of OCS oil and gas used to generate electricity
- all of the potential Channel development of OCS oil and gas devoted directly to end uses such as oil and gas heating.

Nuclear capacity required to substitute for the electricity which could be generated by oil and gas from the potential OCS Channel development would

be 6 to 10 1,000-MW plants.<sup>1,2</sup>

Capacity required to substitute for end uses would be 9 to 17 1,000-MW plants.<sup>1,2</sup> The required amounts of nuclear fuel for end use and electrical generation are shown below.

	<u>End Use</u>		<u>For Electrical Generation</u>	
	<u>From</u>	<u>To</u>	<u>From</u>	<u>To</u>
Short tons of slightly enriched uranium fuel necessary to substitute for oil and gas production from the Santa Barbara Channel. <sup>3</sup>	5,735.9	11,758.5	3,533.9	6,495.2
Short tons of slightly enriched uranium fuel in the first core - first year only	780.0	1,600.0	482.0	884.0
Short tons of slightly enriched uranium fuel required for annual reloading of cores. <sup>4</sup>	260.0	534.0	160.0	295.0
Acres of land required for nuclear power plant sites. <sup>5</sup>	13,500	25,500	9,000	15,000

<sup>1</sup> Assuming 80 percent plant factor.

<sup>2</sup> A limitation of this comparison should be noted. By asserting that a certain number of nuclear generators are required to replace potential OCS Channel development, perfect substitutability between a fixed plant, the nuclear generators, and a depletable resource, the OCS hydrocarbon base, is assumed. The comparison is therefore not perfect. This can be most readily seen by noting the discrepancy between the life expectancy of an OCS oil field (about 20 years) versus the longer average lifetime of a nuclear generator which is about 40 years.

<sup>3</sup> Assuming a 3.5% Fission of the slightly enriched uranium fuel yielding  $1.2 \times 10^9$  BTU/lb., and a 33% efficiency factor for a nuclear generation plant as compared to a 40% efficiency for fossil fuel electric generation.

<sup>4</sup> Based upon annual core reloads equaling about 1/3 of the initial core load.

<sup>5</sup> Assuming 1,500 acres per 1,000-MW unit using cooling ponds.

Some airborne and liquid radioactive materials are released to the environment during normal operation. The amounts released are very small and potential exposure has been shown to be less than the average level of natural radiation exposure. The plants are designed and operated in such a way that the probability of harmful radioactivity releases from accidents is very low.

Nuclear plants use essentially the same cooling process as fossil-fuel plants and thus share the problem of heat dissipation from cooling water. However, light-water reactors require larger amounts of cooling water and discharge greater amounts of waste heat to the water than comparably sized fossil-fuel plants. The effects of thermal discharges may be beneficial in some cases. Adverse effects can be mitigated by use of cooling ponds.

Low level radioactive wastes from normal operation of a nuclear plant must be collected, placed in protective containers, and shipped to an AEC storage site and buried. High level wastes created within the fuel elements remain there until the fuel is spent. They are then isolated in a fuel reprocessing plant and stored in liquid or solid form at AEC facilities.

## 7. Solar Energy

Energy from the sun can be used to heat or cool individual buildings and to generate electricity. In the 1940's and 1950's, prior to the availability of low cost natural gas, firms selling solar water heaters generated considerable business in California and Florida. Commercially

installed solar heating and cooling in homes may be in wider use in many parts of the nation by 1985 but will not be common until later and possibly much later. Intensifying current research and development could hasten these dates (Morrow, 1973). Solar energy may eventually supply 35 to 50 percent of the nearly 20 percent of the nation's energy that is now devoted to space conditioning, thus reducing significantly the peak electricity demands of the summer months.

Congressional interest in solar energy research has recently been aroused. The Solar Heating and Cooling Demonstration Act of 1974 legislates a \$60 million demonstration program aimed at proving the commercial feasibility of solar heating of buildings and homes by 1977 and of combined solar heating and cooling systems for those structures by 1979. Although fuel costs for backup systems and maintenance costs for solar units are miniscule when compared with operating costs of conventional heating and cooling systems, the initial or "fixed" costs of solar units are too high to make them competitive. The typical solar heating system for a home costs \$5,000-\$6,000 (including costs of a standby conventional furnace) compared to \$1,000-\$2,000 for a conventional fossil-fuel home heating unit. However, the rising cost of the gas and oil needed by the conventional heaters means that the initial difference in fixed costs will quickly be overshadowed by the solar systems' lack of fuel costs. Therefore, though more costly at first, the solar units appear to be the economical alternative over time.

The full potential of solar energy can be realized only after large-scale generation of electricity using solar energy becomes technically and economically feasible. In this regard the Ford Administration has requested \$33 million for solar electric programs in fiscal 1975 - almost \$26 million more than the fiscal 1974 appropriation. A number of technical and engineering

problems now prevent commercialization of solar steam-electric plants though pilot projects are well underway. It is estimated that solar electricity could be available on increased scale in 10-15 years. (As a comparison, peak production from potential Channel development might occur in six to eight years.)

Solar-electric energy does have a few disadvantageous aspects--high capital costs, expensive maintenance of solar collectors, thermal waste disposal, and distortion of local thermal balances being the most prominent.

The accelerating real costs of fossil-fuel will continue to increase the attractiveness of the solar energy option. In addition, the environmental impacts of solar energy are relatively less severe than those imposed by the traditional energy sources.

Solar energy cannot substitute for petroleum in all uses, transportation and petrochemicals being the most evident examples. However, as solar energy is used with increasing frequency for heating and electricity generation, oil and gas supplies previously devoted to heating and electricity will be channelled to the petrochemical and transportation industries and other exclusive uses of oil and gas.

## 8. Energy Imports

### a. Oil

Increasing U.S. reliance on foreign energy supplies is another alternative to the proposed offshore California sale. U.S. imports of petroleum in 1973 amounted to 2.264 billion barrels. If oil from foreign sources were to replace the hydrocarbons expected from the potential OCS Channel development, then an additional 1,155.2 million to 2,123.3 million barrels would have to be imported during the life of Channel production. At

1974 world oil prices, this would entail a \$12.1 to \$22.4 billion increase in our oil import bill.

Studies conducted by the Department of the Interior show that oil produced on the OCS of the United States is much cheaper than the foreign alternative. Extraction plus transportation costs for OCS oil are anywhere from \$6.50 to \$8.00 per barrel less than the world oil price.

The Project Independence study concluded that oil import levels will rise or at least remain the same in the next few years, no matter what long term actions the U.S. takes. Projected oil imports under the different strategies studied are shown below.

#### 1985 U.S. Oil Imports

	World Oil Price \$7 (MMBD)	\$11 (MMBD)
Base case w/ and w/o emergency programs	12.4	3.3
Accelerated supply	8.5	0
Conservation	9.8	1.2
Accelerated supply plus conservation	5.6	0

Source: Federal Energy Administration, Project Independence Report, November 1974, p. 34.

For the base case, total 1985 oil imports at \$7 world oil prices are estimated at 12.4 million b/d. Of these, 6.8 million would be susceptible to disruption. At \$11 world oil prices, 1985 imports for the base case are estimated at 3.3 million barrels a day, of which 1.2 million would be subject to disruption.

Canada, the second largest supplier of U.S. crude imports, has adopted a policy of gradual phasing out of all crude exports to the U.S., possibly by 1983. As of January 1, 1975, the level of allowable exports to the U.S. was



lowered to 800,000 b/d, and Canada is considering a further reduction. U.S. oil imports from Canada peaked at about 1.2 million b/d in 1973, and ran from about 760,000 to 900,000 b/d in late 1974. Actual crude exports to the U.S. in the last three months of 1974 were less than the new allowable level.

Total U.S. crude oil imports, on a four week average for December 1974, were slightly over 4 million b/d, compared with 3.04 million b/d for a comparable period in 1973. Oil imports have contributed to U.S. balance of payments problems.

Among the adverse environmental impacts of importing oil are possible spills from tankers carrying imported oil. Spills can result from intentional discharges, accidental discharges, tanker casualties, and tanker collisions. A study of oil pollution in domestic waters during 1969-70 showed that tankers accounted for about 28% of the polluting oil. Results from that study are presented in Table VIII-2.

b. Natural Gas

Pipeline imports of natural gas into the U.S. have come mainly from Canada and Mexico. However, significant expansion of natural gas imports from these countries is questionable because of increasing domestic demand, both current and future, within Canada and Mexico. Canada's intention to gradually phase out all crude oil exports to the U.S. creates uncertainty regarding future natural gas exports to the U.S.

The growing shortage of domestic gas has encouraged projects to import liquefied natural gas (LNG) under long term contract. Large scale shipping of LNG is a relatively new industry and the U.S. does not yet have facilities for receiving base load shipments. Several LNG projects are now under consideration on the Pacific, Atlantic, and Gulf coasts. However, the Middle

TABLE VIII-2

ESTIMATED ANNUAL OIL POLLUTION OF THE OCEANS<sup>a</sup>

MARINE OPERATIONS	METRIC TONS PERCENT	
<u>Tankers</u>		
LOT tank cleaning operations	265,000	5.41
Non-LOT tank cleaning operations	702,000	14.34
Discharge due to bilge pumping, leaks and bunkering spills	100,000	2.04
Vessel casualties	250,000	5.11
Terminal operations	70,000	1.42
<u>Tank Barges</u>		
Discharge due to leaks	20,000	0.41
Barge casualties	32,000	0.65
Terminal operations	18,000	0.38
<u>All Other Vessels</u>		
Discharge due to bilge pumping, leaks and bunkering spills	600,000	12.25
Vessel casualties	250,000	5.11
<u>Offshore Operations</u>		
NON-MARINE OPERATIONS		
Refineries and Petrochemical plants	300,000	6.12
Industrial Machinery	750,000	15.31
Highway Motor Vehicles	1,440,000	29.41
TOTAL	4,897,000	100.0

<sup>a</sup> The final total does not include oil contributed by recreational boats, hydrocarbon fallout, and natural seepage.

Source: Tankers and the U.S. Energy Situation - an Economic and Environmental Analysis. Joseph D. Porricelli and Virgil F. Keith.

East oil cutback has raised questions concerning the security of foreign, especially Algerian, sources of LNG. The complexity of and length of time involved in implementing these proposals has been increased by the need for negotiating preliminary contracts, securing the approval of the Federal Power Commission and the exporting country, and making adequate provision for environmental and safety concerns in the proposed U.S. facilities.

Natural gas imports of 6,468 billion to 11,920 billion cubic feet would be required to replace the total energy expected from potential Channel development. In view of Canadian policy of phasing out crude exports and limiting future energy exports in order to meet anticipated increases in domestic demand, it is doubtful that any more gas would be available for import by pipeline.

LNG import levels will depend on how soon this industry can be introduced into the U.S. The question of security of foreign LNG supplies has caused re-evaluation of these projects.

The environmental impacts of LNG imports arise from tankers; terminal, transfer, and regasification facilities; and transportation of the gas. The primary hazard of handling LNG is the possibility of a fire or explosion during transportation, transfer, or storage.

Receiving and regasification facilities will require prime shoreline locations and dredging of channels. Regasification of LNG will release few pollutants to the air or water.

LNG imports will influence the U.S. balance of payments. This impact will depend on the origin and purchase price of the LNG, the source of the capital, and the country (U.S. or foreign) in which equipment is purchased and LNG

tankers are built.

## 9. Other Energy Sources

The high costs and rapidly shrinking reserves of the traditional energy fuels have encouraged research into new and different sources for potential energy. As the traditional fuels continue to exhibit accelerating rates of cost growth, demand for and eventual substitution of alternate energy forms will occur. Some of these alternate sources have been known for decades but high costs and technical problems have prevented their widespread use.

Environmental impacts of these alternatives are sometimes difficult to assess, especially if a great amount of research and development remains to be completed before operational scale systems can be developed, tested, and evaluated.

For the alternatives listed below, the date of commercial availability will depend on the cost of the traditional energy fuels, the level of Federally-subsidized research, and the probability of encountering insurmountable engineering and technical problems. Thus some of these energy sources could be installed within a decade, while others may prove never to be feasible.

### Possible significant energy contribution before 1985<sup>1</sup>

<u>Energy forms</u>	<u>Primary Limitations</u>	<u>Secondary Limitations</u>
Geothermal energy	Resources	Economics
Tar sands	Resources	Economics
Solar	Technology	Economics

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<sup>1</sup> After: New Energy Forms Task Group 1971-1985, National Petroleum Council Committee on U.S. Energy Outlook, 1972.

Improbable significant contributions before 1985

<u>Energy Forms</u>	<u>Primary Limitations</u>	<u>Secondary Limitations</u>
Hydrogen	Economics	Technology
Biological (agri-cultural & wastes)	Economics	Resources
Tidal	Resources	Economics
Wind	Resources	Economics
<u>Energy Conversion Devices</u>		
Fuel cells	Technology	Economics
Thermionics	Technology	Economics
Thermoelectric	Technology	Economics
Magnetohydro-dynamics	Technology	Economics

Federal energy research and development funding has expanded significantly in the last few years. President Nixon announced in his Energy Message of January 23, 1974, that Federal commitment for direct energy research and development will be increased to \$1.8 billion in FY 75. Table VIII-3 shows the funds for different areas of research and the agencies involved.

#### 10. Combination of Alternatives

The future U.S. energy source mix will depend on a multiplicity of factors, among them the identification of resources, research and development efforts, development of technology, rate of economic growth, the economic climate, changes in life style and priorities, capital investment decisions, energy prices, world oil prices, environmental quality priorities, government policies, and availability of imports.

TABLE VIII-3  
FEDERAL ENERGY R&D FUNDING  
(\$ million)

Direct programs	FY74	FY75	Agency*
<u>Conservation</u>	<u>65.0</u>	<u>128.6</u>	
a. End use (residential & commercial)	15.0	27.9	DOI, other
b. Improved efficiency (transmission)	5.0	18.8	AEC, DOI, NSF
c. Improved efficiency (conversion)	14.9	29.8	AEC, DOI, NSF
d. Improved efficiency (storage)	2.9	6.4	AEC, NSF
e. Automotive	14.2	23.7	AEC, EPA, NSF, DOT, DOD, NASA
f. Other transportation	13.0	22.0	DOT, DOC
<u>Oil, gas, and shale</u>	<u>19.1</u>	<u>41.8</u>	
a. Production	3.0	17.0	DOI
b. Resource assessment	5.0	13.1	DOI, NSF
c. Oil shale	2.3	3.0	DOI
d. Related programs	8.8	8.7	AEC, DOI
<u>Coal</u>	<u>164.4</u>	<u>415.5</u>	
a. Mining	7.5	55.0	DOI
b. Mining, health, & safety	27.0	27.7	DOI
c. Direct combustion	15.9	36.2	DOI, NSF
d. Liquefaction	45.5	108.5	DOI, NSF
e. Gasification (high BTU)**	33.0	65.3	DOI, NSF, AEC
f. Gasification (low BTU)	21.3	50.7	DOI, NSF
g. Synthetic fuels pioneer prog.		42.1	DOI 1/
h. Resource assessment	1.2	1.9	DOI
i. Other (incl. common technology)	11.7	28.1	DOI
<u>Environmental control</u>	<u>65.5</u>	<u>178.5</u>	
a. Near term SO <sub>x</sub>	39.9	82.0	EPA, DOI
b. Advanced SO <sub>x</sub>	4.0	12.0	EPA
c. Other fossil fuel pollutants (incl. NO <sub>x</sub> , particulates)	13.1	57.0	EPA
d. Thermal pollution	1.5	18.5	EPA, AEC
e. Automotive emissions	7.0	9.0	EPA

1/ This request was later reduced by \$27.0 million.

TABLE VIII-3 (Continued)

FEDERAL ENERGY R&D FUNDING  
(\$ million)

Direct Programs	FY74	FY75	Agency
<u>Nuclear fission</u>	<u>530.5</u>	<u>724.7</u>	AEC <u>1/</u>
a. LMFBR	357.3	473.4	
b. Other breeders (GCFBR & MSBR)	4.0	11.0	
c. HTGR	13.8	41.0	
d. LWBR	29.0	21.4	
e. Reactor safety research	48.6	61.2	
f. Waste management	6.2	11.5	
g. Uranium enrichment	57.5	66.0	
h. Resource assessment	3.4	10.4	
i. Other (incl. advanced tech.)	10.7	28.8	
<u>Nuclear fusion</u>	<u>101.1</u>	<u>168.6</u>	AEC
a. CTR	57.0	102.3	
b. Laser***	44.1	66.3	
<u>Other</u>	<u>53.5</u>	<u>157.5</u>	
a. Solar	13.8	50.0	AEC, NSF
b. Geothermal	10.9	44.7	AEC, DOI, NSF
c. Systems studies	17.3	30.0	AEC, DOI, NSF, FEA, Treasury, FPC, other
d. Misc.	11.5	32.8	NSF, DOI
<u>Support programs</u>			
<u>Environmental effects research</u>	<u>169.7</u>	<u>303.4</u>	AEC, EPA, NSF
a. Pollutant characterization, measurement, and monitoring	16.3	37.4	
b. Transport of pollutants	26.6	55.6	
c. Health effects	72.6	112.5	
d. Ecological effects	27.3	65.0	
e. Social and welfare effects	17.5	19.8	
f. Environmental assessment and policy formulation	9.4	13.1	

1/ The AEC research budget was later increased by \$40 million.

TABLE VIII-3 (Continued)

FEDERAL ENERGY R&D FUNDING  
(\$ million)

Support Programs	FY74	FY75	Agency
<u>Basic research</u>	<u>94.5</u>	<u>174.6</u>	AEC, NSF
a. Materials	13.2	32.9	
b. Chemical, physical, engineering	30.8	58.1	
c. Biological	40.3	60.5	
d. Plasmas	2.8	8.2	
e. Mathematical	7.4	14.9	
<u>Manpower development</u>	<u>6.3</u>	<u>8.5</u>	AEC, NSF
Total (direct energy R&D)	999.1	1,815.5	
Total (support programs)	270.5	486.5	
Total (direct and support)	1,269.6	2,302.0	

## \*Agency codes:

AEC - Atomic Energy Commission  
 DOC - Department of Commerce  
 DOD - Department of Defense  
 DOI - Department of the Interior  
 DOT - Department of Transportation  
 EPA - Environmental Protection Agency  
 FEA - Federal Energy Administration  
 FPC - Federal Power Commission  
 NASA - National Aeronautics and Space Administration  
 NSF - National Science Foundation

\*\* Funds for high BTU gasification in the Office of Coal Research budget do not include Trust Fund amounts.

\*\*\* Includes amounts for laser fusion directed toward military applications.



The Project Independence Report<sup>1</sup> estimated U.S. energy demand and domestic supply for four cases. These data are shown below.

U.S. Energy Demand and Domestic Supply, 1985				
World Oil Price	\$7 per barrel		\$11 per barrel	
	Demand (quads)	Domestic Supply (quads)	Demand (quads)	Domestic Supply (quads)*
Base case w/ and w/o emergency programs	109.1	84.2	102.9	96.3
Accelerated supply	109.6	92.6	104.2	104.2
Conservation	99.2	79.6	94.2	91.8
Accelerated supply plus conservation	99.7	88.5	96.3	96.3

\*Quad - a quadrillion BTU's.

The tabulation below shows the breakdown of total domestic fuel supplies for the base case and the accelerated supply case.

Domestic Fuel Consumption by Source, 1985 (in quads)					
	1972 Actual	\$7 world oil		\$11 world oil	
		Base Case	Acc Supply	Base Case	Acc Supply
Coal	12.5	19.9	17.7	22.9	20.7
Oil	22.4	23.1	30.5	31.3	38.0
Gas	22.1	23.9	24.7	24.8	25.5
Hydro and Geo	2.9	4.8	4.8	4.8	4.8
Nuclear	0.6	12.5	14.7	12.5	14.7
Synthetics					0.4
Imports	• 11.7	24.8	17.1	6.5	0
Total	72.1	109.1	109.6	102.9	104.2

The increases in domestic supply under the accelerated supply case are due largely to the following:

<sup>1</sup> The data cited in this section are taken from: Federal Energy Administration, Project Independence Report, November 1974.

Standardization and expedited licensing to increase nuclear capacity 15% by 1985.

Significant new leasing, exploration and development of the Pacific, Gulf of Alaska, and Atlantic OCS.

Additional oil and gas pipelines from Alaska to the lower 48.

Increased Federal leasing and actions to allow additional oil shale production.

Opening Naval Petroleum Reserves #1 and #4 to full scale commercial development.

Possible mandatory allocation or other actions to assure critical materials and equipment to meet expected production levels.

For the base case, the Project Independence Report envisions the role of alternative energy sources as the following:

Petroleum production is severely constrained in the short run and greatly affected by world oil prices in the long run. Before 1977 there is little that can prevent domestic production from declining or at best remaining constant.

Coal production will increase significantly, but is limited by lack of markets. Increases are limited by rate of electric growth, increasing nuclear capacity, and environmental restrictions.

Potential increases in natural gas production are limited.

Nuclear power is expected to grow from 4.5% to 30% of total electric power generation.

Synthetic fuels will not play a major role between now and 1985.

Shale oil could reach 250,000 B/D by 1985 at \$11 world oil prices, but would be lower if \$7 prices prevail.

Geothermal, solar, and other advanced technologies are large potential sources, but will not contribute to our energy supplies until after 1985.

In the interest of clarity of presentation, the previous sections have discussed separately each potential alternative form of energy as a possible substitute potential further Santa Barbara Channel oil and gas development.

However, it is unlikely that there will ever be a single definitive choice between energy sources or that development of one source will preclude development of others. Different energy sources will differ in their rate of development and the extent of their contribution to U.S. energy supplies. Understanding of the extent to which they may replace or complement offshore oil and gas requires reference to the total national energy picture.

Relevant factors are:

- Historical relationships indicate that energy requirements will grow at approximately the same rate as gross national product.
- Energy requirements can be constrained to some degree through the price mechanisms in a free market or by more direct constraints. One important type of direct constraint operating to reduce energy requirements is through the substitution of capital investment in lieu of energy; e.g., insulation to save fuel. Other potentials for lower energy use have more far-reaching impacts and may be long range in their implementation - they include rationing, altered transportation modes, and major changes in living conditions and life styles. Even severe constraints on energy use can be expected to only slow, not halt, the growth in energy requirements within the time frame of this statement.
- Energy sources are not completely interchangeable. Solid fuels cannot be used directly in internal combustion engines for example. Fuel conversion potentials are severely limited in the short term although somewhat greater flexibility exists

in the longer run and generally involves choices in energy-consuming capital goods.

The principal competitive interface between fuels is in electric powerplants. Moreover, the full range of flexibility in energy use is limited by environmental considerations.

- A broad spectrum of research and development is being directed to energy conversion - more efficient nuclear reactors, coal gasification and liquefaction, liquified natural gas (LNG), and shale retorting, among others. Several of these should assume important roles in supplying future energy requirements, though their future competitive relationship is not yet predictable.
- Major potentials for filling the supply/demand imbalance for domestic resources are:
  - More efficient use of energy
  - Environmentally acceptable systems which will permit production and use of larger volumes of domestic coals.
  - Accelerated exploration and development of all domestic oil and gas resources.
  - Development of the Nation's oil shale resources.

Of the foregoing, increased domestic oil and gas production offers considerable possibilities, although adequate incentives must exist for indicated and undiscovered domestic resources to be discovered and extracted.

- The acceptability of oil and gas imports as an alternative is diminished by:
  - The security risks inherent in placing reliance for essential energy supplies on sources which have demonstrated themselves to be politically unstable and prone to use interruption of petroleum supplies to exert economic and political pressure on their customers.
  - The aggravation of unfavorable international trade and payments balances which would accompany substantial increases in oil and gas imports.
  - Apparent high costs of liquefying and transporting natural gas other than overland by pipeline.

93<sup>d</sup> CONGRESS  
1<sup>ST</sup> SESSION

# H. R. 7500

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## IN THE HOUSE OF REPRESENTATIVES

MAY 3, 1973

Mr. SAYLOR (for himself, Mr. DON H. CLAUSEN, and Mr. TEAGUE of California) introduced the following bill; which was referred to the Committee on Interior and Insular Affairs

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## A BILL

To terminate and to direct the Secretary of the Interior and the Secretary of the Navy to take action with respect to certain leases issued pursuant to the Outer Continental Shelf Lands Act in the Santa Barbara Channel, offshore of the State of California; to explore naval petroleum reserve numbered 4, and for other purposes.

- 1       *Be it enacted by the Senate and House of Representa-*  
2       *tives of the United States of America in Congress assembled,*  
3       That effective on the date of enactment of this Act all of  
4       the following described leases, and all rights thereunder is-  
5       sued pursuant to the Outer Continental Shelf Lands Act in  
6       the Santa Barbara Channel, offshore of the State of Cali-

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1    fornia, shall terminate and the United States shall be vested  
 2    with all of the right, title, and interest in said leases:

P-0179	P-0174	P-0171	P-0238	P-0230	P-0213	P-0219
P-0176	P-0173	P-0169	P-0232	P-0222	P-0201	P-0211
P-0178	P-0170	P-0167	P-0237	P-0206	P-0228	P-0220
P-0175	P-0172	P-0199	P-0231	P-0229	P-0234	P-0212
P-0177	P-0168	P-0198	P-0223	P-0221	P-0227	P-0200

3           SEC. 2. (a) The holder of any lease terminated pursu-  
 4    ant to this Act shall be entitled as the sole method for the  
 5    recovery of just compensation for the lease or leases so termi-  
 6    nated to bring an action against the United States in the  
 7    United States District Court for the Central District of Cal-  
 8    ifornia within one year after the date of enactment of this  
 9    Act. Said court is expressly vested with jurisdiction of any  
 10   action so brought without regard to the amount of the claim  
 11   therein. Trial of any such action shall be to the court, without  
 12   a jury.

13           (b) The amount of any judgment in any such action or  
 14   of any compromise settlement of such action and any interest  
 15   accruing thereon shall be certified to the Secretary of the In-  
 16   terior by the Department of Justice.

17           SEC. 3. (a) There is hereby created in the Treasury of  
 18   the United States a special account which shall be known as  
 19   the petroleum reserve account from which payments shall  
 20   be made in accordance with the provisions of this Act. In  
 21   order to provide the funds for the petroleum reserve account,

1 the Secretary of the Navy is directed to offer for sale on the  
2 open market, under such competitive bidding procedures as  
3 he may establish, the United States share of the oil and gas  
4 extracted from Naval Petroleum Reserve Numbered 1 pur-  
5 suant to the provisions of this Act and to pay the funds  
6 realized from such sale into the United States Treasury. In  
7 each year, sales proceeds equal to the Government's receipts  
8 from Naval Petroleum Reserve Numbered 1 during the  
9 twelve calendar months immediately preceding enactment  
10 of this Act shall be credited to the general fund and the re-  
11 maining sales proceeds shall be credited to the petroleum  
12 reserve account. Any sums remaining in the petroleum re-  
13 serve account after the payments authorized by subsection  
14 (b) have been made shall be transferred to miscellaneous  
15 receipts of the Treasury, and thereafter the funds realized  
16 under this subsection shall be paid into miscellaneous receipts  
17 of the Treasury.

18 (b) There is hereby authorized to be appropriated out  
19 of the petroleum reserve account to the Secretary of the  
20 Interior, the Secretary of the Navy, the Secretary of the  
21 Treasury, and the Attorney General, to remain available  
22 until expended when so authorized in appropriation Acts,  
23 such sums as may be necessary to—

24 (1) enable the Secretary of the Interior to pay



1 judgments, compromise settlements, and interest there-  
2 on, as certified by the Attorney General under section  
3 3 hereof;

4 (2) enable the Secretary of the Navy to carry out  
5 petroleum exploration on Naval Petroleum Reserve  
6 Numbered 4, Arctic North Slope, Alaska;

7 (3) reimburse the general funds of the Treasury  
8 for any lost royalties, as determined by the Secretary  
9 of the Interior, resulting from a reduction of existing  
10 production from existing oil and gas leases on Federal  
11 lands caused by production of oil and gas from Naval  
12 Petroleum Reserve Numbered 1 under the provisions  
13 of this Act; and

14 (4) carry out the functions and responsibilities re-  
15 quired of the Secretary of the Interior, the Secretary  
16 of the Navy, and the Attorney General under the pro-  
17 visions of this Act.

18 (c) In the event the funds in the petroleum reserve  
19 account are not sufficient to pay any amount so appropriated  
20 there is authorized to be appropriated to the Secretary  
21 of the Treasury for advance to the petroleum reserve ac-  
22 count out of any money in the Treasury not otherwise ap-  
23 propriated, such funds as may be necessary for such pay-  
24 ments. The Secretary of the Treasury shall be reimbursed

1 for such advances from funds paid into the petroleum re-  
2 serve account in accordance with this Act, with interest  
3 thereon, at such rates as may be determined from time to  
4 time by the Secretary of the Treasury.

5       SEC. 4. Without regard to the provisions of chapter 641,  
6 title 10, United States Code, the Secretary of the Navy is  
7 authorized and directed to produce by whatever means he  
8 deems necessary sufficient oil from Naval Petroleum Reserve  
9 Numbered 1 to fulfill the requirements of section 3 hereof.  
10 The Secretary of the Navy is also authorized to renegotiate  
11 and modify existing contracts relating to production of oil  
12 from said reserve in such manner as may in his judgment be  
13 necessary or advisable to enable such increased production.

14       SEC. 5. There is hereby created a national energy reserve  
15 on the Outer Continental Shelf in the Santa Barbara Chan-  
16 nel, offshore of the State of California, under the jurisdic-  
17 tion and control of the Secretary of the Interior. The said  
18 national energy reserve shall be made up of the land subject  
19 to the leases terminated pursuant to this Act, plus the land  
20 subject to waived lease P-0235 and the following described  
21 land as shown on the official Outer Continental Shelf Leasing  
22 Map, Channel Islands Area Map Numbered 6B, approved  
23 August 8, 1966, and revised July 24, 1967 as:

1 CALIFORNIA  
 2 Official Leasing Map, Channel Islands Area Map  
 3 Numbered 6B

Block	Description
50 north 66 west-----	All.
50 north 67 west-----	All.
51 north 65 west-----	Northwest quarter of the northwest quarter.
51 north 66 west-----	All.
51 north 67 west-----	All.
51 north 68 west-----	All.
51 north 69 west-----	All.
51 north 70 west-----	East half and east half west half.
52 north 64 west-----	All Federal portion thereof.
52 north 65 west-----	All Federal portion thereof.
52 north 66 west-----	All Federal portion thereof.
52 north 67 west-----	All Federal portion thereof.
52 north 68 west-----	All Federal portion thereof.
52 north 69 west-----	All Federal portion thereof.
52 north 70 west-----	All Federal portion of east half and east half west half.
48 north 69 west-----	All.
47 north 69 west-----	All Federal portion thereof.
46 north 69 west-----	All Federal portion thereof.
47 north 68 west-----	All.
46 north 68 west-----	All Federal portion thereof.
47 north 67 west-----	All.
46 north 64 west-----	All Federal portion thereof.

4 The national energy reserve shall be available for lease only  
 5 as determined by the President and under such terms and  
 6 conditions as he may prescribe in accordance with existing  
 7 law

## SECTIONAL ANALYSIS OF PROPOSAL

The Secretary of the Interior submitted this proposed bill to the Speaker of the House on April 18, 1973, with the recommendation that it be referred to the appropriate committee for consideration and that it be enacted. Transmitted with this original bill (later introduced to the 93d Congress as S. 1951 and H. R. 7500) was the following sectional analysis of the proposal.

Section 1 terminates several named leases, all rights to which are vested in the United States.

Section 2 provides the method of recovery for leaseholders, via an action in the U. S. District Court for the Central District of California. The Department of Justice shall certify the judgments awarded to the Secretary of the Interior for payment.

Section 3 creates in the U. S. Treasury a Petroleum Reserve account from which payments are to be made in accordance with the act. The account will be funded by the sale of U. S. oil and gas extracted from Naval Petroleum Reserve Numbered 1. In addition to compensating leaseholders pursuant to section 2 of the act, this account may be used to carry out petroleum exploration of Naval Petroleum Reserve Numbered 4, Arctic North Slope, Alaska; to reimburse the general funds for losses occasioned by any reduction in existing oil and gas production on Federal lands caused by production from Naval Petroleum Reserve Numbered 1; and to enable the various Federal agencies involved in the act to carry out their functions. This section also authorizes the Secretary of the Treasury to make advances to the Petroleum Reserve account.

Section 4 authorizes the Secretary of the Navy to produce sufficient oil from Naval Petroleum Reserve Numbered 1 to meet the requirements of section 3.

Section 5 creates a national energy reserve in the Santa Barbara Channel under the jurisdiction of the Secretary of the Interior.

## REFERENCES

U. S. Department of the Interior energy alternatives and their related impacts.

U. S. Department of the Interior, Bureau of Land Management, 1975, Draft environmental statement (DES 75-8) for proposed 1975 OCS oil and gas general lease sale, offshore southern California, OCS sale No. 35.

IX. CONSULTATION AND COORDINATION WITH OTHERS

In the preparation of this statement, data and information were obtained from the agencies and organizations listed below.

Federal

Department of Commerce  
National Oceanic and Atmospheric Administration  
National Marine Fisheries Service  
Environmental Data Service

Department of Defense  
Naval Oceanographic Office  
Naval Undersea Center

Department of Interior  
Bureau of Land Management  
Bureau of Outdoor Recreation  
Bureau of Sport Fisheries and Wildlife  
National Park Service  
Environmental Protection Agency

State

California Coastal Zone Conservation Commission  
South Central Region  
South Coast Region

Resources Agency  
Water Resources Control Board  
Regional Water Quality Control Board  
Central Coastal Region  
South Coast Region  
Air Resources Board  
Department of Fish and Game  
Department of Water Resources  
Department of Conservation  
Division of Oil and Gas

Other

Southern California Coastal Water Research Project  
University of California, Santa Barbara  
University of California, Los Angeles

Chambers of Commerce  
Santa Barbara  
Ventura

Santa Barbara Historical Society  
Santa Barbara Museum of Natural History

The Draft Statement was made available to the Council on Environmental Quality and the public on June 6, 1975.

We express our appreciation to those Federal agencies who reviewed and commented on the Draft Statement. The National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Bureau of Land Management, and Western Archeological Center of the National Park Service were most helpful with their assistance in preparing both the Draft and Final Statement. The various agencies of the Department of the Interior also provided valuable input in the areas of outdoor recreation and tourism, biology, mineral operations, legal advice and comprehensive review. Appreciation is expressed for all comments, data information, opinions and letters. All were noted and much of the information was helpful in preparing the Final Statement.

A. Summary of Public Hearing Testimony and Responses

Public Hearings

Oral statements at public hearings on the draft environmental impact statement were invited by the Department of the Interior News Releases of June 11, and July 2, 1975, and the Federal Register notices of June 13, and July 7, 1975. The Department of the Interior hearings were held August 25 through August 27, 1975, in the City of Santa Barbara for the purpose of receiving comments and suggestions concerning the subject draft statement.

Presiding over the hearing was Administrative Law Judge Franklin P. Michels, Office of Hearings and Appeals, Department of the Interior. The hearing panel consisted of Frank J. Kelley, Deputy Assistant Secretary Land and Water Resources; Herbert G. Stewart, Special Assistant for Environmental Analysis, Office of the Director, U. S. Geological Survey; and Dr. Russell G. Wayland, Chief, Conservation Division, U. S. Geological Survey. The members of the technical advisory panel were: Peter L. Tweedt, Staff Assistant to the Secretary of the Interior; Fred J. Schambeck, Pacific Area Oil and Gas Supervisor, Conservation Division, U. S. Geological Survey; Bill R. LaVelle, Petroleum Engineer, Conservation Division, U. S. Geological Survey; Edward G. Kreppert, Environmental Specialist, Office of the Assistant Division Chief for Programs, Environmental Analysis Section; Andrew T. Clifton, Environmental Engineer, Conservation Division, U. S. Geological Survey; Russell H. Campbell, Geologist, Geologic Division, U. S. Geological Survey; Robert D. Conover, Acting Field Solicitor, U. S. Department of the Interior; Dr. F. J. Watson, Coastal Ecosystem Activities Leader, U. S. Fish and Wildlife Service; Merline I. Carter, Pacific OCS Office, Bureau of Land Management; Dr. Orien R. Gossett, Pacific OCS Office; and James J. Slawson, Marine Biologist, Environmental Assessment Group, National Marine Fisheries Service.



Hearing testimony was reported by: Valley Reporters, 555 Capital Mall, Suite 415, Sacramento, CA 95814.

Over one hundred persons submitted oral testimony for the hearing record; supplemental written text to oral testimony was incorporated as a part of the hearing record.

Transcripts of the hearing (five volumes, 855 pages) and supplemental written text (498 pages) are on file and available for inspection at the U. S. Geological Survey National Headquarters, Reston, VA. and the Pacific Area Office, Los Angeles, CA.

Speakers at the August 25 through 27, 1975 hearing are listed below.

Philip L. Fradkin	Assistant to the Secretary of the State Resources Agency (Claire T. Dedrick)
William F. Northrop	Executive Officer, State Lands Commission
Mary Overbee	Administrative Assistant to State Senator Omar L. Rains
Naomi L. Schwartz	Member of South Central Regional Coastal Commission (for self)
Robert J. Lagomarsino	State Congressman
Bill Thuman	Ventura County Air Pollution Control District
Jim Barroca	Ventura Chamber of Commerce
Dave L. Schmidt	California Chamber of Commerce
Thomas N. Banks	Southern California Gas Company
C. N. Sweeney	Southern California Edison Company
A. Barry Cappello	Attorney for the City of Santa Barbara (on behalf of the City Council and City of Santa Barbara)
Dr. Robert Mullen	Chairman, Environmental Quality Board
David Schiffman	Mayor of the City of Santa Barbara
James J. Carroll	California Council for Environmental and Economic Balance

Henry F. Berg	Self
Albert F. Reynolds	Environmental Quality Coordinator of Santa Barbara County
Marvin Levine	County and City of Santa Barbara Task Force
Albert F. Reynolds	County and City of Santa Barbara Task Force
Frank J. Frost	County and City of Santa Barbara Task Force
John E. English	County and City of Santa Barbara Task Force
Dr. Robert Mullen	County and City of Santa Barbara Task Force
Lee Waian	County and City of Santa Barbara Task Force
R. C. Sharp	County and City of Santa Barbara Task Force
Dr. Alan Eschenroeder	County and City of Santa Barbara Task Force
Laurence Brundall	County and City of Santa Barbara Task Force
Joe Green	County and City of Santa Barbara Task Force
Michael D. Saddler	County and City of Santa Barbara Task Force
David Bagnard	Fred Huntsinger, Vetco Offshore Industries, Ventura
John Jostes	Self
Murray Lewis	Los Padres Chapter, Sierra Club
Walter Relles	Santa Barbara Group, Sierra Club
Catherine McCammon	League of Women Voters of Santa Barbara
Thomas L. Phillips	Global Marine, Inc.
Lois S. Sidenberg	Carpinteria Valley Association
Francis Sarguis	Get Oil Out
William Gesner	Get Oil Out
Penny Knowles	Get Oil Out
Roger Arnebergh	Self
Robert E. Burt	California Manufacturers Association
Jack H. Willson	Butte County Rice Growers Association
William I. DuBois	California Farm Bureau Federation

Dr. John Burke	Self
Jimmy Jones	Self
John Cushing	Self and Wife
Michael D. Bergen	Self
Mr. Jacobs	Self
Tom Escobbie	Self
Paul Randolph	Self
Patrick Kelly	Self
Peter Dane	Self
Rosario Coulette	Self
James Roden	State Assemblyman Gary Hart
Philip Verleger	Western Oil and Gas Association
E. J. Cahill	Western Oil and Gas Association
John Silcox	Western Oil and Gas Association
E. J. Dickinson	Western Oil and Gas Association
Leonard Gearin	Western Oil and Gas Association
Paul Jennings	Western Oil and Gas Association
C. W. Waage	Clean Seas, Inc.
G. Allan Smalley	Western Oil and Gas Association
Fred Weiss	Western Oil and Gas Association
Henry Lippett, 2nd	California Gas Producers Association
Goldie Joseph	Orange County Council Environment - Employment - Economy - Development
Orrin K. Earl	Pasadena Chamber of Commerce
Don Deining	American Institute of Professional Geologists
Jack S. Russell	Mobil Oil Corporation
Martin Kellogg	Isla Vista Municipal Advisory Council
Mickey M. Gutierrez	Self

Edward Bruce	California Wildlife Federation
Ted Broman	Self
Lanny Kimmett	Self
Lee Staman	Society of American Florists and Flower Growers
Harry Brant	Self
Evelyn McDonald	Goleta Valley Branch, American Association of University Women
Pamela Bradley	Self
Penny Knowles	Santa Barbara Coalition against Oil Pollution
Scott Stewart	San Francisco Chamber of Commerce
Samuel B. Frisk	Gulf Oil Company
James A. Bottoms	Self
T. L. Campbell	Self
Jackie Johns	Los Angeles Chamber of Commerce
Loron J. Hodge	Bakersfield Chamber of Commerce
Stark Fox	Independent Oil and Gas Producers Association
Rosalind Conley	Self (American Association of University Women, Santa Barbara)
Coleen Putnam	Self
C. C. Albright	Long Beach Area Chamber of Commerce
H. Douglas Lemons	Long Beach Area Chamber of Commerce
Fred Johnson	Long Beach Area Chamber of Commerce
Michael Chapman	Long Beach Area Chamber of Commerce
Bob Willard	Long Beach Area Chamber of Commerce
Don Lloyd	Long Beach Area Chamber of Commerce
Carter Boswell	Long Beach Area Chamber of Commerce
Gene Bowman	Long Beach Area Chamber of Commerce
Phillip Jimbrecey	Self
Mr. Randolph	Self

Michael Burden	Self
John Locks	Self
Chad Flax	Self
Vivian Olburn	Self
Mrs. Girson	Self
Ted Bracken	Self
Richard Wesley	Self
Murray Lewis	Self (Sierra Club)

On July 25, 1975, The Santa Barbara County Task Force presented a group report on the DES. The Table of Contents follows. The report was carefully considered and many specific comments therein are similar to those of others which are addressed elsewhere in this section or otherwise result in text modification. This report is on file and available for inspection at the U. S. Geological Survey National Headquarters, Reston, Virginia, and the Pacific Area Office, Los Angeles, California.

REPORT OF SANTA BARBARA COUNTY

TASK FORCE

ON

U.S.G.S. DRAFT ENVIRONMENTAL STATEMENT 75-35

(OIL AND GAS DEVELOPMENT IN THE OCS LANDS OF THE SANTA BARBARA CHANNEL)

Presented to the U.S.G.S. Public Hearings  
in the Santa Barbara Lobero Theater

August 25-27, 1975,

County Environmental Quality Coordinator

Albert F. Reynolds,

Task Force Chairman

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At the hearing, individual substantive and significant issues were addressed by more than one witness; some were addressed by only one witness. The following pages summarize and respond to what is believed to be all of the significant and substantive issues raised relative to the draft environmental statement.

Many issues were raised at the hearing which were not germane to the content and purpose of the draft statement itself, and thus do not appear on the following pages. For example, the merits of one or more of the identified possible levels of future oil and gas development in the Channel; Interior Department leasing policy and procedures; the lack or need of a new national energy policy; the viability of national energy self-sufficiency; the reliability and credibility of the Geological Survey and/or the Department of the Interior, and many others. All such topics are more appropriately addressed in forums and avenues other than environmental impact statements prepared in response to NEPA, by the Department of the Interior.

Technical information was provided on drilling procedures, employee training, blowout preventers, subsea completions, socioeconomics, earthquake design criteria, and the fate of oil in the marine environment. Of special concern were: air quality, water quality, tourism and recreation, public service infrastructure, aesthetics, commercial fishing, per capita income of City residents, and property values.

Reviews, evaluations, and opinions on DES 75-35 range from "totally inadequate and biased" to "one of the most thorough and objective reviewed to date." The following substantive issues were raised in testimony at the public hearing. For easy reference, the responses following these issues have been numbered to correspond with the issue, or comment being addressed.

1. Returns and costs to the State from the potential levels of development should be determined.
2. Various actions should be delayed until the Legislature adopts a coastline plan in 1976.
3. Insufficient geological data is provided.
  - The available amount of detailed seismic data in the area was seen as relatively small,
  - discussions including remedial actions are too generalized,
  - the report should be more specific about timing of a geologic/seismic research program accompanying petroleum exploration, development and production,
  - adequate evaluation of the geologic and seismic hazards of the Santa Barbara Channel region cannot be made without access to the raw data used in the preparation of the EIS and the raw data procured by oil companies now holding OCS leases.
4. Shipping lanes within the Santa Barbara Channel should not be used for oil and gas development.
5. Anticipated increased support vessel traffic should be quantified and the impact of increased support vessel traffic on recreational boating should be addressed.
6. Offshore facilities should not be located within six miles of Areas of Special Biological Significance, marine life refuges and ecological reserves.
7. Long-term and recurrent minor discharges under field conditions have not yet been extensively studied with sufficient baseline data.
8. DES 75-35 is designed to serve as the environmental statement for every single future development on Federal lands in the Santa Barbara Channel, including leasing.

9. The purpose of this statement is not well delineated.
10. It has not been determined how Santa Barbara oil fits into national plans. Nor have energy needs been defined on a short-term and long-term basis.
11. No environmental monitoring study (promised in SYU approval) has been initiated nor have the local governments in Santa Barbara County or the South Central Coast Regional Coastal Commission been consulted on the design of such a study.
12. The compatibility of OCS development to the commercial fishing industry has not been sufficiently addressed.
13. Marine traffic and safety should be addressed in terms of relationship of potential levels of activities in the Channel. The scenario should include the present situation and the possibility of LNG transport ships in the Channel.
14. There should be an indication of the estimated fresh water needs for various levels of development.
15. Adverse onshore development impacts and irretrievable commitment of lands to industrialization cannot be assessed without a site-specific development plan. The term "principles of conservation" under present leasing legislation is historically outmoded.
16. Onshore impacts are not fully evaluated.
17. Additional oil facilities will be needed either on existing sites or at new locations; new locations may require zoning changes and would result in a multiplicity of inherent problems. Increased oil production above present levels would require additional facility capacity either on existing sites or new locations. Processing plants of 10 to 20 acres likely could not be expanded from existing plants which consists of a few acres and are located in the coastal zone. Location of facilities

- at new locations, such as obscure canyons, would require zoning changes in all probability, accompanied by a multiplicity of inherent problems.
18. Income received from potential OCS development in the form of local taxes paid and the cost incurred by the public for increased government services have not been quantified. A cost revenue analysis for each level of OCS development should be prepared.
  19. Disruptions due to OCS facilities maintenance and replacement have not been addressed.
  20. Recommendations have been made in many studies, but most have still not been implemented, e.g., that the USGS undertake immediate and concerted action to develop and promulgate a basic program plan for the assurance of safety and pollution control in OCS operations.
  21. The Department of Interior has not implemented the CEQ recommendation that DOI establish minimum standards for critical OCS operator personnel through certification and appropriate accreditation training programs.
  22. Concern was expressed that if the Federal Ecological Preserve and Buffer Zone were withdrawn from protected status and were leased by the Federal Government resultant production in Federal waters would force the State to allow development in the Santa Barbara Sanctuary.
  23. Concern was expressed that the USGS and other Federal agencies were not assuring that maximum effort and capabilities are being applied to OCS operations to assure environmental protection and safety. E.g., pipeline design for seismic areas.
  24. More specific information is required before air quality impacts can be assessed. It is not reasonable to conclude there will be very minor air quality impacts.
  25. Discrepancies in possible long-range adverse effects of OCS operations on pinnipeds (seals, sea lions, sea elephants) and their rookeries have

not been resolved.

26. The California Coastal Zone Commission and Plan were not acknowledged in DES 75-35.
27. It was stated that offshore oil and gas operations had not been subjected to a severe earthquake and that ability to withstand a severe earthquake was unknown. In reponse, testimony was presented that there was oil development during the Santa Barbara earthquakes of 1925 and 1950; however, this was on State lands including platforms on piers.

There was also considerable discussion as to Channel seismic history and marine structure seismic design criteria.

28. The City Attorney's Office and the County Counsel's Office for Santa Barbara County made a joint request on behalf of the Task Force reviewing the Draft EIS for information obtained from exploratory drilling and other information-gathering activities to determine the geological make-up of the Channel and size of the oil and gas supplies in the Channel. A copy of the letter request is to be made part of this record.
29. The above officials also stated that the Draft EIS is so inadequate that it must be rewritten and recirculated in draft form and hearings must not be terminated until the public has had the opportunity to review and comment on that data.
30. Mitigations should include requiring an assumption of absolute liability for all damages, including tax losses which result from an oil spill.
31. It was stated that the hazards of deep water drilling and potential tanker collision have been analyzed and presented to the Department of the Interior, but the pertinent information was not mentioned in the DES. (Specific sources or references were not named).

32. An apparent inconsistency was noted on draft pages III-179 and III-206 regarding the percentage of local labor for the exploratory phase would be a small or large percentage.
33. DES 75-35 treats the subject of oil spill containment and cleanup on the open seas in an inadequate manner, i.e., deployment of equipment in an emergency, whether response will be made to an emergency, and the capacity of equipment.
34. Plate 1 inaccurately indicates an oil field on the Mesa area; The City of Santa Barbara does not permit oil drilling within city limits.
35. Economic impacts of an oil spill are out of date and the statement refers the reader to DES 75-35 p. III-167 and p. III-182 for an "adequate" discussion that does not exist.
36. The County of Santa Barbara was not consulted by the USGS in preparation of the draft.
37. Petroleum conservation was not addressed in meaningful depth in terms of reducing demand and resource exhaustion. Petroleum conservation should be evaluated in terms of national needs and should relate the Santa Barbara OCS to those needs.
38. Hazards of drilling from floating vessels were inadequately covered.
39. "Worst case analysis" was not presented for an oil spill (e.g., a well being drilled at 10,000 feet in 1,000 feet of water from a floating vessel).
40. USGS regulations on crew training on operation of BOP equipment should be more stringent and comprehensive.
41. An air quality monitoring network should be set up both for onshore and offshore in the Channel area.
42. More detailed consideration and attention were suggested for the areas of:

- disposal of produced waste water DES 75-35,
  - drilling inspection and surveillance procedures and inspection personnel training.
43. The estimated amount of drilling mud discharged into sea may be appropriate for exploratory wells but is too high for platform development wells.
  44. The potential oil and gas reserve estimates seem on the low side.
  45. Inclusion in the FES was requested for City of Santa Barbara statistics on loss of revenue to the City of Santa Barbara from the 1969 spill.

## Responses to Public Hearing Testimony

1. Response to this comment is provided in the revised and greatly expanded Socioeconomics Baseline and Impacts discussion in the FES. See sections II.F., Resources, and III.N., Socioeconomics Impacts.
2. If a final Coastal Plan is adopted by the California Legislature and approved by the U. S. Department of Commerce pursuant to the Coastal Zone Management Act of 1972, the activities of the Department of Interior or of Federal oil and gas lessees directly affecting the Coastal Zone shall, to the maximum extent practicable, be conducted in a manner consistent with the approved coastal zone management program. The discussion of the Coastal Zone Plan has been updated and expanded in this final statement (see section I.F.2.a. and IV.A.1.h.). Also refer to hearing response No. 26 and response No. 38 to the State Resources Agency (Coastal Commission portion).
3. The summary statement of Mr. A. F. Reynolds cites "Significant shortcomings" in the DES 75-35 treatment of geologic and seismic hazards; however, the detailed geologic comments within the Santa Barbara/County Task Force report appear to be critical of the general state-of-the-art of geologic and seismologic information in the Channel region. None of the detailed comments challenges the DES as an accurate and up-to-date summary review of current geologic and geophysical information for the region; nor do they offer significant additions, revisions, or corrections to the data reported. The County report does not cite or otherwise refer to any other report or reports that provide a more complete, more accurate, or otherwise more "adequate" review of the geology and seismology of the Channel region, the present status of information, and the future needs for additional information if commercial development proceeds.



Regarding the requests for: A) "basic raw data used in the preparation of DES 75-35", and B) oil companies' proprietary data", the related formal correspondence between the County Counsel and the Geological Survey and the Department of Interior is presented in the written comment-response portion of this section.

Mr. Coudray comments that: "Specific mitigation measures that are technologically feasible and economically realistic need to be spelled out that will or will not preclude the chance of major oil spill(s) from a seismic or geologic hazard." It is, of course, impossible to write specifications covering all possible contingencies, in the absence of knowledge of the kind of installation or the specific site location; and, similarly, no list of specifications can guarantee performance to the absolute point that all chances of major oil spill are completely "precluded." However, current sound engineering practice calls for careful investigation of conditions in and around the potential site of any structure to determine those factors that might pose a hazard, and for consideration of those hazards in designing the structure to perform in such a way as to resist the kinds and severity of damage that might pose a hazard to safety or potential for adverse environmental impact.

Mr. Brundall is quite candid in his recognition that his comments relate to his judgment concerning the ". . . incomplete state-of-the-art at this point in time." rather than to any failure of the DES to report that state-of-the-art fully and fairly. He further recognizes that the DES recommends acquisition of more and more-detailed geologic and seismologic information, both for the region as a whole and for site-specific purposes.

In his criticism of plate 4 (DES 75-35), Brundall ignores the context of its title, which states that its purpose is to illustrate the "method of interpretation from acoustic profiles". The principal conclusion about recency of faulting intended to be illustrated by plate 4, is that faults of different probable ages are shown on the geologic map (plate 2) with the same symbol. Only detailed examination at specific sites along the faults, such as those points shown on MF-585 by the "Geologic Control Symbols", can discriminate between different ages of faulting.

The DES statement that research could accompany development and production provides the additional consideration that research related to potential for adverse environmental impact should continue throughout the entire period of production.

4. No oil and gas operations or facilities will be located within a certain distance of the established shipping lanes. The Geological Survey and Coast Guard work together in establishing such shipping lane safety zones. The present agreement for the Santa Barbara Channel OCS requires that all oil and gas platforms and drilling vessels must be at least  $\frac{1}{2}$  mile from the shipping lanes.
5. The number of support vessels required for the possible levels of Channel development would depend on many variables. The crews are transported by boat and helicopter. The crews sometime live on the location and sometimes are transported to and from shore each 8-hour shift. Also, the frequency of supply vessel trips varies considerably. The possible levels of Channel development would likely require approximately 15 to 40 support vessel round trips daily from shore to drilling vessels and platforms.

This amount and type of increased traffic in the Channel should result in only minimal negative impact on pleasure boating. Both the support and pleasure boats possess a relatively high degree of maneuverability and must adhere to Coast Guard regulations. The support vessels perform numerous rescue and assist operations in the Channel each year. This is one positive aspect of such appropriately equipped and well manned vessels traversing the Channel daily.

6. The OCS Lands Act (43 U.S.C. 1331-1343; 67 Stat. 462), provides that Section 8 leases are to be maintained under regulations in existence at the time the lease is issued. The leases in the Santa Barbara Channel were issued in 1968. Should a future proposal be received for a leased area within six nautical miles of an area of biological concern, thorough consideration would be given to environmental concerns. Appropriate State and Federal agencies would be consulted. The action to repurchase leases or portions of leases would require legislative action.
7. We concur with respect to baseline data. Studies being conducted by the Bureau of Land Management on future potential lease sale areas are intended to provide baseline data for assessing impacts on any future development. During the past decade, there has been intensive study of long-term and recurrent major and minor oil discharges, as reflected in the references following section IV. Although baseline data may be lacking or incomplete, "control" areas (those similar to the area impacted) have provided a basis for comparison.
8. Decision as to the need for site-specific environmental impact statements will be made on a case-by-case basis in accordance with established NEPA procedures of the Department of the Interior and the Geological Survey.
9. Refer to the Preface and section I.A. for a discussion of the reason for initiating this statement and the basic purpose. The primary objective is to consider the impacts that would occur as a result of the four possible levels of Santa Barbara Channel OCS development.
10. A detailed discussion of national energy needs and plans (short-term and long-term) is considered beyond the scope of this Santa Barbara Channel

statement. The Project Independence Report is cited as the most recent and comprehensive attempt to define national energy requirements now and in the future, as well as methods for meeting our energy needs domestically or from secure foreign sources. A Rand Corporation report prepared for the State of California is cited as one source for a description of the California energy situation. See section III.N. for a complete reference to both of these reports.

11. The Department of the Interior is committed to baseline studies in new frontier OCS areas (proposed OCS lease sale areas) followed by monitoring programs through exploration and development activities. The Southern California OCS Sale 35 FES, and a variety of recent documents, presentations, and testimony of various Bureau of Land Management and Department of the Interior officials before Congressional Committees demonstrates clearly this commitment to baseline and monitoring programs in frontier areas. This commitment is further demonstrated by the Bureau of Land Management's commencement of such programs for certain frontier areas, i.e., the Southern California OCS Sale 35 area. Presently (January 1976) no area-wide, coordinated baseline and monitoring programs have been initiated for leased areas with existing oil and gas operations. In the Santa Barbara Channel OCS leased area, some site-specific monitoring and biological and archeological studies are conducted by the operators, in accordance with agency requirements and guidelines, or by the agency itself. Examples are:

- Seismic monitoring (USGS)-----section IV.B.8.
- Subsidence detection (operator)-----section IV.B.7.
- Biological and archeological surveys to insure protection of these resources (operator)-----sections IV.B.1. and 9.

- Site-specific waste-water discharge

monitoring and analysis (operator)-----sections IV.A.1.c.  
and g., "OCS Order  
No. 8.(5)"

For a discussion of multi-agency, university, and industry involvement and recommendations as to baseline and monitoring programs, see section IV.B.12.

12. See expanded coverage in section III.N.10.
13. Marine traffic and safety considerations for the Santa Barbara Channel are addressed in considerable detail in the DES section III.J.1. Present and likely future vessel traffic as a function of possible increased production in the Channel are quantified appropriately therein. Safety regulations for vessel traffic and the likely impact thereon of increased levels of production are also noted in the revised safety portion of FES section III.J.1.

The impact of LNG transport in the Channel cannot be meaningfully determined at this time due to the large uncertainty of its occurrence, timing, or magnitude. However, refer to section I.F.3. for other activities in the Channel that might affect marine traffic there (including LNG transport).

14. Estimated fresh water needs for a single onshore facility are provided in section III.E.2.d. Total fresh water supply needs would be a function of the level of development of the Channel, which cannot be

determined at this time. However, as noted in table I-1, the range of numbers of onshore facilities for the various possible levels of development is from 1 to 5, hence total water needs for onshore facilities could be estimated from as little as 20 acre feet per year to as much as 100 acre feet per year.

15. These statements are noted. Please see the responses to items 16, and 17.

As noted elsewhere, while the statement addresses the possibility of leasing, it is not a lease sale statement (which would be prepared by the Bureau of Land Management should leasing be considered). The "principles of conservation," as legislatively defined, refer to the conservation of oil and gas resources. OCS orders and Departmental policy, as well as State and local agency policies, do reflect serious concern for the conservation of natural resources other than oil and gas.

Please see the discussions on Areas of Special Biological Significance, Conservation Considerations and Concerns, California Coastal Zone Conservation Commission discussion and Mitigations, as examples.

16. Without site-specific proposals, it is not possible to evaluate onshore impacts in great and specific detail. In the FEIS, the discussions of generalized onshore impacts have been expanded. Specific onshore sites would presumably receive full environmental consideration under various state and local laws as a minimum in the event of a site-specific proposal.

17. These statements are acknowledged and we concur with the possibilities. Further, the California Coastal Zone Conservation Commission Plan, when adopted, will provide policies relating to consolidation of onshore processing facilities and descriptions of the types of areas where development may occur among many additional guidelines. (Policy 83c, 83f in section IV.A.1.h.) (See also response 16)
- This subject is addressed in the revised and greatly expanded Socioeconomics Baseline and Impacts discussion in the FES. See sections II.F., Resources, and III.N., Socioeconomic Impacts.
18. Response to this comment is provided in the revised and greatly expanded Socioeconomics Baseline and Impacts discussion in the FES. See sections II.F., Resources, and III.N., Socioeconomics Impacts.
19. The maintenance of subsea production systems would require the presence of a surface vessel. A subsea production system is frequently suggested as means of totally eliminating the aesthetic impact of a surface facility. However, normally a nearby surface facility is required during the production phase and a surface vessel is required for drilling and maintenance. The maintenance of platforms, onshore facilities and drilling vessels would be a part of the routine operations and daily operational impacts. Mechanics, electricians, etc. are considered in section III.N. "Socioeconomics Impacts." (See table III-8)
20. The status of implementing recommendations made in several studies of OCS operations has been updated in this final/<sup>statement</sup>(section IV.A.8.). There have been many of these studies, as shown in section IV.A.8., and several are presently ongoing. As new studies are completed, the need to revise and expand certain original recommendations and add new ones, becomes apparent. See section IV.A.8. and appendices IV-2 and IV-3 for

examples of the revising of adopted recommendations prior to the completion of implementation. Many of these complex recommendations involve considerable planning, manpower and money and cannot otherwise be meaningfully implemented.

The Review Committee on Safety of Outer Continental Shelf Petroleum Operations, under the auspices of the Marine Board, National Academy of Engineers was established in July 1973, to serve as a third-party audit of the OCS procedures and operations and to review state-of-the-art technologies. This Committee established at the request of the Geological Survey, composed of experts not regularly employed by industry or the Government, has issued four reports to the Geological Survey. The fourth and latest report, issued in August 1975, and the three previous ones are discussed in this final statement; Committee membership is also presented (see section IV.A.8.a.).

21. Prior to the CEQ Report, implementation of a similar training recommendation, resulting from an earlier study, was already in progress. See section IV.A.8. for the status of implementing the recommendations from various studies as to OCS operations and management.
22. The Federal Ecological Preserve and Federal Buffer Zone, adjacent to the State Santa Barbara Oil Sanctuary, are discussed in the introduction on page ii.10, section I.E.4. and section VIII.E.3. and 4. It is acknowledged in the statement that the possibility of drainage from submerged lands within the State Sanctuary would exist should this adjacent restricted Federal area become available for leasing. However, at this time there has been no such suggestion made to or by the Secretary of Interior to make the Federal Ecological Preserve and Federal Buffer Zone



available for leasing. Discussion of the subject in this EIS was and is included for the purposes of looking at the full range of "possible" OCS development in the Channel.

23. The level and extent of USGS efforts to protect the environment is described in great detail in section IV., Mitigation Measures.
24. The identification and quantification of potential air pollution emissions and their impacts from the possible levels of Channel development have been addressed in detail in the greatly enlarged Air Quality and Air Impacts sections II.G.1., and III., and III.LL.
25. The long-term effects of crude oil on marine mammals in their natural habitat are not well known. As may be seen from the many cited expert references, even the immediate impacts of crude oil spills are yet open to some question. Research is continuing in many private and governmental circles, world-wide on both the short-term and chronic effects of petroleum products on the marine environment, as well as, improvements for the techniques of spill prevention and clean-up. The decision as to the future sites for oil facilities on the OCS will, of course, have to be made only after weighing the potential environmental consequences of not only oil spills, but also the factors of human encroachment, as they are known at that time.
26. The California Coastal Zone Conservation Commission and the Plan-in-  
and IV.A.1.h.  
Preparation were discussed in sections I.F.2.a./The U. S. Geological  
Survey is acknowledged on page 17 of the California Coastal Plan as one  
of the Federal Agencies having provided assistance and cooperation in  
the preparation of the plan. The draft statement was issued June 6,  
1975 prior to the pamphlet "In Brief: Preliminary Coastal Plan". The  
Final Plan dated December 1, 1975 was received by the USGS in mid-  
December. As noted in the transmittal letter of the plan "the workload

for us (the commission) has been enormous." Nonetheless, in our informal telephone contacts with individual commissioners, they provided useful and helpful information for the draft EIS preparation. The 162 policies and 44 recommendations (not yet acted on by the California Legislature) the valuable descriptive text and very informative color-coded, annotated map series in the 443-page volume are too numerous to abstract, however, certain of the petroleum-related policies and recommendations have been listed in section IV.A.1.h. Copies of the California Coastal Zone Conservation Plan may be purchased from: Documents and Publications Branch, P. O. Box 20191, Sacramento, California 92520. The plan definitely will be consulted and considered in the event of any site-specific proposal.

27. The following is in response to Dr. Paul C. Jennings' helpful hearing testimony on "earthquake engineering features of the draft statement." We believe a portion of Dr. Jennings' comments stem from misreading or misinterpretation (perhaps due in part to unclear wording in the DES text), and confusion between "expectable ground motion parameters", "design criteria", and "design specifications". DES 75-35 describes ground motions of the sort expected to be measured by seismometers and accelerographs on the ground surface at sites lacking the influence of structures or extreme contrasts in the elastic properties within the local geologic section. As such, ground motion does not relate to the nature or importance of the structure being designed. The capability of a structure to resist specified ground motions without collapse can only be evaluated in the context of the entire spectrum of design considerations. DES 75-35 deals only with the ground motions. In recognition of the potential for misinterpretation, we have revised and expanded the discussion on p. II-129, 130 (DES 75-35). See section II.B.6.g.

Jennings' final general comment consists of urging that the authors of the various sections of DES 75-35 be identified because he sees the effect as "dilution of responsibility through anonymity". Such lack of identification is not based on any reluctance of the individual contributors to be so identified, but reflects the practice of DOI, USGS. Both the draft and final statements are institutional documents carrying the Director's signature indicating both approval and agency responsibility for its contents, as the NEPA has assigned that responsibility.

Following are responses to Dr. Jennings' additional substantive hearing comments:

(1) Jennings asserts that "...the 0.25g and 0.50g design spectra, combined with the other portions of the recommended design criteria for the Santa Ynez platform...have produced a platform which has the calculated capacity to resist without danger of collapse ground motions with peak values equal to those which they recommend." This serves to support the statement of Coulter (DES 75-35, p. II-129, 130), that proposed Platform "C" could resist very large acceleration even though the nominal design coefficient was 0.15g.

(2) Jennings comments that peak acceleration values are not directly related to the amplitude of response of structures with the natural frequencies of offshore drilling platforms. This is, of course, correct, however, as Trifunac and Brady (1975, p. 43) point out: "...one of the simplest methods of scaling the strong ground motion is to use the peak

acceleration recorded in the heavily shaken area. Though one such peak contains only a limited amount of information on the overall spectral and time-dependent properties of ground motion, for traditional reasons, as well as simplicity, it appears that such scaling may remain in engineering and seismological practice for some time." Furthermore, the estimates of peak velocity and displacement give information on the low frequency components of ground motion which are more relevant for offshore drilling platforms.

Jennings also asserts that the ground motion characteristics recommended in DES 75-35 are "incomplete for the purpose of specifying the design values of the maximum credible earthquake." Design specifications are beyond the scope of the Seismology Section of the Impact Statement. The intent of the Impact Statement was to characterize the ground motion. Peak horizontal acceleration, velocity and displacement were recommended. Given these values, methods exist (e.g. Newmark and Hall) for constructing response spectra for design purposes.<sup>1</sup>

(3) Jennings asserts "The values given by the USGS are higher than those thought appropriate by most other experts in this field." This assertion must be questioned in the context of the recent paper by Trifunac and Brady (1975), who estimate maximum acceleration associated with a magnitude 7.5 earthquake at a "soft" site at the causative fault to be as much as 4.5g, and that the average peak accelerations at the fault should be 1.75g. Trifunac and Brady conclude (1975, p. 49): "We

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<sup>1</sup>Newmark, N. M., and Hall, W. J., 1969, Seismic design criteria for nuclear reactor facilities: Fifth World Conference on Earthquake Engineering, Santiago, Chile, 1967, Proc., v. 2, p. 37-50.

found the amplitudes of strong ground motion in the near-field of earthquake energy release to be significantly higher than so far predicted by most investigators... These differences can be explained by the serious lack of near-field data ( $R < 20$  km) and by the use of somewhat arbitrary methods for extrapolation towards the earthquake source in most previous studies."

Jennings also asserts that "...no recommendations are given...concerning the attenuation of motion with distance from the causative fault." He is referred to the discussion and figure on p. II-217 and 128 (DES 75-35) which specifically treats attenuation of ground motion with distance from a causative fault; and to p. II-113-121, which points out that the most modern solutions of epicenter locations in the channel have a relative error of as much as 5 km which, when combined with the observation that many of the faults have dips that may deviate appreciably from the vertical, and when combined with the data of Plate 2--which shows that for the parts of the Channel for which there is good information on fault distribution it is difficult to find a site as much as 5 km from a mapped fault--lead to the concluding statement on p. II-141 (DES 75-35) which states: "Because no part of the Channel is far from one or another of the major faults, and because of the seismicity of individual faults cannot be resolved from among the many nearby faults by the present seismograph net, the hazard should probably be considered to be uniformly distributed throughout the region, even though the instrumental record of small earthquakes indicates a greater frequency on the north-central, east-central, and southeastern parts of the channel..."

The reader is referred to responses to the Dames and Moore review submitted as part of WOGA written comments, and to Texaco written comments relating to Channel seismic activity and seismic design criteria.

28. All correspondence related to this subject is included in the section on written comments to the Director (section IX.B.).
29. The requirements for circulation of the Statement in Draft form prior to preparation of the Final Statement have been fully met per section 1500.7 of the Council on Environmental Quality Guidelines, titled "Preparing draft environmental statements; public hearings."

The matter of data availability is addressed in the USGS response letter to the request noted in the previous comment. The Department and the Survey do not contemplate further public hearings on this statement at the time of filing the FES.

30. Parts (a), (b) and (c) of OCS Order No. 7 clearly state that the lessee is responsible for the cost of clean-up of any spills. The lessee's liability to third parties would be determined according to applicable law.

Regarding the prevention of waste and conservation of the natural resources of the Outer Continental Shelf, regulations have been promulgated establishing bonding requirements for lessees, 43 CFR 3304.1, 3304.2, and liability for oil spills resulting from operations, 30 CFR 250.43. Several of the comments received by the Department have

suggested that the amount of the required bonds should be increased and that absolute liability for oil spills resulting from operations should be extended to include damages suffered by state and local governments and third parties as a result of such spills. Furthermore, some commenters said that a mechanism should be created whereby third party damages could be assessed and collected expeditiously from the party causing the spill.

The bonding regulation is intended to implement the statutory requirement that the successful bidder be one who is responsible and qualified. 43 U.S.C. § 1337(a). The bond is conditioned upon compliance with all the terms of the lease. For an individual lease the bond must be in the amount of \$50,000 or the lessee may furnish a \$300,000 bond to cover all the leases he may hold within a given geographical area specified in the regulation. The right is reserved to the United States to require additional security in the form of a supplemental bond or bonds or to increase the coverage of an existing bond if, after operations or production have begun, need for such additional security becomes apparent. No limitation on the amount of bonds is set by the OCS Act.

The lessee is required to bear the expense for the control and total removal of pollutants proximately resulting from drilling or production operations conducted by or on his behalf. 30 CFR § 250.43(b). The absolute liability for the costs of cleaning up a spill does not extend

to damages suffered by third parties as a result of the spill, which constitutes a separate and different suite of legal concerns. The regulation provides that the lessee's liability to third parties is governed by applicable law. Adjacent state civil and criminal laws effective as of August 7, 1953, the date of enactment of the OCS Act, or other Federal laws and regulations of the Secretary apply to operations on the Outer Continental Shelf.

The administration is presently supporting legislation which would establish a mechanism to assess and collect third party damages expeditiously from the party causing the spill.

31. Deep water drilling and potential tanker collision has been discussed in this statement. As drilling progresses into deeper water, new technical problems will have to be resolved and OCS Orders will be prepared to respond accordingly. (See section IX.B. responses Nos. 1 and 5 to EPA comments on deep water drilling)
32. Response to these comments have been made in the greatly revised and expanded Socioeconomics Baseline and Impacts discussion in the FES. See sections II.F., Resources, and III.N., Socioeconomics Impacts.
33. Refer to the updated inventory list of Clean Seas Inc., clean-up and containment equipment (section IV.A.4. and 5.). See response to EPA and Resource Agency of California comments on spill clean-up and containment capabilities. The Bottom-Tension Boom has contained seep oil in six to eight-foot seas with its full containment capabilities as yet undetermined. This sea state covers about 94 percent of Santa Barbara Channel sea conditions. As stated in the text of this statement,



subsequent to the 1969 Platform A spill, continuing improvements have been made in spill containment and clean-up procedures and equipment. However, to date, no system or equipment has been developed which is completely effective in controlling and removing all spilled oil under all weather and sea conditions (section IV.A.5.).

34. It is acknowledged that the Mesa Oil Field near Santa Barbara as shown on plate 1 is abandoned.
35. Response to these comments was made in the greatly revised and expanded Socioeconomics Baseline and Impacts discussion in the FES. See sections II.F., Resources, and III.N., Socioeconomics Impacts.
36. While the Counties of Santa Barbara and Ventura were not formally consulted, published information from agencies and organizations of both counties were used in draft preparation, and the process adhered to NEPA guidelines. The CEQ specifically intended for such input of State-local agencies to take place during the draft review period. The distribution of approximately 1,000 copies of the statement in draft form, holding of public hearings for oral comments, receiving written comments and responding to such comments are the means by which all interested parties contribute input to the final statement. Approximately 600 copies of the draft statement were mailed to parties the Department believed may have an interest, the remaining 400 were mailed on request. The availability of the draft statement was announced in the Federal Register and in a Department News Release.
37. Conservation is addressed in expanded detail in the revised and enlarged section VIII.G.1., Alternative Sources of Energy, (Energy Conservation).

38. Whether drilling is conducted on land, a platform, or from a floating vessel, many of the procedures, and requirements are similar. Drilling from a floating vessel, however, requires certain modifications in procedures and in some cases equipment modifications. Five areas of major differences in procedures for floating drilling are identified and described in section I.D.3.a. The impacts of drilling from a floating vessel and from a platform are discussed in section III. It is apparent that weather conditions and sea state are more of a factor in floating drilling than in platform drilling.

39. Possible spill volumes for various types of spills are discussed in section III. See table III-17; also see the added discussion in this final statement as to maximum credible spill amount estimates (section III.K.4.).

The drilling depth of the well and water depth are not necessarily major factors as to the ability to abate the source of the spill or contain the spill and prevent oil from reaching relatively more sensitive areas.

40. See our earlier responses nos. 20 and 21 to a similar hearing comment on implementation of certain training recommendations. Several studies on OCS operations and management have resulted in training recommendations. Refer to section IV.A.8. and appendices IV-2 and IV-3 for the status of implementing the recommendations that have resulted from various studies.

As to specific training for blowout preventer operations, OCS Order No. 2 does presently require testing of the preventers at various specified times, and that a blowout prevention drill be conducted weekly for each

drilling crew to insure that crews are properly trained to carry out emergency duties. All blowout preventer tests and crew drills must be recorded on the driller's log.

41. The subject of air quality monitoring data is addressed in the greatly enlarged Baseline Air Quality and Impacts sections in the FES. See sections II.G.1. and III.LL.

42. Disposal of produced waste water is discussed in considerable detail throughout the statement in appropriate sections. Portions of the produced waste water discussion has been updated in the final to more closely reflect the present status as to produced waste water disposal and regulation.

Produced waste water discussion references:

Section I.D.8.a.(2) Section II.G.2.c. and d. Section III.C.2.b.(1)(c)  
Section III.E.2.e. and Section IV.A.1.c. and d.

Santa Barbara Channel OCS inspection frequency and procedures are described in detail in section IV.A.2.

43. It is agreed that the estimate, of the average amount of drilling mud spilled into the sea, may be too high for platform development drilling.

44. The opinion that these reserve estimates are conservative is acknowledged. As stated in the text the reserve estimates given in table I-2 are preliminary and subject to possible drastic revision as more information becomes available and more detailed reservoir studies and reserve analyses are performed.

45. Loss statistics from the 1969 oil spill to the City of Santa Barbara, as estimated and provided by the Mayor's office, are presented below.

"In 1969, following the spill, the City of Santa Barbara spent more than \$100,000 worth of employees' time in assisting, directing, and carrying out the cleanup operation. The City lost more than \$100,000 in rental of City-owned coastline property. The City lost from '69 to '73 more than \$500,000 in bed taxes and \$3 million in sales taxes. The City suffered a diminution in the fair market value of its ocean-front property and a loss of use of the City's ocean-front property from 1969 in effect until the present. To the City of Santa Barbara this is an additional loss of approximately \$3 million.

"Gentlemen, I hope the above demonstrates to you in dollars and cents the impact this oil spill had on a city the size of Santa Barbara with a population of 75,000 people and six and a half miles of coastline. As a result of the loss of tax revenues, the City was required to cut its employee payroll by 71 people. A city cannot absorb that kind of revenue loss by itself without reducing services for all of its citizens."

## B. Written Comments

Written comments on the draft environmental statement, as invited by the aforementioned (section IX.A.) news releases and Federal Register notices, are reproduced in the following portion of this section. As appropriate, response to specific comments are made. For easy reference, responses to each comment have been numbered and the appropriate section of the comment letter has been bracketed and numbered. The letter precedes the response. Correspondence duplicating hearing testimony is included with the hearing records. Appreciation is expressed for all letters, data, information, and opinions.

The following written comments were received:

Federal

Bureau of Land Management	August 5, 1975
Bureau of Mines	August 5, 1975
Bureau of Outdoor Recreation	July 24, 1975
Department of the Army	July 30, 1975
Department of Commerce	September 2, & 16, 1975
Environmental Protection Agency	October 2, 1975
Federal Energy Administration	July 31, 1975
Fish and Wildlife Service	August 11, 1975
National Park Service	July 22, 1975
Office of the Secretary, Ocean Mining Administration	July 31, 1975
U. S. Coast Guard	August 4, 1975
U. S. Energy Research and Development Administration	August 7, 1975

State

State Lands Commission	August 20, 1975
Resources Agency of California and California Coastal Zone Conservation Commission (submitted together)	November 19, 1975

Other Governmental

Santa Barbara, Office of City Attorney	August 8, 1975, Sept. 25, 1975 & August 29, 1975
City of Tehachapi	August 28, 1975

Private Organizations and Individuals

Air Transportation Association	August 13, 1975
Bekins Company	August 1, 1975
B'nai B'rith Messenger	July 31, 1975
F. P. Lathrop Construction Company	July 8, 1975
J. Ray McDermott and Company, Inc.	August 29, 1975
Le Roy Jeffries and Associates	August 22, 1975
Kaiser Steel	September 2, 1975
Modern Plastic Company	August 20, 1975
Parr and Associates (Russ Campbell and Solicitor)	August 27, 1975
Pioneer Division, The Flintkote Company	July 25, 1975
Red Triangle Oil Company	July 16, 1975
Sidney R. Frank Group	August 21, 1975
Sport Fishing Institute	September 9, 1975
Standard Oil Company	August 29, 1975
Texaco, Inc.	August 26, 1975
Union Oil Company of California	August 21, 1975
Valley Nitrogen Producers, Inc.	August 27, 1975
Western Oil and Gas Company	August 27, 1975
Mrs. William Aggeler	August 29, 1975
Malcolm Archbald	August 31, 1975
Mrs. Malcolm Archbald	August 30, 1975
Richard H. Bigelow	August 26, 1975
W. E. Bisgaard	July 30, 1975
W. E. Bruse	August 28, 1975

Private Organizations and Individuals (continued)

Mrs. Bryan Burk	August 4, 1975
Jacki Bergen and Brad L. Clements	No date
Edward N. Dodson	August 27, 1975
Phyllis Dodson	August 29, 1975
Albert Dorskind	August 4, 1975
Mrs. W. M. Fridell	August 4, 1975
Mickey M. Gutierrez	August 29, 1975
William P. Hoopes	August 1, 1975
Ernest J. Loebbecke	July 31, 1975
Ferdinand Mendenhall	August 5, 1975
Howard Morf	August 7, 1975
Gene E. Steed	August 5, 1975
John V. Vaughn	August 4, 1975
Mrs. Carol A. Waters	July 31, 1975





## United States Department of the Interior

1792 (260)

BUREAU OF LAND MANAGEMENT  
WASHINGTON, D.C. 20240

AUG 5 1975

## Memorandum

To: Director, Geological Survey

From: Director, Bureau of Land Management

Subject: Review of draft environmental statement, Oil and Gas  
Development in the Santa Barbara Channel Outer Continental  
Shelf off California DES-75/35

1 [ In response to your request we have reviewed the above subject. We find the weakest section of the draft to be Section VIII on Alternatives to Further Development. For example, the wording on the bottom of page VIII - 3 on the No Action Alternative is confusing. We would suggest that a much more comprehensive discussion be presented on the No Action Alternative. This should include details on what the legal and environmental implications of no action alternative would be. We cannot agree that the 'no action' alternative is not a viable issue for discussion here. There should also be supplementary no action discussions under each of the operational alternatives.

The following detailed comments are provided for your use.

Assistant

Enclosure



Detailed Comments:

2 [ ii. The Preface and Introduction of the DEIS give an excellent summary of the history of OCS development in California and a particularly good summary of development in the Santa Barbara Channel. It may be appropriate, however, to expand the Santa Barbara Blowout and Oil Spill of 1969 Section, (pp. ii-13 to ii-15) and discuss in more detail the damage caused by the 1969 Blowout, and the clean up costs which resulted thereof, or to refer the reader to page III-183.

3 [ I.A.B.E., -- These sections give a good summary of activities currently being conducted but do not give a projection of expected future activities. It may be useful to project a range of probable future activity in this section in the FEIS.

Volume I

4 [ Section I.D.1,2 - page 15-23  
Page 1-22, 3rd paragraph, last sentence: What is the source(s) which indicated water base muds are not harmful to marine life.

[ Section I.D.4.6. -- This section is a comprehensive review of platform and subsea completion technology. The great detail in which the state of the art of subsea technology is treated is especially well prepared.

5 [ Section I.D.7,8,9. Pages I-117, Item (2), lines 4 thru 8. -- Change to read: "In water depths of less than 200 feet, present OCS administrative procedures in New Orleans OCS office requires a minimum pipeline burial of 3 feet. Corps of Engineers in New Orleans requires a minimum pipeline burial of 10 feet in the fairways. Corps of Engineers in Galveston, Texas, requires a minimum pipeline burial of 10 feet in the fairways, and 16 1/2 feet in the anchorage areas."

Page I-120, item (3), paragraph 2. -- "Corrosion prevention measures are required by OCS order No. 9."

Page I-121, Item (4) -- Change paragraph to document the deepest underwater pipeline laid to date was a 10-in pipeline in 1,180 feet of water by an Italian state-owned company, ENI. (Oil and Gas Journal, October 28, 1974).

Page I-124, paragraph 2, line 5. -- Change to read: "The pipeline requirements in OCS Order No. 9 apply to all OCS pipelines."

Page I-134, paragraph 2, line 1. -- Change "Uniform Fire Code to "National Fire Code."

Section II-A, II-1

No comment

6 [ Section B, 6a, page II-84, last paragraph, last sentence. This sentence may lead a reader to believe that more geological and geophysical investigation

will be completed prior to oil production activity. Possibly another sentence could be added which could inform the reader as to the status of further seismic investigations prior to any oil production activities.

7 [ Page II-129, last sentence: What are the ground accelerations the other OCS platforms could withstand.

Section II-C Meteorology  
No comment

Section II-D - Oceanography

8 [ Page II-179, 2nd paragraph, 2nd sentence: It is doubtful that only in the area of Point Conception can waves strike the beach with little modification resulting. With waves from the northwest, it seems reasonable that they will be diffracted around Point Conception, dissipating their energy along the shore south of Point Conception. If waves are refracted at Point Conception, the wave energy will converge in the area of the submarine ridge extending from Point Conception. If the DES statement is true, a reference that can substantiate the sentence should be given. To clarify this statement the Army Corps of Engineers could be consulted.

Page II-193, last paragraph, 3rd sentence. The statement should be: (As waves approach the shore, the period remains constant with an increase in the amplitude and a decrease in wave length.)

## Volume II

9 [ Page II-217 -- It should be indicated that the area from Mugu Lagoon to Latigo Point is designated as an ASBS.

10 [ Page II-218 -- When referring to the rare and endangered species of a particular area, it would be more meaningful and more scientifically accurate to distinguish which subspecies of organism is being described. Such is the case on page II-218 with the clapper rail. According to the DES, the entire clapper rail species (Rallus longirostris) is endangered. This is incorrect. Only the three subspecies in California are endangered, and only the light-footed clapper rail (Rallus longirostris levipes) is found in the subject area being described. This thinking also applies to the peregrine falcon which should be listed as the American peregrine falcon (Falco peregrinus anatum).

The California least tern (Sterna allgrons browni) which also occurs in the subject area should be listed. The California brown pelican (Pelicanus occidentalis californicus) also feeds and roosts in this area.

Page II-225 -- Same comment as for page II-218 applies to this listing of the rare and endangered species.

11 [ The Gray Whale (Eschrichtius gibbosus) should also be listed as an endangered species which occasionally migrates through the Santa Barbara Channel.

It should also be noted that the Guadelupe fur seal (listed as rare by the state) occurs on San Miguel Island.

Page II-226 -- Under item (2). The Bureau of Sport Fisheries and Wildlife no longer exists. Its name is now U.S. Fish and Wildlife Service. Also, Belding's savannah sparrow is not listed on the Federal Endangered Fauna List, only on the California State list.

Section II.E.-2a (1) through (6) The description of the intertidal and benthos was a good summary of the main features of these habitats. All principle groups (macrophytes, invertebrates and fish) are included in the intertidal habitat coverage which is extremely helpful for tying things together.

The main criticisms are those of minor omissions of known facts which would be helpful for a fuller understanding of the community. For example, the acorn barnacle (Cthalamus fuscus) has been omitted from Table II-20. This species was one of the very few species decimated during the 1969 Santa Barbara oil blowout. Several of the community assemblages described in Section 2a (5) do not occur in the area described in the DES, but occur further south in the Southern California Bite. (Refer to Jones, 1969)

Page II-259, 261 - Fay (1971) should be changed to Fay et al. (1972)

Page II-285 -- The Guadelupe fur seal is not listed as endangered by the U.S. Fish and Wildlife Service. It is listed in the "Threatened Wildlife of the United States" 1973 Edition.

Section II-F. -- Page II-301, paragraph 2, line 2 -- Anacapa Island is a National Monument and is not to be developed. What is meant by the phrase, "... Anacapa is ripe with development opportunities."

12 [ Section II-F.7 -- Page 340-44 -- The percentages for different fishing methods total 98%, not 100% -- why?

13 [ Page 353, paragraph 2 -- More recent estimates should be included here. These figures are five years old and more recent data is available.  
We feel the entire section (7a. and b.) should be expanded considerably. The relationship between fishing and offshore platforms should be discussed and more detailed references should be provided throughout the section.

14 [ Section II-F.8 -- This section should include a discussion of potential mariculture sites and how the proposed action would effect them.

15 [ Section II-F-11 -- Mineral Resources Section -- Although this section gives a complete description of the terrestrial mineral resources, no areas of present or potential offshore mineral resources are mentioned. If there are no offshore mineral deposits, it should be indicated, so that the reader could get a better feeling of the offshore environment. If mineral deposits are present, that may be economical to mine in the future, but are not being mined at this time, it should be indicated in the text.

16 [ Section II-F-12 - page II-391, paragraph 2 -- This paragraph should indicate a table on existing tanker mooring facilities in Santa Barbara Channel. Offshore Petroleum Resource, 1971, Resource Agency of California has information on above tanker facilities.

17 [ page II-392, Table II-54 -- Table II-54 should include: 1) platform Harry at Point Conception by Phillips, and 2) 3 ocean floor walls at Elwood by Atlantic Richfield, et al.

II.G.I - Air Quality

18 [ page II-396: line 8 should read "all of Ventura County....."

19 [ Section II-G.2. Water Quality  
page II-415, 2nd paragraph, 2nd sentence: It should be pointed out that industrial wastes are not always discharged directly from their originating source, but are often directed into municipal waste systems.

20 [ page II-417 --Simply indicating that an effluent is discharged at a depth beneath the ocean surface does not show that there is not an osmotic shock to the marine organisms, or that the effluent mass is diffused throughout the water column. If there has been any physical and chemical constituent monitoring at effluent discharge sites, it would greatly enhance this discussion to indicate the reference.

21 [ page II-418, 1st paragraph -- An attached copy of the Hillhouse permit could give the reader a better understanding of present Federal permits. Any monitoring reports around and/or at the discharge site would help indicate if the discharger is meeting the Federal permit.

22 [ page II-423, 1st paragraph, last sentence. Is 1974 correct, if so what was the status at the end of 1974?

23 [ Section II-H, page II-435 -- The Geological Survey indicates that annual fishery catch values fluctuate (in the short term) from year to year, and that the fluctuations will continue.

23 [ Long range historical trends dating from the 1930's and 1940's have shown a reduction of several important commercial species, as well as a general reduction of overall catch. It can, therefore, also be argued that important popular species, as well as overall catch, may continue to decline over a period of many years.

Section III-B.

No comment

24 [ Section III-C.2.a -- This section discusses the impact of structures during the operational phase. The positive aspects of platform placement are discussed in more detail than the negative aspects. It may be appropriate to give an equally detailed description of the adverse impacts of the operational phase in the FEIS.

25 [ Section III.C.2.6 -- page III-16, 3rd paragraph -- Does this paragraph, which shows municipal waste water to have a large mass emission rate, have any relevance to the DES. Just because one industry is discharging huge amounts of a pollutant, does not mean that another industry discharging smaller amounts of the pollutant, has an impact that may be overlooked.

26 [ This discussion of the impacts of drilling muds emphasizes the use of chrome lignosulfonate in the gelled seawater drilling muds. In an example prepared for BLM with reference to the Southern California EIS, one company--ARCO--makes the statement:

"The use of chrome materials, oil and other toxic materials in offshore mud systems has been avoided for several years. Sodium lignosulfonate has replaced ferrochrome lignosulfonate in offshore mud systems."

A copy of this report was sent to Mr. Price McDonald of the Geological Survey, Conservation Division, Branch of Marine Oil and Gas Operations.

27 [ On page III-18 the mud used to drill the typical 8000 foot well calculates to be lighter than seawater--an obvious error.

28 [ page III-16 -- paragraph 4, sentence 3 -- Information on dilution would help to describe the dispersion effect.

29 [ Paragraph 5 -- What is the source of this information.

page III-29 --(a) Blowout and Caprock Rupture -- 1st paragraph, last sentence-- "Care should be taken that casing is run to sufficient depth to prevent formation damage by exposure to pressures from deeper zones."

30 [ This particular item is quite significant to Santa Barbara residents as it was the cause of the original big blowout that stirred up so much controversy. The word care should be expanded to show what actual requirements USGS will require in the form of precontract requirements, stipulations, etc.

Section III.C.3. Oil Spill Estimates page III-35 -- The data in "Petroleum in the Marine Environment" by the National Academy of Sciences/ Washington, D.C./ 1975, disagrees with the data presented. The EIS refers to McCaslin, 1972, and show the 1971 U. S. offshore production as 618 million barrels per year or 1.7 million barrels per day. The EIS goes on to estimate the total loss due to minor spills from U. S. offshore facilities as 1,500 barrels per year or 63,000 gallons, rather than the 662,203 gallons you indicate.

31 [ All this data, however, is very misleading, and will be extremely difficult to justify in the context in which it is used. Spill ratios have little meaning in the Santa Barbara area with its few wells, when the majority of the data comes from the Gulf of Mexico with its many wells and much longer history, and entirely different conditions. Also, why pick data 5 years old, when more recent data is available?

A major spill will completely change the data base. If one is just going to consider small spills, it could be tied into natural seepage.

32 [ page III-73 -- Pipeline trenching operations and the resultant impacts should be discussed, especially if any marsh or other unique habitat is trenched. It is recommended that reseeding should be with the same species as existed prior to construction, and that planting of native shrubs and trees not only be planned but required.

33 [ What type of construction techniques would be utilized when pipelines cross beaches, marshes, or other critical areas? Also, would bulkheads, shell mounds, or other techniques be used to prevent erosion and saltwater intrusion?

34 [ Slope stabilization could be enhanced by requiring use of rip rap, mulch, or other methods common to construction practices. Some quantification of the estimated acreage that would be devoted to onshore construction should be presented.

35 [ Section III.E.2.6, Oil Spills -- page III-78 -- The statement is made that it is highly unlikely that the total maximum volume of stored oil would be spilled. This should be explained. Is it because of some type of baffles in a single large storage container, or will there be several small storage containers, etc?

36 [ The initial statement at the beginning of the second paragraph indicates that a major oil spill during dry weather can be readily handled with only modest, local adverse environmental effects. Experience seems to indicate that a major spill has never been readily "handled". Also, this statement conflicts with the next statement of local massive pollution if the same spill occurs in wet weather.

37 [ page III-80 -- How much acreage of native habitat area would be removed, and for what period of time? What types and approximate quantities of pollutants would be emitted from the onshore storage and treatment facilities?



Section III.L.3. Impact of Spill on Air Quality

38 [ The section is too brief and does not adequately address the problem. For example, what impact would occur from a large and small case spill with the discharge lasting over a several day period. There would be an overnight accumulation of pollutants that would be added to during the next day. Also, what would the onshore increase in air pollution be for a small and large spill. It is recommended that some modeling be done to establish pollutant amount durations, and onshore areas which would be impacted.

39 [ Page III-120 -- Reference 29 is not complete.

Page III-133 -- The Baker (1971a) and 1971b) references are not listed in the bibliography.

Recovery of marsh plants is dependent upon whether or not oil penetrates into the sediment surrounding the root system of the plant.

To cite the Nelson-Smith (1973) summary of Baker's work:

40 [ Heavy pollution is much more damaging because large volumes of oil can soak into the bases of plants and kill their growing points. Penetration of oil into the substratum has direct effects by spreading around root systems and reducing normal bacterial activity or oxygen content. This is indirectly affected by smothering the shoots of plants such as *Spartina* which pass oxygen into the soil via their roots. Baker (1971f) demonstrated a great reduction in this oxygen diffusion when the leaves were painted with oil and pointed out that the roots of healthy *Spartina* are surrounded by brown, oxidized mud whereas after repeated oiling of the plants, this becomes blackened and anaerobic. Bacterial degradation of oil is largely aerobic and, under such reduced conditions, may be very much slowed down.

Chan did not report that there was very little damage to communities on rocky surfaces as indicated on p. III-135. There was little damage to the mussel community, but Chan indicated there was a significant decrease in marine life after the oil spill on other reefs in the area. Most severely affected were acorn barnacles, limpets, and striped shore crabs (Chan, 1972).

Page III-165 -- The DES indicates that, marine organisms accumulate hydrocarbons, but eventually deplete them. The possibility of temporary concentration of hydrocarbons in the food chain and the consequent increased danger of carcinogens or toxicity as the result of this temporary concentration should be indicated.

41 [ Section III.H. -- Table III-9 on p. III-176 should perhaps be updated to project the lower demand forecasts now being anticipated. (Source - FEA Project Independence Blueprint)

42 [ Table III-10, p. 178 is mislabeled somewhat. Perhaps a caption such as "Sources of Petroleum supply of petroleum consumed..." may be more appropriate.

Section III.0.2 Summary - Impacts on Air Quality

43 [ Page III-221, line 1 states "Very minor impacts on air quality would result..." In case of a large case spill or another volume spill lasting several days, this statement would no longer be true. In addition, there will be a negative impact from onshore operations. The section should be expanded for more accuracy.

Page III-221: line 11 - The subject of low level chronic spills is not discussed.

44 [ Page III-222: line 1 - What types of impacts are to be expected, amounts of each type, and duration. This is important because certain types of onshore pollutants are decreasing each year while other types are increasing. The section should be expanded to include the onshore impact from offshore generated pollutants.

Page III-222: line 4 - Fumes from fires and the volatilization of spills do not disperse in a rapid fashion. An impact would result. Some discussion should be directed to the most probable onshore areas where the impact would be the greatest.

45 [ Section III.0.3. p. III-222. This section should be expanded. There are many potentially adverse effects (possible concentration of fish at potential pollution sources) that should be discussed. No mention is made of interference with drifting seine fishermen.

46 [ Section III.0.4. p. III-224. The statement -- "habitat impact for benthic organisms for the most part would be positive "...is debatable. There would be a slight addition to the sessile epifauna habitat, and therefore the addition of epifaunal individuals, but also a consequential decrease in the natural infaunal habitat and resulting decrease of the normal infaunal individuals.

47 [ Page III-232, item 10, paragraph 1, line 3 -- Change to read: "The U. S. Coast Guard recommends that permanent platforms not be within one-quarter mile of sea lane boundaries."

Section IV.A.1.a. p. IV-2 -- Should also include OCS Order No. 11 dated May 1, 1975 and OCS Order No. 12 dated December 1, 1974.

48 [ Section IV.A.1.g. Pacific Area OCS Orders -- p. IV.-11. There are 12 Pacific Area OCS Orders. The appropriate information should be included in this section. The last sentence "OCS Order, No. 12 will likely be effective December 1974" does not seem applicable on July, 1975.

Section IV.A.4.a. Organization Formed by Companies for Spill Containment and Removal -- p. IV-33

49 [ The U. S. Coast Guard National Strike Force, Pacific Team, commanded by LCDR Wiechert, represents a significant capability that can be on site within 2 hours. This should be included along with their equipment. Additionally, there is a significant Navy clean up crew at the Construction Battalion Base in Pt. Hueneme that was not included.

50 [ The P.I.C.E. cooperative group noted has changed their name to "Clean Coastal Waters".

Section IV.A.4.b. Clean Seas, Incorporated -- p. IV-35.

51 [ Clean Seas has a published inventory last dated April 1, 1975, which represents a significant increase in equipment over the January 1974 last noted. This also invalidates the list on p. IV-39, (2) Equipment and Materials to be Purchased by late 1974. It gives the impression that no one has paid much attention to this section for at least a year and therefore ought to be brought up to date.

Section IV.A.6. Mitigating Factors Involving the Relationships of Potential Activities to Shipping -- P. IV,-50.

52 [ The one-half mile boundary from sea lanes was correct at the time the paragraph was written, however, the U. S. Coast Guard is now in process of getting 1/4 mile approved.

53 [ Section IV.0.5. p. III-225, 2nd paragraph, 3rd sentence. From Kolpack\*, it is found that during the Santa Barbara incident, oil slicks usually penetrated a short distance into suspended sediment plumes (shown in Figure 2, page 345). This indicates that oil from the Santa Barbara blow-out are not dispersed with sea water, and could possibly cover bottom sediment.

54 [ Section V.A.1 and 2. This is a somewhat optimistic outlook as many of the impacts, unavoidable or otherwise, are somewhat speculative.  
P. V.5. -- The statement that the duration of the impact on the benthos will last up to 2 years, apparently does not consider the time required for a destroyed population to reach reproductive age. This time is unknown for most species, but for a community in total, the members probably will require at least 5 years. This is based on the age at sexual maturity of the goose neck barnacle (Straughn, 1971) and the assumption that there are a significant number of other species requiring a similar time to reach reproductive age.

\*Kolpack, R.L. 1971. Biological and Oceanographical survey of the Santa Barbara Channel oil spill. Allan Hancock Foundation. Volume II, p. 342 and 345.

55 [ Section V.C. p. V-6. No mention is made of interference with seine fishermen. What about interference in the event of an oil spill and as a result of increased boat traffic. The statement that "methods of commercial fishing, other than trawling, are largely unaffected by offshore structures or pipelines" is not correct.

Section V.I. page V-9 Unavoidable Adverse Impacts - Air Quality

56 [ The text should attempt the kinds and amounts of pollutants that will not be abated through equipment control etc.

57 [ Section VII.B. p-VII-1. Considerably more detail is needed.

58 [ Section VIII. The alternative of energy conservation could be expanded for the FEIS. See the Preliminary Coastal Plan of the California Coastal Zone Conservation Commissions for conservation policies being recommended to the California legislature.

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References used for Biological Comments:

Chan, G. 1972. A study of the effects of the San Francisco oil spill on marine organisms. Part 1. Kentfield, California, College of Marin, 78p.

Jones, G. G, 1969. The benthic macrofauna of the mainland shelf of Southern California Allan Hancock Foundation, Monogr. Mar. Biol. 4:219p.

Nelson-Smith, A. 1973. Oil pollution and marine ecology. Plenum Press, N.Y. 260p.

## RESPONSE TO BUREAU OF LAND MANAGEMENT

1. In our view, a single treatment of the alternative to encompass all possible aspects of future development would be inappropriate, complex, and unnecessarily confusing to the reader. As stated in the referenced passage, it was discussed on subsequent pages in the context of separable categories of possible actions.

The passage has been revised in the final statement to reflect post-draft receipt of proposals for Federal actions.

2. The reader has been referred to the appropriate portions of section III.
3. Section I.E.5. and 6. (tables I-1 and I-2) contain estimates for the number of facilities, exploratory and development wells and potential production for each of the four possible levels of Santa Barbara Channel development. Tables III-7 and III-8 give a hypothetical 40-year time frame for the possible levels of Channel development.
4. Normally, sea water is used as drilling fluid for this type of shallow coring. Occasionally, small amounts of clay (bentonite) are added for viscosity. Discharge of small amounts of this sea water-clay mud would likely result in only very brief local turbidity.

The evidence is indirect, e.g., recolonization of the ocean bottom within 8 months (section III.C.2.b.(1)(b)).

5. These suggested changes have been made where appropriate.
6. Various geological and geophysical studies by private concerns as well as the Geological Survey will continue to be performed in the Channel

for many years concurrent with present production activities and possible future oil and gas activities.

7. This entire page has been rewritten to more clearly present the present situation as to earthquake design criteria.
8. Recommendations accepted and text modified to reflect suggestions.
9. Please see section II.G.2.b.(2) for ASBS discussion.
10. The subspecies involved is indicated by use of the trinomial in the scientific name in the FES.
11. The text has been modified as appropriate.
12. The difference was due to rounding off.
13. Sections II.F.9.a. and b. have been expanded considerably.
14. Other than information on kelp harvesting, no data on potential mariculture in the Channel area exists.
15. A discussion of Santa Barbara Channel potential mineral resources other than oil and gas has been included in section II.F.13. Presently, no minerals other than oil and gas are extracted in paying quantities from the Santa Barbara Channel, however, it is possible in the future that gravel, phosphorite, manganese and other minerals will be extracted from the Santa Barbara Channel ocean floor in paying quantities (also refer to the response to the Bureau of Mines).

16. Table II-66 and figure II-46 list and locate the existing tanker mooring facilities in the Santa Barbara Channel.
17. Platform Harry was abandoned and removed in July 1974.
18. This error has been corrected in the revised Air Quality Baseline section II.G.1.
19. Suggested revision has been incorporated into the text where noted.
20. Produced waste water discharged at a depth below the ocean surface does not guarantee that some degree of very local osmotic shock or high salt concentration gradients do not occur right at the discharge point. However, the rate of produced waste water discharge is small in comparison to the net current flow through past the platform. Hence, normal sea water diffusion kinetics along with the constant renewal of the receiving water volume, result in very low constituent concentration just a few meters away from discharge points.

Table II-68 presents typical produced waste water characteristics from a Santa Barbara Channel lease. Produced waste water in the Channel is essentially similar in makeup and concentration to sea water thus its impact on the receiving water volume is very slight even with minimal dilution.

Also section III.C.2.b.(1)(c)(i) of the DES discussed a monitoring study made on produced waste water discharge effects from Continental Oil Company activity in the Channel.

21. The Hillhouse discharge permit issued by the U. S. Geological Survey may be reviewed at the USGS Pacific Area office in Los Angeles. It

was not reproduced in the DES since appropriate discussion of it was provided in section II.G.2.d.(3) of the DES text. The Geological Survey does agree that receiving water quality does give some indication of the effectiveness of effluent quality control and regulation. See sections II.G.2.c. and d., and IV.A.1. c. and d. for updated discussion on EPA permits and regulations.

22. The 1974 date was correct and discharge has essentially been eliminated in favor of subsurface injection into platform wells.
23. We concur. Additional data is presented in section II.F.9.a., Commercial Fishing. Intensity of fishing is an important factor.
24. Negative aspects of platform structures are addressed in the DES in a manner which was felt to be adequate and appropriate.
25. The purpose of including municipal discharge of chromium into the Channel in this section was not to justify additional, much smaller amounts of its discharge by oil operations, but rather, to merely put such additional discharges into proper perspective.
26. Ferrochrome lignosulfonate (Q-Broxin) has recently been used in some Santa Barbara Channel mud systems.
27. The weight given is the weight of the mud components added to the sea water, not the weight of the sea water plus the other mud components.
28. Dillution and dispersion of discharged drilling muds would be a function of mud type, and discharge rate, concentration of constituents, sea water characteristics, discharge regime, water column exchange rate, and etc. Hence, generalization on drilling mud dispersion would not be useful.



29. Reference is at end of paragraph.
30. The reader is referred to the OCS Order casing requirements in section IV.A.1.g.
31. The comment is acknowledged and estimates of spillage have been re-assessed. The difficulty of making accurate predictions of spill ratios using data, much of which is from a number of years past and from Gulf of Mexico OCS operations, is known.
32. The recommendations are noted. Pipeline routing would be regulated by appropriate State, Federal, and local entities which would likely result in the avoidance of marshes or other unique habitat to the extent feasible. In any event, environmental considerations would be taken into account for a site-specific proposal.
33. Refer to section I.D.7.a. for construction methods for pipelines and III.D.1. for impacts from same.
34. See table III-17 for acreage estimation of onshore facilities.
35. Frequently, there is more than one storage tank and also, normally, there are several treating and separating facilities that would contain a portion of the oil.
36. This paragraph simply indicates that a major onshore spill resulting from landsliding and flooding during wet weather would be more difficult to contain and, depending on the facility location, oil could possibly reach the near shore marine environment. Normally, during dry weather, the impact of an onshore spill is relatively local as compared to an offshore spill.

37. See table III-17 for acreage estimation of onshore facilities. The estimated figure of 30 acres minimum would be the amount of native habitat removed and would be for the life of the facility, about 40 to 50 years.

See the revised and much expanded air quality impacts section III.LL.1.b. for onshore facility air emissions.

38. Refer to the revised and expanded section III.LL.1.d. which addresses the air pollution impacts of oil spills.

39. Page III-120. We concur, however, this is a direct reproduction of a CEQ publication.

Page III-133. Please see revised references, section III.

40. The text has been revised for consistency with these observations. The text has been changed also to include the National Academy of Sciences (1975) finding that there is no evidence for food web magnification in the case of hydrocarbons in the marine environment.

41. The reader is referred to several more recent forecasts.

42. The table has been deleted.

43. Refer to the revised and much expanded sections on Oil Spill Air Pollution Impacts, section III.LL.1.d. and Onshore Facilities Air Pollution Impacts, section III.LL.1.b.

44. Refer to the greatly revised and expanded Baseline Air Quality and Air Quality Impacts sections II.G.1., and III.LL. respectively.

45. This is a summary section. For added detail see section II.F.9.a. and b., Commercial and Sport Fishing.
46. The statement has been deleted.
47. One mile has been changed to 1/2 mile.
48. OCS Orders 11 and 12 have been included, also, the status of other existing OCS Order revisions has been updated.
49. The Coast Guard and Navy are indicated in section IV.A.4.b. as agencies that have clean-up equipment and capabilities.
50. This name change has been made.
51. The Clean Seas inventory of clean-up equipment has been updated.
52. It is noted that the Coast Guard is presently considering a one-fourth mile boundary from sea lanes.
53. We recognize Kolpack's observation that oil slicks in 1969 following the Platform A spill penetrated a short distance into suspended sediment plumes and refer to this observation at the bottom of page III-126. Due to mixture of the oil with sediments and formation of tar balls, it is unlikely that oil would cover bottom sediments over any significant area.
54. The text has been modified.
55. Reader is referred to other portions of text which go into detail on all these aspects.
56. Refer to the greatly revised and expanded Baseline Air Quality and Air

Quality Impacts sections II.G.1., and III.LL. respectively.

57. Refer to section II for cataloging natural resources and section III for impacts.
58. Refer to the revised and expanded section VIII.G. on the alternative of energy conservation provided in the FES.



# United States Department of the Interior

BUREAU OF MINES  
2401 E STREET, NW.  
WASHINGTON, D.C. 20241

August 5, 1975

DES 75-35

## Memorandum

To: Director, Geological Survey

From: Director, Bureau of Mines

Subject: Draft environmental statement, Geological Survey, Oil and Gas Development in the Santa Barbara Channel, Outer Continental Shelf Off California

Personnel in our Western Field Operation Center, Spokane, have reviewed this draft statement for oil and gas development in OCS lands lying generally north of latitude 34°N, west of longitude 119°, and east of longitude 120°30'. Only a part of the OCS in the Santa Barbara Channel has been leased by the Federal Government to date.

A wealth of information has been provided in this statement on all phases of offshore drilling. Its discussion of onshore mineral resources of Ventura and Santa Barbara Counties is adequate. However, no offshore mineral resources other than oil and gas are discussed.

1 The statement page II-383, vol. 2, correctly reports that ". . . most populated areas face depletion of their major sand and gravel resources within the next three decades, unless a sand and gravel deposit can be set aside as natural resource zones for future use." The ocean floors contain part of the Nation's future sand and gravel resources and the bottom sediment map of the draft statement for OCS Sale No. 35, Vol. 4, shows where sand and silty sand deposits occur in the Santa Barbara Channel. We therefore suggest that the statement identify, if possible, other mineral resources, such as sand and gravel, that might be found in the channel area that can supply future needs.

Also the statement would benefit from a discussion as to the effects that leasing would have on submerged mineral resources other than oil and gas. The documents should identify the areas where other mineral development would be prohibited. In the draft statement for OCS Sale No. 35, vol. 2, page 313, the areas surrounding hardware installations, platforms, subsea



clusters, and transfer pipelines are listed as areas which understandably must be restricted from any type of development. This statement, DES 75-35 might indicate what areas are to be withdrawn from other such developments and the duration of such withdrawals.

2 If there is a relationship between the three volumes of this statement and the four volumes of the draft statement relating to the proposed 1975 Outer Continental Shelf and Gas General Lease Sale, Offshore California, OCS Sale No. 35, it should be noted. Page I-20, last paragraph, of this statement recognizes the "Proposed Regulations Pursuant to Geological and Geophysical Exploration in the Outer Continental Shelf," DES 75-30, however, nowhere in this statement are there any references to the permits and requirements specified in DES 75-30. For instance, on page I-22, Part C, "Shallow Coring and Soil Sampling," and Part III-6, 7 and 8, "Geological Exploration," the proposed regulations in DES 75-30 would require a permit for drilling more than 50 feet of consolidated rock, page 11, Appendix A, top paragraph. Other geophysical methods will require a permit also, yet no reference to such requirements can be found in the DES 75-35.

Other than the points raised above, we believe your statement is a job well done.

Acting Director



RESPONSE TO BUREAU OF MINES

1. Presently no minerals other than oil and gas are extracted from the Santa Barbara Channel OCS. However, in the future it is possible that sand, gravel, phosphorite, manganese and other minerals could be recovered from the ocean floor in paying quantities. Mining of such minerals could be accomplished with minimal conflict with existing oil and gas operations. At present, offshore mining technology for the retrieval of authigenic and terrigenous mineral resources is in its infancy. At such time as proposals for commercial extraction of these submerged minerals and techniques are defined, conditions and stipulations to further minimize possible conflict can be prepared. (See section II.F.13)
  
2. See section I.F.3.a. for a discussion of the relationship of possible levels of oil and gas development considered in this statement to those resulting from OCS lease sale 35.



# United States Department of the Interior

BUREAU OF OUTDOOR RECREATION  
WASHINGTON, D.C. 20240

IN REPLY REFER TO:

E3035  
(DES 75-35)

JUL 24 1975

Memorandum

To: Director, Geological Survey

From: ~~Assistant~~ Director, Bureau of Outdoor Recreation

Subject: Review of Draft Environmental Statement, Oil and Gas Development in Santa Barbara Channel Outer Continental Shelf off California (DES 75-35)

The three-volume draft environmental statement, submitted by your June 10, 1975 letter, presents a generally clear, objective, and thorough analysis of impacts associated with the proposed action. There remain, however, certain areas of concern within our jurisdiction which will be addressed in the following paragraphs.

1 We are concerned with the possibility of oil spill damage to the several coastal resources potentially eligible for Marine or Estuarine Sanctuary or National Landmark status. If an oil spill impacts upon a sandy beach, then a condition will result which may last from weeks to several years or more, and the probability of a beached spill reaching a sandy beach within the area is very high as nearly all of the potentially-affected shoreline has been classified by the California Department of Parks and Recreation as "sandy beaches [suitable for]--swimming" (California Coastline Preservation and Recreation Plan, 1971). The size of the beach affected can vary from less than a mile to many miles depending upon conditions in the area at the time. Heavily contaminated beaches will be rendered unsuitable for recreation so long as they remain contaminated with oil. Further, if mechanical means are employed in beach clean-up operations (bulldozers, front end loaders and other earth moving equipment) as was done following the Santa Barbara and Arrow oil spill incidents, then shoreline equilibrium may be upset by beach removal. Excessive removal of beach materials can lead to erosional problems unless enough sand and gravel, for example, are available to replace the removed beach materials. A



Director, Geological Survey

loss of sandy beaches for recreation might therefore be expected as a result of clean-up operations from the "inevitable" spill. Any of these impacts could jeopardize possible inclusion into the aforementioned types of reserve status.

Although the DEIS indicates that the presence of offshore oil structures will enhance the recreational fishing potential, it should be noted that only a very small user group will be able to take advantage of this opportunity, and then only if fishing vessels are allowed (or willing) to navigate within close proximity to the drilling structures. In addition, it has been stated by the Bureau of Land Management (DES 75-8, OCS Sale No. 35, volume 2, page 426) that the sportsfish catch following the Santa Barbara spill was only 10 percent of the catch during comparable six-month periods. Therefore, any statements regarding potential net gain in fishing potential is questionable. In addition, closure of harbors to prevent oil incursion could result in prevention or restriction of boat use for considerable periods of time. As a loss of several thousand boating days is not improbable from such events, this loss in recreation opportunity should be noted in the final EIS.

While we agree that potential impacts to recreation use and resources are difficult to quantify (page III-199), it is possible to identify impacts most likely to occur, and also to relate such impacts to historic losses in recreation opportunities. Insofar as is possible, the final EIS should quantify impacts during all phases of resource development. Areas needing clarification include the length of time that recreation beaches would be disturbed during pipeline construction, nearshore waters made turbid during trenching, and clean-up time and costs. Further, the final EIS should reflect the fact that clean-up operations, especially with detergents and steam, may be more detrimental to sea life than leaving the substrate untouched or mechanically cleaned only.

On page III-199, in the last sentence, the term "would" should be changed to "could."

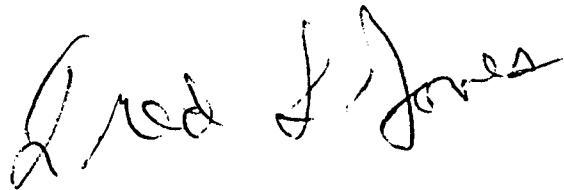
2 [ On page III-200-202, the comments regarding the Land and Water Conservation Fund are generally enlightening but might appear more useful if a breakdown of coastal L&WCF-funded projects were identified separate from the county groupings listed. If desired, our Pacific Southwest Regional Office can furnish this information.

3 [ The final EIS should mention that even though dispersion of air-borne pollutants is expected to occur (section III-L-3), the entry into the

Director, Geological Survey

atmosphere of large amounts of volatilized or combusted hydrocarbons, sulfur oxides, and oxides of nitrogen may not only adversely affect human health, but may also fatally damage forest trees. Technical assistance on this subject is available from the U.S. Environmental Protection Agency, the California Air Resources Board, and the Southern California Association of Governments (SCAG--Air Quality Division) in Los Angeles. Consideration of such impacts may be particularly important in view of Los Padres National Forest's current multiple-use plan which gives priority to protection of watershed values, maintenance of aesthetic quality, and enhancement of recreational opportunities, and also because the National Forest is expected to provide recreation opportunities to replace those lost at oil-covered beaches.

Thank you for the opportunity to comment on this project.

A handwritten signature in black ink, reading "Fred J. Jones". The signature is written in a cursive style with a large, prominent initial "F".

BUREAU OF OUTDOOR RECREATION

1. The information presented is appreciated. Section III has been modified to note this information where appropriate.

The Sport Fishing Institute has expressed, in the letter reproduced elsewhere in this section, its opinion on the use of platforms for sport fishing.

You state that the final EIS should reflect the fact that cleanup operations, especially with detergents and steam, may be more detrimental to sea life than leaving the substrate untouched or mechanically cleaned only.

According to the California State Oil Spill Contingency Plan, the use of any such substances "shall be supervised and enforced by the Department of Fish and Game." That should help prevent any significant damage to the marine environment which might result from the cleanup itself.

2. For the purposes of this statement, the county breakdown was considered sufficient. However, your informative input as to the breakdown of coastal L&WCF-funded projects separate from the county groupings is appreciated and is provided to the reader, following this response.

California Coastal Land and Water Conservation  
Fund-funded projects (Data received from  
Bureau of Outdoor Recreation, December 1975)

<u>Project Number</u>	<u>Project Title</u>	<u>Total Obligation</u>
138	Aquatic Park Acquisition	24633.00
134	Aquatic Park Development	154581.00
258	Berkeley Fishing Pier	43082.76
19	Marine Park	100000.00
5	Alameda Creek - Coyote Hills Par	819996.64
338	San Leandro Shoreline Pk Dev.	93743.00
133	Point Richmond Shoreline Park Dev.	249900.00
372	Martinez Fishing Pier	67848.50
294	Point Pinole	773911.00
151	Clifford Kamph Memorial Park	20298.00
359	Fort Ross State Historic Park	
	Acquis	371535.00
95	Mouth of Mad River Fishing Acces	39592.28
299	Abalone Cove Beach Acq.	1428000.00
145	Nicholas Canyon Beach Acquisition	1486650.00
237	Torrance - Redondo Beach Acquis	202470.00
385	Beach Acquisition	140250.00
306	Long Beach Marina + Park Dev	188777.00
305	Long Beach Marina + Park Acquis	127500.00
170	Beach Lot Acquisition	158545.00
34	San Pedro Public Fishing Pier	372233.40
245	Will Rogers State Beach Dev.	449055.00
298	Dockweiler Beach Development	325380.00
246	Cabrillo Beach Development	111479.66
238	Redondo Beach Park	189465.00
236	Santa Monica-South Bay Bicycle	
	Trail	626918.00
311	Upper Tomales Bay Wildlife Area	153218.87
210	McNear's Beach Park	166199.82
119	Bay Front Park	267750.00
273	North Bay Front Park	344811.00
378	Richardson Bay Lineal Park Dev	22950.00
379	Richardson Bay Lineal Park Acquis	0.00
422	Russian Gulch State Park	130560.00
314	Noyo River Fishing Access	49573.00
351	Manchester State Beach No. 2	178500.00
309	Manchester State Beach Addition	100470.00
274	Del Monte Dunes	759504.00
256	Bolsa Chica State Beach	393214.00
111	Sunset Beach Parking	489064.50
115	Bolsa Chica State Beach Addition	1938000.00
350	Huntington Beach Addition	649984.00
283	Main Beach Park Acquis-Phase II	174420.00
213	Main Beach Park Dev	318240.00
415	Crescent Bay Point Acquisition	280500.00
6	San Clemente Beach Acquisition	280925.00
7	San Clemente Beach Development	8319.00

California Coastal Land and Water Conservation  
Fund-funded projects (Data received from  
Bureau of Outdoor Recreation, December 1975)  
(Continued)

<u>Project Number</u>	<u>Project Title</u>	<u>Total Obligation</u>
341	Doheny Beach Acq.	313869.00
249	Mission Point Development	197217.00
304	Cardiff State Beach Addition	825500.00
269	San Onofre State Beach Project	173400.00
343	Batiquitos Lagoon Beach Access	50524.00
268	Carlsbad State Beach Addition	331500.00
404	"J" Street Beach Access	56100.00
97	Buena Vista Lagoon Wildlife Area	127500.00
11	Mission Beach Aquatic Park	127990.69
27	Ocean Beach Park	74190.53
10	Mission Beach Aquatic Park	7800.00
226	Harbor Drive Bicycle Path Dev.	166260.00
407	Ocean Frontage Access Acquisition	85935.00
375	Warmwater Cove Public Access Dev	32706.00
253	Pismo State Beach Addition	388933.65
243	Foster City Regional Park	331500.00
175	North Montara Beach	313650.00
174	Pacifica Fishing Pier	563151.00
301	Ellwood Pier Project	61200.00
289	Leadbetter Beach Restroom	28050.00
9	Shoreline Park	100000.00
8	Shoreline Park	325000.00
13	Shoreline Park	1175000.00
14	Shoreline Park	25000.00
420	Castle Rock State Park Acquisition	19890.00
386	Moran Lake Park Acquisition	51000.00
131	Santa Cruz Pier	117292.81
93	Twin Lakes State Beach Add	131325.00
141	Stillwater Cove Park Acquisition	99450.00
247	Gualala Point Park Development	108936.00
266	Point Mugu State Park Expansion	2149650.00
130	Emma R. Wood State Beach Acq.	691050.00
109	Hollywood Beach Park	28050.00
296	Mandalay Beach Acquisition	994500.00

3. The identification and quantification of potential air pollution emissions and their impacts from the possible levels of Channel development have been addressed in full detail in the greatly enlarged air quality and air impacts sections II.G.1. and III.LL. Also the last three lines reflect a "worst case" condition, and assume the Los Padres



DEPARTMENT OF THE ARMY  
LOS ANGELES DISTRICT, CORPS OF ENGINEERS  
P. O. BOX 2711  
LOS ANGELES, CALIFORNIA 90033

SPLED-E

30 July 1975

Mr. Henry W. Coulter  
Acting Director  
U.S. Geological Survey  
U.S. Department of the Interior  
Reston, Virginia 22092

Dear Mr. Coulter:

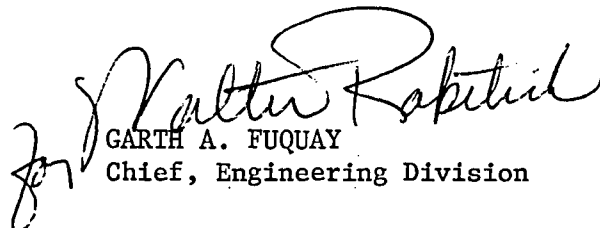
This is in response to your letter of 10 June 1975 in which you requested our review and comments on the draft environmental impact statement on Oil and Gas Development in the Santa Barbara Channel Outer Continental Shelf off California.

The proposed action is not expected to interfere with Santa Barbara Channel navigation.

The draft EIS indicates that drilling may pose a high degree of risk to the marine environment. However, we believe that the risks of oil spills along the coast due to drilling and the possible esthetic damage to the coastline are offset by the risks inherent in the alternative of relying on the use of large tankers which could represent a bigger threat of oil spill than does an offshore drilling rig. This impact should be discussed in the draft EIS.

Thank you for the opportunity to review and comment on this draft statement.

Sincerely yours,

  
GARTH A. FUQUAY  
Chief, Engineering Division





**UNITED STATES DEPARTMENT OF COMMERCE**  
**The Assistant Secretary for Science and Technology**  
Washington, D.C. 20230

September 16, 1975

Mr. Henry W. Coulter  
Acting Director  
Geological Survey  
United States Department of  
the Interior  
Reston, Virginia 22092

Dear Mr. Coulter:

We have now received additional comments from the National Oceanic and Atmospheric Administration on the draft environmental impact statement on "Oil and Gas Development in the Santa Barbara Channel Outer Continental Shelf Off California." These additional comments will, therefore, supplement our letter of September 2, 1975, on this subject.

General Comments:

1 [ The magnitude of proposed oil and gas development in the Santa Barbara Channel area can probably be predicted with some degree of accuracy. The impact of this development is much harder to predict because of the large number of variables relating to potential catastrophic events (i.e. collisions, earthquakes, blowouts, etc.) The statement fails to address the impact of a number of such catastrophic events occurring simultaneously or in close proximity to one another. It also fails to assign any probability to events which are likely to occur.

2 [ A basic problem with the draft environmental impact statement is that much of the information on the marine environment is not current enough to allow valid environmental impact assessments to be made. The statement should include specific recommendations for future biological studies which could augment those portions of the data base which are outdated.



2.

Specific Comments:

VOLUME 2

II. Description of the Environment

E. Biology

2. Marine Biology

a. Marine Organisms of the Santa Barbara Channel Region

(5) Sublittoral Zone (to approximately 200m)

3 Page 264, paragraph 3. The reference to figure II-36 should be changed to figure II-35. Figure II-35 indicates that there are 33.51 square miles of kelp beds around the offshore islands. The text states that there are 39 square miles of kelp beds around the offshore islands and a total of 69 square miles in the Channel Island area. This discrepancy should be explained or the data should be adjusted to conform with the referenced figure.

Table II-21

4 Page 271. The total percentage of classified communities has been incorrectly added. This should be corrected.

(7) Pelagic Environment

(b) Nekton

(i) Neritic Nekton

Page 279, Species list. The tabular list of species includes both sandy shore and rocky shore fishes. The rocky shore species are those fishes listed from giant sea bass through ling cod and the table should be separated on that basis.

(8) Marine Mammals

Table II-25

5 Page 288. Additional occasional or limited seasonal visitors to the California inshore waters include the following: Pacific Right Whale (Balaena glacialis), Sei Whale (Balaenoptera borealis), Finback whale (B. physalus), Sperm Whale (Physeter catadon), Pygmy Sperm Whale (Kogia breviceps), Harbor Porpoise (Phocaena phocaena). The miscellaneous beaked whales (Family Ziphiidae) include: Baird's Beaked Whale (Berardius bairidi), Hubb's Beached Whale (Mesoplodon carlhubbsi), and Cuvier's Beaked Whale (Ziphius cavirostris).



3.

Table II-28

6 [ Page 289. The Totals in years 1969 and 1970 are incorrect.

7. Fishing

a. Commercial

Table II-43 and II-44

6 [ Page 345-348 - Several of the total pounds and total value figures presented in these tables have been added incorrectly and should be refigured.

8. Mariculture

a. Kelp

7 [ Page 357, paragraph 1. The annual dollar value of kelp harvested in the Channel area should be provided if available.

8 [ G. Air and Water Quality

2. Water Quality

b. Water Quality Objectives

(2) Areas of Special (Biological) Significance

8 [ Page 405, paragraph 3. Areas of special biological significance need to be more explicitly defined. "Waters surrounding the Santa Barbara Channel Islands" does not provide enough information to determine the exact extent of the area under consideration.

d. Waste Discharge Related to Oil Production

(4) Produced waste water from State and Federal Santa Barbara Channel platform

(b) Federal Platforms

9 [ Page 421, Figure II-47. The column indicating the concentration of "settable solids" has been mislabeled.

III. Environmental Impact of Santa Barbara Channel Oil and Gas Development.

C. Impact of Drilling and Production Platform

1. Construction Phase

4.

Page 11, paragraph 4. The conclusions presented in this paragraph regarding adverse effects of platform construction on the marine fauna should either be substantiated or deleted.

- 2. Operational Phase
- a. Impact of the Structure

10 Some discussion on the effect that the maximum number of platforms and an increase in ship traffic could have on the migratory behavior of cetaceans should be presented here and in Section III. J. 1. a. Some cetaceans are on the endangered list and every effort should be made to protect any existing populations.

- b. Impact of Platform Activities
  - (1) Debris and Pollutants other than Oil
  - (c) Produced Wastewater
  - (i) Discharging into OCS Waters

11 Toxicity Bioassay  
Species used for bioassay should be representative of the organisms found at the site of the discharges. Because marine organisms may exhibit varying degrees of sensitivity to contaminants throughout their life cycles bioassay data should take this into account.

- (d) Sewage

12 Page 27, paragraph 1. The actual volume of treated effluent expected to be discharged into OCS waters should be stated.

- D. Impact of Pipelines

13 Page 53. Site specific information concerning benthic flora and fauna along proposed pipeline routes needs to be provided so that an accurate assessment of the impact of placing a pipeline by any of several methods may be developed.

- 14 L. Impacts of Major and Minor Oil Spills on Marine and Littoral Environments
  - 1. Formation and Drift of Oil Spills

5.

Page 121, paragraph 2. The statement that man-caused oil spills are probably much less important than natural seepage to the Channel should be either substantiated or deleted.

15 [ Volume 3  
VIII. Alternatives to the Further Development of Oil and Gas Resources of the OCS Portions of the Santa Barbara Channel  
G. Alternative Sources of Energy  
8. Energy Imports  
a. Oil

Page 62, Table VIII-2. The metric tons and percent of oil pollution contributed by offshore operations should be indicated in the table.

As indicated in my earlier letter, we would appreciate receiving eight copies of the final statement.

Sincerely,



Sidney R. Galler  
Deputy Assistant Secretary  
for Environmental Affairs

DEPARTMENT OF COMMERCE (September 16, 1975)

1. One must recognize the remote possibility of a number of catastrophic events occurring simultaneously. However, it is impossible to assign probabilities to a situation that may never have occurred during the history of oil and gas operations. Refer to section III.K.1.b. for a discussion of the problems involved in assigning probability to pollution causing events that may occur as a result of further oil and gas development in the Santa Barbara Channel. For general spill probability discussion see the excerpt from the "Council on Environmental Quality 1974 Report--Statistics on OCS Accident, Oil Spill, and Chronic Discharges" (section III.K.3.). Also see section III.K.4.; this section on Santa Barbara Channel spill probabilities has been added to the final statement.
2. As noted, there are deficiencies in the available data base. Specific recommendations for future biological studies are properly within the charter of the academic community, research institutions, and local, State, and other Federal agencies--in addition to the U.S.G.S.

Continued biological studies are being sponsored by BLM. Hopefully these will augment the data base. Please see response to hearing comment no. 11. (section IX.A.)

(pertaining to pages 2 through 5)

The specific comments are useful, and the text has been changed accordingly.

3. The arithmetic has been recalculated and changed in the text.
4. Please see added note on table II-21. Addition was incorrect in the original source.

5. The text reflects these changes.
6. These figures have been corrected.
7. Refer to expanded kelp harvest discussion in section II.F.10.
8. See section II.G.2.b.(2).
9. The figure has been corrected as necessary.
10. Sentence deleted.

Tables I-1 and III-17 in the DEIS indicates the total number of platforms expected will be between 10 and 21 and the increase in tanker traffic will be insignificant. The determination of platform siting will consider environmental factors such as effects upon marine mammal mitigation. Therefore, the impact on endangered cetaceans should be negligible.

11. The statement is noted. The data presented is that available.
12. OCS sewage production would be several acre feet per year per platform.
13. Without a site-specific proposed plan of development, it is impossible at this time to obtain site-specific information. Future consideration however will be given to pipeline routes, case-by-case at the appropriate time.
14. Section III.L.1. has been revised for clarification and substantiation.
15. See figure III-9. Spillage from U. S. offshore operations in 1970 was 13,285 tons metric, less than 1/3 of 1% of the total from all sources. Worldwide offshore operations contribute 100,000 metric tons or 2% of the sources of oil pollution. These figures do not include natural seepage.

In section III there are several presentations of percentages of ocean pollution from various sources (e.g., tanker spills compared to spills from all other offshore oil and gas operations).



**UNITED STATES DEPARTMENT OF COMMERCE**  
**The Assistant Secretary for Science and Technology**  
Washington, D.C. 20230

September 2, 1975

Mr. Henry W. Coulter  
Acting Director  
Geological Survey  
United States Department of  
the Interior  
Reston, Virginia 22092

Dear Mr. Coulter:

The draft environmental impact statement "Oil and Gas Development in the Santa Barbara Channel Outer Continental Shelf Off California", which accompanied your letter of June 10, 1975, has been received by the Department of Commerce for review and comment. The statement has been reviewed and the following comments are offered for your consideration.

The draft environmental statement is carefully prepared and edited. It is a professional job, and the editor should be commended for his work.

- 1 One section in Volume 2, pp III-122 to III-124 is deficient. Given the substantial climatological and oceanographic data presented on pp. II-153 through II-175, and the prospective leasehold areas as mapped on Plate I, a much better job of estimating the potential oil spill drift trajectories and probable points of impact on shore and island beaches could have been done. The compilation of drilling platform oil spill data contained in pp. III-100 through III-109, when employed in conjunction with the above information, should be used to estimate the area of potential impact with time under at least the four major seasons of the year, and for the climatological extremes of wind and sea. These affected areas should be mapped and a brief discussion of the physical factors prevailing at each location should also be treated in the section on Contingency Plans, pp. IV-32 to IV-50.
- 2 Limitations of oil spill recovery techniques caused by prevailing weather and sea conditions should be addressed also in the Contingency Plan section.



2.

3 [ There should be more discussion on the impact of the development of onshore treatment facilities on the coastal environment. Particular attention should be paid to the impact on any coastal wetlands.

4 [ Chronic oil spills and leaks can be seriously disrupting to the environment, especially over the long term. Although the industry does not have, as of yet, an efficient method of detecting these chronic leaks (below 1.4% - page II-65) automatically, the possible environmental damage should not be ignored. Further research into more efficient methods of detection as well as further research into the effects of these chronic leaks should be continued. In any area where it is determined that such chronic leaks will cause significant environmental disruptions, serious consideration should be given to curtailment of operations in that particular area.

The seismic conditions of the area are adequately covered. Strong support is given to further geological and geophysical research, establishment of an adequate seismic disturbance detection system and further development of sturdier platforms. There should be no development in highly hazardous areas where adequate protection can not be provided.

The detailed discussion of technology and practices throughout the draft environmental impact statement indicates a highly developed "state of the art" with many safeguards against adverse effects on the environment. The various regulations pertaining to undersea pipeline (pp. 117-125, Vol 1) would also seem to provide good protection from unwanted leaks, with early detection and rapid remedy for leaks that occur.

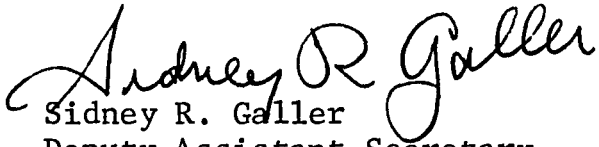
5 [ While various estimates are provided (e.g., pp. 126, 1136, 141, 142, 145, 153, 164) regarding the number and size of facilities that would be required for development, much is dependent on the quantity of oil and gas available - a factor which does not currently seem to be known with a large degree of certainty. Thus, the environmental impact seems dependent on that unknown. If more information could be developed on this matter, the environmental impact statement would be a more useful document.



3.

Thank you for giving us an opportunity to provide these comments, which we hope will be of assistance to you. We would appreciate receiving eight copies of the final statement.

Sincerely,

  
Sidney R. Galler  
Deputy Assistant Secretary  
for Environmental Affairs

DEPARTMENT OF COMMERCE (September 2, 1975)

1. Estimates of oil spill trajectories for several locations and conditions are addressed in the expanded section III.L.1. on Oil Spill Trajectories.
2. Limitations of spill recovery equipment and techniques are included in sections IV.A.4. and IV.A.5. on Contingency Plans and Status of Oil Spill Containment and Cleanup Technology, respectively.
3. The discussion has been expanded in section III.M.1.  
With the very limited amount of wetlands (estuarine, lagoon and marsh) extant in the area under consideration, it is inconceivable that construction of shore treatment facilities would even be contemplated in these areas. The possibility becomes even more remote with the issuance of the final California Coastal Plan (see III-168 of the Plan).
4. Your recommendations are acknowledged. The special considerations given to "Areas of Special Biological Significance" and to cultural resources protection accomplishes to a considerable degree your recommendation on curtailment or restriction of operations in particular areas.

All research results will be considered as they become available, and environmental aspects will be carefully considered.

5. Refer to section I.E. and table I-2 for the estimated potential oil and gas production from the possible levels of oil and gas development.

ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

OCT 2 1975

OFFICE OF THE  
ADMINISTRATOR

Dr. Vincent E. McKelvey  
Director  
U.S. Geological Survey  
Department of the Interior  
Reston, Virginia 22092

Dear Dr. McKelvey:

The Environmental Protection Agency in accordance with its responsibilities under the National Environmental Policy Act and Section 309 of the Clean Air Act has reviewed the draft environmental impact statement on Oil and Gas Development in the Santa Barbara Channel Outer Continental Shelf. Specific comments are attached.

1 [ We commend the Survey on the preparation of an environmental impact statement for the Channel area and on the format of the analysis which examines the four possible levels of oil and gas development activity in the area. However, we recommend consideration of a fifth developmental level which would defer all further leasing or development of deepwater or high risk tracts in the area, until the requisite technology is more fully demonstrated. Our recommendation for consideration of this fifth developmental level reflects our continued concern for the use of proven technology that will provide protection of the environment, while achieving maximum efficient resource extraction.

2 [ EPA is concerned about the possible selection of either developmental option that would entail additional exploratory activity on existing or future leases, if this decision would mean the development of tracts in the Channel before completion of State coastal planning efforts. The State of California is proceeding on its Coastal Plan which, when completed, will provide for and help mitigate the extensive effects of the onshore development associated with OCS oil and gas activities. We recommend no action be taken to foster additional development until the necessary planning is accomplished. In addition, we would encourage the continued preparation of environmental impact statements such as the statement on the Santa Ynez Plan of Development, as site specific decisions are made for increased exploration or development in the area.

3 [

In summary, we would have environmental reservations about selection of options three or four involving additional exploratory activity on existing or future leases. Our specific comments detail areas that could be strengthened, and focus on the analysis of anticipated onshore sale-induced impacts. The remainder of our comments deal with deepwater technology issues, the proposed National Energy Reserve, and the time focus of the environmental impact statement.

We thank you for the opportunity to review this document and look forward to receiving the final statement for review.

Sincerely yours,

A handwritten signature in cursive script, appearing to read "Sheldon Meyers".

Sheldon Meyers  
Director  
Office of Federal Activities

Enclosure

Environmental Protection Agency  
Comments on Draft Environmental Impact Statement  
for Oil and Gas Development in the  
Santa Barbara Channel

Introduction

4 [ The proposed Federal action under consideration involves selecting one of four different levels of development for oil and gas resources in the Santa Barbara Channel. The possible levels of development are: (1) continue production from existing leases; (2) develop new production from existing leases on which oil and gas capable of being produced in paying quantities has been discovered; (3) explore and subsequently develop existing leases on which no discoveries have been made in the Santa Barbara Channel; or (4) lease, explore, and develop presently unleased acreage in the Outer Continental Shelf (OCS) of the Santa Barbara Channel. This action is most significant in that it contemplates a vastly increased commitment to development and production of oil and gas in the area. The Santa Barbara Channel is adjacent to the major metropolitan complex on the West Coast; it is an area renowned for water oriented recreational resources, and an area of known geologic hazard.

EPA commends the Department of the Interior for preparation of a programmatic environmental impact statement encompassing the entire Santa Barbara Channel and for the concept of the four-level analysis. EPA believes that this programmatic environmental impact statement is a necessary and important input to the significant actions being contemplated.

However, as the comments which follow indicate, we encourage preparation of environmental impact statements for any subsequent site specific decision on exploration, development or production activities. The exploration, development, and production activities which follow leasing of OCS lands involve widely varying impacts depending on the extent of reserves discovered and the rate and timing of development factors which are presently unknown and must be assumed.

Our comments focus upon six principal areas of concern: (1) the environmental risks of deep ocean drilling requiring radically new deepwater technologies; (2) potential conflicts regarding the Proposed National Energy Reserve; (3) onshore impacts; (4) mitigation through intergovernmental cooperation; (5) offshore development and associated impacts; and (6) time focus of the EIS.

#### Environmental Risks of Deep Ocean Drilling

The draft statement contemplates oil and gas development in water depths considerably greater than have been attempted in other United States OCS areas. The costs and the technological difficulty of ocean drilling, platform and pipeline construction, and facility operation and maintenance increase exponentially as water depth increases. New and as yet untested technology, including subsea production systems, will be required to develop oil and gas resources in these waters. The risks of deepwater OCS development are compounded by the acknowledged geologic instability of the Santa Barbara Channel. On page 445, Volume 2 of the draft environmental impact statement (DEIS) for Lease Sale Number 35, the Bureau of Land Management noted,

"The capability of a subsea production system to withstand an earthquake, slumping, sliding, or other potential geologic hazard is unknown at this time." In the absence of proven fail-safe technology, EPA believes that subsea completions cannot be considered as a viable alternative.

Furthermore, because of the lack of technological information and empirical evidence on which to base a reasonable judgment that development of deepwater tracts can be accomplished without unacceptable environmental damage, EPA has environmental reservations about proposed actions that would result in offering tracts requiring the use of untested technology.

EPA strongly recommends consideration in the final statement of a fifth level of development of the Santa Barbara Channel. This level would propose postponing the sale or development of tracts with the greatest risk or which are in the deepest water while continuing exploration on existing leases for the purpose of confirming the development possibilities of known potential oil fields. Once the development potential of the existing fields had been confirmed, development of those discoveries could proceed in shallower waters with the least environmental risk. An economic benefit could accrue by reducing the requirement for the more sophisticated and costly production techniques needed for high risk or deepwater tracts. As development proceeded into deeper waters, there would be opportunities to use proven technology and to test and demonstrate new prototype deep water technology.

Since the Santa Ynez Unit involves a platform for water depth much greater than that of existing Channel production platforms, EPA recommends that if all approvals are granted, new deepwater technology employed in the installation and operation of this platform be closely monitored. We suggest all monitored information be made available to the public and the rest of the industry so that future leasing decisions might include consideration of experience with these techniques. In this manner, development might proceed in an orderly fashion into deeper waters with a minimization of risk to platform workers and to the marine environment. In this connection, we also recommend consideration be given to a  
5 special provision for the implementation and testing of subsea production facilities in the Hondo Field to provide more experience with this type of technology as well.

Further, if this fifth developmental option were implemented in the Santa Barbara Channel, consideration might first be given to the proposed platform on Lease V-P0202. This action might then be followed by further exploration of the unnamed potential field in the Santa Clara Unit on Lease I-P-0215 and the unnamed potential field in the Pitas Point Unit. When information on new technology for the above areas had been analyzed and after new deepwater techniques had been demonstrated in the Hondo Offshore Field, the Sacate Offshore Field might be considered.



In view of the potential risk of deepwater operations employing new technology in a seismically active area, EPA believes it is essential that OCS leases include language which informs bidders of investment risk. In the event that subsequent research or experience determines that development of certain leases or development with certain technologies is environmentally unsatisfactory, it is important that the Department of the Interior have appropriate language in the leases which would retain the maximum legal options that are available within the existing authority. This would permit the Department the utmost flexibility to modify (and perhaps to deny) operating permits, and to provide an opportunity for public involvement.

#### Potential Conflicts Associated with Proposed National Energy Reserve

Approximately 85 percent of the total California State lands offshore, including the Santa Barbara Oil Sanctuary, are held in petroleum resource sanctuaries that are legislatively excluded from any petroleum drilling. Large areas of potential Federal offshore leases and the proposed National Energy Reserve are adjacent to either State leases or State petroleum resource sanctuaries.

6 Production on the Federal leases could deplete State reservoirs and prompt the State to accelerate its own production. If Federal production threatens to deplete reservoirs within California's petroleum resource sanctuaries, the State is bound by the sanctuary legislation to begin drilling and production within the sanctuary. The final environmental impact statement (FEIS) should clearly identify the extent of this potential conflict, and assess the environmental impact of any induced or accelerated State activity due to accelerated activities on the Federal leases.

EPA is especially concerned about the leasing of tracts within the proposed National Energy Reserve which lie adjacent to the three mile limit bordering the Santa Barbara Oil Sanctuary or the nearly pristine Channel Islands (including Anacapa Island which has been designated by the State of California as an Area of Special Biological Significance). EPA is also concerned about the leasing of tracts within the proposed National Energy Reserve which lie within the shipping lanes, require deep ocean drilling and/or may lie atop geologically hazardous areas. The complexity of assembling a new boundary for the National Energy Reserve is appreciated. However, EPA believes the final statement should provide a full discussion of the range of options and impacts of the proposed National Energy Reserve.

#### Onshore Impacts

7 The development of the Santa Barbara Channel OCS will result in secondary onshore impacts. Onshore activities and facilities which are required to service the construction of and production from OCS oil and gas facilities include oil platform fabrication sites, boat docks, storage yards, pipeline corridors, pumping stations, tank farms, intermodal transfer facilities and onshore pipelines. Oil refineries, petrochemical processing facilities and electrical generating plants are among the activities and facilities which will seek locations in the coastal zone in order to take advantage of the availability of OCS oil and gas produced either as a raw material or as a source of energy. In turn, these facilities and activities will induce incremental additions to community facilities such as roads, sewers, schools, housing and transit facilities and other public

services. The product of this complex matrix of change is of particular concern to EPA because of serious potential conflicts of coastal land use and resource management with the ability of State and local governments to provide the necessary urban infrastructure, and with the ability to control the generation of waste residuals in the form of wastewater discharges, air pollutant emissions, and toxic materials. It is clear that secondary effects of OCS leasing and subsequent production, as they are manifest over time, will be equally as important as the direct and primary effects.

While the DEIS generally does a commendable job of disclosing the direct and primary effects of and mitigative actions for OCS activity in the Santa Barbara Channel, the discussion of secondary effects and mitigation measures could be improved in the following instances:

#### Socio-Economic Impacts

a. The discussion of socio-economic impacts in Section III is predicated upon population and employment projections for the State of California prepared by the State Chamber of Commerce. No justification is provided for using the Chamber of Commerce projections versus the official projections of OBERS or those published by the State Department of Finance. The projections used in the DEIS not only exceed the current official D100 series baseline values, but they also exceed the upper limit planning estimate of the D150 series. In discussing the employment benefits of OCS development, the DEIS cites the Chamber of Commerce estimate of 170,000 new jobs needed annually statewide through 1980. There is no explanation as to why these figures were preferred over those of the State Department of Finance.

b. The secondary pricing effects throughout the economy, public revenue impacts, and equilibrium effects of the proposed action are not adequately analyzed. The DEIS omits opportunity costs relating either to the four levels of OCS development in the Channel or alternative energy sources. Thus, for example, the discussion of energy requirement impacts on page III-186 states that OCS development will provide critically needed energy supplies but omits a discussion of the net or balance concept of energy production. There should be consideration of the net energy production from the Santa Barbara OCS, particularly in deep water, versus alternative energy sources, including for example, the alternative of increased conservation and "storage and shut-in capacity" discussed in U.S. Energy Policy: Alternatives for Security, Resources for the Future Inc.

c. Ultimately, (in 20-30 years, but with peak production expected eight years after discovery) the economic activity associated with development of nonrenewable OCS resources may end. The social and economic costs of adjustment to this potential outcome must be considered in assessing regional economic and environmental impacts. In the post production period the sponsors of significant OCS employment and capital investment will have to discover new economic purposes, possibly in the face of smaller energy supplies. Irreversible commitments of land to urban uses induced by OCS related activities will make it difficult, if not impossible (see page III-3), to continue to rely upon the current agricultural and tourism economies of Santa

Barbara and Ventura Counties. In addition as noted on page III-13, "Disturbance to commercial fishing operations... could vary from minimal to significant." With the aerospace industry, Southern California has already seen the long-term difficulties which resulted from rapid and intensive growth of one facet of the economic base and the impacts following the demise of that economic sector. To the extent feasible, the final environmental impact statement should consider this major long-term consequence of the proposed development levels, the Federal responsibility and opportunities for mitigation, and the alternative of a balanced (mix of energy sources) energy development program on the economic well-being of the area.

d. The DEIS (page III-181) states that over an eight year period the peak labor force required in Santa Barbara and Ventura Counties for OCS development in the Channel will be about 3,500 employees. From this, it is concluded that "any aggregate socio-economic impacts within the Santa Barbara Channel area are expected to be minimal." The basis for these projections are unstated, and it appears that these projections consider only employment in primary OCS field development activities, thus possibly understating the real impacts on population, shifts in economic markets, and public services. The DEIS emphasizes the economic benefits of OCS development, but fails to analyze the economic benefits of developing alternative sources of energy, thereby leaving the impression that the benefits are unique to OCS activities.

e. On page III-117 the DEIS speaks to the issue of the relationship of OCS Channel development and California's self-sufficiency in oil by 1980. The implied significance of this discussion is misleading since

California, as a State, does not represent the sole market for OCS oil and gas and since evaluation of other energy alternatives, such as increased conservation and storage and shut in capacity are not examined in the same context.

f. The discussion of probable impacts upon the recreation industry appears incomplete. For example, on pages III-183-185, a summary by Mead and Sorenson of the costs of the 1969 Platform A oil spill is cited. This summary, which is not in 1975 dollars, lists the property value loss as \$1,197,000, yet attendant note (5) indicates that \$4.5 million has been fully recovered by property owners in a class action suit. These estimates of loss are for a single event and do not represent the impact of greatly expanded oil development and transport being considered for the Channel. Nor does the summary consider the unknown risks of deep ocean operations. Similarly, on page III-199 it is indicated that "Development activities could cause increased turbidity of that water in localized areas, making swimming undesirable; conditions would return to normal with no lasting effects." But on page III-180, it is indicated that the development phase could last fifteen years; and again the long term cumulative impact is not analyzed.

g. The discussion of impacts of not developing OCS resources (III 186-189) proceeds from an assumption that a growing energy demand must be satisfied, thereby discounting conservation. From this assumption of a critical need for energy, the DEIS singles out one sector, environmental protection and pollution control, to illustrate the essential nature of the demand. The analysis does not consider the very small relative contribution to energy demand of

pollution control versus such other sources of demand as private auto usage, which in 1973 represented 38 percent of nationwide energy demand.

### Impacts of Oil Support Facilities on Water Quality

8 Since Los Angeles is expected to be the major staging area for OCS activity, and production operations are expected to concentrate in Los Angeles/Long Beach, it would be highly appropriate to provide a baseline inventory of existing oil support facilities. The DEIS downplays onshore impacts by virtue of the existing industrial infrastructure. However, to say an area is already industrialized says nothing about its ability to sustain more industrialization rapidly. The degree of onshore impact depends on the availability of existing facilities and the rate of offshore development.

The DEIS treats the onshore environmental impacts of the proposed program primarily in the aggregate, while the most significant impacts could in fact be localized in areas such as Los Angeles/Long Beach Harbor, and coastal areas of Santa Barbara and Ventura Counties where pipelines come ashore or storage and refining complexes are developed.

9 NPDES records indicate that presently, the refinery capacity within California is approximately 1.6 million bbls/day. The DEIS indicates that there may be as much as 2 billion bbls. of oil in the OCS lease tracts in the Channel. There are additional reserves in the Southern California Borderland area as well as in State waters. The FEIS should estimate the need for additional refinery capacity and the corresponding need for any public investment in facilities to handle the wastes from such development.

10

Although existing sources are now under NPDES permits and abatement schedules, the longer range implications for petroleum related facilities development may be to increase the mass burden of industrial wastewaters discharged to the ocean. The FEIS should demonstrate that every effort will be made to minimize and abate any further stress.

11

The DEIS does not discuss the total quantity of solid and liquid wastes (including toxics) that will be generated by onshore activities and the availability of disposal sites over a 40 year production phase. Refineries, for example, may generate large amounts of either solid or dissolved salts. A study conducted by A. D. Little for the Council on Environmental Quality has estimated that a 100,000 barrel/day refinery with no water discharges of pollutants will generate 10,000 tons of solid wastes per year. Ancillary petrochemical complexes would result in an additional 19,000 tons of solid wastes per year. The disposal of oil from oil spills, which must be anticipated in such operations, poses additional problems.

Other environmental impacts of refineries include the need for offsite water resources. Cooling water may be ocean or fresh water, depending on the location of the refinery. The March 1975 Preliminary Coastal Plan of the California Coastal Zone Conservation Commission contains a number of policies which will tend to limit the immediate coastal zone as a location for new or expanded refineries. Therefore, much of this water demand may have to be filled by inland water sources. The lowest estimate of water used by an oil refinery which uses water cooling is 25 gallons of water per barrel of oil, though most existing refineries use hundreds of gallons of water per barrel.



Therefore, a 250,000 barrel per day refinery would require at a minimum 6,250,000 gallons of water per day.

12 The DEIS inadequately examines the impact of onshore support facilities and related increased population on fresh water supplies. The hydrology discussion for the DEIS clearly indicates that onshore areas bordering the Channel are water short, that groundwater resources are being overdrafted, and that there is a serious threat of salt water intrusion. While the DEIS considers the effect of the 20 acre feet (page III-80) per year of water used by a single onshore treatment facility, it does not consider the cumulative consumptive requirements of all support facilities and increased population that will accompany full development of the Channel's oil and gas resources. Neither does the DEIS consider the impact of this demand for water on such consumptive uses as agriculture and municipal growth.

#### Impact of Oil Support Facilities on Air Quality

13 In the Southern California area, air pollution has reached critical proportions. State and Federal efforts to abate the pollution to attain the National Ambient Air Quality Standards (NAAQS) have led to the adoption of many control strategies which affect the Federal OCS leasing program in the Channel. The siting of refineries and associated petrochemical industries in the Southern California area may be severely restricted due to air pollution considerations.

In addition, it is not possible to dismiss casually the relationship between petroleum consumption and air quality, particularly in the South Coast Air Basin. The DEIS discusses only beneficial air quality aspects of increased oil and gas production. Plentiful supplies of these fuels may in microcosm reduce pollution,

as is asserted, but the principal use of most petroleum produced and refined in California is for transportation within the state. The South Coast Air Basin has the most serious oxidant problem in the nation. In addition, ambient concentrations in excess of NAAQS for nitrogen oxide, particulates and carbon monoxide are common throughout the area, and high sulfur dioxide levels have been recorded. Increased refinery activity in an area presently violating the NAAQS could substantially interfere with the attainment of each of these standards, both directly and as a result of associated petrochemical industries. The air quality will be further exacerbated not only by accelerated leasing and production of large quantities of oil in the OCS area south of Ventura, but also by the shipment of Alaskan crude oil to the area for refining.

Refineries and petrochemical facilities in particular will be carefully regulated; any new expansion will be required to utilize equipment to meet new source performance standards (NSPS) and must secure a permit from the Air Pollution Control District (or EPA) prior to construction. Due to the existing severe oxidant problem in the South Coast Air Basin, emissions of hydrocarbons will be very closely scrutinized, and any aggregate increase in total mass emissions of hydrocarbons may be the basis for a permit denial. The very limited land in the presently industrialized area of the South Coast Basin suitable for major new refineries indicates that capacity increases will occur by replacing obsolete units with new units capable of meeting NSPS. To the extent that the new units have improved emission characteristics, overall air quality standards may be maintained.

Although the environmental impact statement is intended to be a

programmatic EIS, the following items are appropriate for discussion of air impacts in the final environmental impact statement since the total level of activity on the Santa Barbara Channel OCS leases may be significantly affected.

a. The ability to process and refine Southern California OCS and imported oil consistent with all applicable air pollution regulations in the South Coast Air Basin, including de-sulfurization capacity.

b. The estimated or probable sulfur content of the Santa Barbara Channel OCS oil and the air pollution aspects of utilizing OCS oil for electrical power generation in the Southern California service area.

c. The estimated or probable emissions of volatile gases and reactive hydrocarbons that may be derived from drilling and trans-shipment operations in the Federal OCS and the impact that meteorological transport of these gases into the Air Basin will have on air quality.

d. Alternative locations for onshore petroleum activities within Southern California that minimize air quality impacts such as fringe areas of the South Coast Air Basin, areas outside the South Coast Air Basin, and inland refineries using dry cooling towers and served by pipeline from the Channel and Los Angeles/Long Beach Harbor.

e. A quantitative estimate of the contribution of Santa Barbara OCS development to the cumulative air quality impact of all Southern California OCS oil and imported oil. The estimate should consider the impact resulting from routine onshore operations and of significant oil spills, such as those that might accompany seismic activity along the coast or a large tanker accident in the Los Angeles/Long Beach Harbor (page II-80-81).

## Mitigation of Onshore Impacts

The FEIS should address the overlapping Federal, State, and local jurisdictions and the appropriate roles for each in mitigating the extremely serious onshore environmental impacts associated with the proposed action in the Santa Barbara Channel.

In November, 1972, the California Coastal Zone Conservation Act was enacted to provide long-term planning for coastal resources now widely recognized as irreplaceable. The California Coastal Zone Conservation Plan will be submitted to the California State Legislature for adoption on December 31, 1975. The inherently large scope and impact of offshore oil development activities could preempt areas of concern in the plan. The award of leases prior to completion and adoption of the Plan would mean subsequent drilling, production, transportation, and refining activities which could conflict with both onshore and offshore plan elements now being refined after extensive public hearings. The potential conflict with the Coastal Zone Management Plan assumes even greater importance since the jurisdiction of the Coastal Commissions includes not only the immediate coastal zone but also the Channel Islands.

Federal development of the California OCS will require pipelines, onshore storage tanks, and related production facilities. These developments will require the approval of the Coastal Commissions, and if any facilities are located on submerged State lands, the State Lands Commission. Coordination between these becomes increasingly important as efforts accelerate to exploit the offshore oil and gas resources.

EPA recommends the Department of the Interior direct special attention in the final statement to delaying exploration and/or development (as described in the third and fourth levels of possible activity in the Channel area) until onshore impacts of OCS development, including cumulative environmental impacts, have been defined sufficiently to enable formulation and implementation of long-term mitigation commensurate with the scope and timing of the impacts. In the Santa Barbara Channel this would mean the postponement of further development of new fields or new leases until legislative adoption of the Preliminary Coastal Plan (no later than December 1977). While the proposed coastal plan provides, by far, the best effort to date to mitigate the adverse impacts of OCS development and plan wisely for its benefits, efforts are underway to refine and improve further the ability of State and local government to manage their environment. The National Oceanic and Atmospheric Administration has allocated \$300,000 to the California Coastal Zone Conservation Commission to improve State capabilities to plan for and manage the projected or potential onshore impacts induced by Federal OCS

actions. Among the specific uses of these funds are establishment of siting criteria for OCS support facilities, identification of appropriate and inappropriate sites and conditions, formulation of controls on siting and operation, and analyses of impacts and timing of additional induced growth at various levels of OCS development. In addition, the Federal Energy Administration and the Department of Housing and Urban Development have joined with the State Lands Commission, State Energy Commission, State Office of Oil and Gas, Air Resources Board, State Water Resources Control Board and other State agencies to determine onshore OCS impacts in Southern California and the adequacy of State management capabilities by July, 1976.

#### Offshore Activities and Associated Impacts

##### OCS Discharges:

The discussion on discharge of produced waste water (page III 20) generally implies that brines are relatively harmless. This conclusion is made in the absence of any supporting data except for a single sample taken from a platform that no longer operates. As mentioned in the draft EIS for OCS Lease Sale 35, there is little data that relates to the impact of continuous discharges of brine waste containing heavy metals, oil, and other toxic substances such as ammonia and phenols on the marine ecology of the area.

##### Dos Cuadras, Carpinteria and Hueneme Fields:

Pages III-38-40 discuss further development of the Dos Cuadras and Carpinteria Offshore Fields and Hueneme Offshore Potential Field. The final environmental impact statement would be improved by an estimate of how many wells and how many platforms are necessary

for the development of a single oil field. For instance, is the purpose of proposed Platforms C and Henry in the Dos Cuadras and Carpinteria Offshore Fields to recover the oil resources in a more timely manner or are they necessary to recover all the available oil in the fields?

Transport of Oil:

EPA has received the results of its contract with Booz, Allen and Hamilton, Inc. entitled A Risk and Cost Analysis of Transporting Southern California Outer Continental Shelf Oil. The alternative transport modes considered are tankers or barges and pipelines. While none of the three oil fields evaluated were in the Santa Barbara Channel, one considered transport from the Santa Rosa Cortes (North) Field to Ventura. Pipelines were found to be the least costly alternative for all three sites evaluated, with the cost decreasing as distance to shore lessened. Furthermore, the estimates of total volume of oil spilled over the life of each field indicated that pipelines are safer by a factor of 5 to 7. Earthquake risk was not found to be a significant factor in estimating the volume of oil spilled by an offshore pipeline over the life of an oil field.

18

Based upon the results of the above study and factors cited in our comments on the DEIS for Lease Sale No. 35, EPA believes that tanker and barge operations from this area are inferior to pipelines. EPA further concurs with the DEIS and CEQ conclusions that oil transport by pipelines has less environmental risk than transport by tanker or barge. EPA encourages consideration of lease stipulations which would ensure that the safer mode of transport to be used so that potential bidders could plan accordingly. The final environmental statement should also discuss the environmental impacts of the several

possible routes for a pipeline to refineries in the Los Angeles/ Long Beach area.

### Oil Spills:

While it is true that there is no conclusive evidence that a major oil spill results in long-term impact on the marine environment, the reason it is true is because little is known about the long-term impact of oil pollution. Therefore, a statement implying that there is no long term impact has no scientific basis.

19 The DEIS treats the environmental impacts of oil spills from the proposed OCS Channel development activities primarily in the aggregate, while the most significant impacts could in fact be localized. Thus, for example, Figure III-9 "Sources of Oil Pollution to the Oceans 1969-1970," is not particularly meaningful for estimating the pollution contribution of shipping and offshore production in the Santa Barbara Channel because of the concentration of OCS activity and shipping (including Alaskan crude oil transport). The aggregate level of oil spills must be put in the perspective of number, magnitude, location and recurrence for meaningful impact analysis to be performed.

### Oil Spill Cleanup

20 Regarding the technology of oil spill cleanup and control, the section entitled Status of Oil Spill Containment and Cleanup Technology (Pg. IV-48) may be misleading. This section states that ". . . the oil industry has developed safety equipment and procedures that . . . provide for effective cleanup in the event of a spill." The material which is presented to substantiate the quoted statement consists of a



listing of the equipment owned by or available to Clean Seas, Inc., (the cooperative which would most likely clean up a spill in the Santa Barbara Channel), a report that the Exxon Bottom tension boom ". . . contained natural seep oil in six-to-eight foot seas," and a brief description of the USCG High Seas Boom.

However, testing of oil spill control equipment at the EPA OHMSETT facility, under controlled conditions, has revealed that both inland and especially offshore equipment for spill control has a great deal of development effort yet to be performed before we can confidently state that the technology of cleanup is "effective". While the DEIS seems to make clear the probability of a major spill from a platform, the actual nature and consequences of a cleanup operation are not presented.

#### Mitigatory Actions for Offshore Impacts

The environmental impact statement should fully discuss overall coordination of Federal and State offshore production as well as cooperative planning among the relevant agencies and oil companies in order to minimize the impacts of development. The discussion should include consideration of the following topics:

a. In regard to coordination, BLM should consider the requirement of a lessee's submittal of a 5 and 10 year plan of development for the use of the local governmental units. Such a plan would outline the schedules of offshore development in relation to the construction of onshore support facilities. This plan could serve as a vehicle for planning coordination and act as an early warning device for possible conflicts.

b. In the past, the location of pipelines and support facilities serving the OCS has been determined by industry initiative and economic incentive. To minimize construction in offshore and onshore areas, every effort should be made to unitize (share by more than one company) pipeline rights-of-way, marine terminals, and storage and separation facilities. In addition, wherever possible, unitization with oil operations in the State submerged lands should be accomplished.

c. The areas around the existing ocean outfalls are known to contain highly organic substrate and high concentrations of heavy metals and DDT. Pipeline routing should completely avoid these areas in order to prevent resuspension of these deleterious materials.

d. All pipelines and/or channel dredging in existing harbors where high concentration of heavy metals in the sediment are known, should be carefully performed (i. e. no jetting) to minimize resuspension. Serious consideration should be given to land disposal of all polluted spoil with clean fill imported to backfill over pipelines.

e. Pipelines should be completed and in operation prior to the commencement of production in order to avoid the use of barges with their known high spill characteristics.

Time Focus of the EIS:

The EIS would be improved by focusing on phases and cumulative effects. The DEIS attempts to identify the time frame for various separate activities expected to occur during exploration, development and production phases. However, the discussion of timing is fragmented throughout the statement. As a consequence, the statement does not take into account the cumulative effects of OCS activities in the Santa Barbara Channel on the marine and the onshore environment.

The cumulative effects of oil and gas extraction activity in the Santa Barbara Channel cannot be viewed in isolation from the additive impacts of other proposed or likely development, including increased OCS activities elsewhere in the Southern California Bight, increased tanker traffic due to crude oil imported from Alaska, LNG tanker and terminal operations, and deepwater port proposals. EPA appreciates the difficulties of forecasting cumulative impacts over time. However, in the absence of such considerations, the actual impact upon the social, economic and environmental condition of Southern California could be seriously underestimated particularly with respect to onshore impacts. For example, before California will have significant new offshore production, "imported" oil will already be arriving via tanker from Alaska. And even with successful OCS development in the Santa Barbara Channel, it is likely that Alaskan oil would continue to come into California for trans-shipment and eventual pipeline transport to the Gulf of Mexico refining and distribution centers. Thus, despite the conclusion in the DEIS that OCS development may present fewer environmental hazards than continued reliance on tanker imported oil, California will probably have significant additional tanker traffic with or without offshore development.

EPA believes that the FEIS should catalog the other major energy related developments that will be occurring at the same time as the Santa Barbara OCS development and attempt to project at a macro level a range of cumulative impacts over time.

RESPONSE TO THE ENVIRONMENTAL PROTECTION AGENCY

1. Deep water development is actually a part of three of the four possible levels of development presented. Prior to approval of any deep water proposal the state of the art will be assessed. For example, the Exxon Submerged Production System is presently being tested in the Gulf of Mexico (see section I.D.6.d.(2)) for several years prior to being considered for installation at greater water depths such as in the Santa Ynez Unit Santa Barbara Channel. Prior to acting on a request for such a deep water installation, the Geological Survey would take into consideration the results of all testing, including several years of offshore subsea field operations and also diver depths capabilities. (See section I.D.6.b.(2) for an updated discussion of the rapid advancement of deep water diving capabilities) As drilling progresses into deeper waters technology must evolve to resolve certain problems and the Geological Survey must assess the technical capabilities and past drilling performance in progressively deeper waters prior to acting on specific deep water drilling proposals. The OCS Orders must be revised (primarily OCS Order No. 2) as the need arises in order to insure proper regulation of such deep water operations.

The recommendation to defer further leasing or development of deep water tracts is acknowledged. Variations of this type alternative are discussed in section VIII.C.D. and E.

2. The recommendation to await the completion, approval and adoption of the State Coastal Plan is acknowledged. If a final Coastal Plan is adopted by the California Legislature and approved by the U. S. Department of Commerce pursuant to the Coastal Zone Management Act of 1972,

the activities of the Department of Interior or of Federal oil and gas lessees directly affecting the Coastal Zone shall, to the maximum extent practicable, be conducted in a manner consistent with the approved coastal zone management program. The discussion of the Coastal Zone Plan has been updated and expanded in this final statement. (See sections I.F.2.a., and IV.A.1.h., the hearing comment No. 26, and response No. 38 to the Resources Agency of California (the Coastal Zone Commission comments were a part of these comments.))

3. Decisions as to the need for site-specific statements will be made on a case-by-case basis in accordance with NEPA procedure.
4. In light of the first sentence of the introduction to the specific comments, the following clarifying comment is made. The Federal Government is not proposing the four levels of development (they are possible levels of development); nor does the statement suggest the "action under consideration involves the selection of one of the four possible different levels of development." The purpose of this statement is to consider impacts that may occur as a result of these possible levels of development. (See the Preface and section I.A. for further explanation as to the purpose of this statement) Neither do we consider this to be a "programmatic" EIS. Only additional leasing would constitute Departmental program initiative, under a well-established program.
5. The concerns relating to deep water drilling are acknowledged. (See the response No. 1 above to this concern expressed in EPA's letter transmitting these specific comments)

The status of subsea production systems has been updated in this final

statement. The various systems are described and the status of the Gulf of Mexico field testing of three of the subsea systems is discussed (see section I.D.6.d.). The testing of these three prototype systems has thus far been satisfactory. These Gulf of Mexico tests are contributing significantly toward the evolution of deep water systems of the future. A new subsection has been added to this final, section I.D.6.d.(7) "Industry Assessment of the Current Status of Technology in Subsea Well Completion Techniques and Subsea Production Systems." Comments as to subsea production system status from industry in response to a Department of Interior Federal Register Notice request, are summarized in this new subsection.

The recommendation that consideration be given to special provision for the implementation and testing of subsea production facilities in the Santa Ynez Unit Hondo Field is acknowledged. (See section I.D.6.d.(2))

In section I.D.6.b.(2) two recent (June 1975) dives to below 1,000 feet are described. One of these dives to a water depth of 1,069 feet involved recovering a blowout preventer stack. This dive was performed from the drilling vessel Handrill, Offshore Labrador Canada for a consortium headed by British Petroleum Canada.

6. The ranges of options and impacts relating to the area that was once proposed as a National Energy Reserve is presented in section VIII.F. Your concern as to the possibility of leasing within the Federal Ecological Preserve and Federal Buffer Zone (which are adjacent to the State Santa Barbara Oil Sanctuary) is acknowledged. This is discussed in section VIII.E.3. and 4. Should this restricted area adjacent to the

Santa Barbara Oil Sanctuary become available for leasing, the possibility of drainage from submerged lands within the State Sanctuary would exist. However, contrary to your expression, the text did not intend to indicate that any consideration is being given to the possibility of making the Federal Ecological Preserve and Federal Buffer Zone available for leasing. The intent was to explore the fullest possible range of possible future activity. The Federal Ecological Preserve and Federal Buffer Zone is discussed in the introduction page ii.10., section I.E.5. and section VIII.E.3. and 4.

7. Response to these comments is provided in the expanded Socioeconomics baseline and impacts discussions in the final statement. (See sections II.F, Resources and III.N., Socioeconomics Impacts)

On page 11 of the EPA comments the figure of private auto usage is 38 percent of the nationwide energy demand in 1973. October 1975 statistics indicate private automobiles account for 13 percent of the uses of energy and 28 percent of the uses of petroleum (7 percent of the latter which is for all urban commuting). (Source: Automobile Club of Southern California, October 1975, Auto Club News Pictorial, p. 2) We believe that the differences in statistics cited are significant.

8. Most activity related to the possible future levels of Santa Barbara Channel Development appears likely to be concentrated in the Ventura area rather than Los Angeles. Any refining capacity requirement on the Los Angeles area would be a result of market demand and would likely result only in a substitution of domestic for foreign crude stocks.



The socioeconomic, ecological, and aesthetic impacts are addressed in the revised sections on those subjects. (See sections III.N. and III.L.)

9. As noted in response No. 8 above, any additional Santa Barbara Channel production would likely be substituted for foreign crude feed stocks in existing refineries. If this should be the actual case, additional refinery capacity would not be necessary. Refinery capacity is developed to meet market demand, not crude oil supply.
10. Waste water discharge regulations are discussed in sections II.G.2.d., IV.A.1.c., d., and g. of the FES. Those sections concern "Regulation of Waste Water Discharged into the Santa Barbara Channel OCS Waters," and the "Pacific Area OCS Orders No. 7 and 8."
11. See response No. 8 above.

The concentration, makeup, and quantity of produced waste water is a function of the formation of origin, state of reservoir development, and recovery techniques. Therefore, to exactly predict the quantity and quality of produced wastes is not possible for the potential levels of development of the Channel. Refer to section II.G.2.d. for results from existing Channel production. For an estimated range of the quantity of produced waste water that might result from the possible levels of Channel development, see table III-17.

12. An expanded discussion of water demand, consumption, and waste water treatment has been provided in the enlarged Socioeconomics Baseline section II.F. on Resources.

13. The identification and quantification of potential air pollution emissions and their impacts from the possible levels of development of the Channel have been addressed in full detail in the greatly expanded Air Quality Impacts section III.LL., Baseline Air Quality, and Meteorology and Air Impacts Mitigation sections II.G.1., II.C. and IV.B.13. have also been thoroughly revised and expanded.

14. The comments of EPA are noted.

See our response to EPA comment No. 2 which also refers to the updated and expanded discussion of the Coastal Plan in this final statement (sections I.F.2.a. and IV.A.1.h.). The socioeconomic impact and air quality impact discussion has been greatly expanded in this final statement and contributes considerably towards assessing onshore impacts that may result from the various possible levels of Santa Barbara Channel OCS development.

15. Geological Survey personnel have met with, and exchanged information with, State personnel on the task force preparing this onshore Southern California OCS Impacts Report. The State personnel made certain preliminary information available for incorporation into this final statement and the Geological Survey personnel provided detailed explanation of certain information in this statement. The Geological Survey task force has been in continuing contact with the task force leaders from the Governor's office responsible for this onshore impact study in an attempt to obtain an advance copy of the report (telephone communication almost daily during the final two weeks of December 1975). However, it appears

the subject onshore impact report will not be available prior to the printing of this final statement.

16. We concur that there is relatively little data relating to the impact of continuous discharge of brine waste containing heavy metals, oil, and other toxic substances such as ammonia and phenols on marine ecology. The study of Bryant (1974) in fresh water areas of the Canadian Arctic, cited in the final EIS for OCS Lease Sale 35, indicated that waste fluids can be considered pollutant when waste treatment is not utilized. Please note the discussion of studies of Mackin (1971) in the Gulf of Mexico, following the Santa Barbara Channel Data. The section has been revised.
17. See table I-1 for platform and well requirement estimates. See sections I.B. and E.1. and III.C.3., for specific discussion as to Dos Cuadras and Carpinteria Field development.

The number of wells and platforms required for development of a single field depends on many factors such as the extent and depth of the producing zone, and the reservoir characteristics.

18. The Booze, Allen and Hamilton, Inc. Report titled "A Risk and Cost Analysis of Transporting Southern California Outer Continental Shelf Oil" prepared for EPA was not available until after this draft statement was sent to the printer. During preparation of the final statement the Task Force reviewed this report and the information has been useful. However, it is believed that some assumptions that were made and certain considerations that were omitted from that report result in invalid transportation cost conclusions for certain of the areas.

Your statement as to the Booze, Allen and Hamilton, Inc. Report concluding that in all instances pipeline transportation cost was lower than tanker transportation cost is in conflict with table III-1 in that report. This table indicates that, for USGS low reserve estimates, on the Santa Rosa Cortes (North) Area, transportation cost per barrel is less by tanker.

We concur that the safest mode of transportation should be used when feasible. Tanker and pipeline spill statistics from numerous sources and the pipeline-tanker spill analysis in the above Booze, Allen and Hamilton, Inc. Report, suggest that pipeline transportation offers a considerably lower spill risk than marine tanker transportation. This is a generally accepted conclusion. The Booze, Allen and Hamilton comparison of the spill risk factors of tanker and pipeline transport, indicating pipelines are safer by a factor of 5 to 9 is included in this final (see section III.D.2.a.).

The discussion in section III.J.2. is the only feasibility study available to the Geological Survey and we are not aware of any other studies of possible routes. Because of the coastal bluffs between Point Conception and Oxnard, it appears that the route shown in figure III-10 for that portion of the route would be relatively geographically restricted.

Marine transportation (tanker) does have the advantage of being adaptable to the shifting market patterns, such as from Los Angeles to northern California. This flexibility may also be helpful in adjusting to possible future specific location restrictions on the installation and expansion of refineries by the Coastal Commission and the State Air

Resources Board. Refinery capacity is developed to meet market demand, not crude oil supply, however, the Coastal Zone Commission may limit such activities to certain specific areas.

19. Although one cannot conclusively state that there have been no negative ecological impacts from offshore oil and gas operations, no permanent damage to the Gulf Coast environment has been documented. An extensive study of the Timbalier Bay area where there are presently 171 platforms, some of which have been producing since 1937, has been conducted by the Gulf Universities Research Consortium (GURC). GURC has concluded that every indication of good ecological health is present in the area, that natural phenomenon have a much greater impact upon the ecosystem than do petroleum operations, that concentrations of all compounds in any way related to drilling or production are sufficiently low to present no known persistent biological hazards, and that Timbalier Bay has not undergone significant ecological change as a result of petroleum operations since 1952 when other more limited baseline data were generated.

Refer to section III.K.1.b. for a discussion of the problems in deriving meaningful spill probabilities from past statistics. Also, from the limited amount of spill incident data within the Santa Barbara Channel it is virtually impossible to derive statistically valid probability of spill occurrence figures. However, this spill probability information in the draft, which included some CEQ OCS spill probability data, has been expanded by incorporating Channel spill probability and maximum credible spill volume information from the Dames and Moore Critique of this draft statement (see section III.K.4.). The Booze, Allen and Hamilton comparison of spill risk factors for pipeline and tanker transport has also been incorporated in this final statement

(see section III.D.2.a.).

20. In the draft statement it is acknowledged that to date, no system or equipment has been developed which is effective in controlling and removing pollution under all weather and sea conditions (section IV.A.5). In the final statement the inventory of Clean Seas Inc. cleanup and containment equipment has been updated; the capabilities of this equipment are also given. Perhaps EPA could arrange with Exxon or Clean Seas Inc. to witness a demonstration of the Bottom-Tension boom. This is one of the more effective heavy duty open seas containment booms developed to date.
  
21. The statement does discuss the role and coordination of the relevant regulatory agencies. Memoranda of understanding are discussed as well as the functions of various agencies as to different aspects of regulating OCS oil and gas operations. (See the Introduction and section IV.A.1)
  - a. Lessees are required to submit plans of development to the Geological Survey and regulations have been revised to require that OCS operators submit such plans to the State. (See our response No. 4 to the State Lands Commission)
  - b. It is agreed every effort should be made to minimize the number of facilities by unitization. (See section I.E. for a detailed discussion on this matter)
  - c. and d. The recommendations are noted and will be given serious considerations in the review of any site-specific proposal.
  - e. Refer to the earlier response to the comments in regard to pipeline and barge transportation. It is agreed that pipelines should be

completed prior to commencement of production when pipelining is to be the transporting method.

22. See tables III-7 and III-8 that have been added to this final statement for a hypothetical 40-year activity time frame for the possible levels of Santa Barbara Channel OCS oil and gas development.

In the draft other possible projects in southern California were discussed (section I.F.3.). This section has been updated and expanded. An attempt has been made to assess the general impacts that may occur as a result of these other possible projects. Emphasis is on the possible activities that are likely to contribute cumulatively to impacts that may result from the various possible levels of Channel development, i.e. activities as a result of the recent OCS lease sale No. 35. (See section I.F.3.)

The possible levels of development involve a sequence of events and facilities which would each have specific and cumulative environmental effects. Substantial uncertainty exists as to the levels of development that will actually occur because most will depend upon non-governmental initiatives. Section III discusses the impacts on the environment of the various possible components required for petroleum development and production. Since there are a variety of possible components and since each component may impact different aspects of the environment, the impacts are summarized as a matrix of impacts of possible components on specified aspects of the environment (see matrices in section III.P.). The various impacts of the possible components on the whole environment are described in subsection A through J, while impacts of the total possible operations on various

environmental aspects are described in subsection III.O: Impacts of oil spills are described in subsection III.L. Socioeconomic and air quality impacts are discussed in subsection III.N. and III.LL. respectively (both greatly expanded in final manuscript). The estimated number of facilities and activities required for and possible production from each possible level of development is given in section I.E. (tables I-L and I-2). Table III-17 summarizes quantitative ranges of cumulative impacts. Rationale for deriving cumulative impacts is presented in footnotes on the table. Tables III-7 and III-8 give a hypothetical 40-year time frame for the possible levels of development. Section V consists of a summary of unavoidable adverse effects that would result from OCS oil and gas activities related to the four possible levels of development.

Concerning cumulative effects, we would not predict significant cumulative impacts, on the biological communities, as a result of the possible levels of development. As indicated throughout this statement, when exploration and development proceed without unforeseen mishaps or accidents, impacts are minor and generally of short duration. Recovery of destroyed organisms is largely supplied from outside the small area impacted.

Impacts are significant when accidents resulting in oil spills occur. The impact of chronic oil spill pollution is discussed, as to the extent it is presently known, in section III.L. According to statistics, large spills would occur unpredictively with respect to time and location and too infrequently for meaningful discussion of cumulative effects.



FEDERAL ENERGY ADMINISTRATION  
REGION IX  
111 PINE STREET  
SAN FRANCISCO, CALIFORNIA 94111



JUL 31 1975

Director, U. S. Geological Survey  
Department of the Interior  
Reston, Virginia 22092

Dear Sir:

We appreciated the opportunity to comment on the Draft Environmental Impact Statement for potential oil and gas development, Santa Barbara Channel OCS. The Federal Energy Administration is interested in the development of all available energy sources in conjunction with acceptable environmental constraints and safeguards. We have reviewed the sections pertaining to District V petroleum consumption, imports and future needs and believe that you have presented a good overview of the energy reason for proposing this action.

All of our Region IX supply-demand projections indicate a need for full development of the oil and gas resources in the Outer Continental Shelf lands off the West Coast if we are to reduce our needs for foreign oil imports to a safe level. We agree that the Alaskan North Slope oil plus OCS development should bring this relationship into a better balance as pointed out in the EIS chapters dealing with the overall energy picture.

We have the following specific comments:

Section I.E.5, Summary Tabulation of the Estimated Number of Possible Facilities at the Four Levels of Development

1 [ We suggest that the affect on refinery capacity of different levels of Santa Barbara Channel development be included to complete the picture of OCS oil's impact within the Coastal Region.

Section III.D.3.c., Pipe Burial and Buoys

2 [ In regards to the statement that burial of subsea pipelines appears unnecessary, we suggest that a more detailed explanation be included of precautions to prevent pipe ruptures due to large ships, other than trawlers, dragging their anchors over uncovered pipelines.

JUL 31 1975

Section III.0.2., Impacts on Air Quality

3

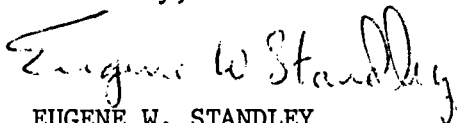
Depending upon the type of air pollution control equipment utilized by the on-shore treatment and storage facilities, impacts on air quality may not be "very minor" as indicated in the statement. Oil and gas treatment plants, and tank farms may contribute significant amounts of hydrocarbons to the atmosphere unless they include completely enclosed-vapor recovery systems for all on-shore facilities. This should be pointed out.

Section IV.A.5, Status of Oil Spill Containment and Cleanup Technology

4

Although comment is made regarding the operational capability of bottom tension booms in six- to eight-foot waves, no mention is made of capabilities in moderate currents. A better perspective of the probability of containing a particular oil spill would be available, if probability of sea-state conditions during various seasons were given.

Sincerely,



EUGENE W. STANDLEY

Director

Energy Resource Development Programs Division

RESPONSE TO FEDERAL ENERGY ADMINISTRATION

1. Refinery capacity is developed to meet market demand, not crude oil supply. Since the United States is reliant on substantial imports of foreign oil, the overall effect of possible OCS Santa Barbara Channel development would be to displace an equivalent amount of imported oil, thus decreasing the degree of dependence on imports. Only an increase in consumer demand on the West Coast exceeding present refinery capacity would result in the need to expand that capacity. Should market demand require increased West Coast refinery capacity, the specific locations of proposed refinery expansion and installation by the industry would be controlled to a large degree by the Coastal Zone Commission and the State Air Resources Board. (California Petroleum Refinery Capacity table II-54c has been updated in this final statement)
  
2. The possibility of a pipeline rupture due to anchors dragging is considered in the statement. Table III-1 indicates one major spill as a result of anchor dragging. This Gulf of Mexico incident occurred in 1967. The 160,000-barrel spill volume is attributed to the lack of adequate pipeline leak detection at that time. Pipeline leak detection and shut-in systems in operation today serve to minimize spill volumes in the unlikely event such a pipeline break should occur. Our records indicate that no major pipeline oil spills have occurred offshore California in State or Federal OCS waters. The historical record does not indicate justification for pipeline burial in deep waters except in certain unique cases. It was suggested in the SYU-FES (74-20) that pipelines totally buried may not withstand earthquakes as effectively as pipelines with portions remaining on the surface so that more independent flexibility relative to the surface can be maintained.

3. The identification and quantification of potential air pollution emissions and their impacts from the possible levels of Channel development have been addressed in full detail in the greatly enlarged Air Quality and Air Impacts sections II.G.1. and section III.LL.
4. All available information as to cleanup and containment capabilities is presented in section IV.A.4. and 5. The Clean Seas Inc. inventory of such equipment has been updated in this final statement.

Please see table II-6, Monthly percentage frequency of occurrence of waves of various heights and periods in the Santa Barbara Channel.



# United States Department of the Interior

ADDRESS ONLY THE DIRECTOR,  
FISH AND WILDLIFE SERVICE

FISH AND WILDLIFE SERVICE  
WASHINGTON, D.C. 20240

In Reply Refer To:  
FWS/OBS

AUG 11 1975

Memorandum

To: Director, Geological Survey  
**Acting Deputy Associate**

From: Director, Fish and Wildlife Service

Subject: Draft Environmental Statement, Oil and Gas Development in  
the Santa Barbara Channel Outer Continental Shelf off  
California (DES-75/35)

We have reviewed the subject statement in accordance with Acting Director Coulter's memorandum of June 10, 1975, and provide the following comments.

It has not been possible for us to exhaustively review your statement nor examine a majority of the literature cited; however, we have noted a number of sections that require additions and/or changes. Our comments are listed according to sections and/or pages of the statement.

- 1 [ The draft environmental statement provides an overview of the natural resources of the Santa Barbara Channel. However, as a general comment, the statement lacks balance. Engineering and geological aspects are presented in great detail but there is only minimal discussion of the possible impacts upon the flora and the fauna of the Santa Barbara Channel.
- 2 [ It is stated (I-122) that an oil line or lines could be routed from the Santa Barbara Channel north to either a proposed deepwater terminal at Morro Bay or Monterey. The statement should include a physical description of these areas and their natural resources and the possible impact(s) of OCS development studied in this draft EIS.
- 3 [ The section concerning marine mammals (II.E.2.a.(8)) should reflect total world populations as well as the numbers found in the Santa Barbara Channel area. This would allow a more meaningful quantification of the possible impacts of OCS development upon marine mammals. For example,



it should be noted that the estimated world populations of California sea lion (Zalophys californianus californianus) and northern (Steller) sea lion are 60,000 and 240,000 to 300,000 respectively (National Marine Fisheries Service, NOAA, Fed. Reg. 39(122):23903-23905).

4 It is stated (III.C.2.a.(1)) that disturbance to commercial fishing operations by the platforms could vary from minimal to significant depending upon factors such as species being sought...weather, and currents. Since commercial fishery statistics exist for the Santa Barbara Channel it would appear that a more analytical approach is possible. Analyses should be conducted to determine if the five existing platforms have influenced commercial fishing operations and/or harvest.

5 Offshore pipeline construction (III.D.1.a.) may lead to the resuspension of toxic heavy metals and persistent pesticides. Since pipelines could be routed around areas of high concentrations of heavy metals or other pollutants in the sediments, information should be provided indicating their distribution in the Santa Barbara Channel.

6 Section III.L.G. states that the Bureau of Sport Fisheries and Wildlife concluded that if brant had been in the 1969 spill area, as they usually are during migration, almost the entire population of this space could have been exposed to extermination. These comments should be more specifically referenced. Also, the name of the Bureau of Sport Fisheries and Wildlife has been changed to the U.S. Fish and Wildlife Service.

The Summary of Impacts on Marine Mammals (III.L.7.d.) should include the conclusions reached by Kenyon (1971) 1/ concerning northern fur seals:

- 7
1. In most open sea areas where fur seals are found on migration they infrequently come in contact with petroleum products. However, when they enter busy shipping lanes, oil contamination may be significant.
  2. Oil contaminated seals apparently do not survive to return to the breeding grounds.

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1/ Kenyon, Karl W. 1971. The effect of oil pollution on marine mammals. U.S. Bureau of Sport Fisheries and Wildlife. Marine Mammal Substation. Naval Support Substation, Naval Support Activities, Bldg. 192, Seattle, Washington 98115. 9 pp. mimeo.

3. Since fur seals usually occur well offshore and the body is of greater specific gravity than water, dead animals would sink and thus would rarely be found on beaches.

8 [ The statement should discuss in detail the change in impact which would result from the selection of a specific alternative to the proposed action. The objective consideration of the relative environmental impact of the various options is not possible because of the lack of analysis.

We appreciate the opportunity to comment at this time.

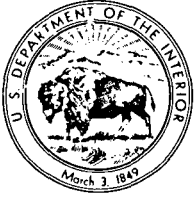


## RESPONSE TO FISH AND WILDLIFE SERVICE

1. The comment is noted. More detailed consideration in site-specific proposals and environmental analyses would be appropriate. We believe the discussion is adequate for purposes of this statement.
2. The "proposed" deepwater terminal at Morro Bay or Monterey is in effect properly "a concept receiving consideration within industry circles." Without a formal and site-specific proposal, it would be premature and speculative to include such a site-specific discussion. However, see section I.F.3. for a general discussion of other potential activities that might have an impact on the Channel area.
3. The comment is well taken and the text has been modified accordingly.
4. Commercial catch and landing data for the general area in which the existing platforms are located have been included in the FES. Conclusive studies on the influence (if any) of those platforms on commercial fishing would have to be site specific. We are aware of no baseline studies conducted at the site prior to platform placement; therefore, information taken from studies which might be conducted now would be of limited comparative value.
5. The comments regarding offshore pipeline construction are noted and will be considered in the event of a site-specific proposal.
6. This section has been rewritten for clarity as the Brandt cormorant has been confused with the black brant or sea goose and the United States Fish and Wildlife Service quotation, therefore, is not applicable.



7. The suggested literature citation is incorporated, although more recent publications (National Academy of Sciences, 1975; Kolpack et al., 1975) do not include these conclusions.
  
8. Please see section I.A.1., Purpose of the Environmental Impact Statement. Estimated facilities, activities and production for each of the possible levels of development are presented in tables I-1 and I-2.



# United States Department of the Interior

NATIONAL PARK SERVICE  
WASHINGTON, D.C. 20240

IN REPLY REFER TO:

L7619  
(WR.)PSE

JUL 22 1975

Memorandum

To: Director, U.S. Geological Survey

Through: Assistant Secretary for Fish and Wildlife and Parks

From: <sup>Assistant</sup> Associate Director, Park System Management

Subject: Review of Draft Environmental Statement, Oil and Gas  
Development in the Santa Barbara Channel Outer Continental  
Shelf off California (DES 75-35)

We have reviewed the draft environmental statement and offer the following comments for your consideration.

## COMMENTS ON THE PROPOSAL

We are concerned that the proposed action will adversely affect the esthetic quality of Channel Islands National Monument if development is allowed to take place within the proposed lease areas. Platforms may be constructed in areas up to within three miles of the islands and would, therefore, present an obvious disruptive visual contrast to the surrounding natural beauty of the area.

If accidents should occur at any level of development, production or transport where large quantities of oil are spilled, the impact upon marine and intertidal organisms would be severe around Anacapa (Channel Islands NM) and the neighboring islands which are presently being considered for inclusion in the National Park System. In addition, the resulting oil-covered shoreline would have an adverse effect upon endangered species' habitat and recreational activity.



Considering the potentially adverse impacts to Channel Islands National Monument and the general Santa Barbara Channel area, we cannot support any further development in this area.

COMMENTS ON THE STATEMENT

There are two actions considered which may affect cultural resources. These are the construction of one or more pipelines to shore, and the possible construction of onshore delivery pipelines to a refining center such as Los Angeles (page I-3).

1 [ All areas where onshore surface disturbance is likely to occur from pipeline or other construction activities should be surveyed by a professional archeologist. Any cultural resources identified should be evaluated for their National Register potential. If they meet the criteria outlined in Title 36, CFR 800.10, they should be nominated to the National Register of Historic Places.

2 [ A copy of the archeologist's report, including recommendations, should be made available to the National Park Service, Western Archeological Center, P. O. Box 49008, Tucson, Arizona 85717 in accordance with section 3(a) of Public Law 93-291. The final statement should document consultation with the State Historic Preservation Officer regarding project impacts on cultural resources.

*Raymond L. Freeman*

RESPONSE TO NATIONAL PARK SERVICE

The general comments of National Park Service are noted.

1. Please see sections III.M.4. and IV.B.9.
2. The splendid input and cooperation during DES and FES preparation of National Park Service, Western Archeological Center, Tucson, Arizona is acknowledged and appreciated.

In the event of a site-specific proposal contact will be made with the State Historic Preservation Officer.



# United States Department of the Interior

OFFICE OF THE SECRETARY  
WASHINGTON, D.C. 20240

July 31, 1975

## MEMORANDUM

To: Director, Geological Survey

From: Environmental Coordinator  
Ocean Mining Administration

Subject: Review of Draft Environmental Statement, Oil  
and Gas Development in the Santa Barbara Channel  
Outer Continental Shelf off California (DES 75-35)

The draft Environmental Impact Statement on the above subject has been reviewed by the Ocean Mining Administration. We find that no major corrections or additions are required from this office.

Robert F. Dill, Ph.D.





DEPARTMENT OF TRANSPORTATION  
UNITED STATES COAST GUARD

MAILING ADDRESS:  
U.S. COAST GUARD (G-WS/73)  
WASHINGTON, D.C. 20590  
PHONE: (202) 426-2262

• 4 AUG 1975

Mr. Vincent E. McKelvey  
Director  
U. S. Geological Survey  
Mailstop 108  
Reston, Virginia 22092

Dear Mr. McKelvey:

This is in response to Mr. Coulter's letter of 10 June 1975 addressed to the DOT Director, Office of Environmental Quality concerning a draft environmental statement on oil and gas development in the Santa Barbara Channel Outer Continental Shelf off California.

The Department of Transportation has reviewed the material submitted. The Coast Guard had the following comments to offer:

"Required Content. The treatment of substantive issues in the draft statement is considered to be adequate. The full range of environmental impacts is explored, the advantages and disadvantages of the proposed action are 'balanced,' and reasonable alternatives to the project are discussed. It appears that the statement is sufficient to insure that environmental values receive equal consideration with economics and need in the decision-making process.

"Specific Comments.

1 [ On pages IV-46 the term 'On-Scene-Commander' is incorrectly used in regards to oil spill-combating operations. The 'On-Scene-Coordinator' is the Federal official pre-designated by the Environmental Protection Agency or U. S. Coast Guard to coordinate and direct Federal discharge removal efforts under Regional Contingency Plans at the scene. The term 'On-Scene-Commander' is not appropriate for pollution response activities.

2 [ "The draft statement provides an incomplete discussion of the Coast Guard's scope of concern regarding the exploration and development of off-shore oil resources. The District Commander has taken the position that, in the interest of promoting safe navigation and reducing the potential for loss of life and property at sea, OCS leases should be issued by the Department of the Interior subject to the following conditions:

"(1) Permanent platforms may not be located within one-quarter mile of sea lane boundaries. This stipulation is justified on two grounds. First, compliance with the Inter-governmental Maritime Consultative Organization's

principles regarding ship routing schemes necessitates a navigation system that enables vessels to navigate with one-quarter mile accuracy when transiting sea lanes. Provision must be made for the mariner operating his vessel up to one-quarter mile outside of an established sea lane whose navigation equipment tells him that he is within the charted sea lane boundaries. Second, the one-quarter mile buffer zone will be necessary to ensure that servicing vessels and barges attendant to offshore platforms are kept outside of charted sea lanes;

"(2) Vessels may not engage in drilling inside sea lanes or within one-quarter mile of established sea lane boundaries;

"(3) Subject to provision (2) above, and except for vessels in direct transit, vessels engaged in lease development may not operate inside sea lanes, or within one-quarter mile of sea lane boundaries unless the express permission of the District Commander has been obtained. This lease provision will give the District Commander direct control over the number and position of work vessels in the sea lanes to ensure that these vessels do not create unacceptable hazards to navigation;

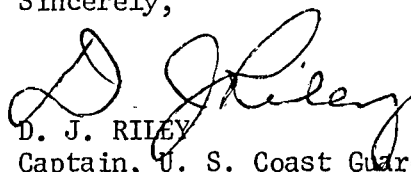
"(4) Subject to provision (1) and (2) above, vessels engaged in drilling and permanent platforms will be permitted within the separation zones; and

"(5) Vessels engaged in lease development anchored outside of the sea lanes may have no cables, anchors, buoys or other associated equipment in the sea lanes at a depth of less than 85 feet."

The Department of Transportation has no other comments to offer nor do we have any objection to this statement. The final statement, however, should address the concerns of the Coast Guard.

The opportunity to review this draft statement is appreciated.

Sincerely,



D. J. RILEY  
Captain, U. S. Coast Guard  
Deputy Chief, Office of Marine Environment  
and Systems  
By direction of the Commandant

RESPONSE TO UNITED STATES COAST GUARD

1. The term "On-Scene-Commander" has been deleted.
2. The Department of Interior acknowledges the District Commander's position that OCS leases should be issued subject to certain conditions as listed. In the event of a future Santa Barbara Channel OCS lease sale, the Department of Interior will confer with the Coast Guard in considering these recommended conditions, as well as any other lease stipulations the Coast Guard recommends.





UNITED STATES  
ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION  
WASHINGTON, D.C. 20545

AUG 7 1975

Mr. William E. Grant, Manager  
Bureau of Land Management  
Pacific OCS Office  
U.S. Department of the Interior  
7663 Federal Building  
300 North Los Angeles Street  
Los Angeles, California 90012

Dear Mr. Grant:

1 [ The DEIS on Oil & Gas Development in the Santa Barbara Channel Outer Continental Shelf Off California has been reviewed by staff of the Energy Research and Development Administration (ERDA). We find the Statement contains a great deal of information about offshore drilling techniques not related to the Santa Barbara Channel area which tends to make the Statement longer than may be necessary. The Statement would possibly be more valuable if it was reduced to contain only material pertinent to the specific site.

2 [ A specific comment is that the first paragraph on page VIII-57 gives the erroneous impression that the measures taken to prevent harmful releases of radioactive material from light water reactor nuclear power plants are of questionable effectiveness. It is suggested that the paragraph be revised to read:

"Some airborne and liquid radioactive materials are released to the environment during normal operation. The amounts released are very small and potential exposure has been shown to be less than the average level of natural radiation exposure. The plants are designed and operated in such a way that the probability of harmful radioactivity releases from accidents is very low."

We appreciate the opportunity to review this Statement.

Sincerely,

W. H. Pennington  
Assessments and Coordination  
Officer  
Division of Biomedical and  
Environmental Research



RESPONSE TO ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

1. Your suggestion to remove the information about offshore drilling techniques not directly related to the Santa Barbara Channel area was considered. However, it was decided not to delete the general description of drilling and development operations and techniques in the interest of making available to the reader an overall concept of possible future oil and gas operations. Most of this general material is in Appendices I-2 and I-3 at the end of section I, and, therefore, does not disrupt the presentation of the more pertinent information.
2. The suggested paragraph revision has been incorporated.

## STATE LANDS COMMISSION

EXECUTIVE OFFICE

1807 13TH STREET  
SACRAMENTO, CALIFORNIA 95814

August 20, 1975

Director  
U. S. Geological Survey  
MS 108, National Center  
Reston, VA 22092

USGS DES 75-35 Comments

Dear Sir:

After a comprehensive review of the "Draft Environmental Impact Statement for Potential Oil and Gas Development in the Santa Barbara Channel OCS Off California", we find the statement inadequate in that it fails to examine all environmental impacts that could result from unspecified potential petroleum operations and facilities in the Channel.

1 [ The Statement provides only a generalization as to what might be expected in the Channel area regarding offshore extractive operations, and is completely void of any site-specific discussion and/or analysis.

2 [ DES 75-35 contains many statements that no applications are pending for OCS activities in the Santa Barbara Channel, and that no specific actions are being considered in the report. Contradictory, however, are pages 12-13 of Volume I, which state that a Mobil Oil Corporation 1974 application to erect a drilling platform on OCS Lease P-0202 is being held in abeyance pending completion of this DES.

3 [ Throughout the report there are inferences that DES 75-35 will serve as the comprehensive vehicle for future actions without preparation of additional site-specific environmental impact statements or full public review and discussion of each proposed development. If such is the case, we oppose any such use of this generalized and inadequate overview. Prior to any proposed site-specific operation in the subject area, a complete environmental impact report covering each operation must be prepared and made available for review and comment. A commitment to do so should be made abundantly clear in the Final Environmental Impact Statement.

August 20, 1975

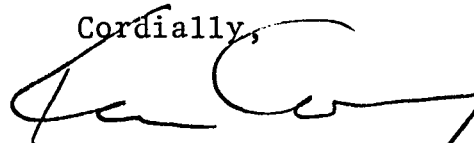
4 [ Additionally, as has been stated in detail to the Department of the Interior on many occasions, the decision for the development (as differentiated from the exploration and evaluation phases) of the outer continental shelf resources should be made in concert with a viable national energy policy. Such policy must be developed in partnership with affected adjacent states. This partnership must begin at the earliest planning stages and continue throughout the entire program. Further, in order to develop and implement a viable energy policy, Government should conduct further exploration of the OCS for definition of the location and extent of the petroleum resources as well as evaluation of the benefits and environmental risks which would accompany development and production operations. Information garnered from such exploration must be shared with affected agencies on a cooperative basis.

As you are imminently aware, the California Coastal Plan is to be submitted to the State Legislature in 1976. Any Federal OCS development should be integrated with this Plan. The uniqueness of the California coastline should not be made the unwilling victim of unreasoned Federal OCS development policy.

Specific detailed comments on the technical aspects of DES 75-35 are attached.

Thank you for the opportunity to review and comment on this critical subject.

Cordially,



Kenneth Cory  
Chairman, State Lands Commission

Attachment

STATE LANDS COMMISSION  
EXECUTIVE OFFICE1807 13TH STREET  
SACRAMENTO, CALIFORNIA 95814COMMENTS ON DEPARTMENT OF INTERIOR DRAFT  
ENVIRONMENTAL IMPACT STATEMENT FOR POTENTIAL  
OIL AND GAS DEVELOPMENT IN THE SANTA BARBARA  
CHANNEL OUTER CONTINENTAL SHELF OFF CALIFORNIA  
(DES 75-35)General:

Conspicuously absent from the Draft is an Executive Summary. The absence of such summary hampers review and makes it very difficult to properly assess the report without exhaustive review of the entire document.

5 [ Additionally, the Division was unable to identify any section which discussed growth inducing and cumulative effects of OCS oil operations in the Santa Barbara Channel. Inasmuch as these are required by CEQA and CEQ, the Division feels that it would be appropriate to incorporate these sections into the final EIS.

6 [ Page ii-13: This section, discussing the Santa Barbara Channel blowout and oil spill resulting from the drilling of the fifth development well from Platform "A" is incomplete and misleading in its description of the blowout. The report states "Flow from the well was promptly controlled by

activating blowout prevention equipment; but because of usual geological conditions, this caused fluids from deeper reservoirs to reach the ocean floor through fractures in shallow strata." The description contained within McCulloch, U. S. Geological Survey Professional Paper 679-C and Appendix A, Geological Survey Professional Paper, would be more complete.

7 Page I-23, L.9: The permit program for shallow coring to 500 feet and to 750 feet under certain conditions should be modified such that drilling without any blowout prevention control should be restricted to no more than 100 feet. We feel that drilling to such depths without proper well control is an unnecessary environmental risk.

8 Page I-38, Subparagraph (a) and page I-40, Subparagraph (d): These sections refer to B.O.P. installations on the conductor casing, set and cemented after drilling to depth of 300' to 500' below ocean floor. No mention is made of any B.O.P. installed prior to reaching that depth. Both State Lands Division "Procedures" for drilling operations and the U. S. Geological Survey OCS Order No. 2 specify that the Drive or Structural Casing (Called Conductor casing in State "Procedures") which is set at a depth of about 100' below ocean floor shall have at least "one remotely controlled annular type blowout preventer and related equipment.....", installed prior to drilling below that depth. This is an important omission. Furthermore, the statement beginning on L.6, Page I-39, which reads "The blowout preventer assembly and riser systems are then installed and the actual drilling proceeds", implies that a complete blowout preventer stack

is installed on the conductor casing. This is not so as both the existing and proposed revised OCS Order No. 2 requires only one annular preventer and a diverter system to be installed on the conductor casing, and allows drilling to proceed to a maximum of 1500' below the ocean floor. The State Lands Division has commented several times during the revision of OCS Order No. 2 that this blowout preventer requirement is inadequate for exploratory drilling from vessels, and, has recommended that at least one annular preventer, one set of drill pipe rams and one set of blind-shear rams be installed on the conductor casing.

9 Pages I-41 and I-42, Subparagraphs (1), (2), (3) and (4): These sections relate to important design criteria and procedures for the conduct of drilling operations from vessels which presumably are established by Geological Survey OCS Orders. It is apparent that the writers of the DES did not review the existing and proposed revised OCS Order No. 2 as these important requirements are not included. During the period that OCS Order No. 2 was being revised, the State Lands Division sent written comments to both the Chief, Conservation Division, U.S.G.S. in Reston, Virginia, and the Oil and Gas Supervisor, Pacific Area, recommending that the scope of the drilling procedures be broadened to include specific and detailed requirements for drilling from vessels similar to those identified in the DES. The State Lands Division firmly believes that the proposed revised OCS Order No. 2 is completely inadequate with regard to the conduct of drilling operations from vessels. Unless adequate drilling procedures are established to assure that this type of operation will be conducted safely, drilling from vessels should not be permitted in the Santa Barbara Channel or on any other OCS lands. It is recommended that the proposed OCS Order No. 2 now being processed by the U.S.G.S. be revised to provide specific requirements for drilling from vessels.

Page I-43, L. 1 and Page I-54, L. 7: These sections deal with B.O.P.E. and Drilling Fluid for well control purposes, but drilling personnel qualifications for well control purposes are not mentioned, although drilling crew with control drills is (p. 55). OCS Order No. 2, specifies that company and contractor drilling supervisors shall have completed a well-control school or seminar within the previous year and shall have passed a proficiency test; also that well-control training for drillers, other than the required weekly blowout prevention drills, shall be required. In addition, it is suggested that consideration be given to formalized training for all drilling and production personnel.

10 Page I-53, L 1.: This section implies that drilling fluids, liquid waste water, and drill cuttings, once freed of oil contamination, may be discharged into the ocean. However, as noted elsewhere in the report, regulations regarding the disposal of waste water and other materials into the ocean are currently under revision whereby such disposal may not be permitted.

11 Page I-82, L. 28.: It is stated "Wellhead equipment is specifically designed for hydrogen sulfide service and maximum wellhead pressure". We wish to point out that this generally is not true. Only if the hydrogen sulfide problem is known to be present will wellhead equipment be so designed. The EIS is totally lacking in an adequate discussion of the special handling and greater potential environmental risks involved in the production of sour crude oil.

12 Page I-83 and 84: The lengthy discussion of velocity-actuated safety devices is irrelevant as these devices are not permissible in current extractive operations.



13 Page I-92: The lengthy discussion of proprietary equipment for ocean floor completions does not take into consideration proven operating limitations of the equipment to the water depths encountered in the Channel.

14 Page I-121, L.9.: "Present capabilities in Offshore Pipeline Construction". The pipelines described are at depths considerably less than would be encountered in the Santa Brabara Channel, with the exception of the Strait of Messina line. At the present time equipment is being designed or constructed with a predicted capability of laying pipelines in depths of 3,000', and an experimental line has been laid (and retrieved) in 1,005 feet of water. However, there appears to be no assurance based on experience that production pipelines can be safely installed and utilized in certain areas of the Channel.

15 Page I-123, Section (c): "Operation and Maintenance". This section should include a statement about inspection for internal corrosion in pipelines by means of an electronic surveillance or other approved methods. The State Lands Commission requires periodic internal inspections for corrosion in pipelines located on State tide and submerged lands.

16 Page I-128.: The EIS does not address itself sufficiently to the possible hydrogen sulfide problems involved with oil production in this area.

17 Page III-95, L. 17.: Consideration should also be given to planning for offshore pipeline corridors. Development of the Santa Barbara Channel oil and gas resources could require up to one hundred eleven miles of additional offshore pipelines (Pg. I-164). A reduction in the number of miles of pipeline needed (given pipeline corridor planning) would lessen the potential for environmental degradation.

18

Page IV-1, L. 4.: The EIS states that "...OCS oil and gas operations would comply with applicable regulations of County, State and Federal agencies including....the State Lands Commission and the Division of Oil and Gas....". This statement is misleading because neither the State Lands Commission or Department of Oil and Gas have jurisdiction over OCS operations beyond the three-mile limit.

19

Page IV-12,: OCS Order No. 2, "DRILLING PROCEDURES" is presently being revised. We wish to point out here that this Division's comments on proposed revisions of OCS Order No. 2 have not been incorporated into subsequent revisions thereof. We wish also to reiterate that in view of the great public concern in regard to offshore drilling and the inherent hazards associated therewith, you include these proposed revisions prior to final adoption of your PROCEDURES. Further, continued approval of drilling operations from floating vessels for which regulations have not been adopted is a serious matter, and such procedure should be discontinued until appropriate regulations have been approved.

20

Page IV-32 to IV-48: This section sufficiently defines the oil spill contingency plans and equipment available for use in the Santa Barbara Channel. The statement should contain detailed discussion on the actual field testing of this equipment. Further the U.S.G.S. should require OCS operators to submit for approval a "Critical Operations and Curtailment Plan". Criteria should take into account weather conditions, the effectiveness and availability of oil-spill containment and recovery equipment, and other factors relating to safety of operations. Critical well operations would be required to be curtailed. It should be noted that Union Oil Company has been unable to control or contain the five barrel a day seepage at Platform A.

21

Page IV-48, L. 24.: Refers to the adoption by the State Lands Commission of a staff report indicating that the oil industry has developed safety equipment and procedures that minimize the possibility of a major spill occurring and provision for effective clean-up in the event of a spill. It should be pointed out that this report refers to leases operating under stringent State regulations and to wells drilled in State waters at much shallower depths.

22

Page IV-55 et seq.: These sections show that the USGS has not implemented recommendations made as the result of special studies of OCS operations. The descriptions of actions taken on the 15 original recommendations are too nebulous to be of any value. It is recommended that the Final Environmental Statement describe definitive actions taken so that these can be analyzed for sufficiency. The Final Environmental Statement should be delayed until such definitive actions can be described.

Examples of the nebulous statements which are considered inadequate are (underscores added):

Page IV-56 L.2.: "OCS Order No. 5 for the Gulf of Mexico has been revised and now requires operators to submit quarterly failure-analysis reports on subsurface safety devices. The Gulf Coast Offshore Operator's Committee is developing procedures..." Page IV-56 L. 12. "The Pacific Area has been furnished the Gulf of Mexico Area revised OCS Order No. 5 for consideration and adoption to the Pacific Area." Page IV-56 L.22. "The Regional offices of the Geological Survey are developing accident investigation reporting procedures which are more responsive to cause and effect relationships. The Pacific Area has performed a study...."

Page IV-57 L.11. "It is anticipated that an information dissemination system will be designed..."

Page IV-57 L.19 "Research and Development": "A cooperative committee on off-shore safety and anti-pollution research has been formed...."

Page IV-58 L.2. "Standards and Specifications" A cooperative committee on offshore safety and anti-pollution standards has been formed..."

Page IV-58 L. 11. "Draft copies of these standards have been made available for review and comment. The final copies of these standards will be published later in 1974".

Page IV-59 L.26 and IV-60 L. 27.: "...and are continuing to work with the U. S. Geological Survey in making meaningful and effective changes in OCS operations."

Page IV-60 L. 6.: "These studies are currently being evaluated with ....."

Page IV-59 L. 26 and IV-60 L. 27.: "...and are continuing to work with the U. S. Geological Survey in making meaningful and effective changes in OCS operations."

Page IV-60 L. 6.: "These studies are currently being evaluated with ....."

Page IV-60 L. 15.: "The study looked in detail at the offshore production facilities, the pipelines to shore, and the alternate offshore storage and terminal system from the viewpoint of safety to personnel and oil in water pollution".

Page IV-60 L. 21.: "...28 were in need of additional analysis...."

Page IV-60 L. 16.: "... the particular items recommended for documentation are not specifically addressed."

Page IV-61 L. 19.: "However, the Pacific Area will review the Gulf of Mexico revised OCS Order No. 8 when completed, for consideration and possible adaptation to the Pacific Area."

Page IV-62 L. 2.: "The Pacific Area will review the Gulf of Mexico Area OCS Order No. 8, when completed, for adaptation of the erosion control section to the Pacific Area."

Page IV-62 L. 7.: "A committee has been formed....."

Page IV-62 L. 15.: ".....have plans for developing a training course in OCS orders and regulations for presentation to the industry. "The Pacific Area has made a study.....".

Page IV-63 L. 4.: "The API and oil industry are taking the lead in developing a motivation program."

Page IV-63 L. 7.: "Additional personnel have been hired for the Pacific Area and Gulf of Mexico Area OCS offices. The areas of responsibilities and goals of the individual organizational units are being developed. Also under development, is a system for incorporating reports from other program areas into an annual review."

Page IV-64 L. 4.: "The Geological Survey is currently developing formalized procedures..."

Page IV-64 L. 7.: "Proposed new and revised Orders are to be published ....."

Page IV-64 L. 11.: ".....is reviewing other OCS Orders for revision."

Page IV-64 L. 13.: "Standardization of Pollution Report Form - The Pacific Area has reviewed the Gulf of Mexico Area proposed form and has submitted suggestions and comments.

Page IV-64 L. 18: States that oil and gas operations had been conducted in the Santa Barbara Channel for 77 years before the first major oil pollution incident (the Platform A Spill). However, oil and gas production operations had been conducted on OCS lands for only seven years prior to the Platform A Spill.

Page IV-74 L. 10.: It is our opinion that a formal training and certifications program should be established for all offshore drilling and production personnel.

23

Page IV-83 et seq.: This section (12) speaks of baseline and monitoring studies found in response to Senate National Ocean Policy Study hearings. Such studies pertain to outer continental shelf oil and gas development and are ongoing. It would appear very difficult to properly assess potential damage to the environment without knowledge derived from the completed studies.

24

Page V-9 L. 18.: It appears that insufficient data exists to conclude the "the overall impact of the planned development on air quality should be small." For such conclusion detailed site-specific data must be available.

25

Page VIII-1 et seq.: Alternatives of delaying further leasing until the need for production is proven and until technology is improved is not adequately discussed.

RESPONSE TO THE STATE LANDS COMMISSION

1. The statement is primarily for the purpose of considering the impacts that would result from possible future levels of development. Therefore, by necessity the statement is, for the most part, void of site-specific discussion. Exceptions to this are the discussions of the three possible platforms C, (lease OCS-P 0241), Henry (lease OCS-P 0240) and the Mobil platform for lease OCS-P 0202 (see sections I.B. and III.C.3.).
  
2. It is explained in the statement that Mobil has submitted a preliminary notice of intent to install a platform on lease OCS-P 0202 and that this tentative proposal, indefinite and lacking in detail, is not recognized as a formal application suitable for commencing serious evaluation and consideration. Action by the Survey on this preliminary notice is being held in abeyance pending submission of additional more definite and detailed information, and the completion of this statement. The operator has stated that the economic feasibility of this possible platform is dependent on further evaluation drilling. (See sections I.B., I.B.2. and III.C.3.b.)

The statement in the draft that no development applications are pending for the Santa Barbara Channel OCS has been qualified in this final statement. This was a valid statement at the time the draft was published. However, subsequent to publication, an application to install Platform Henry on lease OCS-P 0240 was received by the U. S. Geological Survey (see sections I.B. and III.C.3.a.).

3. Decisions as to the need for site-specific statements will be made on a case-by-case basis in accordance with established NEPA procedures of the

Survey and the Interior Department.

4. As the Commission is aware, the OCS regulations (CFR 250.34) are revised so as to require the OCS operators to submit development plans to the State prior to Department of Interior approval. The proposed modified regulations were published in the Federal Register (Vol. 40, No. 179, September 15, 1975) for comments and the final adopted modified regulations were published in the Federal Register, November 4, 1975 (Vol. 40, No. 213). The objective of the modification is to provide affected States with early information and an opportunity for early review and comment on development associated with OCS oil and gas. Such information will allow the State to assess and plan for possible onshore impacts from specific proposed OCS operations at the earliest possible date.

If a final Coastal Plan is adopted by the California Legislature and approved by the U. S. Department of Commerce pursuant to the Coastal Zone Management Act of 1972, the activities of the Department of the Interior or of Federal oil and gas lessees directly affecting the coastal zone shall, to the maximum extent practicable, be conducted in a manner consistent with the approval coastal zone management program. The discussion of the Coastal Zone Plan has been updated and expanded in this final statement. (See sections I.F.2.a. and IV.A.1.h)

5. Response to this comment is provided in the greatly expanded Socio-economics Baseline and Impacts sections in the FES. (See sections II.F., Resources, and III.N., Socioeconomics Impacts)
6. For this statement the discussion of the Platform A blowout is considered adequate. For further detail the reader is referred to USGS Professional



Paper 679.

7. The suggested shallow coring depth limitation "without blowout prevention control" is acknowledged.
8. The Geological Survey personnel in Los Angeles, presently revising OCS Order No. 2, have been given these recommendations for consideration. Recommendations are being incorporated wherever appropriate. (See section IV.A.1.g. for the revision status of OCS Order No. 2)
9. The introductory sentence to the design criteria and procedures list in the draft was incorrect and has been reworded in the final.

Your recommendations on drilling from vessels and training of all drilling and production personnel is presently being considered by the Geological Survey.

10. The waste water disposal discussion in this final statement has been updated to include information about EPA OCS discharge permits and EPA OCS discharge regulations and requirements (see sections II.G.2.c. and d., and IV.A.1.c. and d.). Presently drill cuttings and produced waste water are discharged to the OCS waters and this practice will likely continue for at least several years (per telephone discussion with EPA representatives).
11. OCS Order No. 2, presently being revised, has been expanded to include hydrogen sulfide detection and control requirements. During the interim while OCS Order No. 2 is being revised, an OCS "Notice to Lessees" has been issued by the Geological Survey, spelling out in detail hydrogen sulfide detection and control requirements. A discussion of the revised OCS Order No. 2 and hydrogen sulfide Notice to Lessees, have been included in this final statement. (See section IV)

12. This discussion of velocity-activated sub-surface safety devices is considered relevant in presenting the reasons for placing greater reliance on surface controlled subsurface safety devices now used in the Channel as compared to those velocity-activated types that have not performed well in recent operations in the Gulf of Mexico.
13. Operating limitations of subsea completion systems are discussed in section I.D.6. That section has been updated and expanded in the final, including a status report on Gulf of Mexico field tests of three subsea production systems.
14. It is recognized that certain portions of the Santa Barbara Channel deep water basin are beyond the present pipeline installation state of the art.
15. Recommendation for internal corrosion inspection is acknowledged.
16. See response to item 11 above on hydrogen sulfide problems.
17. Planning which would minimize facility numbers is stressed in the statement (see section I.E.).
18. Federal OCS operators would have to comply with applicable regulations of the County and State including the State Lands Commission and Division of Oil and Gas concerning certain aspects of activities extending into State waters and onshore (e.g. pipelines and subsurface injection into onshore wells of OCS produced waste water from onshore facilities). Therefore, we do not agree that the referenced statement is misleading.

19. As stated above, the Geological Survey is presently considering recommendations of the Commission on revision of USGS OCS Order No. 2,
20. Field testing of equipment is discussed and problems involving the conducting of a "representative" field test using actual oil is recognized. It appears that additional coordination between OCS operators, EPA, Navy, Coast Guard and the Geological Survey and possibly others in conducting and assessing such tests would be essential.

The uncontrolled five barrel a day Platform A seepage is noted in the Introduction to this statement.

21. It is acknowledged that the State Lands Commission staff report refers to leases operating under State regulations in shallower State water.
22. The status of implementing recommendations made as a result of special studies of OCS operations has been updated (section IV.A.8.). There have been many of these studies, as shown in section IV.A.8., and appendices IV-2 and IV-3, and several are presently ongoing. As new studies are completed, the need to revise and expand certain original recommendations, and add new ones becomes apparent. Many of these complex recommendations involve considerable planning, manpower and money and cannot be meaningfully implemented overnight.

The Review Committee on Safety of Outer Continental Shelf Petroleum Operations, under the auspices of the Marine Board, National Academy of Engineers, was established in July 1973, as a third-party audit of the OCS procedures and operations and to review state-of-the-art technologies. The Committee established at the request of the Geological Survey, composed of experts not regularly employed by industry or

the Government, has issued four reports to the Geological Survey. The fourth and latest report, issued in August 1975, and the three previous ones, are discussed in this final statement; committee membership is also presented (see section IV.A.8.a.).

23. The problems related to meaningful baseline and monitoring studies are recognized. An expanded discussion on this matter is contained in this final statement. In regards to the comment reference to completed studies, it must be recognized that at least the monitoring phase in many cases would be ongoing for the life of the oil and gas activities. Also see our response No. 11 to hearing transcript comments related to baseline studies and section IV.B.12.
24. The identification and quantification of potential air pollution emissions and their impacts from the possible levels of Channel development have been addressed in full detail in the greatly expanded Air Quality sections. (See section III.LL., for Air Quality Impacts. Baseline Air Quality, Meteorology, and Air Impacts Mitigation are also addressed in the revised sections II.G.1., II.C. and IV.B.13., respectively)
25. The alternatives, of delaying further leasing until the need for production is proven and until technology is improved would be factors in any future consideration to hold further lease sales in the Santa Barbara Channel or elsewhere.

CLAIRE DEDRICK

SECRETARY

EDMUND G. BROWN JR.

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State Water Resources Control Board  
Regional Water Quality Control Board

Department of Conservation  
Department of Fish and Game  
Department of Navigation and  
Ocean Development  
Department of Parks and Recreation  
Department of Water Resources

THE RESOURCES AGENCY OF CALIFORNIA  
SACRAMENTO, CALIFORNIA

NOV 19 1975

Dr. Vincent E. McKelvey  
Director  
U. S. Geological Survey  
Department of the Interior  
National Center  
Reston, Virginia 22092

Dear Dr. McKelvey:

The State of California has reviewed Volumes 1, 2 and 3 for the "Oil and Gas Development in the Santa Barbara Channel Outer Continental Shelf Off California, Draft Environmental Statement DES 75-35", submitted to the Office of Planning and Research (State Clearinghouse) in the Governor's Office, in accordance with Part II of the U. S. Office of Management and Budget Circular A-95 and the National Policy Act of 1969.

This review was coordinated with the Departments of Water Resources, Food and Agriculture, Transportation, Health, Conservation, Fish and Game, Navigation and Ocean Development, and Parks and Recreation; the State Water Resources Control Board; the San Francisco Bay Conservation and Development Commission; the Solid Waste Management Board; the Air Resources Board; the State Lands Commission; and the California Coastal Zone Conservation Commission.

The State's specific comments are attached, together with State Water Resources Control Board Resolutions. The general and specific comments of the California Coastal Zone Conservation Commission Staff are attached in full.

GENERAL COMMENTS

The State has a number of serious concerns with the draft environmental impact statement for potential oil and gas development in the Santa Barbara Channel OCS off California that it hopes are addressed before there is federal approval for any new development in the Channel.

### Decision Making Process

As with the proposed lease sale Number 35 off Southern California, there is no process for joint federal-state decision making. The procedure for development outlined in this EIS and the U. S. Geological Survey's proposed modification of leasing regulations show this absence of consideration for the governmental entities at the state and local level who have to live with the problems incurred by outside jurisdictions. The regulations and procedures outlined for this area attempt to structure development plans in such a way as to evade the provisions of both the Coastal Zone Management Act (CZMA) and the National Environmental Policy Act (NEPA). It should be made clear that the consistency provision of the CZMA and the requirements of NEPA for a supplemental environmental statement are applicable to development plans.

1 Meeting these requests is absolutely necessary because in no other way can the onshore impacts be gauged and regulated by the proper state and local agencies in a way that balances the need for new domestic energy supplies with keeping the environmental and social fabrics of a predominately rural, recreational-oriented area intact. To be more specific, the consistency clause of the CZMA makes it imperative for the development plans to be matched against the coastal plan. That plan has been put in final form and will be submitted to the Legislature for its adoption next year. The draft EIS is vague on whether site specific impact statements will be executed for individual developments within the leasehold area. The final EIS should state that these additional impact statements will be prepared, as was done for the Santa Ynez unit.

### Deficiencies

2 The statement does not address the cumulative impact of all energy developments proposed for the Santa Barbara area shoreline. They include possible additional oil and gas activity on state-owned lands, increased tanker traffic from Alaska, a liquefied natural gas terminal at Pt. Conception, a possible nuclear power plant, and additional activity from lease sale Number 35. The EIS is also deficient in its discussion of onshore impacts and in particular does not discuss what such development might do to the balance presently existing between limited channel oil development and the present residential-recreational-light commercial level of activity in the area.

3 There is little discussion in the EIS on how the goal of consolidation of sites and activities might be accomplished although there is a brief mention of the possibility of concentrating

onshore facilities in two or three areas. What is needed is a full discussion of the legal, economic and environmental issues involved in requiring consolidation of facilities, and a clear determination, if indeed, that is desirable. The EIS for the entire lease area should make the determination if consolidation is desirable, rather than the site specific statements which will not address this overall question. There is no discussion of where the produced oil will be refined which would settle the question of onshore pipeline location versus barge or tanker traffic.

4 The draft statement is inadequate in its treatment of the potential effect of the proposed operations on air quality. More consideration has to be given to the potential emission of hydrocarbons and sulfur compounds associated with various possible levels of development.

Regulations

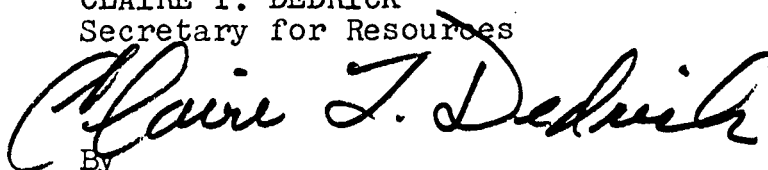
5 Adoption of modifications to the leasing regulations by the U. S. Geological Survey are pending. When they are adopted, pertinent portions of the regulations should be made applicable to development in the Santa Barbara Channel. In particular, the State believes that the Secretary of the Interior should be given the responsibility for approval of development plans. As the regulations are presently drafted, this power is given to the Area Oil and Gas Supervisor. The State believes this power should be transferred to the more visible and politically responsible secretary.

6 The State of California enacted new legislation this year (Chapter 458, Statutes of 1975) which would prohibit any person to construct, expand, place, or locate any oil or gas pipeline or associated facilities for the transportation of oil or gas from an offshore area or submerged lands within the permit area of the coastal zone, unless the project meets certain requirements.

Thank you for the opportunity to review and comment on this project.

Sincerely,

CLAIRE T. DEDRICK  
Secretary for Resources

  
By \_\_\_\_\_

Attachments

SPECIFIC COMMENTS ON THE DRAFT ENVIRONMENTAL  
STATEMENT FOR THE  
OIL AND GAS DEVELOPMENT IN THE SANTA BARBARA CHANNEL  
OUTER CONTINENTAL SHELF OFF CALIFORNIA

OIL AND GAS DEVELOPMENT

Page i-1. States that a total of 197 wells have been drilled on the OCS leases of Dos Cuadras and Carpinteria fields. This figure does not include exploratory holes drilled within these leases.

Page ii-2. Platform "Harry", Conception Offshore field, should be removed from the map. The productive area near shore for Coal Oil Point is not productive and should be removed. The proposed national energy reserve, as shown on the map, not only includes the 35 leased parcels but also 14 parcels within the ecological preserve and buffer zone.

Page ii-3. Add municipal leases to state and federal leases of California from which the combined production was produced.

Page ii-4, paragraph 2. Implies that state regulation of oil and gas development began in 1921. State regulation started with the passage of the Creative Act in 1915, establishing the agency that is now the Division of Oil and Gas. In 1921, the first statutes governing the leasing of state-owned tidelands were passed.

Page ii-13. States that surface flow from the well was controlled by activating the blowout-prevention equipment. All this was done after failing to connect the kelly and dropping the drill pipe. Reservoir fluids reached the ocean floor because of unusual geologic conditions as stated, but also because of insufficient casing tie-down.

7 Page ii-15, line 7. States that the spill was brought under control in 10 days. This should be changed to indicate that it was the subsurface flow from the well that was brought under control.

Page ii-17. The number of wells drilled on federal lands is discussed thoroughly, whereas state statistics are limited to producing wells. There have been a total of 1,169 offshore wells drilled under state jurisdiction in the Santa Barbara Channel: 694 development and 475 exploratory, of which 153 were drilled from shoreside sites. In addition, there have been about 3,300 wells drilled within the onshore coastal zone of the channel.

Page ii-18. The section on State Government Action indicates that the State Lands Commission imposed a moratorium on all new drilling on existing state tideland leases. The moratorium did not apply to wells drilled from onshore sites or to tidelands granted to the cities, and that during November and December 1974, drilling programs were approved for Carpinteria, Summerland, Belmont, Rincon, and South Elwood fields. It should also be stated that more than 200 wells have been drilled from offshore sites within the State's territorial boundaries since the blowout and that the State Legislature added 1,216,000 acres of state land to sanctuaries where oil and gas leasing is not allowed unless drainage is occurring.



Page I-15. Add abandonment to list of potential activities.

Page I-23. The limit of shallow coring is stated to be 500 feet of penetration, or 750 feet if not more than 50 feet of competent formation is encountered. In the ES for proposed OCS exploration regulations, deep stratigraphic drilling is described as penetrations of more than 50 feet of consolidated rock or a maximum of 300 feet of penetration. The 500 to 750 feet allowable appears to be in conflict with OCS orders which require the cementing of conductor at a depth between 300 to 500 feet below the ocean floor.

Page I-43. In discussion of drilling fluid, bentonite is mentioned as a weight material.

Page I-46. States that mud logging equipment is required by OCS Order No. 2 for development wells. This order (6/1/71) requires mud monitoring, not mud logging equipment.

Page I-49, paragraph 2. Refers to the lower pipe rams as an annular type preventer. This term, as used in blowout-prevention literature, refers to the bag-type valve at the top of the stack.

Page I-50. In this diagram, the choke and kill lines should be connected at the spool.

Page I-53. States that ocean dumping of waste materials and debris is not permitted. This should be changed to indicate that treated waste materials, such as cuttings, biological wastes, and produced water, may be dumped into the ocean.

Page I-55. Crew training and drills are required but some provisions should be made for the drills to be evaluated and approved by the USGS.

Page I-56. Casing is required to be cut at least 5 feet below the mud line. The depth of casing removal should be limited in order to facilitate reentry for handling possible subsequent problems.

Page I-73. States that auxiliary electrical power is normally installed. This should be changed to indicate that OCS orders require the installation of auxiliary power.

Page I-83. States that subsurface safety valves are used in flowing wells. The regulation should be changed to require valves in wells that are capable of flowing to the ocean floor and not to the elevation of the platform.

Page I-126. In this discussion of onshore treating and storage facilities, it should be stated that within the territorial boundaries of the State, all applicable state statutes and regulations shall apply.

Page I-172. Indicates that "at the meeting of December 11, 1973, the State Lands Commission adopted new regulations". This should be changed to read "adopted procedures covering drilling and production operations and restrictions on these operations". Then add that "the State Division of Oil and Gas adopted regulations (Title 14, Chapter 4, Subchapter 1.1 of the

California Administrative Code) governing the drilling, production, maintenance, and abandonment of offshore wells within the territorial boundaries of the State, which were certified by the California Secretary of State and became effective on May 22, 1974."

Page I-191. Source: Change California "Department" to "Division" of Oil and Gas.

Page I-193. States that some of these wells have been deflected as much as 70 degrees from the vertical. Change this to 80 degrees.

Page II-32. "Middle Miocene strata have not yielded significant production ..." Middle Miocene production has been established at South Elwood Offshore field in state waters where a few wells have been recompleted in the Monterey Shale and several more are planned. In addition, Middle Miocene strata have been tested and found to be productive in the Santa Clara-Santa Ynez Units.

Pages II-41, Section h. Fischer mapped fan channels for his dissertation at U.S.C.

Page II-72. "Miocene age have also been productive of oil and gas, particularly in the area west of the Elwood field". Vaqueros and Sespe production occurs along the zone north of the Red Mountain fault (p. II-50, par. 1) from Summerland on the east to Alegria on the west.

Pages II-84, and 85, Section b and Table II-1. R-F intensities at Santa Barbara are shown for most earthquakes. Note that the City of Santa Barbara may be particularly susceptible to high R-F intensities because it is on alluvium.

Page II-139, Section a. Needs explanation of sources of pressure and methods used to control pressure while drilling.

Page II-143, Section d. Note that tsunamis are not hazardous to platforms.

Page II-385. The map of oil fields on this page is dated 1958. An up-to-date map should be used, one that includes offshore fields.

Page II-386. The cumulative production for Santa Barbara County is incorrect and should be changed to 1,029,046,263 barrels of oil and 1,459,476,980 Mcf of natural gas as of December 31, 1972.

Page III-28. Add to the causes of blowouts, the improper or inadequate response by personnel at the well site.

The second paragraph implies that if casings are severely damaged on a flowing well, a major blowout could occur. All flowing wells are required to have subsurface safety valves installed below the ocean floor. Therefore, this valve or the production packer would have to fail before a blowout occurred.

Page III-49. One additional impact from the development of the Hueneme Offshore field which should be discussed is the possibility of drainage from state-owned lands and subsequent state development.

Pages III-106 and 108. The tabulation of oils spills from 1957 through 1972 should be extended through 1974.

Page IV-10. States that the California Division of Oil and Gas reviews proposals for underground water disposal. Section 1748.2, Article 3, Subchapter 1.1, Chapter 4, Title 14 of the California Administrative Code states that all subsurface injection projects require prior approval of the Division of Oil and Gas. The California Division of Oil and Gas regulates all drilling, operation, maintenance, and abandonment of oil and gas wells within the territorial boundaries of the State, so as to prevent, as far as possible, damage to life, health, property, and natural resources, damage to underground oil and gas deposits, loss of oils, gas, and reservoir energy, and damage to underground and surface waters suitable for irrigation or domestic purposes.

8 Page VIII. The discussion on alternate sources of energy should include Methanol.

#### WATER QUALITY CONTROL PLAN

Page I-70. ASBS were identified and adopted in State Water Resources Control Board Resolutions 74-28 (March 21, 1974) and 74-32 (April 18, 1974), (see attached copies).

The designation of ASBS by the State Water Resources Control Board established a series of areas along the coast of California wherein the State and Regional Board maintain natural water quality conditions through applicable legislative authority and administrative measures. The concept of ASBS is now embodied in the state and federal water quality standards for the ocean waters of California.

9 The State Board adopted the "Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California" (Temperature Plan) on January 7, 1971, and adopted a revision on October 13, 1971. The Temperature Plan provides specific policy guidance for the State Board and Regional Boards in the control of waste discharges having a temperature higher than the natural temperature of the receiving water. The plan includes a provision which requires new discharges of heated waste into coastal waters to be a sufficient distance from ASBS to assure the maintenance of natural temperature in these areas. No provisions are included for ASBS in enclosed bays or estuaries at this time.

The State Board adopted the "Water Quality Control Plan for Ocean Waters of California" (Ocean Plan) on July 6, 1972. The Ocean Plan includes a provision requiring that the location of waste discharges must be determined after a detailed assessment of oceanographic characteristics and current patterns to assure that natural water quality conditions are not altered in areas designated as being of a special biological significance. The plan also provides that wastes shall be discharged a sufficient distance from ASBS to assure maintenance of natural water quality conditions in such areas.

The Temperature Plan and the Ocean Plan were accepted by the Federal Environmental Protection Agency as part of the state-federal water quality standards on August 18, 1972.

The primary purpose of designating ASBS is to guide the State and Regional Boards in decisions relating to the control of waste discharges to coastal waters. Ordinarily, control will be exercised in the establishment of waste discharge requirements, as authorized by the Porter-Cologne Act (Section 13260, Water Code), and the issuance of permits as required by the Federal Water Pollution Control Act of 1965 and its Amendments of 1972 (Section 402, PL 92-500).

Generally, the Regional Boards would prohibit the direct discharge of wastes into an ASBS or its immediate vicinity. Dischargers some distance away are required to have a monitoring program to demonstrate that the discharge could not be detected inside the ASBS. Wastes presently being discharged into ASBS are phased out. Existing discharges which influence water quality in ASBS are either phased out or must comply with requirements which forbid any detectable waste substances within ASBS.

The Ocean Plan is not applicable to vessel wastes, the control of dredging, or the disposal of dredging spoil. Therefore, the discharge of wastes from boats and dredging activities in ASBS would not be affected by such designation.

"Areas of special biological significance" (ASBS) are those areas containing biological communities of such extraordinary, even though unquantifiable value, that no acceptable risk of change in their environments as a result of man's activities can be entertained.

ASBS in Southern California are:

San Miguel, Santa Rosa, and Santa Cruz Islands

San Nicolas Island and Begg Rock

Santa Barbara and Anacapa Islands

San Clemente Island

Santa Catalina Island, including the following subareas:

Subarea #1 Isthmus Cove

Subarea #2 North end of Little Harbor to Ben Weston Point

Subarea #3 Farnsworth Bank

Subarea #4 Binnacle Rock to Jewfish Point

Mugu Lagoon to Latigo Point

Heisler Park Ecological Preserve

Newport Beach Marine Life Refuge

Irvine Coast Marine Life Refuge

San Diego-La Jolla Ecological Reserve

San Diego Marine Life Refuge

Discharges of sewage, drilling debris, oil, and formation water from offshore platforms, as well as oil spills entering ASBS in detectable quantities, are subject to regulation whether or not the discharges originate on state lands. The DES for OCS Lease Sale 35 (DES 75-8), prepared for the Department of the Interior by the Bureau of Land Management, recognizes the establishment of ASBS and suggests prohibition of oil development activities within six miles of such areas as a possible mitigation measure. The discussion of ASBS in Section II.G.2.B.(2) should be rewritten to conform with the present

status of ASBS and to take account of the limitations imposed by the existence of such areas on discharges from oil development activities. Surface current diagrams on page II-73 indicate that discharges from potential development areas in the Santa Barbara Channel will be transported to ASBS.

11 The lists of ocean dischargers in Tables II-63 (page II-408) and II-64 (page II-409) require updating. Table II-63 should note that the City of San Buenaventura Seaside Plant (4A-56-001) is no longer in operation. In Table II-64, the only one of the four industrial dischargers under the jurisdiction of the Regional Water Quality Control Board, Los Angeles Region, which is still active is the Continental Oil Company Grubb Lease Seawater Processing Plant (Number 119).

12 Page II-13. Attribution of leaks from the Platform A blowout to "unusual geologic conditions" is evasive. We understand that construction standards at that time did not require special measures to meet existent geologic conditions. Construction standards for future offshore wells should be matched to the conditions discovered during drilling. The DES claims (page IV-48) that improved construction techniques will reduce the probability of a blowout of this type.

13 Page II-414. Table II-67 again erroneously lists these dischargers. No oil brine is being discharged to the ocean from any of the companies listed in Area II. The only discharge is from the previously mentioned Continental Oil Company Grubb Lease facility. This discharge is a periodic flushing of a 3,000-barrel (126,000-gallon) capacity flocculation tank. The discharge contains aluminum hydroxide floc and insoluble material removed from the influent seawater stream.

14 Pages II-423 and III-26. It may not be feasible to reinject all produced wastewater into subsurface formations. Some operators who have tried this are requesting to discontinue because it is adversely affecting their production. Apparently, successful reinjection depends on the viscosity of it in the injection strata.

Alternative treatment and dilution strategies for wastewater should receive detailed discussion.

15 Page III-41. It seems probable that there would be improvements in design over those platforms built in 1969. Any designs that would make future platforms safer should be incorporated.

16 Page III-64. If a break in the pipeline occurs between shore and the 300-foot-depth contour, the DES should indicate what effective measures will prevent the oil in the line below the break from eventually leaking into the ocean.

#### PROTECTION OF WATER RESOURCES

17 The report should indicate what effective preventive measures will be taken to protect the shore and offshore and the surface and subsurface water resources that lie within the 3-mile limit from possible contamination in case of leaks or rupture of the pipeline systems.

## AIR QUALITY

Shore Treatment Installations. The DES states that, depending on level of development of the oil fields, from one to five shore treatment installations will be required. These installations will involve, at the minimum, oil-brine separators, oil storage depots with off-loading facilities, and gas desulfurizing units.

The oil-brine separators will emit hydrocarbons and probably oxides of nitrogen. The oil storage facilities, even when equipped with the most efficient floating roofs on the tanks, are sources of hydrocarbon emissions.

The loading of ships barges to transport the crude oil to the refineries may be a major source of hydrocarbon emissions. The gas desulfurizing units, even when equipped with three-stage Claus units and Stretford or other efficient tail gas scrubbers, will emit appreciable quantities of SO<sub>2</sub> and some oxides of nitrogen.

Because the locations of existing and potential oil fields are known, it should be possible to make a reasonable estimate of the probable location and capacity of the onshore installations for various levels of development and to quantify the probable emissions of pollutants for each level.

18

There are two EIS's for onshore installations which could serve as guides: one prepared by Dames and Moore for ARCO's proposed increase in production from Platform Holly and one prepared by Exxon for its proposed installation in Las Flores Canyon. There are also EPA emission factors available for ship loading operations.

Therefore, we recommend that the total emissions should be calculated for several levels of development and, by application of appropriate models, estimates should be made of ambient air quality for comparison with state and federal air quality standards.

Shipping and Unloading Crude Oil. It appears from the DES that the crude oil will be shipped by barge or tanker to existing refineries in the Los Angeles-Long Beach area or to the San Francisco Bay area. Estimates should be made of the quantities destined for each area at the various levels of development and the emissions in transit and in loading should be calculated. Therefore, appropriate models should also be used to determine the additive effect of these emissions at the unloading areas.

Preliminary calculations indicate a definite possibility of substantial excess emissions of hydrocarbons, oxides of nitrogen, and sulfur dioxides at the shore installations and of hydrocarbons at the delivery points at tank loading facilities and in transit. Therefore, further analysis as indicated above should be instigated and incorporated in the final EIS.

## VESSEL TRAFFIC

19

Page III-34. Areas within the shipping lanes should not be used for the development of oil or gas. Here the report states that the United States Coast Guard does not permit structures within one mile of shipping lanes, but in

another part (page IV-50), the distance listed is 1/2 mile. The correct distance requirement should be indicated because the report makes reference twice to this situation.

20 There is no information on the increase in support vessel traffic and how it would affect pleasure boating in the area. On weekends, any increase would cause more problems with recreational boating. Therefore, an analysis of the support traffic activity should be included in the final ES.

The DES does not evaluate the effect of the channel structures and increased commercial vessel traffic on the small craft accident rate for the areas concerned. The final ES should address these issues so that the potential for boating accidents can be recognized and mitigated.

#### WASTE DISPOSAL

We recommend that the disposal of solid and liquid wastes generated during the operation of the proposed project be coordinated with Santa Barbara and Ventura Counties.

21 Based on the experience of the Santa Barbara oil spill of 1969, and on the oil spill scenarios presented in the DES, a considerable quantity of oil contaminated wastes requiring disposal could be generated by a major oil spill and cleanup operation, particularly if beach areas are involved. The report should evaluate the impact of the disposal of these wastes on the existing solid waste disposal facilities in Santa Barbara and Ventura Counties.

The oil spill contingency plan should include measures for the disposal of these wastes in an environmentally sound manner. This plan should identify potential disposal sites and include provisions for coordination with those planning activities of Santa Barbara and Ventura Counties' agencies responsible for solid waste management.

#### FISH AND WILDLIFE

Because the proposed development could have significant impact on fish and wildlife resources, the following conditions should be included as mitigation measures in the document and leases for this proposed development:

22 1. Drilling sites, subsurface completions, and offshore oil storage and conveyance facilities shall not be located in existing or proposed lease areas within six nautical miles of ASBS, marine life refuges, and ecological reserves.

23 2. Prior to drilling, the lessee shall demonstrate to the satisfaction of the State of California that the applicant possesses rapidly deployable oil spill containments and recovery capabilities in sufficient quantities to prevent spill damage to ASBS, marine life refuges, and ecological reserves.

Page II-219, last sentence. The statement should read "one" of the few remaining wetlands..."

Page II-264, paragraph 2. Kelp cutting is limited to four feet by the Department of Fish and Game.

- 24 [ Page III-13. The discussion on the visual impact of platforms should include consideration of the impact on the apparent solitude requirements associated with pinniped breeding on the Channel Islands.
- 25 [ Page III-121. The comment that "man-caused spills are probably much less important than natural seepage to the channel" needs to be supported by documentation or deleted.
- 26 [ Page III-133, paragraph 2. Available data show that oil spills can have long lasting deleterious effects on wetlands. This should be included in the DES.
- 27 [ Page IV-35. The coordination and response plans provided in this document have been greatly improved over previous contingency plans. Nevertheless, the open sea capabilities claimed for the listed containment and recovery equipment are almost entirely hypothetical and should be stated as such.
- 28 [ Page V-2. The endangered California brown pelican nests in the project area on Anacapa and Santa Cruz Islands and is not a rare resident, as reported in the document. The least tern also nests along the shore in these areas.
- 29 [ Pages I-41 & I-42. The DES delineates 27 safety features or design criteria for conduct of drilling operations from vessels that are established by USGS OCS Orders. A review of OCS Order No. 2 covering drilling procedures reveals that only four of the 27 items listed are covered. The State believes that it is absolutely necessary that OCS Order No. 2 be revised to include all of these items in the regulations.



# CALIFORNIA COASTAL ZONE CONSERVATION COMMISSION

1540 Market Street, San Francisco 94102 — (415) 557-1001

Comments of California Coastal Zone  
Conservation Commission Staff

on

Draft Environmental Impact Statement for

"Oil and Gas Development in  
the Santa Barbara Channel  
Outer Continental Shelf Off California"

The following comments represent the work of Coastal Commission staff only, and have not been reviewed or approved by the Commission itself. Several general comments on the Draft EIS will be presented first, followed by comments addressed to specific parts of the document.

## General Comments

### 1. Failure to Address Potential Cumulative Effect of Santa Barbara Channel Development

Perhaps the most significant challenge the environmental impact statement must meet is to determine whether oil and gas development can proceed on Federal and State leases throughout the Santa Barbara Channel area without the unique character and uses of the Channel and adjacent coastal areas being altered by the cumulative effect of the myriad incremental environmental and land use impacts that inevitably result from such large-scale industrial activity. The Draft EIS raises most of the specific environmental problems, and some of the problems of conflicting uses. It does not, however, address the possibility that the balance presently existing between limited Channel oil development and the residential, scenic, recreational, fishing, agricultural, and other uses dependent on the clean natural environment could be destroyed by a doubling or tripling of petroleum-related activities and development.

### 2. Inadequate Identification of Other Energy Activities Planned for Santa Barbara Channel Area

The Environmental Impact Statement should consider additional oil and gas development activities the Santa Barbara Channel within the complete context of other energy-related activities presently being considered for the same area, in order to accurately project the cumulative effect of petroleum development, the potential for use conflicts, and various safety concerns. Among the possible projects not adequately considered are:

- a) additional oil and gas activities on State-owned lands;
- b) increased tanker traffic, involving tankers of increased size, associated with Alaskan oil development and proposed development of a deepwater port in the Los Angeles/Long Beach area;
- c) the proposed liquefied natural gas marine terminal at Pt. Conception (Cojo Bay);
- d) the possible proposal for a nuclear power plant on the 975-acre parcel east of Point Conception owned by Southern California Edison Company.

*Richard Hammond*

3. Inadequate Discussion of Consolidation of Marine Terminals and Onshore Facilities

32 In Volume I of the Draft EIS, p. I-143, under the heading "Minimization of the Number of Facilities", it is stated that "... an alternative to the traditional piecemeal development is the coordinated development of all oil production in the Santa Barbara Channel." There is a brief discussion of possibly concentrating all onshore facilities in two or three areas that are already industrially developed, in order to minimize environmental impacts. After that brief mention, however, the document ignores this possible "mitigating measure" altogether. There is no discussion as to how the goal of consolidation of sites and facilities might actually be effected. How, for example, might Federal or State agencies intervene to require consolidation where feasible? What are the potential legal, economic, and environmental problems that might be encountered in proposals to consolidate.

Furthermore, the Draft EIS does not present any of the information necessary to measure the actual potential for consolidation of facilities: (a) a comprehensive listing of offshore lease owners, unit operators, and all petroleum activities presently underway or planned on Federal or State leases in the Santa Barbara Channel; and (b) a baseline inventory of existing marine terminals and onshore facilities showing, among other things, company facility and land ownership; degree of present use of the facility, and available excess capacity; the age of the facility and state of its technology; and excess acreage available at each site.

4. Inadequate Information About Various OCS-Related Onshore Activities

33 The Draft EIS is vague as to where platform construction is likely to occur, saying only, for example, at page III-11, "Construction of each platform would involve fabrication, possibly at Terminal Island or elsewhere..." The Draft indicates that the prospective development under discussion here may involve 10-21 new platforms, and in view of that projection, the document should give much fuller discussion of possible construction sites, including a listing of the construction sites of existing California platforms and the California shipyards or other facilities where such construction could feasibly occur.

34 The Draft EIS makes no mention of such essential considerations as staging areas for offshore activities, service and supply centers, offshore-related light industrial and commercial development, construction laydown areas, heliports and helicopter traffic. There should be full discussion of where such facilities presently exist, their capacity to handle increased activity, and the likelihood of need for new development.

35 The Draft document presents no discussion of where the oil produced is likely to go for refining, or what possible end uses might be made of the oil. Analysis should be made of lease ownership by company, refinery location by company, and the historical disposition of Santa Barbara Channel oil. How much of the Channel oil, for example, is likely to be sent north to the San Francisco Bay area for refining? This information may effect determinations of the need for marine terminals, the amount of barge and tanker traffic in the Channel and in San Francisco Bay, and the viability of the proposed alternative of a land pipeline to the Los Angeles area.

5. Inadequate Discussion of Safety Standards for Subsea Equipment and Operations

6 The Draft EIS presents brief descriptions of various types of subsea completion and production systems being considered for use in the Santa Barbara Channel, and of testing now underway on some subsea systems. No attention is given, however, either in the sections dealing specifically with subsea systems or in the section identifying "mitigating measures", to the benefits that might accrue from Federal regulation of the design, testing, monitoring, and maintenance of such systems, or to the personnel training standards the industry should be required to meet.

6. Inadequate Discussion of Vessel Traffic Safety

7 The Draft EIS's treatment of vessel traffic safety is deficient in at least three respects: (a) it does not fully develop Santa Barbara vessel traffic projections based on Alaskan oil flows, LNG carrier traffic, and Santa Barbara Channel oil and gas development; (b) it contributes further to the confusion caused by various recent Department of the Interior environmental impact documents as to the standard regulating proximity of oil platforms to shipping lanes (see appended list of eight differing statements of the standard, culled from recent Interior publications); and (c) the section on "mitigating measures" presents no discussion of what improvements, such as new navigational equipment or monitoring systems, might conceivably be applied to reduce the risks of vessel collision.

7. Inadequate Discussion of Coastal Planning Process and Specific Plan Policies

The Draft EIS includes slightly over one page of information about the California Coastal Zone Conservation Commission. The draft document notes that if the Coastal Plan is adopted, "it will apply to several aspects of OCS oil and gas production activity". Since the Plan has not yet been published and sent to the Governor and the Legislature, it may be understandable that it is not given fuller treatment in the Draft EIS.

38 There are, however, policies in the final Coastal Plan that should be noted in the EIS at least as proposed State policy directions that may affect Santa Barbara Channel petroleum development. Among these are policies relating to preservation of prime agricultural lands and protection of air quality, which may limit the availability of onshore processing facilities in Ventura County; and policies relating to consolidation of oil and gas sites and facilities, establishment of guidelines on the appearance and design of facilities, standards describing the types of areas where development should occur, and standards to protect coastal recreational uses.

Copies of the final Coastal Plan policy language will be available by October 20, and should be given fuller attention in the Final EIS if time allows.

Specific Comments

Page I-65, paragraph 2: The Draft EIS should give a fuller discussion of the Exxon platform project, and the extent to which it might be considered a precedent for subsequent Channel platform construction and installation. The EIS could identify, for example, the place of fabrication; the number of Californians employed on the project; the capability of facilities in California to undertake similar such fabrication projects; the process of joining together the two prefabricated platform sections, and the possible environmental effects, if any. Will the joining process take place in the coastal permit zone off the Channel Islands?

39

Page I-65, paragraph 4: The single sentence identifying "the Los Angeles Harbor area, a center of heavy industrial activity" as "a probable prefabrication site for platforms" is an unacceptably brief consideration of an important planning issue. Discussion should include analysis of where existing platforms for California production were constructed; where there are shipyards or other facilities in California where platform fabrication might occur, and what their availability for platform fabrication is likely to be within the applicable time period; and where, if not in California, the necessary platforms will be constructed, giving full consideration to demand for platforms that could materialize as a result of accelerated offshore leasing proposals on the Atlantic, Gulf, and Alaskan coasts.

40

Pages I-77 to I-111: The discussion of subsea completion and production systems would be enhanced by presentation of information as to what water depths and economic considerations dictate the use of such systems. It would be useful to have information regarding the economics and the safety record of the numerous subsea completions in shallower waters along the Santa Barbara Channel. As noted in the General Comments, above, there should be more substantial discussion of how USGS is approaching the problem of regulation of subsea system design, testing, monitoring, and maintenance, other than on a case-by-case basis.

41

Pages I-126-7: The Draft EIS presents all of two paragraphs discussing the need for, and the possible location of, onshore treating and storage facilities. There is one sentence surmising that some of the existing onshore facilities only two of which presently handle Federal OCS production, might be able to accommodate future production, "...depending on agreement by the operators involved, State and County approval, and their mechanical condition"; but there is no further information allowing one to judge the extent to which that surmise might prove true, or the extent to which use of existing Facilities or sites might eliminate the need for new sites. Without better information as to what facilities presently exist, their capacity and present degree of use, their age and mechanical condition, company ownership, excess available land, etc., there is no way to measure the accuracy of the EIS's projection that 1-5 additional onshore separation and treatment facilities may be required to service Channel production. At the very least, the EIS could present such particulars for the "two onshore treating and storage facilities in the Carpenteria-Rincon area which handle the present Federal offshore production."

42

*Richard Hammond*

Page I-136: The Draft EIS notes that at present there are seven nearshore loading terminals in the Channel area, then goes on to say, "A significant increase in Channel production would require the consideration of adding new terminals or the modification of existing ones." Such facile treatment of such an essential issue precludes analysis necessary to understand the overall impact of additional Channel oil and gas development. The EIS should identify the location, ownership, capacity, and existing use of the existing facilities; those with the best potential for serving new Federal production; and the degree to which such facilities might be replaced by construction of an overland pipeline to the Los Angeles/Long Beach area.

Pages I-142 to I-144: (See "General Comments" 3, Inadequate Discussion of Consolidation of Marine Terminals and Onshore Facilities, Full discussion of the potential for consolidation through coordination of planning and development should also be included among possible "Mitigating Measures", Part IV.

Page I-145, paragraph 1: The Draft EIS states, "It is estimated that the two present onshore facilities could handle any additional production which might result from such platforms." No information is given, however, to support this projection: how much oil might be anticipated? what is the capacity of the two existing facilities? is there room for expansion on the existing acreage? are there any environmental problems that might result from expansion of those facilities?

Page I-145, paragraph 2: The Draft EIS might include some discussion of the availability, nationwide and worldwide, of mobile drilling rigs for which Channel development might be competing, and the relationship between Santa Barbara Channel drilling rig requirements for development of the Southern California Borderlands leases planned for sale in December, 1975.

Page I-146, top paragraph, continued from page I-145: Same comment as for Page I-145, paragraph 1 (above).

Page I-146 to I-152: The Draft EIS could present fuller, more current information about planned or underway operations on the various units. See attached sheet of information from The Oil and Gas Journal of July 7, 1975. This section makes no mention of the three wildcat tracts in widely separated areas of the Channel, P-0176, P-0199, and P-0212. It would be helpful if oil company ownership interests were included in the information on each unit discussed.

Page I-150: At two places on this page the Draft EIS states that production from the Santa Clara Unit and from the Hueneme Offshore Field "...would be pipelined to shore to an existing treating and storage facility or to a new onshore treating and storage facility that would probably be located between Port Hueneme and Ventura". It should be possible to present a fuller, more informational discussion as to the location, capacity, and potential for expansion of existing facilities; the amount of offshore production that would necessitate a new facility; the environmental and land use conflicts that might affect planning for a new facility in Ventura County, including policies relating to preservation of prime agricultural land; and the feasibility of finding a landfall for the oil other than in Ventura County.

Page I-151 and I-152: There appear to be approximately 77 unleased tracts in the Channel, outside of the buffer zone and the ecological preserve. In view of the number of leases involved, there should be fuller discussion of the reasons for the low estimate as to recoverable resource and the number of facilities that might be required. For example, the tracts might be broken down according to water depth. It is hard to know from the discussion whether the tracts were not nominated previously for leasing because of water depths or because of unfavorable geological findings. With industry advancing so rapidly toward deepwater technology, the EIS should present further consideration of how quickly some of these tracts might become technologically and economically accessible to petroleum production, and how soon pressure might develop for leasing of these tracts.

46

Page I-165: (See "General Comment" #7, above). The EIS should present a fuller discussion of the structure and content of the Coastal Plan, at least identifying the policies developed in the Plan that might have an effect on the manner in which Santa Barbara Channel oil and gas development is carried out, including policies relating to oil spill hazard, air quality protection, preservation of prime agricultural lands, siting of offshore and onshore facilities related to offshore petroleum production, marine and land transportation, recreational opportunities, development patterns, and implementation of the Coastal Plan. Ideally, preparation of the Final EIS could await the availability of the final Coastal Plan policies (around October 20) and the Office of Planning and Research's OCS study project, which will include a section analyzing the potential effect on OCS development of the Coastal Plan.

47

Page I-168: For comments on Section 3, "Other Proposed Projects", see "General Comments" #2, Inadequate Identification of Other Energy Activities Planned for Santa Barbara Channel Area.

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VOLUME II

Page II-387, Table II-53: This table could be significantly improved by updating. Attached to these comments is a more recent listing.

48

Page II-390, II-391: On these pages, the Draft EIS purports to give a description of "Marine Transportation" and "Oil and Gas Pipelines", as an important aspect of the Santa Barbara Channel coastal environment. Again, this document simply fails to give information that is essential to projecting the degree of development that must occur to accommodate Santa Barbara Channel oil and gas development, and the likelihood of environmental impact. Which of the harbors, for example, presently support offshore petroleum activities? What kind of facilities do they have, and what type and volume of offshore petroleum-associated traffic, and with what effect on competing marine vessel uses? As to pipelines, what is the capacity of the Shell Oil Company pipelines to the Los Angeles/Long Beach area? What is the present excess capacity? Is there any extra land along the Shell right-of-way for expansion? Table II-54 on page II-392 could be improved by presenting figures as to present levels of use. Some analytical language describing the potential of any of the existing pipelines to handle any of the new production would be useful.

49

Page II-413, Table II-66: This table would be improved by the inclusion of information regarding present levels of use of the mooring facilities, vessel traffic at each facility, and limit on the size of vessel that can be accommodated (tonnage and draft). Some analytical treatment of the potential of each of the existing mooring facilities (and their pipelines and onshore facilities) to handle increased volumes from new production, or conversely, to be phased out of use altogether, would be useful.

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VOLUME III

Page III-2: The Draft EIS states " Since no specific proposal is being considered and due to the lack of specific knowledge of where additional oil may be discovered and developed in the Channel, it is impossible to predict exactly where, or even how many, and what type of facilities may be required." While this statement may be partially true, certainly enough is known about where oil activities are planned or underway, and enough is knowable about existing offshore and onshore facilities, transportation economics, local land use and coastal management goals, and so forth, to perform area-specific analyses of possible development requirements, alternatives, and impacts, and to conduct some area-specific evaluations of "mitigating measures". The study presently being conducted by the California Office of Planning and Research is attempting just such analyses. An EIS that does less than this will add very little knowledge to what is already known about offshore petroleum development generally, and will amount to a critical missed opportunity for inquiring fully into the potential for developing offshore petroleum in a manner that minimizes environmental disruption.

51

Page III-3, paragraph 4: What is important here is not necessarily the "natural state" versus "urban areas", but rather the idea that onshore sites should be reclaimed for other priority uses, perhaps including coastal open space or recreation, when their life is completed. A principal concern is that historically it is infrequent that land on which industrial development is allowed to occur is returned to non-industrial uses.

52

Page III-33: In discussing the potential for collision, the Draft EIS states "Collision by a vessel (with a platform) is unlikely due to requirements for navigational equipment on the passing ships as well as on the platform." Nowhere are such requirements discussed, although at pages IV-2 and IV-12, it is stated generally that the Coast Guard has promulgated regulations regarding such safety concerns. Mention might be made here of the August 15, 1975 collision of a 33,000 dwt. British tanker with an offshore drilling platform in the Gulf of Mexico off Galveston, Texas, which resulted in large fire, substantial crude oil spill, and several deaths. Discussion also might include discussion of the voluntary nature of the shipping lanes through the Channel, the degree to which existing traffic adheres to the shipping lanes, and any traffic monitoring or directive operations currently in operation in the Channel area.

53

Page III-34, first sentence: For concern over the several apparently conflicting statements in various Department of Interior documents as to the required distance between shipping lanes and platforms, see "General Comments" #6, above.

Pages III-42 and III-47: The Draft EIS says, "No additional onshore treating and storage facilities would be required as the production would be received at the existing onshore facilities." Whose facilities? Located where? What is the present capacity, use, and excess capacity of these facilities? Where will the treated oil be sent for refining, and by what means of transport? These same questions could be directed to the sketchy discussion presented for each of the offshore fields.

54

Page III-52, paragraph 3: See comment for Page I-150, above, regarding possible location of a new treating and storage facility in Ventura County.

Page III-72, and following "Impact of Onshore Treating and Storage Facilities": Somewhere in this discussion mention should be made about the cumulative impact that multiple industrial facilities may have in gradually shifting the fundamental character of an area, or in opening the way for further, possibly unrelated industrial or other development.

55

Page III-72, last sentence: The Draft EIS says, "New onshore treatment and storage facilities quite likely would be constructed in areas that are either well hidden from public view or in areas that are already dedicated to industrial development," and then goes on to cite the Santa Ynez onshore facility as an example of this. The Santa Ynez unit onshore facility, however, only partially exemplifies the statement. Exxon had to obtain a zoning variance to put its industrial facility in Las Flores Canyon, which is an open, natural environment, and not an industrial area at all.

56

Page III-86, line 21: Regarding the assertion that only minor amounts of air pollutants will be emitted during loading operations, with no noticeable impact onshore, the California Air Resources Board and the County of Santa Barbara are reviewing this and related concerns.

57

Page III-92: See "General Comments" #6(a), above, for comment on the ship traffic projections presented here.

58

Pages III-93 to III-95: Rather than present oil pollution statistics for the world's oceans, doesn't the U.S. Coast Guard or the California Department of Fish and Game have some statistics on numbers and types of oil spill incidents in the Santa Barbara Channel? (There are apparently unofficial Coast Guard statistics for the Los Angeles/Long Beach area.)

59

Pages III-96 to III-100: The Draft EIS does not make clear whether the proposed Exxon pipeline could service offshore operations other than those on the Santa Ynez Unit. What is the full potential of the pipeline alternative as applied to all prospective Channel operations, and what are the technological and economic obstacles to realizing such potential? To what degree could the land pipeline supplant marine traffic, and eliminate the need for existing or new marine terminals? At page III-99, paragraph 3, the alternative of expanding along the Shell pipeline right-of-way is mentioned, but apparently only in passing. The pipeline apparently begins in the Oxnard area and goes south. How might it be tied in with production operations in the northern Channel areas? The reader is directed to Figure II-45 for the route of the existing Shell pipeline. It is not possible to identify the pipeline in question on that figure.

60



Pages III-210 and III-211: For comments related to the paragraph entitled "Coastal Zone", see the comments for Page III-72, and following, above. The Draft EIS assumes that since development must be consistent with land use and zoning regulations, the impacts will be minimal. The history of development related to offshore petroleum recovery, however, is that industry obtains zoning variances or changes wherever necessary to accommodate its requirements, resulting in a variety of immediate environmental effects, and in a change in fundamental land use patterns in a given area.

61

Page III-213: The discussion on this page focuses too much on the possible need for new refining capacity based on increased Channel production. There is no evidence that increased crude oil availability will lead to refinery capacity expansion in the absence of increased local market demand. The first sentence in paragraph 4 should de-emphasize refineries, and should include some estimates as to how much land might be required, including buffer space, for the 1-5 new treatment, separation, and storage facilities. Mention should also be made of possible land requirements for such activities as are mentioned in "General Comments", #4, above.

62

Page III-221, "Impacts on Air Quality": The Draft EIS, both here and elsewhere in the document, makes light of the potential for significant adverse impacts on air quality. The California Air Resources Board is presently reviewing several air quality issues related to Channel oil and gas development. Discussion should be presented here, and in Section II. G. on Air Quality, of the fact that all coastal areas affected by Channel oil and gas development are designated as "air quality maintenance areas" by the Air Resources Board. There should also be discussion of the effect of the coastal and inland topography on coastal air quality, the current level of reactive hydrocarbon emissions and of oxidant, and the dependence of the recreational and agricultural economic activities on clean air.

63

RESPONSE TO THE RESOURCES AGENCY OF CALIFORNIA,  
INCLUDING CALIFORNIA COASTAL ZONE CONSERVATION COMMISSION

The State Lands Commission submitted separate comments on the draft statement. This was called to the attention of The Resources Agency of California (via telephone) which then requested that both the State Lands Commission and the Resources Agency comments be included and responded to. Numerous State Lands Commission comments were incorporated in the Resources Agency comments, therefore, frequent reference to similar State Lands Commission comments and responses is made.

1. Refer to our responses to similar comments by the State Lands Commission and EPA (comment number 2) and also the Coastal Zone Commission (comment number 38).
2. Refer to our response (number 22) to EPA comment on cumulative impacts. See our updated and expanded discussion on other possible activities within the area, and possible additive impacts (section I.F.3.).

Discussion of onshore impacts has been expanded in the revised sections on Air Quality Impacts, Socio-economics and Terrestrial Biology. Refer to sections III.LL. and III.N., respectively.

3. Consolidation of sites and activities is stressed in the statement (e.g., section I.E.).

The question of where the oil would be refined is by necessity discussed only in general for market demand along with the Coastal Zone Plan and the Air Resources Agency would, to a large degree, dictate where the oil could be refined. The California Refinery Capacity table II-54c has been updated in this final statement. (See our response to EPA comments

on the possible need for refinery installation and expansion).

4. The identification and quantification of potential air pollution emissions and their impacts from the possible levels of Channel development have been addressed in full detail in the greatly enlarged air quality and air impacts sections II.G.1., and III.LL.
5. Your recommendation is acknowledged.
6. It is recognized that the State has authority over portions of pipelines that cross State waters.
7. These several pages of detailed suggested modifications and additions were incorporated where appropriate; they were most helpful and appreciated.
8. Methanol and a number of other energy source alternatives were not discussed in the DES because of their economic and technical limitations and probable minor potential for contributing significantly to the energy resources of the United States in the foreseeable future.

Synthetic oil and gas fuels derived from coal are discussed in the DES and these are considered by most to be more promising than methanol coal derivative as a liquid fuel alternative to natural crude oil or natural gas.

While systems for extraction of methanol from coal do exist, its low specific heating value as compared to natural crude oil (about one half) along with certain other drawbacks tends to decrease its attractiveness as a hydrocarbon energy source.

9. The current information and status summary is appreciated as is the transmittal of the very helpful reference document "Areas of Special Biological Significance Designated by the State Water Resources Control Board, April 18, 1974."

The ASBS information is incorporated in sections I.F.3.e., and II.G.2.b.(2).

10. The discussion of ASBS in section II.G.2.b.(2) has been updated as required. As noted in the revised discussion of the subject, the concept of ASBS is now embodied in the State and Federal water quality standards for the ocean waters off California.

Also, the FES on Lease Sale 35 off southern California indicates sewage and produced waste discharges would be regulated as a function of ASBS proximity.

11. Updating has been completed.
12. More stringent casing setting requirements for numerous Platform A and B wells drilled subsequent to the 1969 blowout, to meet existing geologic conditions, have proven to be successful in preventing the re-occurrence of such a blowout.
13. The erroneous listings have been deleted.
14. It is acknowledged that in certain instances it is not technically or economically feasible to reinject OCS produced waste water into subsurface formations. Treatment of produced waste water to prescribed requirements and discharging it into OCS waters is presently the most likely alternative from an economic and environmental standpoint.

15. It is agreed that all platforms should incorporate the latest design criteria.
16. This section has been rewritten for clarification.
17. The same measures would be taken to protect the shore and offshore resources that lie within the three-mile limit from possible pipeline spills that would be taken to protect those areas from a spill originating from any source. These measures are described in section IV.A.4.
18. The identification and quantification of potential air pollution emissions impacts appear in sections II.G.1., and III.LL.
19. The text has been revised to reflect the proper "½ mile" exclusion distance regulation for shipping lane traffic.
20. A revised discussion of tanker traffic impacts is provided in section III.J.1. Potential interference problems between pleasure boating and supply vessels would tend to be less than for tankers since pleasure craft and supply vessels usually are smaller and more maneuverable. Also see our response to Public Hearing item number 5.
21. Disposal of solid and liquid wastes would be in accordance with all applicable Federal, State, and local laws. Coordination with Santa Barbara and Ventura Counties on disposal areas would, of course, be performed to the necessary extent.

It is true that a considerable quantity of clean-up waste was generated by the 1969 Santa Barbara spill, however, such occurrences are very infrequent and would not be a continuing source of additional load on

local approved dumping sites. In the unlikely event of another large oil spill, clean-up wastes would, as before, be disposed of properly in an approved local dumping site that could accept the type and quantity of generated material.

The oil spill contingency plans do provide for, and require, appropriate disposal of clean-up wastes in the event of their generation.

Should a local disposal site not have the necessary capacity or classification for receiving oil spill clean-up waste material, it would then be transported to another dump that could accept such waste.

22. Please see the response to public hearing item number 7.
23. Procedures of the Conservation Division require the submission of a spill contingency plan subject to the approval of the Area Oil and Gas Supervisor prior to the commencement of any operations on a lease (30 CFR 250.34).
24. Because none of the leases are within three miles of the Channel Islands, the visual impact of any platforms should be minimal. The following paragraphs taken from an article by Robert DeLong for the National Marine Mammal Commission entitled "San Miguel Island Management Plan" would seem to support that conclusion.

"Another important objective is the development of non-consumptive esthetic utilization of the San Miguel pinniped resources. One fact has become evident from the study of pinnipeds -- 'humans and pinnipeds don't mix.' Yet the pinniped resource belongs to the people and it is desirable that they be allowed to see more than the occasional seal in the circus, zoo or oceanarium. Movies made with telephoto lenses could be produced for television without disturbing populations.

"The movies could show pinnipeds in their natural setting, allowing millions of viewers to learn the fascinating natural histories of seals and sea lions.

"The possibility exists for organized educational group visits to San Miguel Island. It should be cautioned that educational groups would require close supervision. Observation would have to be confined to distance viewing. Binoculars or telescopes could be used as necessary.

"Development of petroleum resources around San Miguel Island will cause an increase in human activity. Certainly, ocean drilling and construction of land-based facilities would create much disturbance. I can only suggest that, if petroleum development is initiated, then facilities to support marine rigs not be placed on the Island."

25. Section III.L.1. has been rewritten for clarification and additional documentation provided.
26. This is now indicated in the preceding paragraph.
27. The open sea capabilities given are not entirely hypothetical. However, it is agreed that more field testing and evaluating is desirable. It is also possible that certain of the equipment capabilities given are below the true potential. The Bottom-Tension Boom has contained natural seep oil in six- to eight-foot seas with its full containment capability as yet undetermined. This covers about 94 percent of the Santa Barbara Channel sea conditions, and is approaching the limit that man can stay out and work safely with such equipment.

As stated in the text of this statement, subsequent to the 1969 Platform A spill, improvement has occurred in spill containment and clean-up procedures and equipment. However, to date, no system or equipment

has been developed which is completely effective in controlling and removing pollution under all weather and sea conditions (section VI.A.5.).

28. Text has been corrected.
29. The introductory sentence to the 27 items listed has been modified for clarification. The OCS Order No. 2 revision recommendations provided by the State to the Geological Survey are presently being considered. The OCS Orders are not intended to spell out in minute detail each and every equipment and procedure requirement, i.e., "the OCS Orders do not specify that a functioning brake accompany the drawworks of drilling rigs, or that the crown of the derrick be greased at specific intervals." The Geological Survey engineers and inspectors observe field projects to see that the environment is protected and that operations are conducted in accordance with safe, good operating practices. This involves more than just seeing that the operator adheres to OCS regulations and orders.

#### CALIFORNIA COASTAL ZONE CONSERVATION COMMISSION

(Submitted with the Resources Agency Comments)

30. An assessment of the cumulative impacts of the four possible levels of development is presented in section III. Refer to our response to EPA's similar comment on cumulative impacts for a detailed explanation and identification of the cumulative impact information presented in section III.
31. The discussion of other possible activities and resulting additive impacts has been updated in the final (see section I.F.3.).
32. The statement does stress the desirability of minimization of facilities



(see section I.E.). However, as to how and which of these possible facilities may be consolidated (or which existing ones may be used for new oil production) must be determined on a case-by-case basis. A more detailed, complete inventory of existing treating and storage facilities in Ventura and Santa Barbara Counties has been included in this final statement (see table I-3). This inventory includes such information as: facility operator, capacity (design, existing and surplus), age, expansion potential and acreage when available.

33. The construction location for possible future Santa Barbara Channel platforms would be dependent upon many presently unpredictable factors. This is normally not definitely determined until the platform construction contract is let by the operator. Exxon at one time considered the Los Angeles - Long Beach harbor area as a possible construction site for the Santa Ynez Unit 850-foot platform. However, according to our sources, it was determined that some modification of the existing shipyard area would be required to handle such a large structure. Also, according to Exxon, the Coastal Zone Commission made a preliminary staff report stating that they would recommend denial of a proposal for such construction in the Long Beach - Los Angeles shipyard area. These considerations contributed to some degree in the platform being constructed in other places: the decks in Morgan City, Louisiana, and the jacket in Oakland, California. On the West Coast the areas that would be likely platform construction sites are Los Angeles - Long Beach, California; Oakland, California; and Vancouver, Washington. Platform C, the last platform to be constructed for the Santa Barbara Channel was built at the American Pipe and Construction Company yard in Vancouver, Washington. This platform is presently stored at the construction

site (see sections I.B. and III.C.3.a. for Platform C discussion).

Platforms A and B were also constructed at Vancouver, Washington, while Platform Hillhouse was constructed at Kaiser's Oakland, California, yard in San Francisco Bay.

34. The socio-economic discussion has been largely expanded to reflect in more detail the possible onshore impacts.
35. The California Refinery Capacity table II-54c has been updated in this final statement. Refer to our response to the Resources Agency of California and EPA's comments as to prediction of refining locations for possible additional Channel oil production.
36. As submerged production systems testing and usage evolves, so will regulation of design, operations, monitoring, and maintenance. In this statement the present status of safety standards, design, and operational and maintenance procedures have been described for the subsea systems now being designed and in some cases field tested. The subsea system discussion has been updated in the final statement (see section I.D.6.). The description of the Gulf of Mexico field testing of three of these systems is a part of the evolution of deep water submerged production systems of the future. A discussion of industry assessment as to the current status of subsea production systems technology has also been added to this final (see section I.D.6.d.(7)). Also see section I.D.6.b.(2) for recent diver depth-capability advancement.
37. Response to this comment is provided in three parts as was the comment itself. (a) The DES did not address in detail Santa Barbara Channel traffic projections based on Alaskan Oil Flows and LNG carrier traffic

since these traffic elements do not yet exist and their size and occurrence are still highly uncertain. (See section I.F.3. for general discussion of other activities, including those just mentioned, that may affect the Channel area) The DES does, however, address traffic impacts from the potential levels of possible Channel oil and gas development in section III.J.1.a. (b) Section III.C.2.b.(2)(d) of the FES indicates appropriately that a "½ mile" exclusion distance is required adjacent to shipping traffic lanes. (c) Refer to the revised discussion of navigation safety measures that are presented in section III.J.1.a. of the FES.

38. The Draft EIS was issued June 6, 1975. Therefore, draft preparation of the Coastal Plan and the DEIS were in part occurring simultaneously. The individual members of the Commissions contacted provided useful and appreciated information and source materials. It was clear at the time of DES writing that the reporting the status of the California Coastal Zone Conservation Commission was as much as could be done at that time.

We concur that the policies recommended by the final Coastal Plan would significantly affect Santa Barbara Channel petroleum development, and further note that these require concurrence by the State Legislature and Department of Commerce prior to State and Federal legal status.

The Final Coastal Plan received in December 1975 is a document containing a wealth of information, descriptions, findings, proposed policies, color-coded and the annotated series of land use/resources/ecological maps. It is a valuable document for environmental statement preparation and planning in the coastal zone; if it were not for space limitation, it could well serve as an appendix to the FES; rather it should serve

as a companion volume to any coastal EIS. (Please see sections I.F.2.a. and II.A.1.h.)

39. To date, Exxon is continuing to seek various permits and approvals from County and State agencies and commissions. Onshore facility consolidation and a pipeline from the Channel area to a refinery area are two possibilities being considered by the State, County and Exxon, in conjunction with the processing of applications for the onshore facility. The construction of the platform in Oakland, California, and Morgan City, Louisiana, is the only Santa Ynez Unit operational activity that has commenced. Presently no detailed employment figures are available at this early stage. The reader is referred to the Santa Ynez Unit Development Final Statement (FES 74-20) for details as to the probable location and procedure for joining together the two prefabricated platform sections. This operation would be for a duration of only a few days and, with careful planning, should have little or no impact on the environment.
40. Refer response number 32 to the earlier comment on possible platform construction locations.
41. Presently there are no complete subsea completions systems operating off the west coast, only 40± single well subsea completions on State tideland leases. Considerable information is provided in this statement on the Exxon subsea system presently being field tested in the Gulf of Mexico (see section I.D.6.d.).
42. Refer to our above response to your similar comment as to possible facility consolidation, use of existing facilities and description of existing facilities.

43. Rig availability would fluctuate from one month to the next.
44. The activity status of the Channel has been updated in this final (see section I.). The oil company ownership interests for all OCS Santa Barbara Channel leases are identified in pocket plate 1.
45. Refer to our response (number 32) to your earlier similar comment on possible facility consolidation, use of existing facilities and description of existing facilities.
46. Seventy-five tracts, of the 110 Santa Barbara Channel tracts offered, were bid on with four bids being rejected by the Department of the Interior. The majority of the tracts, that were not nominated by the oil companies and not offered for lease, lie within the deeper waters of the central Channel Basin.

The unleased Santa Barbara Channel acreage represents:

- (1) tracts that were not nominated by oil companies and not offered,
- (2) tracts that were offered but not bid on,
- (3) tracts that received bids that were rejected by the Department.
- (4) tracts withdrawn by the Secretary of the Interior for the Ecological Reserve and Buffer Zone.

This lack of interest in certain areas appeared to be due to a combination of factors, lack of geologic information, low potential indicated by geologic information, and deep waters.

The oil companies evidenced a willingness to pay very high prices for tracts having good anticlinal structure, even in relatively deep water. No doubt there are many reasons why this was so. Factors having a bearing could have been the probable existence of multiple sands with thick potential producing sections where the possibility of a pay-out

from deep water would be enhanced, and the proximity of deep water tracts to shallow water tracts where it would be possible to deliver production from submerged well completions in deep water to platforms on adjoining shallow water tracts. The desire to acquire acreage in an area where conditions exist that are relatively favorable to the development of deep water producing techniques also may have had an influence.

On tracts where they would have to prospect for other types of traps, such as faults or pinchouts, the companies indicated a willingness to pay only low prices in deep water.

47. Refer to response number 38 for an updated discussion of the Coastal Plan.

Geological Survey personnel for this Channel Statement have met with, and exchanged information with, State personnel on the task force preparing the Onshore Southern California OCS Impacts Report. The State personnel made certain preliminary information available for incorporation into this final statement and the Geological Survey personnel provided detailed explanation of certain aspects of Santa Barbara Channel OCS operations. The Geological Survey task force has made numerous attempts to obtain an advance copy of this Governor's Office Impact Report (telephone communication almost daily during the last two weeks of December 1975). However, it presently appears the subject impact report will not be available to this task force prior to the printing of this final Santa Barbara Channel Statement.

48. The California Refinery Capacity table II-54c has been updated. See response to comment number 35.
49. According to the sources we have contacted, the pipeline network from the Santa Barbara Channel area to the Los Angeles - Long Beach refinery area is operating at capacity. The present levels of use of the pipelines listed on table II-54d have been requested from each of the operators. This information will be included in the statement if it becomes available prior to printing. If it is submitted subsequent to printing, this information will be on file at the Los Angeles Geological Survey Office, and available to the Secretary of the Interior for consideration in any future decision-making required.
50. See above response. Also, see added table I-3 for a description of all existing treating and storage facilities within Santa Barbara and Ventura counties. The design, existing and surplus capacities, along with the expansion potential, are given in this table.
51. As mentioned above, task force members preparing this statement have conferred with State task force members of the California Office of Planning Study. The socio-economic discussion in this final has been greatly expanded. See the appropriate portions of sections II and III.

52. The conclusion of the FEIS text paragraph now acknowledges this probability.
53. As noted in section IV.A.1.g., OCS Order #1, "There are additional requirements that all structures be equipped with navigational aids but these are Coast Guard requirements covered by their regulations (33 CFR Subchapter N., Parts 140 to 147)", . . . .Therefore, detailed discussion of Coast Guard navigation requirements were purposely and appropriately not included in the DES.
54. The oil produced from possible Platforms C and Henry would be transported by the two existing pipelines to shore and would be received at the two existing onshore facilities presently handling the total OCS Santa Barbara Channel production. These two Ventura County onshore treating and storage facilities, the Mobil Rincon and Phillips La Conchita, are listed on table II-67 and are shown on figure II-48 as facilities 116 and 117. They are also listed on table I-3; see the footnotes of that table.
55. The comment is noted, and we do not disagree with the generalization. However, this does not seem to be the fact for the two existing treating and storage facilities receiving oil from Federal OCS leases. Both are located in Ventura County. One is located along Highway 101 which parallels the Southern Pacific Railroad. Screening by vegetation is extremely efficient. The other is located completely out of sight within coastal bluffs. Neither of these facilities appear to have caused the potential impact suggested, i.e., shifting the fundamental character of the area or stimulating unrelated industrial or further development. See response number 54 above for further information as



to these two onshore facilities.

56. The FEIS text has been changed to acknowledge this.
57. Refer to response to comment #4 above.
58. Refer to response to comment #37 above.
59. The U. S. Coast Guard has collected statistics on polluting incidents in the entire Eleventh Coast Guard District since 1970; these are unofficial and prepared for internal use. Compilation is available only for calendar year 1974. Number of incidents and volume in gallons for 1974 are presented in section III.L.1. While seven pages of summarized data were furnished by the U. S. Coast Guard for 1970, it was not possible to categorize further for the Channel area as the compiled data encompasses the entire Eleventh Coast Guard District (Mexican border to north of Point Conception).
60. It was Exxon's preliminary determination that the pipeline from the Santa Barbara area to the Los Angeles - Long Beach refinery was not an immediate, feasible alternative to tanker transportation of initial Santa Ynez Unit production. For the latest information and developments as to this matter, the reader is referred to recent various Coastal Zone Commission and Exxon correspondence contained in an issue analysis document dated October 14, 1975 prepared by Exxon and submitted to the Coastal Zone Commission.

The discussion in this statement on the possibility of onshore pipeline transport to refinery areas as a means of minimizing or eliminating tanker traffic was not intended to be presented as a transportation

alternative for any one particular operation.

61. Please see response to hearing comments 15 and 17. Also, see response to your earlier comment number 55. An effective, well-implemented Coastal Plan should serve to minimize onshore impacts.
62. The DES text was not intended to imply that increased Santa Barbara Channel production would result in the need for new refining capacity, as market demand is the determining factor as to refinery capacity needs. Refer to table III-17 for the estimated onshore facility acreage requirements and for a summary of quantitative ranges of cumulative impacts. Information from the table footnotes combined with the facility estimates is the rationale for deriving these ranges.
63. Refer to response to comment number 4 above.

# Office of the City Attorney

BARRY CAPPELLO  
CITY ATTORNEY



FREDERICK W. CLOUGH  
ASSISTANT CITY ATTORNEY  
ANTHONY C. FISCHER  
DEPUTY CITY ATTORNEY  
CITY HALL  
SANTA BARBARA, CALIFORNIA

## City of Santa Barbara

August 8, 1975

Mr. H. T. Cypher  
Acting Oil and Gas Supervisor  
U. S. Geological Survey  
7744 Federal Building  
300 North Los Angeles Street  
Los Angeles, California 90012

CERTIFIED MAIL

Re: Draft Environmental Statement (DES 75-35)  
Oil and Gas Development in Santa Barbara  
Channel Outer Continental Shelf Off  
California

Dear Mr. Cypher:

The City of Santa Barbara and the County of Santa Barbara are attempting within the limited time available until the hearing on the Draft Environmental Statement to evaluate and to prepare comments on the proposed oil and gas development. A Task Force made up of persons with expertise in various aspects of oil and gas development has been reviewing the Draft Environmental Statement. In order to adequately review and comment on the Environmental Impact Statement, the raw data used in the preparation of the Draft Environmental Impact Statement or otherwise contained in the Department's files must be made available to these experts in order to adequately assess the potential hazards and other environmental impacts if the Santa Barbara Channel area is drilled or produced. In addition, the raw data which has already been developed by oil companies and others as lessees must also be made available.

We therefore request that the following information pertaining to the area which is the subject of the draft statement be made available in the Santa Barbara area for review and evaluation prior to the hearing:

August 8, 1975

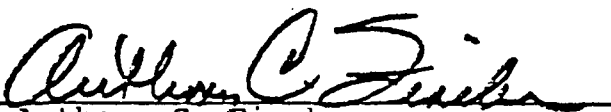
- A. All electric logs and core descriptions from shallow and deep coring operations.
- B. Reservoir data, drillers logs, tower sheets, electric logs, results of drill stem tests, pressure data, and mud records from exploratory drilling.
- C. Deep penetration seismic data and shallow penetration, high resolution acoustic data.

It is our position that this raw data must be made available for an understanding of the plans and programs in order that an adequate review of the Environmental Impact Statement can be prepared. It is further our position that it is extremely important that the information be made available immediately in order to prepare for the hearings in the Santa Barbara area. To proceed with the hearings on this matter without making available in Santa Barbara the requested information would be contrary to the spirit, intent and requirements of the Environmental Policy Act and the regulations issued by your Department to insure compliance with the Act. (See Department Manual, Part 516, Chapter 2.)

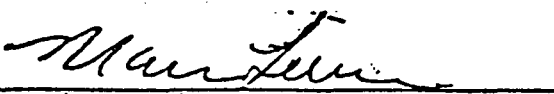
If you have any questions regarding this request, do not hesitate to contact either of the undersigned immediately.

Very truly yours,

A. Barry Cappello  
City Attorney

By   
Anthony C. Fischer  
Deputy City Attorney

George P. Kading  
County Counsel

By   
Marvin Levine  
Deputy County Counsel

cc: Task Force Members

August 22, 1975

Mr. Marvin Levine  
Deputy County Counsel  
Office of the City Attorney  
City Hall  
Santa Barbara, CA 93101

Dear Mr. Levine:

Your letter of August 8, 1975 requesting information pertaining to the area which is the subject of the Draft Environmental Statement (DES 75-35) Oil and Gas Development in Santa Barbara Channel addressed to Mr. H. T. Cypher was not received by this office until August 18, 1975. Mr. Cypher had been on leave until August 18 and the Postal Service refused to deliver the certified letter to anyone other than the named addressees.

We are reviewing the large volume of data requested. A substantial portion of the data is undoubtedly proprietary, other portions may or may not be. It will not be physically possible to complete this review and make an appropriate determination of the information which can be made available and any which cannot prior to the hearing on the Environmental Impact Statement scheduled for August 25.

Though not identified as such, it has been determined that your request falls within the provisions of the Freedom of Information Act. Accordingly, a determination will be made and advice will be provided to you within the time limits provided for in 43 CFR Part 2.

Sincerely yours,

(Orig. Sgd.) F. J. SCHAMBECK

F. J. Schambeck  
Oil and Gas Supervisor  
Pacific Area



UNITED STATES  
DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY  
345 Middlefield Road  
Menlo Park, CA 94025

September 2, 1975

Mr. Anthony C. Fischer  
Deputy City Attorney  
City Hall  
Santa Barbara, CA 93101

Dear Mr. Fischer:

In his letter of August 22, 1975, Mr. F. J. Schambeck, Oil and Gas Supervisor, Pacific Area, advised you that your request of August 8, 1975 for information pertaining to the area which is the subject of the Draft Environmental Statement (DES 75-35) Oil and Gas Development in Santa Barbara Channel was received by his office on August 18, 1975. Mr. Schambeck further stated that your request was being treated as an inquiry under the Freedom of Information Act. This letter is to advise you of our determination with respect to the availability of the requested information.

You requested three categories of information as follows:

- "A. All electric logs and core descriptions from shallow and deep coring operations.
- B. Reservoir data, drillers logs, tower sheets, electric logs, results of drill stem tests, pressure data, and mud records from exploratory drilling.
- C. Deep penetration seismic data and shallow penetration, high resolution acoustic data."

The drillers logs, tower sheets, and mud records, included in your Category B are records maintained by lessees and available for inspection by USGS Officials but are not normally submitted to USGS nor maintained in our files and therefore cannot be provided.

Well records are available on certain terminated leases on the OCS off California (Santa Barbara Channel) as follows:

<u>STATE</u>	<u>OCS LEASE</u>	<u>COMPANY</u>	<u>WELL NO.</u>
California	-0186	Humble O & R	1
California	-0186	Humble O & R	2
California	-0186	Humble O & R	3
California	-0207	Exxon	1
California	-0235	Humble O & R	1
California	-0235	Humble O & R	2

These records are available for inspection at the office of the Oil and Gas Supervisor, U. S. Geological Survey, 7744 Federal Building, 300 North Los Angeles Street, Los Angeles, California. Copies of these records may be obtained at your expense from the following reproduction companies:

Continental Graphics  
101 South La Brea Avenue  
Los Angeles, California 90036

Graphic Reproduction Center, Inc.  
1712 Newbury Road  
Newbury Park, California 91320

The Geologic Division of the USGS has collected considerable geophysical data for the area covered by your request. This information was used in substantial part in the preparation of the draft environmental statement for the Santa Barbara Channel (DES 75-35). Approximately 50% of this information has been placed in open file. It is available for inspection at the U. S. Geological Survey Library, 345 Middlefield Road, Menlo Park, California. If copies are desired, the Library will make the material available to a company of your choice for reproduction at your expense. Two companies in this area have been filling other requests:

Baker Graphics Service  
441 Emerson Street  
Palo Alto, California 94301  
Telephone 323-2416

Palo Alto Blueprint and Supply  
332 Lytton Avenue  
Palo Alto, California 94301  
Telephone 325-1561

The company picks up the material to be reproduced from our Library and returns it to us; reproduced material and bill are forwarded to you.

The remaining data held by the Geologic Division are available for inspection at the Pacific Arctic Branch of the Office of Marine Geology, 1380 Willow Road, Menlo Park - mailing address 345 Middlefield Road, Menlo Park, California 94025. As this information is in varying degrees of work in preparation for open file, it would facilitate your inspection if contact were made three to four days prior to the time you wish to review the material in order that it can be assembled to facilitate the process. Arrangements can be made by calling Mr. Jack E. Schoellhamer at 415-323-8111 extension 2230. If copies of the material not yet placed in open file are desired, Mr. Schoellhamer will work with your representative to develop the most expeditious plan for its reproduction.

It is our determination that the balance of the requested information is specifically exempt from disclosure by the provisions of the Freedom of

Information Act in the statutory exemptions (4) "trade secrets and commercial or financial information obtained from any person and privileged or confidential" (5 USC 552(b)(4)); and (9) "Geological and geophysical information and data (including maps) concerning wells." (5 USC 552(b)(9)).

The two cited exemptions are related. The House report on S-1160 (Public Law 89-487 of July 4, 1966) includes the following comment with respect to exemption (9) concerning geological and geophysical information and data: "this category was added after witnesses testified that geological maps based on explorations by private oil companies were not covered by the 'trade secrets' provisions of present laws. Details of oil and gas findings must be filed with Federal agencies by companies which want to lease Government-owned land. Current regulations of the Bureau of Land Management prohibit disclosure of these details only if the disclosure 'would be prejudicial to the interests of the Government' (43 CFR, pt.2). Witnesses contended that disclosure of the seismic reports and other exploratory findings of oil companies would give speculators an unfair advantage over the companies which spent millions of dollars in exploration."

In his memo on implementation of Public Law 89-487, the Attorney General stated "It should be noted that, although the information involved in exemption (9) might not be a 'trade secret' within the meaning of the earlier version of exemption (4), it would seem to constitute commercial and financial information covered by the present exemption (4), as described at pp. 32-34 above. The addition of exemption (9) is helpful in explaining the intention of the statute with respect to such information."

There are sound grounds for invoking the statutory exemptions referred to above in this instance. The information involved was provided by lease operators in accord with provisions of Title 30 CFR Part 250, Oil and Gas and Sulphur Operations in the Outer Continental Shelf. Section 250.97 of Part 250 provides: "Geological and geophysical interpretations, maps, and data required to be submitted under this part shall not be available for public inspection without the consent of the lessee so long as the lease remains in effect or until such time as the supervisor determines that release of such information is required and necessary for the proper development of the field or area."

Unilateral release of the information at this time would constitute an arbitrary and capricious breach of faith on the part of the United States. The information is proprietary in character. It has significant competitive interest in that it reveals the commercial activities of the lessee. It has substantial economic value for the lessee and for an interested third party for what it may reveal with respect to reservoir structure and characteristics applicable not only to the existing lease but to other potentially leasable areas nearby. The information was acquired by the lessees at substantial expense and is information which



would customarily not be released to the public by the company from whom it was obtained. Failure of the United States to fulfill its obligations would diminish reliability of information supplied in the future by these and other lessees and discourage or eliminate voluntary contributions of proprietary data to the USGS.

The report of the House of Representatives on S-1160 (PL 89-487) states with respect to exemption (4): "Moreover, where the Government has obligated itself in good faith not to disclose documents or information which it receives, it should be able to honor such obligations." It is thus clear that the Congress intended the general restriction in exemption (4) and the more specific restriction in exemption (9) to insure the confidentiality promised when the data were acquired.

This determination is a decision of Joel M. Johanson, Assistant Director, U. S. Geological Survey, Western Region after consultation with Robert Conover, Acting Field Solicitor, Department of the Interior, Riverside, California; technical and supervisory staff of the USGS in Los Angeles, Menlo Park, Reston, Virginia and Washington, D.C.; and the staff of the Solicitor of the Department of the Interior, Washington, D.C.

You may appeal this decision to the Assistant Secretary of the Interior for Program Development and Budget under 43 CFR 2.17 by writing to: Freedom of Information Act Officer, Office of the Assistant Secretary--Program Development and Budget, U. S. Department of the Interior, Washington, D.C. 20240. Your appeal must be received within 20 working days (Saturdays, Sundays, and public legal holidays excepted) of the date of this denial. Your appeal must be accompanied by copies of the original request and this initial denial. The appeal should be marked, both on the envelope and on the face of the appeal letter, with the legend FREEDOM OF INFORMATION ACT APPEAL. In order to expedite the appellate process and to insure full consideration of your appeal, your letter should contain a brief statement of the reasons why you believe this initial decision to be in error.

Some comment is required concerning the relationship of the proprietary data which we have determined must be withheld and the data which were used to prepare the draft environmental statement.

There are two topical areas of the draft environmental statement (DES 75-35) of potential concern with respect to the use of proprietary data (1) the description and evaluation of the geology and geologic conditions (including seismic risk and hazards) and (2) the estimates of oil and gas resources. No proprietary data were requested or used in preparing any part of the draft statement. However, some task force members had access to and knowledge of proprietary geologic and engineering data from the Channel area as part of other activities and work assignments.

For purposes of providing a regional overview of the geology, the published reports and data, or other publicly available data in the Survey files were deemed adequate to meet the needs. This approach and position are identified in the draft statement at: Volume 1, pages II - 9 to 12, Volume 1 pages II - 76 to 81, Volume 2 page III - 52 (first four lines).

Similarly, proprietary data were not used in preparing the estimates on potential resources appearing in the environmental impact statement. These broad regional estimates were derived by gross volumetric methods. They are based on the regional geologic overview and broad assumptions of production characteristics based on general familiarity with channel area production and actual publicly available data from Dos Cuadras and Carpinteria operations. The statement at mid-page on I-155 is incorrect. The geologic and hydrocarbon formation test information from exploratory wells was not used in preparing the field estimates. Rather, the fact that discoveries had been made and tests submitted was used to classify the field estimates among the several resource categories outlined on page I-157 and Table I-2.

Sincerely yours,



Joel M. Johanson  
Assistant Director  
Western Region

Same letter to:  
Mr. Marvin Levine  
Deputy County Counsel  
105 East Anapamo Street  
Santa Barbara, California 93101

# Office of the City Attorney

BARRY CAPPELLO  
CITY ATTORNEY



FREDERICK W. CLOUGH  
ASSISTANT CITY ATTORNEY  
ANTHONY C. FISCHER  
DEPUTY CITY ATTORNEY  
CITY HALL  
SANTA BARBARA, CALIFORNIA

## City of Santa Barbara

August 29, 1975

Mr. V. E. McKelvey  
Director  
U. S. Geological Survey  
National Center (MS 108)  
Reston, Virginia 22092

Re: Draft Environmental Statement (DES-75-34)  
Oil and Gas Development in the Santa Barbara  
Channel, Outer Continental Shelf off California

Dear Mr. McKelvey:

On August 25, 1975, during the hearing on DES-75-35, the City of Santa Barbara and the County of Santa Barbara requested that the hearing remain open and that the draft statement be rewritten and recirculated. The reason for that request was the inadequacy of the Draft EIS and the fact that the data requested by letter dated August 8, 1975 (copy attached) had not been made available.

On August 27, 1975, your Special Assistant for Environmental Analysis, Herbert G. Stewart, closed the hearing in Santa Barbara with comments to the effect that the period for comments on the Draft EIS would conclude on September 1, 1975, and that the U.S.G.S. would thereafter proceed to prepare the final Environmental Impact Statement. Please advise whether this is, in fact, the position of the U.S.G.S. or whether the Draft EIS will be rewritten and recirculated as a draft. Also, will the data requested in our letter dated August 8, 1975, be provided and comments thereon considered in preparation of a final EIS?

During the hearings, Frank J. Kelly, Deputy Assistant Secretary, made comments to the effect that the data requested in our letter had already been provided to the State of California. If that has occurred, please provide the name and address of the State office receiving the data. We raise this question in view of the

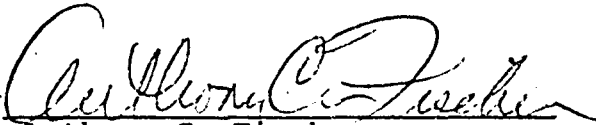
August 29, 1975

comments at the hearing of the representatives of the State of California to the effect that the data has not been provided.

As we stated during the hearings, to proceed with the preparation of a final EIS without making available the requested data and without preparation of a new draft EIS and public comment thereon, is contrary to NEPA and the Guidelines of the Council on Environmental Quality. We hereby request to be advised whether the position of the U.S.G.S. is as was stated by Mr. Stewart at the close of the hearing. If so, please be advised that we will have no alternative but to seek the help of the courts to stop this violation of the spirit, intent and specific requirements of NEPA.

Very truly yours,

A. Barry Cappello  
City Attorney

By   
Anthony C. Fischer  
Deputy City Attorney

Enclosure

cc: Marvin Levine,  
Deputy County Counsel  
County of Santa Barbara



# United States Department of the Interior

GEOLOGICAL SURVEY  
RESTON, VIRGINIA 22092

OFFICE OF THE DIRECTOR

NOV 26 1975

Mr. Anthony C. Fischer  
Deputy City Attorney  
Office of the City Attorney  
Santa Barbara, California 93102

Dear Mr. Fischer:

I have delayed responding to your letter of August 29, 1975, until the transcript of the public hearings on our draft environmental statement (DES 75-35) was available for consultation. Regrettably, it was unduly delayed and was received only a few weeks ago.

With regard to your inquiries as to Mr. Stewart's remarks, I have enclosed an excerpt of the Hearings transcript on this matter.

You are advised that Mr. Stewart's appraisal of the procedures to be followed in the normal course of events is correct, as are his statement of the anticipated course of action in the present case and his acknowledgement that many decisions in the matter may lie beyond the province of this Bureau.

The substantial body of comment, both oral and written are now under study and appraisal, and the decision has been made to proceed with preparation of the final environmental statement.

With reference to your letter of August 8, 1975, to H. T. Cypher, requesting certain data, I am sure that you have our separate response of Assistant Director Johanson dated September 2, 1975.

As to your question regarding the comments of Mr. Kelly at the Hearings, he has acknowledged such comments, and we offer the following relevant information: On May 30, 1975, W. F. Northrop and a number of other staff officials of the California State Lands Commission conferred here with our staff to request and discuss access to various OCS data related to the Department's environmental statement on proposed OCS Lease Sale 35, Offshore Southern California. Arrangements were promptly made for their access to relevant nonproprietary data. State Lands Commission officials visited our offices in Menlo Park, California, on several occasions, for that purpose; on June 3, 10, 22, and July 2, 7, 15, 22, 1975. The State officials involved in those visits included Messrs. Wilbur Thompson, Bill Ardent, Don Clarke, Vid Duda, Jack Treadway, Joe Fantozzi and George Buto. In addition, some information was provided by mail to Mr. Ed Weldon.

In addition to all relevant published and open-file reports of the Survey, I have enclosed a list of other data to which the State was offered access. The State officials consulted with many of our Menlo Park staff for this purpose, and as a result they were provided whatever of these data they desired.

Sincerely yours,

A handwritten signature in cursive script that reads "O. E. Weldon". The signature is written in dark ink and is positioned above the printed name of the Director.

Director

Geological and Geophysical Data  
in  
Southern California Outer Continental Shelf Area Proposed for  
Leasing in Sale Number 35

Geophysical Data - Publicly Available

	Line Miles (Approximate)
1. Shipborne Gravity	4600
2. Shipborne Magnetic	4850
3. Seismic	9480
a. High Resolution, Single Channel, Shallow Penetration	4315
b. Single Channel, Deep Penetration	5165

Geological Data - Publicly Available

	Number of Samples (Approximate)
1. Grab Samples	0
2. Dart Cores	504
3. Dredge Cores	64
4. Box Cores	12
5. Gravity Cores	20

Summary of Publications, Reports and Presentations  
by  
Geologic Division, U.S. Geological Survey  
on  
Southern California OCS Area and Area Proposed for Leasing on  
Sale Number 35

Publications

Administrative Reports

- (1) Aug. 1973; 1st pre-negotiation report (through the Director USGS) to Bureau of Land Management. Titled "Geologic inferences and mineral resource potential of the California Continental Borderland seaward of the Channel Islands."
- (2) Jan. 1974; pre-tract selection report (through the Director USGS) to Bureau of Land Management. Titled "Geologic inferences and mineral resource potential of the California Continental Borderland north of Mexico-U.S. boundary."

Published Reports

- (1) Graenz, H. G., Silver, Eli, von Huene, Roland, 1975, Seismic reflection profiles, USNS BARTLETT (Nov. 1972) cruise, offshore central and southern California: U.S. Geol. Survey Open File Rept. 75-121.
- (2) Roberts, A. E., 1975, Selected geologic literature on the California continental borderland and adjacent areas, to January 1, 1975: U.S. Geol. Survey Circ. 714, 116 p.
- (3) Vedder, J. G., Boyer, L. A., Junger, Arne, Moore, G. W., Roberts, A. E., Taylor, J. C., and Wagner, H. C., 1974, Preliminary report on the geology of the continental borderland of southern California: U.S. Geol. Survey Misc. Field Studies Maps, MF-624.
- (4) Vedder, J. G., 1975, Seismic reflection profiles, R/V KEISE (May-June 1973, Leg 3) cruise, offshore southern California: U.S. Geol. Survey Open File Rept. 75-
- (5) Wagner, H. C., 1975, Seismic reflection profiles, R/V KEISE (May 1973, Leg 2) cruise, offshore southern California: U.S. Geol. Survey Open File Rept. 75-205.
- (6) Zieay, J. I., Wentworth, C. H., Buchanan, J. M., and Wagner, H. C., 1974, Preliminary map showing recency of faulting in coastal southern California: U.S. Geol. Survey Misc. Geol. Inv. Map 535.



## Abstracts

- (1) Eyer, L. A., Sarnett, N. B., and Pisciotto, K. A., 1975, Interpretation of gravity and magnetic surveys of the California continental borderland: Am. Assoc. Petroleum Geologists Abs., Pacific Section Mtg., Long Beach, Calif., p. 8-9
- (2) Clarke, S. H., Jr., Howell, D. G., and Nilsen, T. H., 1975, Paleogene paleogeography of California: Am. Assoc. Petroleum Geologists Abs., Pacific Section Mtg., Long Beach, Calif. p. 22.
- (3) Howell, D. G., 1975, Eocene paleogeography of southern California continental borderland: Am. Assoc. Petroleum Geologists Abs., Annual Mtg., Dallas, Texas, p. 37-38.
- (4) Howell, D. G., 1975, The East Santa Cruz Basin fault, southern California continental borderland: Geol. Soc. America Abs., Cordilleran Section Mtg., Los Angeles, Calif., p. 331.
- (5) Howell, D. G., 1975, Middle Eocene paleogeography of southern California: Am. Assoc. Petroleum Geologists Abs., Pacific Section Mtg., Long Beach, Calif., p. 35.
- (6) Jungar, Arne, 1974, Source of the San Onofre Breccia [California]: Geol. Soc. America Abs., Cordilleran Section Mtg., Las Vegas, Nevada, p. 199-200.
- (7) Jungar, Arne, 1975, Some thoughts on the structure of the continental borderland, southern California: Geol. Soc. America Abs., Cordilleran Section Mtg., Los Angeles, Calif. p. 331.
- (8) McLean, H., Howell, D. G., and Vedder, J. G., 1975, Paleogeographic implications of the Miocene-Basement unconformity, Santa Cruz Island, California: Geol. Soc. America Abs. Cordilleran Section Mtg., Los Angeles, Calif., p. 346.
- (9) Taylor, J. C., Vedder, J. G., and McLean, Hugh, 1975, Basement and Cenozoic volcanic rocks from offshore southern California: Am. Assoc. Petroleum Geologists Abs., Pacific Section Mtg., Long Beach, Calif., p. 6.
- (10) Vedder, J. G., Taylor, J. C., Wagner, H. C., Jungar, Arne, and Moore, G. W., 1975, Seafloor bedrock patterns from Patton Escarpment to the mainland shelf of southern California: Am. Assoc. Petroleum Geologists Abs., Pacific Section Mtg., Long Beach, Calif., p. 7.
- (11) Wagner, H. C., and Jungar, Arne, 1975, Geology of the San Pedro Basin and shelf, offshore southern California: Geol. Soc. America Abs., Cordilleran Section Mtg., Los Angeles, Calif., p. 353-354.

Reports soon to be released

- (1) Beyer, L. A., and Russett, N. B., 1975, Complete bouguer gravity map of the continental borderland of southern California and the adjacent mainland: U.S. Geol. Survey Misc. Field Studies Maps, MF-
- (2) Junger, Arno and Wagner, H. C., 1975, Geological evolution of the Santa Monica and San Pedro Basins, southern California offshore: U.S. Geol. Survey Misc. Field Studies Maps, MF-
- (3) Moore, G. H., 1971, Seismic reflection profiles, R/V POLARIS (June, 1970) cruise, offshore southern California: U.S. Geol. Survey Open File Rept. 75-
- (4) Moore, G. H., and Beyer, L. A., 1975, Seismic reflection profiles, R/V POLARIS (Nov.-Dec. 1973, Leg 3) cruise, continental borderland of southern California: U.S. Geol. Survey Open File Rept. 75-
- (5) Moore, G. H., and McCulloch, D. S., 1975, Seismic reflection profiles, R/V POLARIS (June, 1969) cruise, offshore southern California: U.S. Geol. Survey Open File Rept. 75-

1 facilities. But this is the whole point of why I  
2 explained the May election. We had the control, but  
3 we wanted to vote whether to have the oil or not.  
4 It's too late. And this is why I want to point out  
5 right now in this present environmental statement  
6 we are at the position where we can say "no" to the  
7 oil leases. But once you have said yes to that, then  
8 they blackmail us with the fact that they are going  
9 to put in some refining processes out in the sea.  
10 Whether we like it or not, they already have all the  
11 permits for that. And they showed us that that would  
12 be detrimental and that there would not be the natural  
13 gas -- could not be saved that way. And so many people  
14 were fooled and voted to have it in Flores Canyon.

15 The only selection that we are going to have  
16 on a local basis is where to put, what Canyon are we  
17 going to ruin, what estuary are we going to fill?  
18 What portion are we going to industrialize? I don't  
19 say that that is a choice. It's too late.

20 And this is what I am not sure of, I was  
21 disappointed in your remarks because I felt that you  
22 didn't understand the importance of this current hearing  
23 to the citizens of Santa Barbara.

24 MR. STEWART: An interesting way of closing  
25 the hearings, I would like to pass on a few words of

1 what procedurally we can anticipate from drilling  
2 beyond this point.

3 The verbatim transcript of these proceedings,  
4 the written materials which you submitted in support  
5 of your presentations, along with the separate  
6 written comments offered by Federal, State and local  
7 governmental agencies and the public at large, on  
8 the Draft Environmental Statement, and which will  
9 continue to be received through August 31, will  
10 be assembled and will be carefully reviewed.

11 All substantive issues having perhaps  
12 a different concept than some of you obviously have,  
13 will be addressed. Such changes as appear to be  
14 appropriate and required will be made. The manuscript  
15 will be re-prepared before review by the Geological  
16 Survey and by the Department of the Interior and  
17 offered for filing a Final Environmental Statement  
18 with the Council on Environmental Quality and printed  
19 and released to the public.

20 This is what we would anticipate in the normal  
21 course of following the legal process, procedures,  
22 and guidelines.

23 We recognize certainly that there are many  
24 decisions to be made which are not within the province  
25 of the Geological Survey to make independently. There

1 will be review and conclusions drawn within the Depart-  
2 ment. We would assume that at this point, that process  
3 will be followed. The extent to which the document  
4 will be rewritten will depend on assessment and a re-  
5 evaluation of all the materials produced either in  
6 writing or orally.

7 The volume, I am sure, will require a number of  
8 months to assess and respond to. But in that time  
9 frame, beyond that we don't really have any feel.  
10 That's what we can plan and anticipate at this particular  
11 time.

12 JUDGE MICHELS: Thank you Mr. Stewart.

13 That then brings us to the end of our hearing  
14 and I would just like to say for myself, and I think  
15 I can speak for all the panel here; that we do  
16 appreciate all of your coming and making these comments,  
17 and we want to thank you for the many courtesies  
18 that the citizens of Santa Barbara and elsewhere  
19 extended to us. So with that, the public hearing  
20 in this matter will be closed.

21 MR. SLAWSON: I would just like to say to  
22 the people that maybe some of the panel members here  
23 do own oil or are stockholders. I personally do not.  
24 And we have tried to be as nice to you as we would like  
25 you to have been to us. I just want to say that we will

1 not take sides with anyone. And I thank you for  
2 listening to my comments.

3 (WHEREUPON, the meeting was adjourned.)

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1                   This is to certify that the attached  
2 proceedings before the U.S. Geological Survey in  
3 the matter of:

4                               DES 75-35

5                               Santa Barbara, California

6                               August 25, 26 and 27, 1975

7 were held as herein appears, and that this is the  
8 original transcript thereof for the file of the  
9 Department.

10  
11  
12  
13                               RANDY FRANZSEN  
14                               Official Reporter  
15                               (Volumes I, II, IV and V-a)

16  
17                               VAL DIXON  
18                               Official Reporter  
19                               (Volumes III and V-b)

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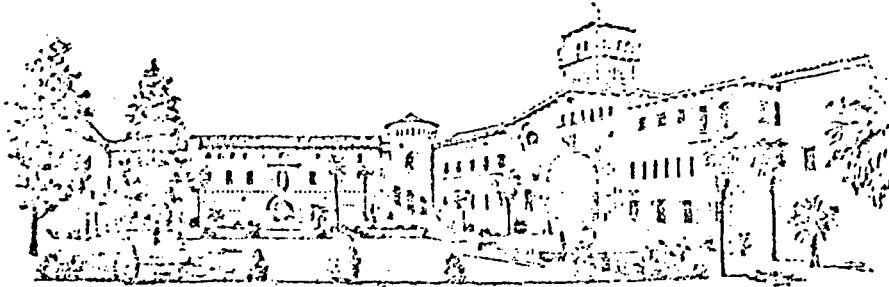
OFFICE OF THE  
COUNTY COUNSEL  
SANTA BARBARA COUNTY

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5 E. Anapamu St.  
Barbara, Calif. 93101  
Telephone 966-1611

BERT D. CURIEL  
Chief Assistant

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Assistant



DEPUTIES

Susan Trescher  
Marvin Levine  
Don H. Vickers  
Bruce Wm. Dodds  
William R. Allen  
C. William Altman  
Melbourne B. Weddell

September 25, 1975

Freedom of Information Act Officer  
Office of the Assistant Secretary  
Program Development and Budget  
United States Department of the Interior  
Washington, D.C. 20240

Re: Freedom of Information Act Appeal--Letter enclosed  
Request dated August 8, 1975  
Response dated September 2, 1975  
Letter dated September 25, 1975

Dear Sir:

This letter is written to formally object and appeal the failure of the United States Geological Survey to make available certain data in Santa Barbara necessary for commenting as part of the review process of Draft Environmental Impact Statement DES-75-35. The enclosed correspondence sets forth the information requested and the response. Our letter dated September 25, 1975, requests further clarification of the response.

We did not request the needed information under the Freedom of Information Act but rather under NEPA. The U.S.G.S. unilaterally treated our request under the Freedom of Information Act, and while we make this appeal, we do not admit that the Freedom of Information Act is applicable. At any rate we believe that the requested information is not barred from public access under the Freedom of Information Act, the O.C.S.L. Act and the regulations or the lease. The data which we seek is not commercial or financial and not necessarily information and data concerning wells. In any event where the leases are unitized or the adjoining leaseholders are the same parties, the information is not subject to unfair competition which is the purpose of the exemption in the Freedom of Information Act.

It is our position that the response of Mr. Johanson fails to recognize and deal with the fact that this data is essential to a



Freedom of Information Act Officer  
September 25, 1975  
Page Two

review of the Draft EIR. While the U.S.G.S. decided erroneously or simply neglected to review the proprietary data, the need to review that data for an intelligent and informed analysis of the environmental impacts is obvious as was demonstrated by the past experience with the blowout on Platform "A" in the Channel. Also, an intelligent decision on whether the risk of drilling in the Channel is outweighed by the need for the oil, can only be made after review and analysis of the best available data as to the amount of oil to be produced and the risks involved. The data as to the amount of oil to be produced is also essential to assess onshore impacts caused by oil production activities.

We are not sure whether your office is the proper office to decide whether the data should be released as part of the review process of the Draft EIR and for that reason a copy of this letter is being sent to the Director of the U.S.G.S.

Very truly yours,

COUNTY OF SANTA BARBARA  
GEORGE P. KADING, COUNTY COUNSEL

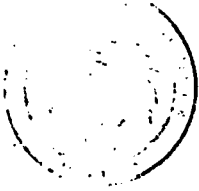
CITY OF SANTA BARBARA  
A. BARRY CAPPELLO, CITY ATTORNEY

By



MARVIN LEVINE

Deputy County Counsel



UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY  
345 Middlefield Road  
Menlo Park, CA 94025

October 3, 1975

Mr. Marvin Levine  
Deputy County Counsel  
Santa Barbara County  
105 E. Anapamu Street  
Santa Barbara, CA 93101

Dear Mr. Levine:

Your letter of September 25, 1975 concerning the Draft Environmental Statement (DES 75-35) Oil and Gas Development in Santa Barbara Channel raises a number of legal questions. Accordingly, the letter has been referred to the Solicitor of the Department of the Interior for response.

Sincerely yours,

A handwritten signature in cursive script, appearing to read "Joel M. Johanson", is written over a horizontal line.

Joel M. Johanson  
Assistant Director  
Western Region

cc: Solicitor, Washington, D.C.  
Attn: Larry Hoese (w/cy incoming)  
Director  
Asst. Director, Environmental Conservation  
Field Solicitor, Riverside, CA (w/cy incoming)



# United States Department of the Interior

OFFICE OF THE SECRETARY  
WASHINGTON, D.C. 20240

November 10, 1975

Dear Mr. Levine:

This responds to your letter of September 25, 1975, which appealed from a partial denial of information you requested of the Assistant Director, Western Division - U. S. Geological Survey. The letter of denial was dated September 2, 1975.

Although your initial request was not made under the Freedom of Information Act, you marked your letter of September 25 as an appeal under the Act, and we have treated it accordingly. We do not believe that the National Environmental Policy Act which you cited grants access to information superior to the broad general access provided in the Freedom of Information Act.

Our determination on your appeal is that the denial was proper and should be upheld. We agree with the judgment of Mr. Johnson of the Geological Survey that Exemptions (9) and (4) (5 U. S. C. 552b (4) and (9)) are applicable.

Exemption (9) permits withholding of "geological and geophysical information and data, including maps, concerning wells." Mr. Johnson's letter to you of September 2 cites the background of the exemption. All the information denied you except possibly the cement bond logs fits within that exemption.

Exemption (4) also applies to the information denied. Beyond the language of the Act, the courts have provided a test for determining if information falls within the exemption: the information must be (1) not ordinarily disclosed to the public by the originator and (2) if disclosed by the Government, such disclosure will either (a) inhibit the Government's future ability to collect similar information or (b) render substantial competitive harm to the originator of the information. As Mr. Johnson outlined to you, the information was obtained by the Geological Survey with the understanding that it was not to be released, that it was produced by the lessees at considerable expense and that disclosures would render significant competitive harm to the operators from whom the information was obtained. We believe that given these tests, Exemption (4) is clearly applicable to the information denied in this case.

This is a final decision by the Department of the Interior on your request. The recent Amendments to the Freedom of Information Act require that I inform you that you have a right to obtain judicial review in the United States District Court for the District in which the withheld records are located, or which you reside or have your principal place of business, or in the United States District Court for the District of Columbia.

The officials responsible for this decision are Royston C. Hughes, Assistant Secretary of the Interior, and David Lindgren, Deputy Solicitor of the Department.

Sincerely,

(Sgd) Royston C. Hughes

Royston C. Hughes  
Assistant Secretary - Program  
Development and Budget

Mr. Marvin Levine  
Deputy County Counsel  
County of Santa Barbara  
105 East Anapamu Street  
Santa Barbara, California 93101

# CITY OF TEHACHAPI

KERN COUNTY, CALIFORNIA

129 EAST F STREET • P. O. BIN 668

ALTITUDE 4,000 FEET

INCORPORATED 1909

REGULAR MEETING FIRST AND THIRD MONDAY OF EACH MONTH

**TEHACHAPI, CALIF. 93561**

LAWRENCE M. COOK  
CITY ADMINISTRATOR

August 28, 1975

Director, U.S. Geological Survey  
Mail Stop 108  
National Center, Reston Va. 22092

Gentlemen:

The City of Tehachapi is very much concerned and has an interest in the progress of developing Oil and Gas production in the Santa Barbara Channel off the shore of California.

Enclosed is a copy of a "brief" filed with the California Public Utilities Commission by the Tehachapi Cummings County Water District outlining the importance and need of a firm supply of natural gas to bring much needed water to our area.

During the hearings conducted by the Public Utilities Commission it became quite clear that the Southern California area will experience a shortage of natural gas within a very short time.

The impact on this area if a sufficient supply of natural gas is not made available will be extremely harsh on all aspects of the community.

We therefore urge that production of gas and oil from the Santa Barbara Channel proceed as rapidly as possible.

The Oil Industry and the governmental regulatory agencies have had 25 years of experience on off shore oil drilling. This has given them sufficient knowledge of the potential problems that can arise and has produced the necessary technology to deal with those problems.

It was never the intent of the Environmental Impact Report procedures to stop developments but rather to assure that possible problems be identified and mitigating actions be provided for.

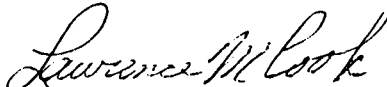
It is unfortunate that various groups have distorted the purpose of the EIR procedures to stop or delay essential projects in order to further their own special interests at the expense of the rest of the citizens.

Director, U.S. Geological Survey  
August 28, 1975

Page 2.

We feel that sufficient data has been provided to justify proceeding with the off shore development of gas and oil production and we respectfully request that it be done without further delay.

Sincerely,

  
LAWRENCE M. COOK  
City Administrator

LMC:lib

1 BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA  
2  
3 Investigation on the Commission's )  
Own Motion into the Natural Gas )  
4 Supply and Requirements of Gas ) Case No. 9642 et al.  
Public Utilities in the State )  
5 of California, et al. )

6  
7 BRIEF ON BEHALF OF  
8 TEHACHAPI-CUMMINGS  
9 COUNTY WATER DISTRICT

10 A. Introduction.

11 The purpose of this brief is to summarize the position  
12 of Tehachapi-Cummings County Water District ("the District"  
13 hereinafter in this brief) with respect to the above-referenced  
14 proceeding. That position is set forth more fully in Exhibits  
15 Nos. 201 and 231 introduced in this proceeding. Those exhibits  
16 constituted a statement by the attorneys for the District  
17 (Exhibit 201) and Prepared Supplemental Testimony by Robert J.  
18 Jasper, General Manager of the District (Exhibit 231).

19 B. The District's Use of Natural Gas and the Priority Which  
20 Should Be Afforded It.

21 The District utilizes natural gas in order to operate  
22 its water importation system ("the system" hereinafter). The  
23 system was constructed at a total capital cost of approximately  
24 \$9,500,000.00 for the purpose of bringing water from the Cali-  
25 fornia Aqueduct near the Edmondson Pumping Plant into the District.  
26 The system consists of some thirty-four miles of pipeline with  
27 the water in question being lifted some thirty-four hundred feet  
28 in elevation through the use of several pumping plants which

1 utilize natural gas as a source of energy.

2           It should be noted that the District requires and  
3 contracted with Southern California Gas Company for a firm supply  
4 of natural gas in order to operate the system. This is in part  
5 due to the fact that the District's peaking rights off the state  
6 aqueduct are limited to eleven percent of its entitlement in any  
7 one month, both under the District's agricultural contract and its  
8 municipal contract. Accordingly, substantial reservoir capacity  
9 has been constructed as a part of the system. The reservoir must  
10 be filled during the off-irrigation season and then slowly emptied  
11 during that season as demand exceeds the amount of water which  
12 may be imported into the District during any particular month.  
13 Thus, the system must be operated almost continually, necessitating  
14 a firm supply of energy for that operation.

15           As is indicated in Exhibits 201 and 231, the water  
16 imported by the District through the use of the system is utilized  
17 for both domestic and agricultural purposes. If adequate water is  
18 not delivered to the area of the District, agricultural crops,  
19 including permanent orchards, will suffer and there would be a  
20 shortage of water for domestic use. Thus, the placement of  
21 residential users of natural gas in Priority 1 without similarly  
22 placing the District's use of such gas in that priority could  
23 well result in persons in the area having a supply of natural gas  
24 to their homes but not having a supply of water thereto.

25           The District realizes that the Commission's staff has  
26 recommended a Priority 2a classification for the use referred to  
27 herein. However, in order to protect the substantial investment  
28 of public funds in the above described water importation system



1 and in order to protect agricultural and domestic uses of water  
2 in the area of the District, it is respectfully urged that this  
3 Commission classify the District's use of natural gas in its  
4 water importation system as a Priority 1 use. If such Priority  
5 1 classification is not granted, it is submitted that the particu-  
6 lar use in question should be in a separate priority following  
7 Priority 1, but prior to any other type of classification. The  
8 particular classification suggested herein is as follows:

9 "All usage by governmental entities for the purpose  
10 of delivering imported water to water users."

11 As is indicated in Exhibit 231 to these proceedings,  
12 very few entities in addition to the District are so utilizing  
13 natural gas at the present time.

14 C. Lack of Practicable Alternative Sources of Energy for the  
15 System.

16 The Commission should also be aware that the District  
17 has no practicable alternative source of energy which may be  
18 utilized to operate the system. This is so because of the increase  
19 costs inherent in operating the system on a source of energy  
20 other than natural gas and on the costs of converting the system  
21 so that another type of energy may be utilized. In particular  
22 regard to conversion to another type of energy, all other types  
23 of energy with the exception of electricity would require the  
24 District to construct storage facilities in the vicinity of the  
25 pumping plants in question. This would require construction in  
26 inaccessible areas and would present delivery problems to the  
27 supplying entity. In addition, the construction of such storage  
28 facilities would create substantial fire hazards in the vicinity

1 of the District's pumping plants.

2           The District has no moneys available for conversion  
3 costs, which would be substantial, and could only be raised by  
4 obtaining a favorable vote on a further bond issue. Any  
5 alternative fuel, including capital costs of conversion, would  
6 price agricultural water out of the market--the District's present  
7 charge for agricultural water is \$60 per acre foot at its  
8 pipeline, and \$114 per acre foot for other uses. (See Exhibit  
9 23, page 3).

10           If the District's use of natural gas is left in  
11 Classification 2a, it is requested that the Commission now  
12 determine that the District has no economic or practicable source  
13 of energy with which to operate its system.

14  
15 Dated: *July 15, 1975*

MARTIN E. WHELAN, JR., INC.  
MARTIN E. WHELAN, JR.  
JAMES L. MARKMAN  
Attorneys for TEHACHAPI-CUMMINGS  
COUNTY WATER DISTRICT

16  
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18  
19 By *Martin E. Whelan, Jr.*  
Martin E. Whelan, Jr.

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Air Transport Association



OF AMERICA

1709 New York Avenue, N.W.  
Washington, D. C. 20006  
Phone (202) 872-4000

August 13, 1975

Director  
U.S. Geological Survey  
Mail Stop 108  
National Center  
Reston, Virginia 22092

Re: Draft Environmental Impact Statement for  
Potential Oil and Gas Development, Santa  
Barbara Channel OCS, Off California

Dear Sir:

On behalf of the Air Transport Association of America, an unincorporated association of the nation's certificated air carriers, I wish to express our support for the Survey's proposed consideration of oil and gas development in the Santa Barbara Channel.

The Air Transport Association, whose members constitute the major consumers of aviation fuel, is vitally interested in achieving the proper balance between the commendable objective of environmental protection and the nation's pressing demand for augmented petroleum supplies during this time of domestic energy shortfall and economic recession.

We wholeheartedly concur with the Western Oil and Gas Association that there is a critical need to develop new energy sources in the United States. Without the development of potential domestic energy sources subject to appropriate environmental controls, the nation must become increasingly dependent upon costly, uncertain supplies of imported crude oil which, as evidenced by the 1973 oil embargo, will inevitably expose us to severe economic repercussions and dislocations.

Like the Western Oil and Gas Association, we believe that the composition of economic activity cannot be expected to change rapidly and that ongoing energy price and supply dislocations are

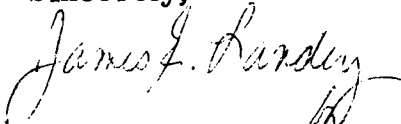
Director  
U. S. Geological Survey  
August 13, 1975  
Page 2

closely tied to the recent economic slide into recession. Indeed, until adequate energy supplies again become available at reasonable costs commensurate with increased commercial activity, full employment and sustained economic growth cannot be achieved.

Accordingly, the Air Transport Association believes that the Survey should seriously consider the potential for oil and gas development in the Santa Barbara Channel. While we are not expert in this area, it would appear that such exploration and development can occur without undue environmental harm.

In short, the proposed exploration and development could constitute a useful first step toward achieving domestic energy self-sufficiency and long-run economic recovery and growth at minimal environmental risk to affected Southern California areas.

Sincerely,

  
James E. Landry  
General Counsel

JEL/mh



THE BEKINS COMPANY

1335 SOUTH FIGUEROA STREET • TELEPHONE 749-9111 • LOS ANGELES, CALIFORNIA 90015

Since 1891

DANIEL P. BRYANT  
HONORARY CHAIRMAN

August 1, 1975

Director  
U. S. Geological Survey  
Mail Stop 108  
National Center  
Reston, Virginia 22092

Dear Sir:

I am a person who has the highest regard for those who would do everything possible to preserve the beautiful and valuable parts of our country through ecological conservation.

But, I am also a man who is somewhat worried about the lack of overall energy planning and the long delays which have accompanied the development of domestic sources of energy.

What I am leading up to is the fact that I want my opinion recorded in the file of the Santa Barbara Channel hearings on August 25-27. Some years ago that channel was the scene of an oil spill -- a most unfortunate incident, but one which does not seem likely to recur. Even if it did, I am reliably informed that the oil industry has greatly increased its capability in containing floating oil, with the result that little or no damage would be done to the shoreline of the channel.

It is my opinion that the Alaska pipeline should have been approved four years earlier than it was; and if it had been, we would have something like two million barrels a day available to the country, which we do not have now and which we will not have for some time to come. The Santa Barbara

**BEKINS**

## THE BEKINS COMPANY

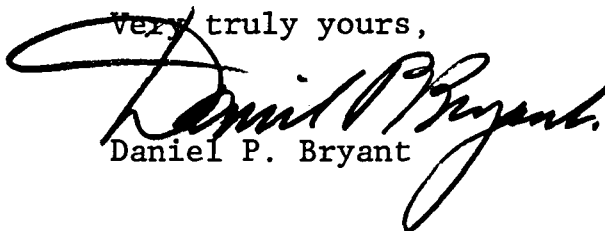
1335 SOUTH FIGUEROA STREET • TELEPHONE 749-9111 • LOS ANGELES, CALIFORNIA 90015

*Since 1891*DANIEL P. BRYANT  
HONORARY CHAIRMAN

Channel situation is somewhat different because oil would be available very promptly, as basic exploration and development have been completed. I have heard that one of the arguments against opening up the channel is that the oil would not be available until the late 70's and, as I indicated above, this is not true. But if it were, we are going to need that oil--and gas, too--in the late 70's and in the 1980's, so I regard the argument as specious. I say that even though we get full production from Alaska and Elk Hills.

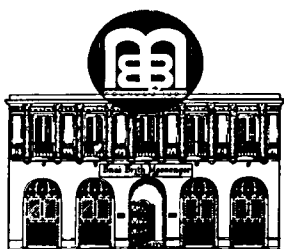
Before we all feel the pinch of real shortages--and natural gas is going to be in short supply in Southern California within the next two years if new supplies are not made available--I want to go on record as being in favor of opening the Santa Barbara Channel to further development, including the offering of more leases in that area.

Very truly yours,



Daniel P. Bryant

DPB:pb



# B'nai B'rith Messenger

EVERY FRIDAY — SINCE 1897

JOSEPH JONAH CUMMINS

Editor and Publisher

TELETYPE LA482

Cable Address:

"BEBEEM"

2510 WEST 7th STREET / LOS ANGELES, CALIFORNIA 90057 / DUnkirk 0-5000

July 31, 1975

Hearings - Santa Barbara Channel  
August 25-27, 1975

Director  
U.S. Geological Survey  
Mail Stop 108  
National Center  
Reston, VA 22092

Dear Sir:

I urge you to open up the Santa Barbara Channel.

People are saying that there can be further delay in developing the Outer Continental Shelf, including the Santa Barbara Channel. The nation needs the oil and gas available from that channel. It needs it now and it will need it in the late '70s and through the 1980s. This will be true even though we get full production from Alaska and possibly Elk Hills.

It is my understanding only four spills of consequence have occurred on the Outer Continental Shelf during the drilling of somewhere between 17,000 and 19,000 wells. We know about the Santa Barbara spill. It was a terrible thing to happen, but the oil industry is providing clean-up capability; and if such an accident were to happen again, there is little chance oil would reach the beaches under any circumstances.

Please record my opinion as being strongly in favor of increased exploration and production in the Santa Barbara Channel.

Very truly yours,

IX-235



**F. P. LATHROP**  
CONSTRUCTION COMPANY  
SUITE 1100 • WATERGATE TOWER • 1900 POWELL STREET  
EMERYVILLE, CALIFORNIA 94608 • 415/548-9200 • LIC. 133719

July 8, 1975

Director  
USGS NATIONAL CENTER  
MS 108  
Reston, Virginia 22092

Dear Sir:

It is my understanding that hearings will be conducted in California regarding the question of whether the Federal Government will allow drilling for oil and gas off the coast of California. I am unable to attend these hearings to testify and I am therefore writing to you to convey my thoughts.

I would like to identify myself as a successful businessman. I own and operate a construction company that builds approximately \$50,000,000 worth of projects a year. In addition to that, I am an owner of real estate such as apartment houses, industrial buildings, and highrise office buildings in the multi-million dollar bracket. In other words, this is not a letter from a crank, but a letter from an intelligent citizen and businessman that is concerned about the energy requirements of this country.

I think that it is imperative that the Federal Government take every step possible to promote the drilling for gas and oil wherever it is possible to find it. This means to me, allowing the oil companies to drill for gas and oil off the coast of California. It also means that these companies should be allowed to do this as soon as possible. Furthermore, any increase in royalties that the oil companies have to pay would be a deterrent rather than a help. It means that the private industry, the oil companies, should be the ones to do this; certainly not the Federal Government. I believe it is imperative to the welfare of this country that every source of energy be developed as rapidly as possible and that the Federal Government should help and promote this, rather than hinder it. The most immediate source of energy available is gas and oil and this source of energy must supply our energy needs until nuclear or thermal sources can be developed. I therefore strongly urge that the oil companies be allowed to drill off the California shore and that the Federal Government take all steps possible to promote and help the oil companies proceed as rapidly as possible.

Very truly yours,



F. P. Lathrop

FPL:sds

cc: Congressman John Murphy, Chairman  
Select Committee on OCS IX-236



J. RAY McDERMOTT & CO., INC.  ENGINEERS AND GENERAL CONTRACTORS

3505 BROADWAY P. O. BOX 24064, OAKLAND, CALIFORNIA 94623 (415) 549-2400

August 29, 1975

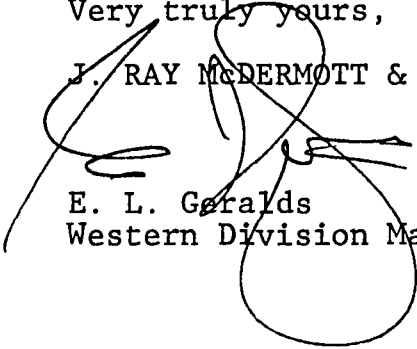
Director  
U. S. Geological Survey  
National Center (MS108)  
Reston, VA. 22092

Dear Sir:

We are submitting the following written comments  
relative to DES 75-35.

Very truly yours,

J. RAY McDERMOTT & CO., INC.



E. L. Gerald  
Western Division Manager

ELG/vhb

Enc:

U. S. DEPARTMENT OF INTERIOR  
BUREAU OF LAND MANAGEMENT  
HEARING ON PROPOSED OFFSHORE LEASE SALE  
BEVERLY HILLS, CALIF.

FEBRUARY 6, 1975

Members of the Panel, J. Ray McDermott & Co., is a marine engineering and contracting company specializing in the design, fabrication and erection of offshore drilling and production platforms, loading facilities, and submarine pipelines for the marine petroleum industry. We are a U. S. corporation with principal offices in New Orleans, Louisiana, and we operate worldwide through subsidiary corporations in all areas where there are marine or offshore oil operations.

The purpose of my presentation is to describe the offshore platform and installed facilities from an engineering, construction and safety standpoint.

The basic function of an offshore platform is to provide a stable working area from which drilling and production operations can be carried out above the zone of maximum wave action. The platforms for use offshore California will be conventional steel template-type platforms. This type of construction is like the thousands of similar platforms located in marine oil fields throughout the world, and several hundred of these are larger and more complex than would be required for California operations.

Platforms have been used by the marine oil industry for almost thirty years, the first ones in shallow water in the Gulf of Mexico in the late 1940's. Technology of design and construction has advanced in these almost thirty years at about the same rate of speed as has engineering knowledge and expertise. Scientists and engineers in this span of time have hurtled along from the complex theory of relativity to nuclear reactors manufacturing commercial electricity, and are well along in the exploration of space. Designers and builders of platforms have gone from wood platforms in 8 to 10 feet of water to steel and concrete platforms in 450 feet of water. Steel platforms are the more conventional of the two types.

Currently being constructed in California is a platform for 850 feet of water. Such a platform might be expected to be about 175 feet wide by 230 feet long where the base sits upon the ocean floor and is held to the ocean bottom by steel piles driven 300 or more feet into the ocean floor. Height can be expected to approximate 945 feet with the top of the drilling deck approximately 95 feet above the ocean surface. With this drilling deck being more or less 85 feet wide by 170 feet long, or about 15,000 square feet in area, an 850 foot water depth platform would be expected to weigh about 20,000 tons. It would be built of steel and fabricated by a California Industry, employing on it, and others like it in lesser or greater water depth, some 1500 workers, 90% of whom would be skilled and highly paid, together with their families which these wages would support and the service workers required to attend them.

In outline on the horizon these platforms would look like the 15 or so platforms already in California waters and would be no more offending in an esthetic way than a modern rectangular 95 story building, which in size it would approximate. We must remember that 10 stories are visible and 85 are below water.

These platforms are being, and will continue to be designed to meet earthquake severities of 8.2 Richter on epicenter and maximum storm wave heights, current velocities and wind velocities that could be expected only one time at the particular location in a 100 year period. These criteria are established in the Santa Ynez Environmental Impact Statement and need not be reiterated here. The design encompasses all these forces from nature while supporting the normal operating loads from drilling and production operations and the weight of all equipment and supplies stored on the platform. The summation of this is that platforms offshore will be just as safe or safer than the modern 1975 vintage buildings you see in any typical downtown California city.

Offshore platforms are designed in accordance with the most rigorous criteria, established by the American Petroleum Institute, and their construction and erection meet rigid, frequent and constant Federal inspections both during the period of design and construction and for the years after erection. At sea a platform is used as a tool for the extraction of energy.

Also during fabrication, facilities for pollution elimination include curbs, gutters, drains and special drip pans used to

contain and collect all contaminants. The fluids collected are directed into a collection tank which will automatically maintain the oil at a level sufficient to prevent discharge of oil into the sea. Produced waste water is discharged to the sea after treatment which reduces the oil content to meet regulatory requirements. Sample stations are installed in these disposal systems so that the effluent can be checked. Specially approved sewage disposal treatment plants are installed and are used in all cases where effluent is discharged to the sea. All discharges from these platforms meet completely the NPDES discharging standards and are monitored for acceptable quality.

After drilling is completed, the drilling rig is removed and production equipment is activated. Generally this equipment was placed on a lower deck of the platform during fabrication but was not used during drilling. McDermott designs and builds these production systems, does the piping, wiring and instrumentation, the systems analysis, the testing, start-up and run-in -- in short a total responsibility turn-key function. For safety and pollution elimination the minimum safety devices and procedures used in the process systems of offshore platforms are based on American Petroleum Institute standard 14C in compliance with the United States Department of the Interior "OCS Orders 1 through 12 Governing Oil, Gas and Sulphur Leases in the Outer Continental Shelf Gulf of Mexico or Applicable OCS Areas."

Where possible, production safety devices are tested on a

periodic basis under actual conditions. Devices which cannot be tested under actual conditions are removed and inspected on a periodic basis. All testing results are reported to the USGS in compliance with OCS Order 8.

Infinite care and sound engineering considerations go into these systems. The basis of this design starts with the arrangement of equipment on each platform. This arrangement is given particular attention to insure safe, pollution-free, efficient production of oil and gas. Basic guidelines for arranging equipment on offshore structures are available, such as the American Petroleum Institute RP 2G, "Recommended Practice for Production Facilities on Offshore Structures." As far as possible, production equipment is arranged in areas which are in turn protected from each other.

The design and construction of offshore platforms is an ever expanding field in which new proven techniques are constantly being developed and employed. Like all companies whose operations are a part of the energy business, the engineers employed by J. Ray McDermott & Co., are completely aware of and conversant with the problems of maintaining an acceptable undisturbed environment. This Company knows that a viable environment can exist while the development of energy sources accelerates, as it must. By our corporate analysis if domestic energy development does not accelerate either the nights may get longer and colder and darker or the imbalance of payments will bankrupt all of us.

Thank you.

---

E. L. Geraldts



LeRoy W. Jeffries and Associates, Inc. 3540 Wilshire Boulevard • Los Angeles, California 90010

(213) 388-9638

LeRoy W. Jeffries  
President

August 22, 1975

I, LeRoy W. Jeffries, a marketing and public relations consultant, who works principally in the interest of Black people in Los Angeles, as well as in other cities throughout the nation, wish to testify in favor of Santa Barbara OCS development for the following reasons:

Recently in a conversation with John Mack, Executive Director of the Los Angeles Urban League, he informed me that since Blacks and other minorities in the Inner City are usually the last hired and the first fired, the impact on this group resulting from the energy crisis has affected them disproportionately on recent lay offs 25 to 30 percent.

Blacks and other minorities in the Inner City are more disadvantaged by the energy crisis by having to travel greater distances to their places of employment, which in most cases have moved from the city to surrounding suburban areas. Therefore, the higher cost of oil and gasoline makes it extremely difficult for these citizens to reach their places of employment. Of these Inner City minority workers, more than 75 percent are in the lower occupational categories.

The National Urban League's Research Department just released its quarterly economic report on

August 22, 1975

Page Two

the Black Worker, which presents a devastating picture of the Black economic Depression. It estimates true Black unemployment, including those out of work, those working part-time when they want full-time work, and those who have given up trying to find jobs, at about 25 percent, or one out of every four Black workers. For Black teenagers, the official rate is 40 percent. In some urban areas, almost half the people are without full-time jobs.

This is one of the basic reasons why I believe that oil and gas development in the Santa Barbara Channel outer continental shelf will stimulate employment and stabilize the price of oil and gasoline for the Inner City residents.

In checking with officials of the minority-owned Bank of Finance in Los Angeles, which has a branch office on the periphery of Watts, I have been told by the President that because of the economic climate which has been agitated by the energy crisis, that there is a faster clearing of checks by Inner City depositors, and that real estate loan foreclosures are significantly high. He also noted that there is a net reduction in the bank's savings accounts as well as a high level of increase of delinquency notes on consumer loans.

My Los Angeles friends who deal with many Black Inner City policyholders in the insurance industry, tell me that recently purchased policies by these minorities are lapsing much faster because of the energy crisis.

The Black Economic Research Center, New York City, in a paper titled, "The Impact of the Current

Testimony of LeRoy W. Jeffries  
Re: Santa Barbara OCS Development  
Director, U. S. Geological Survey, National Center  
Reston, Virginia



August 22, 1975

Page Three

Economic Crisis on Black owned Business," dated January, 1975, states the following on the failure rate of Black business between 1972 and 1975, and I quote ... "Our own survey indicates a rather dismal picture for Black firms. During 1972-75, the death rate was more than 13 percent per year, for a total of 40.2 percent over the three year period. Hardest hit were firms in the contract construction industry and wholesale trade, each with a 50 percent failure over the three year period. Miscellaneous business services (primarily architectural and accounting) were not far behind with a 46.7 percent failure rate. Retail, manufacturing and transportation firms showed failure rates of 38.2 percent, 35.6 percent and 35.1 percent respectively."

The tables in the study further show the Black owned business failure rate by selected states:

Georgia	71.4 percent
Texas	36.4 percent
Illinois	41.2 percent
California	46.5 percent

In summation, it seems to me that the abnormal conditions brought on by a negative economic climate, agitated by the energy crisis, that one of the practical ways of alleviating this situation would be to allow oil and gas development in the Santa Barbara channel OCS. I believe that if action is taken in this direction that the price of oil and gasoline would become stabilized and that employment in the Inner City would be stimulated.

Testimony of LeRoy W. Jeffries  
Re: Santa Barbara OCS Development  
Director, U. S. Geological Survey, National Center  
Reston, Virginia

# Lenders Reject In-City Housing, Senate Unit Told

WASHINGTON (AP)—Gov. Dan Walker of Illinois said Monday that lenders increasingly are refusing to make mortgage loans to would-be home buyers in declining neighborhoods in cities.

Walker and witnesses from several cities appeared before the Senate Banking Committee to support a bill by Chairman William Proxmire (D-Wis.) which would require banks and savings institutions to disclose their geographical lending patterns.

Proxmire said he hoped the bill, if it became law, would encourage savers to put their money in institutions which kept some of the funds in their own neighborhoods.

Walker said that Chicago residents often have found they cannot get savings institutions to lend them money to buy or improve homes within the city.

"Unless we ensure a free and constant flow of funds into the neighborhoods of our great urban centers, we can write off those areas," the governor said.

"Our cities are a composition of smaller communities. They preserve the cultural heritage of our people," he said.

"If these component parts are allowed to deteriorate because of inadequate mortgage money, the cities as a whole are sure to crumble."

Paul Buckwalter of Cincinnati, Ohio, told the panel a housing coalition there had found that local lending institutions were failing to make loans in black and racially transitional neighborhoods.

Mrs. Fran Matarrese of Oakland, Calif., said there are more than 1,000 houses vacant in the East Oakland section of her city because of the refusal of lenders to make home loans in what they regard as a high risk area.



Kaiser Steel Corporation  
Executive Offices ■ Kaiser Center  
1200 Broadway Plaza ■ Oakland, California 94612  
Telex: 155011 ■ Cable Address: KAISTEEL ■ Telex: 155011

September 2, 1975

Director  
U.S. Geological Survey  
Mail Stop 108  
National Center  
Reston, VA 22092

RE: Draft Environmental Impact Statement for Potential Oil and Gas  
Development, Santa Barbara Channel

Dear Sir:

Kaiser Steel Corporation had hoped to be included among those  
in support of oil and gas drilling leases in the Santa Barbara Channel.

I understand that the deadline for written comments before the  
U.S. Geological Survey was September 1. Delays caused by the ab-  
sence of key individuals and the holiday weekend just passed caused  
us to miss that deadline. However, I am enclosing our written com-  
ment in the hope that it can still be included.

My apologies for the late submission. We will appreciate what-  
ever consideration can be given our request.

Sincerely,

James A. Maggetti  
Vice President and General Manager  
Metal Products & Fabricating

Enclosure



STATEMENT OF JAMES A. MAGGETTI  
VICE PRESIDENT & GENERAL MANAGER, METAL PRODUCTS & FABRICATING  
KAISER STEEL CORPORATION

TO THE GEOLOGICAL SURVEY  
U. S. DEPARTMENT OF THE INTERIOR

SEPTEMBER 2, 1975

Thank you for the opportunity to submit this written comment on my company's views on oil and gas drilling in the Santa Barbara Channel.

Kaiser Steel strongly favors the development of oil and gas leases in the Santa Barbara Channel.

We believe that with careful attention to the requirements of good environmental quality control, the accelerated development of our domestic oil and gas reserves is in the national interest and will mean employment for thousands of persons in California.

Kaiser Steel is the largest integrated steel producer in the West. In addition to other facilities, it operates a major steel plant at Fontana, California, 45 miles east of Los Angeles. The plant produces steel from western raw materials, which is sold principally to western manufacturers. Kaiser Steel itself manufactures steel products such as automotive parts, steel drums and tubing. The company also fabricates and erects structural steel to form buildings and bridges, as well as offshore drilling platforms and other structures.

The Kaiser steel plant has an annual payroll of approximately \$115 million. In terms of Kaiser Steel's overall annual impact on the Southern California economy, the steelmaking facilities at Fontana can be described as the basic employment, income and expenditure foundation of a \$600 million industry. And hundreds of

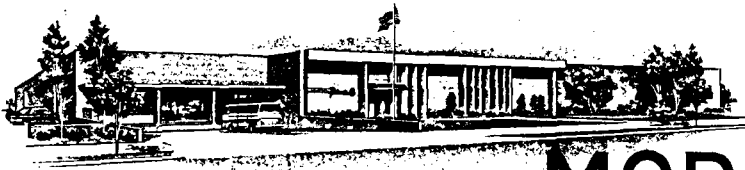
western manufacturers representing billions of dollars in payrolls and investment depend upon the steel manufacturing operation as their primary source of steel.

As part of the fabric of California's economy, Kaiser Steel is in favor of proceeding with the development of the Santa Barbara Channel oil and gas leases because of the beneficial effect the development of these reserves will have on the state's employment picture and its energy supplies.

We also see the reopening of offshore drilling as a much-needed boost to the western steel market, which, like the steel industry as a whole, is substantially down from the past several years. Each exploratory drilling rig or drilling platform requires several thousand tons of fabricated steel. Kaiser Steel sees these platforms in terms of potential jobs at its steelmaking, fabricating and erecting facilities in California.

The demand for both new jobs and for the raw materials from which energy is derived exceeds supply. Therefore, Kaiser Steel believes the proposed leasing of Santa Barbara Channel drilling sites under strict environmental guidelines will strengthen not only the western energy supply, but the western employment situation as well.

#



DOMINGUEZ INDUSTRIAL PARK

**MODERN** *Plastic Co.*  
SINCE 1937

19200 SOUTH REYES AVENUE • COMPTON, CALIFORNIA 90221 • (213) 537-4212

August 20, 1975

Director  
U.S. Geological Survey  
Mail Stop 108  
National Center  
Reston, Virginia 22092

Gentlemen:

*I take this opportunity to thank the United States Geological Survey for allowing me to express my views in writing on the vital issue of the Santa Barbara Channel federal waters.*

*I am making my written presentation as a President of a small business, a businessman, and as a concerned citizen about the subject matter of the hearing on August 25 through 27, 1975.*

*I am President of Modern Plastic Co. in Compton, California. We are custom injection molders of thermo plastic materials. We are 100 percent dependent on oil and natural gas. All thermo plastic is made from crude oil, natural gas, or crude oil and natural gas. The total plastic industry uses less than 1.5 percent of the U.S. petroleum and natural gas production. Thermo plastic material is used in many industries and is vital in the medical, pharmaceutical, and health care fields.*

*Our business is small; about \$4 million in sales and we had, prior to the energy crisis, 175 employees. I do not believe our business can survive another energy crisis. The last crisis forced our business to lose approximately twenty percent of our sales volume in the second best economic year in U.S. history - 1973. In many cases potential customers chose alternative, more expensive materials for fear of lack of supply of thermo plastic material. This, along with current economic conditions, has caused almost fifty percent of our employees to lose their jobs. The average increased costs for plastic materials of approximately forty percent is due mainly to the increased costs of oil and electrical power, our company's fourth highest cost item. These increases have badly depressed our business and the custom molding industry.*

To save energy and control costs, we must obtain and process our crude oil here. Dow Chemical Company is planning a monomer plant in the San Francisco Bay area to serve existing polymer plants in California. This new facility and others like it should be furnished with local feedstock for the most economical and energy saving method of producing chemicals and plastics.

I urge the U.S. Geological Survey to do nothing that might delay or hamper the possibility of developing oil and gas wherever it may be.

As a businessman, I think it makes prudent sense to proceed to develop the oil and gas reserves in the Santa Barbara Channel. A few of my reasons follow:

1. Oil and gas are badly needed and currently in short supply with increasing demands daily. It is estimated that the projected growth and demand in thermo plastic material alone will increase at the rate of ten percent per year, while the supply is only currently increasing at the rate of three and one-half percent per year. In my opinion, there is no question that there is a shortage of petrochemical feedstocks and it will continue unless more oil is found.
2. The development of the Channel oil and gas reserves is already started and should proceed. Now is the time to continue development so we can become less dependent on others for imports and possible energy shortages. Los Angeles is the world center of the plastics processing industry. Within a thirty-mile radius of the Los Angeles City Hall, more pounds of plastic are processed than in any comparable area in the world. This industry should be supplied from local sources.
3. Ninety percent of California's energy comes from oil and gas. I believe we must have it; we cannot do without it.
4. In my opinion, we need the oil and gas to find and develop alternative sources for energy and products.
5. Oil means jobs - for energy. One million dollars of oil brings \$250,000 in wages, not including support groups. California needs jobs - as our nine to ten percent unemployment figures show, which is above the national average.

6. The private oil companies, at their own expense, are taking the financial risks; the public has nothing to lose and everything to gain. It seems wise to me, as a businessman, to have production in this proven area off the California coast.

As an individual, I too, am concerned about a National Energy Policy, environmental impact and coastal environment.

I believe if we wait for a National Energy Policy to be decided upon and implemented, we will be so late that any such policy will be ineffective and redundant.

I believe the theory of "no need" has been dispelled by the imports and dependence now on others for our oil demands.

As for spillage, I understand there have been only four "spills" out of some 17,000 wells actually drilled, none of which caused long-term environmental damage. Also, now there are improved ways to recoup oil spills if they should happen again. I think the figures will prove themselves. Continuous discharge of sewage outfalls, I believe, is a bigger problem in the ocean than any oil spill could be.

With the proper incentives, I believe the oil companies will find ways to satisfy the demand and the free market will provide alternative materials.

As a private citizen, for these and other reasons, I urge the U.S. Geological Survey to act as quickly as possible to allow the oil industry to continue the development of the Santa Barbara Channel under proper environmental safeguards.

Thank you for the opportunity to express my views.

Sincerely,



RICHARD G. VAN VORST

RGVV:df



August 27, 1975

Director  
U. S. Geological Survey  
M. S. 108, National Center  
Reston, Va. 220,92

Re: Comments on Santa  
Barbara Channel  
Environmental Statement,  
D & S 75.

Dear Sir,

The Draft, Environmental Statement,  
Oil and Gas Development in the Santa  
Barbara Channel, Outer Continental Shelf  
Off California, D & S 75, June 6, 1975,

- (1) does not point out the hazards to  
the region if the reservoirs of oil  
and gas in the region are not depleted,
- (2) the advantages to the region if the  
reservoirs of oil and gas in the region  
are depleted.

(a) The number and intensity of  
earthquakes having epicenters in this  
would be reduced, hence the region  
would be safer for persons, property,  
and the environment.

August 27, 1975

(c) The natural seeps of petroleum products would be reduced to a negligible amount.

I Hazards to the region if petroleum products are not depleted.

A. The magnitude 7.5 earthquake is too low as the maximum credible earthquake, if the reservoirs of petroleum products are not depleted. (D&S 75, page II-84.)

The 7.5 magnitude was based on historical records rather than proper evaluation including the Quaternary history of deformation. a copy of the paper by Allen (1975) is Appendix A. Typical application of this base can be made from Jennings, et al. (1973) which includes historical faults in red with date of last movement, orange is used for Quaternary, and black for Pre-Quaternary. The term "creep?" is used about a dozen times in the map of "South Half of California". This term "creep?" is used twice in the Santa Barbara Channel region, once at Santa Barbara on Mesa fault and once at Coal Oil Point. a black and white copy of the Santa Barbara Channel region is shown as Figure 1. another example

of maps showing age of faulting for earthquake evaluation is U.S.G.S map MF-585, sheet 1 of 3, Ziony, et al. (1974). The scale, 1:250,000 provides good detail but it is too large for enclosure.

The reason that historical time is not sufficient for earthquake evaluation is evident from the 2000 year records in Japan and 3,000 year records in China. The repetition rate on many earthquakes is much longer than the United States records (about 200 years). The same applies to the channel area in particular. The continued compressional forces from the south are compressing the East-West trends in tighter and increasing the fluid pressures in petroleum reservoirs, as will be discussed later.

High-fluid-pressure gradient up to 0.9 psi per foot of depth have been measured in the onshore portion of the Rincon Trend (McCulloch, 1969, Figure 11). High-fluid-pressure gradients, particularly as depth increases, should be expected in a large portion of the Santa Barbara Channel. The Dos Cuadras Offshore Oil Field has a pressure gradient



FIGURE 1

of 0.7 psi per foot in the interval from about -3318 feet to about -3963 feet. a further increase is expected in the interval below -4000 feet. Some of the shale in the Santa Barbara Channel was deposited rapidly producing high-pressure low-density shale as was observed by Bruce (1973) in the Gulf of Mexico. Strong pressure from the south has tightly folded sediments in the Channel as described by Berry (1973) and is illustrated in his Figure 13. It is a vise-like action between the West Side Fault (the Sierran-Klamath) and the Franciscan. Berry's (1973) Figure 1 is a map of a series of wells and Figure 2 is a plot of pressure vs depth. The Ft. Bragg wells had a pressure slightly less than the lithostatic pressure, 1.06 psi per foot. These were near the San Andreas fault, then the Arbuckle wells and Kirk-Buckeye fields are farther from the fault. The Arbuckle field has hydrostatic pressure, 0.433 psi per foot down to about 3,300 ft and then increase in steps to near lithostatic pressure. The Kirk-Buckeye fields have hydrostatic pressure down to about 6,500 feet and then increase in steps to near lithostatic pressure. This same type of pressure variation is indicated

in the Santa Barbara Channel.

The importance of high fluid pressures as a cause of earthquakes has been accepted by more seismologists. Healy (1975a) stated:

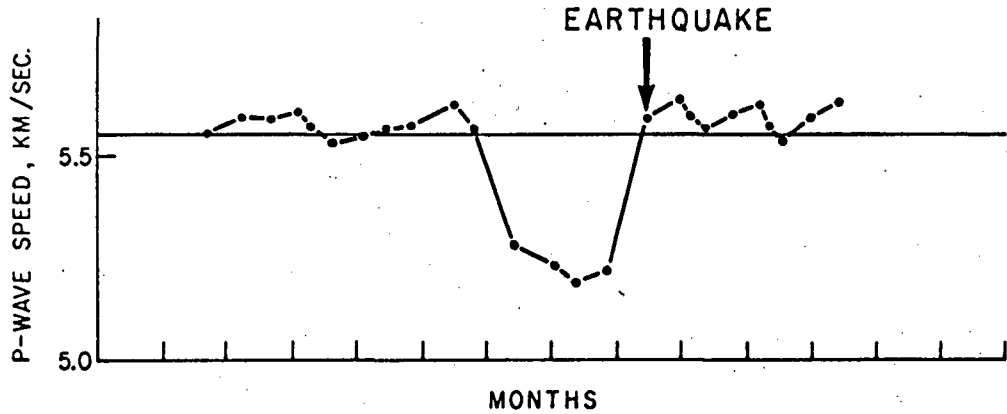
"In cases where we have direct evidence on the relationship of fluid pressure to earthquakes we find that fluid pressure is a critical first-order parameter in the process. In fact, the only parameter which seems adequate to explain the distribution of earthquakes with depth is the distribution of fluid pressures with depth. The dilatancy diffusion models described by Rus, Scholz, and Anderson and Whitcomb all involve fluid pressure as a critical parameter, but these models do not exhaust the possible ways in which fluid pressure might produce the premonitory phenomena.--"

Healy (1975b) is an excellent bibliography of papers in English on "Recent Highlights and Future Trends in Research on Earthquake Prediction and control." (Underlining by Paw.)

a variety of criteria have been used for premonitory basis. The criteria used by Aggarwal, et al. (1973), is  $T_s/T_p$ , where  $T_s$  is the travel time for the shear waves and  $T_p$  is the travel time for the P waves. The largest change is in the travel time for the p waves, but the change in travel time for the shear waves occurs during a different portion of the cycle, hence a different diagnostic pattern is obtained. The method described by Wallace (1974) is simple, as illustrated in Figure 2A. The P wave velocity is plotted as a function of time, the velocity varies a small amount prior to the start of the characteristic premonitory phenomena, where the velocity starts to decrease. The amount of the decrease and the time interval before the velocity rise, provide a basis for estimation of the earthquake magnitude. There is typically usually two or three days before the earthquake occurs, as shown by the arrows in Figure 2A. Any form using a variation in velocity requires that the equipment be in operation, preferably a month or more, prior to the start of the premonitory phenomena.

# EARTHQUAKE PREDICTION

## A. BY CHANGES IN SPEED OF SEISMIC WAVE



## B. BY "GAPS" IN MOVEMENT ALONG FAULT

*Fig. 2*

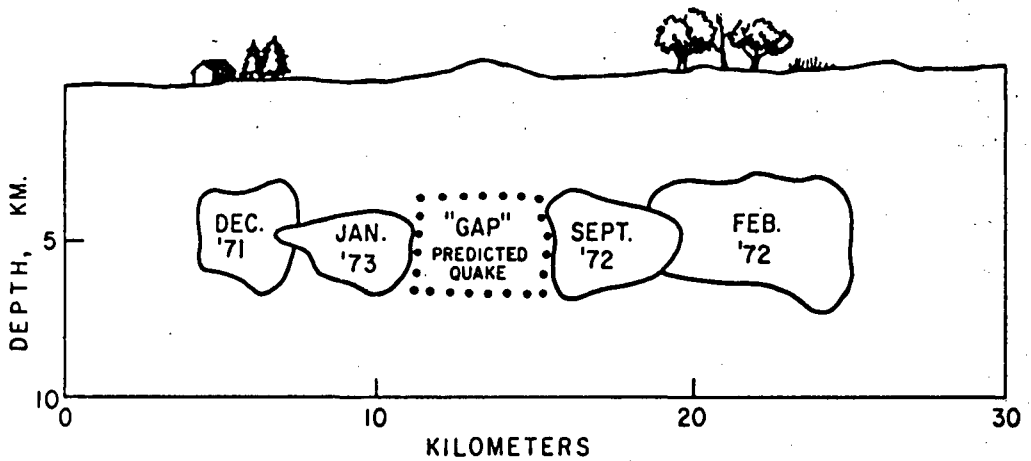


FIGURE 2. Earthquake prediction. A, By changes in speed of seismic wave. Speed of P-wave may decrease for months before an earthquake, then rise to normal just before the earthquake. B, By "gaps" in movement along fault. Microearthquake mapping identified slip surfaces on the San Andreas fault related to four moderate earthquakes (magnitude 4-5). A "gap" suggests that the next slip and a related earthquake will lie between others.

*Figures 2A and 2B*



August 29, 1945

Fortunately, other techniques can be used for that purpose, including the "Gap" prediction method as illustrated in Figure 2.5. This method indicates an earthquake on the San Andreas. A similar section is near Ft. Tejon, the last earthquake there was in 1857. It extends from Cholame to San Bernardino. The 1857 earthquake in this section damaged all houses in Santa Barbara and greater damage to Ft. Tejon.

I pray that the Santa Barbara Region has all reservoirs of petroleum products depleted prior to this earthquake. There are several faults north of Santa Barbara which have not moved yet, such as Big Pine fault which moved in 1852. If these faults move one at a time, the damage will be much less. It is possible that a major earthquake could trigger the delicately balanced conditions in the channel, hence have an aftershock act like a local earthquake, or possibly a series of earthquakes.

II Suggested modifications of II B 6 h, pages  
II-134 through II-136.

The U. S. Army Rocky Mountain Arsenal liquid waste disposal well should not be considered as pertinent to the Santa Barbara Channel problems. Neither the fluid pressure or porosity of the formation at the bottom of the well were measured prior to injection and all data is based on assumptions. There was no earthquake monitoring equipment at the well. One old seismograph station was in a noisy location and one new station had been operating a few weeks and was not advised about the injection at the RMA injection well. The injection was started and about 45 days later earthquakes were recorded with epicenters near the RMA. Operations continued on and off matter for about four years. Complaints about 4.5 magnitude earthquakes and David Evans accused the RMA of the entire vibrations. The USGS was called in and made a credible report and suggestions. These suggestions solved the problem. However there were so many unknowns, that it was difficult to confirm

Aug 27, 1975

anything during the operations. No provisions were made initially to record every break-down, shutdown to change filters etc. They not only were applying high pressure, but sudden changes could also weaken the formation. Fatigue can weaken materials and the faster the impact is applied the greater the effect.

The man-made earthquakes due to subsidence primarily quotes data over 20 years old, even some of the recent publications discuss old data, such as Kovach (1974). He compares present operations with prior to 1955 and included "This program has been successful, and, some rebound has occurred due to massive fluid injections." Frame (1952) had a title "Earthquake damage, its cause and prevention in the Wilmington oil field" (Underlining by Pass.) Further examination of these comments will show that present data differs radically from these comments so all should be deleted, except to indicate obsolete practices under those conditions.

### III Proper techniques for water flooding in secondary recovery of petroleum products.

Gibbs, et al. (1973), described the early work at the Rangely oil field, Colorado. Subsequent work is described in appendix 2, from Earthquake Information Bulletin, an array of portable seismometers were placed around the Rangely oil field. The earthquakes were found to occur near some injection wells at the edge of the field and were also concentrated at a fault through the field (Figure 2 in appendix 2). The earthquakes were recorded only where the pressures exceeded the original pressure in the field. Four wells were selected near the fault and were treated for one year, as previously. In the fall of 1970, the pressure was reduced as planned to less than 3750 psi as shown in Figure 3. Within a month after the pressure was reduced the earthquake frequency from 30 to 40 per month to only one or two per month. In the latter part of 1972 and early 1973, the pressure was increased above 3750 psi and the earthquake activity increased to more than 30 per month. The pressure was reduced to a low value. The present arrangement is shown in Figure 4 from Biggs, et al. (1974).

Fig. 3

## EARTHQUAKE CONTROL

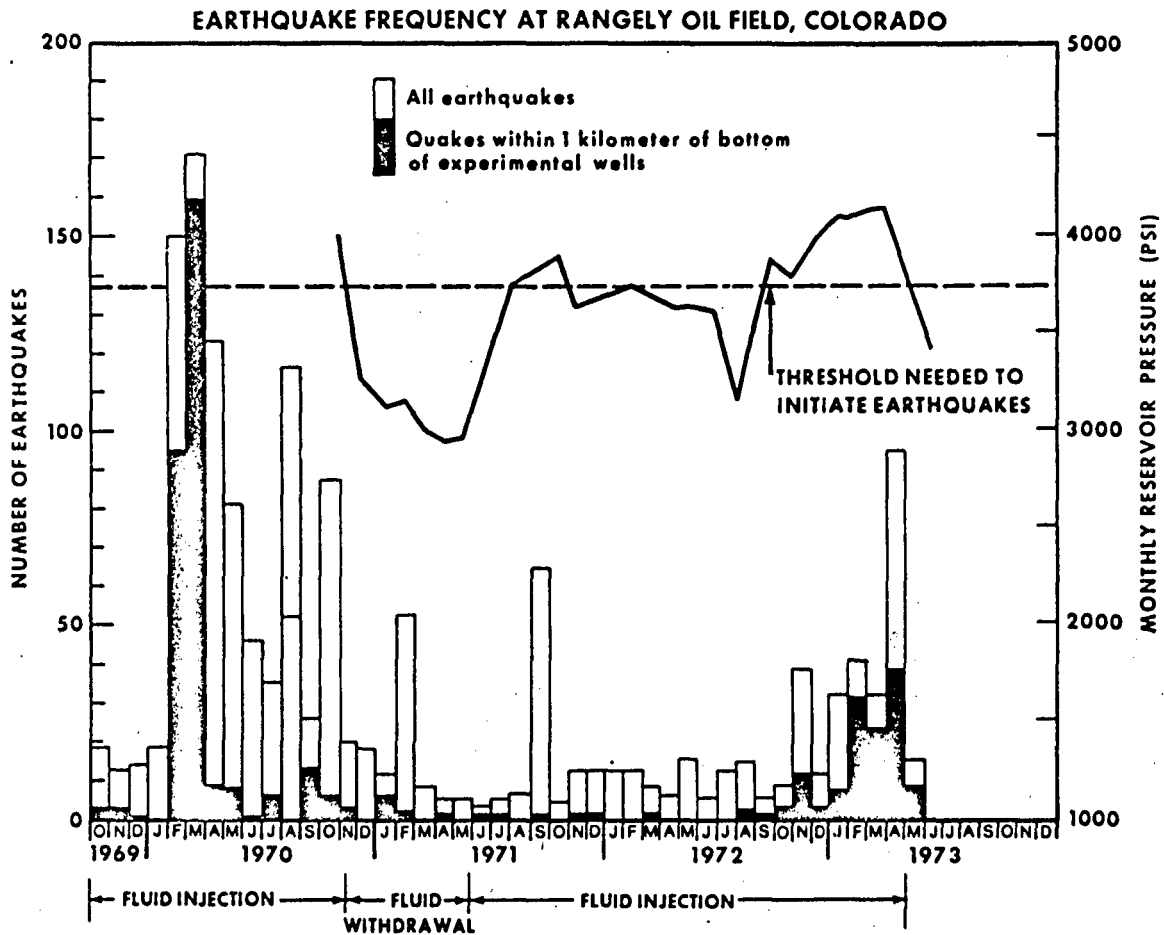
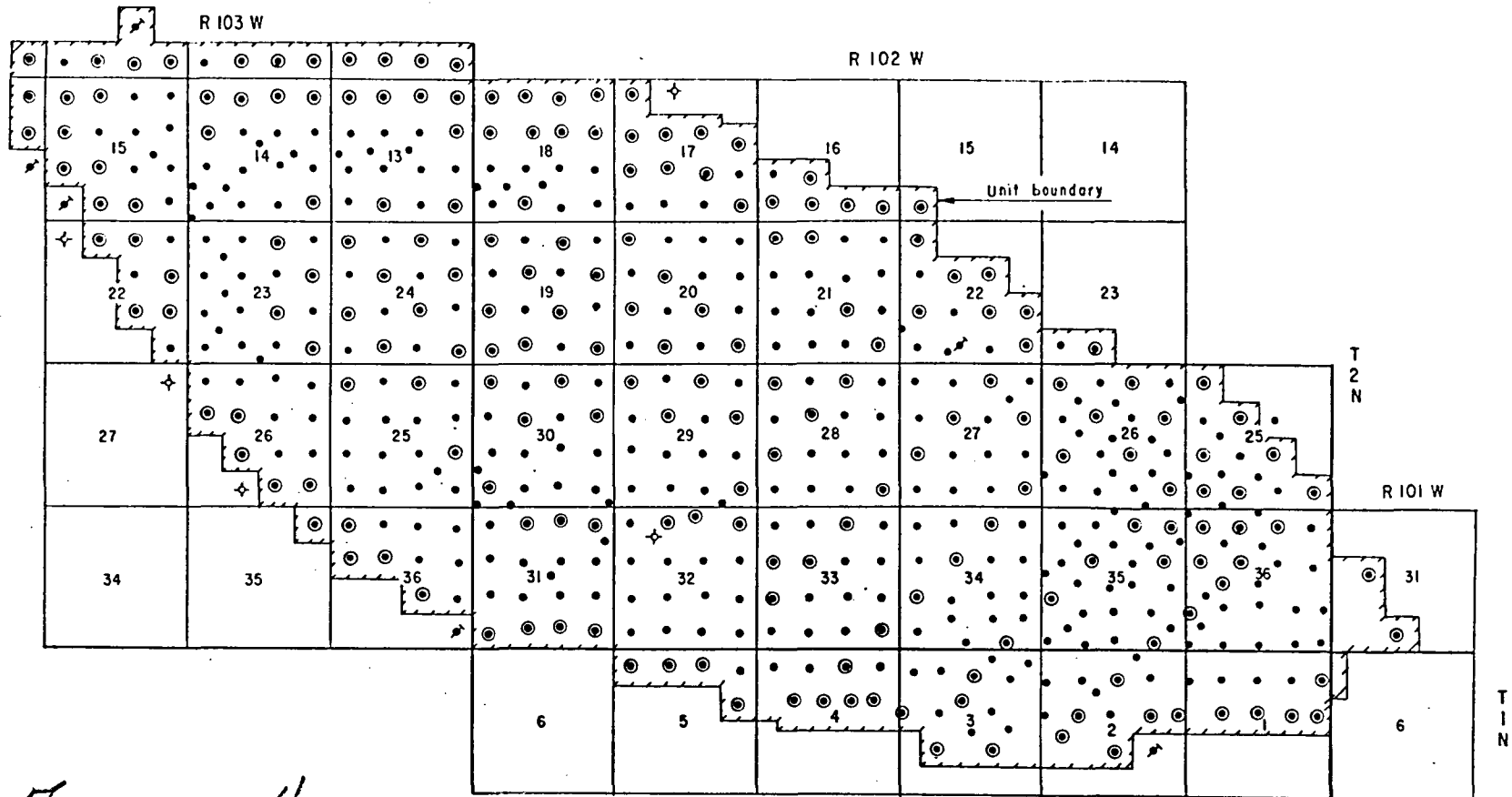


FIGURE 3—Earthquake control. The level of earthquake activity was controlled at Rangely oilfield, Colorado, as shown in this graph, by controlled pumping so that the reservoir pressure was either above or below a critical threshold level.

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Well status 1-1-70

LEGEND

- Oil well, Weber
- ✂ Oil well, abandoned
- ⊙ Water-injection well
- ✦ Dry hole

*Figure 11*

*U.S. Bureau  
of Mines*

*R.S. 7959*

FIGURE 15. - Rangely field.

*Wallace, 1974*

III Techniques not included in D E S 75

A. Pressure predictions ahead of bit

Wilson and Bush (1973) describe a method based on continuously recording flowline temperature. Their Figure 3 illustrates a typical case for a high-pore pressure case on the Pacific Coast.

Pennebaker (1972) Canadian Patent 905,518

B. Means to obtain earthquake velocity data uniformly or at an accelerated rate

Eisler (1967) used 100 kg charges out to 42 km and obtained an accuracy of  $\pm 1$  milli-second. Eisler (1969) repeated the previous measurements with an accuracy of  $\pm 1$  ms, but over certain paths, the time had increased by 6 ms.

De Fazio (1971) used a continuous vibrator at 500 Hz. De Fazio, et al. (1973) measured the solid earth tide and change in situ seismic velocity in a mine.

Reasenberq, et al. (1974) used a Bolt 40 cubic inch air gun every 6 or 10 seconds for velocity measurements out to 200 meters in Massachusetts.

August 29, 1975

There are numerous items that I have not been able to prove or disprove, which would have a serious impact, if true. For example, Dr. Bailey Willis (1925) published the following:

"It was well known, nevertheless, that strong pressure exerted against the mountain range from the south has caused it to move gradually, so that Gaviota Peak, a triangulation point of the U.S. Coast and Geodetic Survey has been pushed northward twenty four feet in thirty years."

a copy of this is enclosed. There is no reference as to where the reference point was located. It is also possible that there was an error in surveying or triangulation points moved. The underlining was added by Parr. This triangulation point is listed in the U.S. Coast & Geodetic Survey, Special Publication 202, page 25, (1927 datum) Last report, I had, is this Gaviota peak was missing but Honda and Black can be located.

Respectfully yours

IX-268

J. J. Parr, Jr.



## SCIENCE NEWS July 10

*Science Service, Washington, D. C.*

## THE SANTA BARBARA EARTHQUAKE

BY DR. BAILEY WILLIS

*President of the Seismological Society of America,  
Professor Emeritus of Geology, Stanford University*

(Copyright, 1925, by Science Service)

THE Santa Barbara earthquake was a movement on a fault that runs along the Santa Ynez range of mountains and passes through the Sheffield reservoir which held the city's reserve water supply. The general direction of the movement of the earth along this fault was apparently south to north, as shown by the scar made by the trail of the cannon mounted on the platform near the post office building. This showed that it moved sixteen inches south. The chimneys which were demolished on many houses, otherwise uninjured, were thrown in all directions according to the mechanical conditions surrounding them. In some cases they remained standing although twisted as much as thirty degrees at the line of fracture.

An inspection of the damage in Santa Barbara shows that the lessons of the San Francisco and Tokyo earthquakes could be applied here. I drove through the city within an hour after the shock and noted the buildings of various kinds—wood frame, brick, reinforced concrete, etc. Those that remained undamaged were well constructed. Badly designed reinforced concrete failed, as shown by the disastrous collapse of the San Marcos office building, an edifice of four stories in which one corner gave way. Brick veneers which were not tied to the frame fell out, as in the case of the California hotel, where the floors remain standing, although stripped of walls on three sides. In general good design and honest workmanship stood, while incompetency and bad workmanship were exposed in all their miserable nakedness.

The earthquake was not unexpected among seismologists. During the last seven years we have had the San Jacinto, Inglewood, Elinore and San Bernardino shocks, each one resulting from movement on one of the four great earthquake faults of southern California. The system of faults which outlines the San Gabriel range extends west through the Santa Paula Valley and skirts the Santa Ynez range had not, up to this time, shown any evidence of disturbance. It was well known, nevertheless, that a strong pressure exerted against the mountain range from the south has caused it to move gradually, so that Gaviota Peak, a triangulation point of the U. S. Coast and Geodetic Survey, has been pushed northward twenty-four feet in thirty years. As the last great earthquake shock in this region occurred sixty-eight years ago, in 1857, those who are familiar with the history of earthquakes in California expected a disturbance.

To a certain extent their expectations are now fulfilled, but fortunately the Santa Barbara earthquake is much less severe and much less general in effect than some seismologists have feared it might be. There is now little

reason to anticipate any severe shock in the immediate future. We shall experience the usual crop of aftershocks, but they will gradually die away as the rock returns to their normal condition of elastic strain.

The expectations of seismologists in regard to the coming of the Santa Barbara shock were of general nature only because we have not yet established the recording stations, which if set up throughout the coast region of California would enable us to foresee such occurrences. The Carnegie Institution of Washington is now engaged in establishing stations at Pasadena, Riverside, La Jolla and other points in southern California, where instruments designed to record local earth tremors will be set up.

All the stations will operate in unison under the central control of the principal stations at Pasadena and the records which they will yield will enable us to fix the focus of even the slightest tremors within fifty or sixty miles of the stations. As the records are continuous, we shall know exactly where the earthquake strain is gathering and how it increases or diminishes from day to day or month to month.

In the course of time a chain of stations of this character will no doubt be established from San Diego to the Oregon line. But it will have to be done through the cooperation of the communities interested and will not be accomplished until public opinion is educated to an understanding of the advantage of knowing all that we can about earthquakes and the methods of protecting ourselves against their effects.

## NOTES ON THE SANTA BARBARA EARTHQUAKE

BY WATSON DAVIS

*Managing Editor, Science Service*

AGAIN Mother Nature has had growing pains and again it is demonstrated that man does not learn by experience.

For while the delightful Pacific coast town of Santa Barbara is in ruins, without water, gas or electricity, while the whole length of its principal State Street is practically wrecked, there are some buildings that are essentially undamaged. Those buildings that came through their serious shaking nearly unscathed were those that were built well.

The lesson that can be learned from the disaster here which I have just witnessed is that in areas subject to earthquakes, engineer, architect, contractor and owner must insist that the structures that they erect must be nearly earthquake-proof as modern engineering can make them.

This is a lesson that should have been learned from the disasters at San Francisco and Tokyo. Unfortunately, it will probably require many more earthquakes, many of them of much greater severity than this one, to cause men

to refrain from erecting death traps over their very heads. For earthquakes will continue to occur in California as well as in other parts of the surface of the globe.

Near the railroad station, at 6:44 A. M., there was a handsome hotel, recently erected at a cost of some \$200,000. At 7:04 its guests found themselves exposed to public view on three sides of the structure. The shock had simply sliced the brick walls from the frame of the building. Such instances may be multiplied many times.

Yet Professor Bailey Willis, president of the Seismological Society of America, who was in Santa Barbara and experienced the quake, says that it was a moderately severe, but not a very severe, shock, and that it was not a shock in which any decently built house should come down.

That the shaking was comparatively slight I can personally attest, for I had the great privilege of going through this earthquake totally unconscious of what was happening. I was asleep. I was on the last overnight Southern Pacific train to pass through Santa Barbara before the shock. At the instant of the first shock this train had reached three miles south of Santa Barbara, where it was nearly derailed by the force of the earthquake. The engineer stopped until the six severe shakes within nineteen minutes had passed away, and then proceeded cautiously toward Los Angeles. I supposed that the motion was due to normal train operations and slept through it all. The reports of the other passengers caused me to hurry back to Santa Barbara on the first Red Cross relief train leaving Los Angeles.

One eminent geologist, Professor Bailey Willis, has already made a rapid but careful investigation of the disaster and his results are given in a signed article written exclusively for *Science Service*. Dr. Arthur L. Day and Dr. H. O. Wood, in charge of the earthquake investigations of the Carnegie Institution of Washington, with headquarters at Pasadena, are now *en route* to the disaster scene.

In spite of the coincidence of the two earthquakes, seismologists state that there is no relation between the Montana shocks of Saturday and Sunday, and those at Santa Barbara. Both of these disturbances will, however, be the subject of detailed investigation by competent scientists.

### THE CAUSES OF EARTHQUAKES

EIGHT to ten thousand earthquakes are recorded every year in various parts of the world, and probably four times as many as this occur, but far from being alarming this is a very reassuring fact, Dr. William Bowie, of the U. S. Coast and Geodetic Survey, told representatives of *Science Service* recently. This is because the earth is thus shown to be a body capable of yielding to stresses and strains. If it were not the case, the strain would accumulate until great enough to produce disruptions far more violent than any that have ever occurred, and perhaps sufficient to wipe out all the works of man.

While the earthquake in California followed so closely upon the heels of the one in Montana, this is only a coincidence, said Dr. Bowie, and there was no direct connection between them, except that the shock of the Montana quake might have been the trigger to set off the one in California. This could not have occurred, however, unless the conditions had been ready for a tremor, and any one of a number of things might have been the last straw. Dr. Bowie thinks it possible that the rising of the tide might do it, as a depth of water of only eight feet, when extended over an area of hundreds of square miles, would exert a pressure of millions of tons.

The real cause of earthquakes, he said, is erosion, by which rains carry soil from mountains to valleys, and sedimentation, by which rivers and streams carry material to their mouths and deposit it there. These work gradually, but in time the amount of material moved is enormous, and the distribution of weight on the earth's surface is greatly altered. Because of the earth's ability to yield, the crust gives, and a fault, or crack, develops, along which future quakes may occur. A recognized fault passed through Santa Barbara, and is shown on a map issued by the Seismological Society of America showing the California faults. The Santa Barbara fault was supposed to be dead, however, as no tremor had occurred along it within historic times. The famous San Andreas fault, which caused the San Francisco earthquake in 1906, extends for many hundreds of miles, but does not pass near Santa Barbara.

In spite of the great damage done by the California shake, it was not nearly so violent as the one in Montana, said Commander N. H. Heck, in charge of the Coast and Geodetic Survey's seismological investigations. This was indicated by the seismographic records obtained by the survey's stations at Cheltenham, Md., and Tucson, Ariz., as the records of the Montana quake were much more distinct, and was borne out by the reports of the area affected. In California, only about four counties felt the tremors, while three states besides Montana were shaken.

### ITEMS

THAT the monkey has a true color sense has been demonstrated by a series of experiments reported by J. A. Bierens De Haan in an article in the forthcoming issue of *The Journal of Comparative Psychology*. At the Physiological Institute of the Free University at Amsterdam, Holland, Mr. De Haan carried out 3,100 experiments with one monkey and 800 with another to determine their abilities to distinguish between different colors. Colored papers were used, and the monkeys were found to be able not only to distinguish red, blue, green and yellow papers from each other, but also to distinguish the colored ones from each of a series of thirty gray papers ranging in continuous gradation from white to black. Factors such as special smells, texture differences between the colored and gray cards, and special marks on the cards were carefully avoided so that the monkeys would not be influenced by anything other than differences in color.

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esp. Sheet 1 of 3. IX-273

RESPONSE TO MR. J. O. Parr, Jr.

The information you submitted related to earthquake activity is appreciated and interesting. Please note that a part of the Ziony, et al., map mentioned in your comment has been added to this final statement as Plate 7.

**PIONEER**  
DIVISION  
**THE FLINTKOTE COMPANY**  
P. O. BOX 2218, TERMINAL ANNEX  
55<sup>TH</sup> AND ALAMEDA STS.  
LOS ANGELES, CALIFORNIA 90051

WILSON HARVEY  
GENERAL MANAGER

July 25, 1975

Mr. Vincent E. McKelvey  
Director  
U. S. GEOLOGICAL SURVEY, NATIONAL CENTER  
12201 Sunrise Valley Drive  
M.S. 108  
Reston, VA 22092

Dear Mr. McKelvey:

I understand that hearings will be held by the U. S. Geological Survey in Santa Barbara on August 19-21 in connection with offshore oil and gas. We will not be able to participate in this hearing but do, however, desire to express our support for development of these offshore energy sources.

We use substantial quantities of energy at our 40-acre Vernon, California complex in the production of roofing and flooring products, also a variety of paperboard; hence our interest.

Our facility consists of:

- 1) A paper mill with three cylinder machines which recycle waste paper.
- 2) An asphalt roofing plant with two roofing machines.
- 3) An asphalt emulsion and cutback plant.
- 4) A floor tile plant with two tile machines.
- 5) A five-boiler steam plant.

This facility has been in continuous operation in the same Vernon location since 1907 and we currently employ approximately 650 people, over half of whom are from the minority population.

Our production is geared to the important building and construction industry with our main marketing area being California.

The paper mill produces gypsum paper for drywall manufacture, dry felt for asphalt roofing manufacture, and chipboard and boxboard for a variety of consumer and commercial uses. The cost of Flintkote's finished gypsum and asphalt roofing products, so essential to the housing and construction industry, is affected by the operation of the paper mill.

Our five-boiler steam plant powering the paper mill consumes around four million cubic feet of natural gas per day and is equipped for alternative low sulfur fuel oil and/or diesel oil usage. We are facing a serious situation in the current California Public Utilities Commission Case 9642 which is the End-Use Priority System in connection with the allocation of natural gas. We will probably face a drastic curtailment, if not total loss, of natural gas due to our boiler classification. It appears we will be placed next to lowest in the five-scale priority listing. This will make it mandatory to use the more costly low sulfur fuel oil or diesel oil.

The low sulfur fuel oil we use today comes from foreign sources. The cost of this foreign oil is three times higher on a per therm basis than natural gas. Use of this oil will have a serious impact on the cost of our paperboard and, as a result, on the cost of our finished gypsum and asphalt roofing products. Our Accounting Department advises me it will raise our paper mill manufacturing costs by approximately \$23 per ton.

The Flintkote Company last year instructed all its plants in the United States and Canada to institute immediately an all-out internal energy conservation program. We are already deeply involved in this



endeavor at our Vernon plant. At this time, we feel certain that whatever conservation measures we take will not be enough to offset the energy price-supply situation with which we are confronted. It is urgent for the long-term future of our operation that we have access to local crude oil and natural gas to assure that we can continue to operate and remain competitive.

The total energy expenditure in 1973 including electrical power, natural gas and fuel oil for this facility was \$1,509,000. This jumped to \$2,222,000 in 1974 and we are anticipating a much greater dollar figure in 1975.

We consume over four million KWH electric power per month at this facility. The electric power plants operate mostly on low sulfur fuel oil from foreign sources. The cost impact of this foreign oil is being passed on to us in the form of fuel cost adjustments. For example, our last month's electric bill totaled \$126,241. Of this amount, \$57,598 represented fuel cost adjustments. A local source of crude oil and natural gas should help the Southern California Edison Company energy supply problem and, hopefully, with beneficial cost results for us and their various other customers.

We consume substantial tonnages of asphalt flux per year for asphalt roofing production. Since 1973, our asphalt flux costs have more than doubled. A good part of the crude from which this asphalt is derived comes from overseas. I am hopeful that the Southern California outer-continental shelf oil development will provide us with a local source of crude oil for asphalt production. This would assure our supply position for the future.

Our plant's dependence on foreign energy sources and foreign asphalt could force us sometime in the future to curtail or even suspend some of our operations.

Mr. Vincent E. McKelvey  
July 25, 1975  
Page 4

I am very hopeful that off-shore oil and natural gas can be realized promptly so that we can continue to operate at full production and give full employment.

Sincerely,

THE FLINTKOTE COMPANY  
PIONEER DIVISION

  
Wilson Harvey  
General Manager

WH:FK

# RED TRIANGLE OIL COMPANY

RNOLD F. HOHENSHELT  
President

JOEL G. HOHENSHELT  
Secretary

GLEN BLUE  
Treasurer

2809 SO. CHESTNUT

P.O. BOX 2625

FRESNO, CA. 93745

(209) 237-3835

July 16, 1975

U. S. Geological Survey  
MS 108  
National Center  
Reston, Virginia 22092

Gentlemen:

I am the owner of Red Triangle Oil Company, an independent unbranded oil jobber.

I am writing to you first as a concerned citizen.

Second, as a concerned oil jobber and businessman in California, my operation is located in Fresno, California and I serve a four county area in the San Joaquin Valley.

Third, I represent the National Oil Jobbers Council, an association of Oil Jobbers with a membership of 16,000, which members represent oil in 50 states. We handle 75% of the heating oil and 25% to 35% of the gasoline in the United States. In using Small Business Administration guidelines, 95% of our members are small businessmen. We serve homes, farms, business and many other petroleum users at the grass roots level. We are not "Big Oil" and I do not represent their interests. However, sometimes our interest run concurrent when it comes to national interest.

The National Oil Jobbers does, however, have some rather gut economic feelings about why oil should be produced off the coast of California.

I would like to quote a few facts that you may or may not be aware of.

In the San Joaquin Valley:

We have nine refineries.

Total Capacity	171,000 B. P. D.
Actual runs now	<u>137,500</u> B. P. D.
SHORT	33,500 B. P. D.



1. Our customers that feed the world depend on crude oil from the valleys domestic wells, which are failing at the rate of 5% to 8% nationally. When this crude runs out our costs for petroleum will go up and your tabel costs will rise.
2. Russia has exceeded the United States in oil production.
3. Canada is cutting exports to this country.
4. No port in the continental United States can receive a super tanker.
5. In the United States a record number of wells were drilled. 32,099 in 1974.
  1. 12,931 Oil
  2. 7,131 Gasoline
 Of these 12,037 were dry holes.
6. In the next 30 years, this country is committed to fossil fuel. One only needs to look at our problems today and one of those reasons is oil.
7. California has had a 300% increase in electrial rates due partially to the costs of oil.
8. Crude, including Alaska, estimated reserves are 34.25 billion barrells as of December 31, 1974, a drop of 3%.
9. Let's look at natural gas:
 

Estimated reserves 237.1 trillion cubic feet, a drop of 12.9 trillion cubic feet.
10. Other states are doing their share both on and off shore, is Califronia going to do it's share?

It is just plain old economics, if crude is to run this country for the next 30 years we must find more oil, and the cheepest place is from off the coast. Alaska will only replace approximately 5%. I think with industry and Government working together, we can celebrate our 400th birthday.

My fellow members are in a no growth industry. They are told by government how much to sell, to whom, and at what price. I am personally obligated to spend over \$400,000 for vapor recovery. In order to pay for the increase costs to me and our members, we must expand our operations to offset these costs. With California productions, we can pay our bills.

Very truly yours,



Joel G. Hohenshelt

# SIDNEY R. FRANK...GROUP

C E R T I F I E D   C O N S U L T I N G   M E T E O R O L O G I S T

1500 CECIL COOK PLACE • POST OFFICE BOX 580  
SANTA BARBARA AIRPORT • GOLETA, CALIF. 93017  
TELEPHONE 805-964-4477 • HOME 805-965-7540  
21 August 1975

Mr. F. J. Schambeck  
Oil & Gas Supervisor  
U.S.G.S. Pacific Area  
7744 Federal Building  
300 No. Los Angeles Street  
Los Angeles, CA 90012


Dear Mr. Schambeck,

Due to a mis-direction of the mail, we did not receive the invitation to join in the Santa Barbara County's Task Force critique of the Draft E.I.S. on oil and gas development in the Santa Barbara Channel until past the deadline for responding. Accordingly, we wish to add our comments to the E.I.S. from the point of view of meteorology and air quality - our field of expertise.

1 [ The fundamental problem with the E.I.S. as far as the meteorology/air quality is concerned is that the two are not considered together. The general meteorology and climatology are covered as far as descriptive characteristics are concerned. Similarly, areas where emissions will contribute to atmospheric pollutant loading are described in a qualitative manner. The missing link, then, consists of the failure to quantify the pollutant contributions and, with the appropriate meteorological parameters, to compute the air quality. It is only through this type of analysis that the impact on air quality can be considered as adequately addressed.

We would be pleased to discuss this with you in greater detail and offer suggestions as to specific actions that should be taken if you so desire.

Sincerely,



Sidney R. Frank

SRF:a

RESPONSE TO SIDNEY R. FRANK GROUP

1. The identification and quantification of potential air pollution emissions and their impacts from the possible levels of Channel development have been addressed in full detail in the greatly enlarged air quality and air impacts sections II.G.1. and III.LL.

The meteorology section II.C. has also been expanded and the complex interrelation between air pollution impacts and meteorology has been considered in greater depth in the FES.



# SPORT FISHING INSTITUTE

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C. R. SULLIVAN  
*Executive Secretary*

September 9, 1975

Mr. Vincent E. McKelvey  
Director, U.S. Geological Survey  
MS 108, National Center  
Reston, VA 22092

Dear Director McKelvey:

The Sport Fishing Institute is keenly interested in the environmental impact of oil and gas exploration, production, and transportation, particularly with respect to the shallow offshore coastal areas that are so significant to the production of coastal marine life. The purpose of this letter is to respond to the Santa Barbara Channel Environmental Statement dated June 6, 1975. Our response is limited to fisheries resources considerations which, of course, is the primary area of our organizational concern in these matters.

1 The fish and fishing data provided in the EIS show that the Santa Barbara Channel sport fishery has many times the economic value of the corresponding commercial fishery. Neither fishery appears to have been significantly damaged by the crude oil spill that occurred in 1969. The tendency of offshore oil-production platform structures to attract large numbers of fish has been well-documented and affords enhanced access to fish populations by sport fishermen. Generally speaking, the more platforms (functioning as high-profile artificial reefs) that are available, the greater the accessibility to fish populations by anglers and the more successful and productive the fishing effort. Santa Barbara Channel anglers harvest roughly 7 million fish and spend roughly \$10 million dollars per year in the process. The business thus generated represents a contribution to the California economy that far overshadows the economic contribution of the corresponding commercial fishery (\$983,682 annual average landed value -- equivalent, at most, to about \$3.5 million of retail value).

2 If new oil-production platforms are to make maximal contributions to sport fishing, however, they must be readily available to sport fishermen, and regulating authorities must adopt policies, consistent with safety, that will provide for maximum angler-use. The presence of

additional offshore oil production platforms will probably prove hazardous to commercial fishermen. However, such liability should be compensated several-fold by the over-riding advantages of the structures to sport fishing.

Page III-3 of the EIS states (emphasis added): "For a period of 20 to 40 years, oil and gas would be produced from wells in the Santa Barbara Channel. At the end of the operations period, production from the Santa Barbara Channel would phase out. As production from Santa Barbara fields begins to drop, the fields would be abandoned, wells would be plugged and cut off below the ocean floor, and platforms would be removed."

The latter statement is inimical to the projection of long-term benefits to the sport fisheries, and should be reconsidered. A 1974 Resolution adopted by the Sport Fishing Institute Board of Directors, addressing that very issue, urges a quite different course of action. We call this Resolution to the attention of Department of Interior and California State Authorities, herewith, and urge that it be given careful consideration, viz:

BENEFICIAL USE FOR  
NONACTIVE OFFSHORE OIL RIGS

WHEREAS, the construction of artificial reefs at suitable locations in coastal marine waters has proven to be an effective and desirable fish management practice, both by provision of new surface area for attachment and growth of larval marine organisms, with consequent increase in organic production, and by concentration of fish populations for greater accessibility by marine anglers and improved recreational fishing; and

WHEREAS, offshore drilling and production rigs erected in coastal marine waters for purposes of petroleum extraction from the Continental Shelf perform a function similar to that of artificial reefs, with the added feature of vertical extension through all temperature strata from surface to bottom that results in attracting pelagic fishes, as well as demersal species, thereby enhancing the quality aspect (e.g., "variety") of recreational fishing; and

WHEREAS, oil companies are now required by law, at considerable cost, to completely remove nonactive offshore oil rigs after production has terminated, with corresponding losses in marine productivity and recreational fishing opportunity, and an estimated 2,000 such rigs will outlive their usefulness for petroleum production in the Gulf of Mexico, alone, during the next quarter-century;



NOW, THEREFORE, BE IT RESOLVED, that the Board of Directors of the Sport Fishing Institute, assembled in regular Semi-annual Meeting, this thirteenth day of November, 1974, at Key Biscayne, Florida, do herewith propose and urge the Secretary of the Interior and the Secretary of Commerce, working cooperatively through their appropriate departmental constituent agencies in concert with other appropriate federal, state, and private entities, to develop applicable policy, procedures, and guidelines, and to effect necessary enabling modification of related statutes, for the purpose of converting nonactive oil rigs to use as permanent artificial reefs where desirable to assure their continued functioning for enhancement of marine productivity and recreational fishing by the general public.

Under the section on "Impact of Pipelines", we note this statement: "The on-shore and shallow marine portions of these pipelines would be buried or protectively covered with rock or concrete block (rip-rap)." In some situations where such circumstances exist, pipelines thus covered may offer some utility as low-profile artificial reefs, with at least limited if variable potential for attracting and concentrating fish. Related studies should be undertaken and, where such potential is actually realized, locations should be clearly marked by buoys to make them known and available for use by anglers.

3 We also urge that California State authorities incorporate requirements to provide for public recreational access when granting easements for pipeline and other rights-of-way where opportunities to do so become evident. With sufficient planning and coordination, public parking, boat-launching, and related access-site facilities can be made a part of pipeline installation projects, thereby more efficiently utilizing shoreline corridors withdrawn for project purposes.

We concur with the narration on Page III-200 of the EIS, which discusses the favorable result of OCA oil-and-gas production with respect to the Land and Water Conservation Fund administered by the Bureau of Outdoor Recreation. In its ten-year history, the LWC Fund has granted over \$2.2 billion in federal-aid to states for developing and preserving outdoor recreation resources. Sixty-two percent of this amount has come in the form of revenues from sales of OCS oil-and-gas leases. The State of California, alone, has received more than \$68 million, with federal agencies spending an additional \$170 million from the Fund in development of government-owned lands in California. Present authorization for the Land and Water Conservation Fund is \$300 million annually, with substantial increases thought likely to be legislated in the relatively

Mr. Vincent E. McKelvey

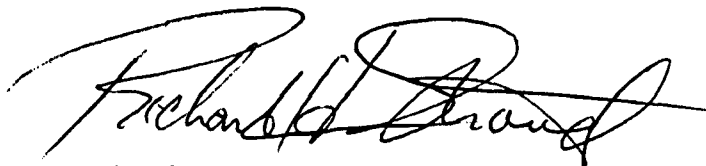
Page 4

September 9, 1975

near future by Congress. The only feasible source of additional moneys appears to be revenues derived from OCS oil-and-gas-lease sales, and from oil-and-gas production royalties.

The Sport Fishing Institute urges that any further oil development in the Santa Barbara Channel be made contingent upon the strict and faithful implementation of the safety standards that are outlined in the Draft EIS. Eternal vigilance will be required, and all operational entities involved must have corresponding firm operating policies to assure such vigilance and minimize pollution hazards. We assume that the purpose of the anticipated increase in tanker traffic in the Channel will be primarily to transport crude oil rather than the lighter fractions resulting from its refinement. Spilled crude has been shown to have relatively minor direct impact upon fin-fishes in marine waters. On the contrary, spilled gasoline or light diesel fuels can have disastrous biological consequences. If the premise noted above with respect to the tanker transport aspect is incorrect, we specifically reserve the right to, and do herewith, express opposition to that aspect until and unless modified accordingly.

Sincerely yours,



Richard H. Stroud  
Executive Vice President

RHS:mjw

CC to: Russell Peterson, CEQ  
Russell Train, EPA  
Charles Fullerton, California Dept. of Fish and Game

RESPONSE TO SPORT FISHING INSTITUTE

1. The information presented is appreciated.
2. The suggested use of non-active oil rigs as permanent artificial reefs where desirable is acknowledged. As stated in the resolution many Federal, State and private entities would necessarily contribute to such decisions.
3. The statements and suggestion are noted.



**Standard Oil Company of California**

225 Bush Street, San Francisco, CA 94104

August 29, 1975

Forrest M. Smith  
Coordinator  
Water Conservation

Director U.S. Geological Survey  
MS 108, National Center  
Reston, VA 22092

Dear Sir:

The U.S. Geological Survey is to be complimented on the preparation of a very objective and thorough draft environmental statement DES 75-35 which covers the oil and gas development in the Santa Barbara Channel Outer Continental Shelf. Standard Oil Company of California has reviewed the draft statement and would like to offer the attached comments. We trust that our comments will be useful to you in the preparation of the final statement.

Sincerely,

A handwritten signature in cursive script, appearing to read "F M Smith".

Attachment

COMMENTS ON THE USGS  
DRAFT ENVIRONMENTAL STATEMENT  
SANTA BARBARA OCS

Page I - 126

1 [ Section "e. Tankers" is somewhat confusing as written. We believe that the depth of water encountered in some areas of this development plus advances in ocean construction technology may make tankers the economic mode of transporting oil ashore. Consequently, this paragraph should be worded more generally so that certain facilities and modes of transport are not excluded.

Page II - 391

2 [ The first paragraph makes reference to "deep water" harbors in San Francisco, Los Angeles-Long Beach, San Diego and ports in Ventura and Santa Barbara counties. Normally, the term "deep water" is associated with terminals contemplated to handle VLCC's. Consequently its use here is inappropriate and it should be deleted or modified as necessary.

Page II - 396

3 [ The EIS would be strengthened if the section on Air Quality Data were expanded to compare air quality in Santa Barbara and Ventura Counties with the ambient air quality standards. In addition, it would be helpful to briefly discuss the state implementation plan as it applies to these counties and to state the outlook for meeting those air quality standards which are presently exceeded.

Page II - 407, Part C, Para. 1, Last Line

4 [ This statement about the unavailability of wastewater toxicity data (written in 1971) is no longer true. California's Water Quality Control Boards have been requiring routine bioassays on wastewaters discharged to the ocean.

Page III - 11

5 [ Referring to the sentence at the top of this page, is this the total number of employees required to explore the entire area? If so, it should be clarified to indicate that only a portion of the 1200 individuals would be working at a given time since exploration would be spread over many years.

Page III - 29, Part (a), Para. 1; Page III - 34, Part (g)

6 [ It should be strongly emphasized in both places that producing blowouts/ fires such as the ones described will not occur if surface-controlled subsurface safety valves operate correctly. Recent past performance of California's offshore producing operations has demonstrated this.

Page III - 35, Part (3)

7 [ Spill data from years subsequent to 1971 should be included by the

USGS in the final EIS. The two referrals to Section III.L. should apparently be to Section III.K.

Page III - 36, Line 3

8 [ The final EIS should explain the reasons why the Department of Interior denied the platform applications.

Page III - 60

Is there any support for the statement that "Blasting would rupture any nearby kelp pneumatocysts..."? If so, there should be a definition of "nearby". Otherwise, some readers may envision blasting destroying entire kelp forests.

Page III - 61

The discussion in the third paragraph regarding long-term effects on kelp should be deleted in view of the discussion in the last paragraph on Page III - 55 which indicates that kelp would repopulate after blasting and jetting.

Page III - 66, Para. 1

9 [ The first sentence is incorrect because USGS records show a 900-bbl. pipeline spill on December 16, 1969 (USGS, 1975, Accidents Connected with Federal Oil and Gas Operations on the OCS).

Page III - 75

10 [ The official USCG estimate of the amount of spilled oil into the Oakland Estuary in January 1973, is 171,000 gallons or 4,072 barrels. The DES is in error when it states 40,000 barrels.

Page III - 80

11 [ The first sentence in the fourth paragraph and the third sentence in the last paragraph refer to adverse effects of air pollutant emissions on vegetation. There is no evidence to indicate that such effects occur around onshore treatment and storage facilities. Further, the county pollution control districts would review any proposed new facilities to assure that such effects do not occur.

Page III - 81

In the third line from the bottom of this page, the word "would" should be changed to "could" since few plant fires would damage or kill vegetation and animals.

Page III - 83

12 [ The word "generally" should be inserted before the word "preferable" in the last line of the first paragraph since it will not always be preferable to expand existing terminals.

Page III - 91

13 [ The third paragraph states that cargo tanks on such ships would be equipped with remote reading tank gauges and high level alarms. While many new vessels are so outfitted, older vessels are not. Consequently, this paragraph should be modified.

Page III - 92

14 [ In the first line at the top of the page the words "A primary concern..." are a little strong. Suggest changing to "One concern...".

15 [ The last paragraph on this page discusses the fact that the capacity of a barge or tanker would probably be about 175,000 barrels. This is an incorrect generalization. Barges and tank ships may be both larger and smaller and a typical size has not been determined.

Page III - 93

16 [ We agree that it is unlikely that all of the compartments of a marine vessel would be destroyed. Therefore, we would suggest that the USGS use a figure here representing the maximum credible spill that could occur from a marine vessel that experienced an oil spill, which is 60,000 barrels.

17 [ The first full paragraph makes the statement that "the danger of oil spills at sea is presently increasing rapidly due to increasing ocean transport." We believe this statement should be deleted as it takes no account of use of traffic lanes, tighter regulations of many forms, better equipment, improved training of crews, etc.

8 [ Suggest deleting the phrase "and other vessels contribute almost half" from the last sentence of the second paragraph and replacing it with the phrase "amounts to about 1/4" since the contribution of other marine vessels is not relevant here.

9 [ The second paragraph discusses the probability of collision involving vessels leaving the OCS loading facilities. We believe the last three sentences of this paragraph should be deleted in favor of the following: "Consequently, review of present traffic patterns should be made and consideration given to establishing areas of further control to minimize the chance of collision. Generally, visibility will be adequate to permit safe navigation. During periods of low visibility the existence of modern radar and adequate bridge attention preclude the danger of collision."

Page III - 95

0 [ The first full paragraph discusses the safety of U.S. flag vessels versus those of foreign flag. Many foreign flag vessels are designed to U.S.C.G. and A.B.S. standards, or the equivalent, and consequently are as safe as U.S. flag tankers. Furthermore, many foreign flag vessels are newer and equipped with more modern equipment. Therefore, this paragraph should be deleted.

Page III - 101, Section K

21 [ In this section and elsewhere in the DES, it is emphasized (correctly, we believe) that it is virtually impossible to derive precise future spill predictions based on historical spills that occurred over an extended period of time. As stated, such predictions do not take into account improvements in technology, operating practices, and regulator measures. However, Section K then presents a great deal of historical spill data (some as much as 17 years old and some not applicable to OCS petroleum development) without reaching any conclusions. These data should be deleted from the final EIS if they are not used. Specific comments on Section K follow.

Page III - 102, Table III - 1

OCS spill statistics (USGS, 1975, Accidents Connected with Federal Oil and Gas Operations on the OCS) report 45 spills during 1964 through 1973, not 44 as shown. Figures in Table III - 1 should be checked.

Page III - 103 to III - 109, Part 2

22 [ We can determine no purpose for including this section and Table III - in the DES, and no purpose is apparent from the accompanying text. Furthermore, contrary to the last line on Page III - 103, Table III - 3 lists many worldwide tanker spills that are entirely unrelated to OCS development operations.

Page III - 121

23 [ If the information is available, it would be helpful to state the total annual seepage from all natural seeps in the Santa Barbara Channel. The amount of seep attributed to Coal Oil Point seems low. The range is more likely 100-300 BPD.

Page III - 128

The last sentence on this page should be revised to eliminate the reference to food web concentration in view of Dale Straughan's recent work around natural seeps and the NAS Report, Petroleum in the Marine Environment, which concludes "There is no evidence of food web concentration of petroleum hydrocarbons in marine organisms."

Page III - 129

24 [ Suggest revising the end of the first sentence in the last paragraph to read "...has a short-term adverse impact on air quality."

Page III - 130

Suggest adding to the end of the first paragraph the following sentence: "However, this is a temporary effect."



Page III - 132

[ Section 5 on this page fails to recognize that oil spill containment and cleanup will prevent most spills from reaching the shoreline.

Page III - 134 - 135

The discussion covers only the immediate effects of the Santa Barbara spill on marine organisms. It should be expanded to describe the work of Straughan and co-workers at USC.

Page III - 136

The last sentence on the bottom of the page would be improved by relating more recent experience as follows: "On the other hand improved treatment techniques have achieved more successful results. During the Oakland Estuary spill which occurred in January 1973, almost 50 percent of the birds survived that were picked up alive."

Page III - 138

The second paragraph on this page is unduly speculative and negative in view of the fact that there is no evidence to indicate that a single whale or dolphin has died as a result of an oil spill. In addition, there doesn't seem to be any basis for worrying about "subtle and long-term effects" on whales and dolphins in view of the NAS Report Petroleum in the Marine Environment which concludes "There is no evidence of food web concentration of petroleum hydrocarbons in marine organisms."

Page III - 142

Referring to the second sentence in the third paragraph, one wonders what sort of conclusive evidence or proof would be necessary to exclude the possibility that oil affects marine mammals. The fact that there is no evidence to indicate that any marine mammal has been killed as a direct result of an oil spill seems quite persuasive.

Page III - 154

In the last sentence of the third inset paragraph a statement is made that many of the dispersants are more toxic than oil. Another sentence should be added to indicate: "On the other hand, third generation dispersants have been developed that are very effective and have very low toxicity when properly applied."

Page III - 161

The sentence beginning in the seventh line on this page refers to concentration of hydrocarbons in the food chain based upon a 1968 report. This discussion should be deleted in view of the more recent findings of the NAS in the report Petroleum in the Marine Environment.

Page III - 167

26

Suggest adding after the third sentence in paragraph 9: "In addition the existence of more effective containment and cleanup equipment located in Santa Barbara would prevent oil from reaching the shoreline in most cases and would thereby reduce the impact of the spill."

Page III - 179

27

The fifth sentence in the first paragraph states that "The shortages of capital, equipment and skilled labor would probably be the most limiting factors in the search for oil". Based upon actual experience to date and present trends, it appears that the limiting factor will be government regulatory red tape, environmental impact statements, public hearings, public referenda and law suits.

Page III - 200

Suggest adding a sentence to the two sentences at the top of the page: "In any event oil spills have a temporary adverse effect on the environment."

Page III - 213

28

The section beginning on this page is the only place in the report which infers that additional production in the Santa Barbara Channel would cause new refineries to be built or existing refineries to be expanded. This inference should be deleted. Refinery capacity will be construed as needed to supply consumer demand for petroleum products; and this refinery capacity will be located near consumer market centers to the greatest extent possible. Additional California OCS production would simply replace foreign crude oil that would otherwise be processed in this refinery capacity. It would not cause new capacity to be built.

Page III - 219

In the fifth line of the second paragraph, suggest deleting the phrase "motor oil" since motor oil is not toxic and oil is already discussed separately.

Page III - 220

29

Suggest revising the first sentence in the last paragraph to read: "Ground-water contamination would not result from sewage disposal, waste water (brine) disposal and water source wells, because all three would be..."

Page III - 225

30

In the first line of the second paragraph, suggest deleting the word "many" and inserting the word "may" after "solids".

Page III - 228

Pelicans should be deleted from the fifth line of the second paragraph since they are normally not affected by a spill. Not one pelican was among the 3,690 birds of 37 species reported by Smail in California Birds Volume III #2, 1972. As described by Smail, the affected birds are those species which spend the night on the water and dive under water from the surface rather than from the air. (Golden Gate oil spill)

The last paragraph on this page should reference the conclusion of the NAS Report Petroleum in the Marine Environment that states: "There is no evidence of food web concentration of petroleum hydrocarbons in marine organisms."

Suggest new section on status of techniques for cleaning and caring for oil birds be included in this portion of the statement.

"Cleaning and Caring for Oiled Birds

Improved techniques for cleaning and caring for oiled birds have improved the survivor rate from about 5 percent in 1971 to 41 percent in 1973. The results of ongoing research in improved cleaning agents, cleaning methods and after care is expected to further mitigate damage to wildlife as a result of oil spills.

Reference: 1975 Conference on Prevention and Control of Oil Pollution, Rehabilitating Oiled Equatic Birds, David C. Smith, International Bird Rescue Research Center."

Page IV - 51

Suggest adding the following to the second paragraph: "Also review of present traffic patterns should be made and consideration given to establishing areas of further control to minimize the chance of collision. Generally, visibility will be adequate to permit safe navigation. During periods of low visibility the existence of modern radar and adequate bridge attention preclude the danger of collision."

Page V - 1

The choice of words in the first sentence of the second paragraph is very poor since it appears to state that oil would be continuously discharged from petroleum facilities.

A sentence should be added to the third paragraph stating: "Although all evidence clearly indicates that recovery occurs rapidly after crude oil spills."

Page V - 2

The first sentence in the section on Birds should be revised to read as follows: "...those that spend the night on the surface and dive under water, such as cormorants, murre, and grebes." Species such as terns, pelicans and shearwaters that dive from the air seem to be able to recognize and avoid oil slicks.

Section b. beginning at the bottom of this page should be revised to clearly recognize the fact that there is no evidence of marine mammal death resulting from an oil spill and to indicate that the adverse effects mentioned are speculative. Also, the speculation in the last paragraph of this section regarding "indirect effects" should at least recognize the conclusions of the NAS that there is no evidence of petroleum hydrocarbon accumulation in the food web and also Dale Straughan's recent studies around natural oil seeps. In addition, the statement regarding the ability of organisms to purge themselves should be expanded to indicate the numerous organisms which have been tested and shown to have this ability.

Page VII - 1

The statement in the second sentence in the second paragraph with regard to the conclusion that there would be irreversible and irretrievable losses in terms of water supply, air and fish, should be substantiated.

Page VII - 2

It is suggested that the last two sentences in the paragraph ending at the top of the page be changed as follows: "The significance of such low level oil pollution has recently been determined." Exposure of sublethal concentrations of oil has shown no effect on growth rate of marine organisms. This conclusion was reached by R. D. Anderson<sup>1</sup> and Cox<sup>2</sup> in their research on oysters and shrimp, respectively. Their conclusions agree with those obtained by Mackin and Hopkins,<sup>3</sup> who found no difference in the growth rate between oysters growing in an area subjected to oil contamination and that of control oysters in an uncontaminated area. Nor did Straughan, in her work supported by API, find that the natural oil seeps near Santa Barbara affected the growth rate of marine organisms living in the area.<sup>4</sup> More recently, these

- 
1. R. D. Anderson, "Effects of Petroleum Hydrocarbons on the Physiology of the American Oyster 'Crassostrea virginica Gmelin,'" Ph.D. Dissertation, Texas A & M University, 1973.
  2. B. A. Cox, "Response to the Marine Crustaceans Mysidopsia Almyra Bowman, Penaeus Aztecus Ives, and Penaeus Setiferus (Linn.) to Petroleum Hydrocarbons," Ph.D. Dissertation, Texas A & M University, 1974.
  3. J. G. Mackin and S. H. Hopkins, "Studies on Oysters in Relation to the Oil Industry," Publication of the Institute of Marine Science, University of Texas, 1962, 1, 1-319.
  4. D. Straughan, report in preparation for the American Petroleum Institute, September 1974.

results are confirmed by Battelle-Northwest studies at Lake Maracaibo, Venezuela. There they exposed lisa, a fish native to that area, for 11 weeks to Tia Juana Medium crude oil.<sup>5</sup> No effect on growth rate was observed. Since growth rate integrates many life processes and physiological factors, we are encouraged by those results. Part of our research program is directed toward studying more extensively the potential effects of exposure of marine life to sublethal concentrations.

- 
5. "Summary Report on Effects of Oil Discharges, Domestic and Industrial Wastewaters on the Fisheries of Lake Maracaibo, Venezuela," W. L. Templeton, Editor, Battelle-Northwest Laboratories, Richland, Washington, report to Creole Petroleum Corporation, Caracas, Venezuela, 1974.

RESPONSE TO STANDARD OIL COMPANY OF CALIFORNIA

The information and suggestions are appreciated. Many of the comments not bracketed have been incorporated if, and as, appropriate without acknowledgment here. Each was considered in the light of comments from governmental agencies and other entities as well as recent available literature.

1. The possibility of tankers being used to transport oil ashore is recognized in the event of offshore treating and storage facilities.
2. The word "deepwater" has been deleted.
3. The identification and quantification of potential air pollution emission and their impacts from the possible levels of Channel development have been addressed in full detail in the greatly enlarged air quality and air impacts sections II.G.1. and III.LL.
4. Sentence has been deleted.
5. This subject has been addressed in the greatly enlarged and expanded Socioeconomics Baseline and Impacts sections. (See sections II.F., Resources and section III.N., Socioeconomics Impacts)
6. Subsurface valve types, purpose and performance record is discussed in section IV.
7. The reader has been referred to section III.K. for more recent detailed spill data. The cross-reference III.L. has been changed to III.K.
8. The reason for denial is briefly stated in section I.B.

9. This exception has been noted.
10. Correction made.
11. This passage has been revised appropriately.
12. The word "generally" has been inserted for it is agreed that in certain instances expansion of existing terminals would not be preferable.
13. Paragraph revised as appropriate.
14. Paragraph revised as appropriate.
15. Paragraph revised as appropriate.
16. The paragraph was slightly modified to further reflect the unlikelihood of all tank compartments being ruptured in an accident. Loss of total cargo was noted as a possible but highly unlikely event.
17. The paragraph has been revised as required.
18. Paragraph revised as appropriate.
19. Paragraph revised as appropriate.
20. Paragraph deleted.
21. The historical spill data is presented for the reader as an indication of what has happened in the past. The text explains that this data is not likely to be a reliable indication of what will happen in the future for the various reasons stated.
22. This unrelated OCS oil and gas operations information is provided for purposes of establishing perspective.

23. See section III.L.1.a. for revised natural seep estimates.
24. The air quality impacts section has been greatly revised and expanded and this concern is addressed in appropriate detail therein.
25. This section is intended to describe impacts in the event oil does reach the beaches. The ability to contain and clean up spills is discussed in section IV.
26. A sentence similar to the one you suggest has been added, however, the ability to prevent a spill from reaching the beaches would be dependent upon the conditions extant at the time of release.
27. The comment is noted.
28. A sentence has been added to indicate that refinery capacity is developed to meet market demand not crude supply.
29. Text revised as appropriate.
30. Text revised as appropriate.
31. Text revised as appropriate.
32. A phrase has been added identifying produced waste water discharge as the source of the possible small intermittent or continuous oil discharges.



**TEXACO**  
INC.

1001 CONNECTICUT AVENUE, N.W.  
WASHINGTON, D. C. 20036

WILLIAM K. TELL, JR.  
VICE PRESIDENT

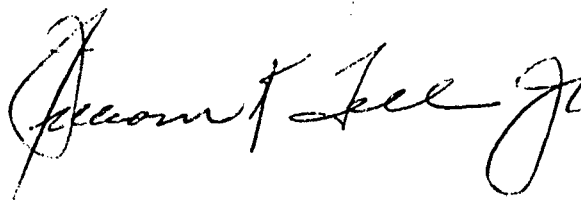
August 26, 1975

Director  
U. S. Geological Survey  
National Center, Mail Stop 108  
Reston, Virginia 22092

Gentlemen:

As provided for in the FEDERAL REGISTER of June 13, 1975, Vol. 40, No. 115, pages 25241-25242, attached are Texaco's comments on the "Draft Environmental Impact Statement, Oil and Gas Development in the Santa Barbara Channel, Offshore California."

Very truly yours,



WKTjr:arg  
Attachment

COMMENTS

ON

DRAFT ENVIRONMENTAL STATEMENT

SANTA BARBARA CHANNEL

BY

TEXACO INC.

AUGUST 26, 1975

Texaco Inc. has reviewed the Draft Environmental Statement prepared by the United States Geological Survey to examine potential impacts arising from oil and gas production on Federal OCS lands in the Santa Barbara Channel.

We find the Statement to be thorough and the U. S. Geological Survey staff should be commended for developing such a complete analysis.

We would like to take this opportunity to address specific comments to those few areas of the Draft Statement where we believe some clarification or correction should be made.

In the category of geology and seismic activity of the Santa Barbara region we believe that our studies are more than adequate for a proper background understanding to protect the environment wherever necessary. Since the U.S.G.S. has essentially the same data and access to other data not available to Texaco, we feel some contradictory statements should be corrected or further explained. For example, the EIS states that at present our understanding of the offshore is unrefined due to the fact that marine geologic studies necessary for interpreting the offshore are in their "infancy". This statement is somewhat contradicted by an earlier statement which concedes to the fact that the Santa Barbara Channel "... has been the site of some of the world's

most intensive marine geologic studies,...". In fact, many investigators are continuously engaged in studies of the structure, seismicity and tectonics of the Santa Barbara Channel region.

Among these are: California Institute of Technology; California State University, Northridge; Ohio University; Santa Barbara City College; U. S. Geological Survey; University of California, Santa Barbara; and University of Southern California, just to mention a few.

The inference in the Draft Environmental Statement seems to be that because the geology of the offshore, faulting in particular, is concealed by water, we know little about it. Actually, as Dr. Clarence Allen, seismologist with California Institute of Technology, testified (BLM hearings May 6, 1975, Los Angeles), we know more about many of the offshore faults than we know about their counterparts on land, due to the fact that marine acoustical profiling techniques offer better opportunities for geophysical portrayal of buried strata offshore. A great amount of acoustical profiling work has been done in the past in the Santa Barbara Channel and much of this information is public domain.

The contemporary seismic setting for the Santa Barbara Channel region is established on the basis of six cited earthquakes of local magnitude, six or greater, that have occurred "near" the

Channel. Three of these earthquakes (Point Arguello, 1927; Kern County, 1952; and San Fernando Valley, 1971) had epicenters over fifty miles away from the Santa Barbara Channel region. From these data, however, the EIS concludes that the Santa Barbara Channel region is seismically active.

In discussing destructive earthquakes, an extensive list of "significant felt" earthquakes in the Channel region is presented. A number of these earthquakes are based on unconfirmed reports. The observed intensities of several of the earthquakes are described as "probably felt". The earliest destructive earthquake which affected the Santa Barbara Channel region, according to the EIS, occurred in December of 1812. Although the intensity of the earthquake is unknown, based upon reported damage (of 1812 adobe construction), the EIS concludes that the effects resemble those accompanying other California quakes of magnitude seven. However, a recent detailed study of the historic record by Marine Advisors, Inc., concluded that some aspects of this quake are unsubstantiated and cannot be accepted on face value, and indeed much of the historic evidence is contradictory. Ironically, this is the earthquake that the EIS cites as a basis for design criteria of structures in the Channel. We note that the intensity of the 1812 earthquake was estimated at magnitude seven on page

7 [ II-85, Vol. 1, this same earthquake is referred to on page II-125  
ashaving an intensity up to 7.5, a significantly higher value on  
the logarithmic scale.

8 [ The Point Mugu earthquake of 1973 (6.0 magnitude,  
centered near Point Mugu) did no damage to platforms, wells, pipe-  
lines and onshore treating and storage facilities located in the  
Santa Barbara Channel region, according to the EIS. Following this  
statement, the EIS concludes that this is not surprising since the  
nearest OCS platforms are some thirty miles from the earthquake  
epicenter. Yet, in an earlier statement several earthquakes having  
epicenters 50 to 80 miles from the Channel are cited as "...useful  
in evaluating the earthquake hazards" in the Santa Barbara Channel  
region.

The EIS proposes that a magnitude 7.5 earthquake (based  
on the 1812 earthquake) should be adopted as the maximum "credible"  
earthquake for design purposes in the Santa Barbara Channel region.  
A peak horizontal acceleration of 1.0 g at bedrock, near the epi-  
center for a magnitude 7.5 earthquake is extrapolated from data  
9 [ from other earthquakes. The statement suggests that the 1.0 g  
extrapolated figure is a "best estimate" at the present time.  
Since the 1.0 g peak horizontal acceleration is calculated at bed-  
rock without regard to the dampening effect of soil and water, we

question the validity of this figure as it relates to actual platform design criteria.

Under normal good building practices, structures may exceed the design factor applied for horizontal acceleration. The EIS points out that platforms constructed using lower values for horizontal bedrock acceleration will at specific sites be strong enough to resist significant damage from earthquakes shaking. As an example, the EIS notes that computations made for Platform "C" indicate that it should withstand ground accelerations of as much as 2.0 g even though the factor used in the design for horizontal acceleration due to earthquake shaking was 0.15 g!

Design criteria for structures associated with oil field development and production take the possibility of earthquakes into consideration. Onshore California where seismicity is comparable to offshore areas, technology has proven that major earthquake-resistant structures can and have been built. Downtown Los Angeles is a testimonial to this ability. Offshore technology, too, has taken on the challenge. No platform has ever been destroyed by an earthquake in California or elsewhere. Each platform is specifically designed for particular conditions which exist at a specific site determined by intensive investigations conducted and analyzed by soils and design experts who are knowledgeable of the

local conditions.

Underwater pipelines are less vulnerable to earthquakes than would at first appear. Hundreds of pipelines crisscross fault zones in California and withstand earthquakes quite well. Should an accident occur, activating shut-off valves would allow only a small amount of liquid to escape in the event of a break.

14 The EIS in its extensive coverage of earthquake activity and seismicity leaves the reader with the impression that normal oil field operations represent a significant risk toward triggering earthquakes. Dr. Clarence Allen in his testimony of May 6, 1975, pointed out the fact that oil has been produced onshore in California from numerous fields for more than 70 years (including several fields near the San Andreas Fault), and in all this time there has not been a single instance where a significant earthquake has been related to oil field operations. Recent studies by California Institute of Technology and the University of Southern California in the Los Angeles Basin indicate no reason for special concern.

The sections of the Statement relating to drilling and production cover the various phases of these operations in detail and for the most part in an adequate and complete manner. With a careful review and proper editing, corrections can be made to the



statements that are not consistent with good offshore oil field practices and the OCS orders that are included as part of this Statement. A list by volume and page number of the inconsistencies has been prepared by experienced persons in the industry and these comments were made available to the U.S.G.S. from the Western Oil and Gas Association.

15 It is believed that the reference to sea floor wells and production systems is overemphasized. Although equipment and know-how is now available for wells and production systems in this environment and further development of the state of the art is in progress, it is not necessarily a practical approach to producing hydrocarbons offshore except possibly from an aesthetic point of view. Repair and maintenance of subsea systems will require the use of surface vessels such as drill ships and workboats that may be required for extended periods of time. Obviously the greater the number of subsea wells existing, the greater will be the need for surface-servicing equipment to keep the systems operational. Subsea systems also limit the types of artificial lift equipment that can be employed, thus possibly limiting the amount of oil that can ultimately be recovered from a reservoir. For wells and production systems on the sea floor, a number of flow and control lines are required. The possibility of small leaks in subsea lines exists

and the more lines laid on the ocean floor the greater the potential exposure to leaks from such piping.

In summary, we would like to reiterate that there is an urgent need for additional sources of hydrocarbons for the Nation. Californians depend, as does the rest of the Nation, on petroleum products to meet their ever-increasing need for energy. Today hydrocarbons fill 75% of our Nation's energy requirements, but, unlike the rest of the United States, California relies on oil and natural gas to provide nearly 90% of the State's basic energy needs. California today is the third largest oil-producing State, yet it must import nearly a million barrels per day in order to meet the State's own energy needs.

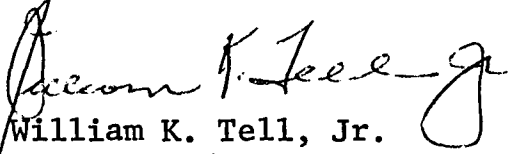
In 1974, California's domestic crude oil production dipped to 307 million barrels, down ten million from 1973. California's production has declined every year since 1968, when the State's all-time record production was 373 million barrels. Adequate alternate sources of energy for California will not be a reality within the next 10 to 15 years. California has no oil shale or significant deposits of coal.

Clearly, if we are to achieve energy independence from foreign oil for California as well as for the rest of the Nation, potential reserves of the highly promising Santa Barbara Channel

must be developed as soon as possible. We believe that those potential hazards or risks attendant to offshore oil production are well within acceptable limits, and, after carefully weighing environmental impacts of such development, we conclude the potential environmental hazards and risks are minimal and, consequently, are not valid justifications for curtailing development of the Santa Barbara Channel reserves.

Respectfully submitted,

TEXACO INC.

  
William K. Tell, Jr.  
Vice President

August 26, 1975

## RESPONSE TO TEXACO

### General evaluation:

The Texaco critique does not concur with the recommended maximum expectable earthquake and associated expectable ground motions. It does not, however, offer data or discussion in support of specific alternatives. The ground motions recommended in DES 75-35 were developed after careful study of seismological records, historic records, and geologic evidence, and with consideration for the regional tectonic setting. The rationale for selecting those ground motions is described in DES 75-35 and in referenced sources. None of the critiques has proffered significant seismologic, historic, or geologic data to support their contention that lower values for those expectable ground motions would be more appropriate. Therefore, no substantive revisions are contemplated.

The Texaco critique mistakes design criteria for design specifications. There has been no attempt by the Geological Survey to dictate engineering design specifications. The design criteria listed in DES 75-35 relate entirely to the required performance of the structures under postulated conditions of ground motion so as to provide for public safety and minimum adverse environmental impact. The resistance of structures to damage by such ground motions is an achievement and responsibility of structural engineering design.

### Responses to specific comments:

1. p. 1, para 4, first part -- DES 75-35 has not, of course, represented studies made by Texaco, or any other company, to be less than "adequate". However, no regional studies of seismicity or contemporary deformation

in the Channel region have been published by Texaco; nor have any unpublished studies by Texaco been made available for use by the USGS in the preparation of the geology and seismology sections of DES 75-35. It is incorrect to state that the USGS and Texaco have "essentially the same data". The most obvious error stems from the fact that Texaco must have detailed information on fields in California State Tidelands in which it is an operator, fields for which the USGS would have no information other than from published records and reports.

2. p. 1, para 4, last part, and continuation on p. 2 -- The so-called "contradiction" is much more explicitly drawn in the DES (p. II-11), precisely to emphasize the irony that even though the Channel has been the subject of much study, it remains much less known than adjacent land areas. This is a function of both the complexity of the geology and the expense of gathering marine geophysical and geological data. The significance of this "contradiction" appears to be clear to other competent reviewers, and no revision is contemplated.
3. p. 2, para 1 -- Many published studies of investigators from the listed institutions have provided data used and cited in DES 75-35. The importance of ongoing research programs (without regard to identification as to whether by the USGS or by some other research group whose aim is publication of results) and expectations of results are noted on p. II-12, and colleges, universities, research organizations are noted on p. II-332 to II-336.
4. p. 2, para 2 -- Allen's comment is more appropo of the lack of good information on onshore faults than an indication that offshore faults are well located and thoroughly understood. Offshore faults are

recognized in acoustic profiles only when; 1) Dissimilar strata are juxtaposed, 2) dissimilar dips in similar strata are sharply juxtaposed, or 3) flat, or gently dipping strata have been displaced vertically. Lateral slip and lateral components of oblique slip cannot be discriminated. Faults having "acoustic basement" on both sides and no offset of strata or deposits overlying the "basement" cannot be recognized from acoustic records. Moreover, with profiles generally one mile apart or more, it is virtually impossible to discriminate between short, en-echelon structures and continuous structures.

5. The cited data support the conclusion that a magnitude 6.0 earthquake may reasonably be expected in the time span anticipated (see p. II-80, 81, 125). The conclusion in DES 75-35 that the Channel region is seismically active is clearly based on the total historic and seismic record, not simply the 6 earthquakes discussed individually in the text (See especially p. II-84, paragraph 2, and the first two paragraphs on p. II-81.)
  
6. p. 3, para 2, and p. 4, last para -- The "design criteria" (p. I-66, 67)

include no mention of specific earthquake magnitudes or ground motion parameters, much less the 1812 earthquake. Secondly, the basis for the estimate of a magnitude 7.5 earthquake is clearly detailed on p. II-124, 125), leading to the conclusion as stated on p. II-124: "These considerations suggest that a magnitude 7.5 earthquake should be adopted as the maximum credible earthquake...." The conclusion is clearly based on the entire seismic history and tectonic setting, and the 1812 earthquake merely provides one possible example of past occurrence.

7. p. 4, ll. 1-3 -- While the difference between 7 and 7.5 can, indeed, be significant on a logarithmic scale, there hardly seems any room for misinterpretation of the DES statements cited. On p. II-85, "--The reported damage and other effects resemble those accompanying other California earthquakes of magnitude 7.--" is clearly a general range, not a precise estimate, and is certainly consistent with the earlier statement. Moreover, the difference between 7 and 7.5 is clearly not "significant" in the context of the precision with which magnitude can be estimated, sometimes even within a modern seismic net, and estimates of magnitude made from intensities deduced from historic records are necessarily cruder still. In addition, even though much of the older historic evidence is contradictory and unreliable, it would certainly not be prudent to ignore it in any attempt to assess the potential for hazard.
8. p. 4, para 2 -- The significance of citing these statements in sequence here is elusive. They are certainly not inconsistent with each other. Surely, the knowledge that significant earthquakes centered 30 to 80 miles from OCS platforms have had little or no damaging effect that far from the epicenter yields some information that aids in "...evaluating the earthquake hazards...", just as the existence of those earthquakes in the

regional tectonic framework of the Channel aids in describing expectable earthquake parameters.

9. p. 5, lines 1, 2 -- The "design criteria" (p. II-66, 67) relate to the performance of the structure when subjected to earthquake stresses. The recommended ground motions are explicitly defined as representing bedrock sites (p. II-128, 129). Neither of these are "specifications" for engineering design of any structure. Such specifications must be developed within the framework of the local conditions at each potential site.
10. p. 5, para 2 -- This comment appears, for the most part, to paraphrase the DES as to this matter.

It is, however, interesting that "normal good building practices" include so many safety factors, and other (non-earthquake) design considerations that affect earthquake resistance, that the horizontal accelerations a structure can withstand may exceed, by more than a factor of 10x, the accelerations it was nominally designed to resist.

11. p. 5, last para, lines 1-3 -- The proper subject is the degree of consideration, not "consider or not-consider".
12. p. 5, para 2 -- Downtown Los Angeles is a poor "testamomial". Most high structures there have not been tested by strong (near-epicenter) ground motions during their lifetime. A better example would be the southern San Joaquin Valley in 1952 -- especially water towers and some oilfield production facilities (see: Johnston, 1955; Steinbrugge and Moran, 1955) -- or the San Fernando Valley area in 1971 (USGS Prof. Paper 733).



13. p. 5, last sentence. -- This is certainly the expected procedure. Nor is it questioned by DES 75-35.
  
14. p. 6, paragraph 2 -- Experiments at the Rangely Field, Colorado (Raleigh and others, 1972) have documented circumstances where earthquakes have been triggered as a result of fluid injection; and recent investigations (Yerkes and Castle, 1975) have concluded that certain small earthquakes in the Goose Creek, Texas field (1925), Wilmington, California (1947, 1949, 1951, 1955, and 1961), and Hester-Convent, Louisiana (1943) oilfields may be attributable to fluid extraction. The acknowledging of such isolated cases is not necessarily an indication of a significant risk but rather an indication of the need to recognize the possibilities and take certain precautions (i.e., closely control subsurface injection programs and monitor for possible oil field operation-related seismic activity and subsidence). The lack of specific document citation by the reference to "Recent studies by Caltech and USC", makes review of that data and results impossible.
  
15. Your opinion on subsea production systems is appreciated. See the updated and expanded discussion of the status of subsea production systems (section I.D.6.)

Union Oil and Gas Division: Western Region

Union Oil Company of California  
Southern California District  
2427 Harbor Boulevard, Ventura, California 93003  
Telephone (805) 642-0376



August 21, 1975

Director  
U. S. Geological Survey  
Mail Stop 108  
National Center  
Reston, Virginia 22092

Dear Sir:

The attached comments are presented to update the "Draft Environmental Impact Statement for Potential Oil and Gas Development, Santa Barbara Channel Outer Continental Shelf off California."

Sincerely,

A handwritten signature in cursive script, appearing to read "D. E. Craggs".

D. E. Craggs  
District Operations Manager

DEC:vbm  
Attach.

cc w/attach.: W. A. Radlinski, Reston, VA  
Hillery Oden, Menlo Park, CA  
F. J. Schambeck, Los Angeles, CA  
M. F. Reitz, Santa Barbara, CA

COMMENTS ON VOLUME 1 OF 3  
"OIL AND GAS DEVELOPMENT IN SANTA BARBARA  
CHANNEL OUTER CONTINENTAL SHELF OFF CALIFORNIA",  
JUNE 6, 1975

COMMENTS

In reference to Volume I, Paragraph I-D-6-d-(5) "Other Submerged Production Systems," Page I-109 of subject report, Union Oil Company of California, as operator of OCS P-0241 for co-lessees Gulf, Mobil and Texaco, has in conjunction with several equipment manufacturers developed an artificial lift pumping system for subsea wells.

The system was installed in June 1972 on P-0241, Platform "A", and has operated trouble free since that time. The pump was removed for inspection one time after seven months of operation to test the recovery procedure and to inspect the pump. The procedure worked fine and the pump was not worn. The pump was returned to the well and is still operating. The tubing strings were pulled for inspection and rerun in May 1973. They were found to be in excellent condition.

THE SYSTEM

The artificial lift pumping system that has been developed for this particular application--shallow subsea wells, in diver depth water, near a platform--is an adaptation of proven hydraulic oil well pumping equipment into a new configuration fitting this specific need. The first consideration for such a system is that the well can be drilled, operated, serviced, and eventually abandoned without escape of hydrocarbons to the

ocean. Other important design criteria are the need for good formation sand control so the well will not require repairs and for a pump that can be easily changed when need be.

The sand control is obtained by packing gravel between the formation and the slotted liner. This method has been very effective in preventing the movement of unconsolidated sands in California and in this particular oil field.

The pumping system utilizes a Kobe free pump (downhole pump) driven by water pressure. The "free pump" operates in the bottom hole cavity located on the lower extremity of the 2-1/2" tubing string. It can be pumped to the wellhead, when in need of repair, by reversing direction of power water circulation. A diver working from a small boat can replace the old pump with a new one in one dive of less than 30 minutes.

One of the most unique features is the wellhead, designed and built by Deep Oil Technology, a subsidiary of The Fluor Corporation, in which three concentric strings of tubing are nested and separated by seals. The bottom hole assembly, adapted for this use by Kobe, Inc., and Baker Oil Tool Company, accepts the "free-pump" and also seals between the tubing strings. Power water, in a closed system, is pumped through a line from the platform down the well through the 2-7/8" tubing string, where it drives the bottom hole pump and is then exhausted to the platform via the annulus of 2-7/8" and 4-1/2" tubing strings. Production is pumped through the annulus formed by the 4-1/2" to 6-5/8" tubing strings. The annulus

between the outside tubing string (6-5/8") and the 10-3/4" casing conducts formation gas to the wellhead.

Subsea lines - A bundle of four two-inch pipelines and a control cable run between the well and the platform. The pipelines conduct (1) power water to the well, (2) power water from the well, (3) oil from well, and (4) gas from well. The electric cable monitors pressures and valve positions, and transmits electronic signals to solenoid valves in the production control unit, mounted on the wellhead, to operate valves and other safety devices.

All safety valves consist of hydraulically operated valves that can be actuated either from the control console on the platform or operate automatically in the event of abnormal pressure on any of the lines. Two fail-safe downhole safety valves are employed: one below the pump intake and one through the packer that seals between the 6-5/8" tubing and 10-3/4" casing. Each wellhead outlet is equipped with a manually operated valve and hydraulically operated fail-safe valve.

Remote control of all equipment is accomplished by use of the production control unit mounted at the wellhead and the monitoring and control console mounted on the platform. Electrical impulses from the control console operates solenoid valves at the wellhead unit to direct power water, acting as hydraulic fluid, to operate the wellhead and downhole valves. The control console on the platform monitors all pressures and well conditions continually.

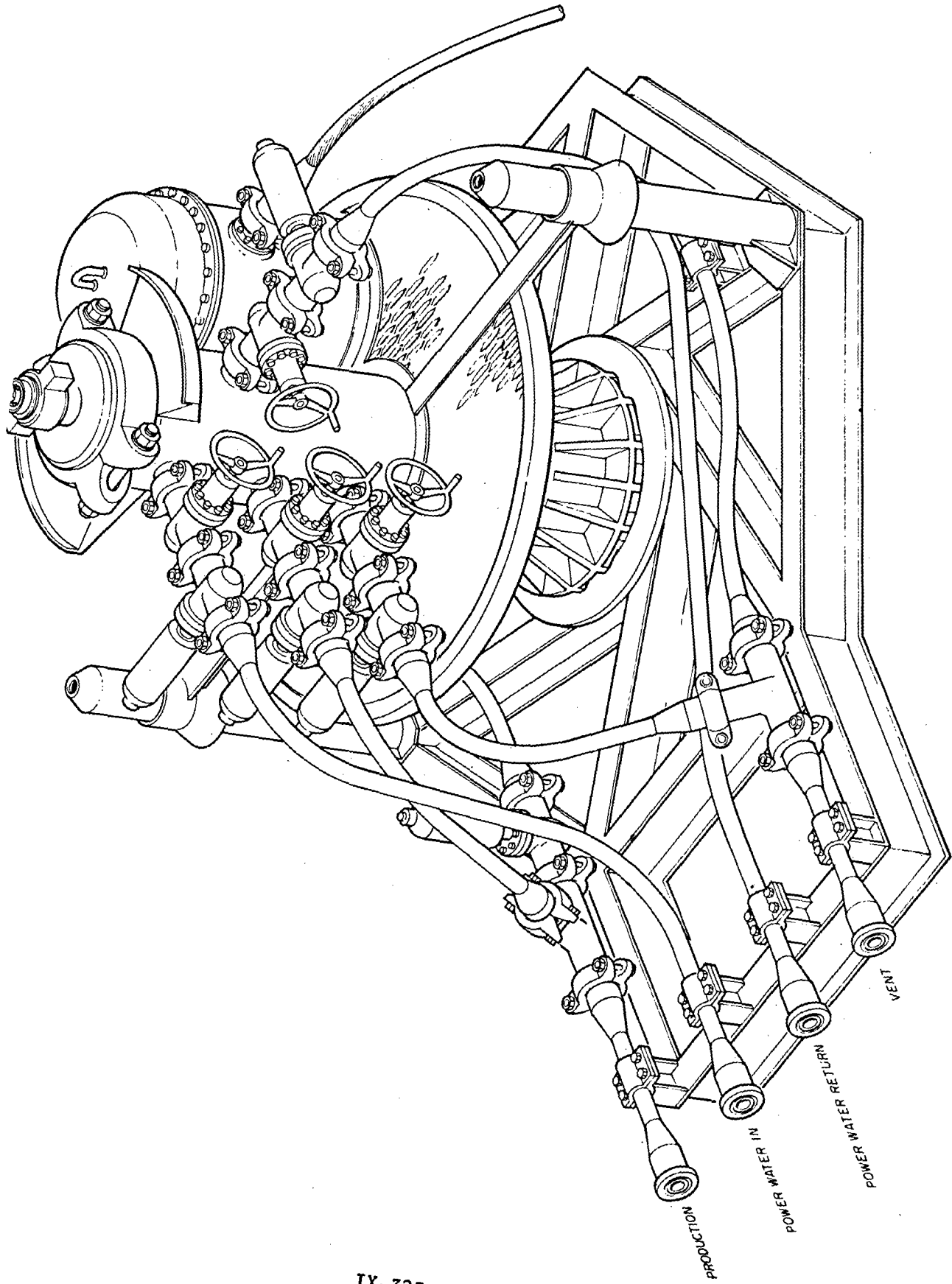
THE TEST INSTALLATION

In June 1972, with U.S.G.S. approval, the subsea producing system was installed in Well #A-24, Platform "A", OCS P-0241. The only difference between this and the subsea installation is that the wellhead is located on the platform instead of the ocean floor. All downhole and wellhead valves and controls have been operated remotely since that time.

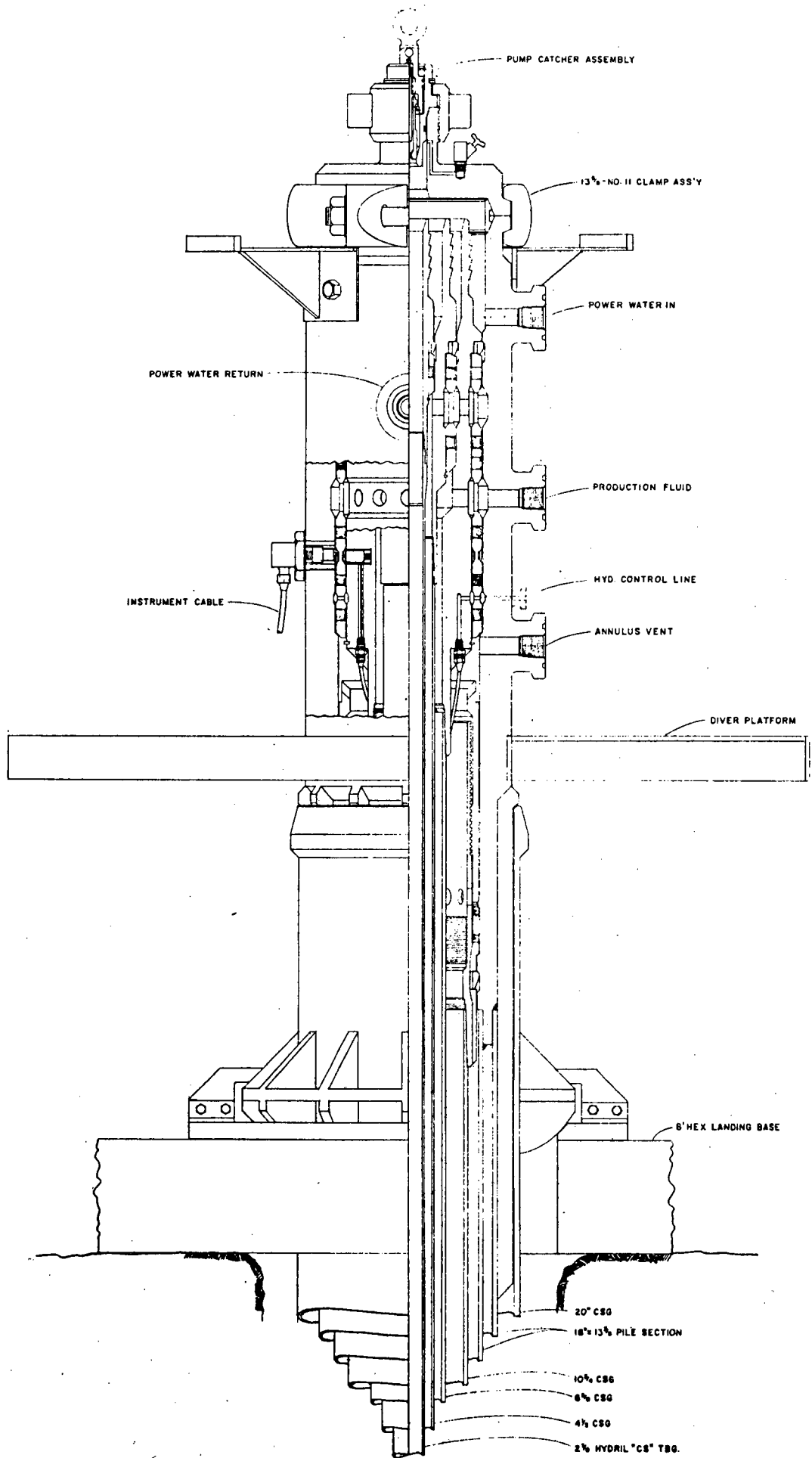
SUMMARY

This is a subsea producing system designed to do a particular job in a specific area. Continuous operation during the past three years indicates that the system is correctly designed to function safely and efficiently.

DEC:vbm  
8-12-75



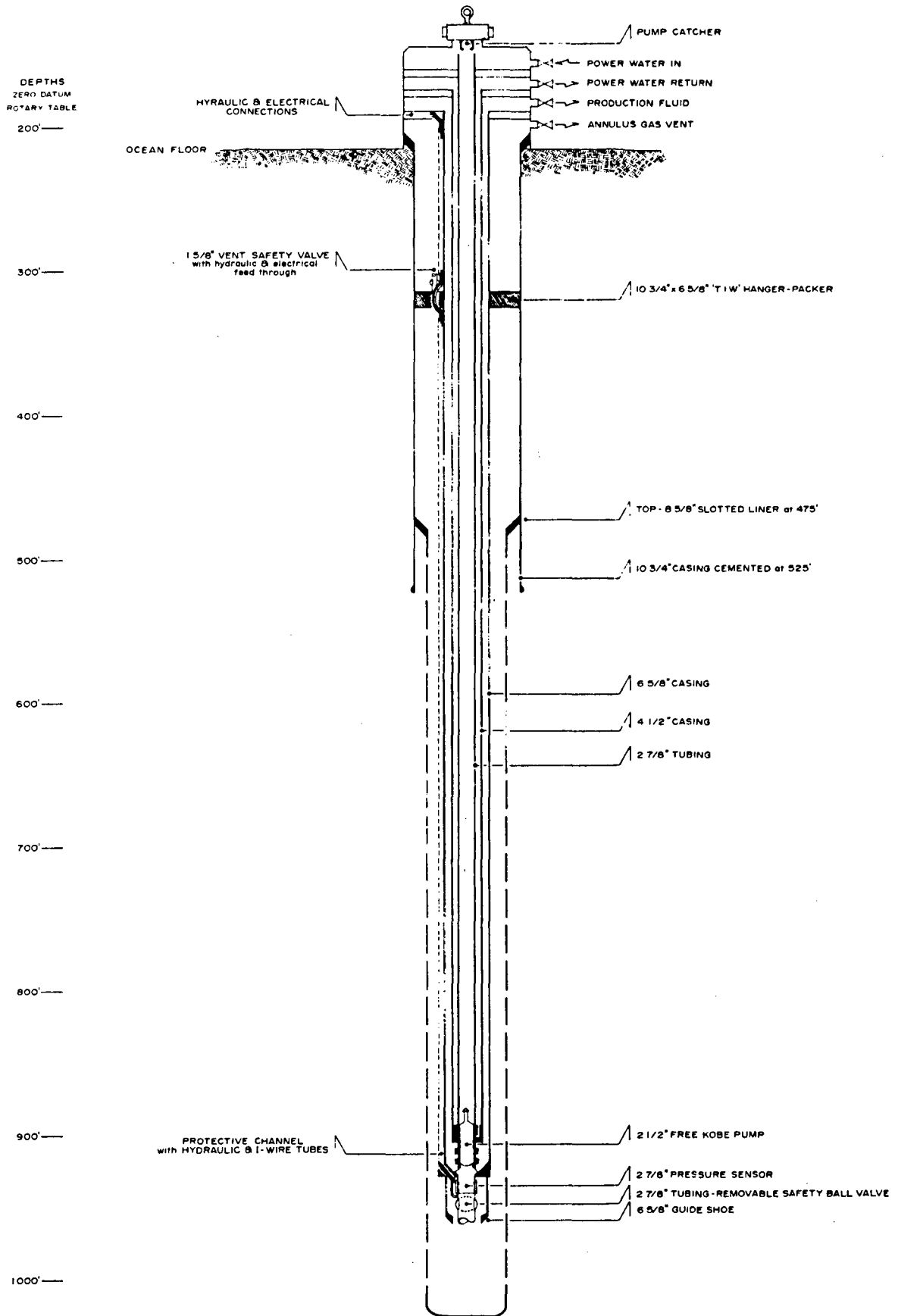
IX-323



Seafloor Hydraulic Production Assembly



# CONFIGURATION DURING PRODUCTION



RESPONSE TO UNION OIL COMPANY OF CALIFORNIA

Your detailed up-to-date information on the artificial lift pumping system for subsea wells is appreciated and most informative.

# VALLEY **N**ITROGEN **P**RODUCERS, INC.

August 27, 1975

Director  
U. S. Geological Survey  
Mail Stop 108  
National Center  
Reston, VA 22092

STATEMENT FROM VALLEY NITROGEN PRODUCERS, INC.  
FOR THE HEARING BY THE DEPARTMENT OF THE INTERIOR  
ON OUTER CONTINENTAL SHELF OIL AND GAS LEASING  
AND DEVELOPMENT IN THE SANTA BARBARA CHANNEL

Valley Nitrogen, with main offices in Fresno, California, is an agricultural cooperative formed to manufacture fertilizers for California farmers. We have 4,700 members. However, 53 of these members are other agricultural cooperatives which in turn represent several thousand additional participating growers, which means we are owned either directly or indirectly by some 10,000 to 12,000 California farmers.

Because we do represent such a broad segment of the agricultural industry, we supply approximately 30-35% of all nitrogen fertilizer consumed in California and approximately 40% of all nitrogen fertilizer applied in Arizona. Last year our total production represented some 800,000 tons. We must manufacture these products. Even if we could purchase sufficient quantities abroad, costs to California farmers would be staggering. Until recently, world prices for these chemicals have averaged 50% to 100% above our prices in California, and any number of uncontrollable factors can impose a recurrence of such a condition. Our reliance on the rest of the world for this essential commodity would be as risky as relying on it for oil and gas.

IX-327  
Plant Locations: Helm, El Centro, Bena and Imperial, California — Chandler, Arizona

1221 VAN NESS AVENUE • P. O. BOX 1752 • FRESNO, CALIFORNIA 93717 • Phone: Fresno (209) 486-0100



This year, Valley Nitrogen will produce some 900,000 tons of all types of fertilizer, which includes phosphates and potash. However, the backbone of the fertilizer requirements in the West is nitrogen.

The one vital point that most of our modern society does not recognize is the absolute dependency of agriculture upon natural gas. Agriculture has obvious and enormous needs of petroleum for fuel and lubricants; however, the most important point is this: there is only one practical feedstock for nitrogen fertilizers. Natural gas is virtually the only feedstock for manufacturing anhydrous ammonia in the United States and anhydrous ammonia is the basic building block from which derivative nitrogen fertilizers are made.

Anhydrous ammonia itself is used in tremendous quantities directly as a fertilizer. It is also converted into nitric acid which is then combined with ammonia to form ammonium nitrate. It is converted into a highly useful 46% prilled urea. Ammonia is also reacted with sulfuric acid to make ammonium sulfate and with phosphoric acid to make ammonium phosphates.

We can state, then, that the nitrogen fertilizer industry in California or the United States is dependent entirely upon the availability of natural gas. Incidentally, the phosphate or potash fertilizers by themselves are relatively useless when applied to the soil unless there is a reasonable balance of nitrogen applied so the plant can fully utilize the total plant nutrients.

It has been estimated that one ton of fertilizer can yield five to ten times its weight in additional food crop yields. To illustrate this point, let's say that one ton of 46% nitrogen urea is applied at the rate of 200 pounds per

acre. This means the one ton of fertilizer would cover 10 acres of grain. Without fertilizer those 10 acres would produce perhaps one ton per acre or a total of 10 tons; however, with application of the one ton of fertilizer on the 10 acres, the production would be increased to two tons per acre, making a gain of 10 tons of grain for the one ton of fertilizer applied.

What does this mean? It means that the 900,000 tons of fertilizer that Valley Nitrogen is presently producing represent an increased production of many millions of tons of agricultural crops. From a humanitarian standpoint it is apparent that a tremendous number of people in California and the United States would inevitably be severely undernourished without an adequate supply of natural gas to support our agricultural industry.

Briefly stated, millions of tons of extra food are produced each year in California alone because of nitrogen fertilizer. Virtually every bit of that nitrogen fertilizer is manufactured from natural gas. Without natural gas this tremendous flow of agricultural products each year would be irretrievably lost; the cost to the nation would be incalculable.

We are presently faced with impending curtailment at our ammonia manufacturing plants because of inadequate supplies of natural gas. The importation of liquified natural gas from overseas may make a contribution to the heating of homes, but is completely out of the question for supplying the huge quantities needed in the manufacture of fertilizer. The most authoritative estimates are that nationwide ammonia losses due to natural gas curtailments will amount to several hundred thousand tons during this coming winter season. If the curtailments continue for

August 27, 1975

long or get worse, the resulting losses to agriculture will be reflected not only in a loss of food production, and skyrocketing food costs, but also in jobs lost and in jobs not created in agriculture and related industries.

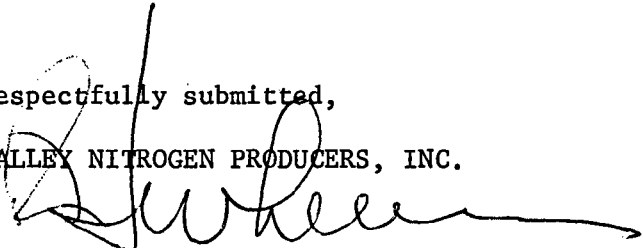
It is clear that the only logical alternative to depressed farm production and employment is the immediate development of oil and gas fields both onshore and offshore. We are totally unimpressed by fears of disaster from OCS activity. Technology developed and demonstrated to date clearly indicates any mishaps would be adequately contained. It is apparent that if the petroleum industry is sufficiently intelligent to discover and recover petroleum and gas from under the seas, it is surely capable of performing this task in a safe and satisfactory manner.

Not only must we consider the potential environmental impacts that could result from further development in the Santa Barbara Channel, we must also consider the inevitable negative human impacts that will result if additional sources are not developed.

Valley Nitrogen therefore urges the Department of Interior to proceed immediately with the expansion and development of oil and gas leases in the Santa Barbara Channel area of the Outer Continental Shelf.

Respectfully submitted,

VALLEY NITROGEN PRODUCERS, INC.



R. Henry Wheless  
Vice President-Economic Development

RHW:ss

**WESTERN OIL AND GAS ASSOCIATION**

609 SOUTH GRAND AVENUE • LOS ANGELES, CALIFORNIA 90017

(213) 624-6386

August 27, 1975

Mr. V. E. McKelvey  
Director  
U.S. Geological Survey  
National Center (MS 108)  
Reston, Virginia 22092

Submission of Written Comment  
DES 75-35 -- Oil and Gas  
Development in the  
Santa Barbara Channel

Dear Mr. McKelvey:

This Association presented three hours of oral testimony at the Public Hearing on DES 75-35. As indicated in that testimony, we are now filing our written "critique" covering specific portions of the Draft Environmental Statement.

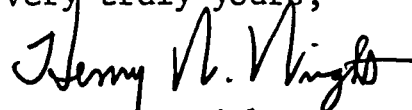
Enclosed for your consideration are comments on eight major topics found within DES 75-35. They are: Geotechnical; Biology; Socio-economics; Oil Spill Potential; Drilling and Production; Marine Operations; Pipelines and Economics. Comments on the first four topics were developed for the Association by the consulting firm of Dames and Moore and are bound together. Comments on the last four topics were developed by personnel from our member companies and are also bound together.

We believe DES 75-35 is a good report. Our comments are submitted in the hopes that the final environmental statement can be regarded as outstanding in its completeness and accuracy.

Within the next few days multiple copies of the enclosed material will also be sent to Mr. Fred J. Schambeck, your Area Oil and Gas Supervisor in Los Angeles, for his review and that of his staff.

Thank you for considering our views.

Very truly yours,



Henry W. Wright, Manager  
Land & Water Department

HWW:mgp  
Enclosures (2)

cc: Mr. Fred J. Schambeck  
(w/o enclosure)

IX-331

**WESTERN OIL AND GAS ASSOCIATION**

609 SOUTH GRAND AVENUE • LOS ANGELES, CALIFORNIA 90017

(213) 624-6386

CRITIQUE

OF

U. S. GEOLOGICAL SURVEY

DRAFT ENVIRONMENTAL STATEMENT

FOR

SANTA BARBARA CHANNEL OCS

OIL AND GAS DEVELOPMENT

- Drilling and Production
- Marine Operations
- Pipelines
- Economics



INDUSTRY'S COMMENTS ON THE  
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<u>Volume</u>	<u>Page</u>	<u>Comments</u>
1	I-3	<p>1 The first sentence states "Treating facilities would require additional platform space, but storage would probably be under water". It is recognized that the platform cannot handle the oil weight for storing tanker quantities of crude on the platform surface as indicated by recent publicity of under water storage in the North Sea. However, industry has not considered under water storage a reasonable solution to the problem in the Santa Barbara Channel; therefore, we suggest a wording revision as follows:</p> <p style="padding-left: 40px;">Treating facilities would require additional platform space; oil storage would be in a nearby permanently moored vessel.</p>
1	I-6	<p>2 The third sentence in the third paragraph states "A few wells on platforms A and B are also produced by this system", referring to gas-lift operations. This is in error. There are no gas-lift wells on platforms A or B. We suggest omitting the subject sentence.</p>
1	I-21	<p>3 The last sentence in the second paragraph states "The use of side scan sonar from submersible vehicles has been extremely successful"..... Since side scan sonar surveys can also be conducted successfully from surface vessels, we suggest a wording revision as follows:</p> <p style="padding-left: 40px;">However, the use of side scan sonar from surface vessels as well as submersible vehicles have both been successful in mapping sea floor geomorphology.</p>
1	I-43	<p>4 In the second sentence of the second paragraph, the correct terminology would be barite, not bentonite.</p>
1	I-44	<p>5 The third paragraph infers for small kicks the influx may simply be circulated out without closing the BOP's. This is not true. We suggest the paragraph be revised as follows:</p> <p style="padding-left: 40px;">If formation fluid enters the well bore and a surface indication of some influx of formation fluid is observed, such an occurrence is called a kick. All kicks will use precautionary well control measures of circulating out through the choke with the BOP's closed.</p>
1	I-56	<p>6 The fourth sentence in the first paragraph states "The bottom is dragged to be sure that no obstructions were overlooked". Dragging the bottom after abandonment of a well is unnecessary and not very effective. It may apply in deeper water where diver inspection is impractical or hazardous. We suggest omitting the last part of the sentence by adding a period after the word "removed".</p>

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<u>Volume</u>	<u>Page</u>	<u>Comments</u>
1	I-59	7 [ In the second sentence of the first paragraph, we suggest inserting the word "commercial" before hydrocarbon reserve.
1	I-61	8 [ Figure 1-10 shows a drawing of the platform for the Santa Ynez unit. This is the original and not the design being used. This should be changed to the latest jacket type platform which was approved by the U.S.G.S. and is currently under construction.
1	I-68	9 [ The "Severe Storm" section, although it does not directly so state, has very strong implications that because the Santa Ynez unit platform was designed to meet 400-year storm conditions, that this will become the new acceptable guideline for design criteria by the U.S.G.S. We do not propose nor endorse such a suggested change. In designing a platform, many environmental factors are considered, including the major factors of storms and earthquakes. It so happened that in designing this 850-foot water depth Santa Ynez unit platform to meet desired earthquake criteria, it coincidentally met essentially all requirements for the 400-year storm. From the operator's viewpoint, there was another benefit in a second coincidence which revealed that the 400-year Santa Barbara Channel storm adequately satisfied the 100-year Gulf of Mexico storm condition. This created flexibility in use of the design because it was also adequate for the more severe weather conditions of the Gulf of Mexico. Historically, industry has designed platforms for up to 100-year storm criteria. We see no justification for a change at this time.  The U.S.G.S. should establish guidelines for use in various areas but should maintain full authority and flexibility by continuing to make individual reviews and approve platform designs as in the past. To publish a fixed platform criteria would discourage innovative thinking in design and not allow the U.S.G.S. the discretion of applying guidelines they believe necessary and applicable by an area and use basis.
1	I-71	10 [ The Protective Coating section indicates that synthetic rubber and monel sheathing is applied to all members in the wave zone between elev (-) 8'-0" and elev (+) 16'-0". This is an Exxon practice and is not an established concept or conventional corrosion protection procedure. We suggest replacing the words "three types" with the word "examples" in the last sentence of the paragraph. The sentence would then read "Examples of protective coatings are":

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<u>Volume</u>	<u>Page</u>	<u>Comments</u>
1	I-72	<p>In the Beautification section, we suggest deleting the last sentence because of the following reasons:</p> <p style="padding-left: 40px;">A number of methods of screening and beautification were investigated for the Santa Ynez unit platform. These studies indicated that reasonable effective screening techniques were possible. However, because of concern by the U. S. Coast Guard and ourselves that camouflage techniques could increase hazards to navigation, these studies were discontinued. It is currently believed that the natural state of the platform is the most satisfactory solution. It presents maximum visual impact to the close proximity of an approaching ship, yet has low impact from shore because of both distance and frequent low visibility weather conditions.</p>
1	I-74	<p>The first sentence of paragraph 1 needs to be clarified since platform development wells would not normally use submerged production systems. We suggest that the last part of the sentence be omitted by placing a "period" after the word "rigs".</p>
1	I-77	<p>In the second paragraph, the description of the gravel packing technique is not correct. The description should be changed to something similar to this: Gravel is pumped into the top of the annular space between the liner and the wall of the hole with fluid returns taken through a "stinger" extending to near the liner shoe.</p>
1	I-84	<p>The last paragraph states "Sand monitoring devices are included" .... This is misleading since there is no requirement for them. We suggest the words "can be installed" be substituted for "are included".</p>
1	I-95	<p>The last paragraph states "It would be ideal to have all production facilities located on the sea floor." It would be "ideal" only from an aesthetic point of view since it might well be operationally impractical and economically disastrous. We suggest revising the sentence to read as follows: The ideal from an aesthetic point of view for an offshore oil field might be to have ...</p>
1	I-105 I-107	<p>The 1974 OTC was held in Houston, not Dallas.</p>
1	I-128	<p>The fourth sentence in the second paragraph states "The use of an internal floating roof with cone roofed tanks for a vapor recovery system." It is not an industry practice to utilize a cone roof tank with an internal floating roof for a vapor recovery system since the two roofs serve two different and opposite purposes. The floating</p>

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1	I-128	(Cont'd.) roof is designed to prevent vapor evolution from the stored crude oil while a cone roof is installed to collect vapor emissions for a vapor recovery system. We suggest the sentence be revised as follows: Special cone roofed tanks with a vapor recovery system or tanks with internal floating roofs have been designed to prevent vapor emissions to the atmosphere.
1	I-193	Under the "Casing" section, there is a typographical error in discussing the first string of casing. Stated is "this depth may be as little as 30 feet to more than 500 feet". To place this in agreement with OCS Order No. 2, it should read: This depth may be as little as 300 feet to as much as 500 feet.
1	I-211	The fourth sentence of the In-Situ Combustion section states "This process is essentially experimental to date" .... This is not true; Mobil has been successful with this secondary recovery process for more than ten years in the Bakersfield area. We suggest omitting the first part of the sentence. The sentence would read as follows: Extremely high recoveries have resulted where . . .
1	II-72	The second sentence is in error. The sentence should be revised as follows: Except for South Elwood, the Middle and Upper Miocene strata have not yielded significant production in the Channel region, but . . .
1	II-75	In the section "Production from Existing Producing Leaseholds", the second sentence is in error. Dos Cuadras produces from the Miocene as well as the Pliocene. We suggest the sentence be revised as follows: "Both fields are on the Rincon anticlinal trend and most of the . . ."
1	II-80 to II-137	Dames and Moore will provide comment on this section titled "Earthquake Activity in the Santa Barbara Channel Region." Their written comments for text revisions should be submitted to the U.S.G.S.
1	II-137 to II-152	Section - Geologic Conditions and Processes Having a Potential for Hazard ("Geologic Hazards"). This section describes almost every conceivable geologic hazard in such a way as to make it sound catastrophic and commonplace. To avoid giving a distorted view of the subject, mitigating factors or conditions which are known to exist should be mentioned in the same paragraph in which the hazard is described.

INDUSTRY'S COMMENTS ON THE  
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Volume  
1

Page  
II-137  
to  
II-152

Comments

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(Cont'd.)

13 [ Page II-139 - The discussion of Reservoir Fluids and Pressure on Pages II-139 and 140 is presented in such a manner that a reader might get the impression that these are abnormal and unique to Santa Barbara Channel. The addition of the following two sentences would place it in proper perspective for the reader. At the end of paragraph one, Pages II-140, add the sentence as follows: More stringent casing regulations, imposed after the 1969 oil spill and more frequent inspections by the U.S.G.S. personnel have greatly reduced the chances of a subsurface blowout behind casing such as the above mentioned 1969 blowout.

Replace the last sentence on Page II-140 with the following: The above described geologic conditions and processes generally describe almost every oil producing area of the world and are well understood by industry. The fluid expansion process and reservoir energy release is the natural mechanism by which oil fields are produced; uncontrolled, it could cause a blow-out.

14 [ Page II-143 - Add a sentence at the end of paragraph one as follows: However, seismic sea waves are very rare, and to our knowledge have never been known to damage oil production facilities, onshore or offshore, anywhere in the world.

15 [ Page II-144 - Replace the last sentence of the first paragraph with the following: Liquefaction conditions described here are considerations for constructing buildings, warehouses, docks and all major onshore and offshore structures. Routine geologic and engineering site examination and soil testing identify the foundation soil conditions. The solutions for problem areas are moving to acceptable soil conditions or extending the foundation members deeper into competent foundation soils.

Page II-145 - It is suggested that the first sentence in paragraph three (lines 19 and 20) be deleted. It is difficult to see how a submarine landslide could even theoretically cause a seismic sea wave of significant size.

Page II-150 - Delete the last sentence. There is no evidence of triggering earthquakes by injecting fluid to balance withdrawals. The only case cited in which fluid injection was even suspected of triggering earthquakes was one in which there were no past or concurrent withdrawals. Thousands of oilfield injection and disposal wells have been utilized without

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Volume	Page	Comments
1	II-137 to II-152	(Cont'd.) Page II-150 (Cont'd.) similar effects. Add the following paragraph (taken from Volume 3, pp IV-76-77): It is documented that subsidence of the ground's surface due to the production of oil and/or gas has occurred only after the production of very large volumes of oil and/or gas per unit area from very shallow, relatively unconsolidated, thick producing reservoirs, without concurrent repressuring operations. The known potential field areas in the Santa Barbara Channel do not have shallow unconsolidated sands with the potential of producing such large quantities of fluid. The possibility of subsidence in the Santa Barbara Channel, as a result of fluid production, is considered remote.
	16	Page II-152 - Replace the last sentence with the following: Routine engineering site examination and foundation soil sampling and testing techniques used in site selection preclude the construction of facilities where flooding, erosion, or expansive soils would be hazards.
2	III-20	17 Near the center of the page is the statement "Extent of recolonization of cuttings mounds by benthic eoi- and infauna is now known". Testimony given by Dr. R. P. Zingula of Exxon Company, U.S.A. at the Conference on "Environmental Aspects of Chemical Use in Well Drilling Operations", sponsored by the Environmental Protection Agency, Office of Toxic Substances, Washington, D.C., described his investigations of the ocean floor drill cutting piles. His findings showed that recolonization started immediately and that the area returned to a "normal" sea bottom containing essentially the same fauna and in essentially the same abundance within eight months. On this basis and to provide maximum information to the reader, a rewrite of the above sentence is suggested as follows: Extent of recolonization of cuttings was investigated by Dr. R. P. Zingula and his findings indicate that the area returns to a normal sea bottom containing essentially the same fauna and in essentially the same abundance within eight months. (Testimony at E.P.A. Office of Toxic Substances, Conference on Environmental Aspects of Chemical Use in Well Drilling Operations, Houston, Texas, May 21-23, 1975).
2	III-30	18 This section on seismic shaking is a recap of the platform earthquake design considerations. Dames and Moore should provide written comments for any text revisions.

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<u>Volume</u>	<u>Page</u>	<u>Comments</u>
2	III-34	The first sentence states "The U.S.G.S. and U. S. Coast Guard will not allow a platform to be built within a mile of any shipping lane". We suggest that that statement should read 1/2 mile as specified on Page IV-50.
2	III-43	Picture of platform "C" shows pile penetration of 150' (343-193). Penetration will be 85'. Sketch should be corrected.
2	III-72	The second sentence in the second paragraph states "H <sub>2</sub> S is reduced to elemental sulfur". The words "may be" should be substituted for the word "is" since it depends on the concentrations involved to warrant the removal of H <sub>2</sub> S.
2	III-80	The second sentence of the last paragraph states "For example, normal operations would result in atmospheric emission of small amounts of incinerated waste products and the voiding of other gases into the atmosphere. Such activities could adversely affect vegetation at the site" is an overstatement of the problem which historically does not occur. Although theoretically possible, operating history over the past decade indicates essentially no damage to surrounding vegetation. With the recent implementation of regulations by E.P.A., California Air Resources Board and the County Air Pollution Control Districts regulations, the likelihood of detrimental effects is even further reduced. Because of the above and in order not to mislead the reader, a rewrite of this sentence to include proper qualification is suggested as follows: For example, normal operations would result in atmospheric emission of small amounts of incinerated waste products and the voiding of other gases into the atmosphere. Such activities could adversely affect vegetation at the site; however, historically this has not been the case and with the new and more stringent E.P.A., California Air Resources Board and the County Air Pollution Control Districts regulations, the likelihood of detrimental effects is further reduced.
2	III-88	This section discusses the <u>Operational Phase</u> of SPS (cluster type) development. Two points need additional clarification. First, since the SPS is primarily applicable, from an economic standpoint, to the deeper water depths of perhaps 1000 feet or more, and since fishing trawlers seldom frequent such water depths, interference with fishing will be minimal. Second, it should be brought to the reader's attention that although the SPS minimizes the number of surface platforms, an SPS system does not necessarily eliminate platforms because it requires a surface support facility nearby. Therefore, revised wording of the first paragraph under 3. <u>Operational Phase</u> , Page III-88 is suggested as follows:

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<u>Volume</u>	<u>Page</u>	<u>Comments</u>
2	III-88	(Cont'd.) A SPS (cluster type) would occupy about one-half acre of ocean floor, and other types would require less. Very limited habitat for deep-water bottom-dwelling marine animals would be altered. On the other hand, the environment of some marine species would be enhanced by the sheltered habitat provided by the structure. Trawling gear could become entangled with such installations in the event that commercial fishermen would operate in the area, however, to the extent the SPS is primarily economically applicable to the deeper water depths of approximately 1000 feet, and since fishing trawlers seldom frequent such water depths, the probability of such conflicts is remote. Utilization of SPS in the future would serve to minimize the number of platforms required, thus lessening the long-term aesthetic impact. The SPS does not necessarily eliminate all platforms since it requires a surface support facility located nearby. Further, considerable additional floating equipment (drilling vessels, service boats, work-over rigs, etc.) would be required to operate and service the subsea system.
3	IV-6	22 [ The first sentence at the top of the page states "NPDES permits are not required for pollutant discharges from any vessel or floating craft". This does not presently apply to a drill-ship operating offshore California. We suggest including the words "except drill-ship" after the word "craft".
3	IV-35	23 [ The last sentence of the last paragraph in page IV-34 indicates that two years is the earliest date before new platform drilling could commence. This is not so - - platform "C" and Holly could drill much sooner, and possibly Hueneme before two years. We suggest omitting the last part of the subject sentence by adding a "period" after the word "years".



MARINE COMMENTS

VOL. 1, Page I - 125

- d. Barges -- Should be mentioned that these barges would be equipped with segregated clean ballast tanks.

VOL. 1, Page I - 126

- e. Tankers -- Present coastwise tankers are in the 30/35,000 ton category and carry about 200/230 M bbls. of cargo. No ballast is pumped overboard unless it is from segregated clean ballast tanks.

Vessels are equipped with containers on board to contain small spills involved in connecting or disconnecting loading hoses.

VOL. 3, Page III - 84

2. Operational Phase of Near Shore Loading Terminal.

Recurrent minor spills can result from ship's deballasting water.

Vessels engaged in this type of movement would most likely be equipped with clean segregated ballast tanks; therefore, the likelihood of any oil spillage from deballasting is nil.

VOL. 3, Page III - 85

G. Impact of Offshore Treatment and Storage Terminal.

Discusses such impacts. Stated and recognized in other sections for this mode of operation is the fact that a gas line to shore will be required for gas sales. It should also be recognized in this section. A revision to this section by the addition of a statement at the end of the first paragraph is suggested as follows:

Although not included in the discussion below, it is recognized that in production operations utilizing an offshore treating and storage terminal, a gas line to shore to facilitate gas sales will be desirable. Details of similar pipeline construction and operation are discussed in the transportation section.

2. Operational Phase.

Recurrent spills due to leak in ship's flanges when loading.

There are Coast Guard Regulations that make each vessel

MARINE COMMENTS

2.

have holding storage to prevent any small spillage from going over the side.

## PIPELINE COMMENTS

### VOL. 1, Page I - 123

First paragraph. The statement infers that the Federal Pipeline Regulations (Part 195.404 and Part 195.408) specifically require pressure sensing recorders and built-in alarm systems. This method of leak detection is not a DOT requirement, and the referenced paragraphs make no mention of leak detection.

### VOL. 2, Page I - 124

Second paragraph. The statement infers that remotely operated mainline block valves are an industry standard. This is not true. Most mainline block valves are manually operated and only in specific instances can remotely controlled valves be justified. Neither DOT nor ANSI specify requirements for remotely controlled block valves.

### VOL. 2, Page III - 64

26 This Line Break section contains conclusions which are correct; however, insufficient material is included to assist the reader in readily understanding and reaching this conclusion. It is suggested that revised wording starting with the third sentence through the first conclusion be included as follows:

The sea floor slope is relatively flat from the shoreline to the 300 foot water depth contour; at this point there is a major increase of slope into deeper water.

If a break occurs between shore and 300 foot contour, the probable oil spill volume may be 70 to 170 barrels. (This is because the almost flat bottom has minor undulating features which would effectively trap the seawater and form barriers after minor displacement of oil from the line).

### VOL. 2, Page III - 96

This section implies that a land pipeline between Santa Barbara and Los Angeles would not be favorable because of the "convenient sea route" between the Santa Barbara channel and Los Angeles, leaving the impression that a land pipeline would not be a valid alternative. We believe an economic

study would probably confirm that a land pipeline would in fact be more economical than a tanker or barge movement.

The statement also infers that a land pipeline would cause significant environmental impact. We do not believe the USGS study has been extensive enough to determine the degree of impact of such a pipeline. The brief description of a Santa Barbara to Los Angeles pipeline on pages 97 and 98 does not result in "significant impact."

## ECONOMIC COMMENTS

- 1, III-178 Table III-10. It is quite doubtful that the data given in the top half of the table represents petroleum "consumption".
2. III-183. Mead estimates the "property value loss" from the 1969 Santa Barbara spill at \$1.2 million, and yet the court settlement was for \$4.5 million. Furthermore, his so-called range for the total cost of the spill (low: \$16.42 million, high: \$16.44 million) is almost absurd if it is supposed to represent something other than a point estimate.
3. III-187 line 21. It is about time that the need for OCS production stop being justified because of "the continual increase in energy use per capita."
4. III-190. The mathematics of yearly anti-pollution expenditures by businesses in California is off by a factor of ten.
- 27 5. III-213. Whether or not a new refinery will be built in this area depends primarily on whether or not the demand for petroleum products exists in the area.

### 6. Outdated Data

Outdated operating statistics are still shown in a number of instances, for example:

Volume 2, page II-386 - Cumulative Production to 1972.

Volume 2, page II-387 - Refinery Capacity 1/1/71.

Volume 2, page III-175 - Oil Imports 1970 and 1971.

### 7. Mathematical/Typographical Errors

The words "per year" should be stricken after "\$20 billion" on the fourth line from the bottom of page III-190 in Volume 2. Calculated California anti-pollution expenditures are \$20 billion over 10 years, not annually.

28 [ The clause "and before 400 to 700 million tons of coal" is meaningless at the end of the first sentence of the second paragraph of Volume 3, page VIII-51.

### 29 [ 8. Factual Errors

The word "1.3" should be changed to "1.9" on the fourth

line of Volume 3, page VIII-43. The 1.3 passenger per car ratio applies only to the "earning a living" mode, not to overall automobile use which is shown as 1.9 occupants per car on page 37 of "1973/1974 Automobile Facts and Figures."

30

The last sentence of the first paragraph of Volume 3, page VIII-54 appears incorrect. To our knowledge, "hydropower" is principally used to service base load, not peak load, power needs in areas where it is the major power source. However, "pumped-storage power," which represents only a small portion of total hydro-power, is used for peak loads.

9. Overemphasis of Shale Oil's Environmental Problems

31

Pages VIII-48-49 of Volume 3 appear to paint an overly pessimistic view of environmental risks associated with shale oil development. For example, the discussion at the top of page VIII-49 suggests that it may not be possible to a) dispose of the spent shale, b) induce revegetation, c) avoid ground water contamination, or d) obtain adequate water supplies. A closing paragraph could be added to state that adequate technology and resources exist to overcome these environmental road-blocks, but economic incentives appear inadequate at present prices.

10. Inconsistency of Demand Growth Rates

Oil demand growth rates shown for District V (Volume 2, pages III-176-178) and those for the total U.S. in the Project Independence Report used to calculate required U.S. oil imports (Volume 3, page VIII-60) are inconsistent, as shown below:

32

<u>Oil Consumption</u>	<u>Million B/D</u>		<u>1973 - 1980 Average Annual % Growth</u>
	<u>1973</u>	<u>1980</u>	
PAD District V	2.4	3.4	5.1
U. S. Total	17.5	16.4-20.8	(0.9)-2.5

The PAD V 1980 projection is based on a pre-embargo U. S. Army Corps of Engineers study dated June, 1973 whereas the Project Independence Report estimates were issued in November, 1974 after the embargo ended.

For this reason, as well as changes induced by quadrupled foreign and "new" oil prices, the District V and U.S. demand projections contained in DES 75-35 are incongruous.

11. SUGGESTED REVISION FOR TABLE II-53 (Page II 387 Volume 2)CAPACITY OF CALIFORNIA PETROLEUM REFINERIES

(From: The Oil and Gas Journal, April 7, 1975. Refinery capacities as of January 1, 1975)

Company	Location	Capacity <sup>1</sup>
Atlantic Richfield Co.	Carson	185,000
Beacon Oil Co.	Hanford	12,000
Champlin Petroleum Co.	Wilmington	30,600
Douglas Oil Co. of California	Paramount	35,000
Douglas Oil Co. of California	Santa Maria	9,500
Edgington Oil Refineries, Inc.	Long Beach	29,500
Edgington Oxnard Refinery	Oxnard	2,500
Fletcher Oil & Refining Co.	Carson	19,200
Golden Bear Div., Witco Chemical Corp.	Oildalte	11,000
Golden Eagle Refining Co.	Carson	13,000*
Gulf Oil Corp.	Hercules	27,000
Gulf Oil Corp.	Santa Fe Springs	51,500
Exxon Oil & Refining Company, USA	Benicia	88,000
Kern County Refinery, Inc.	Bakersfield	15,900
Lunday-Thagard Oil Co.	South Gate	5,400
Macmillan Ring-Free Oil Co.	Signal Hill	12,200*
Mobil Oil Corp.	Torrance	123,500
Mohawk Petroleum Co.	Bakersfield	22,100
Newhall Refining Co., Inc.	Newhall	11,500
Phillips Petroleum Co.	Avon	110,000
Powerine Oil Co.	Santa Fe Springs	46,000
Road Oil Sales, Inc.	Bakersfield	1,500
Sabre Refining Inc.	Bakersfield	3,500
San Joaquin Refining Co.	Oildale	29,300
Shell Oil Co.	Martinez	100,000
Shell Oil Co.	Wilmington	96,000
Standard Oil Co. of California, Western Operations, Inc.	Bakersfield	26,000
	El Segundo	230,000
	Richmond	190,000
Sunland Refining Corp.	Bakersfield	15,000
Tenneco Oil Co.	Bakersfield	1,200
Texaco Inc.	Wilmington	75,000
Toscopetro Corp.	Bakersfield	40,000
Union Oil Co. of California	San Francisco	111,000
	Wilmington	108,000
West Coast Oil Co.	Oildale	15,000

I

Barrels per calendar day

\*Barrels per stream day

RESPONSE TO WESTERN OIL AND GAS ASSOCIATION

The detailed specific comments and information developed by personnel from industry are useful. Rather than acknowledge or respond to each here, they have been incorporated, when appropriate, throughout the text.

1. Wording revised.
2. Subject sentence omitted.
3. Wording revised.
4. Correction made.
5. Paragraph revised.
6. Last part of sentence omitted.
7. The word "commercial" added.
8. Drawing will be revised or replaced.
9. Section has been reworded to avoid implication that the Geological Survey is recommending that all platforms be designed to meet 400-year storm conditions.
10. Wording revised.
11. The sentence omitted.
12. A number of these suggestions were incorporated in this final text.
13. The suggested sentences have been added.
14. A modified sentence has been added.



15. The suggested revisions have been incorporated when considered appropriate.
16. Sentence replaced.
17. We concur. The rewrite has been added as suggested.
18. This seismic section has been revised. Also, see the response to the Dames and Moore portion of WOGA comments and to hearing transcript response number 27.
19. Suggested modifications made where appropriate.
20. The suggested revision has been incorporated in the text where noted.
21. Information obtained from National Marine Fisheries Service (personal communication, 1975) contradicts the statement that "fishing trawlers do not seldom frequent water depths of 1,000 feet or more." However, your clarifying language as to SPS surface facility requirements has been added.
22. The suggested revision has been incorporated in the text where noted.
23. The Clean Seas, Inc. inventory list has been updated, therefore, the sentence referring to the "two years" has been eliminated.
24. The suggested revisions have been incorporated in the text where noted.
25. The suggested statement has been inserted.

26. Your pipeline comments were informative and were incorporated where appropriate.
27. Response to these comments is provided in the revised and greatly expanded Socioeconomics Baseline and Impacts discussion in the FES. See sections II.F., Resources, and III.N., Socioeconomics Impacts.
28. The suggested revision has been incorporated in the text.
29. The suggested revision has been incorporated in the text.
30. This comment is in error since, for most cases, the notation in the DES text that hydropower usually is used to service peak loads is correct. Except for certain areas of the northwest U.S.A. where water flows are exceptionally large, hydropower principally serves peak load demands and acts as a "spinning reserve" standby for fossil fuel power plant system outages.
31. Addition of the suggested closing paragraph was made to the text of the FES.
32. The incorrect material has been deleted.
33. Suggested revision has been incorporated in the table noted.

DAMES AND MOORE CRITIQUE - A PART OF THE WESTERN OIL AND GAS ASSOCIATION  
COMMENTS

The Western Oil and Gas Association (WOGA) comments consisted of two parts, as the WOGA transmittal letter indicates. The preceding part (just responded to) was prepared by industry personnel and covered drilling and production, marine operations, pipelines and economics. The following part was prepared for WOGA by Dames and Moore. It covers geotechnical risk, biology, socio-economics, and oil spill potential. The Dames and Moore portion consists of a ninety-one-page bound volume detailed critique report and is on file and available for inspection at the U. S. Geological Survey National Headquarters, Reston, Virginia, and at the Pacific Area Office, Los Angeles, California. Only the summary and the geotechnical portion of this detailed technical critique have been reproduced and responded to as follows. However, the entire critique has been most informative and appreciated. Portions of the information provided have been incorporated where appropriate throughout this statement. In this final statement, the reference is cited as Dames and Moore, August 1975, Critique of U. S. Geological Survey Draft Environmental Statement for the Santa Barbara Channel Outer Continental Shelf oil and gas development, DES 75-35; prepared for Western Oil and Gas Association.

DAMES AND MOORE

CRITIQUE

OF

U.S. GEOLOGICAL SURVEY

DRAFT ENVIRONMENTAL STATEMENT

FOR

SANTA BARBARA CHANNEL

OUTER CONTINENTAL SHELF

DEVELOPMENT

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## SUMMARY

This report presents the findings of an evaluative review of selected portions of the United States Geological Survey Draft Environmental Statement on Oil and Gas Development in the Santa Barbara Channel, Outer Continental Shelf off California.

The review encompasses four major areas of concern to the Western Oil and Gas Association which are geotechnical risk, biology, socioeconomics, and oil spill potential. The purpose of this critique is not only to identify weaknesses, but also to present information on methodology and available literature sources which may be used by the USGS to strengthen these weak areas.

A [ The Geotechnical section of this critique focuses on the subject of seismic risk. Dames & Moore found that the USGS was not only overly conservative in specifying design criteria for the Santa Barbara Channel Outer Continental Shelf (OCS) development, but also left room for confusion due to differences in terminology used for earthquake design criteria in Section I and the maximum credible earthquake in Section II. Considerable problems with the DES arise from the fact that portions of the report are misleading either because they contain inaccurate statements of fact, inaccurate interpretations, or omissions of information that would clarify the topic being discussed.

B [ The USGS DES Biology section is generally comprehensive in discussing most aspects of ecological impacts although there are many omissions of literature citations. Often it is not clear whether the author is citing another authority or stating his own convictions. Frequently, more recent



works have not been cited. The major substantive omission is the effect on marine organisms of the platforms and other project structures and the steps that may be taken to prevent or mitigate any adverse effects.

C The USGS DES Socioeconomic section lacks organization, omits or mislocates discussions of vital topics, and bases conclusions and impacts upon inadequate information regarding the existing environment. For instance, population is discussed on a county-wide basis when impacts probably will be confined to coastal areas. Government revenue and expenditures have been overlooked preventing one assessment of the project on local public finance. No attempt has been made to quantify visibility of project facilities. This is considered a significant omission since the visual quality of the coastal zone is an important public concern. In addition, the DES also fails to discuss impacts to coastal land use.

D Section 4 of this report deals with oil spills, a subject of such importance that <sup>o</sup>through analysis is essential in its evaluation. The USGS DES presents data on spills connected with pipelines, platforms, and tanker accidents, much of which is not applicable to the Santa Barbara Channel. The USGS attempts to estimate the probability of spill occurrences are inadequate. The approach is overly simplistic, lacks specific oil spill volume data, and uses a subjective, arbitrary scale.

## RESPONSE TO DAMES AND MOORE CRITIQUE SUMMARY

A. Response to Geotechnical portion of the Dames and Moore critique.

The Geotechnical portion of this critique is reproduced and responded to in detail following summary responses B., C., and D. below.

B. Response to the Biology portion of the Dames and Moore critique.

Both the Terrestrial and Marine Biology sections have been updated and additional and more recent literature citations included. Table II-40a has been developed to include baseline data on the fish of coastal streams and rivers. The DES was issued on June 6, 1975, at which time the now recently published information on ongoing research was not available.

C. Response to the Socioeconomic portion of the Dames and Moore critique.

The Socioeconomic baseline data and impact discussion has been greatly expanded in this final statement (see sections II and III). The suggestions and information sources cited in the Socioeconomic portion of the Dames and Moore critique were most helpful in preparing the vastly expanded Socioeconomic discussion.

D. Response to the Oil Spill Probability of Occurrence portion of the Dames and Moore critique.

See section III.K.4. that has been added to this FES in order to present the Dames and Moore suggested approach to deriving Santa Barbara Channel maximum credible spill volumes.

## 1.0 GEOTECHNICAL

Dames & Moore's critique of the geotechnical portions of the U.S. Geological Survey Draft Environmental Statement (USGS DES) on the Santa Barbara Channel consists of two elements. The first is a general discussion of the seismic risk assessment made in the report. The second is a discussion of specific portions of the report that we feel are misleading.

### 1.1 GENERAL SEISMIC RISK ASSESSMENT

#### 1.1.1 Introduction

1 [ The USGS has taken a very cautious position regarding the seismic design criteria for the Santa Barbara Channel Outer Continental Shelf (OCS) development. They state that for design purposes all potential sites within the region must be regarded as susceptible to a maximum credible earthquake of magnitude 7.5, unless more extensive geologic and geophysical investigations are made to establish a more detailed seismic zonation. They further associate ground motion parameters for bedrock sites near the epicenter of magnitude 7.5 earthquakes with peak horizontal accelerations greater than 1.0g and durations of strong shaking in excess of 40 seconds.

2 [ Dames & Moore believes it is inappropriate and unnecessary to define the seismic design parameters in this much detail for the DES. Only in the unlikely instance that a platform or pipeline would be installed without preliminary geologic and engineering studies would these criteria (Vol I, pp I-66

to 67) need to be applied. It is Dames & Moore's opinion that the structural design criteria for future platforms should be based on two levels of earthquakes, and the sites should be carefully investigated to ensure that potentially hazardous areas, including recently active faults, are avoided. This approach was used in the design of the Hondo Platform in the Santa Ynez unit. The criteria cited in Section I of the DES were developed for this structure. The multidisciplinary advisory panel of experts to be convened by the USGS should develop the specific design criteria guidelines and requirements.

3 At the very least, undesirable confusion is likely to result from terminology differences in the earthquake design criteria cited in Section I and the maximum credible earthquake and implied design motion parameters discussed in Section II. Greater clarity is essential in order to use these concepts for engineering design purposes. Dames & Moore believes the ground shaking associated with the maximum credible earthquake should only be considered as an upper limit for the Criterion 2 earthquake for which structural safety against collapse must be provided. Even for this condition the design values are too high for most sites in the channel.

4 There is sufficient information to develop appropriate seismic design parameters for each prospective platform site, considering its specific foundation conditions and proximity to major active faults. In developing these parameters, three aspects of the DES assessment of seismic risk should be re-evaluated:

1. The possible location of the maximum earthquake.
2. The use of the maximum credible earthquake as the design event.
3. Appropriate ground motion values associated with the maximum credible earthquake.

#### 1.1.2 Location of the Maximum Credible Earthquake

The USGS DES asserts that a maximum credible earthquake of magnitude 7.5 could occur anywhere in the channel. This assertion is apparently based on the conclusion that the offshore structure is not well known, and on the observed lack of alignment of instrumental earthquake epicenters along known faults.

It is true that the offshore structure is not completely understood, and some small active faults may not have been identified. Nevertheless, only a few major active faults could possibly be capable of generating the maximum credible event, and we feel these faults probably have been identified and at least approximately located.

Ambraseys and Tchalenko (1968) have evaluated the rupture length versus magnitude relationship for numerous earthquakes worldwide. Using their data to make a most conservative estimate of rupture length, one arrives at a length of approximately 30 kilometers (19 miles) for a magnitude 7.5 event. Thus, even though a minimum rupture length of 6 kilometers has been reported for a magnitude 7.5 event by Bonilla and Buchanan (1970), it seems most likely that an earthquake of this magnitude would be generated on a major throughgoing fault with a length in excess of 20 miles.

6 [ Such major active faults are not likely to have escaped detection during the extensive geophysical survey already conducted by USGS. At the very least, this survey should have identified major areas in the channel where such faults do not exist and much less extensive areas where they may exist.

The USGS cites the apparent lack of alignment of offshore earthquake epicenters and known faults as further evidence that the geologic structure is incompletely known and, hence, that a fault capable of generating the design earthquake could exist anywhere in the channel. However, Dames & Moore believes that the following factors more reasonably explain this apparent lack of alignment of surface fault traces and epicentral locations.

1. Stronger consideration should be given to the probable inaccuracy of epicentral locations. Two lines of evidence suggest the importance of this:

7 [ a. The more recent and, hence, more accurately located events (Lee and Vedder, 1973) show a much stronger alignment with known faults than the older events (Vol I, Figs II-12, 13; pp II-112, 114).

8 [ b. The onshore epicenters (Fig II-12, p II-112) show no better alignment with mapped faults than the offshore epicenters, yet the USGS does not state that the structure of the onshore area is inadequately understood.

9

2. The orientation of fault planes is not sufficiently understood. In an area with numerous thrust and reverse faults, the epicenters should not be expected to line up along the surface trace of the faults.

10

3. Almost all the previously recorded earthquakes were small magnitude events ( $\leq$  magnitude 4.5). Allen et al. (1965) has discussed a similar lack of alignment of small magnitude seismic events on faults in the Los Angeles Basin. Thus, in this respect, the Santa Barbara Channel is really not different from the Los Angeles Basin--an area that has been extensively mapped and investigated. It should be noted, however, that while the small magnitude events may not have occurred along major faults, the distribution of large events has been distinctly different. Allen et al. (1965) reports that less than 20 percent of the magnitude 6.0 and greater shocks did not occur on known faults. This is, of course, significant to the channel because only the larger events will affect seismic design criteria, and they apparently should occur on the known major faults.

11

The DES assertion that the entire channel should have the same seismic criteria also fails to take into consideration the pronounced differences between the structure and the seismic history of the east and west channel areas. The west channel area appears to contain significantly fewer faults. In addition, the seismic events shown on Figure II-15 (Vol I, p II-118) are strongly concentrated in the eastern channel area. The combination of these factors indicates that the west channel area is presently less tectonically active and, hence, should not be assigned the same seismic risk as the east channel area.

### 1.1.3 Selection of the Design Earthquake

12 [ Probability considerations can provide valuable insight to the selection of the design earthquake as demonstrated for Platform Honda. Further, an acceleration value of 1.0g is likely to be of such low probability of occurrence at most sites as to preclude its use as the design event for the criteria cited on page I-67 of the DES.

13 [ The USGS assumes that California earthquake history is too short to be used for reliable, probabilistically determined design values. This assumption fails to acknowledge the fact that, even though the instrumental records of earthquakes in southern California only began in the 1920's, historical data on large earthquakes is sufficient to extend the record another 100 years. Using the historical earthquake data to extend the record to 1812, one can draw reasonable recurrence curves on which to base meaningful probabilistic studies. (The linearity and position of the recurrence curves on a semilog plot can be checked against worldwide seismicity plots to test the validity of the basic data used in probability analysis.)

Uncertainty concerning the relationships of earthquake epicenters and known active faults can be covered in the probability analysis by comparing results computed for randomly located earthquakes, with results computed for epicenters associated with suspected active faults.

Probability analysis in earthquake design has been used only in the past decade, but so has the association of maximum credible acceleration values with design of structures other than nuclear power plants. Strong advocates of the



14 use of probabilistic methods for assessing earthquakes include Algermission of the USGS (1972), who has published an assessment of earthquake risk in Arizona and Utah and is currently working on a seismic probability map for the entire United States.

15 In addition, probabilistically determined earthquake values have already been accepted for design of a platform in Federal waters. The design of the Santa Ynez unit platform by Housner and Jennings (1969) incorporated earthquake values determined probabilistically from the southern California seismic record.

16 It could be argued that a 1.0g earthquake is justified for Criterion 2 under the language of "having an extremely small probability of occurrence." However, the return period for such an event at a specific site in the channel would probably be at least 10,000 years. The resulting probability of  $10^{-4}$  seems somewhat conservative for offshore platform design.

#### 1.1.4 Ground Motion Parameters Associated with the Design Earthquake

The DES associates high bedrock accelerations (1.0g) and long durations of strong shaking (40 seconds) with the magnitude 7.5 event. These values appear unnecessarily conservative for platform design because:

- 17
1. The channel structure is well enough known to identify the faults capable of generating a magnitude 7.5 event. Therefore, it should not be assumed that the ground motion will be uniformly, distributed, but rather that it will attenuate as the distance from the causative major fault increases.

18

2. The DES considers only bedrock motion. Many sites will be founded in soft sediments that will probably substantially attenuate strong bedrock motion (Seed, et al., 1972).

19

3. The ground motion parameters have been extrapolated from data recorded for smaller earthquakes and there is some question as to the validity of such extrapolations. In addition, the data is strongly influenced by the extreme acceleration values from two events, the 1971 San Fernando earthquake and the 1955 Parkfield earthquake. Use of this data provides more conservatism than may be warranted.

#### 1.1.5 Seismic Risk Design Perspective

20

The design recommendations of the USGS DES must be put in some perspective. However, care must be taken when citing design acceleration values for other buildings and facilities, because the procedures in applying these values are highly variable. In addition, the natural period of structures must be considered. Short-period structures tend to amplify high frequency ground accelerations; whereas, long-period structures (such as offshore platforms in deep water) will attenuate these accelerations.

Further confusion may arise from the statements in the DES that the original platforms in the channel were designed for 0.15g. These values relate to static structural, or code design, and have little relationship to the peak ground acceleration value used for the Santa Ynez unit (0.50g) and the design value recommended in the DES (1.0g). The latter acceleration is only applicable to dynamic analyses and is usually applied to response spectrum techniques.

21

Even for dynamic analysis, correlation is lacking between instrumental maximum accelerations and effective acceleration values for engineering analysis. For example, the USGS peak horizontal acceleration associated with a magnitude 7.5 earthquake for the Trans-Alaska pipeline is 1.15g (Page et al., 1972); whereas, the effective ground motion acceleration used for analyzing soil behavior (landslides and liquefaction) is 0.45g and that used for structural design is 0.22g (Newmark, 1975).

In addition, well-constructed steel structures have performed remarkably well in strong earthquakes. Admittedly, experience with the performance of offshore structures in strong earthquakes is limited, as such structures have been used in the seismically active areas of California and Alaska only in the past 10 or 15 years, and they have not yet been subjected to strong ground shaking. However, their satisfactory performance can be reasonably inferred from the performance of steel-framed buildings as far back as the 1906 earthquake and of other steel structures, such as elevated water tanks, during the 1952 Kern County earthquake.

22

Existing available information is sufficient to develop safe design criteria at each platform site, in a manner similar to that used for the Honda platform in the Santa Ynez unit. The criteria cited in Section I of the DES were developed for this platform.

## 1.2 SPECIFIC SEISMIC RISK ASSESSMENT

The following discussion cites specific portions of the report that are misleading either because they contain inaccurate statements of fact, inaccurate interpretations, or unfortunate omissions of information that would clarify the topic being discussed. The comments are divided into those that relate to seismic hazards and those that do not. The former category consists of: structural geology, seismicity, seismotectonics, and earthquake engineering. The latter category is grouped into several unrelated topics.

### 1.2.1 Comments Relating to Seismic Hazards

Structural Geology--The structural geology portion of the DES is reasonably comprehensive and accurate. Nevertheless some aspects deserve comment.

The regional structural setting is summarized as follows (Vol I, p II-43):

23 The Santa Barbara Channel is the seaway that occupies the submerged western part of the Transverse Ranges province of southern California. Throughout that province, the major folds and faults generally trend east-west (figure II-2), as do the metamorphic fabric of pre-Cretaceous basement rocks, and the fabric and petrochemical trends of the late Mesozoic batholithic rocks of the province (Baird and others, 1974).

This statement is true; however, it may be made more accurate by including discussion of the changes in structural trend in the western channel. The structures between Point Conception and San Miguel Island trend west-northwest and those west of Point Conception generally trend northwest. The change in trend is reflected in both the physiography and the Bouguer gravity anomalies (Vol I, p II-55).

24 A change in structural trend may be significant for two reasons. First, the west-northwest structures may indicate that the western channel region does not belong in the structurally defined Transverse Ranges. If this is true, it should be considered during attempts to identify seismotectonic zones in the channel, or, perhaps more appropriately, when the assertion is made that the channel cannot be zoned.

25 Second, if the active faults in the western channel do trend west-northwest or northwest, one might more reasonably expect dominant strike-slip rather than reverse displacement (Vol I, p II-55). This possibility could have significant implications when considering the intensity of strong motion anticipated during large seismic events. The seismic design criteria recommended in the DES assume dominant reverse displacement on all the active faults located in the channel. The resulting peak acceleration values might, therefore, be higher than can be expected reasonably from earthquakes generated on the faults actually present in the western channel region.

It is significant that the largest event to occur in the general channel area was the magnitude 7.5 Point Arguello earthquake of 1927. Approximate location of this earthquake would place it in an area of dominant northwest-trending

structures. Thus, it may not have occurred in the structural/seismotectonic province that includes most of the channel.

26

The USGS DES asserts that the available surface and subsurface structural information is insufficient to identify active faults in the channel. However, the USGS has run at least 20 geophysical survey lines across the channel and has presented interpretations of several of these. The following refers to the subsurface data (Vol I, p II-78):

...The very thick Holocene and Pleistocene deposits there are generally flat-lying, and the thickness and structure of potential oil-bearing strata below them are unknown....

27

If the resolution is sufficient to allow an interpretation of the attitude of Holocene and Pleistocene deposits, then it should be sufficient to determine whether these deposits have been offset by active reverse faults. If they have not been offset, it seems unlikely that an active fault capable of generating a major seismic event exists in this area.

28

The report does discuss offshore faults; however, the discussion is occasionally confusing. For example, the DES states (Vol I, p II-123):

Several west-trending faults have been mapped offshore in the northeast part of the Channel, and sub-bottom profiles show that they extend at least several hundred feet beneath the sea floor.

Does this mean the faults extend up to within several hundred feet of the sea floor? In other words, are the faults overlain by several hundred feet of sediment/bedrock? If they are, can they be considered active?

Further confusion results from the absence of definitions for several important terms. For example, the DES states (Vol I, p II-121):

The Santa Ynez fault zone, which trends westward for about 82 miles (130 km) along the northern margin of the Transverse Ranges (figure II-13), exhibits some physiographic evidence that suggests recent movements, and it has been considered an active tectonic feature (Page and others, 1951).

29

The term, "active tectonic feature," has not been defined. Such a feature is usually defined as one showing evidence of Holocene activity, yet reference to Table II-2 (Vol I, p II-124) indicates the Santa Ynez fault apparently does not show such evidence.

30

Plate 2 (Vol III, in pocket) is misleading because it shows the traces of subsurface faults. For example, the faults lying just south of Coal Oil Point are Miocene structures; they do not penetrate the upper 1,000 feet of the overlying Sisquoc Formation (Dames & Moore, 1974c). Projection of these and perhaps other subsurface faults to the surface gives the impression of a greater fault and seismic hazard than actually exists.

31

Seismicity--The following statement on seismic history in the DES is inaccurate (Vol I, p II-81):

...During the past 60 years, 24 earthquakes of local magnitude 6 (Richter Scale unless otherwise specified) or larger have occurred in southern California. Six of these occurred in and near the Santa Barbara Channel region: Santa Barbara earthquakes of 1925 (magnitude 7.5),

Santa Barbara earthquake of 1941 (magnitude 6), Kern County earthquake of 1952 (magnitude 7.7), San Fernando earthquake of 1971 (magnitude 6.4), and Pt. Mugu earthquake of 1973 (magnitude 6). However, the Kern County quake (White Wolf fault zone), and the Point Arguello quake (Morro Bay) are considerable distance from the Santa Barbara Channel.

The San Fernando earthquake should be included in the last sentence because it also occurred a considerable distance from the channel.

32 In Table II-1 (Vol I, pp II-86 to 102) the earthquake intensities are given in the Rossi Forel scale. This scale is considered archaic and has been replaced by the Modified Mercalli Scale of 1931. Because the latter scale is in current use in the United States and nearly everywhere else, an approximate conversion of the Rossi Forel intensities to Modified Mercalli intensities for the older earthquakes should be given. Also the Modified Mercalli intensities of more recent earthquakes should be cited as published.

33 The locations of strong earthquakes on Figure II-10 (Vol I, p II-103) should include an indication of the accuracy of the epicentral locations. Although the accuracy of epicentral locations has increased significantly during the last 40 years, the epicentral location for older events such as the 1812 and 1925 earthquakes have not been established with any certainty.

34 The description of the 1925 Santa Barbara Channel earthquake (Vol I, p II-104) includes an estimated epicentral location near the Ellwood oilfield. Little instrumental control



was available to locate this event. However, based on iso-seismal evidence, it was probably farther offshore and to the east.

35 The DES also contains a detailed discussion of the 1941 Santa Barbara Channel earthquake (Vol I, p II-104). Included in the discussion are damage reports, ground accelerations, and an epicentral location. However, the damage to the numerous petroleum facilities in the general area is not mentioned. This information is available and should be included to provide a better understanding of the response of oil facilities to seismic shaking. According to the operators of the Signal Marine Terminal, no damage was sustained by any of their facilities during this earthquake (Dames & Moore, 1974c).

Seismotectonics--The following discussion contains comments relating regional tectonics to seismic activity and the distribution of seismic events with respect to known faults.

In presenting its case against the validity of seismic zonation of the channel region, the USGS makes the following statement (Vol I, p II-120):

36 ...The fault-plane solution for the magnitude 3.4 event on September 4, 1973, located 7 miles (12 km) northwest of Ventura, and a composite fault-plane solution for four events occurring on August 24 through September 13, 1973, at Ojai agree with the north-over-south reverse slip on the Red Mountain fault. However, when the foci are projected to the surface along the inferred northwest-dipping fault planes, they intersect the ground surface well to the south of the Red Mountain fault. Thus, the earthquake activity detected in the Ventura region may be associated with faults whose activity is not recognized from geologic evidence.

37

The last sentence states one possible interpretation of the data. An equally plausible explanation may be that the fault plane flattens at depth. Surface projections of a north-dipping fault plane that flattens at depth would be expected to intersect the ground south of the actual surface expression of the fault.

The DES also presents arguments in support of a magnitude 7.5 maximum credible earthquake in the channel (Vol I, p II-125):

...Both the geographic extent and the intensity of the shaking are comparable to other California earthquakes of magnitude 7 to 7.5. Empirical data on the length of surface rupture for earthquakes in this magnitude interval range from less than 6 miles (10 km) to 60 miles (100 km) (Bonilla and Buchanan, 1970). Through-going fault structures of these and greater lengths certainly exist in the Santa Barbara Channel region.

38

This statement is particularly misleading because it implies that faults with lengths as short as 6 miles are capable of generating magnitude 7.5 events. Bonilla and Buchanan reported surface rupture lengths, not total fault lengths. For a 6-mile fault to satisfy this empirical relationship, the entire fault must move. This simply is not reasonable (Albee and Smith, 1966). Active faults may exist in the channel area that are capable of generating a magnitude 7.5 event. However, they certainly must be major structures, probably with lengths in excess of 20 miles.

The following statement presents another somewhat questionable argument (Vol I, pp II-125 to 126):

Although no events of magnitude 7.5 are definitely known in the Channel, two events of about that magnitude have occurred on the periphery of the Channel region in the past 47 years. These were the magnitude 7.5 event of 1927, located near the western end of the Channel and the magnitude 7.7 event of 1952, located to the northeast of the Channel region. Both earthquakes had substantial vertical displacement, as is also characteristic of recent fault movement in the Santa Barbara Channel region. In addition, the 1952 shock, like the 1971 San Fernando earthquake, resulted from horizontal compression with an orientation parallel to the contemporary axis of maximum compression in the Channel. It is therefore likely that the stress necessary for the generation of a magnitude 7.5 earthquake is attainable in the Channel region.

39 [ This statement is misleading because the conclusion does not necessarily follow from the preceding comments. The occurrence of the 1927, 1952, and 1971 earthquakes do not necessarily demonstrate the attainability of a magnitude 7.5 event in the channel for the following reasons:

1. The 1927 Point Arguello earthquake may have occurred in a structural/tectonic setting significantly different from that existing in the channel (see comments under structural geology in this critique relating to Vol I, p II-43).
2. The 1952 Kern County earthquake occurred in a significantly different structural/tectonic province.
3. Both the 1952 event and the 1971 San Fernando earthquake occurred in terrain underlain by significantly different geology (predominantly crystalline rocks); they also both occurred much closer to the controlling tectonic feature in Southern California (the San Andreas fault) near its "Big Bend," in an area of known major stress accumulation.

40 [

The USGS DES makes the following statement (Vol I, p II-126):

...Until the active faults can be delineated in more detail, the design earthquake cannot be assigned to a particular fault or fault system.

41 [ This statement appears misleading and unreasonable. Certainly the active faults should be delineated in more detail. This does not imply, however, that the major faults (faults capable of generating the maximum credible earthquake) have not been identified during the extensive geophysical surveys conducted by the USGS. Probably no more than three or four faults in the channel are capable of generating a magnitude 7.5 event, and their approximate locations are known.

The USGS geophysical surveys at least should indicate substantial areas where a major fault certainly does not exist.

Earthquake Engineering--The USGS sections dealing with design ground motion probably overestimate shaking intensity, and the sections dealing with the design of earthquake-resistant structures are misleading.

The following statements summarize the ground motion parameters recommended by the USGS (Vol I, pp II-128 to 129):

Ground motion parameters for bedrock sites near the epicenter of a magnitude 7.5 earthquake based on the above data are: a peak horizontal acceleration greater than 1.0 g (980 cm/sec<sup>2</sup>) and a peak horizontal velocity greater than 125 cm/sec. The duration of strong shaking (time interval between first and last peaks of absolute acceleration greater than 0.05 g) predicted for the maximum

expectable earthquake is in excess of 40 sec. These values are largely extrapolated values from smaller earthquakes and from earthquakes of comparable magnitude observed further from the causative fault. Revision of these current best estimates may be necessary as more empirical data close-in to large earthquakes are collected. Corresponding near-fault horizontal ground motions for a magnitude 6.5 earthquake, based on instrumental data, are: peak absolute acceleration 0.9 g, peak absolute velocity 100 cm/sec, and duration 17 sec (Page and others, 1972).

42 [ This statement requires clarification. First, the terms "near the epicenter" and "near-fault" should be defined. Also the report should be consistent in referencing motion to either epicentral or slipped-fault proximity. The discussion of motion during the San Fernando earthquake indicates that proximity to the slipped fault is more critical (Vol I, p II-109).

43 [ Second, the 40-second duration of shaking greater than 0.05g has been extrapolated, and there is some question as to the validity of such extrapolations. Bolt (1973) cites 31 seconds as the maximum duration of shaking greater than 0.05g for magnitude 7.5 earthquakes.

44 [ The USGS also refers to seismic wave amplification in soft sediments. It should be noted, however, that ground motion is more likely to be attenuated than amplified by soft, unconsolidated sediments at high acceleration levels (Seed et al., 1972). Also the strength of the soils in many locations will limit the maximum accelerations to values much less than at bedrock sites, but velocities and displacements will be correspondingly higher (Ambraseys, 1973).

45 Earthquake acceleration values of 0.25g for Criterion 1 and 0.50g for Criterion 2 were used with other appropriate design parameters for the Hondo platform. The platform as finally designed was analyzed for the most severe shaking associated with the 1971 earthquake. This analysis showed that design criteria were sufficient to accommodate the stresses associated with that event.

The DES also refers to a computation made for Platform C (Vol I, pp II-129 to 130):

46 ...For example, according to H.W. Coulter, U.S. Geological Survey (1974, oral communication), there was a computation made for Platform C in 1969 that indicated it should withstand ground accelerations of as much as 2.0 g even though the factor reputedly used in the design for horizontal acceleration due to earthquake shaking was 0.15 g.

No such computation was made for the owner, Union Oil Company of California, and the basis for Mr. Coulter's comment should be documented in writing. It is unlikely that a significant engineering analysis was performed for a 2.0g acceleration.

#### 1.2.2 Comments Unrelated to Seismic Risk

The following statement should be clarified (Vol I, p II-143):

47 ...A seismic wave associated with the earthquake of December 21, 1812, broke along the Santa Barbara coast. The wave height is unknown, but the onshore runup may have been as high as 30 to 50 feet above sea level at some points between Santa Barbara and Gaviota. Such events pose a potential for hazard to shoreline installations, where damage could result in a spill of oil.

The USGS itself questioned this statement elsewhere in the DES (Vol I, p II-85). Because many reviewers of this document will read only the hazards and impacts sections, the questionable nature of this 50-foot wave should be mentioned again in these sections.

48 In addition, the DES contains no reference to the comprehensive tsunami study conducted by the U.S. Army Corps of Engineers (1974). This study contains extensive discussions of the tsunami risk in the Santa Barbara Channel.

Another subject, ground water availability, is an extremely sensitive issue in Santa Barbara County, and, thus, it must be treated as accurately as possible. The following statement is both inaccurate and misleading (Vol I, p II-57):

Possible overdraft conditions exist in the Carpinteria ground-water basin, and an adjudication of water rights is pending for the Goleta ground-water basin because of an existing water shortage. Any major expansion of existing facilities or location of new crude-oil treatment or storage facilities in these areas may not be feasible until imported water becomes available.

49 Based on recent discussions with R.R. Liebernacht, it appears that the statement regarding the Carpinteria ground-water basin is inaccurate. Mr. Leibernacht, the director of the Carpinteria County Water District, has indicated that overdraft conditions do not exist (pers. comm., 1975).

The moratorium on new water hookups in Goleta is not likely to affect new onshore facilities because existing land use patterns would probably preclude development of such facilities in the area served by the Goleta County Water

District. The new facilities probably would be located farther to the west, in an area with access to ample ground water from both alluvial and bedrock aquifers. These aquifers are not in hydrologic continuity with any of the ground-water basins currently being produced by the Goleta County Water District.

The DES states that (Vol I, p II-32):

50 Middle Miocene strata have not yielded significant production of oil or gas in the Channel region as yet, but tests in the Hondo Offshore area of the Santa Ynez Unit indicate that they contain the principal potential producing horizons of that area. The reservoirs tested include both fractured siliceous shale and chert of the upper part of the Monterey Formation and sandstones found in the lower part of the formation.

To make this statement more complete, the report should mention that the operators of Platform Holly have completed several wells in the middle Miocene and that most of the future production from the South Ellwood field is expected to be from the middle Miocene Monterey Formation.



DETAILED RESPONSE TO THE GEOTECHNICAL PORTION OF THE  
DAMES AND MOORE CRITIQUE

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General Comment:

The Dames and Moore geotechnical critique devotes much of its length to seismology, tectonics, and earthquake engineering design. The critique questions to varying degree the earthquake parameters recommended in DES 75-35 and suggests to the reader that the earthquakes to be expected in the Channel region should be: 1) of lesser magnitude, 2) of less frequent recurrence, 3) of more restricted geographic influence, and 4) accompanied by shaking of less violence. The critique gives disproportionate emphasis to minor weaknesses in phrasing and expression (some real, some potential, and some possible "ambiguities"), in several instances resulting in significant misrepresentations of positions taken by DES 75-35. In recognition of this, portions of the text have been revised and expanded i.e., the discussion on page II-129 and 130 (DES 75-35). In spite of its contention that the recommended earthquake parameters should be reduced, the critique specifies that the Hondo area platform was designed using lower values for expected earthquake parameters but that review analysis indicates it should be capable of withstanding stresses comparable to those recommended in DES 75-35. The clear implication is that safety factors and other (non-earthquake) design considerations have combined to produce a structure that is considerably more resistant to earthquake damage than the design-input parameters would nominally indicate. The reader is also referred to our response to hearing response No. 27 and our response to Texaco's written comment.

Specific responses:

1. p.1., para. 2--This paragraph summarizes some of the parameters estimated in DES 75-35 to be associated with a magnitude 7.5 earthquake. It characterizes the recommended parameters and distribution as "very cautious".

This paragraph appears based on an inaccurate characterization of the statements in the DES (in the middle of p. II-126 and on II-141) which indicate the desirability for more detailed delineation of active faults and the need for site-specific data at future platform sites -- neither of which refer to "seismic zonation" of the region. The only reference to "more detailed seismic zonation" occurs on p. II-84. Seismic zonation of the entire Channel is, of course, not a necessary condition to re-evaluation of the expectable ground motions at a given site. It should in no sense be construed as a substitute for site evaluation.

2. p.1., para. 3 & continuation on p. 2 -- Examination of p. I-66 - I-67 (DES 75-35) indicates that no earthquake parameters are recommended there. The comment appears to be based on the notion that the ground motion parameters described on p. II-128 - II-29 are intended to be design specifications. Some revision of the text at that point has been made in hope of avoiding further confusion on this matter.
3. p. 2., para. 1 -- This comment states that the Advisory Panel ought to do exactly what DES 75-35 recommends that it should do. The procedure recommended by Dames and Moore in this paragraph is identical to that recommended in DES 75-35. For example, on p. I-67, two levels of earthquakes, having different probabilities of occurrence, are

suggested -- this is the principal difference between Criterion 1 and Criterion 2 (p. I-67).

4. p. 2., para. 3 -- The assertion that opens this paragraph is true only if the site location is known so that site characteristics and other design considerations (such as water depth) have been established. However, for sites "in the Channel", not yet selected, it is obviously not possible to consider specific foundation conditions nor actual distance from "major active faults". Therefore: 1) The possible epicenter location of the maximum earthquake cannot be arbitrarily assigned to some distance from a prospective platform site unless the site itself is first specified; 2) If a prospective platform site is anywhere along one of the structural trends having established major production, its proximity to a known active fault (or branch thereof) is such that no attenuation can reasonably be assumed as a basis for using less than the maximum credible earthquake to estimate expectable ground motions; and 3) It is presumed that the ground motion parameters used as design input to any specific structure at any specific site would be reviewed within the context of all the design considerations for the prospective platform, and a determination of whether or not the design satisfies the criteria of p. I-66, 67 (DES 75-35) would be made for each proposed platform design.
  
5. p. 3., para. 2 and p. 4, para. 2 -- These statements are misinterpretations of statements in the DES (see p. II-84, II-126-129, II-141). The DES does conclude that faults capable of generating the "maximum expectable earthquake" do exist in the Channel Region, that the activity of each (together with many branches) is incompletely known, and that (p. II-141): "Because no part of the Channel is far from one

or another of the major faults, ....the hazard should probably be considered to be uniformly distributed throughout the region, ..."

It further states (p. II-84) that: "The present data are insufficient to discriminate among different parts of the region as to where a maximum credible earthquake might occur; ...". To conclude that:

"...all potential sites within the region must be regarded as susceptible to the maximum" is not the same as stating that "...a fault...could exist anywhere in the channel." or that an "...earthquake of magnitude 7.5 could occur anywhere in the channel " (A matter of semantics)

The existing geologic and seismic data is not sufficient for one to generalize and validly conclude that platform design specifications for less than the maximum expectable Channel earthquake (7.5) are justifiable for certain parts of the Channel. However, in certain instances detailed geologic and geophysical investigation for a specific platform site may suggest that a lower seismic hazard exists for that particular site and design specification requirements could be safely adjusted accordingly.

6. p.4., para. 1 -- Plate 2 (and the newly added Plate 7) shows the faults presently recognized from USGS and other (published) investigations. The text (p. II-11, 12) specifically notes the uneven quality of the data. It is obvious that the lack of mapped faults in the area of the Central Deep (see p. II-78) may well be an artifact, derived from inadequate data in that area. With that possible exception, yet to be established by adequate acoustic profiling, it can be readily seen that no "major area" of the Channel is very far from a known or inferred major fault. Historic seismicity demonstrates that some of the faults are "active". The USGS does not have the data to assert that any are

prudently classed as "inactive".

7. p. 4., para. 4 -- Lee and Vedder (1973) estimated that accuracy of USGS locations was  $\pm 5$  km -- not close enough to sort out, for example, whether an event plotted on the Pitas Point fault was not actually on some part of the Red Mountain fault system to the north, or the Oak Ridge system to the south.
8. p. 4., para. 5 -- Because the DES treats principally with the OCS, judgments of "adequate" or "inadequate" concerning the understanding of onshore structural features have been avoided. The status of onshore geologic information is briefly summarized in paragraph 2, II-11, which does indicate a continuing need for new data from onshore areas.
9. p. 5., para. 1 -- It is quite correct to note: "In an area with numerous thrust and reverse faults, the epicenters should not be expected to line up along the surface trace of the faults." Furthermore, in a fault system containing several strands, dipping appreciably gentler than vertical, and where recorded seismicity indicates significant fault activity, it is extremely difficult to discriminate between "active" strands and "inactive" strands, if any may reasonably be considered "inactive". Moreover, by comparison with results of the San Fernando earthquake, the most severe shaking to be anticipated would not necessarily be in the area of the epicenter, but would be at the surface of the upper plate between the epicenter and the surface trace of the fault (see p. II-109).
10. p. 5., para. 2 -- Allen and others (1965, p. 775) are also careful to point out that "...most of the earthquakes used in this study have been located only to within 15 km, and many are even more poorly located,..."

From the smoothed data, they (Allen and others, 1965, p. 776) carefully refer to "fault zones" and "zones of high strain release". They do not attempt to ascribe specific zones of strain release to specific strands or faults within the relatively broad zones of faulting. Moreover, they caution that the short instrumental record of seismic activity is by no means sufficient to delineate all the faults on which there is geologic evidence of Quaternary activity, including some parts of the San Andreas fault which are known to have broken at the surface during the 1857 earthquake.

Although it seems likely that future large seismic events should occur on the known major faults, there is no assurance at the present time that: 1) All major faults have been recognized and located; or 2) The distribution of the earthquakes recorded so far (mostly small ones) is representative of the probable distribution of large events. Allen and others (1965, p. 768-769) cite the White Wolf fault in Kern County as one which would not have been recognized as "active" compared to many others in the region until after the Kern County earthquakes of 1952. Moreover, they wrote prior to the San Fernando earthquake of 1971, which originated on a fault that was not generally recognized as either "major" or "active" until after the damaging seismic event.

11. p. 5., para. 3 -- The "pronounced differences" are more apparent than demonstrably real -- they do not, for example, include evidence that major faults that project into the Central Deep from the west are terminated there. The lack of mapped faults can be attributed, most probably, to lack of data rather than actual absence of faults.

Figure II-15 is hardly representative of the earthquake distribution,

nor was it ever intended to be, as is obvious from both caption and text; it shows the focal mechanisms for selected earthquakes (see p. II-119). The data illustrated on figures II-12 and II-14 do suggest a greater frequency of small earthquakes in the east, as contrasted with the west part of the Channel; however, significant numbers of small earthquakes have been recorded from the western part, and there is no satisfactory rationale for suggesting that large earthquakes there would be less severe or recur less frequently.

12. p. 6., para. 1 -- Statistically, it is probably correct to infer a low probability for recurrence of 1.0 g horizontal acceleration at any 1-acre site (for example) in the 1,120,000 acres included in the Santa Barbara Channel. DES 75-35 outlines the data, assumptions, and rationale for inferring a recurrence rate of 250 years for magnitude 7.5 earthquakes in the region (p. II-133). That rate is presumed to represent the recurrence rate for a single event of that magnitude somewhere in the Channel region.

On the other hand, the geologic features and geophysical data from which the 250-year rate is deduced are concentrated along structures that are intimately associated with the most productive known oilfields of the region. Thus, in our view it would not be prudent to assume that the probability of recurrence at any potential platform site is reduced in direct proportion to the entire area of the Channel.

13. p. 6., para. 2 -- The tabulated data on historic earthquakes (Table II-1) and the discussion on p. II-84, II-106, II-121-123 can hardly be correctly characterized as failure "...to acknowledge the fact that, even though instrumental records of earthquakes in southern California

only began in the 1920's, historical data on large earthquakes is sufficient to extend the record another 100 years."

The validity of earthquake recurrence rates estimated from probabilistic (statistical) studies is severely limited by the size of the area for which the estimates are desired. Only one earthquake having an estimated magnitude as high as 7 to 7.5 has occurred within the Channel region during the historical record (Dec. 21, 1812). The discussion on p. II-132 (DES 75-35) demonstrates the misleading nature of attempts to estimate recurrence rates for large earthquakes from those of smaller earthquakes. An historical record that yields an observed recurrence rate of  $24 \pm 8$  years for magnitude 6 events cannot, therefore, be extrapolated to cover magnitude 7 to 7.5 events any more reliably than the seismic data for magnitude  $1\frac{1}{2}$  to  $5\frac{1}{2}$  events can be extrapolated to predict the recurrence interval for a magnitude 6.0 event.

14. p. 7., para. 1 -- The referenced paper by Algermissen discusses an analysis that covers a two-state area on a page-sized map. To reiterate a comment made earlier, the validity of earthquake recurrence rates estimated from probabilistic studies is severely limited by the size of the area for which the estimates are desired. This is brought out by Allen and others (1965, p. 776-777, and especially p. 785 and 786).
15. p. 7., para. 2 -- The "earthquake values" cited were used prior to the analysis made for DES 75-35. Questions about the adequacy of the design become moot as a result of the testimony of Jennings (1975) to the effect that "...the 0.25 g and 0.50 g design spectra, combined with the other portions of the recommended design criteria for the Santa Ynez platform and the conservative manner in which the recommendations



have been implemented, have produced a platform which has the calculated capacity to resist without danger of collapse ground motions with peak values equal to those which they /DES 75-35/ recommend."

16. p. 7., para. 3 -- This statement is useful only if someone proposes to place a platform at the epicentral site where a magnitude 7 or 7.5 earthquake is known to have occurred in the past. Moreover, in the absence of reference to or inclusion of the actual curves and data used to make the estimate, and discussion of its accuracy, the commentators' estimate must be treated as an unsupported assertion.
  
17. p. 7., last para. -- Attenuation of ground motion with distance from a causative fault is specifically cited on p. II-128 and in fig. II-16. The degree of attenuation cannot be ascertained, however, without prior knowledge of the relative positions of the displaced part of the causative fault and the site of construction operations. Although the commentator asserts that: "The Channel structure is well enough known to identify the faults capable of generating a magnitude 7.5 event.", he has not offered significant additional data that would aid others in so doing. Plates 2, 4, and 7 display at least 10 faults in the region with continuous lengths of 20 miles (27 km) or more, and the western projections of the Malibu Coast fault and the Santa Monica fault have not yet been identified in acoustic profiles along their projections across Mugu Canyon and the Mugu Fan. The distribution of the known faults, together with the near-certainty that important faults remain recognized in the Central Deep, across the Pescado Fan, and across the Mugu Canyon-Mugu Fan area, makes it imprudent in our view to propose that any significant part of the Channel lies more than 5 km (radius of accuracy of modern epicenter locations) distant from the sea floor

projection of a potential surface of rupture.

The statements, taken in full context, made on p. II-141 of the DES explicitly include the rationale for concluding that the seismic hazard should be considered uniformly distributed for purposes of regional evaluation. The expectation that further site studies should be conducted to develop ground motion specifications for proposed structures at specific sites is implicit.

18. p. 8., para. 1 -- Soft sediments may also amplify ground motions, as the records of damage to many urbanized lowlands has demonstrated.
19. p. 8., para. 2 -- In the absence of seismic records of ground motions from stronger earthquakes, there is no choice but to extrapolate from smaller ones.

It seems appropriate that the data should be strongly influenced by the extreme acceleration values from the San Fernando, 1971, and Parkfield, 1955, earthquakes. Strong-motion records from sites near the causative fault are very rare because of the short history of strong-motion records, their concentration in populated areas, their limited numbers in some of the most active seismic areas, and the need for coincidence of working strong-motion instruments and earthquake epicenters in order to record maxima. As Trifunac and Brady (1975, p. 45) point out:

"For distances less than about 20 kilometers, where only an insignificant number of recorded points are now available, predicted peak accelerations

[of several authors] begin to deviate from each other. At small distances from the source, say 1 kilometer, these differences are as large as one order of magnitude."

As to "conservatism", the "maximum" expectable acceleration recommended by DES 75-35 is appreciably lower than the "average" 1.75 g for a 7.5 magnitude earthquake at the causative fault that is predicted by the projection of Trifunac and Brady (1975).

20. p. 8, last 2 paras. -- The statements referred to in the critique have been revised in hopes of avoiding further confusion. Most of the "confusion" seems to arise from a consistent misreading of the DES statements about design considerations as though they are intended to refer to design specifications. The earthquake parameters recommended refer to ground motions that one would expect to measure on bedrock exposures at some given site, and include no factors relating to the nature or importance of any structure that might be placed at that site. They contain no factor relating to attenuation or amplification by site foundation conditions. Characteristics of structures that are dictated by conditions other than resistance to earthquake shaking are not included. Yet all those factors, and others as well, may contribute to the capability of the designed structure to resist damage by earthquake shaking. The DES has, therefore, not attempted to set "design specifications", but simply to provide regional evaluation of expectable ground motions, in the context of the present knowledge of the seismicity and tectonic state of the region.
21. p. 9, para. 1 -- The intent of Page and others (1972, especially p. 3) is quite clear. They specifically state that the recommended ground

motion values "... are for a single horizontal component of motion.... They correspond to normal or average geologic site conditions and are not intended to apply where ground motion is strongly influenced by extreme contrasts in the elastic properties within the local geologic section. They characterize free-field ground motion, that is, ground motion not affected by the presence of structures. They contain no factor relating to the nature or importance of the structure being designed. They are not the maximum possible. ... The acceleration values may be exceeded if there is appreciable energy in frequencies higher than 8 Hz (cycles per second). The displacement values correspond to dynamic ground displacements, as would be recorded on a strong-motion instrument having a frequency response flat to ground displacement for periods less than 10 to 15 seconds."

Newmarks' (1975) use of the term "effective" would appear to indicate the use of engineering coefficients to adjust for effects of local geologic conditions (soil response) and factors relating to the nature of the structures being designed.

22. p. 9., para. 3 -- We do not share this rather sweeping conclusion. It is possible that the data are sufficient for many potential sites, but it seems to us incautious to make the same assertion about all potential sites. It would be only prudent to make careful examination of the vicinity of a potential site for its proximity to faults having a potential for earthquake hazard. Certainly, the local foundation conditions for each must be evaluated individually.
23. p. 10., last para., and p. 11, para. 1 -- The cited paragraph is the introductory paragraph to the section on "structural Geology". It

would be inappropriate to include at this point details concerning the swing in trends to west-northwest in the extreme western part of the area, or, for that matter, details concerning the east-northeast trends of structures in the eastern part of the channel region. The swing in structural trends is, in fact, discussed (p. II-55) within the section on "Structural Geology" to which the cited paragraph is an introduction! The change in geomorphic trends is discussed on p. II-6.

We do not agree with the commentator in characterizing the area of change in trends as "... between Point Conception and San Miguel Island..." in the absence of comparable data from the deep area between the two shelf areas. The structures on the Mainland Shelf show a gradual change between Point Conception and Point Arguello, and northwest structural trends are found only to the west of Point Arguello. The structures on the Channel Islands Platform begin to change trend as far east as San Miguel Island. No structural trends have been established for the deep area between the Channel Islands Platform and the Mainland Shelf. It is, of course, possible that the commentator has seen seismic profiles for this area that are not available to the USGS, and that document the position and trends of structures below the surficial sediment.

24. p. 11., para. 2 -- The DES explicitly recognizes areal differences in seismic risk (p. II-130): "Estimation of the earthquake risk in the Santa Barbara Channel region depends on 1) the location of a given site relative to specific active faults; 2) the magnitude of expectable earthquakes on these specific faults; and 3) the occurrence rate of damaging earthquakes." The DES nowhere

states that the "Channel cannot be zoned." The conclusion actually reads: "Because no part of the Channel is far from one or another of the major faults, and because the seismicity of individual faults cannot be resolved from among the many nearby faults by the present seismograph net, the hazard should probably be considered to be uniformly distributed throughout the region, even though the instrumental record of small earthquakes indicates a greater frequency on the north-central, east-central, and southeastern parts of the Channel." (p. II-141)

25. p. 11, para. 3 -- We find no support in the historical record for the sort of conclusions reached by the commentator in this paragraph, and in our view the contrary conclusion would be more appropriate. The earthquake history of California indicates that most of the largest earthquakes have occurred on strike-slip faults trending northwest to west-northwest. The 1927 earthquake (magnitude 7-1/2) west of Point Arguello is now thought by some to have been generated by predominantly strike-slip displacement of a northwest-trending fault (Gawthrop, W., 1975, Seismicity of the central California coastal region: U. S. Geol. Survey Open-file Report 75-134) and, of course, the largest California earthquakes have been along the San Andreas fault. If the western part of the Channel should be included in a seismo-tectonic province dominated by strike-slip faulting on northwest trending structures, as the commentator suggests, expectations could be for higher magnitude earthquakes (presumably accompanied by stronger ground motions), rather than smaller ones.
26. p. 12., para. 1 (this para. begins on the preceding page) -- The Point Arguello earthquake probably was generated in a structural province different from that containing Santa Barbara Channel. However, it was felt in Santa Barbara; it damaged buildings as far east as Gaviota, and

tsunami confirmed by tide-gage records as far away as San Francisco and San Diego. Its effects in the Channel region are certainly pertinent to any assessment of seismic hazard.

27. p. 12., para. 2, 3, 4 -- The out-of-context quotation is very misleading. In the context of the unquoted lead sentence of the paragraph from which the quote was removed, the quoted statement clearly refers specifically to the area identified as the "Central Deep", not to the Channel as a whole. An index of seismic profiles (see Vedder and others, 1975) will show the USGS has run only 5 profiles that could remotely contribute to information in the Central Deep. In all of those profiles, penetration of the sediments in the deep-water area was poor, and records, though indicating thick, flat-lying deposits, record only discontinuous reflecting horizons that could be discontinuous by virtue of faulting. Both Oak Ridge fault and the Malibu Coast fault could continue into this area, if they do, in fact, continue westward along their onshore (and inferred offshore) trends.
28. p. 12., last 3 paras. -- The quoted sentence is the first of two sentences that make up a complete paragraph. The second sentence reads: "Some of the faults in the vicinity of Dos Cuadras field appear to cut very young bottom sediments (McCulloh, 1969, p. 32)." In this context, it is impossible to conclude that the faults are "overlain by several hundred feet of bedrock."

29. p. 13., para. 3 -- In the referenced context it is clear that "active tectonic feature" is a euphemism for "young fault." Dames and Moore use the identical phrase to refer to the same fault on p. 35, v. II. of their Final Environmental Impact Report on resumption of drilling at Platform Holly (November, 1974). The first use of the term goes back to Hamilton and others (1969).
30. p. 13, para. 4 -- The statement that the faults south of Coal Oil Point do not penetrate the upper 1,000 feet of the Sisquoc is not supported by the maps and statements included in the Dames and Moore (1974) FEIR. Their map (their plate III.A-7) does not show the faults as concealed. Their text (p. 32, v. II) simply asserts that the "...mapped east-west faults are subsurface structures ..." without offering evidence or discussion as to possible minimum ages of displacement. Their text (p. 137, v. II) also asserts "... recent studies have shown these faults to be inactive for the last 10-12 m.y. (Oceanographic Services, Inc., 1974)." The Oceanographic Services, Inc. reference is to a letter that has not been made available to the USGS. The most modern subsurface data available to the USGS is Report No. TR12 of the California Division of Oil and Gas (1974), which indicates a fault trending about west-northwest and dipping north, cutting the basal contact of the Sisquoc Formation. As the basal Sisquoc is probably no older than Delmontian (late upper Miocene), and Turner (1970, table 1) tentatively assigns an approximately 10 m.y. age to the top of the Mohnian, the assignment of these faults to as much as 12 m.y. (since lower Mohnian) of inactivity seems inappropriate. Finally, it is important to note that the absence of evidence of vertical displacement, the only kind visible on seismic profiles, is no assurance that strike-slip offset



has not occurred.

In the absence of documentary evidence to support the commentators' assertion that thick unfaulted late Miocene strata overlie the fault, indicating long-term inactivity, we think it would not be prudent to alter the way in which the faults are displayed on Plate 2. The addition of Plate 7 displays the present state of information on the antiquity of displacement on the subject faults.

31. p. .3, last para., continued as first para., p. 14 -- There is an apparent internal inconsistency in the quoted passage, and appropriate changes have been made in this final statement.
32. p. 14., para. 3 -- Rossi-Forel intensities are used because they were available in the original sources for the table (Townl y and Allen, 1939; modified by Hamilton and others, 1969; subsequently updated and modified for DES 75-35). It is a consistent system for comparative measure. There is no convenient nomogram for conversion to Modified Mercalli.
33. p. 14, para. 4 -- The precision of epicenter location is of no practical significance in examining the data illustrated by figure II-10, the purpose of which, as indicated on p. II-85, is to illustrate the general locations of the earthquakes selected for further text discussion.
34. p. 14, last para., continued as first para. p. 15 -- In the absence of documentation or reference in support of the commentators' assertion, the location reported in the cited source (Richter, 1958, p. 534) -- based on aftershock records -- remains the most appropriate in our view.

35. p. 15, para. 2 -- We have as yet been unable to locate published references to such damage (or lack of it) other than the assertion by Dames and Moore (1974, v. I, p. 138) that: "According to the operators of the Signal Marine Terminal, no damage was sustained by any of their facilities as a result of this earthquake."
36. p. 15, last 3 paras. --The characterization of the statement quoted from the DES as part of a "...case against the validity of seismic zonation of the channel region..." is inaccurate, as previously noted. The rest of the paragraph that precedes the quoted part, but which has not been included in this comment, makes it perfectly clear that the subject is the evidence for recent activity (including seismicity) on the Red Mountain fault, and the question approached by the quoted passage is whether or not some specific seismic events occurred on the Red Mountain fault. Only the concluding sentence deals with the possibility that the recorded seismicity may be associated with faults whose activity has not yet been recognized from other evidence. That this is a very real potential has since been documented by the detailed work of Sarna-Wojcicki and Yerkes (written communication, 1975) on offset terrace and alluvial deposits and soil horizons along Ventura fault, indicating recurrent, very young prehistoric displacement along that fault, which appears to be an onshore continuation of the Pitas Point fault. At least one recent seismic event (August 26, 1970) magnitude 3.6) probably originated on that fault.
37. p. 16, para. 1 -- While the suggested alternative interpretation is possible, we do not characterize it as "equally plausible." Most of the low-angle faults whose subsurface configuration is known or partly known in the area under discussion get steeper with depth. A fault that

"flattens at depth" would be an uncommon geometric style for faults of the area, and therefore, a more unlikely explanation for the seismic events in question.

38. p. 16., para. 4 -- As noted earlier, there are at least 10 faults in the area having continuous lengths of 20 miles or more. Some of the still shorter faults may be branches whose continuity with longer ones has not yet been recognized. To avoid the possibility of misinterpretation, the last sentence of the quoted passage should be changed by substituting 100 km for "these", so that the passage reads:  
"...structures of 100 km and greater lengths ...".
39. p. 17, paras. 3 and 4 -- We do not believe that the "structural/tectonic setting" of the Channel region can be treated as though the stresses within it are independent of those acting on immediately adjacent areas. Such an assumption is not warranted by any regional structural analysis.
40. p. 17, last para., -- The bend in the San Andreas fault from northwesterly to west-northwesterly takes place at about the meridian of Ventura. Ventura and Bakersfield are nearly equidistant from the junction of the San Andreas with the Garlock fault. Parts of the Channel region have stress accumulations that have been measured (see DES 75-35, p. II-133).
41. p. 18, para. 2 -- The repeated assertion by Dames and Moore that all the faults capable of generating a magnitude 7.5 earthquake in the Channel region have been identified and located is nowhere supported by any data or discussion. The geological and geophysical coverage used in generating the geologic map and sections in this environmental statement is described on p. II-9 to II-12 (DES 75-35); and in our view it is unreasonable to conclude that acoustic profiles

spaced an average of 1 mile apart, with several gaps as wide as 5 miles between crossings of deeper parts of the Channel, and capable of recognizing only vertical components of displacements on any one profile, can be expected to provide assurance that all faults capable of generating a magnitude 7.5 earthquake have been identified and located -- even approximately.

42. p. 19, para. 2 -- "Near-fault," as defined by Page and others (1972, p. 3), is probably the term that should be most consistently used, however, it should have the added qualification that the statement refers to the part of the fault that ruptured to generate the subject earthquake. "Epicenter", of course, generally refers to the instrumentally determined epicenter, which may not lie on the surface trace of the originating fault. The distinction, however, is hardly critical except in the context relating a specific potential site for a structure and a specific fault or faults. The terms are in no way intended to serve as a basis for determining the amount of attenuation to be expected at given distances from epicenters or slipped parts of faults, but simply to recognize that attenuation with distance does occur. Since the most accurate possible location for an epicenter in the Channel is presently to within only 5 km, a precise definition for "near the epicenter" would only serve to confuse the real issue with misleading verbal detail.

43. p. 19, para. 3 -- It is probably significant to note that Bolt's (1973, p. 6) table 2 reports durations for frequencies of 2 Hz or greater; whereas the rationale for the duration suggested in DES 75-35 is discussed by Page and others (1972, p. 11-13), and pertains only to unfiltered bracketed durations. The two approaches to estimate of

duration, therefore, are not directly comparable. The durations suggested by Page and others (1972, p. 3), which are consistent with the calculated range of values and with felt data from the 1964 Alaska earthquake (m=8.5), we believe are probably more in line with ground motions as expected to be recorded on strong-motion instruments.

44. p. 19, last para. -- We have been unable to find any published paper referable to "Seed et al.,1972", and the reference is not listed by the commentator. Judging from statements by Seed (with others) in other publications, however, the comment in this paragraph appears to be at variance with the actual findings of those authors, which the "attenuation alluded to is commonly restricted to the higher frequency ranges.

Ambraseys (1973, p. 10) suggests that large bedrock velocities might be rejected for transmission by an overlying weak deposit because of internal and surface yielding of deposits and soft rocks, pointing to non-tectonic ground fractures, slumping, "shattered earth", fissuring of different patterns, and small displacements on bedding planes and joints of sedimentary rocks as being common features in epicentral areas of strong earthquakes. If the site conditions are such that the earth materials on which a structure is founded undergo permanent deformations as a result of an earthquake, the accommodation of those failures becomes a more important factor to the integrity of the structure than the shaking. Foundation materials that have low yield strengths generally call for special construction procedures to alter their properties or otherwise compensate, with the result that strong ground motions are more likely to be coupled to the structures.

45. p. 20, para. 1 -- Comments noted.

46. p. 20, paras. 2, 3, 4, -- Nowhere does DES 75-35 represent the quoted statement as referring to computations made for, or on behalf of, the owner.
47. p. 21, para. 1 -- The text has been changed.
48. p. 21, para. 2 -- The cited report became available only after the DES section on Seismic Sea Waves had been prepared, and appropriate changes have been made in the text of the FES. We do not characterize the discussions pertaining specifically to the Santa Barbara Channel as "extensive". This should be clear from the following short paragraph added to the section on Seismic Sea Waves: "A recent study by the U. S. Army Waterways Experiment Station (Houston and Garcia, 1974) gives estimates of runup for 100-year ( $R_{100}$ ) and 500-year ( $R_{500}$ ) tsunamis for selected parts of the coast of the Channel. The estimates for  $R_{100}$  range from 5.0 ft at Oxnard (but as much as 10.1 ft in the harbor at Port Hueneme) to 10.5 ft at Ventura, and for  $R_{500}$  range from 11.0 ft at Santa Barbara to 21.7 ft at Ventura. These estimates, however, are only for tsunamis of distant origin because the equations used to simulate and propagate tsunamis probably do not provide an adequate description of near-source processes. For near origins Houston and Garcia (1974, p. A3, A4) conclude that: 'The probability of a destructive, locally generated tsunami occurring in southern California is not considered very great. ...' However, that conclusion is candidly based (ibid) on the interpretation that northwest-trending strike-slip faults (inefficient generators of tsunamis) predominate throughout the southern California Borderland, and clearly does not consider the tsunami-generating potential of east-west-trending oblique-slip faults in the Channel."

49. p. 21, paras. 3, 4, 5 -- A change in the text has been made regarding the possibility of overdraft conditions in the Carpinteria basin. At the time DES 75-35 was prepared, studies were in progress in attempts to determine whether or not the Carpinteria basin was in overdraft. The possibility of overdraft, therefore, was a real consideration. We are now informed that a study of the Carpinteria basin has been completed by Geotechnical Services, Inc., for the Carpinteria County Water District, and that a report is due in February 1976. According to Joe Gonzales (President, Geotechnical Services, Inc., oral commun.), the report will state that at the present time there is no overdraft in Carpinteria basin.
50. p. 22, para. 3 -- The information on which the comment is based did not become available to the USGS until the November, 1974, publication of the Impact Analysis on Platform Holly drilling resumption.
51. The cited paragraph (DES 75-35, p. 32, para. 3) has been modified.

612 Miramonte Drive  
Santa Barbara, Calif.  
August 29, 1975

Director, U.S. Geological Survey  
National Center (MS 108)  
Reston, Virginia 22092

Dear Sir:

I attended the recent hearings in Santa Barbara with regard to the Environmental Impact Survey submitted by the U.S.G.S. The conclusions by experts were very adequately presented, showing that this Impact Statement has great lapses. The citizens of Santa Barbara have been cynical regarding these hearings, feeling that the Interior Dept. and Washington officials in the Interior Dept. and the Presidency have only the oil companies' interests at heart, if they ignore the rational suggestions made at these hearings. Now we shall find out if indeed our government is being run by those companies who have wastefully exploited our natural resources in the past, and now are using international political pressures to direct unwise future decisions. This is a real danger to free enterprise, and a government supposedly run by the people, and for them. We await your actions, and those of our elected representatives. At times we sympathize with members of a panel such as the group who sat for so many hours in the Lobero. Perhaps you too, feel that you have no power to protect natural resources of air, water, internationally known beauty in coastline. Perhaps you too, feel that this inadequate environmental report must be approved and rammed through, regardless of the consequences. Perhaps you will instead restore some confidence in the voters and residents of this area in their government officials. We'll be hoping that your time and our interest won't have been wasted.

Sincerely,



Mrs. William Aggeler



8/31/75

Director, U.S. Geological Survey  
Reston, Virginia

re: Leasing: Santa Barbara  
Channel.

Dear Sir

I am a resident of Santa Barbara City - and have been since 1960. California born, I grew up in the Los Angeles area. The alarming uncontrolled growth of that area led to our move to Santa Barbara.

The recent hearings on leasing offshore for oil exploration, which I attended was merely a continuation of the struggle between the commercial giants and the people who prefer to see their country remain unexploited. There are of course two sides to the problem, and you must and will judge wisely and rationally under all the circumstances.

I implore you to realize the unusual circumstances that weigh heavily against further oil development in the Santa Barbara channel. I was amazed at how oil-related interests and non-resident growth oriented individuals brushed aside the patent peculiar and serious dangers to development in this channel, dangers which could and should not be challenged in the present state of meager knowledge and lack of control on those who we would have to rely for safe operation. Please don't open up the channel -

at least until two things have occurred:

1. There is a complete program of training licensing and supervision over the personnel who would be involved - and that means from the highest to the lowest in the labor chain
2. There is a thorough study to show the need for that particular oil - and a further plan to the end that if it has to be recovered it can be done without spoiling the tourist industry (very important economically here) and the beauty of the area which it serves - and which citizens and visitors so thoroughly enjoy.

Very Truly Yours

Malcolm Grebbold  
1417 Las Canoas Rd  
Santa Barbara CA. 93105

MRS. MALCOLM ARCHBALD

1617 LAS CANOAS ROAD, SANTA BARBARA, CALIFORNIA 93105

August 30, 1975

Director, U.S. Geological Survey  
Reston, Virginia 22092

Dear Sir:

As a Santa Barbara citizen I urge you to delay development for oil and gas in our Channel. At the conclusion of the hearings on the DRAFT ENVIRONMENTAL STATEMENT, it is apparent that many highly qualified people with real expertise find the STATEMENT inadequate and, in many cases, in error. Surely EVERY precaution should be seriously and carefully considered before subjecting this beautiful and fragile Channel to the hazards of deep water drilling and the impact of resulting onshore activity. California needs to complete its coastal zone plans and a comprehensive energy policy geared to long-range needs should be developed.

I am a native Californian and a grandmother. I desperately want some of our once beautiful state saved for my grandchildren to enjoy!

Sincerely yours,

*Louise Archbald*

Mrs. Malcolm Archbald

450 Ellwood Beach Dr., Apt. 12  
Goleta, California 93017  
August 26, 1975

Director  
U.S. Geological Survey  
National Center (MS108)  
Reston, Virginia 22092

Dear Sir:

I spoke at the hearing on the draft EIS for oil and gas development in the Santa Barbara Channel today at 3:00 pm. This letter is in response to some comments of Mr. Kelley's following my presentation.


Mr. Kelley made two points: first, that my characterization of the Interior Department's actions as "hasty" was untrue since the department has been studying further development for several years, and second, that various companies have purchased leases in the channel and are legally entitled to develop them.

I have called the department's actions hasty for three reasons. Real interest publicly shown by the department in further development in the channel and in all the outer continental shelf oil areas is recent, going back only several months. The Congress and the state are considering plans to manage the OCS and the state coastal zone; approval of development plans now would render these plans vacuous and is therefore hasty. Finally, the inadequacies of the EIS demonstrate that it was hastily written and is not the result of several years of study.

Oil companies which own leases do have a right to develop them. But we also have a legal right to be protected from pollution caused by this development. Our businesses, property values, and enjoyment of this area are at stake. One protection we are entitled to is an adequate impact report, and this one is not it.

I am not opposed to oil development per se; I am opposed to oil pollution, and I oppose any development which threatens to cause significant pollution.

Sincerely,

  
Richard H. Bigelow

Enclosure

P. O. Box 237  
Holtville, Calif. 92250  
July 30, 1975

Director, U.S. Geological Survey  
Mail Stop 108  
National Center  
Reston, Virginia 22092

Dear Sir:

I am writing to urge a favorable decision on the proposed oil and gas development on the Federal Outer Continental Shelf lands in the Santa Barbara Channel.

I am a farmer. I farm approximately 1,000 acres of irrigated land in the Imperial Valley of California. I am a Director of the California Farm Bureau Federation, and also a Director of Valley Nitrogen Producers, Inc., a farmer-owned fertilizer manufacturing distribution cooperative with approximately 4,700 members.

An adequate supply of petroleum products is an absolute necessity for the day-to-day operation of my farming operation. I have no horses to replace my tractors, neither do any other farmers in the United States. A short term fuel shortage on U.S. farms would result in extensive crop losses, resulting in higher food prices. A long term fuel shortage would result in starvation for a large number of U.S. citizens.

Valley Nitrogen Producers, Inc. owns a 600-ton per day anhydrous ammonia plant at El Centro, California. This plant represents an investment in excess of Thirty Million Dollars (\$30,000,000.00). The projected gas curtailment to this plant calls for it to be shut down in two more years. This will result in a fertilizer loss which can have no other result than to limit food production. If alternate sources of fertilizer are available, costs will be higher and food costs will go up.

Resumption of development in the Santa Barbara Channel may not save this vital facility. On the other hand, any additions to natural gas supplies in California could well prolong its operating life.

Page 2.

A certain amount of regulation may be desirable for environmental protection. However, in my judgment we cannot bow to the obstructionists to such a degree that we allow them to trigger the economic decline of this nation and eventual starvation of its citizens.

Sincerely yours,



W. E. BISGAARD

WEB/mb

cc: R.L. Manning

5214 Mono Drive  
Santa Barbara, Ca. 93111  
August 28, 1975


U. S. Geological Survey  
National Center (MS 108)  
Reston, Virginia 22092

Gentlemen:

I would like to express my comments as an individual for the hearing record on oil drilling off the coast of Santa Barbara.

Although the anti-oil groups in this area are very vocal, well financed and backed by the only newspaper, my conversations with others here indicate that many, many people favor the recovery of oil from the ocean with reasonable safeguards. They simply are not motivated enough on the subject to form groups and shout. But they do feel that oil energy requirements in 1975 are vastly different from those in 1969 and that off-shore oil is now needed for the best interests of the entire United States.

Yours very truly,



W. E. Bruse

WEB:d



August 4, 1975

Director  
U.S. G.S.  
MS 108,  
National Center  
Reston, Va. 22092

Gentlemen:

As a former resident of California and one who intends to return, please let me plead the case for development of California offshore oil.

For 15 years I have worked in the oil industry. They are the most conservative

Attitude, environmentally oriented person - you'll find in any industry.

Our nation's economic future rests on development of our own fuel resources and the balance of payments will surely see us go under.

The accidents in drilling, or producing, are minor compared to the success. It takes to worrying about an airline crash in relation to the pilots that are safely concluded.

Please put our country's best future first - for oil & gas production.

Yours truly  
A. Stewart



Director of Geological Survey,

This letter pertains to recent hearings held in Santa Barbara, California to determine the environmental impact of off and onshore oil and gas facilities. My opinion on the whole issue is objective for the most part, however, logic seems to point out more disadvantages than advantages to further development at this time.

I do not feel present facilities should be removed, although added development, especially for this area, which depends heavily on tourism, would not suit, I believe, most of the coastal population. I myself, live near the most heavily developed area near Santa Barbara and there are definite and extremely

noticeable side effects to such activities.

There are numerous facts, figures and opinions to back both sides of this type of an issue but those are irrelevant when you start looking at the integrity of those sources. This seems to be the time of enlightenment for the American people except that is all it is. It only appears that way because there is still a lot of deceiving being done.

I feel that the oil and gas companies of the U.S. are creating many shams and I am on the receiving end of many of them. The oil and gas in the Santa Barbara channel and on the coast does not need to be taken so hastily.

In fact there should be a nation-wide halt to concentrated development in that area and it should be changed to exploring different, more easily attainable types of energy. There are many reasons for doing this one being conservation of nature and such perishable things of nature. But unfortunately, no one would make any money so forget that!

What other reason could any people have for acting in such ways to fellow human beings and a planet which supports their own lives? I would say stupidity but I may be treading on somebody's toes.

With reports of billions of dollars in profits why must gas prices go up? With Pres. Ford calling for

· independence from foreign oil why do oil companies export so much of American oil?

There is no proof of anybody actually needing the California coastlines gas and oil so badly they have to switch to something else, so it just can't be so necessary.

A living ocean and breathable air are necessities so lets keep them.

Thank You,

Jackie Bergen  $\ddagger$

Brod L Clements

4411 Via Cayente  
Santa Barbara, California  
August 27, 1975

Director  
U.S. Geological Survey  
National Center (MS 108)  
Reston, Va. 22092

Dear Sir:

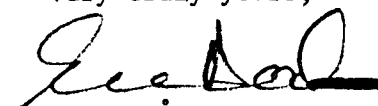
RE: Hearings on Draft Environmental Statement, Oil & Gas Development  
in the Santa Barbara Channel Outer Continental Shelf of California

My remarks are prompted by various statements made during hearings in Santa Barbara on August 25, 1975. I should preface my comments by acknowledging that I have not seen the Draft Environmental Statement. However, in support of their views, many of the proponents of OCS development talked about national security and the prospects of Arab "blackmail." I agree that these are important considerations.. in fact, they are reasons why we should NOT open the Santa Barbara Channel for development at this time. Under current practice, the identification and development of oil reserves is quickly and inevitably followed by production. In short, the granting of development rights leads to production as soon as possible. Because of security considerations and the vulnerability to "blackmail", our national policy should be to identify oil containing areas and then hold them in reserve. To produce our current reserves is precisely the wrong policy in the face of national security needs.

I appreciate that this is not feasible under current institutions and procedures. The Department of Interior should take the lead in suggesting new institutions which will permit development without production. I also heard Secretary Kelly's demurrer that the Hearing Panel could only respond to the mandate of Congress. And yet, most legislation is initiated by the Administration, and I urge that the Department of Interior take the lead in exploring ways of developing reserves without immediately producing the oil.

I must also add that after the arrogance of previous Department officials (eg. McKelvey, Solanas..) during Santa Barbara meetings, Secretary Kelly's concern and patience are refreshing.

Very truly yours,



Edward N. Dodson

4411 Via Cayente  
Santa Barbara, California  
August 29, 1975

Director  
U.S. Geological Survey  
National Center (MS 108)  
Reston, Va. 22092

Dear Sir:

I am a Santa Barbara housewife, mother of four, student, community worker, graduate of Brown University, married to Dr. Edward N. Dodson (Yale, MIT, Stanford), Director of Economic Resources and Planning, General Research Corporation, former Chairman, City of Santa Barbara's Environmental Quality Advisory Board. I write to reflect upon certain reactions I had while sitting through two mornings and two evenings of the recent hearings in Santa Barbara.

First, I should like to thank the panel for its attentiveness during the hearings. Having attended many of the previous oil hearings, I must say it was a welcome change to feel that the panel consisted of intelligent human beings instead of the arrogance to which we have been subjected before. If the residents of Santa Barbara appeared to be skeptical, critical and even rude, let me assure you they had good reason!

As you could see if you had the time to walk around Santa Barbara, our town is special. And it's special because Santa Barbarans have cared enough to plan and protect their life style. It is one of the few places left where living can be a joy.

Also, the residents of Santa Barbara are special. They still know how to smile. And, for the most part, they are intelligent. Oh, they may be confused by a quarter of a million dollar campaign pitch which assures them they're due for a refinery either off shore or on shore, but they rejected anything offshore. The feeling against oil development in the channel runs deep.

We who lived through the 1969 oil spill remember it vividly. A community whose whole economic base depends upon its climate and ocean environment took a long time to recover from that blow. When your whole world becomes "one enormous cesspool" and large amounts of the oil were simply covered over by a layer of sand-- not removed from the beaches-- the oil contamination remains with us even today.

There were many references to the tourists who might go elsewhere if our town changes its character. And I think I heard reference to the university and the colleges whose payrolls provide the largest single factor in our economy. And the retired people--who stay only because the town is a pleasant place. All these people support our merchants and our service industries and if the tourists, university personnel and students and the retired people leave, the town dies.

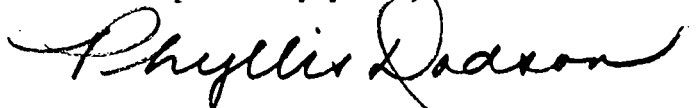
Another major economic factor in Santa Barbara-- the one which provides my bread and butter but to which I did not hear reference during the hearings-- is the Research and Development companies,-- the "think tanks." For the most part, the scientists who work for R&D companies have worked in many other parts of the country-- and the world-- and have chosen to live in Santa Barbara. Oh, they could make more money elsewhere, but they would spend 50 weeks of the year working to save enough money to spend 2 weeks of the year in a place like Santa Barbara. By living here they can run on the beaches during their lunch hours. Here it takes a brief 5-10 minutes to get to a symphony concert or a lecture. Here their children can surf, swim, hike mountain trails, ride horses and enjoy a good education. Their wives can work, attend college, do volunteer work and walk in the downtown area after dark without fear of a knife being wedged between their shoulders. When I heard the arguments saying we had to develop our channel for our "national security," I wondered just how many problems of "national security" are solved by our local scientists and engineers simply because they can eliminate many of the urban problems and pressures from their minds and concentrate on solving the problems facing our nation. In addition to their regular work week, the R&D workers provide much of the volunteer service which comprises the bulk of the local social service agencies and city and county commissions. But the assets of the R&D companies go home at night. There is no heavy equipment. If Santa Barbara changes, the R&D industry will move elsewhere. I, for one, have no intention of raising my 4 children in an oil town.

So you have a dilemma on your hands. My personal opinion is that Santa Barbarans are not "fanatics." We are not "provincial" or "selfish." And we are NOT in the minority! It's all very well for outsiders to come to Santa Barbara and hurl insults at the residents, but Santa Barbara IS a special place. It has ALREADY paid its price. 1969 was enough!

In closing I should like to defend an individual whom I heard smeared more than once-- Frank Sarguis. I am proud to call both Nan and Frank Sarguis "friends." As a young boy Frank lived in occupied Europe. He saw his father die under a Nazi regime. He came to this country as an immigrant and worked his way through university and law school. He could easily make much, much more money, but instead of asking "What's in it for me?", he is dedicated to helping his fellow man. If there were more attorneys in this country like Frank Sarguis, the word "lawyer" wouldn't be such a dirty word.

Thank you for your consideration.

Respectfully yours,



Phyllis Dodson

(Mrs. Edward N. Dodson III)

*Albert Donskind*

807 North Roxbury Drive  
Beverly Hills, California 90210

August 4, 1975

Director  
United States Geological Survey  
Mail Stop 108  
National Center  
Reston, Virginia 22092

Dear Sir:

The hearings scheduled by the United States Geological Survey on August 25 to 27 are of interest to me. However, since I cannot attend I wanted to let you know of my opinion.

As a businessman in Southern California, I am naturally interested in business economics in this area. I believe the time has come to proceed with plans to open up production in the Santa Barbara Channel and to grant additional leases in order that all of the petroleum and gas resources may be fully developed.

I have watched the frustrating situation in Alaska, where a huge national resource was thoroughly discussed but received no action until recently. If proper care is taken of the environment, there is no reason we cannot develop any resource in this country at any place. This is just as true of the Santa Barbara Channel as it is of Alaska, Elk Hills, or any spot in the country where energy sources may be found in the future.

Santa Barbara has been a center of interest for offshore advocates as well as their opponents for the past several years, due to the oil spill there. I understand that spill was one of only four of any consequence which have occurred along the Outer Continental Shelf during the drilling of nearly 20,000 oil and gas wells. Friends in the petroleum industry tell me a similar spill today, while extremely unlikely, would be contained and cleaned up before it reached the beaches, as capabilities in this area have been improved many times in the years since that first spill. I hope you will record my vote for increased development of the Santa Barbara Channel.

Very truly yours,

*Albert A. Donskind*



Monday, August 4

U. S. Department of the Interior  
7744 Federal Building  
300 North Los Angeles Street  
Los Angeles, California 90012

To Whom It May Concern:

This is not a note to request permission to testify at the hearings in the Sobers Theater, Santa Barbara, on Aug. 25, with regard to potential environmental impacts arising from oil & gas development of the outer continental shelf in the Santa Barbara Channel.

It is a note simply to express my deep distrust and outright suspicion of anything the oil companies say or do. They appear to operate solely for their own profits with utter indifference for the consumer. They manipulate supply and prices with a staggering disregard

not only for the citizens of this country, but for the country itself & further, in combination with worldwide oil companies, for the whole world. Their apparent contempt of anything but their profits is really mind-boggling.

There are other methods of getting energy: fuel oil & gasoline could be developed from our coal resources; solar power could also be used. One further reads of other methods. Why are these other methods not investigated more strenuously. I can only assume it is because the oil companies don't want them to be. The oil lobby appeared to be a very powerful one indeed. In fact, in moments of utter cynicism I sometimes feel that oil owns our government.

There are other energy methods

to be investigated so why do we in  
Santa Barbara have to contend  
with the fear of more & larger,  
ugly oil platforms in the channel,  
if the oil companies have their way,  
bigger & larger spills too, no doubt.

"Power corrupts & absolute power  
corrupts absolutely." That phrase  
is synonymous in my mind with  
oil!

Sincerely,

Barbara Tridell  
(Mrs. W.M.)

Comments on: U.S. Geological Survey. 1975. Draft environmental statement, oil and gas development in the Santa Barbara Channel Outer Continental Shelf, off California. DES 75-35. U. S. Dept. of the Interior.

By

Mickey M. Gutierrez

Marine Hydrocarbon Development Policy Worker  
Isla Vista Community Council Planning Dept.  
966-C Embarcadero del Mar  
Isla Vista, CA. 93017

805/961-3775

August 29, 1975

My comments regarding the Draft ES 75-35 are very sincere and are substantiated by referring the reader to sources that verify, concur with or imply, my contentions. As an introductory note I would first like to comment that I was deeply pleased by the Department of Interior's action of holding 3 days of public hearings on the Draft ES, here at Santa Barbara. Secondly, the written and oral comments received by the DOI, I expect, will be critically weighed and considered. Thirdly, it can only be through the combined efforts of the federal, state, county, and local governments and private individuals, groups, agencies, or whatever, that will enable the United States to develop an energy policy that will be environmentally sound and acceptable, while at the same time energy sufficient.

The Draft ES 75-35 is an official federal document that was required by Public Law 91-190, the "National Environmental Policy Act of 1969," to be produced. The Draft ES was undertaken by the USGS of the DOI because of the proposed possibility that the Santa Barbara channel OCS was going to be leased for oil and gas development.<sup>1</sup> It appears that this Draft ES is as inadequate, insufficient and biased as previous EIS's for reasons that I will elaborate on later, but for now, "DOI's manner of operating and history make it appear that it seeks to circumvent the procedures and examination that NEPA and the public demand."<sup>2</sup>

The only time that the public has been able to give any real input into this decision-making process has been at the hearings; "DOI's chosen arena is within the Executive Branch, dealing with the public only at hearings...!" when by law<sup>3</sup> the public should be involved to a greater degree in this process. I honestly question the impact that we, the public, have at these

hearings; "...the draft environmental impact statement issued by the Department of the Interior is merely a pro forma document..."<sup>4</sup> implies that the decision has already been made and the hearings and draft EIS are nothing more than procedural technicalities. That, then is my first criticism of the Draft ES; the public did not have sufficient, if at all any, input into the creation of this document, that states it "...is to serve as one of the bases for future decisions by the Secretary of the Interior and the U.S. Geological Survey regarding future OCS oil and gas operations in the Channel."<sup>5</sup>

A second criticism of the Draft ES is that it comes across as a very subjectively written document, its bias leaning significantly towards advocating the leasing and developing of the SB channel OCS. The best way to illustrate my contention is to review certain passages that are found in the Draft ES.

The effect of minor oil spills on the marine environment of the Santa Barbara Channel can be compared to that of the natural oil seeps of the area. (III-121)  
The impression that is given from this statement is that minor (however many gallons or barrels that "minor" is) oil spills are similar to "natural seeps" therefore there is no need to worry, however, the reader is not told what the impact of natural seeps are and what the impact of natural and man-made oil spills put together, are.

The impact on the physical environment during operations of offshore treatment and storage terminals would be minor, except for the possible effects of minor recurrent oil spills or major oil spills. (III-86)

No where throughout the entire Draft ES does the draft adequately cover a major oil spill or the cumulative effect of several minor spills; therefore, the reader of the above statement cannot in all truthfulness comprehend the impact of re-

current oil spills and a major oil spill. The point that I want to get across here is that for an official federal document that is supposed to analyze a certain proposed action, it does so in a very uncritical and <sup>un</sup>objective manner. Some more phrases:

5        an energy shortage of substantial proportions (i-1)  
is possible but not likely (III-10)  
development is motivated by the need of our energy in-  
tensive society (III-1)

6        The tone of the Draft ES cannot be seen as being at all objective or anti-leasing.

7        My third criticism of the draft is its failure in full-filling its stated and federally required purpose: " to identify and evaluate all probable and potential environmental impacts " of certain different levels of development of the SB channel OCS.<sup>6</sup> One such impact not adequately covered is the socioeconomic impact once the oil and gas industries are finished. The need to examine this far-off impact is a very legitimate one. Another and also important impact is the political one. With different stages of development it will have to be decided who will monitor these stages, especially when pipelines will be running across state coastal acreage, county and city land, etc. All these different jurisdictions raise questions about "eminent domain", especially between the state and federal government. The draft completely ignores the political impacts, which in all essence are the bases for legitimatizing governmental action or decisions.

8        A fourth criticism and an extremely important one is the failure of the draft to critically analyze all alternatives to the proposed action, even though this is a required procedure set down in the NEPA of 1969, Title I, sec. 102, C, iii.

The draft ignored, for what exact reasons I do not know but can guess, examining the viableness of "energy conservation" in all its different levels. The American people have increased their consumption of petroleum and other non-renewable resources over 50% from 1960 to 1970 while the American population was growing at approximately 15%.<sup>7</sup> What this basically means in simple terms is that the American people have an insatiable appetite for energy (6% of the world's population consuming 35% of its energy).<sup>8</sup> We are a country that practices an "extreme over-consumption of energy," as its energy ethic (also an extreme waste of energy).

The Energy Research and Development Administration (ERDA) came out in June 23, 1975, with a publication titled, "A National Plan for Energy Research, Development and Demonstration: Creating Energy Choices For The Future." In that publication there are presented different scenarios that the U.S. could follow with respect to an energy policy (at present there is no national energy policy, which may be one reason why we should delay in the leasing of the OCS) and with respect to energy conservation it states, "place primary national emphasis on the reduction of energy waste and inefficiencies to ease supply problems."<sup>9</sup> It should be obvious from the above quote that energy conservation is indeed a very important alternative, yet it was denied any consideration in the Draft ES.

9 My fifth and final criticism is that I question the very premise that is the reason for initiating this Draft ES. I agree that there is not as much petroleum and gas as American industries would want, but as I have already pointed out, the U.S. is a glut with respect to energy. The government, Draft ES, and oil and gas



industries constantly tell us that if we don't become self-sufficient with respect to energy then: (1) we will lose our military and economic security, (2) our standard of living will drop, (3) how will the U.S. handle its balance of payments. By asking these questions, the government and its affiliates immediately put people on the defensive and they say, "We have oil and gas out on the OCS so lets dig it up, irrespective of the environmental harm it does!" This is the tactic and strategy that the DOI and oil and gas industries have employed. The real answer, however, is to first analyze the problem and then have a variety of solutions, not just one—development of the SD channel OCS.

My critique of the Draft ES has not been that explicit in all respects but I believe that I have given or shown substantial cause for the Department of Interior to reject the Draft ES 75-35. That would be my first recommendation my next would be:

ESTABLISH as a working policy, I repeat, a working policy, the process of communicating and sharing all data with state, county, local governments and private individuals, agencies, etc., when formulating an ENVIRONMENTAL IMPACT STATEMENT.

10

RESPONSE TO MICKEY GUTIERREZ

1. The assumptions are unwarranted. Refer to the Preface and section I.A. for the stated purpose of this environmental impact statement.
2. The distribution of approximately 1,000 copies of the statement in draft form, holding of public hearings for oral comments, receiving written comments and responding to such comments are the means by which all interested parties contribute input to the final statement. Approximately 600 copies of the draft statement were mailed to parties the Department believed may have an interest, the remaining 400 were mailed upon request. The availability of the draft statement was announced in the Federal Register and in a Department News Release.
3. This is noted in the abstract of the Public Hearings along with a range of quite different reactions and contentions. The position of the USGS is nonadvocacy.
4. Quantification, to the extent of available data, appears in III.L.1.

Section III.L. assesses the impacts of oil spills regardless of source, and notes the fact that the fate of oil in the marine environment and the impacts of ongoing research are subjects of ongoing research by many investigators. Some of the published conclusions and data are conflicting. Additionally, there is a paucity of data in some areas, including the subject of cumulative impacts of natural seeps and man-made seeps.

Both the National Academy of Sciences, 1975: Petroleum in the Marine

Environment, and Kolpack et al. 1973, Fate of Oil in a Water Environment--A Review and Evaluation of the Literature, are comprehensive references on the state of knowledge.

To quote the preface of National Academy of Sciences, 1975 (see section III references): "In the future, the uncertainty regarding petroleum in the marine environment can only be narrowed by the accumulation of more firm information. Until then we must be content with figures of less than complete certainty . . . Divergences of viewpoints were discussed and mostly reconciled without rancor, despite the importance of many questions and the difficulty of obtaining reliable data."

The University of Southern California Environmental Geology Program notes (Kolpack et al., 1973, see section III references): "The literature indicates that there has been an unbalanced treatment of the various questions related to the fate of oil in the water environment."

The California Coastal Plan (1975, p. 34-35) prepared by the California Coastal Zone Commission recognizes that:

- The long-term and sub-lethal effects of spilled oil are not completely known. There have been few research projects on these effects and conclusions so far have been equivocal.
- Studies on the effects of spilled oil along the coast are complicated by the presence of natural oil and gas seeps that regularly emit petroleum, with unknown effects on the marine environment.

5. See our response to your comment No. 3 above.

6. The DES is not a lease sale statement (see section I.A.).
7. Socioeconomic impact considerations have been greatly expanded in the final statement. It is repeatedly stated that the onshore facilities would have to be in accordance with all applicable County and State regulations. Refer to our responses to EPA, The Resources Agency of California and the California Coastal Zone Conservation Commission in regard to the Coastal Zone Plan. See sections I.F.2.a. and IV.A.1.h. for an updated and expanded discussion of the Coastal Zone Plan.
8. In the draft statement, energy conservation was the first alternative considered in the energy alternatives section. This discussion has been expanded in this final statement (refer to section VIII.G.1.).
9. Refer to the Preface and section I.A. for a discussion as to the reasons for initiating this statement, and for the basic stated purpose. This statement identifies and assesses the impacts that would result from possible future Channel development. Three of the four possible levels of development involve areas that were leased prior to 1969.
10. Refer to response number 4 of the State Lands Commission.

August 1, 1975

Director, U.S. Geological Survey  
MS 108, National Center  
Reston, VA 22092

Dear Sir —

I am writing to urge the re-opening of the Santa Barbara Channel for further development of oil and gas reserves. We have come such a long way since the 1969 spill, both in improved safety techniques and regulation, and in dire need for expanded energy sources.

I am a conservationist. I have lived on the Southern California coast for the past eight years, and wish to see the environment preserved. But I am not an obstructionist. It makes no sense to me, politically or economically, to continue to delay the search and production of vital energy. I have written both Senator Tunney and Cranston and expressed displeasure with their tactics. Please take the leadership in this issue.

Thank you,

William Hobbes

ERNEST J. LOEBBECKE  
433 SOUTH SPRING STREET  
LOS ANGELES, CALIFORNIA 90013

July 31, 1975

Director  
U. S. Geological Survey  
Mail Stop 108  
National Center  
Reston, Virginia 22092

Dear Sir:

I would appreciate your entering this letter in the files of the August 25-27 hearings in Santa Barbara, representing my opinion as a private and interested citizen.

As a resident of Southern California for the past forty-five years and one who has used its beaches and oceans for recreational purposes, I have some knowledge of the effects of the oil production which has occurred off-shore during that time. The so-called Santa Barbara Channel spill was an unfortunate incidence, but the drilling companies immediately responded to the problem and any damage must, in the long view, be considered as extremely minimum.

I am informed that since that time the oil industry has developed a containment capability which would greatly reduce, if not entirely eliminate any effects in the unlikely event that another spill should occur.

I am further informed, and I consider the source reliable, that some 18 or 19 thousand wells have been drilled on the Outer Continental Shelf and that only 4 spills of any consequence have occurred.

In light of this nation's desperate need for oil it seems to me that such a record in itself would dictate that the development of off-shore drilling should be approved and encouraged, particularly in light of current levels of technical competence and supervision of the drilling companies.

Here in Southern California there is a more pressing need for the

Director

U. S. Geological Survey - page 2

July 31, 1975

continued development of the Santa Barbara Channel fields. In addition to the oil which is produced, this area also produces natural gas. All of the evidence which I have seen seems to indicate that there will be a shortage of natural gas in Southern California in the course of the next two or three years. This, it seems to me, is another reason for the continued development of the Santa Barbara Channel area.

It is my view that the course is justified, and I urge you to encourage further exploration and production in that area by offering additional leases to qualified and interested producers.

Very truly yours,

A handwritten signature in cursive script, appearing to read "Ernest J. Loebbecke", written in dark ink.

Ernest J. Loebbecke

## FERDINAND MENDENHALL

5 August 75

Director  
U.S. Geological Survey  
Mail Stop 108  
National Center  
Reston, Virginia 22092

Dear sir:

Unfortunately, I will not be able to attend the hearings scheduled by the U.S.G.S. on the question of opening the Santa Barbara Channel to additional exploration and production to be held in Santa Barbara on August 25-27, 1975. Therefore, I would like you to know that, as a businessman long interested in the economics of Southern California, and the nation, I urge you to open up the Santa Barbara Channel to further exploration and production from that exploration. Also, please give serious consideration to recommending the offering of additional leases in that area.

The nation has seen, during the past eighteen months, the terrible effects of the lack of domestic crude oil and natural gas on the economy, on the consumers, and business in general, and on employment. The sad part about all of this is that it is unnecessary. If the Alaska pipeline had been approved four years earlier than it was, as it should have been, we would have an additional two million barrels a day available domestically. When the argument about the Alaskan pipeline was going on, people were saying now that there can be further delay in developing the Outer Continental Shelf, including the Santa Barbara Channel, because if it is developed the oil will not be available until the late '70s. In the first place, some of this oil would be available very promptly because the exploration and development phases have been completed. In the second place, the oil will certainly be needed in the late '70s and in the 1980s. This remains true even though we get full production from Alaska and from Elk Hills.

The problem of natural gas is slightly different. We simply cannot afford to meet all new requirements for



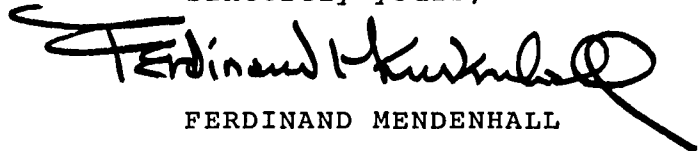
Director  
U.S. Geological Survey  
Page 2

natural gas solely by importation. Cost alone excludes that possibility. There is natural gas to be found in conjunction with the production of crude oil in the Santa Barbara Channel and the natural gas is going to be in short supply in Southern California--right here--within the next two years if new supplies are not found and made available.

Most of us in this area know about the Santa Barbara spill firsthand. It was a terrible thing to happen. However, it is the only spill of any consequence we have experienced in this area; and when one bears in mind that the oil industry is providing containment and clean-up capability far beyond that available when the spill occurred, such an accident if it were to happen again, a most unlikely possibility, would not result in oil reaching beaches under any conceivable circumstances.

I am strongly in favor of opening the Santa Barbara Channel to additional production at once.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Ferdinand Mendenhall", with a large, stylized flourish at the end.

FERDINAND MENDENHALL

HOWARD MORF  
INVESTOR  
1770 EAST VALLEY ROAD  
SANTA BARBARA, CALIFORNIA 93108

August 7, 1975

United States Department of the Interior  
Geological Survey  
7744 Federal Bldg.  
300 N. Los Angeles St.  
Los Angeles, California 90012

Dear Sirs:

I have completely overlooked the expiration date to request time to express an opinion on your hearing, August 25, 26 and 27.

In my opinion, it is a most unfortunate situation when a misguided segment of our population is really confused as to the American economic mechanism.

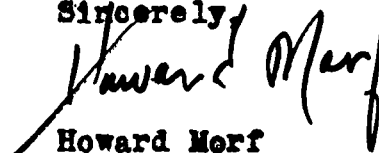
Now, more than ever, we need oil. It is an important factor in solving our balance of payments and in gaining more respect for our dollar throughout the world.

Obviously, curtailing our imports will help to control inflation. This is important to the majority of our population, who must also be considered.

I lived at the beach for five years, from 1945 to 1950, at Fernald Point, here in Santa Barbara. Then, as now, we did find some tar on the beach, occasionally.

There is no justification for the delays.

Sincerely,



Howard Morf

5401 Lennox Apt. 80E  
Bakersfield, Ca. 93309  
August 5, 1975

Director  
U. S. Geological Survey  
MS 108  
National Center  
Reston, Va. 22092

Re: 1,306 page draft Environmental  
impact statement prepared by  
the U.S.G.S. for public comment  
on developing oil and gas  
reserves in the Santa Barbara,  
California Channel

Dear Sir:

As an interested citizen of the United States, I would like to go on record as favoring the development of the Santa Barbara California channel for oil and gas production.

Too long have we, the United States, been dependent upon foreign sources of oil and gas. We have no alternative to the immediate development of our own oil and gas reserves.

Admittedly there may be some adverse effects upon the environment, but the need for oil and gas far outweigh the adverse effects.

I think the U.S.G.S. can find that although there will be some adverse effects, that such will not have a significant effect on the environment. As I understand the Federal law, the economic effects are to be given equal weight with the adverse environmental effects.

I hope that the law will be followed in making your decision.

Certainly offshore drilling has been successfully accomplished for years in the Gulf of Mexico without seriously injuring the environment. At the same time, this economic activity has been of tremendous value to that area and to the entire United States.

There is no meaningful alternative to development of the offshore oil and gas resources and I strongly advocate such development.

Very truly yours,

  
Gene E. Steed

**JOHN V. VAUGHN**  
555 SOUTH FLOWER STREET  
LOS ANGELES, CALIFORNIA 90071

August 4, 1975

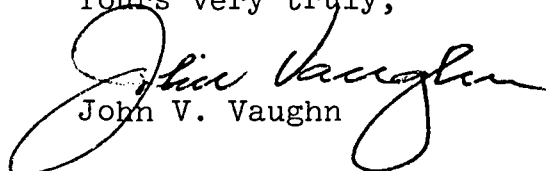
Director  
U. S. Geological Survey  
Mail Stop 108  
National Center  
Reston, Virginia 22092

Dear Sir:

I will not be able to attend the hearings in August on the question of developing potential oil and gas deposits in the Santa Barbara Channel, but, as a businessman long interested in the economics of California and the rest of the country, I would like my opinion to be on record in the files of the hearings.

We in California have felt the effects of the shortage of domestic oil and natural gas on business in general and on employment. We must develop our energy resources or face the impact on our economy that increased foreign imports of petroleum will cause in future years. I urge you to support the development of oil and gas deposits in the Santa Barbara Channel Continental Shelf and that additional leases in the area be offered.

Yours very truly,

  
John V. Vaughn

JVV:dvr

CAROL ARTH WATERS

1842½ NORTH NORMANDIE AVENUE, LOS ANGELES, CALIFORNIA 90027

July 31, 1975

The Director  
U. S. Geological Survey  
Mail Stop 108  
National Center  
Reston, Virginia 22092

Dear Sir:

I am aware that hearings will be held in Santa Barbara, California, August 25-27, on the draft environmental impact statement (DES 75-35) for potential oil and gas development, Santa Barbara Channel OCS, off California.

Because I will not be able to attend the hearings, I would request that you enter this letter into the record.

In urging that the federal government open up the Santa Barbara Channel to further oil and gas production, I do so as a businesswoman and as the owner of Santa Barbara property with my husband. As a Southern Californian for 46 years, I am more concerned than I have ever been about the economy here and specifically, the effects on business and employment brought about in large part by the lack of domestic crude oil and natural gas.

People who occupy positions of leadership and, therefore, are supposed to lead us in tough times as well as easy ones, have stood on one foot and then the other and said "yes," "no," and "maybe" while we have urged that they get on with the job. Every day lost in development of our domestic reserves puts us that much farther behind.

We went through the "spill" in Santa Barbara. We didn't like it any better than anyone else including the oil companies. We are convinced that the companies will operate with great care and, should a spill occur, that they will thoroughly and completely take care of it.

We cannot be self reliant if our oil and gas reserves are not developed. We do not have any more time to argue. Decisions must be made in our own interest.

Sincerely,



Mrs. Carol A. Waters

IX-441