ENVIRONMENTAL REPORT (EXPLORATION)

FOR

PROPOSED EXPLORATORY WELLS P-0204-1, P-0208-2, AND P-0209-2

SANTA BARBARA CHANNEL

OFFSHORE SOUTHERN CALIFORNIA

FEDERAL OCS LEASE BLOCKS 204, 208, AND 209

TO SUPERVISOR,

THE UNITED STATES GEOLOGICAL SURVEY

FROM

CHEVRON U.S.A.,

OPERATOR

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October 30, 1978

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INTRODUCTION

Chevron U.S.A. Inc. proposes to drill three exploratory wells in the Santa Barbara Channel region of the Pacific Ocean, about 11 miles southwest of the City of Ventura and about 7.5 miles north of Anacapa Island (Figure 1). The proposed wells will be located in Federal OCS leases P-0204, P-0208 and P-0209. These leases lie in the southeasterly part of the Santa Clara Unit and they are all associated with the same prospect (Figure 2).

These projects will be of temporary duration. The active drilling phase of each well will probably last about 45 to 60 days, after which evaluation and abandonment procedures will probably last another 15 to 25 days. It will take about 6 days to move in and then out of each location. This results in a total of about 60 to 90 days for each project.

The submission of this Exploration Environmental Report, which will be accompanied, or followed by, Exploration Plans for each well, is intended to fulfill the requirements of Section 250.34-3 of CFR Title 30, Part 250, as promulgated January 27, 1978.

This report is designed to respond to the specific requirements defined in Section 250.34-3(a)(i) through (xi) inclusive of the above cited regulations.

Information available in recent applicable environmental studies and environmental impact statements has been referenced extensively in this report. Data has been summarized from other reports by state agencies and independent authors. Information applying specifically to this project has been furnished by the professional staff of Chevron U.S.A. Inc.

The general environment in the area of the project, including information on the oceanography, submarine geology, sensitive and hazardous areas, potential project impacts, alternatives and mitigations, and many other aspects,

is amply discussed in a number of the references listed in the bibliography. Considering the extensive nature of these prior studies, and in order to avoid redundancy, data which is directly applicable to this project is often simply referenced in this report.

The impacts of the proposed projects on the environment, as analyzed in the following presentation, are concluded to be negligible in magnitude and temporary in nature. If the proposed exploratory projects result in the confirmation of a commercially developable accumulation of oil or gas, or both, then a plan for the development of the resource will be required. In this event, another Environmental Report for the development phase also will be required per 30 CFR 250.34-3(b).

ENVIRONMENTAL CONDITIONS IN AREA OF PROPOSED EXPLORATION

The following summary of environmental conditions in the area of proposed exploratory wells P-0204-1, P-0208-2, and P-0209-2 has been prepared to accompany the Exploration Plans as they are submitted with requests for permits to drill these wells. Each of the following subheadings has been numbered to conform with Title 30, Part 250.34-3 of OCS Rules and Regulations published in the Federal Register, Volume 43, No. 19 - Friday, January 27, 1978.

This Environmental Report (Exploration) includes, as required, available information that is accurate and applicable to the geographic area. The following information is from "the most recent Environmental Impact Statement(s) for the area" as well as other generally available and current publications.

1.0 Description of the Affected Ocean Area

The area which will be affected by the proposed exploratory wells (P-0204-1, P-0208-2, and P-0209-2) is located in the southeast corner of the Santa Barbara Channel (Figure 1). The federal tracts involved are part of the Santa Clara Unit which includes 8 tracts in the east end of the Santa Barbara Channel, extending from 6 to 12 miles west from the Montalvo coastline. Location of the Santa Clara unit boundary, Parcels P-0204, P-0208 and P-0209, and the proposed well locations are shown on Figure 2.

1.1 Bathymetry

Water depths at the proposed drill sites will be as follows:

P-0204-1 = 676'

P-0208-2 = 394'

P-0209-2 = 711'

The ocean floor in the area of the three proposed wells has a moderate overall slope to the southwest of about 210 ft. per mile, resulting in a slope ratio of 1:25. A steepening in this slope, which trends nearly east-west, occurs at the 120 meter (394 ft) depth and continues to a depth between 200 meters (656 ft) and 230 meters (755 ft). These ocean floor conditions have been reported by NOAA (Ref. 1) and are described in the waterborne surveys performed by General Oceanographics, Inc. (Ref. 2) (Figure 3). This change in sea-floor slope occurs between the proposed location of the P-0208-2 and the proposed locations of P-0209-2 and P-0204-1. In the immediate vicinity of P-0208-2 the slope is about 173 ft. per mile for a slope ratio of about 1:30. At the P-0209-2 and P-0204-1 locations the slope is about 100 ft. per mile for a slope ratio of approx. 1:53.

Locally the sea-floor in this general area exhibits minor slump features and a hummocky topography. This hummocky topography has been reported by General Oceanographics, Inc. (Ref. 2) to lie in a zone bounded by the 120 meter and 200 meter water depths and shown on figure 3. It appears that this hummocky topography is related to shallow slide conditions on the surface of the more steeply sloping ocean floor mentioned above. All of the proposed drill sites have been located away from these potential slide areas. Locations P-0204-1 and P-0209-2 both lie on moderately sloping surfaces to the south of the slump zone. Location P-0208-2 is over 1000 feet north of the slump zone on a moderately sloping surface (figure 3).

1.2 Ocean Currents and Waves

It is anticipated that the three proposed wells will be drilled at various times throughout the year and will, therefore, experience the seasonal range of current variations. Because the proposed wells are quite close to each other, the most widely separated being only about 2 miles apart, current conditions are assumed to be the same at all three locations.

The surface currents in this area of the Santa Barbara Channel are not strong, ranging in velocity from 0.3 to 0.6 knots in summer to 0.5 to 0.7 knots in winter. Current directions are variable with the widest variations occurring during the summer. Winter directions tend to be westerly and summer directions easterly and southeasterly (Ref. 3 & 4). Subsurface Channel currents are primarily related to tides and sea floor topography. They usually have a lower speed than surface currents and differ most widely from surface currents in both speed and direction during the summer months. Kolpack (Ref. 5) suggests that the northeasterly flowing subsurface current in the easterly Channel region (i.e., the California undercurrent) is deflected to a westerly course by the central Channel sea floor ridge. This deflection may commence at or near the vicinity of the proposed exploratory wells. Intersea Research Corporation (Ref. 6) found that the subsurface currents had the same general direction as the surface currents during their studies for the proposed Santa Clara unit pipeline.

Surface wave conditions in the eastern portion of the Santa Barbara Channel are quite mild because of the few storms passing through the area, and because of the protection from northwesterly winds afforded by the Santa Ynez Mountains. Significant wave heights average less than 6 ft. Severe storm waves (100 yr.

max.) have a 95% probability of not exceeding about 10.5 meters (34.4 ft.) in height. Wave direction is generally from west to northwest because of the prevailing winds from this direction (Ref. 3, pps. II-199-207).

1.3 Water Quality

The physical and chemical characteristics of the waters in the Santa Barbara Channel vary with the currents, discharges from various onshore sources, and the interactions between these and other processes. A great deal of information is available from the Final EIS for the Development of Oil and Gas in the Santa Barbara Channel OCS, FES/76-13 (Ref. 3, pp. II-214 through II-226) and the Draft EIS Proposed 1979 OCS Sale No. 48 (Ref. 4, pp. 87 through 119).

The temperature in the Southern California Bight fluctuates annually between about 10°C and 18°C. During the summer the waters stratify with a thermocline at a 20- to 30-meter depth. These temperature changes are due to the atmospheric temperature, advection of water from nearby areas, cold water upwellings, and the mixing of warm surface water with cold deeper waters (Ref. 3, p. II-214).

The salinity of the area waters varies between about 33.3 o/oo (parts per thousand) and 34.0 o/oo. These fluctuations are caused by precipitation and evaporation at the surface, by freshwater land runoff, advection, and by upwellings (Ref. 3, p. II-216).

The density of the waters of the area varies with both the temperature and the salinity of the water, ranging from 1.02347 to 1.02590 qms/cm^3 (Ref. 5, p. 57). The variation in the Southern California Bight divides the water

into a shallow surface, wind-mixed layer of 10- to 50-meter thickness and a thick, deep bottom layer of greater density.

The hydrogen ion concentration (pH) of the area from Point Conception to the Mexican Border ranges between 7.5 to a maximum of 8.6 with a mean of 8.1 (Ref. 3, p. II-216).

Dissolved oxygen is a product of photosynthesis by marine flora, free exchange with the overlying atmosphere, and turbulent mixing by winds, tides, and currents. The surface is nearly always saturated, sometimes as high as 140 percent of saturation. Dissolved oxygen decreases with depth and at 60 meters is about 4 mg/l, which is about 50 percent of saturation. Below sill depth (that depth below which the ocean floor constitutes a closed topographic basin) there may not be adequate oxygen for marine life. Hydrogen sulfide production by anaerobic bacteria in the top sediment layers will further decrease free dissolved oxygen to levels as low as 0.1 mg/l (Ref. 3, p. II-218).

Various inorganic nutrients such as nitrogen, phosphorous, and silica are supplied by upwellings, advection and land discharges (rivers and industrial and domestic effluents). These nutrients are depleted by uptake by phytoplankton. Nitrate concentrations vary from 0.01 mg/l to 0.16 mg/l at the surface, 0.20 mg/l to 0.40/mg/l at 90-m depth. Phosphate varies between about 0.40 mg/l and 0.90 mg/l; silicate trace to 2.85 mg/l (Ref. 3, p. II-218).

Trace metals such as copper, cobalt, zinc, iron, manganese, boron, molybdenum, and selenium are physiologically essential to biological productivity. However, these same elements can be toxic in concentrated

and/or transformed conditions. It is difficult to ascertain general concentrations for trace metals in sea water due to the limits of detection of analytical equipment and uncertainty as to the physical/chemical state of the constituent. Factors such as variations with depth, nearness to shore, upwellings, storm runoff, or extensive alterations in plankton populations all create variation ranges (Ref. 3, pps. II-220-223).

Along the California coast, the mean visual transparency of the water varies from less than 6 meters to more than 15 meters; lower values occur close to shore. The attenuation of light is measured by an extinction coefficient which relates the light remaining at a depth to the original incident light. Extinction coefficients offshore California are in the range of 0.08 to 0.40 per meter. This coefficient is dependent upon the quantity and size of suspended particles in the water, and to the kind and quantity of dissolved organic substance, all which increase nearer the coast (Ref. 3, p. II-224).

According to the Central Coast Region, California Regional Water Quality Control Board (Ref. 7), the chief water quality problem involves the discharge to state waters of municipal and industrial waste waters, most through short outfalls with minimum dilution and dispersion. There are eleven municipal dischargers and fourteen separate industrial dischargers in the Santa Barbara Channel. All separate industrial dischargers are related to oil production. However, the total constituent mass emission rates contributed by the industrial discharges for total suspended solids and oil and grease are about two percent of that contributed by the municipal discharges, and chemical oxygen demand is about seven percent of that of municipal discharges. All discharges in the OCS must adhere to "appropriate standards in effect at the time." This could be OCS Orders 7 and 8 and/or regulations generated by the Federal Water Pollution Control Act Amendments of 1972 and through the NPDES permit process.

1.4 Submarine Geology

The proposed drilling sites for wells P-0204-1, P-0208-2, and P-0209-2 lie in the central portion of the east end of the Santa Barbara Channel (Figure 1). Descriptions of the environment and geologic framework within the channel have been published by the Bureau of Land Management (Ref. 4) and U.S. Geological Survey (Ref. 3 & 8). These reports should also be referred to for a detailed description of the stratigraphic section present in this area.

As shown in Figure 1, the Santa Barbara Channel is located within a geomorphic province called the Transverse Ranges. The diverse geologic terrain

in this province has predominant topographic and structural trends that have a nearly east-west orientation. In the immediate area of the prospect to be drilled by the three proposed wells the same topographic and subsurface structural trend exists (Figure 4).

1.41 Shallow Drilling Hazards

The bottom sediments at each of the proposed drill sites consist of a thin layer (i.e., 10 to 20 feet) of unconsolidated muds mixed with silt and clay. These mudline sediments are immediately underlain by sediments of similar lithology that are stiffer and better consolidated. At the P-0208-2 location the mudline sediments appear to rest on older sediments that are Pleistocene in age. Whereas, at the P-0204-1 and P-0209-2 sites the mudline sediments rest on Holocene silts and clays that may range up to 50 feet in thickness.

In the immediate area of all three drill sites a hummocky topography exists. This particular feature, which appears to be related to shallow slide conditions on a steeper slope, has been discussed in Section 1.1, Bathymetry.

There is no evidence of any shallow faulting in the vicinity of the proposed drill sites (Ref. 2).

The shallow sediments do contain a minor amount of gas. The presence of this gas acts as an acoustical barrier that affects some of the records from shallow high resolution geophysical surveys. This gas condition has not proven to be a hazard during the drilling of 18 shallow core holes and 7 deep exploratory wells on the eight leases that make up the Santa Clara Unit (i.e., P-0204, P-0205, P-0208, P-0209, P-0210, P-0215, P-0216, & P-0217).

1.42 Deep Drilling Hazards

The usual deep drilling hazards encountered while penetrating hydrocarbon bearing formations are expected during the drilling of the three proposed wells. As part of the blowout and oil spill prevention plan, Chevron's drilling program will contain a casing program that will be in accordance with OCS Order No. 2 - Drilling Procedures.

The deepest hole drilled in the area went to a depth of 12,854 feet. Like the other six wells drilled in the immediate area above normal formation pressures were encountered between approximately 4500 feet and 7500 feet. The above normal pressures represented an increase in pressure gradient from .45 psi/ft. to .65 psi/ft. These pressures were controlled without incident by setting casing above the formations with increased pressure and drilling with higher weight drilling fluids. Below 7500 feet normal hydrostatic pressures of .44 psi/ft. were encountered.

1.43 Seismicity

Earthquake activity in the Santa Barbara Channel has been adequately covered by the Bureau of Land Management in their 1978 report (Ref. 4), the U.S. Geological Surveys 1969 and 1976 Reports (Refs. 8 & 3), and the earthquake reports of 1973 & 1976 by the Seismological Laboratory at the California Institute of Technology (Ref. 9 & 10).

There are no known active faults in the area of the proposed drilling sites. The closest active fault is the Oak Ridge fault, an east-west trending thrust fault whose near surface trace is over 6 miles north of the P-0208-2 drill site (Figure 4). This is also the dominant potentially active fault within range of Chevron's operation which would establish the design

criteria for future development. All other active faults are too far removed to create levels of ground shaking at the proposed drill sites which could exceed those from a magnitude 6.5 Richter scale earthquake at 10 Km depth on the Oak Ridge fault. It is estimated from Schnable and Seed (Ref. 11) that such an earthquake could cause ground accelerations of about .25 g at the drill sites.

1.5 Weather Patterns

The California coastline east of the proposed test wells has a Mediterranean Climate which is tropical and dry in the summer. The area lies on the southeastern edge of the Pacific High Pressure Area. As the Pacific High moves northward in the summer, the winds are primarily from the northwest. This creates warm dry summers because the high forces the low pressure areas eastward at more northerly latitudes. As the high retreats to the south in winter, the low pressure areas also advance south yielding mild, wet winters. Mean daily temperatures over the Santa Barbara Channel range from the low 50's in winter to the high 60's in the late summer. Extremes of 20°F and 115°F have been recorded. Annual rainfall averages at Santa Barbara about 17.0"; Oxnard - 14.6". The rainfall occurs mainly in the winter, November through April. The dominance of the northwesterly winds also decreases in winter and wind patterns become more diffuse. Maximum velocities are encountered from the northwest in the spring and may reach 60-65 knots. Severe storms, i.e., thunderstorms, are infrequent and rare. Funnel clouds and hurricanes are virtually unheard of (Ref. 3 & 4).

Wind patterns in the vicinity of the proposed projects (refer Ref. 3, Vol. 1, pps. II-166 and 167) suggest two predominant wind directions. From the locale of these projects the wind blows partly shoreward toward the Montalvo coast and partly southeasterly into the ocean area of the Santa Monica Basin. During early morning hours of the winter months, the wind blows from the Montalvo shoreline toward the project(s) area and out to sea. The eastern end of the Channel is one of the more sheltered regions and winds there are weaker and more variable than further to the west. Average daytime wind velocities range from 8 to 11 mph, at night dropping to 3-5 mph.

Storm (wind generated) waves in the eastern part of the Channel are of lesser magnitude than those in the western portion. In the vicinity of the proposed wells Riffenburgh's studies (Ref. 3) indicate a 95% probability that the maximum 100 year wave will not exceed 36 feet in height and 790 feet in length.

Fog is a common phenomenon in the area. This is due to light, anticyclonic winds in the warm months. The occurrence of fog is greatest and most extensive in the summer. From April through October, visibility is reduced to 2 miles or less an average of 20% of the time. From November through March, the same reduction occurs only 6% of the time (Ref. 3, pps. II-179, 180).

1.6 Air Quality

The onshore areas of Santa Barbara and Ventura counties are within the South Central Coast Air Basin. Ambient air quality data for the Santa Barbara Channel region can be obtained from the California Air Resources Board (CARB), the Santa Barbara Air Pollution Control District (SBAPCD), and the Ventura Air Pollution Control District (VAPCD). Data is available for total oxidant, carbon monoxide, nitrogen oxides, hydrocarbons, and suspended particulates. 1976 is the latest year for which reasonably complete information is available.

Several studies have noted that there is a lack of air quality data in the offshore area. The nearest stations to the proposed OCS projects are located in the city of Ventura and at Pt. Mugu. These are operated by the Ventura County Air Pollution Control District. Unfortunately, these station locations are probably too far from the proposed drill sites to be used directly for air quality determinations.

However, prevailing winds in the area of the proposed drill sites are easterly and south-easterly, sea to land and seaward, respectively. This should inhibit the transport of air pollutants created onshore to the drill sites. There are very few emission sources of any consequence in the western portion of the Channel that can impact air quality at the drill sites. Thus, it is concluded that air quality at the drill sites and surrounding region is good, and that Federal Standards are not exceeded.

2.0 Environmentally Sensitive or Potentially Hazardous Areas, Alternatives and Mitigating Measures

In this section it is required that those environmentally sensitive or potentially hazardous areas which might be affected by the proposed exploratory activities be described. A description of possible alternatives to the proposed projects and measures to be taken to preserve or protect these areas also is required. Included in such areas are those of cultural, biological, archeological, and geological significance, as well as areas designated as being of particular concern by affected states, in accordance with the Coastal Zone Management Act.

2.1 Environmentally Sensitive Areas

Included in this discussion of environmentally sensitive areas is an inventory of such areas in the general region of the Santa Barbara Channel as enumerated below. These are also shown in map form (Figure 5). Because the proposed projects do not lie within or near any such area, no detailed discussion is contained herein, but references for some are indicated. Other reports (Ref. 12, Chapters 6 and 16) have suggested other values to be included within the "sensitive" categories and the discussion of alternatives and mitigations following would also pertain to these.

In the general region of the Santa Barbara Channel the following officially protected areas presently exist:

1. State Oil and Gas Sanctuary (No. 1, Fig. 5), (Ref. 12, p. 339).
2. San Miguel, Santa Rosa, Santa Cruz and Anacapa Islands (Nos. 2 and 3, Fig. 5), and Mugu Lagoon to Latigo Point (No. 4, Fig. 5). These are designated as Areas of Special Biological Significance by the State Water Resources Control Board (See: Ref. 3, Vol. 2, p. 600; Ref. 12, p. 338; and Ref. 16).
3. Channel Islands National Monument (No. 5, Fig. 5), of which only Anacapa Island lies in the general region of these projects (Ref. 12, p. 336).
4. Federal Ecological Reserve and Buffer Zone (No. 6, Fig. 5). This area lies about 15 miles northwest of the proposed projects (Ref. 3, p. ii-11).

The proposed projects should have little or no effect on biological conditions in the immediate drill site areas. Biological conditions further removed from the proposed drill sites could only be effected by a major oil spill (i.e., over 1000 barrels). Sections 3.1 and 3.2 should be referred to for the oil spill preventive measures to be employed by Chevron during the drilling. There are no known rare or endangered species of flora or fauna residing in the proposed project area. Available evidence indicates that total exposure of the flora and fauna, which occupies the project area, to the discharge of drilling fluids and drill cuttings will result in no adverse effects to measurable numbers of these organisms (Ref. 15 and 22).

Regarding the California Gray Whale (Eschrichtius robustus) and the Pacific Right Whale (Eubalaena glacialis), contact was made with Drs. William C. Cummings and Raymond Gilmore, scientists at the Natural History Museum in San Diego. Dr. Cummings was formally Senior Scientist at the Naval Ocean Systems Center in San Diego, and has spent the last 15 years doing bioacoustic and marine biological research related to whales. Dr. Gilmore was recommended as one of the top authorities in the nation on the California gray whale.

Both Drs. Cummings and Gilmore indicated that the internal navigational systems of whales are highly sophisticated and that it would be very unlikely for such whales to come into contact with any objects in the ocean. They stated that whales are very adept at avoiding even "whale-watching" boats that attempt to follow migrating whales as closely as possible.

The Gray Whale is very accustomed to both natural and man-made objects and noises, and frequently travels in the shipping lanes where noise levels are at their highest. As to the Pacific Right Whale, it was stated that the last sighting of such a whale was off the coast of California near San Diego

in 1955, and that one sighting every 20 years would be about normal for this species.

While Drs. Cummings and Gilmore indicated that there was no definitive study which provides information on the effect, if any, on migratory patterns of the types of noises which will be created by Chevron's proposed activities, they both stated their opinion that the proposed exploratory drilling does not pose any threat to the whales or their migratory patterns.

Commercial and sport fishing will not be materially affected by the presence of a drilling vessel in the project area. The operations contemplated by Chevron are of small dimensions, having a short duration (about 40 days), and not involving any construction, large amount of noise or the use of any freighters or other large vessels, other than the drilling vessel itself. Since the project area is located near the center of the eastern end of the Santa Barbara Channel, over $6\frac{1}{2}$ miles from the nearest shoreline, it receives little or no sport fishing or recreational use.

Anacapa Islands, located approximately 8 miles south of the most southerly well in this prospect area, will not be adversely affected by the proposed drilling. Oil spill trajectory studies (Ref. 12), current pattern studies (Ref. 3, p. II 188 to 194) and prevailing wind patterns (Ref. 3, p. II - 162) indicate that there is very little likelihood that an oil spill will move toward the islands. The nearest landfall, approximately $6\frac{1}{2}$ miles east of the easterly most proposed well, is the continental coastline of Southern California. An oil spill at any of the proposed drill sites, if not contained, is expected to impact this coastline and not the channel islands.

The impact of any such spill even on the shoreline of Ventura county is not expected to be lasting, but will have some short duration adverse effects (Refs., 34, 35, and 36).

The Santa Barbara Channel region also is known to contain sites of historic and prehistoric values. These involve archeological finds and other evidence of early cultures. The proposed exploratory wells and ensuing development, should any occur, are located in water depths ranging from 400 to 720 feet (approx.), and therefore are not considered as relating to the potential for recovery of archeological or cultural remains. Furthermore, no such sites or potential cultural remains have been identified in the area of the proposed wells by the U.S.G.S. Supervisor pursuant to NTL-77-3, effective March 1, 1977 (U.S.G.S. requirement).

2.2 Hazardous Areas

A number of geologic events and circumstances could occur or prevail in the Santa Barbara Channel Region with an adverse environmental impact on petroleum exploration or development operations. These include earthquakes, sea-floor fault ruptures, submarine landslides, etc. Careful examination of the sea-floor by waterborne geophysical surveys at the proposed sites indicates that there are no significant submarine hazards present (Ref. 2). The earthquake risk during the drilling of these exploratory wells is minimal because the wells will be drilled from a floating vessel and the time period of exposure to earthquake hazard is very small. For further discussion of the geologic and seismic conditions at the well site see Sections 1.4 and 1.43.

A technical hazard exists relating to down-hole drilling conditions in that control of a well may be lost as the result of improper drilling practices, encountering unexpected abnormally high pressures, etc. Drilling of the proposed wells will be done strictly in compliance with all U.S.G.S. regulations and orders. Prior drilling of the Exxon et al well No. P-0205-1,

approximately one mile from each of the currently proposed sites, provides valuable experience to assist in proper programming for the proposed exploratory wells on parcels P-0204, P-0208 and P-0209. No significant hazards were encountered in the Exxon well, which penetrated the same sequence of rocks anticipated in these proposed tests. For further discussion of this aspect of the project refer to Section 1.4.

One of the proposed well locations, P-0209-2, is close to the northbound shipping lane. This location will be carefully reviewed by the Coast Guard and U.S.G.S. and will be required to meet Coast Guard standards. The proposed P-0209-2 site lies just north of the main northbound shipping lane in the south-central part of lease P-0209. While this location is close to the northbound shipping lane it is well removed (by over 3 miles) from the southbound lane. The Exxon et al P-0205-1 well was similarly located just outside the northbound lane, about one mile east of the proposed P-0209-2 location, and was drilled without incident. The Corps of Engineers, the Coast Guard, and the U.S.G.S. will all review the proposed location for well P-0209-2 and will insure that minimum hazard to navigation will result from this project before granting the required permits.

2.3 Cultural and Archeological

Two of the proposed exploratory drilling projects described herein are located in water depths of 500 ft. or greater. Consequently, based on a determination made by the Bureau of Land Management, no archeological or cultural survey is required for these operations. Proposed well site P-0208-2 will be water depths of about 400 feet.

The foregoing notwithstanding, Chevron U.S.A. Inc. contracted for the performance of detailed waterborne geophysical surveys to be run over the tracts involved (P-0204, P-0208 and P-0209). These surveys were completed in August, 1978. They were performed and analyzed by General Oceanographics, Inc. (Ref. 2). Tools run included the magnetometer, side-scan sonar, mini-sparker, super-sparker, sub-bottom profiler and fathometer. Most of the instruments were run simultaneously with the exception of some local resurveying performed to improve data quality. The grid-spacing was generally 1000 ft. by 1000 ft. except in certain shallower water areas where a 500 ft. by 1000 ft. grid was employed.

As a consequence of these surveys, and analyses thereof, no significant obstructions were noted on the sea floor in the areas of the proposed exploratory wells (Fig. 3).

A cultural resources report covering OCS lease block 0208 and portions of 0204, 0205, and 0209 was prepared by Scientific Resource Surveys, Inc. (Ref. 14). After reviewing all of the geophysical records it was their opinion that there will be no adverse effects to Cultural Resources on Block 0208 by this proposed action.

2.4 Alternatives

There are two alternatives to the proposed action which may be considered. The first of these is to drill the proposed wells at other locations. The only potential environmental hazard which might be mitigated or reduced by so doing would be that of proximity of the P-0209-2 well to the northbound shipping lane. The constraints of the geologic interpretation already require that a rather long deviated (directed) well be drilled in order

to effectively test the potential from the presently proposed site. To move the P-0209-2 location elsewhere could result in an ineffective test which failed to adequately evaluate the resource potential. Also, there is little or no assurance that a location a few hundred feet farther from the primary shipping lane would be any less hazardous because it is known that many vessels may not be able to adhere rigidly to the shipping lane courses. Because it would be a complete waste to drill a well which did not adequately evaluate the resource potential; and because the Coast Guard must review and approve the present location, this alternative is not considered to be a viable one at this time. Nothing would be gained by moving the P-0204-1 or P-0208-2 locations and therefore this is not considered to be a practicable option.

The second alternative is to not proceed with exploratory drilling (i.e., no projects). In view of the very urgent need for additional supplies of domestic oil and gas, the lack of which poses a serious threat to our national security and economic stability, this alternative seems unworthy of consideration. Furthermore, under existing law and the terms of the lease(s) the Secretary of the Department of the Interior (DOI) is obliged to respond to a legitimate application to conduct operations on valid leases providing all terms and conditions are met. The proposed exploratory wells appear to be environmentally acceptable projects and, therefore, no projects are not considered a viable alternative.

Sections 3.0 and 9.0 of this report describe the mitigation and preventive measures to be employed to insure environmental protection during the conduct of these projects.

The greatest measure of environmental protection results from careful site selection, thorough pre-drilling hazard evaluation, and the use of proper drilling techniques. In all these categories the proposed projects have been designed and planned to meet the highest professional standards and to strictly conform to every current U.S.G.S. regulation and order.

3.0 Oil or Waste Material Spill Prevention, Clean-Up and Control Counter Measures Plan

This section contains a description of procedures, personnel, and equipment for preventing, reporting, and cleaning up spills of oil or waste materials, including information on response time, capacity and location for equipment.

3.1 Prevention

Prevention of oil spills during the proposed exploratory drilling operations will be maximized by following the prescribed requirements in OCS Order No. 2 for the Pacific Region. Specifically, the order establishes requirements for casing; blowout prevention equipment (BOPE); installation and testing and training of personnel which insure that uncontrolled flow from the well will be prevented. To enhance this requirement, Chevron will utilize equipment that reflects the best state-of-the-art as described in the Exploration Plans for these leases. All other activities related to the exploratory drilling work at all times will be conducted in an orderly fashion, to best prevent an oil spill incident from occurring (Ref. 16).

To prevent pollution to the ocean waters from harmful quantities of waste materials, Chevron will be operating under the NPDES Permit (CA0110401) issued by the EPA to Global Marine for the drill ship.

3.2 Control and Cleanup

In the event that a spill does occur, including sheens on the water, procedures for reporting and response are described in Chevron's Oil Spill and Emergency Contingency Plan for Santa Barbara Channel OCS. Leases which has been previously submitted to the U.S.G.S. as part of the plan of Development for the Santa Clara Unit. This Plan is also applicable to tracts P-0204, P-0208, and P-0209.

All Chevron and contract personnel directly involved in the proposed exploratory drilling will be trained in boom deployment and cleanup operations. Therefore, response to spills will be immediate.

An oil sheen on the ocean surface will call for immediate response. Clean up of the oil sheen or even larger spills will take place in an orderly fashion. Supervision of the clean up will be handled by the Contract Foreman or Company drilling representative, using trained personnel from the drilling vessel crew and the on-site containment equipment and absorbent material listed in the oil spill containment and equipment list (Appendix C). Generally, small spills occurring on the deck can be cleaned up with available absorbent goods before they reach the open water. If an open water spill occurs, that is of five (5) barrels or less of hydrocarbons, the crew will deploy absorbent booms and pads to clean up the spill. The clean-up steps involved in spills exceeding five (5) barrels of hydrocarbons are as follows:

1. Alert the local spill cooperative immediately. For the Santa Barbara Channel this will be Clean Seas, Inc. Next, the appropriate cooperative and/or contractor will be called to bring their clean-up equipment if it becomes apparent that the "onboard" equipment can not handle the spill. Mr. Waage, General Manager of Clean Seas estimates that his equipment can reach the proposed well sites within 7 hours.

2. Assess wind and current direction to determine the possible path of the spilled hydrocarbons.

3. Deploy the containment boom stored on the vessel and surround the spill.

4. Use skimmer stored on board the vessel to recover oil retained by the boom.

5. Utilize the spill cooperative (Clean Seas) equipment as needed to effect rapid and complete clean-up of the spill.

6. Use absorbent goods to remove final traces of hydrocarbons.

Chevron will activate the Major Oil Spill Contingency Plan whenever a major hydrocarbon spill occurs (i.e., a major spill is considered to be over 1000 barrels or a continuous discharge for several days that will exceed 1000 barrels). In this event, Chevron will utilize all feasible equipment and manpower resources to effect a rapid clean-up.

4.0 Onshore Support and Storage Facilities

This section discusses location, size and number of onshore support and storage facilities and related land requirements, rights-of-way and easements

which could result from or be required by approval of the proposed exploration plans. This includes, where possible, a time table regarding the acquisition of lands and the construction or expansion of any facilities.

Onshore services will originate from the Carpinteria, Ventura and Port Hueneme areas. Because the support services and storage facilities required for these projects are already in existence at these locations, no increase in their size or complexity will occur. Also, because the projects use a temporary, self-propelled vessel, acquisition of lands, rights-of-way, and easements is not anticipated.

5.0 Personnel Requirements of Offshore and Transportation Activities

This section discusses the number and type of people expected to be employed in support of offshore transportation activities including, where possible, the approximate number of new employees and families likely to move into the affected coastal areas.

At this time it is anticipated that the drilling vessel Glomar Atlantic will drill the proposed exploratory wells. Since the wells will be drilled one at a time over about a one year span, the impacts of the drilling will be the same for each well. A crew boat will be employed to transport working personnel and contracted services to and from the drilling vessel. Materials and supplies will be transported by a larger supply boat. A helicopter service will be contracted for medical emergencies and other situations as they arise. Local vendors furnishing various materials and offering services will also be employed in support of these exploration plans.

Population growth in the affected coastal areas will be temporary and minimal. Most employees directly associated with the drilling vessel are transient. Their homes and families are located outside the affected coastal area. The work schedule of these employees (usually 7 days on and 7 days off) is such that their employer transports them between job and home. The categories of people who are likely to reside in the affected coastal area include current Chevron employees and employees of local suppliers of materials or services. The need to hire additional employees to support these operations is not anticipated.

About 140 persons are expected to be employed during each of the three proposed exploratory operations: drilling vessel (110 total but 80 on board at any one time); supply boat with a crew of 6; crew boat with a crew of 2; Chevron personnel (6 total, 2 on board at any one time); and 18 miscellaneous service company personnel (each on short periods of service).

6.0 Travel Routes Between Offshore and Onshore Facilities and Associated Time Frames

This section discusses the most likely travel routes for boat and aircraft traffic between offshore and onshore facilities, an estimate of frequency with which such routes will be traversed, and the probable onshore locations of terminals.

A contracted crew boat will transport personnel to the well sites from the pier at Carpinteria. The crew boat probably will not cross the shipping lanes en route. The current plans call for about 15 trips per month using this service.

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engine water jackets and as such will not contact any pollutants. Temperature increases will be minimal (2°-4°F) at the design circulating rate of 2,000 gallons per minute (2,880,000 gpd).

Sanitary wastes will be processed in an aeration-type sewage plant approved by the U.S. Coast Guard for marine service. The effluent will be treated with chlorine in accordance with conditions set out in the NPDES permit. The estimated discharge is 5000 gallons per day at each proposed well.

The kitchen, shower, and washing machine wastes are basically non-toxic, containing only food, soap, and biodegradable detergents and cleaning agents. These wastes are estimated to amount to 40 gals. per day per man, resulting in a total of 2800 gals. per day for a 70-man crew.

Trash and garbage (paper containers, wiping materials, etc.) will be placed in suitable portable containers which will be transported ashore for disposal in an approved dump site. An estimated 110 lbs. per day of this waste will be generated for a crew of 70 men.

The barge is designed to contain all deck drainage and wash-down water which will be processed in a suitable oil-water separator prior to ocean disposal. The quality of this effluent is controlled by conditions set out in the NPDES permit. It is estimated that about 1,000 gallons per day will be generated in this manner at each proposed well. Both sea water and fresh water will be present in this discharge.

It is estimated that engine room drainage will range between 30 and 50 gallons per day. Normally this water will contain minimal quantities of lubricating oils. Excess oil contamination will be disposed of onshore.

Engine cooling water (non-contact) discharge will have served to cool engine water jackets and as such will not contact any pollutants. Temperature increases will be minimal (2^{o}-4^{o}F) at the design circulating rate of 2,000 gallons per minute (2,880,000 gpd).

The maximum amount of waste water generated from subsurface formation tests is estimated at 15,000 gallons for the entire operation of each proposed well. Any oily water derived from these tests will be transported ashore for suitable disposal in an approved dump site or processed in the deck drain oil-water separator prior to any disposal of the waste water in the ocean.

As a result of distilling sea water as a source of potable and domestic water, approximately 14,000 gpd of concentrated brine is produced as a by-product. This brine is non-toxic and will result in no pollution upon ocean discharge.

7.2 Gaseous Emissions

Gaseous emissions associated with these projects are primarily exhaust and combustion products. The emissions will occur during the period of time it takes to drill and abandon each proposed well (estimated at 60 to 90 days). The specific emission sources include:

1. Generators used to supply power for the drilling operations.
2. Supply and crew boat engines and helicopters.
3. Drill ship movement to and from the proposed site.
4. Natural gas flaring.

In the course of evaluating each proposed well we anticipate flaring about 1500 MCF of gas during drill stem tests. The emissions from this type of operation are generally considered to be low and because of the temporary nature of the projects are not considered significant.

Following is a summary of the estimated quantities of gaseous emissions resulting from each proposed exploratory drilling operation. Units are in pounds/hour unless otherwise indicated (Ref. 33).

	CO	NO_x	SO_2	Unburned Hydrocarbons	Average Operating Time (Total Time, hours)
Prelim. site prep.	14.3	6.6	4.4	6.3	54
Drill ship movement	7.0	32.4	2.2	3.1	18
Drilling Operations*	25.3	117.6	7.9	11.1	1680
Support vessels supply boats	46.7	215.0	14.3	20.5	190
crew boats	4.8	22.0	1.5	2.1	100
Helicopter	14.0	1.4	0.4	1.3	35
Natural Gas Flaring	480.0	neg.	neg.	33.0	-

*Represents average. Actual hourly rates will vary depending upon the activity taking place.

8.0 Estimate of Significant Demand for Major Supplies and Services, Etc.

This section discusses the approximate amount of any significant demand for major supplies, equipment, goods, services, water, aggregate, energy or other resources within the affected Coastal area.

These drilling operations will not place any demands on the resources within the affected area other than those which the area has been experiencing with past and present exploration work. The following demands for supplies and equipment required for the actual drilling work are estimated to be:

I. Approximate resources for the drilling of each proposed well.

A. 430,000 pounds oilfield casing.

B. 3,000 cubic feet cement (neat).

C. 13,950 cubic feet mud (barite, bentonite and miscellaneous mud additives).

D. 25 oil well rock bits.

II. Resources for Crew Servicing Drilling Vessel.

A. Food to prepare three meals per day for 100 persons.

B. Soap and laundry detergent (100 lbs. detergent, 20-30 gals. bleach).

C. Linen supplies for 100 persons.

D. Miscellaneous items to maintain vessel.

E. 10 tons sand (for sandblasting), 500 gallons paint.

In addition to the above, the following services will be required during each proposed drilling operation: well logging, perforating, well testing, drilling fluids, engineering, mud logging and oilwell cementing. The planned drilling vessel has the capability to distill water for drilling and crew requirements.

9.0 Assessment of Impact

This section discusses the impacts on the offshore and onshore environments expected to occur as a result of implementation of the proposed exploratory plans. These impacts are expressed in terms of magnitude and duration of each proposed operation with special emphasis upon the identification and evaluation of unavoidable and/or irreversible impacts on the environment.

9.1 Offshore Impacts

The only negative impacts on the offshore environment which are expected to occur as a result of drilling the proposed exploratory wells are minor, transitory, local effects on air and water quality in the Channel offshore region. The discharge of wastes to the ocean from these operations will have no discernible impact on the environment, since this will be done in accordance with the NPDES permit (Appendix B). Unpredictable negative impacts which are not expected to occur, but might occur, include the effects of accidental leakage or spillage of diesel fuel, or of crude oil during the drilling process. The magnitude of such impact is unpredictable, but the duration would be of only a few days since spill containment would commence almost immediately.

9.1(a) Air Quality

As indicated in Section 7.2 of this report, air emissions from the operation will consist mainly of exhaust and combustion products from the diesel power generation engines located on the drilling vessel. These emissions will occur for only about 60 to 90 days (duration of each of the operations). Their magnitude is discussed in Section 7.2. Well tests will last only a few hours and all gas will be flared. Due to favorable circulation and air quality in the area, negative air impacts caused by the project would be dispersed a short distance from the source. Therefore, it is concluded that the small amount of emissions associated with the drilling of the proposed exploratory wells would not cause air quality standards to be exceeded.

Another potential air emission source is a large (1000 bbls. or more) oil spill. Technology and regulations make the likelihood of a spill remote. In addition, special programs previously discussed (Sections 3.1 and 3.2) would be placed in effect to control and eliminate a spill as quickly as possible. Thus, a large spill is quite unlikely, but if it occurs, the effect on air quality will be of short duration, with most of the volatile fractions having evaporated within 24 hours.

9.1(b) Marine Environment

The drilling fluid used at the proposed well sites will be a water-base fluid containing no oil. Bioassay tests conducted on this type of drilling fluid used at other exploratory operations in the Santa Barbara Channel show that the fluid is non-toxic, having a TLm-96 range of 8500 mg/l to over 560,000 mg/l (Refs. 23, 26, 27, 29). The earth removed from the hole in the form of drill cuttings will also be non-toxic because it is similar to sediments continuously deposited by local rivers to the marine environment. The magnitude of this material is discussed in Section 7.1. Its disposal would occur over a period of 45-60 days. Studies on the dispersion of drilling mud and drill cuttings released from drilling vessels and platforms show that the materials disperse rapidly with background levels occurring within 300 feet of discharge (Refs. 22, 23, 26, 27, 28). At the proposed locations water depths of 400 to 700+ feet ensure these materials will be highly dispersed before settling to the ocean floor. Studies by the California State Dept. of Fish and Game (Ref. 17) and others (Refs. 18-30) show that deposition of drill cuttings on the ocean floor and dispersion of small amounts

of drilling mud in the ocean environment have had "no adverse effect on the marine environment" (Ref. 3, p. III-10). Estimates of the volumes of these discharges were given in Section 7.1. These discharges would occur over about a 45-60 day period.

As specified in the NPDES permit for the drilling vessel, the volume of oil discharged as deck drainage will not exceed 52 mg/l (approximately 47 ppm., or about .047 gals/day). When compared to the volumes of oil discharged annually by rivers (1.6 metric tons), natural seeps (0.6 mta), and tankers (2.2 mta), this discharge (about 2.5 gals. over a 50-day period) will have a negligible effect on the marine environment (Ref. 31).

The NPDES permit granted to the drilling vessel specifies that domestic and sanitary wastes not cause visible oil or floating solids, and that the discharge maintains 1.0 mg/l residual chlorine, as cited in 40 CFR 435.2 and 435.5. The Environmental Protection Agency has concluded that this type of control for these wastes will ensure that there is no significant adverse effect on the marine environment.

Spillage of diesel fuel might occur as a result of an accident involving a supply boat or during transfer of the fuel to the supply boat or to the drilling vessel. The U.S. Coast Guard enforces regulations covering transfer of fuel and the Coast Guard procedures will be rigorously implemented by the fuel supply and drilling vessels. If an accidental spill of diesel fuel occurs while loading the supply boat or transferring the fuel to the drilling vessel, the volume involved will probably be small enough (a few hundred gals.) that it can be contained and cleaned up by equipment maintained at the onshore loading site and on board the drilling vessel. A larger transfer

spill or a spill that might result from a fuel supply vessel accident will be handled by the oil spill co-op in the area in the same manner as described below for a crude oil spill from the drilling vessel.

A spill of crude oil could occur from the drilling of these well(s) only if they encountered a formation containing sufficient oil at a high enough pressure to flow from the well(s), and if there were a "concurrent" unavoidable failure in the blowout prevention control equipment, or improper procedures were used in drilling the well(s). Drilling crews and vessel operators are trained in proper drilling procedures and in the deployment and use of oil spill prevention and control equipment maintained at the drilling vessel. Note that there has never been a spill of crude oil anywhere in the world as the result of exploratory drilling. In the event of any oil spill (diesel fuel or crude oil), the Chevron U.S.A. Spill Contingency Plan will be implemented immediately and used to contain and clean up the spill. Note that only approved clean-up methodologies will be employed. The potential for damage to the shoreline would be minimized because of the prompt containment and clean-up of the crude oil or diesel fuel, and the small volume of diesel fuel which might be spilled (Refs. 27, 29, 30 and 31).

9.2 Onshore Impacts

9.2(a) Air Quality

Aerovironment, Inc., conducted a study of the air quality impacts resulting from development following proposed OCS Lease Sale #48 (Ref. 13). Using a worse-case tanker scenario, emissions from extensive development were

found to be minor. Therefore, emissions discussed in 9.1(a) from a single exploratory well will be negligible in comparison and have no impact on onshore air quality.

9.2(b) Water Quality

There will be no impacts on onshore water supplies.

9.3 Socioeconomic Impacts

As discussed in Section 5.0, no significant increase in the population or support facilities will be required. Therefore, the socioeconomic impact is negligible.

9.3(a) Aesthetic Impacts

On clear days, the drilling vessel will be visible from shore, although it will appear rather small at the distance involved (6-8 miles). The impact of this visual sighting will be negative, neutral or positive, depending on the subjective reaction of the viewer. In any case, the temporary duration of its presence (60-90 days) will result in a negligible transient environmental impact.

9.4 Mitigating Measures

Mitigating measures have been discussed in previous sections as appropriate.

Mitigating and preventive measures are described in: 1) Introduction, Para. 2 (temporary duration of project); 2) Section 1.41, p. 9, Para. 3 (no shallow faulting; 3) Section 1.42, p. 10, Para. 2 (successful prior drilling); 4) Section 1.43, p. 10, Para. 2 (no active faults); 5) Section 1.5, p. 11,

Para. 1 (severe storms rare); 6) Section 2.1, p. 14, Para. 1 (project not near biologically sensitive areas); 7) Section 2.1, p. 15, Para. 1 (no evidence of cultural remains); 8) Section 2.2, p. 15, Para. 1 (locations avoid sea floor hazards); 9) Section 2.2, p. 15, Para. 2 (drilling in accordance with USGS orders and regulations); 10) Section 2.3, p. 17, Para. 2 (no objects on sea floor); 11) Section 2.4, p. 19, Para. 1 (careful site selection and hazard studies); 12) Section 3.1, p. 19, Paras. 1 and 2 (p. 20) (best state-of-art BOPE - operations conform to NPDES permit); 13) Section 3.2, p. 20, Paras. 1 and 2 (clean-up and containment equipment immediately available); 14) Section 4.0, p. 21, Para. 2 (no new or expanded onshore facilities required); 15) Section 5.0, p. 22, Para. 1 (negligible impact of operating personnel); 16) Section 7.1, p. 26, Para. 1 (sanitary wastes processed in sewage plant); 17) Section 7.1, p. 26, Para. 3 (trash hauled ashore for disposal); 18) Section 7.1, p. 26, Para. 4 (deck drainage processed through oil-water separator); 19) Section 7.1, p. 26, Para. 5 (oily waste water transported to shore); 20) Section 7.1, pps. 26 and 27, Para. 1 (oily water from testing hauled ashore to approved disposal site); 21) Section 9.1(b), p. 31, Para. 1 (water-base drilling fluid used); 22) Section 9.1(b), pps. 31 and 32, Para. 1 (NPDES permit limits oil and waste discharges); 23) Section 9.1(b), pps. 32 and 33, Paras. 1 and 2 (prompt containment and clean-up limits potential spill impacts); 24) Section 9.3, p. 33, Para. 1 (no significant increase in population, no new facilities required).

The main mitigation measure will be utilization of safe and proper operating procedures in all phases of the exploratory drilling program.

9.5 Unavoidable and Irreversible Impacts

The only unavoidable transitory impacts on the offshore environment that are expected to occur as a result of drilling these exploratory wells are the previously discussed local effects on air and water quality in the Santa Barbara Channel. Irreversible impacts would be limited to the deposition of cuttings on the ocean bottom. However, this impact has neither "a beneficial nor detrimental effect on the environment" (Ref. 17). Recent studies show possible positive effects (Ref. 19).

A potential impact could result from a large oil spill. However, any damage sustained by the shoreline, 9 or more miles distant, would likely be minor and of short duration (Ref. 32, p. 35).

10.0 Consistency Certification

See consistency certification packet attached to this environmental report.

11.0 Inquiries regarding this report may be directed to:

Mr. Clair Ghylin, Manager, Land Department
Chevron U.S.A. Inc. - Western Region
575 Market Street, Room 1744
San Francisco, CA 94105
Phone (415) 894-4442

or

Mr. D. S. Moore, Senior Staff Engineer,
Environmental and Chemical
Chevron U.S.A. Inc. - Western Region
575 Market Street, Room 1856
San Francisco, CA 94105
Phone (415) 894-2285

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APPENDIX A

Permits and Government Clearances

Chevron U.S.A. Inc.
P. O. Box 606, La Habra, CA 90631 • Phone (213) 691-2251

September 11, 1978

Exploratory Well OCS-P 0209 #2
Santa Barbara Channel

Admiral H. W. Parker, Commander
United States Coast Guard
Eleventh Coast Guard District
Union Bank Building
400 Oceangate
Long Beach, CA 90822

Dear Admiral Parker:

As discussed in our meeting with Coast Guard and U. S. Geological Survey personnel on September 7, 1978, Chevron U.S.A. Inc. proposes the drilling of an exploratory well, OCS-P 0209 #2, in the buffer zone of the Northbound Sea Lane in the Santa Barbara Channel. The scheduled dates for drilling this well and the location are as follows:

	Location	Commencement	Completion
OCS-P 0209 #2	119° 24' 50.7" W.Long. 34° 08' 01.7" N.Lat.	January 15, 1979	April 9, 1979

The commencement and completion dates are subject to modifications occasioned by delays in the permitting process, but any such modification will immediately be reported to you. I have enclosed your form, Underwater Oil Drilling Operations.

As explained at the meeting by Mr. Paul Schnurr, a Chevron geologist, there are multiple objective zones targeted for the well. Because some of the zones have a relatively small aerial configuration, and current technology cannot define the zones with exactness, it is important to confine the parameter of penetration to a limited area. In order to do so, and to minimize the possible problems that could arise from "dog-legging" the well at too severe an angle, Chevron seeks your approval to drill the well from a location 400 to 800 feet outside, but within the buffer zone, of the Northbound Sea Lane. We would hope for approval at the smaller distance from the sea lane, but could accomplish our objectives from any further distance up to 800 feet.

If you have any questions regarding this matter, or need additional information, please do not hesitate to contact me at the above address, or at (213) 691-2251, Extension 2570.

Very truly yours,

Barry L. Kotler

BLK:ab
Enclosure

DEPARTMENT OF THE ARMY

NOTE.—It is to be understood that this instrument does not give any property rights either in real estate or material, or any exclusive privileges; and that it does not authorize any injury to private property or invasion of private rights, or any infringement of Federal, State, or local laws or regulations, nor does it obviate the necessity of obtaining *State assent* to the work authorized. IT MERELY EXPRESSES THE ASSENT OF THE FEDERAL GOVERNMENT SO FAR AS CONCERNS THE PUBLIC RIGHTS OF NAVIGATION. (See *Cummings* v. *Chicago*, 188 U. S., 410.) 16—13168-2

PERMIT

U. S. Army Engineer District, Los Angeles
Corps of Engineers.
Los Angeles, California
13 August, 1970.

Standard Oil Company of California
Western Operations, Inc.
P. O. Box 606
La Habra, California 90631

Gentlemen:

Referring to written request dated 25 November 1968 for permission to conduct exploratory drilling on the Outer Continental Shelf

I have to inform you that, upon the recommendation of the Chief of Engineers, and under the provisions of Section 10 of the Act of Congress approved March 3, 1899, entitled "An act making appropriations for the construction, repair, and preservation of certain public works on rivers and harbors, and for other purposes," you are hereby authorized by the Secretary of the Army.

to conduct exploratory drilling operations on OCS Parcel 0209 (Tract 361) except
(Here describe the proposed structure or work.)
for that portion of Parcel 0209 lying within the recommended shipping traffic lanes

in the Pacific Ocean (Santa Barbara Channel)
(Here to be named the river, harbor, or waterway concerned.)

at locations off Ventura County, California
(Here to be named the nearest well-known locality—preferably a town or city—and the distance in miles and tenths from some definite point in the same, stating whether above or below or giving direction by points of compass.)

in accordance with the plans shown on the drawing attached hereto marked: "Proposed
(Or drawings; give file number or other definite identification marks.)
Drilling Vessel Location, OCS P-0209 (361). Application by Standard Oil Company of California, Western Operations, Inc. Date: Nov. 25, 1968."

subject to the following conditions:

0209

Incl 1

EXXON COMPANY, U.S.A.
1800 AVENUE OF THE STARS • LOS ANGELES, CALIFORNIA 90067 (213) 552-5400

PRODUCTION DEPARTMENT
WESTERN DIVISION

August 31, 1978

In re: Permit Nos. 77-248 and 77-251
OCS P-0204 and OCS P-0208
Santa Clara Unit
Santa Barbara Channel
OCS California

Mr. C. M. Holt, Sr.
Chief, Navigation Branch
U. S. Army Corps of Engineers
300 North Los Angeles Street
P. O. Box 2711
Los Angeles, California 90053

Dear Mr. Holt:

The two captioned Permits were issued to Exxon Company, U.S.A. on September 30, 1977. The Permits authorize the exploratory drilling of oil and gas wells on Federal oil and gas leases OCS P-0204 abd OCS P-0208 in Santa Barbara Channel.

Exxon wishes to advise you that it has appointed Chevron U.S.A. Inc. as its agent to use or operate under the subject Permits. Chevron plans to drill one or more wells on each of the two leases. Drilling will not commence until later this year however.

In connection with this matter, we are furnishing Chevron copies of the Permits. Should Chevron need Notices of Authorization for the Permits, will you please furnish them to Chevron.

If this advice is insufficient for the intended purpose, will you please so advise. An acknowledgement concerning this matter will be appreciated.

Yours very truly,

JOHN CORDELL HICKS

JCH/jw
Attachments
cc: Mr. Barry Cotler
Chevron U.S.A. Inc.

Application No. (77-248 (

Name of Applicant Exxon Company, U.S.A.

Effective Date 30 September 1977

Expiration Date (If applicable) 31 December 1980

DEPARTMENT OF THE ARMY
PERMIT

Referring to written request dated 19 August 1977 for a permit to:

(X) Perform work in or affecting navigable waters of the United States, upon the recommendation of the Chief of Engineers, pursuant to Section 10 of the Rivers and Harbors Act of March 3, 1899 (33 U.S.C. 403);

( ) Discharge dredged or fill material into navigable waters upon the issuance of a permit from the Secretary of the Army acting through the Chief of Engineers pursuant to Section 404 of the Federal Water Pollution Control Act (86 Stat. 816, P.L. 92-500);

( ) Transport dredged material for the purpose of dumping it into ocean waters upon the issuance of a permit from the Secretary of the Army acting through the Chief of Engineers pursuant to Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (86 Stat. 1052; P.L. 92-532);

Exxon Company, U.S.A.
P.O. Box 2180
Houston, Texas 77001,

(Here insert the full name and address of the permittee)

is hereby authorized by the Secretary of the Army:

to conduct exploratory drilling of oil and gas wells on the Outer Continental Shelf-Parcel P-0204 (Tract 352),

(Here describe the proposed structure or activity, and its intended use. In the case of an application for a fill permit, describe the structures, if any, proposed to be erected on the fill. In the case of an application for the discharge of dredged or fill material into navigable waters or the transportation for discharge in ocean waters of dredged material, describe the type and quantity of material to be discharged.)

in the Pacific Ocean

(Here to be named the ocean, river, harbor, or waterway concerned.)

at within the Santa Barbara Channel,

(Here to be named the nearest well-known locality—preferably a town or city—and the distance in miles and tenths from some definite point in the same, stating whether above or below or giving direction by points of compass.)

in accordance with the plans and drawings attached hereto which are incorporated in and made a part of this permit (on drawings: give file number or other definite identification marks):

EXXON COMPANY, U.S.A.
FILE NUMBER: WA 416

subject to the following conditions:

I. General Conditions:

a. That all activities identified and authorized herein shall be consistent with the terms and conditions of this permit; and that any activities not specifically identified and authorized herein shall constitute a violation of the terms and conditions of this permit which may result in the modification, suspension or revocation of this permit, in whole or in part, as set forth more specifically in General Conditions j or k hereto, and in the institution of such legal proceedings as the United States Government may consider appropriate, whether or not this permit has been previously modified, suspended or revoked in whole or in part.

b. That all activities authorized herein shall, if they involve a discharge or deposit into navigable waters or ocean waters, be at all times consistent with applicable water quality standards, effluent limitations and standards of performance, prohibitions, and treatment standards established pursuant to Sections 301, 302, 306 and 307 of the Federal Water Pollution Control Act of 1972 (P.L. 92-500; 86 Stat. 816), or pursuant to applicable State and local law.

c. That when the activity authorized herein involves a discharge or deposit of dredged or fill material into navigable waters, the authorized activity shall, if applicable water quality standards are revised or modified during the term of this permit, be modified, if necessary, to conform with such revised or modified water quality standards within 6 months of the effective date of any revision or modification of water quality standards, or as directed by an implementation plan contained in such revised or modified standards, or within such longer period of time as the District Engineer, in consultation with the Regional Administrator of the Environmental Protection Agency, may determine to be reasonable under the circumstances.

d. That the permittee agrees to make every reasonable effort to prosecute the work authorized herein in a manner so as to minimize any adverse impact of the work on fish, wildlife and natural environmental values.

e. That the permittee agrees to prosecute the work authorized herein in a manner so as to minimize any degradation of water quality.

f. That the permittee shall permit the District Engineer or his authorized representative(s) or designee(s) to make periodic inspections at any time deemed necessary in order to assure that the activity being performed under authority of this permit is in accordance with the terms and conditions prescribed herein.

g. That the permittee shall maintain the structure or work authorized herein in good condition and in accordance with the plans and drawings attached hereto.

h. That this permit does not convey any property rights, either in real estate or material, or any exclusive privileges; and that it does not authorize any injury to property or invasion of rights or any infringement of Federal, State, or local laws or regulations, nor does it obviate the requirement to obtain State or local assent required by law for the activity authorized herein.

i. That this permit does not authorize the interference with any existing or proposed Federal project and that the permittee shall not be entitled to compensation for damage or injury to the structures or work authorized herein which may be caused by or result from existing or future operations undertaken by the United States in the public interest.

j. That this permit may be summarily suspended, in whole or in part, upon a finding by the District Engineer that immediate suspension of the activity authorized herein would be in the general public interest. Such suspension shall be effective upon receipt by the permittee of a written notice thereof which shall indicate (1) the extent of the suspension, (2) the reasons for this action, and (3) any corrective or preventative measures to be taken by the permittee which are deemed necessary by the District Engineer to abate imminent hazards to the general public interest. The permittee shall take immediate action to comply with the provisions of this notice. Within ten days following receipt of this notice of suspension, the permittee may request a hearing in order to present information relevant to a decision as to whether his permit should be reinstated, modified or revoked. If a hearing is requested, it shall be conducted pursuant to procedures prescribed by the Chief of Engineers. After completion of the hearing, or within a reasonable time after issuance of the suspension notice to the permittee if no hearing is requested, the permit will either be reinstated, modified or revoked.

k. That this permit may be either modified, suspended or revoked in whole or in part if the Secretary of the Army or his authorized representative determines that there has been a violation of any of the terms or conditions of this permit or that such action would otherwise be in the public interest. Any such modification, suspension, or revocation shall become effective 30 days after receipt by the permittee of written notice of such action which shall specify the facts or conduct warranting same unless (1) within the 30-day period the permittee is able to satisfactorily demonstrate that (a) the alleged violation of the terms and the conditions of this permit did not, in fact, occur or (b) the alleged violation was accidental, and the permittee has been operating in compliance with the terms and conditions of the permit and is able to provide satisfactory assurances that future operations shall be in full compliance with the terms and conditions of this permit; or (2) within the aforesaid 30-day period, the permittee requests that a public hearing be held to present oral and written evidence concerning the proposed modification, suspension or revocation. The conduct of this hearing and the procedures for making a final decision either to modify, suspend or revoke this permit in whole or in part shall be pursuant to procedures prescribed by the Chief of Engineers.

l. That in issuing this permit, the Government has relied on the information and data which the permittee has provided in connection with his permit application. If, subsequent to the issuance of this permit, such information and data prove to be false, incomplete or inaccurate, this permit may be modified, suspended or revoked, in whole or in part, and/or the Government may, in addition, institute appropriate legal proceedings.

m. That any modification, suspension, or revocation of this permit shall not be the basis for any claim for damages against the United States.

n. That the permittee shall notify the District Engineer at what time the activity authorized herein will be commenced, as far in advance of the time of commencement as the District Engineer may specify, and of any suspension of work, if for a period of more than one week, resumption of work and its completion.

o. That if the activity authorized herein is not stated on or before 31st day of December, 19 78 (one year from the date of issuance of this permit unless otherwise specified) and is not completed on or before 31st day of December, 19 80 (three years from the date of issuance of this permit unless otherwise specified) this permit, if not previously revoked or specifically extended, shall automatically expire.

p. That no attempt shall be made by the permittee to prevent the full and free use by the public of all navigable waters at or adjacent to the activity authorized by this permit.

q. That if the display of lights and signals on any structure or work authorized herein is not otherwise provided for by law, such lights and signals as may be prescribed by the United States Coast Guard shall be installed and maintained by and at the expense of the permittee.

r. That this permit does not authorize or approve the construction of particular structures, the authorization or approval of which may require authorization by the Congress or other agencies of the Federal Government.

s. That if and when the permittee desires to abandon the activity authorized herein, unless such abandonment is part of a transfer procedure by which the permittee is transferring his interests herein to a third party pursuant to General Condition v hereof, he must restore the area to a condition satisfactory to the District Engineer.

t. That if the recording of this permit is possible under applicable State or local law, the permittee shall take such action as may be necessary to record this permit with the Register of Deeds or other appropriate official charged with the responsibility for maintaining records of title to and interests in real property.

u. That there shall be no unreasonable interference with navigation by the existence or use of the activity authorized herein.

v. That this permit may not be transferred to a third party without prior written notice to the District Engineer, either by the transferee's written agreement to comply with all terms and condition of this permit or by the transferee subscribing to this permit in the space provided below and thereby agreeing to comply with all terms and conditions of this permit. In addition, if the permittee transfers the interests authorized herein by conveyance of realty, the deed shall reference this permit and the terms and conditions specified herein and this permit shall be recorded along with the deed with the Register of Deeds or other appropriate official.

The following Special Conditions will be applicable when appropriate:

STRUCTURES FOR SMALL BOATS: That permittee hereby recognizes the possibility that the structure permitted herein may be subject to damage by wave wash from passing vessels. The issuance of this permit does not relieve the permittee from taking all proper steps to insure the integrity of the structure permitted herein and the safety of boats moored thereto from damage by wave wash and the permittee shall not hold the United States liable for any such damage.

DISCHARGE OF DREDGED MATERIAL INTO OCEAN WATERS: That the permittee shall place a copy of this permit in a conspicuous place in the vessel to be used for the transportation and/or dumping of the dredged material as authorized herein.

ERECTION OF STRUCTURE IN OR OVER NAVIGABLE WATERS: That the permittee, upon receipt of a notice of revocation of this permit or upon its expiration before completion of the authorized structure or work, shall, without expense to the United States and in such time and manner as the Secretary of the Army or his authorized representative may direct, restore the waterway to its former conditions. If the permittee fails to comply with the direction of the Secretary of the Army or his authorized representative, the Secretary or his designee may restore the waterway to its former condition, by contract or otherwise, and recover the cost thereof from the permittee.

~~MAINTENANCE DREDGING: ( ) That when the work authorized herein includes periodic maintenance dredging, it may be performed under this permit for ____ years from the date of issuance of this permit (ten years unless otherwise indicated); and (2) That the permittee will advise the District Engineer in writing at least two weeks before he intends to undertake any maintenance dredging.~~

II. Special Conditions (Here list conditions relating specifically to the proposed structure or work authorized by this permit):

1. That vessels shall not engage in drilling inside sea lanes or within one-quarter mile of established sea lane boundaries.

2. That subject to provision 1 above, and except for vessels in direct transit, vessels engaged in lease development shall not operate inside sea lanes, or within one-quarter mile of sea lane boundaries, without the express permission of the District Commander, United States Coast Guard.

3. That vessels engaged in lease development anchored outside of the sea lanes shall have no cables, anchors, buoys or other associated equipment in the sea lanes at a depth of less than 85 feet.

This permit shall become effective on the date of the District Engineer's signature.

Permittee hereby accepts and agrees to comply with the terms and conditions of this permit.

Exxon Company USA
By John Cordell Hicks ______ 9-30-77

PERMITTEE DATE

BY AUTHORITY OF THE SECRETARY OF THE ARMY:

[signature] LTC ______ 30 September 1977

for HUGH G. ROBINSON DATE
Colonel, CE
DISTRICT ENGINEER,
U.S. ARMY, CORPS OF ENGINEERS

Transferee hereby agrees to comply with the terms and conditions of this permit.

______ ______

TRANSFEREE DATE

Appendix B

Drilling Vessel NPDES Permit

GLOBAL MARINE DEVELOPMENT INC.

KOLL CENTER NEWPORT
4100 MACARTHUR BOULEVARD
NEWPORT BEACH, CALIFORNIA 92660

TELEPHONE: 714-752-5050
TELEX: 69-2316
CABLE: GLOMARCO
REPLY TO:
P.O. BOX 3010
NEWPORT BEACH, CA 92663

19 June 1978

Mr. Thomas A. Hudson
Chevron U.S.A. Inc.
Post Office Box 7643
San Francisco, California 94120

SUBJECT: GLOMAR ATLANTIC Drilling Ship Operating Permits

ENCLOSURE: Copy of National Pollutant Discharge Elimination System (NPDES) Permit for GLOMAR ATLANTIC

Dear Tom,

The above enclosure is forwarded to you for your reference and file.

If you have any questions regarding this enclosure please feel free to call Norm Dion for clarification.

Norm can be contacted at the GMDI office at Ext. 215.

Sincerely,

R. Curtis Crooke
President

RCC:ch
Enclosure

cc: C.R. Schaeffner w/o Encl.
P. Sikand w/o Encl.
J. Kane w/o Encl.

CERTIFIED MAIL NO. 551598

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
215 Fremont Street
San Francisco, Ca. 94105

In reply refer to: E-4-1
869.2C

RECEIVED
JUN 01 1978
J. T. DEAN

MAY 26 1978

CC
T. L. PHILLIPS
SCOTT HOELSCHE
C. R. KING
G. L. KOTT
F. C. NEWTON
FILE

Mr. Norman Dion
Global Marine, Inc.
Global Marine House
811 West Seventh Street
Los Angeles, Ca. 90017

Dear Mr. Dion:

Enclosed is a signed and dated copy of the National Pollutant Discharge Elimination System (NPDES) permit for:

GLOMAR ATLANTIC NPDES No. CA0110401

The Regional Administrator has reviewed the NPDES application in accordance with the Federal Water Pollution Control Act (33 U.S.C. 1251, et. seq.) and has also published a public notice of tentative determinations regarding the application. After considering the expressed views of all interested persons and agencies, pertinent Federal statutes and regulations, and State comments and/or certification of the discharge, the Regional Administrator, pursuant to 40 CFR 125.35, has made final determinations (the enclosed permit) which do not differ significantly from those proposed in the public notice.

The permit shall be issued and shall become effective thirty days from the date of signature unless there is a written request for an adjudicatory hearing pursuant to 40 CFR 125.36(b). Any request for an adjudicatory hearing must be submitted within ten days following receipt of this letter.

Sincerely,

Clyde B. Eller

Clyde B. Eller
Director
Enforcement Division

Enclosures

cc: Cal. RWQCB: Central Coast, Santa Ana, L.A., San Diego
U.S. Fish and Wildlife Service, Laguna Niguel & Portland
Corps of Engineers, Los Angeles
11th Coast Guard District
Cal. Dept. of Fish and Game, Long Beach
U.S. Geological Survey, Los Angeles
Bureau of Land Management, Los Angeles

AUTHORIZATION TO DISCHARGE UNDER THE
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251, et. seq.; the "Act"),

Global Marine, Inc.

is authorized to discharge:

bilge and ballast water, treated work area deck drainage, auxiliary system cooling water, and water from fire pump #2 (Discharge 001) from the starboard side of Frame 62;

refrigerator cooling water, discharge from air compressor and dryer, and aft coolers (Discharge 002) from port side of Frame 67;

condenser cooling water (Discharge 003) from starboard side of Frame 58;

forward sea water eductor discharge and water from fire pump #1 (Discharge 004) from port side of Frame 34;

forward sea water eductor discharge and condenser cooling water (Discharge 005) from starboard side of Frame 34;

quarters plumbing waste (Discharges 006 and 008) from the port side of Frames 31 and 62, respectively;

sanitary waste (Discharge 007) from the port side of Frame 49;

distilling plant brine (Discharge 009) from starboard side of Frame 59;

helicopter deck drainage (Discharges 010 through 017), 010 and 011 from the port side of Frames 66 and 68, respectively; 012 and 013 from the port side of Frame 85; 014 and 015 from the starboard side of Frames 68 and 85, respectively; 016 from the starboard side of Frame 85; and 017 from the centerline at Frame 105;

bridge deck, boat deck and poop deck drainage (Discharges 018 through 023), 018 and 019 from the port and starboard sides of Frame 65, respectively; 020 and 021 from the port and starboard sides of Frame 73, respectively; and 022 and 023 from the port and starboard sides of Frame 88, respectively;

main deck drainage (Discharges 024 through 030), 024 from the starboard side of Frame 64; 025 and 026 from the port and starboard sides of Frame 88, respectively; 027 and 028 from the port and starboard sides of Frame 100, respectively; 029 and 030 from the port and starboard sides of Frame 42, respectively;

drill cuttings, and sand and silt from desander and silt separator (Discharge 031) from the centerline at Frame 46;

drilling muds, excess cement slurries, sand trap overflow, and drainage from degasser and desander tanks (Discharge 032) from the centerline at Frame 46;

drilling muds, excess cement slurries, and drainage from desilter tank, mixing tank and active tank (Discharge 033) from the centerline at Frame 46;

engine salt water cooling (Discharge 034) from the starboard side of Frame 62;

B.O.P. control fluid (Discharge 035) from the blow-out preventer valve on the ocean floor;

from the drilling vessel, Glomar Atlantic, to authorized discharge sites within the waters of the Pacific Ocean beyond the territorial seas off the coast of the State of California in accordance with effluent limitations, monitoring requirements and other conditions set forth in Parts I, II, and III, hereof.

This permit shall become effective on June 26, 1978.

This permit and the authorization to discharge shall expire at midnight, January 31, 1983.

Signed this 26th day of May, 1978.

For the Regional Administrator

Clyde B. Eller
Director, Enforcement Division

The authorized discharge sites include (by OCS lease parcel number):

in the Santa Barbara Channel from Pt. Conception to Goleta Point,

P-0180 P-0181 P-0182 P-0183 P-0184 P-0185
P-0186 P-0187 P-0188 P-0189 P-0190 P-0191
P-0192 P-0193 P-0194 P-0195 P-0196 P-0197;

in the Santa Barbara Channel north of San Miguel and Santa Rosa Islands,

P-0167 P-0168 P-0169 P-0170 P-0171 P-0173
P-0174 P-0175 P-0176 P-0177 P-0178 P-0179;

in the Santa Barbara Channel from Santa Barbara to Ventura,

P-0166 P-0198 P-0199 P-0200 P-0201 P-0202
P-0203 P-0204 P-0205 P-0206 P-0207 P-0208
P-0209 P-0210 P-0211 P-0212 P-0213 P-0215
P-0216 P-0217 P-0218 P-0219 P-0220 P-0221
P-0222 P-0223 P-0224 P-0226 P-0227 P-0228
P-0229 P-0230 P-0231 P-0232 P-0233 P-0234
P-0235 P-0237 P-0238 P-0240 P-0241;

in waters south of Santa Rosa and Santa Cruz Islands,

P-0243 P-0244 P-0245 P-0246 P-0247 P-0248
P-0249 P-0250 P-0251 P-0252 P-0253;

in the San Pedro Channel between San Pedro and Laguna,

P-0293 P-0295 P-0296 P-0298 P-0300 P-0301
P-0302 P-0303 P-0304 P-0306 P-0309 P-0310
P-0311;

in waters west of Santa Barbara Island,

P-0289 P-0290 P-0291; and

in waters west of San Clemente Island in the Tanner Bank Area,

P-0257 P-0258 P-0259 P-0260 P-0262 P-0263
P-0264 P-0265 P-0266 P-0267 P-0268 P-0269
P-0270 P-0271 P-0272 P-0273 P-0274 P-0275
P-0276 P-0277 P-0278 P-0280 P-0281 P-0282
P-0284 P-0285 P-0286 P-0287 P-0288.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning the effective date of this permit and lasting through January 31, 198 the permittee is authorized to discharge from outfall(s) serial number(s) 001 (bilge and ballast water, auxiliary system cooling water, water from fire pump #2, and work area deck drainage). Such discharges shall be limited and monitored by the permittee as specified below:

a.

Effluent Characteristic	Discharge Limitations				Monitoring Requirements*	
	kg/day (lbs/day)		Other Units (Specify)			
	Daily Avg	Daily Max	Daily Avg	Daily Max	Measurement** Frequency	Sample Type
Flow-m^3/Day (MGD)	-	-	-	-	Once/Month	Discrete
Temperature	-	-	-	-	Once/Month	Discrete
Oil and Grease	-	-	-	-	Once/Month	Discrete

After a review of effluent monitoring representing at least one (1) year of discharge from the permittee's facility, the Regional Administrator may, upon due notice, revise the permit to establish final temperature limitations. Such a revision of this permit may also include an Implementation Schedule for an abatement program or other appropriate conditions to achieve the final temperature limitations.

b. Samples taken in compliance with the monitoring requirements specified in Condition I.A.1.a. shall be taken at the following locations: Discharge 001, subsequent to all treatment process and prior to entry into the waters of the Pacific Ocean.

c. There shall be no visible oil, foam or floating solids in the receiving waters as a result of Discharge 001.

d. The use of chemical additives is prohibited.

* The monitoring requirements shall commence on the effective date of this permit.
** The monitoring frequency is once per month with a minimum frequency of once per site.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

2. During the period beginning the effective date of this permit and lasting through January 31, 1983 the permittee is authorized to discharge from outfall(s) serial number(s) 002, 003, 004, 005, and 009 (miscellaneous discharges).
Such discharges shall be limited and monitored by the permittee as specified below:

a.

Effluent Characteristic	Discharge Limitations kg/day (lbs/day)		Other Units (Specify)		Monitoring Requirements *	
	Daily Avg	Daily Max	Daily Avg	Daily Max	Measurement** Frequency	Sample Type
Total Volume (gallons)**	-	-	-	-	Quarterly	Estimate

b. There shall be no visible oil or floating solids in the receiving waters as a result of these discharges.

c. Samples taken in compliance with the monitoring requirements specified above shall be taken at the following locations: Discharges 002 through 005, and 009, subsequent to all treatment processes and prior to entry into the waters of the Pacific Ocean.

d. The use of chemical additives is prohibited.

* The monitoring requirements shall commence on the effective date of this permit.
** Total volume discharged from discharges 002 through 005, and 009 during that particular quarter of the year.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

3. During the period beginning from the effective date of this permit and lasting through January 31, the permittee is authorized to discharge from outfall(s) serial number(s) 006 and 008 (quarters plumbing waste).
Such discharges shall be limited and monitored by the permittee as specified below:

a.

Effluent Characteristic	Discharge Limitations				Monitoring Requirements *	
	kg/day (lbs/day)		Other Units (Specify)			
	Daily Avg	Daily Max	Daily Avg	Daily Max	Measurement** Frequency	Sample Type
Flow-m^3/Day (MGD)	-	-	-	-	Once/Month	Estimate

b. There shall be no visible oil or floating solids in receiving waters as a result of these discharges.

c. Samples taken in compliance with the monitoring requirements specified above shall be taken at the following locations: Discharges 006 and 008, subsequent to all treatment processes and prior to entry into the waters of the Pacific Ocean.

* The monitoring requirements shall commence on the effective date of this permit.
** The measurement frequency is once per month with a minimum frequency of once per site.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

4. During the period beginning the effective date of this permit and lasting through January 31, 1983, the permittee is authorized to discharge from outfall(s) serial number(s) 007 (sanitary wastes).

Such discharges shall be limited and monitored by the permittee as specified below:

a.

Effluent Characteristic	Discharge Limitations kg/day (lbs/day)		Discharge Limitations Other Units (Specify)		Monitoring Requirements* Measurement** Frequency	Monitoring Requirements* Sample Type
	Daily Avg	Daily Max	Daily Avg	Daily Max		
Flow-m^3/Day (MGD)	-	-	-	-	Once/Month	Discrete
Suspended Solids	-	-	-	-	Once/Month	Discrete
Biochemical Oxygen Demand (5 day)	-	-	-	-	Once/Month	Discrete
Residual Chlorine	-	-	1.0 mg/l***	-	Once/Month	Discrete

b. There shall be no visible floating solids in the receiving waters as a result of these discharges.

c. Samples taken in compliance with the monitoring requirements specified above shall be taken at the following locations: Discharge 007, the effluent from the sewage treatment system prior to entry into the waters of the Pacific Ocean.

* The monitoring requirements shall commence on the effective date of this permit.
** The measurement frequency is once per month with a minimum frequency of once per site.
*** After a minimum retention time of fifteen minutes, the effluent shall have a minimum chlorine residual of 1.0 mg/l and be maintained as close to this concentration as possible.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

5. During the period beginning the effective date of this permit and lasting through January 31, 1983 the permittee is authorized to discharge from outfall(s) serial number(s) 010 through 030 (drainage from helicopter deck, bridge deck, boat deck, poop deck, and main deck).
Such discharges shall be limited and monitored by the permittee as specified below:

a.

Effluent Characteristic	Discharge Limitations				Monitoring Requirements*	
	kg/day (lbs/day)		Other Units (Specify)			
	Daily Avg	Daily Max	Daily Avg	Daily Max	Measurement Frequency	Sample Type
Total Volume (gallons)**	-	-	-	-	Quarterly/Yr	Estimate

b. There shall be no visible oil or floating solids in the receiving waters as a result of these discharges.

c. The discharge of fuel through discharge points 010 through 030 is prohibited.

d. Samples taken in compliance with the monitoring requirements specified above shall be taken at the following locations: Discharges 010 through 030, subsequent to all treatment processes and prior to entry into the waters of the Pacific Ocean.

* The monitoring requirements shall commence on the effective date of this permit.
** Total volume discharged from discharges 010 through 030 during that particular quarter of the year.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

6. During the period beginning the effective date of this permit and lasting through January 31, 1983, the permittee is authorized to discharge from outfall(s) serial number(s) 031 (drill cuttings, sand & silt), 032 a 033 (excess cement slurries, drilling muds, sand trap overflow, degasser & desander tank drainage, desilter tank, mixi Such discharges shall be limited and monitored by the permittee as specified below: tank, & active tank drainag

a.

Effluent Characteristic	Discharge Limitations kg/day (lbs/day)		Other Units (Specify)		Monitoring Requirements*	
	Daily Avg	Daily Max	Daily Avg	Daily Max	Measurement Frequency	Sample Type
Total Volume	-	-	-	-	**	**

b. There shall be no discharge of free oil as a result of the discharge of drill cuttings and/or drilling muds.

c. There shall be no visible floating solids in the receiving waters as a result of these discharges.

d. The discharge of oil-base drilling muds is prohibited.

e. The discharge of drill cuttings, drilling muds, and/or cement slurries is prohibited in Areas of Special Biological Significance as designated by Bureau of Land Management (BLM) lease contracts. Any subsequent modification of BLM contracts may be a basis for a modification of this requirement. Areas of Special Biological Significance presently identified in BLM contracts include, but are not limited to, areas in OCS parcels P-0273, P-0274, P-0277, and P-0278.

f. There shall be no discharge of toxic materials.

* The monitoring requirements shall commence on the effective date of this permit.

** The total volume (cubic meters) of drilling cuttings and spent drilling muds discharged at each site shall each be monitored by an estimate sample type. Total volume (gallons) discharged from sand trap overflow, degasser and desander drainage, desilter tank, mixing tank and active tank shall be monitored quarterly.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

7. During the period beginning the effective date of this permit and lasting through January 31, 1983, the permittee is authorized to discharge from outfall(s) serial number(s) 034 (engine cooling water).

Such discharges shall be limited and monitored by the permittee as specified below:

a.

Effluent Characteristic	Discharge Limitations				Monitoring Requirements *	
	kg/day (lbs/day)		Other Units (Specify)			
	Daily Avg	Daily Max	Daily Avg	Daily Max	Measurement** Frequency	Sample Type
Flow-m^3/Day (MGD)	-	-	-	-	Once/Month	Discrete
Temperature	-	-	-	-	Once/Month	Discrete
Oil and Grease	-	-	-	-	Once/Month	Discrete

After a review of effluent monitoring representing at least one (1) year of discharge from the permittee's facility, the Regional Administrator may, upon due notice, revise the permit to establish final temperature limitations. Such a revision of this permit may also include an Implementation Schedule for an abatement program or other appropriate conditions to achieve the final temperature limitations.

b. The use of chemical additives is prohibited.

c. There shall be no visible floating solids in the receiving waters as a result of these discharges.

d. Samples taken in compliance with the monitoring requirements specified above shall be taken at the following locations: Discharge 034, prior to mixture with the waters of the Pacific Ocean and at a point in the receiving waters where there is no thermal influence from the discharge (receiving waters need only be monitored with respect to temperature).

* The monitoring requirements shall commence on the effective date of this permit.
** The monitoring frequency is once per month with a minimum frequency of once per site.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

8. During the period beginning the effective date of this permit and lasting through January 31, 1983, the permittee is authorized to discharge from outfall(s) serial number(s) 035 (control fluid from blow-out preventer (BOP)).
Such discharges shall be limited and monitored by the permittee as specified below:

a.

Effluent Characteristic	Discharge Limitations				Monitoring Requirements *	
	kg/day (lbs/day)		Other Units (Specify)			
	Daily Avg	Daily Max	Daily Avg	Daily Max	Measurement Frequency	Sample Type
Total Volume (gallons)**	-	-	-	-	Monthly	Estimate

b. There shall be no visible oil or floating solids in the receiving waters as a result of this discharge.

* The monitoring requirements shall commence on the effective date of this permit.
** The total volume of control fluid discharged into the waters of the Pacific Ocean each month of the year shall be monitored.

B. SCHEDULE OF COMPLIANCE

1. The permittee shall achieve compliance with the effluent limitations specified for discharges in accordance with the following schedule:

Not Applicable

2. No later than 14 calendar days following a date identified in the above schedule of compliance, the permittee shall submit either a report of progress or, in the case of specific actions being required by identified dates, a written notice of compliance or noncompliance. In the latter case, the notice shall include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirement.

3. A "schedule of compliance" means a program composed of two integral parts: (a) plan - description of new or modified facilities to treat and dispose of the effluent; and (b) schedule - a timetable setting forth the date by which all wastewaters will be in compliance with the effluent limitations of this permit. The schedule shall include (if appropriate) dates by which the permittee will accomplish:

   a. Completion of a preliminary engineering plan report;

   b. Completion of construction plans and specifications;

   c. Initiation of construction;

   d. Completion of construction;

   e. Demonstration of compliance with effluent limitations.

C. MONITORING AND REPORTING

1. *Representative Sampling*

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge.

2. *Reporting*

Monitoring results obtained during the previous 3 months shall be summarized for each month and submitted on forms to be supplied by the Regional Administrator, to the extent that the information reported may be entered on the forms. The results of all monitoring required by this permit shall be submitted in such a format as to allow direct comparison with the limitations and requirements of this permit. Unless otherwise specified, discharge flows shall be reported in terms of the average flow over each 30-day period and the maximum daily flow over that 30-day period. Monitoring reports shall be postmarked no later than the 28th day of the month following the completed reporting period. The first report is due on August 28, 1978 . Duplicate signed copies of these, and all other reports required herein, shall be submitted to the Regional Administrator and the State at the following addresses:

Regional Administrator
Environmental Protection Agency
Region IX, ATTN: E-5/MR
215 Fremont Street
San Francisco CA 94105

State of California Water
Resources Control Board
Attn: Mr. Larry F. Walker
P.O. Box 100
Sacramento, Ca. 95801

3. *Definitions*

See Part III.

4. *Test Procedures*

Test procedures for the analysis of pollutants shall conform to regulations published pursuant to Section 304(g) of the Act, under which such procedures may be required.

5. *Recording of Results*

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information:

a. The exact place, date, and time of sampling;

b. The dates the analyses were performed;

c. The person(s) who performed the analyses;

d. The analytical techniques or methods used; and

e. The results of all required analyses.

6. *Additional Monitoring by Permittee*

If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified above, the results of such monitoring shall be included in the calculation and reporting of the values required in the Discharge Monitoring Report Form. Such increased frequency shall also be indicated.

7. *Records Retention*

All records and information resulting from the monitoring activities required by this permit including all records of analyses performed and calibration and maintenance of instrumentation and recordings from continuous monitoring instrumentation shall be retained for a minimum of three (3) years, or longer if requested by the Regional Administrator or the State water pollution control agency.

A. MANAGEMENT REQUIREMENTS

1. *Change in Discharge*

All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit more frequently than or at a level in excess of that authorized shall constitute a violation of the permit. Any anticipated facility expansions, or treatment modifications which will result in new, different, or increased discharges of pollutants must be reported by submission of a new NPDES application or, if such changes will not violate the effluent limitations specified in this permit, by notice to the permit issuing authority of such changes. Following such notice, the permit may be modified to specify and limit any pollutants not previously limited.

2. *Noncompliance Notification*

If, for any reason, the permittee does not comply with or will be unable to comply with any daily maximum effluent limitation specified in this permit, the permittee shall provide the Regional Administrator and the State with the following information, in writing, within five (5) days of becoming aware of such condition:

a. A description of the discharge and cause of noncompliance; and

b. The period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate and prevent recurrence of the noncomplying discharge.

3. *Facilities Operation*

The permittee shall at all times maintain in good working order and operate as efficiently as possible all treatment or control facilities or systems installed or used by the permittee to achieve compliance with the terms and conditions of this permit.

4. *Adverse Impact*

The permittee shall take all reasonable steps to minimize any adverse impact to receiving waters resulting from noncompliance with any effluent limitations specified in this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.

5. *Bypassing*

Any diversion from or bypass of facilities necessary to maintain compliance with the terms and conditions of this permit is prohibited, except (i) where unavoidable to prevent loss of life or severe property damage, or (ii) where excessive storm drainage or runoff would damage any facilities necessary for compliance with the effluent limitations and prohibitions of this permit. The permittee shall promptly notify the Regional Administrator and the State in writing of each such diversion or bypass, in accordance with the procedure specified in Part II.A.2. above.

6. *Removed Substances*

Solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters shall be disposed of in a manner such as to prevent any pollutant from such materials from entering navigable waters.

7. Safeguards to Electric Power Failure

In order to maintain compliance with the effluent limitations and prohibitions of this permit, the permittee shall either:

(a) maintain in good working order an alternative power source sufficient to operate the wastewater control facilities; or,

(b) halt, reduce or otherwise control all discharges upon the reduction, loss, or failure of the primary source of power to the wastewater control facilities.

RESPONSIBILITIES

1. *Right of Entry*

The permittee shall allow the head of the State water pollution control agency, the Regional Administrator, and/or their authorized representatives, upon the presentation of credentials:

a. To enter upon the permittee's premises where an effluent source is located or in which any records are required to be kept under the terms and conditions of this permit; and

b. At reasonable times to have access to and copy any records required to be kept under the terms and conditions of this permit; to inspect any monitoring equipment or monitoring method required in this permit; and to sample any discharge of pollutants.

2. *Transfer of Ownership or Control*

In the event of any change in control or ownership of facilities from which the authorized discharges emanate, the permittee shall notify the succeeding owner or controller of the existence of this permit by letter, a copy of which shall be forwarded to the Regional Administrator and the State water pollution control agency.

3. *Availability of Reports*

Except for data determined to be confidential under Section 308 of the Act, all reports prepared in accordance with the terms of this permit shall be available for public

inspection at the offices of the State water pollution control agency and the Regional Administrator. As required by the Act, effluent data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the Act.

4. *Permit Modification*

After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked in whole or in part during its term for cause including, but not limited to, the following:

a. Violation of any terms or conditions of this permit;

b. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts; or

c. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge.

5. *Toxic Pollutants*

Notwithstanding Part II, B-4 above, if a toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under Section 307(a) of the Act for a toxic pollutant which is present in the discharge and such standard or prohibition is more stringent than any limitation for such pollutant in this permit, this permit shall be revised or modified in accordance with the toxic effluent standard or prohibition and the permittee so notified.

6. *Civil and Criminal Liability*

Except as provided in permit conditions on "Bypassing" (Part II, A-5) and "Power Failures" (Part II, A-7), nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance.

7. *Oil and Hazardous Substance Liability*

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Section 311 of the Act.

8. *State Laws*

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation under authority preserved by Section 510 of the Act.

9. *Property Rights*

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

10. *Severability*

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

PART III

OTHER REQUIREMENTS

Part I.A.8. Additional Monitoring Requirements: Bioassay of Spent Drilling Muds

Within ninety (90) days of initiation of drilling mud discharges, the permittee shall demonstrate compliance with Condition I.A.6.f. by conducting and reporting the results of a 96-hour static bioassay determining the LC_{50} (concentration at which fifty percent of the test organisms survived for 96 hours) of spent drilling muds. A sample of spent drilling muds, immediately prior to their intended discharge, shall be collected for analysis. The bioassay shall be conducted with a test organism approved, in writing, prior to use, by the Regional Administrator. The following shall be submitted to the Regional Administrator:

(a) the date the sample was collected;
(b) the total volume of spent muds discharged on the date of the sample;
(c) the water depth into which the muds were discharged;
(d) the results of the 96-hour bioassay, including the survival percentages of all dilutions tested and the graph from which the LC_{50} was extrapolated;
(e) a list of all components, including the weights, used to compose the drilling muds which were discharged. If commercial names are listed, their chemical constituents shall also be provided; and
(f) the results of any other bioassay conducted on the drilling muds, including the information in (a) through (e), above.

Part I.C.3. Definitions

a. "Territorial seas" means that part of the ocean measured three miles seaward from the line of lower low water and the line closing bays, rivers, and historic waters and which is shown on a series of charts prepared by the National Security Council, Law of the Sea Taskforce on the United States Baseline and published by the National Ocean Survey.

b. A "discrete sample" means any individual sample collected in less than fifteen (15) minutes.

c. The "daily maximum" discharge means the total discharge by weight during any calendar day.

d. The "daily maximum" concentration means the measurement made on any single discrete sample or composite sample.

e. "Sanitary wastes" include human body wastes discharged from toilets and urinals.

f. The term "deck drainage" includes all water resulting from platform washings, deck washings, and runoff from curbs, gutters, and drains including drip pans and work areas.

g. A "composite sample" means four (4) samples taken over a twenty-four (24) hour period, analyzed separately and the four samples averaged. The daily maximum limitations for oil and grease are based on the above definition of composite samples.

Part I.C.8. Monitoring Modification

Monitoring, analytical, and reporting requirements may be modified by the Regional Administrator upon due notice.

Part II.B. Responsibilities

11. Other Affected Authority

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable law or regulation under authority preserved by Section 511 of the Act.

12. Discharge Site Modifications

A minimum of 120 days prior to the initiation of any discharges at a site not authorized by this permit, the permittee shall provide to the Regional Administrator a written request for the modification of the discharge sites authorized in this permit. This written request shall include:

(a) the new site(s), listed by the parcel number(s) assigned in the leasing contracts,

(b) the lambert coordinates of the center of each parcel, and

(c) any additional information necessary to the Regional Administrator for determinations regarding the modification request.

Until the modifications have been approved by the Regional Administrator and are in effect, any discharge at an unauthorized site is prohibited.

Part III.A. Notification of Relocation

No less than fourteen (14) days prior to any relocation and initiation of discharge activities at an authorized discharge site by the drilling vessel, Glomar Atlantic, the permittee shall provide to the Regional Administrator and the appropriate state agency, written notification of such actions. The notification shall include the parcel number and exact coordinates of the new site and the initial date and expected duration of drilling activities at the site.

Part III.B. Reapplication

If the permittee desires to continue to discharge, the reapplication shall be submitted no later than 180 days prior to the expiration date of this permit.

Federal Register

WEDNESDAY, DECEMBER 1, 1976

PART II:

ENVIRONMENTAL PROTECTION AGENCY

WATER PROGRAMS

Guidelines Establishing Test Procedures for the Analysis of Pollutants

Amendments

Title 40—Protection of Environment

CHAPTER I—ENVIRONMENTAL PROTECTION AGENCY

SCHAPTER D—WATER PROGRAMS

[FRL 630-4]

PART 136—GUIDELINES ESTABLISHING TEST PROCEDURES FOR THE ANALYSIS OF POLLUTANTS

Amendment of Regulations

On June 9, 1975, proposed amendments to the Guidelines Establishing Test Procedures for the Analysis of Pollutants (40 CFR 136) were published in the FEDERAL REGISTER (40 FR 24535) as required by section 304(g) of the Federal Water Pollution Control Act Amendments of 1972 (86 Stat. 816, et seq., Pub. L. 92-500, 1972) hereinafter referred to as the Act.

Section 304(g) of the Act requires that the Administrator shall promulgate guidelines establishing test procedures for the analysis of pollutants that shall include factors which must be provided in: (1) any certification pursuant to section 401 of the Act, or (2) any permit application pursuant to section 402 of the Act. Such test procedures are to be used by permit applicants to demonstrate that effluent discharges meet applicable pollutant discharge limitations and by the States and other enforcement activities in routine or random monitoring of effluents to verify compliance with pollu- control measures.

Interested persons were requested to s written comments, suggestions, or ob ons to the proposed amendments by September 7, 1975. One hundred and thirty-five letters were received from commenters. The following categories of organizations were represented by the commenters: Federal agencies accounted for twenty-four responses; State agencies accounted for twenty-six responses; local agencies accounted for seventeen responses; regulated major dischargers accounted for forty-seven responses; trade and professional organizations accounted for eight responses; analytical instrument manufacturers and vendors accounted for seven responses; and analytical service laboratories accounted for six responses.

All comments were carefully evaluated by a technical review committee. Based upon the review of comments, the following principal changes to the proposed amendments were made:

(A) *Definitions.* Section 136.2 has been amended to update references: Twenty commenters, representing the entire spectrum of responding groups pointed out that the references cited in §§ 136.2 (f), 136.2(g), and 136.2(h) were out-of-date; §§ 136.2(f), 136.2(g), and 136.2(h), respectively, have been amended to show the following editions of the standard references: "14th Edition of Standard thods for the Examination of Water Waste Water;" "1974 EPA Manual thods for the Analysis of Water and Waste;" and "Part 31, 1975 Annual Book of ASTM Standards."

(B) *Identification of Test Procedures.* Both the content and format of § 136.3, "Table I, List of Approved Test Procedures" have been revised in response to twenty-one comments received from State and local governments, major regulated dischargers, professional and trade associations, and analytical laboratories.

Table I has been revised by:

(1) The addition of a fourth column of references which includes procedures of the United States Geological Survey which are equivalent to previously approved methods.

(2) The addition of a fifth column of miscellaneous references to procedures which are equivalent to previously approved methods.

(3) Listing generically related parameters alphabetically within four subcategories: bacteria, metals, radiological and residue, and by listing these subcategory headings in alphabetic sequence relative to the remaining parameters.

(4) Deleting the parameter "Algicides" and by entering the single relevant algicide, "Pentachlorophenol" by its chemical name.

(C) *Clarification of Test Parameters.* The conditions for analysis of several parameters have been more specifically defined as a result of comments received by the Agency:

(1) In response to five commenters representing State or local governments, major dischargers, or analytical instrument manufacturers, the end-point for the alkalinity determination is specifically designated as pH 4.5.

(2) Manual digestion and distillation are still required as necessary preliminary steps for the Kjeldahl nitrogen procedure. Analysis after such distillation may be by Nessler color comparison, titration, electrode, or automated phenolate procedures.

(3) In response to eight commenters representative of Federal and State governments, major dischargers, and analytical instrument manufacturers, manual distillation at pH 9.5 is now specified for ammonia measurement.

(D) *New Parameters and Analytical Procedures.* Forty-four new parameters have been added to Table I. In addition to the designation of analytical procedures for these new parameters, the following modifications have been made in analytical procedures designated in response to comments.

(1) The ortho-tolidine procedure was not approved for the measurement of residual chlorine because of its poor accuracy and precision. Its approval had been requested by seven commenters representing major dischargers, State, or local governments, and analytical instrument manufacturers. Instead, the N,N-diethyl-p-phenylenediamine (DPD) method is approved as an interim procedure pending more intensive laboratory testing. It has many of the advantages of the ortho-tolidine procedure such as low cost, ease of operation, and also is of acceptable precision and accuracy.

(2) The Environmental Protection Agency concurred with the American Dye Manufacturers' request to approve its procedure for measurement of color, and copies of the procedure are now available at the Environmental Monitoring and Support Laboratory, Cincinnati (EMSL-CI).

(3) In response to three requests from Federal, State governments, and dischargers, "hardness," may be measured as the sum of calcium and magnesium analyzed by atomic absorption and expressed as their carbonates.

(4) The proposal to limit measurement of fecal coliform bacteria in the presence of chlorine to only the "Most Probable Number" (MPN) procedure has been withdrawn in response to requests from forty-five commenters including State pollution control agencies, permit holders, analysts, treatment plant operators, and a manufacturer of analytical supplies. The membrane filter (MF) procedure will continue to be an approved technique for the routine measurement of fecal coliform in the presence of chlorine. However, the MPN procedure must be used to resolve controversial situations. The technique selected by the analyst must be reported with the data.

(5) A total of fifteen objections, representing the entire spectrum of commenters, addressed the drying temperatures used for measurement of residues. The use of different temperatures in drying of total residue, dissolved residue and suspended residue was cited as not allowing direct intercomparability between these measurements. Because the intent of designating the three separate residue parameters is to measure separate waste characteristics (low drying temperatures to measure volatile substances, high drying temperatures to measure anhydrous inorganic substances), the difference in drying temperatures for these residue parameters must be preserved.

(E) *Deletion of Measurement Techniques.* Some measurement techniques that had been proposed have been deleted in response to objections raised during the public comment period.

(1) The proposed infrared spectrophotometric analysis for oil and grease has been withdrawn. Eleven commenters representing Federal or State agencies and major dischargers claimed that this parameter is defined by the measurement procedure. Any alteration in the procedure would change the definition of the parameter. The Environmental Protection Agency agreed.

(2) The proposed separate parameter for sulfide at concentrations below 1 mg/l, has been withdrawn. Methylene blue spectrophotometry is now included in Table I as an approved procedure for sulfide analysis. The titrimetric iodine procedure for sulfide analysis may only be used for analysis of sulfide at concentrations in excess of one milligram per liter.

(F) *Sample Preservation and Holding Times.* Criteria for sample preservation and sample holding times were requested by several commenters. The reference for sample preservation and holding time criteria applicable to the Table I parameters is given in footnote (1) of Table I.

(G) *Alternate Test Procedures.* Comments pertaining to § 136.4, Application for Alternate Test Procedures, included objections to various obstacles within

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PART 136--GUIDELINES ESTABLISHING TEST PROCEDURES FOR THE ANALYSIS OF POLLUTANTS

Amendment of Regulations

ERRATA SHEET

Page	Parameter Number	Correction or Addition
52783	62	14th ed. Standard Methods, - add "232" to page reference
52784	89	Parameter and units, change "Nitrate" to "Nitrite"
52784	96	14th ed. Standard Methods, change "582" to "574"
52784	96	1974 EPA methods add footnote designation "27"
52784	96	14th ed. Standard Methods, add footnote designation "27"
	Footnote 27	"Method 510D, Page 582, is not approved"

U. S. ENVIRONMENTAL PROTECTION AGENCY

ENVIRONMENTAL MONITORING AND SUPPORT LABORATORY

CINCINNATI, OHIO 45268

December 16, 1976

se procedures for expeditious approval of alternate test procedures. Four lytical instrument manufacturers mented that by limiting of applicafor review and/or approval of alterte test procedures to NPDES permit 136.4 became an impediment to ercial development of new or roved measurement devices based on measurement principles. Applicas for such review and/or approval now be accepted from any person. intent of the alternate test prore is to allow the use of measureit systems which are known to be valent to the approved test proces in waste water discharges.

pplications for approval of alternate procedures applicable to specific disges will continue to be made only by DES permit holders, and approval of applications will be made on a -by-case basis by the Regional Adistrator in whose Region the disge is made.

pplications for approval of alternate procedures which are intended for onwide use can now be submitted by person directly to the Director of the ironmental Monitoring and Support oratory in Cincinnati. Such applicas should include a complete methods e-up, any literature references, combility data between the proposed alate test procedure and those already roved by the Administrator. The apation should include precision and racy data of the proposed alternate procedure and data confirming the ral applicability of the test proce to the industrial categories of waste r f ich it is intended. The Dir o e Environmental Monitoring Support Laboratory, after review of itted information, will recommend oval or rejection of the application e Administrator, or he will return pplication to the applicant for more mation. Approval or rejection of aptions for test procedures intended ationwide use will be made by the inistrator, after considering the recendation made by the Director of nvironmental Monitoring and Sup Laboratory, Cincinnati. Since the cy considers these procedures for oval of alternate test procedures for awide use to be interim procedures, ill welcome suggestions for criteria pproval of alternate test procedures ationwide use. Interested persons submit their written comments in ate on or before June 1, 1977 to: obert B. Medz, Environmental Pro Technologist, Monitoring Quality nce Standardization, Office of oring and Technical Support (RD-Environmental Protection Agency, ngton, D.C. 20460.

Freedom of Information. A copy public comments, an analysis by ete of those comments, and docuproviding further information on tionale for the changes made in nal regulation are available for tion and copying at the Environ Pr ion Agency Public Infor Reference Unit, Room 2922, Waterside Mall, 401 M Street, SW., Washington, D.C. 20460, during normal business hours. The EPA information regulation 40 CFR 2 provides that a reasonable fee may be charged for copying such documents.

Effective date: These amendments become effective on April 1, 1977.

Dated: November 19, 1976.

JOHN QUARLES,
Acting Administrator,
Environmental Protection Agency.

Chapter I, Subchapter D, of Title 40, Code of Federal Regulations is amended as follows:

1. In § 136.2, paragraphs (f), (g), and (h) are amended to read as follows:

§ 136.2 Definitions.

• • • • •

(f) "Standard Methods" means *Standard Methods for the Examination of Water and Waste Water*, 14th Edition, 1976. This publication is available from the American Public Health Association, 1015 18th Street, N.W., Washington, D.C. 20036.

(g) "ASTM" means *Annual Book of Standards, Part 31, Water, 1975.* This publication is available from the American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania 19103.

(h) "EPA Methods" means *Methods for Chemical Analysis of Water and Waste, 1974.* Methods Development and Quality Assurance Research Laboratory, National Environmental Research Center, Cincinnati, Ohio 45268; U.S. Environmental Protection Agency, Office of Technology Transfer, Industrial Environmental Research Laboratory, Cincinnati, Ohio 45268. This publication is available from the Office of Technology Transfer.

2. In § 136.3, the second sentence of paragraph (b) is amended, and a new paragraph (c) is added to read as follows:

§ 136.3 Identification of test procedures.

• • • • •

(b) • • • Under such circumstances, additional test procedures for analysis of pollutants may be specified by the Regional Administrator or the Director upon the recommendation of the Director of the Environmental Monitoring and Support Laboratory, Cincinnati.

(c) Under certain circumstances, the Administrator may approve, upon recommendation by the Director, Environmental Monitoring and Support Laboratory, Cincinnati, additional alternate test procedures for nationwide use.

3. Table I of § 136.3 is revised by listing the parameters alphabetically; by adding 44 new parameters; by adding a fourth column under references listing equivalent United States Geological Survey methods; by adding a fifth column under references listing miscellaneous equivalent methods; by deleting footnotes 1 through 7 and adding 24 new footnotes. to read as follows:

• • • • •

TABLE I.—*List of approved test procedures* [1]

Parameter and units	Method	1974 EPA methods	14th ed. Standard methods	References (page nos.) Pt. 31 1976 ASTM	USGS methods [2]	Other approved methods
1. Acidity, as $CaCO_3$, [3] milligrams per liter.	Electrometric end point (pH of 8.2) or phenolphthalein end point.	1	273(44)	116	40	[4](607)
2. Alkalinity, as $CaCO_3$, [3] milligrams per liter.	Electrometric titration (only to pH 4.5) manual or automated, or equivalent automated methods.	2 5	278	111	41	[4](607)
3. Ammonia (as N), milligrams per liter.	Manual distillation [5] (at pH 9.5) followed by nesslerization, titration, electrode. Automated phenolate.	159 165 168	410 412 616	237	116	[4](614)
BACTERIA						
4. Coliform (fecal), [6] number per 100 ml.	MPN; [7] membrane filter.		922 937		[8](45)	
5. Coliform (fecal) [6] in presence of chlorine, number per 100 ml.	do. [9]		922 928, 937			
6. Coliform (total), [6] number per 100 ml.	do. [9]		916 928		[8](35)	
7. Coliform (total) [6] in presence of chlorine, number per 100 ml.	MPN; [7] membrane filter with enrichment.		916 933			
8. Fecal streptococci, [10] number per 100 ml.	MPN; [7] membrane filter; plate count.		943 944 947		[8](50)	
9. Benzidine, milligrams per liter.	Oxidation—colorimetric [11]					
10. Biochemical oxygen demand, 5-d (BOD$_5$), milligrams per liter.	Winkler (Azide modification) or electrode method.		543		[8](50)	[12](17)
11. Bromide, milligrams per liter.	Titrimetric, iodine-iodate.	14		223	53	
12. Chemical oxygen demand (COD), milligrams per liter.	Dichromate reflux.	20	550	472	124	[4](610) [12](17)
13. Chloride, milligrams per liter.	Silver nitrate; mercuric nitrate; or automated colorimetric-ferricyanide.	29 31	503 504 613	267 265	[13](46)	[4](616)

See footnotes at end of table.

Parameter and units	Method	1974 EPA methods	14th ed. standard methods	References (page nos.) Pt. 31 1976 ASTM	References (page nos.) USGS methods [8]	Other approved methods
14. Chlorinated organic compounds (except pesticides), milligrams per liter.	Gas chromatography [12]					
15. Chlorine—total residual, milligrams per liter.	Iodometric titration, amperometric or starch-iodine end-point; DPD colorimetric or Titrimetric methods (these last 2 are interim methods pending laboratory testing).	35	318 322 332 329	278		
16. Color, platinum cobalt units or dominant wave length, hue, luminance, purity.	Colorimetric: spectrophotometric; or ADMI procedure.[13]	30 39	64 60		82	
17. Cyanide, total,[14] milligrams per liter.	Distillation followed by silver nitrate titration or pyridine pyrazolone (or barbituric acid) colorimetric.	40	391	503	85	[9](22)
18. Cyanide amenable to chlorination, milligrams per liter.	do	49	378	503		
19. Dissolved oxygen, milligrams per liter.	Winkler (Azide modification) or electrode method.	51 56	443 450	388	126	[4](000)
20. Fluoride, milligrams per liter.	Distillation [4] followed by ion electrode; SPADNS; or automated complexone.	65 69 61	390 391 393 614	307 305	93	
21. Hardness—Total, as $CaCO_3$, milligrams per liter.	EDTA titration; automated colorimetric; or atomic absorption (sum of Ca and Mg as their respective carbonates).	68 70	202	161	94	[4](617)
22. Hydrogen ion (pH), pH units.	Electrometric measurement.	239	460	178	120	[4](603)
23. Kjeldahl nitrogen (as N), milligrams per liter.	Digestion and distillation followed by nesslerization, titration, or electrode; automated digestion automated phenolate.	175 165 162	437		123	[4](612)
METALS						
24. Aluminum—Total, milligrams per liter.	Digestion [11] followed by atomic absorption [15] or by colorimetric (Eriochrome Cyanine R).	93	153 171		[11] (19)	
25. Aluminum—Dissolved, milligrams per liter.	0.45 micron filtration [11] followed by referenced methods for total aluminum.					
26. Antimony—Total, milligrams per liter.	Digestion [11] followed by atomic absorption.[15]	94				
27. Antimony—Dissolved, milligrams per liter.	0.45 micron filtration [11] followed by referenced method for total antimony.					
28. Arsenic—Total, milligrams per liter.	Digestion followed by silver diethyldithiocarbamate; or atomic absorption.[15] [16]	9 96	285 253 159		[11] (31) [11] (37)	
29. Arsenic—Dissolved, milligrams per liter.	0.45 micron filtration [11] followed by referenced method for total arsenic.					
30. Barium—Total, milligrams per liter.	Digestion [11] followed by atomic absorption.[15]	97	152		52	
31. Barium—Dissolved, milligrams per liter.	0.45 micron filtration [11] followed by referenced method for total barium.					
32. Beryllium—Total, milligrams per liter.	Digestion [11] followed by atomic absorption [15] or by colorimetric (Aluminon).	99	152 177		53	
33. Beryllium—Dissolved, milligrams per liter.	0.45 micron filtration [11] followed by referenced method for total beryllium.					
34. Boron—Total, milligrams per liter.	Colorimetric (Curcumin)	13	287			
35. Boron—Dissolved, milligrams per liter.	0.45 micron filtration [11] followed by referenced method for total boron.					
36. Cadmium—Total, milligrams per liter.	Digestion [11] followed by atomic absorption [15] or by colorimetric (Dithizone).	101	148 182	345	62	[9] (019) [10] (37)
37. Cadmium—Dissolved, milligrams per liter.	0.45 micron filtration [11] followed by referenced method for total cadmium.					
38. Calcium—Total, milligrams per liter.	Digestion [11] followed by atomic absorption; or EDTA titration.	103	148 159	345	68	
39. Calcium—Dissolved, milligrams per liter.	0.45 micron filtration [11] followed by referenced method for total calcium.					
40. Chromium VI, milligrams per liter.	Extraction and atomic absorption; colorimetric (Diphenylcarbazide).	89, 105	192		76 75	
41. Chromium VI—Dissolved, milligrams per liter.	0.45 micron filtration [11] followed by referenced method for chromium VI.					
42. Chromium—Total, milligrams per liter.	Digestion [11] followed by atomic absorption [15] or by colorimetric (Diphenylcarbazide).	105	148 192	345 338	78 77	[9] (019)
43. Chromium—Dissolved, milligrams per liter.	0.45 micron filtration [11] followed by referenced method for total chromium.					

See footnotes at end of table.

Parameter and units	Method	1974 EPA methods	14th ed. standard methods	References (page nos.) Pt. 31 1975 ASTM	USGS methods [2]	Other approved methods
78. Thallium—Total, milligrams per liter.	Digestion [15] followed by atomic absorption.[16]	149				
79. Thallium—Dissolved, milligrams per liter.	0.45 micron filtration [17] followed by referenced method for total thallium.					
80. Tin—Total, milligrams per liter.	Digestion [15] followed by atomic absorption.[16]	150				[11] (65)
81. Tin—Dissolved, milligrams per liter.	0.45 micron filtration [17] followed by referenced method for total tin.					
82. Titanium—Total, milligrams per liter.	Digestion [15] followed by atomic absorption.[16]	151				
83. Titanium—Dissolved, milligrams per liter.	0.45 micron filtration [17] followed by referenced method for total titanium.					
84. Vanadium—Total, milligrams per liter.	Digestion [15] followed by atomic absorption [16] or by colorimetric (Gallic acid).	153	152 200		441	[11] (67)
85. Vanadium—Dissolved, milligrams per liter.	0.45 micron filtration [17] followed by referenced method for total vanadium.					
86. Zinc—Total, milligrams per liter.	Digestion [15] followed by atomic absorption [16] or by colorimetric (Dithizone).	155	148 265	345	159	[3] (619) [10] (37)
87. Zinc—Dissolved, milligrams per liter.	0.45 micron filtration [17] followed by referenced method for total zinc.					
88. Nitrate (as N), milligrams per liter.	Cadmium reduction; brucium sulfate; automated cadmium or hydrazine reduction.[21]	201 197 207	423 427 420	358	119	[3] (614) [10] (28)
89. Nitrate (as N), milligrams per liter.	Manual or automated colorimetric (Diazotization).	215	434		121	
90. Oil and grease, milligrams per liter.	Liquid-liquid extraction with trichloro-trifluoroethane-gravimetric.	229	515			
91. Organic carbon; total (TOC), milligrams per liter.	Combustion—Infrared method.[22]	236	532	447	[11] (4)	
92. Organic nitrogen (as N), milligrams per liter.	Kjeldahl nitrogen minus ammonia nitrogen.	175, 159	437		122	[3] (612, 614)
93. Orthophosphate (as P), milligrams per liter.	Manual or automated ascorbic acid reduction.	249 256	481 624	344	131	[3] (621)
94. Pentachlorophenol, milligrams per liter.	Gas chromatography [18]					
95. Pesticides, milligrams per liter.	do.[7]		555	329	[11] (24)	
96. Phenols, milligrams per liter.	Colorimetric, (4AAP)	241	562	545		
97. Phosphorus (elemental), milligrams per liter.	Gas chromatography [20]					
98. Phosphorus; total (as P), milligrams per liter.	Persulfate digestion followed by manual or automated ascorbic acid reduction.	249 256	476, 481 624	334	133	[3] (621)
RADIOLOGICAL						
99. Alpha—Total, pCi per liter.	Proportional or scintillation counter.		648	591 [12] 75 (+78)		
100. Alpha—Counting error, pCi per liter.	do		648	594	[11] (79)	
101. Beta—Total, pCi per liter.	Proportional counter		648	601 [11] 75 (+78)		
102. Beta—Counting error, pCi per liter.	do		648	606	[11] (79)	
103. (a) Radium—Total, pCi per liter.	do		661	661		
(b) [23] Ra, pCi per liter	Scintillation counter		667		[11] (81)	
RESIDUE						
104. Total, milligrams per liter.	Gravimetric, 103 to 105° C.	270	91			
105. Total dissolved (filterable), milligrams per liter.	Glass fiber filtration, 180° C.	266	92			
106. Total suspended (nonfilterable), milligrams per liter.	Glass fiber filtration, 103 to 105° C.	268	94			
107. Settleable, milliliters per liter or milligrams per liter.	Volumetric or gravimetric		95			
108. Total volatile, milligrams per liter.	Gravimetric, 550° C.	272	95			
109. Specific conductance, micromhos per centimeter at 25° C.	Wheatstone bridge conductivity.	275	71	120	148	[3] (606)
110. Sulfate (as SO_4), milligrams per liter.	Gravimetric; turbidimetric; or automated colorimetric (barium chloranilate).	277 279	493 496	424 425		[3] (624) [3] (623)
111. Sulfide (as S), milligrams per liter.	Titrimetric—Iodine for levels greater than 1 mg per liter; Methylene blue photometric.	284	505 503		154	
112. Sulfite (as SO_3), milligrams per liter.	Titrimetric, iodine-iodate	285	508	435		
113. Surfactants, milligrams per liter.	Colorimetric (Methylene blue).	157	600	494	[11] (11)	
114. Temperature, degrees C.	Calibrated glass or electrometric thermometer.	286	125		[11] (31)	
115. Turbidity, NTU.	Nephelometric	295	132	223	156	

[1] Recommendations for sampling and preservation of samples according to parameter measured may be found in "Methods for Chemical Analysis of Water and Wastes, 1974" U.S. Environmental Protection Agency, table 2, pp. viii-xii.

Parameter and units	Method	1974 EPA methods	14th ed. standard methods	References (page nos.) Pt. 31 1975 ASTM	References (page nos.) USGS methods [3]	Other approved methods
44. Cobalt—Total, milligrams per liter.	Digestion [11] followed by atomic absorption.[10]	107	148	345	80	[12] (37)
45. Cobalt—Dissolved, milligrams per liter.	0.45 micron filtration [17] followed by referenced method for total cobalt.					
46. Copper—Total, milligrams per liter.	Digestion [11] followed by atomic absorption [10] or by colorimetric (Neocuproine).	108	148 196	345 293	83	[4] (610) [12] (37)
47. Copper—Dissolved, milligrams per liter.	0.45 micron filtration [17] followed by referenced method for total copper.					
48. Gold—Total, milligrams per liter.	Digestion [11] followed by atomic absorption.[10]					
49. Iridium—Total, milligrams per liter.	Digestion [11] followed by atomic absorption.[10]					
50. Iron—Total, milligrams per liter.	Digestion [11] followed by atomic absorption [10] or by colorimetric (Phenanthroline).	110	148 208	345 326	102	[4] (610)
51. Iron—Dissolved, milligrams per liter.	0.45 micron filtration [17] followed by referenced method for total iron.					
52. Lead—Total, milligrams per liter.	Digestion [11] followed by atomic absorption [10] or by colorimetric (Dithizone).	112	148 215	345	105	[4] (610)
53. Lead—Dissolved, milligrams per liter.	0.45 micron filtration [17] followed by referenced method for total lead.					
54. Magnesium—Total, milligrams per liter.	Digestion [11] followed by atomic absorption; or gravimetric.	114	148 221	345	100	[4] (610)
55. Magnesium—Dissolved milligrams per liter.	0.45 micron filtration [17] followed by referenced method for total magnesium.					
56. Manganese—Total milligrams per liter.	Digestion [11] followed by atomic absorption [10] or by colorimetric (Persulfate or periodate).	116	148 225, 227	345	111	[4] (610)
57. Manganese—Dissolved milligrams per liter.	0.45 micron filtration [17] followed by referenced method for total manganese.					
58. Mercury—Total, milligrams per liter.	Flameless atomic absorption.	118	156	333	[14] (51)	
59. Mercury—Dissolved, milligrams per liter.	0.45 micron filtration [17] followed by referenced method for total mercury.					
60. Molybdenum—Total, milligrams per liter.	Digestion [11] followed by atomic absorption.[10]	120		350		
61. Molybdenum—Dissolved, milligrams per liter.	0.45 micron filtration [17] followed by referenced method for total molybdenum.					
62. Nickel—Total, milligrams per liter.	Digestion [11] followed by atomic absorption [10] or by colorimetric (Heptoxime).	141	148	345	115	
63. Nickel—Dissolved, milligrams per liter.	0.45 micron filtration [17] followed by referenced method for total nickel.					
64. Osmium—Total, milligrams per liter.	Digestion [11] followed by atomic absorption.[10]					
65. Palladium—Total, milligrams per liter.	Digestion [11] followed by atomic absorption.[10]					
66. Platinum—Total, milligrams per liter.	Digestion [11] followed by atomic absorption.[10]					
67. Potassium—Total, milligrams per liter.	Digestion [11] followed by atomic absorption, colorimetric (Cobaltinitrite), or by flame photometric.	143	235 234		134	[4] (610)
68. Potassium—Dissolved, milligrams per liter.	0.45 micron filtration [17] followed by referenced method for total potassium.					
69. Rhodium—Total, milligrams per liter.	Digestion [11] followed by atomic absorption.[10]					
70. Ruthenium—Total, milligrams per liter.	Digestion [11] followed by atomic absorption.[10]					
71. Selenium—Total, milligrams per liter.	Digestion [11] followed by atomic absorption.[10] [13]	145	159			
72. Selenium—Dissolved, milligrams per liter.	0.45 micron filtration [17] followed by referenced method for total selenium.					
73. Silica—Dissolved, milligrams per liter.	0.45 micron filtration [17] followed by colorimetric (Molybdosilicate).	274	467	398	130	
74. Silver—Total,[16] milligrams per liter.	Digestion [11] followed by atomic absorption [10] or by colorimetric (Dithizone).	148	148 243		142	[4] (610) [12] (37)
75. Silver—Dissolved,[16] milligrams per liter.	0.45 micron filtration [17] followed by referenced method for total silver.					
76. Sodium—Total, milligrams per liter.	Digestion [11] followed by atomic absorption or by flame photometric.	147	250	403	143	[4] (621)
77. Sodium—Dissolved, milligrams per liter.	0.45 micron filtration [17] followed by referenced method for total sodium.					

See footnotes at end of table.

[1] All page references for USGS methods, unless otherwise noted, are to Brown, E., Skougstad, M. W., and Fishman, M. J., "Methods for Collection and Analysis of Water Samples for Dissolved Minerals and Gases," U.S. Geological Survey Techniques of Water-Resources Inv., book 5, ch. A1, (1970).

[2] EPA comparable method may be found on indicated page of "Official Methods of Analysis of the Association of Official Analytical Chemists" methods manual, 12th ed. (1975).

[3] Manual distillation is not required if comparability data on representative effluent samples are on company file to show that this preliminary distillation step is not necessary; however, manual distillation will be required to resolve any controversies.

[4] The method used must be specified.

[5] The 5 tube MPN is used.

[6] Black, K. V. and others, "Methods for Collection and Analysis of Aquatic Biological and Microbiological Samples: U.S. Geological Survey Techniques of Water-Resources Inv. book 5, ch. A4 (1973)."

[7] Since the membrane filter technique usually yields low and variable recovery from chlorinated wastewaters, the MPN method will be required to resolve any controversies.

[8] Adequately tested methods for benzidine are not available. Until approved methods are available, the following interim method can be used for the estimation of benzidine: (1) "Method for Benzidine and Its Salts in Wastewaters," available from Environmental Monitoring and Support Laboratory, U.S. Environmental Protection Agency, Cincinnati, Ohio 45268.

[9] American National Standard on Photographic Processing Effluents, Apr. 2, 1975. Available from ANSI, 1430 Broadway, New York, N.Y. 10018.

[10] Fishman, M. J. and Brown, Eugene, "Selected Methods of the U.S. Geological Survey for Analysis of Wastewaters," (1976) open-file report 76-177.

[11] Procedures for pentachlorophenol, chlorinated organic compounds ,and pesticides can be obtained from the Environmental Monitoring and Support Laboratory, U.S. Environmental Protection Agency, Cincinnati, Ohio 45268.

[12] Color method (ADMI procedure) available from Environmental Monitoring and Support Laboratory, U.S. Environmental Protection Agency, Cincinnati, Ohio 45268.

[13] For samples suspected of having thiocyanate interference, magnesium chloride is used as the digestion catalyst. In the approved test procedure for cyanides, the recommended catalysts are replaced with 20 ml of a solution of 510 g/l magnesium chloride ($MgCl_2 \cdot 6H_2O$). This substitution will eliminate thiocyanate interference for both total cyanide and cyanide amenable to chlorination measurements.

[14] For the determination of total metals the sample is not filtered before processing. Because vigorous digestion procedures may result in a loss of certain metals through precipitation, a less vigorous treatment is recommended as given on p. 83 (4.1.4) of "Methods for Chemical Analysis of Water and Wastes" (1974). In those instances where a more vigorous digestion is desired the procedure on p. 82 (4.1.3) should be followed. For the measurement of the noble metal series (gold, iridium, osmium, palladium, platinum, rhodium and ruthenium), an aqua regia digestion is to be substituted as follows: Transfer a representative aliquot of the well-mixed sample to a Griffin beaker and add 3 ml of concentrated redistilled HNO_3. Place the beaker on a steam bath and evaporate to dryness. Cool the beaker and cautiously add a 5 ml portion of aqua regia. (Aqua regia is prepared immediately before use by carefully adding 3 volumes of concentrated HCl to one volume of concentrated HNO_3.) Cover the beaker with a watch glass and return to the steam bath. Continue heating the covered beaker for 30 min. Remove cover and evaporate to dryness. Cool and take up the residue in a small quantity of 1:1 HCl. Wash down the beaker walls and watch glass with distilled water and filter the sample to remove silicates and other insoluble material that could clog the atomizer. Adjust the volume to some predetermined value based on the expected metal concentration. The sample is now ready for analysis.

[15] As the various furnace devices (flameless AA) are essentially atomic absorption techniques, they are considered to be approved test methods. Methods of standard addition are to be followed as noted in p. 78 of "Methods for Chemical Analysis of Water and Wastes," 1974.

[16] Dissolved metals are defined as those constituents which will pass through a 0.45 μm membrane filter. A prefiltration is permissible to free the sample from larger suspended solids. Filter the sample as soon as practical after collection using the first 50 to 100 ml to rinse the filter flask. (Glass or plastic filtering apparatus are recommended to avoid possible contamination.) Discard the portion used to rinse the flask and collect the required volume of filtrate. Acidify the filtrate with 1:1 redistilled HNO_3 to a pH of 2. Normally, 3 ml of (1:1) acid per liter should be sufficient to preserve the samples.

[17] See "Atomic Absorption Newsletter," vol. 13, 75 (1974). Available from Perkin-Elmer Corp., Main Ave., Norwalk, Conn. 06852.

[18] Method available from Environmental Monitoring and Support Laboratory, U.S. Environmental Protection Agency, Cincinnati, Ohio 45268.

[19] Recommended methods for the analysis of silver in industrial wastewaters at concentrations of 1 mg/l and above are inadequate where silver exists as an inorganic halide. Silver halides such as the bromide and chloride are relatively insoluble in reagents such as nitric acid but are readily soluble in an aqueous buffer of sodium thiosulfate and sodium hydroxide to a pH of 12. Therefore, for levels of silver above 1 mg/l 20 ml of sample should be diluted to 100 ml by adding 40 ml each of 2M $Na_2S_2O_3$ and 2M NaOH. Standards should be prepared in the same manner. For levels of silver below 1 mg/l the recommended method is satisfactory.

[20] An automated hydrazine reduction method is available from the Environmental Monitoring and Support Laboratory, U.S. Environmental Protection Agency, Cincinnati, Ohio 45268.

[21] A number of such systems manufactured by various companies are considered to be comparable in their performance. In addition, another technique, based on combustion-methane detection is also acceptable.

[22] Goerlitz, D., Brown, E., "Methods for Analysis of Organic Substances in Water": U.S. Geological Survey Techniques of Water-Resources Inv., book 5, ch. A3 (1972).

[23] R. F. Addison and R. G. Ackman, "Direct Determination of Elemental Phosphorus by Gas-Liquid Chromatography," "Journal of Chromatography," vol. 47, No. 3, pp. 421-426, 1970.

[24] The method found on p. 75 measures only the dissolved portion while the method on p. 78 measures only suspended. Therefore, the 2 results must be added together to obtain "total."

[25] Stevens, H. H., Ficke, J. F., and Smoot, G. F., "Water Temperature—Influential Factors, Field Measurement and Data Presentation: U.S. Geological Survey Techniques of Water Resources Inv., book 1 (1975)."

4. In § 136.4, the second sentence of paragraph (c) is amended by deleting the word "subchapter" immediately following the phrase "procedure under this" and immediately preceding the word "shall" and replaced with the phrase "paragraph c;" and § 136.4 is amended by adding a new paragraph (d) to read as follows:

§ 136.4 Application for alternate test procedures.

* * * * *

(c) * * * Any application for an alternate test procedure under this paragraph (c) shall: * * *

(d) An application for approval of an alternate test procedure for nationwide use may be made by letter in triplicate to the Director, Environmental Monitoring and Support Laboratory, Cincinnati, Ohio 45268. Any application for an alternate test procedure under this paragraph (d) shall:

(1) Provide the name and address of the responsible person or firm making the application.

(2) Identify the pollutant(s) or parameter(s) for which nationwide approval of an alternate testing procedure is being requested.

(3) Provide a detailed description of the proposed alternate procedure, together with references to published or other studies confirming the general applicability of the alternate test procedure to the pollutant(s) or parameter(s) in waste water discharges from representative and specified industrial or other categories.

(4) Provide comparability data for the performance of the proposed alternate test procedure compared to the performance of the approved test procedures.

§ 136.5 [Amended]

5. In § 136.5, paragraph (a) is amended by inserting the phrase "proposed by the responsible person or firm making the discharge" immediately after the words "test procedure" and before the period that ends the paragraph.

6. In § 136.5, paragraph (b) is amended by inserting in the first sentence the phrase "proposed by the responsible person or firm making the discharge" immediately after the words "such application" and immediately before the comma. The second sentence of paragraph (b) is amended by deleting the phrase "Methods Development and Quality Assurance Research Laboratory" immediately after the phrase "State Permit Program and to the Director of the" at the end of the sentence, and inserting in its place the phrase "Environmental Monitoring and Support Laboratory, Cincinnati."

7. In § 136.5, paragraph (c) is amended by inserting the phrase "proposed by the responsible person or firm making the discharge" immediately after the phrase "application for an alternate test procedure" and immediately before the comma; and by deleting the phrase "Methods Development and Quality Assurance Laboratory" immediately after the phrase "application to the Director of the" and immediately before the phrase "for review and recommendation" and inserting in its place the phrase "Environmental Monitoring and Support Laboratory, Cincinnati."

8. In § 136.5, the first sentence of paragraph (d) is amended by inserting the phrase, "proposed by the responsible person or firm making the discharge," immediately after the phrase, "application for an alternate test procedure," and immediately before the comma.

The second sentence of paragraph (d) is amended by deleting the phrase, "Methods Development and Quality Assurance Research Laboratory," immediately after the phrase, "to the Regional Administrator by the Director of the," and immediately preceding the period ending the sentence and inserting in its place the phrase, "Environmental Monitoring and Support Laboratory, Cincinnati."

The third sentence of paragraph (d) is amended by deleting the phrase, "Methods Development and Quality Assurance Research Laboratory," immediately after the phrase, "forwarded to the Director," and immediately before the second comma and by inserting in its place the phrase, "Environmental Monitoring and Support Laboratory, Cincinnati."

9. Section 136.5 is amended by the addition of a new paragraph (e) to read as follows:

§ 136.5 Approval of alternate test procedures.

* * * * *

(e) Within ninety days of the receipt by the Director of the Environmental Monitoring and Support Laboratory, Cincinnati of an application for an alternate test procedure for nationwide use, the Director of the Environmental Monitoring and Support Laboratory, Cincinnati shall notify the applicant of his recommendation to the Administrator to approve or reject the application, or shall specify additional information which is required to determine whether to approve the proposed test procedure. After such notification, an alternate method determined by the Administrator to satisfy the applicable requirements of this part shall be approved for nationwide use to satisfy the requirements of this subchapter; alternate test procedures determined by the Administrator not to meet the applicable requirements of this part shall be rejected. Notice of these determinations shall be submitted for publication in the FEDERAL REGISTER not later than 15 days after such notification and determination is made.

[FR Doc.76-35032 Filed 11-30-76;8:45 am]

federal register

TUESDAY, OCTOBER 16, 1973
WASHINGTON, D.C.

Volume 38 ▪ Number 199

PART II

ENVIRONMENTAL PROTECTION AGENCY

▪

WATER PROGRAMS

Guidelines Establishing Test Procedures for Analysis of Pollutants

Title 40—Protection of Environment

CHAPTER I—ENVIRONMENTAL PROTECTION AGENCY

SUBCHAPTER D—WATER PROGRAMS

PART 136—GUIDELINES ESTABLISHING TEST PROCEDURES FOR THE ANALYSIS OF POLLUTANTS

Notice was published in the FEDERAL REGISTER issue of June 29, 1973 (38 FR 17318) at 40 CFR 130, that the Environmental Protection Agency (EPA) was giving consideration to the testing procedures required pursuant to section 304(g) of the Federal Water Pollution Control Act Amendments of 1972 (86 Stat. 816, et seq., Pub. L. 92-500 (1972)) hereinafter referred to as the Act. These considerations were given in the form of proposed guidelines establishing test procedures.

Section 304(g) of the Act requires that the Administrator shall promulgate guidelines establishing test procedures for the analysis of pollutants that shall include factors which must be provided in: 1, any certification pursuant to section 401 of the Act, or 2, any permit application pursuant to section 402 of the Act. Such test procedures are to be used by permit applicants to demonstrate that effluent discharges meet applicable pollutant discharge limitations, and by the States and other enforcement activities in routine or random monitoring of effluents to verify effectiveness of pollution control measures.

These guidelines require that discharge measurements, including but not limited to the pollutants and parameters listed in Table I, be performed by the test procedures indicated; or under certain circumstances by other test procedures for analysis that may be more advantageous to use, when such other test procedures have the approval of the Regional Administrator of the Region where such discharge will occur, and when the Director of an approved State National Pollutant Discharge Elimination System (NPDES) Program (hereinafter referred to as the Director) for the State in which such discharge will occur has no objection to such approval.

The list of test procedures in Table I is published herein as final rulemaking and represents major departures from the list of proposed test procedures which was published in 38 FR 17318, dated June 29, 1973. These revisions were made after carefully considering all written comments which were received pertaining to the proposed test procedures. All written comments are on file and available for public review with the Quality Assurance Division, Office of Research and Development, EPA, Washington, D.C.

The principal revisions to the proposed test procedures are as follows:

1. Where several reliable test procedures for analysis are available from the given references for a given pollutant or parameter, each such test procedure has been approved for use for making the measurements required by sections 401 and 402 and related sections of the Act. Approved test procedures have been selected to assure an acceptable level of intercomparability of pollutants discharge data. For several pollutants and parameters it has still been necessary to approve only a single test procedure to assure this level of acceptability. This is a major departure from the proposed test procedures which would have required the use of a single reference method for each pollutant or parameter.

2. Under certain circumstances a test procedure not shown on the approved list may be considered by an applicant to be more advantageous to use. Under guidelines in §§ 136.4 and 136.5 it may be approved by the Regional Administrator of the Region where the discharge will occur, providing the Director has no objections. Inasmuch as there is no longer a single approved reference method against which a comparison can be made, the procedures for establishing such comparisons that were required by the proposed test procedures in § 130.4(b) have been deleted from this final guideline for test procedures for the analysis of pollutants.

3. A mechanism is also provided to assure national uniformity of such approvals of alternate test procedures for the analysis of pollutants. This is achieved through a centralized, internal review within the EPA of all applications for the use of alternate testing procedures. These will be reviewed and approved or disapproved on the basis of submitted information and other available information and laboratory tests which may be required by the Regional Administrator.

As deemed necessary, the Administrator will expand or revise these guidelines to provide the most responsive and appropriate list of test procedures to meet the requirements of sections 304(g), 401 and 402 of the Act, as amended.

These final guidelines establishing test procedures for the analysis of pollutants supersede the interim list of test procedures published in the FEDERAL REGISTER on April 19, 1973 (38 FR 9740) at 40 CFR Part 126 and subsequent procedures published on July 24, 1973 (38 FR 19894) at 40 CFR Part 124. Those regulations established interim test procedures for the submittal of applications under section 402 of the Act. Because of the importance of these guidelines for test procedures for the analysis of pollutants to the National Pollution Discharge Elimination System (NPDES), the Administrator finds good cause to declare that these guidelines shall be effective October 16, 1973.

JOHN QUARLES,
Acting Administrator.

OCTOBER 3, 1973.

PART 136—TEST PROCEDURES FOR THE ANALYSIS OF POLLUTANTS

Sec.

AUTHORITY: Sec. 304(g) of Federal Water Pollution Control Act Amendments of 1972 86 Stat. 816, et seq., Pub. L. 92-500).

§ 136.1 Applicability.

The procedures prescribed herein shall, except as noted in § 136.5, be used to perform the measurements indicated whenever the waste constituent specified is required to be measured for:

(a) An application submitted to the Administrator, or to a State having an approved NPDES program, for a permit under section 402 of the Federal Water Pollution Control Act as amended (FWPCA), and,

(b) Reports required to be submitted by dischargers under the NPDES established by Parts 124 and 125 of this chapter, and,

(c) Certifications issued by States pursuant to section 401 of the FWPCA, as amended.

§ 136.2 Definitions.

As used in this part, the term:

(a) "Act" means the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1314, et seq.

(b) "Administrator" means the Administrator of the U.S. Environmental Protection Agency.

(c) "Regional Administrator" means one of the EPA Regional Administrators.

(d) "Director" means the Director of the State Agency authorized to carry out an approved National Pollutant Discharge Elimination System Program under section 402 of the Act.

(e) "National Pollutant Discharge Elimination System (NPDES)" means the national system for the issuance of permits under section 402 of the Act and includes any State or interstate program which has been approved by the Administrator, in whole or in part, pursuant to section 402 of the Act.

(f) "Standard Methods" means *Standard Methods for the Examination of Water and Waste Water*, 13th Edition, 1971. This publication is available from the American Public Health Association, 1015 18th St. NW., Washington, D.C. 20036.

(g) "ASTM" means *Annual Book of Standards, Part 23, Water, Atmospheric Analysis, 1972*. This publication is available from the American Society for Testing and Materials, 1916 Race St., Philadelphia, Pennsylvania 19103.

(h) "EPA Methods" means *Methods for Chemical Analysis of Water and Wastes*, 1971, Environmental Protection Agency, Analytical Quality Control Laboratory, Cincinnati, Ohio. This publication is available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 (Stock Number 5501-0067).

§ 136.3 Identification of test procedures.

Every parameter or pollutant for which an effluent limitation is now specified pursuant to sections 401 and 402 of the Act is named together with test descriptions and references in Table I. The discharge parameter values for which reports are required must be de-

termined by one of the standard analytical methods cited and described in Table I, or under certain circumstances by other methods that may be more advantageous to use when such other methods have been previously approved by the Regional Administrator of the Region in which the discharge will occur, and providing that the Director of the State in which such discharge will occur does not object to the use of such alternate test procedures.

Under certain circumstances the Regional Administrator or the Director in the Region or State where the discharge will occur may determine for a particular discharge that additional parameters or pollutants must be reported. Under such circumstances, additional test procedures for analysis of pollutants may be specified by the Regional Administrator or Director upon the recommendation of the Director of the Methods Development and Quality Assurance Research Laboratory.

TABLE I—LIST OF APPROVED TEST PROCEDURES

Parameter and units	Method	References		
		Standard methods	ASTM	EPA methods
General analytical methods:				
1. Alkalinity as $CaCO_3$ mg $CaCO_3$/liter.	Titration: electrometric, manual or automated method—methyl orange.	p. 370	p. 113	p. 6. p. 8.
2. B.O.D. five day mg/liter.	Modified winkler or probe method	p. 489		
3. Chemical oxygen demand (C.O.D.) mg/liter.	Dichromate reflux	p. 495	p. 219	p. 17.
4. Total solids mg/liter	Gravimetric 103-105° C	p. 535		p. 280.
5. Total dissolved (filterable) solids mg/liter.	Glass fiber filtration 180° C			p. 278.
6. Total suspended (nonfilterable) solids mg/liter.	Glass fiber filtration 103-105° C	p. 537		p. 278.
7. Total volatile solids mg/liter.	Gravimetric 550° C	p. 530		p. 282.
8. Ammonia (as N) mg/liter.	Distillation—nesslerization or titration automated phenolate.			p. 134. p. 141.
9. Kjeldahl nitrogen (as N) mg/liter.	Digestion + distillation—nesslerization or titration automated digestion phenolate.	p. 460		p. 149. p. 167.
10. Nitrate (as N) mg/liter.	Cadmium reduction; brucine sulfate; automated cadmium or hydrazine reduction.	p. 458 p. 461	p. 124	p. 170. p. 176. p. 185.
11. Total phosphorus (as P) mg/liter.	Persulfate digestion and single reagent (ascorbic acid), or manual digestion, and automated single reagent or stannous chloride.	p. 526 p. 532	p. 42	p. 236. p. 246. p. 259.
12. Acidity mg $CaCO_3$/liter	Electrometric end point or phenolphthalein end point.		p. 148	
13. Total organic carbon (TOC) mg/liter.	Combustion—infrared method [1]	p. 287	p. 702	p. 221.
14. Hardness—total mg $CaCO_3$/liter.	EDTA titration; automated colorimetric atomic absorption.	p. 179	p. 170	p. 70. p. 78.
15. Nitrite (as N) mg/liter.	Manual or automated colorimetric diazotization.			p. 185. p. 196.
Analytical methods for trace metals:				
16. Aluminum—total [2] mg/liter.	Atomic absorption	p. 210		p. 98.
17. Antimony—total [2] mg/liter.	Atomic absorption [4]			
18. Arsenic—total mg/liter.	Digestion plus silver diethyldithiocarbamate; atomic absorption.[3]	p. 65 p. 62		p. 13.
19. Barium—total [2] mg/liter.	Atomic absorption [4]	p. 210		
20. Beryllium—total [2] mg/liter.	Aluminon; atomic absorption	p. 67 p. 210		
21. Boron—total mg/liter	Curcumin	p. 69		
22. Cadmium—total [2] mg/liter.	Atomic absorption; colorimetric	p. 210 p. 422	p. 692	p. 101.
23. Calcium—total [2] mg/liter.	EDTA titration; atomic absorption	p. 84	p. 692	p. 102.
24. Chromium VI mg/liter.	Extraction and atomic absorption; colorimetric.	p. 429		p. 94.
25. Chromium—total [2] mg/liter.	Atomic absorption; colorimetric	p. 210 p. 426	p. 692 p. 403	p. 101.
26. Cobalt—total [2] mg/liter.	Atomic absorption [4]		p. 692	
27. Copper—total [2] mg/liter.	Atomic absorption; colorimetric	p. 210 p. 430	p. 692 p. 410	p. 106.
28. Iron—total [2] mg/liter	do	p. 210 p. 433	p. 692 p. 183	p. 108.
29. Lead—total [2] mg/liter	do	p. 210 p. 436	p. 692	p. 110.
30. Magnesium—total [2] mg/liter.	Atomic absorption; Gravimetric	p. 210 p. 416 p. 201	p. 692	p. 112.
31. Manganese—total [2] mg/liter.	Atomic absorption	p. 210	p. 692	p. 114.
32. Mercury—total mg/liter.	Flameless atomic absorption [5]			
33. Molybdenum—total [2] mg/liter.	Atomic absorption [4]			
34. Nickel—total [2] mg/liter.	Atomic absorption; colorimetric [4]	p. 413	p. 692	
35. Potassium—total [2] mg/liter.	Atomic absorption; colorimetric; flame photometric.	p. 283 p. 285	p. 328	p. 116.
36. Selenium—total mg/liter.	Atomic absorption [4]			
37. Silver—total [2]	Atomic absorption [4]	p. 210		
38. Sodium—total [2] mg/liter.	Flame photometric; atomic absorption	p. 317	p. 326	p. 118.
39. Thallium—total [2] mg/liter.	Atomic absorption [4]			
40. Tin—total [2] mg/liter	do			
41. Titanium—total mg/liter.	do			
42. Vanadium—total [2] mg/liter.	Atomic Absorption; [4] Colorimetric	p. 187		
43. Zinc—total [2] mg/liter.	Atomic Absorption; Colorimetric	p. 210 p. 414	p. 692	p. 120.
Analytical methods for nutrients, anions, and organics:				
44. Organic nitrogen (as N) mg/liter.	Kjeldahl nitrogen minus ammonia nitrogen.	p. 468		p. 149.
45. Ortho-phosphate (as P) mg/liter.	Direct single reagent; automated single reagent or stannous chloride.	p. 532	p. 42	p. 235. p. 246. p. 259.
46. Sulfate (as SO_4) mg/liter.	Gravimetric; turbidimetric; automated colorimetric—barium chloranilate.	p. 331 p. 334	p. 81 p. 82	p. 256. p. 258.
47. Sulfide (as S) mg/liter.	Titrimetric—iodine	p. 551		p. 291.
48. Sulfite (as SO_3) mg/liter.	Titrimetric; iodide-iodate	p. 337	p. 251	
49. Bromide mg/liter	do		p. 216	
50. Chloride mg/liter	Silver nitrate; mercuric nitrate; automated colorimetric-ferricyanide.	p. 96 p. 97	p. 23 p. 21	p. 29. p. 31.
51. Cyanide—total mg/liter.	Distillation—silver nitrate titration or pyridine pyrazolone colorimetric.	p. 397	p. 856	p. 41.
52. Fluoride mg/liter	Distillation—SPADNS	p. 171 p. 174	p. 191	p. 64.
53. Chlorine—total residual mg/liter.	Colorimetric; amperometric titration	p. 382	p. 223	
54. Oil and grease mg/liter.	Liquid-Liquid extraction with trichlorotrifluoroethane.	p. 254		
55. Phenols mg/liter	Colorimetric, 4 AAP	p. 602	p. 445	p. 232.
56. Surfactants mg/liter.	Methylene blue colorimetric	p. 339	p. 619	p. 131.
57. Algicides mg/liter	Gas chromatography [4]			
58. Benzidine mg/liter	Diazotization—colorimetric [4]			
59. Chlorinated organic compounds (except pesticides) mg/liter.	Gas chromatography [4]			
60. Pesticides mg/liter	Gas chromatography [4]			
Analytical methods for physical and biological parameters:				
61. Color platinum-cobalt units or dominant wave-length, hue, luminance, purity.	Colorimetric; spectrophotometric	p. 160 p. 392		p. 38.
62. Specific conductance mhos/cm at 25° C.	Wheatstone bridge	p. 323	p. 183	p. 284.
63. Turbidity jackson units.	Turbidimeter	p. 350	p. 467	p. 308.

See Note at end of Table I

RULES AND REGULATIONS

Appendix C

Oil Spill Equipment and Materials Inventory

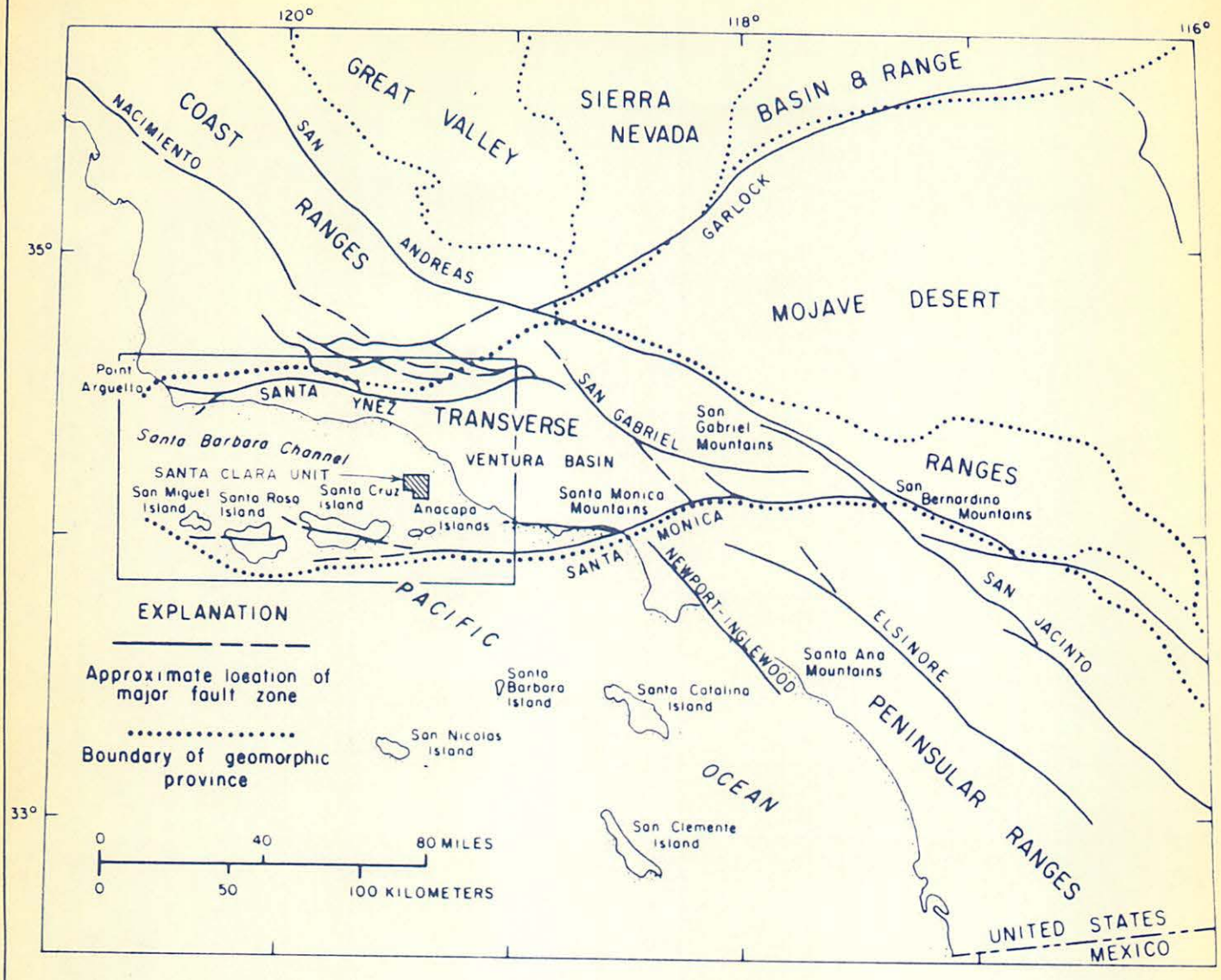
CHEVRON U.S.A. - LA HABRA, CALIFORNIA

Oil Spill Equipment and Materials Inventory

1	Model 1011-OS Floating oil skimmer with 1-1/2 HP 115/230 volt Class 1 Group D explosion proof GE motor
1	Homelite Generator #176A 35-1 3,500 Watts w/spark arrester
1,500	Feet, #3-12.24 Floating Barrier as manufactured by Oil Spill Services w/12" fence and 23" skirt and 3/8" chain
6	Bales, Conwed Sorbent Booms (240 feet)
2	Bales, Conwed Sorbent Continuous Sweeps
2	Boxes, Conwed Sorbent Regular Sweeps
4	Hudson Ozark Sprayers
10	Drums, Corexit dispersant (Concentrated)
3	Drums, Shell "Herder"

Appendix D

Description of Drilling Vessel



Index map showing relation of Santa Barbara Channel region to major faults and physiographic provinces of southern California

Source:- U.S. Geological Survey 1974

FIGURE 1

Chevron U.S.A. Inc. Western Region Production Department	ENGINEERING DRAFTING CHECKED APPROVED	SCALE NOTED DATE A-SB-4017-0