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Location ~~Development/Production~~ and Environmental R

5549

Control No. N- 1249

U. S. GEOLOGICAL SURVEY

JUL 21 1983

OPERATIONS
SUPPORT
GULF OF MEXICO REGION METAIRIE, LA.

OLECO OIL & GAS COMPANY
Plan of Exploration
Ship Shoal Block 166
OCS G 5549

SUBMITTED BY: E. S. Breda
E. S. Breda
Oil & Gas Supervisor

Office of
Management Support

SEP 12 1983
DS

Records Management

DATE: JUL 19 1983

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ODECO OIL & GAS COMPANY
PLAN OF EXPLORATION
SHIP SHOAL BLOCK 166

I. General Plan

In accordance with 30 CFR 250.34, revised December 13, 1979 this Plan of Exploration is being submitted. Our plans to drill two Exploratory wells on this lease. They are designated as OCS G 5549 wells #1, & #2. Should the proposed wells have no commercial production, they will be plugged and abandoned with casings removed 15' below mud line.

II. Tentative starting and completion dates, surface and bottom hole locations, total depth and objective of proposed well.

OCS-G-5549 Well #1

Estimated Commencement date 10/1/83, Complete 10/20/83

Surface Location: 4000' FNL and 3700' FWL of Ship Shoal Block 166

Bottom Hole Location: Straight Hole

Total Depth: 8650' TVD

Objective: Pleistocene sands - See geological program

OCS-G-5549 Well #2

Estimated Commencement date 10/20/83, Complete 11/10/83

Surface Location: 3400' FNL & 6000' FWL of Ship Shoal Block 166

Bottom Hole Location: Straight Hole

Total Depth: 5700' TVD

Objective: Pleistocene sands - See geological program

III. Facility

A. Drill Barge - ODECO's "Ocean Pride"

See attachment for rig specifications, pollution control and diverter systems.

B. No additional facilities will be added offshore or onshore as a result of the exploration activities.

IV. Oil Spill Contingency Plan

Odeco Oil & Gas Company fulfills its oil spill contingency plan by being a member of Clean Gulf Associates, P. O. Box 51239, New Orleans, Louisiana 70157, an agency which handles clean up operations in the event of an oil spill. Fast Response Service can be obtained by calling Halliburton Services in Harvey, Louisiana (504)366-1735.

A. Estimated deployment time of the equipment to this area is 12 hours.

B. Description of clean up equipment.

1. Fast Response System Model I consists of:

- a. Primary and auxiliary skid with 180 bbl. tank on each skid
- b. One "Don Wilson" skimmer.
- c. One basket and one lot of Bennet oil boom section.
- d. Fire extinguisher skid.

2. Fast Response System Model II consists of:

- a. Section of floating oil boom
- b. Skimmer
- d. Pump

IV. Oil Spill Contingency Plan

B. Description of clean up equipment. (Cont'd.)

3. High volume open sea skimmer system (HOSS Barge).
4. Shallow water skimmer system.
5. Auxiliary shallow water skimmer and booms.
6. Helicopter spray system (HUSS Units).
7. Waterfowl rehabilitation units and bird scarers.
8. Miscellaneous Material
9. Radio systems.

V. Fuel Consumption - Drilling Operations

Drilling rig uses an average of 50 bbls. of diesel fuel per day during drilling operations. Each supply boat uses approximately 25 bbls. (42 gal/bbl.) of diesel per day. Two boats service drilling rig daily.

	<u>BOATS</u>	<u>RIG</u>
Approx. Rig Days	40	40
Bbls/day Consumption	<u>x 50</u>	<u>x50</u>
Total Fuel Consumption	2000 bbls.	2000 bbls.

VI. Safety Standards and Programs - Drilling Operations

Odeco believes the safety of its employees is directly proportional to each employee's skills and knowledge of the work to be performed. To improve these skills and increase this knowledge, a "Rig Crew Training Program" has been instituted. This program provides the necessary on-the-job training to enable each employee to make a planned progression from roustabout to driller. It consists of on-site video cassette programs, International Association Drilling Contractors approved "Home Study Courses", "Minerals Management Services" required Crane Operating and Blow Out Prevention Training and United States Coast Guard's Seamen's Training. All employees must pass required testing in each of these courses. A pay incentive is included to encourage participation. In addition, this program is supported by generally accepted methods of rig inspection drills and safety meetings which are in compliance with U.S.C.G. and M.M.S. standards which, we believe, will ultimately enhance the safe work performance of our employees.

VII. Base of Operation

- A. Marine service to service drilling operations is provided from Dulac, Louisiana.
- B. Air Service (helicopter) is provided from Houma, Louisiana.

VIII. Type Drill Mud Used and Chemical Components

A. Bariod

B. Chemical Components

Akaflo-S

Mixed oxyethylated phenols

Aluminum Stearate

(CH₃)₂(CH₂)₂(COO)₂ Al

VIII. Type Drill Mud Used and Chemical Components (Cont'd.)

B. Chemical Components (Cont'd.)

Aquagel	Sodium montmorillonite
Bariod	Bariod Sulfate
Bicarbonate of Soda	Na ₂ CO ₃
Carbonox	Lignitic humic acid powder
Caustic Soda	Sodium Hydroxide
CC-16	Caustized Carbonox
Cellex	Sodium Carboxymethylcellulose
Dectrid	Dextrinized polysaccharide powder
HME	Selective, nonionic surfactant-Chemco product
Impermex	Starch
Lime	Calcium Hydroxide
Micatex	Mica flakes
Q-Broxin	Ferrochrome lignosulfonate
Sapp	Sodium acid pyrophosphate
Soda Ash	Sodium Carbonate
Sodium Chromate	Sodium Chromate
Soltex	Hydrocarbon powder
Superdril	Gilsonite
Torq-Trim	Biodegradable, non toxic lubricant
Wall-Nut	Nut hulls

IX. Shallow Hazards Survey

A cultural resources and multi-sensor engineering survey is presently being conducted and the results will be submitted to the MMS upon completion of the report. Should any anomalies indicate the presence of significant cultural resources in the area of the two locations, an amendment to the locations will be submitted.

X. Gaseous Emission Data

Drill barge "Ocean Pride" will be used. Estimated total rig days for drilling these wells will be 40 days.

- A. Rig: Emission calculated for 40 days - stated in (lbs/day) Tons 40 days.
See attachment for emission summary by rig and basis for calculated of Summary.

Drill Barge "Ocean Pride"
(1 lbs./day) Tons 40/days

1. CO (592.99) 11.86
2. Hydrocarbon (127.62) 2.55
3. NO_x (3760.05) 75.20
4. SO₂^x (197.26) 3.95
5. Particulates (41.21) .82

X. Gaseous Emission Data (Cont'd).

B. Helicopters: Estimate 6 round trips in 40 days, two and one half hours per round trip = 17.5 hours operating time. Stated in (lbs./day) Tons per 40 days, averaged to 40 days. See attached for emissions per hour of use.

1. CO (.20) .00
2. Hydrocarbon (.04) .00
3. NO_x (.88) .02
4. SO₂ (5.68) .11
5. Particulates (.09) .00

C. Boats (crew) Twenty Nine (29) trips in 40 days at 5 hours per round trip = 145 hours. (Supply) Eighteen (18) trips in 40 days at 11 hours round trip = 198 hours. 145 + 198 = 343 operating hours. Stated in (lbs/day). Tons per 40 days, averaged to 40 days. See attached for emissions per hour of use.

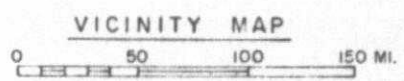
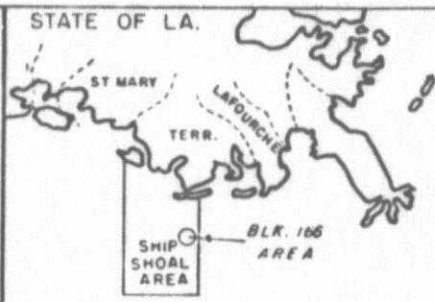
1. CO (54.94) 1.09
2. Hydrocarbon (20.20) .40
3. NO_x (253.71) 5.07
4. SO₂ (16.97) .34
5. Particulates (18.58) .37

D. Supply Base - 30 ton crane. Estimated use in 40 days = 131 hours. Stated in (lbs./day) Tons/40 days. Averaged for 40 days. See attached for emission per hour.

1. CO (12.51) .25
2. Hydrocarbon (1.16) .02
3. NO_x (30.48) .61
4. SO₂ (1.56) .03
5. Particulates (1.66) .03

XI. Attachments

- A. Vicinity Map Block 166
- B. Geological Programs with structure map for each location
- C. Shallow Drilling Hazards statements with seismic map showing location of wells.
- D. Drill Barge Data - "Ocean Pride" including schematic of diverter and statement on pollution control.
- E. Emission Summary with basis of calculations for drill barge.
- F. Emission hourly rates for boats, helicopter, and crane.



Lat. $28^{\circ}40'16.532''$
Long. $90^{\circ}53'44.214''$

Lat. $28^{\circ}40'15.909''$
Long. $90^{\circ}50'49.129''$

Y = 1,938.15'

15,600.00'

Odeco Oil & Gas Co.

2 OCS-G-5549

167

BLK. 166

165

X = 2,140,400.00'
13,961.54'

13,961.54'
X = 2,156,000.00'

15,600.00'

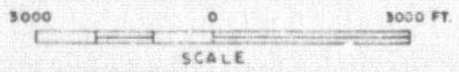
Y = -12,023.39'

Lat. $28^{\circ}37'58.328''$
Long. $90^{\circ}53'44.812''$

185

Lat. $28^{\circ}37'57.705''$
Long. $90^{\circ}50'49.794''$

MASTER SHEET



PROPOSED MINERAL DEVELOPMENT
SHIP SHOAL AREA
GULF OF MEXICO

DATE:

ODECO OIL & GAS COMPANY

GEOLOGICAL PROGRAM AND WELL RECOMMENDATION
OCS-G 5549 WELL NO.1 SHIP SHOAL BLOCK 166

LOCATION: Straight Hole - 4000' FNL and 3700' FWL of Ship Shoal Block 166

TOTAL DEPTH: 8650' TWD

WELL CLASSIFICATION: Exploratory

LOGGING SERVICES:

1.) ISF-SONIC/GR-SP:

Run #1 - Base of conductor to surface casing depth.

Run #2 - Base of surface casing to total depth.

2.) FDC-CNL/GR:

Over resistive sections as indicated by the ISF-Sonic which may bear hydrocarbons.

3.) Sidewall Cores:

Within resistive, porous zones as indicated by the services listed above.

4.) HRD:

Base of surface casing to total depth.

5.) Velocity Survey and V.S.P.:

At total depth.

6.) Mud Log:

To be operational from base of surface casing to total depth.

WELL OBJECTIVE: This well is designed to evaluate Pleistocene sands down-thrown to an east-west trending down-to-the-south fault and then cross the fault at 6800' into Pliocene sands on the upthrown side. The trapping mechanism changes from four way closure at 4000' to fault closure below 6000'. Eight levels of seismic amplitude anomalies are indicated on seismic line SS 91 under the well location (S.P. 236) and these correspond to the following depths and paleo: PL-4, 3960' and 4070'; PL-6, 4410', 5047', and 5480'; PL-9, 5930' and 6370'; P-2, 8140'. The PL-4 zone is gas productive in Ship Shoal Block 186. The PL-6 and PL-9 zones are gas productive in Ship Shoal 167 and the P-2 zone is oil bearing in Ship Shoal 167. Neither salt nor abnormal pore pressure is expected at this location.

Geological Program and Well Recommendation
OCS-G 5549 Well No. 1 Ship Shoal Block 166
June 15, 1983
Page Two

PALEONTOLOGICAL MARKERS:

Trimosina B	?	to	4450'
Angulogerina B	4450'	to	
Lenticulina	5960'	to	
Eponides Hannai	8100'	to T.D.	(8650')

Submitted by: _____

R. D. Woodcock
Senior Exploration Geologist

RDW:chs

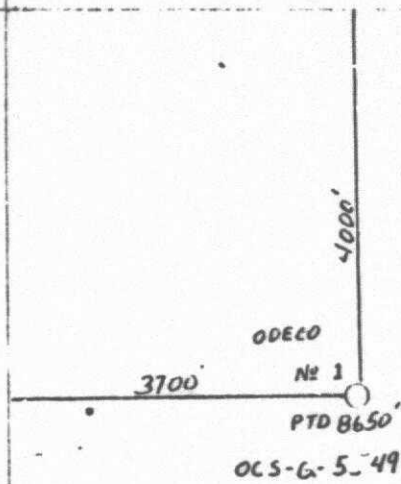
Approved by: _____

S. C. Hurley
Exploration Manager

Approved by: _____

H. A. Valles
Senior Vice President

SHIP SHOAL 166



ODECO

ODECO OIL & GAS COMPANY

ODECO BUILDING • 1600 CANAL STREET
MAIL TO: P.O. BOX 61780, NEW ORLEANS, LA. 70161

June 17, 1983

Mr. John Borne
District Supervisor
Minerals Management Service
P. O. Box 10145
Houma, Louisiana 70360

RE: Shallow Hazard Report for
Proposed OCS-G 5549, Well
No. 1 Ship Shoal Block 166
Offshore Louisiana

Dear Mr. Borne:

Seismic data in the vicinity of our proposed OCS-G 5549 Well No. 1 has been reviewed. We find no evidence of any shallow drilling hazards. Data reviewed is listed below:

Line 6336 shot by Tomlinson Geophysical in 1982. Line OS-692 shot by GSI in 1976. Lines SS-84 and SS-91 shot by Petty-Ray in 1976 and 1977.

Very truly yours,

R. R. Gregory
R. R. Gregory
Staff Geophysicist

RRG:chs

Attachment

ODECO OIL & GAS COMPANY
JUNE 16, 1983

GEOLOGICAL PROGRAM AND WELL RECOMMENDATION
OCS-G 5549 WELL NO.2 SHIP SHOAL BLOCK 166

LOCATION: Straight Hole - 3400' FNL and 6000' FWL of Ship Shoal Block 166

TOTAL DEPTH: 5700' TVD

WELL CLASSIFICATION: Exploratory

LOGGING SERVICES:

1.) ISF-SONIC/GR-SP:

Run #1 - Base of conductor to surface casing depth.

Run #2 - Base of surface casing to total depth.

2.) FDC-GNL/GR:

Over resistive sections as indicated by the ISF-Sonic which may bear hydrocarbons.

3.) Sidewall Cores:

Within resistive, porous zones as indicated by the services listed above.

4.) HRD:

Base of surface casing to total depth.

WELL OBJECTIVES: This well is designed to evaluate Pleistocene sands down-thrown to an east-west trending down-to-the-south fault. The trapping mechanism is four way dip closure. Three levels of seismic amplitude anomalies are indicated on seismic line 6336 under the well location (S.P. 8288) and these correspond to the following depths and paleo: PL-4, 2200', 3950' and PL-6, 4600'. The PL-4 zone is gas productive in Ship Shoal Block 186. The PL-6 zone is gas productive in Ship Shoal 167. Neither salt nor abnormal pore pressure is expected at this location.

PALEONTOLOGICAL MARKERS:

Trimosina B	?	to	4450'
Angulogerina B	4450'	to	5700'

Geological Program and Well Recommendation
OCS-G 5549 Well No. 2 Ship Shoal Block 166 ,
June 16, 1983
Page Two

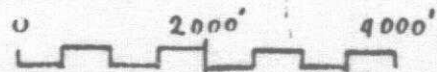
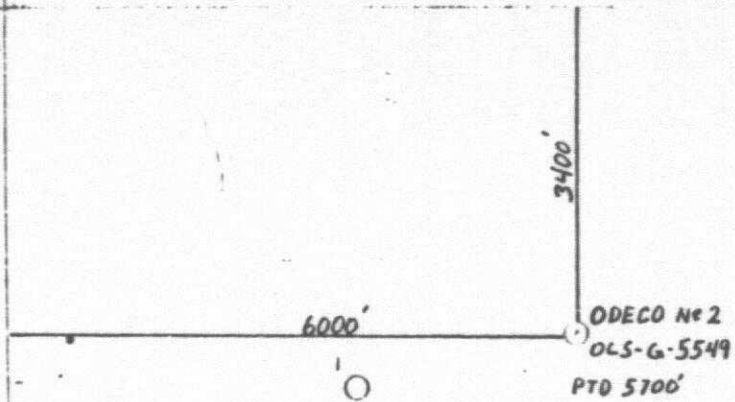
Submitted by: _____
R. D. Wrock^{hw}
Senior Exploration Geologist

RDW:chs

Approved by: _____
S. C. Hurley
Exploration Manager

Approved by: _____
H. A. Vallas
Senior Vice President

SHIP SHOAL 166



HIPPI

ODECO OIL & GAS COMPANY

ODECO BUILDING • 1600 CANAL STREET
MAIL TO: P.O. BOX 61780, NEW ORLEANS, LA. 70161

June 17, 1983

Mr. John Borne, District Supervisor
Minerals Management Service
P. O. Box 10145
Houma, Louisiana 70360

RE: Shallow Hazard Report for
Proposed OCS-G 5549, Well
No. 2 Ship Shoal Block 166
Offshore Louisiana

Dear Mr. Borne:

Seismic data in the vicinity of our proposed OCS-G 5549 Well No. 2 has been reviewed. We find no evidence of any shallow drilling hazards. Data reviewed is listed below:

Line 6336 shot by Tomlinson
Geophysical in 1982. Line
OS-692 shot by GSI in 1976.
Lines SS-84 and SS-91 shot
by Petty-Ray in 1976 & 1977.

Very truly yours,

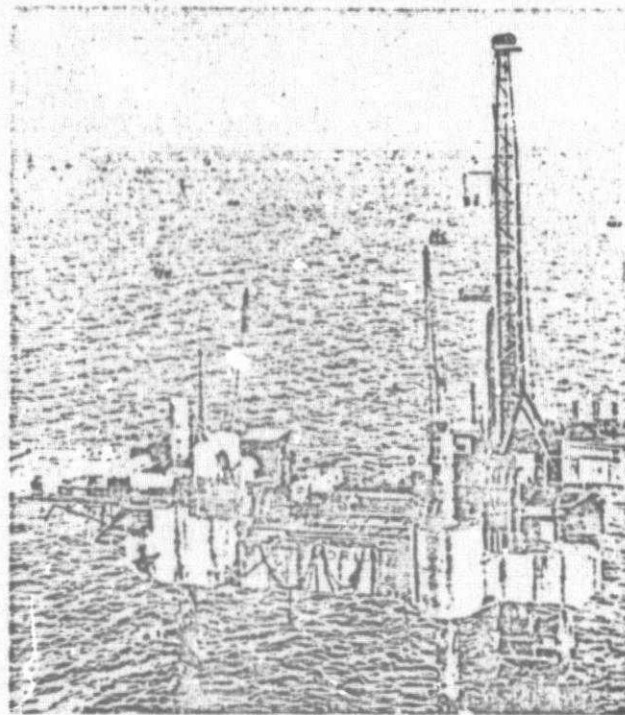
R. R. Gregory
R. R. Gregory
Staff Geophysicist

RRG:chs

Attachment

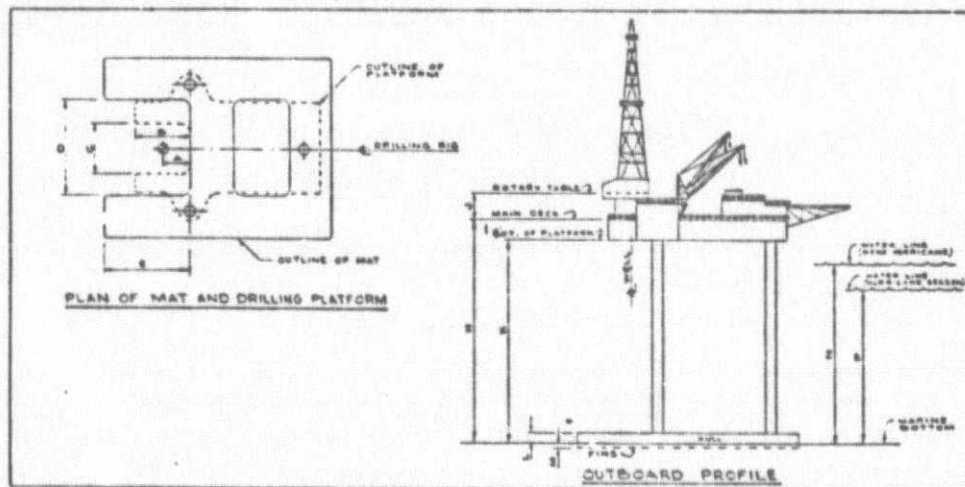
OCEAN PRIDE

BETHLEHEM MAT SUPPORTED JACK-UP



BARGE DATA

- MAT** ----- 170' Long x 160' Wide x 10' Deep with 2' scouring skirt. Slot in Mat is 80' Long x 88' Wide
- PLATFORM** ----- Contains all living and working areas 164' Long x 86' Wide x 16' Deep. Slot in Platform is 50' x 48'
- QUARTERS** ----- For 48 men



CLEARANCES & DIMENSIONS

	DIMENSIONS												OPERATING DEPTH		
	A	B	C	D	E	H	J	K	L	M	N	P	Maximum	Hurricane	Minimum
													Normal	Season	
Ocean Pride	15'	48'	50'	88'	80'	193'	20'	177'	10'	2'	152'	142'	152'	142'	24'

EQUIPMENT

- 1 ----- 140' -- 1,100,000 lb. Standard derrick
- 1 ----- National 110 double drum drawworks powered by three (3) Superior PTD6-S diesel engines.
- 1 ----- National N-275 rotary w/Varco KMPC pin drive.
- 1 ----- National P-500 Swivel
- 1 ----- National 500 ton traveling block grooved for 1-3/8" line
- 1 ----- Oilwell 5807 Crown Block grooved for 1-3/8" line.
- 1 ----- National 500 ton Hook
- 1 ----- Koomey 120 gallon accumulator
- 1 ----- 13-5/8" 5000 # W.P. GK Hydriil Bag type Preventer.
- 1 ----- 13-5/8" 5000 # W.P. Cameron Type "U" triple B.O.P.
- 2 ----- National N-1600 mud pumps, each independently powered by EMD-V16-567 diesel engines.
- 2 ----- Mission 6 x 8 Centrifugal mud mixing pumps each powered by 50 HP electric motors
- 1 ----- Brandt dual screen shale shaker.
- 10,000+ ----- 5" 19.50 # Grade "E" Range 2 drill pipe w/4 1/2" IF tool joints.
- 5,000' ----- 5" 19.50 # Grade "G" Range 2 drill pipe w/4 1/2" IF tool joints.
- 21 ----- 7 1/4" Zip drill collars w/5 1/2" H-90 connections
- 1 ----- 5 1/4" Hex Kelly
- 2 ----- 30 Ton Unit Cranes
- 1 ----- Halliburton cementing Unit
- 1 ----- Schlumberger logging unit
- 1 ----- Pioneer desander
- 1 ----- Pioneer desilter
- 1 ----- SWACO Degasser
- 2 ----- 350 KW AC generators, each powered by GMC-V-16-71 engines

STORAGE CAPABILITIES

Dry Mud 3,000 sks
 Active Mud 1,000 Bbl.
 Reserve Mud 500 Bbl.
 Bulk Mud 5,000 sks

Bulk Cement 2,540 cu.ft.
 Diesel Fuel 1,550 Bbl.
 Drill Water 3,840 Bbl.
 Potable Water 500 Bbl.

ODECO

INTER-OFFICE CORRESPONDENCE

TO: R. S. Gloger

LOC.: N. O.

DATE:

CARBONS TO:

FROM: W. J. Wilkinson

LOC.: N. O.

SUBJECT: Pollution and Waste Disposal from D/B OCEAN PRIDE

The D/B OCEAN PRIDE was constructed with certain features which were incorporated specifically to stop any pollutant likely to be found during normal drilling operations. It is equipped with drip pans and/or drains under floor and other machinery to retain all oil spills.

Provisions have been made for the collection, storage, and later transfer to shore base of all used oil from machinery on the drilling platform.

Containers have been provided to transfer solid waste, such as boxes, cartons, cans, etc., which cannot be incinerated to a shore base.

Copies of OCS Order Nos. 1 through 10 which are applicable to the contract drilling operations have been furnished the toolpushers. Rig supervisory personnel have been shown the seriousness of control of pollutants.

Should it come to your attention that any liquids or solids have escaped into the Gulf without our knowledge, I sincerely ask that you bring this to my attention.


W. J. Wilkinson

WJW/ggt

BLOWOUT PREVENTER ACTIVATION

The Blowout Preventers on the drilling rig OCEAN PRIDE are HYDRAULICALLY activated from controls located on the rig floor and the living quarters.

DIVERTER SYSTEM OPERATIONAL PROCEDURE

The Diverter System as shown in Attachment 1 is installed so that the HCR Valve (s) will open automatically when the Hydril is closed. The diverting valves will remain open and be used to divert wellbore fluids downwind when necessary.

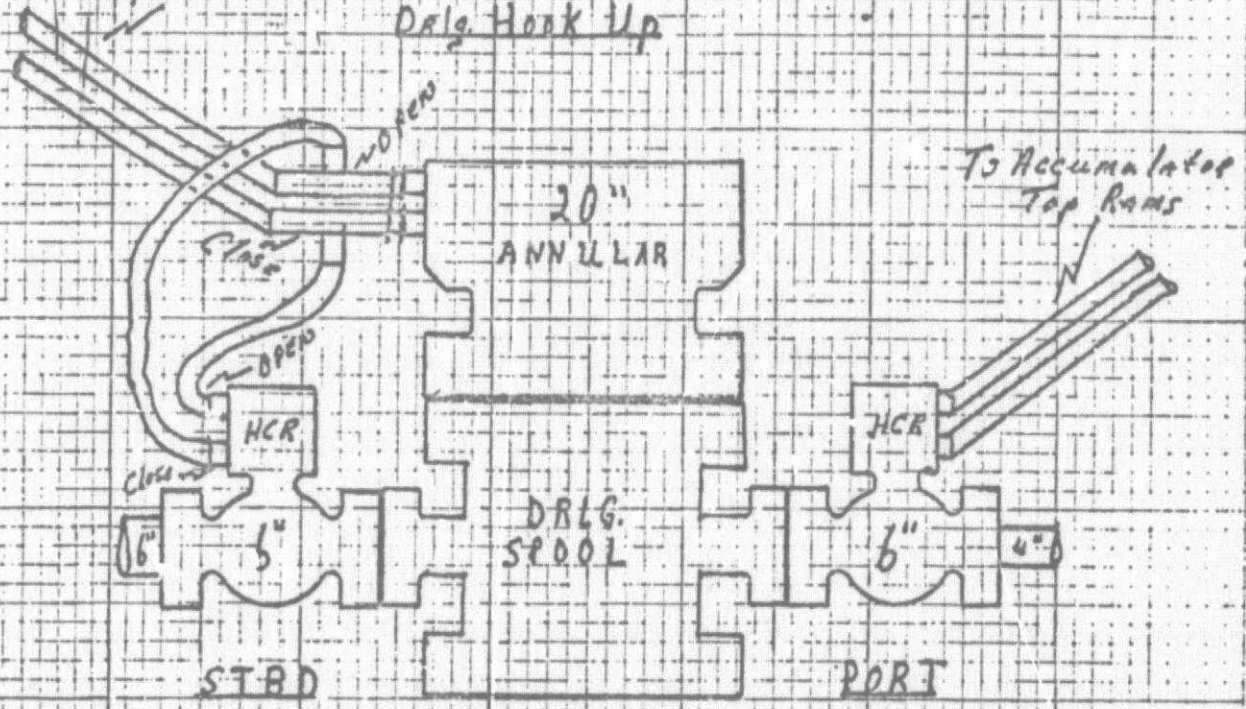
Prior to drilling the Hydril shall be closed and seawater pumped through the system. The diverting valves shall be function tested at this time. In the event it is necessary to use the diverter system for well control, the following sequence is recommended:

- A) Clear Kelly from Hydril.
- B) Close Hydril.
- C) Use diverting valves to direct well fluids downwind.
- D) Pump mud in hole as fast as possible. Pump Seawater if mud is expended.

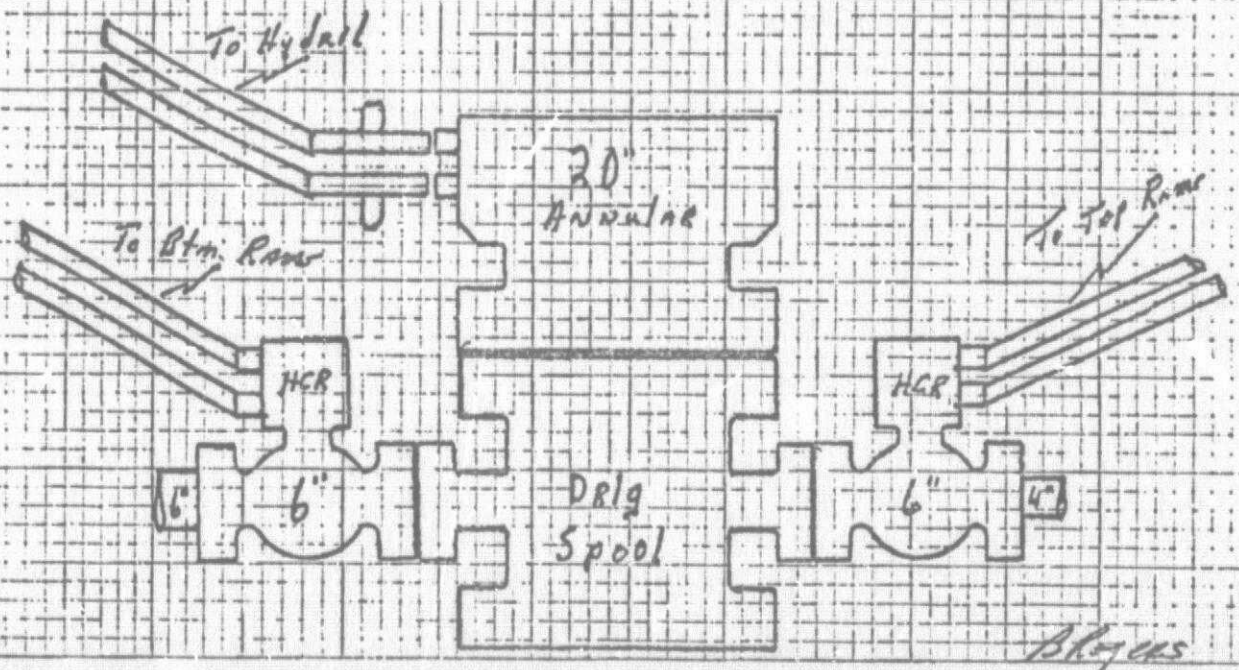
DIVERTOR SYSTEM OCEAN PRIDE

To Accumulator
Hydrail

Drlg. Hook Up



Test Hook Up

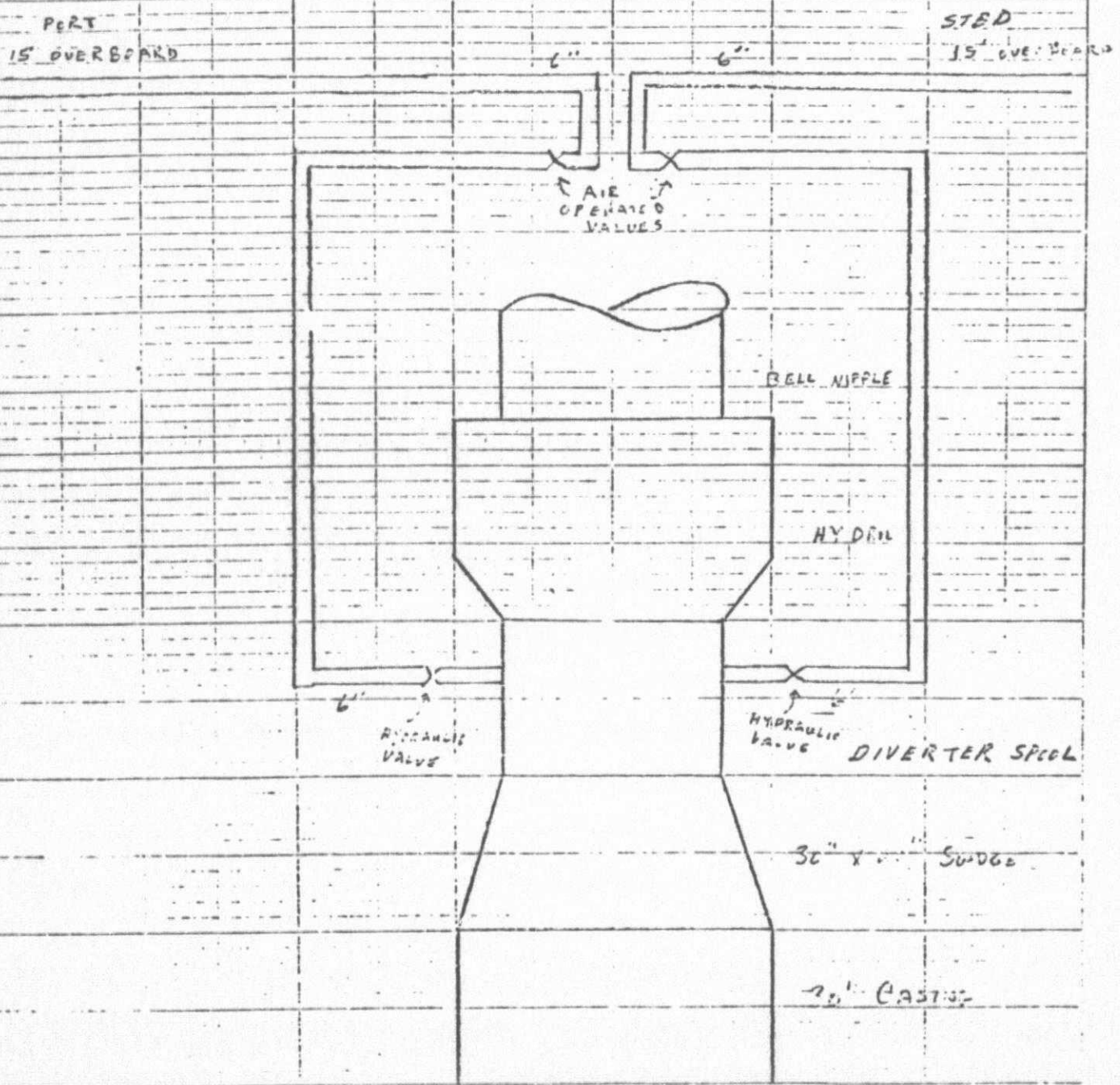


Allycus

DIETZGEN CORPORATION
MADE IN U.S.A.

PL. 380-10 DIETZGEN GRAPH PAPER
10 X 15 PER INCH

OCEAR PRIDE SCHEMATIC OF DIVERTER SYSTEM



NO. 0782

"OCEAN PRIDE"

EMISSIONS SUMMARY

SOURCE NO.	SOURCE	STACK HT. (Ft.)	STACK DIA. (Ft.)	EMISSIONS (TONS/YEAR)				
				CO	HYDROCARBON	NO _x	PARTICULATE	SO ₂
1	GM 16V71	60	1.33	14.4	3.10	91.5	1.0	7.45
2	GM 16V61	60	1.33	14.4	3.10	91.5	1.0	7.45
3	Mud Pumps (EMD 16-567)	60	.67	30.59	6.58	194.4	2.12	5.83
4	Mud Pumps (EMD 16-567)	60	.67	30.59	6.52	194.4	2.12	5.83
5	Schlumberger (4-71)	65	.13	0.05	0.01	0.32	Neg	0.03
6	Drawworks (Superior PTD-6)	65	.83	5.84	1.26	37.10	0.41	3.02
7	Drawworks (Superior PTD-6)	65	.83	5.84	1.26	37.10	0.41	3.02
8	Drawworks (Superior PTD-b)	65	.83	5.84	1.26	37.10	0.41	3.02
9	Cold Start (LD-1)	60	.13	0.01	Neg	0.06	Neg	0.01
10	Halliburton (GM 3-53)	73	.25	0.08	0.02	0.51	0.01	0.04
11	Halliburton (GM 8V71)	73	.5	0.2	0.06	1.84	0.02	0.15
12	Halliburton (GM 8V71)	73	.5	0.2	0.06	1.84	0.02	0.15
Total				108.22	23.29	687.67	7.52	36.0

X 2000 = lbs./yr.

÷ 365 = lbs./Day

216,440 46,580 1,375,340 15,040 72,000

592.99 127.62 3760.05 41.21 197.26

Pollutant from diesel engines on drilling rigs were calculated using the following:

$$\frac{\text{TONS}}{\text{YR}} = .0096563 \times C \times P \times (\text{BHP})$$

where

- .0096563 = conversion from Grams/hr. to Tons/yr.
- C = Grams/BHP-Hr of pollutant - see (1)
- P = Average % useage in a yr. - see (2)
- BHP = Rated HP of engine

(1) Available data from manufacturers of diesel engines and theoretical combustion data was surveyed, and the following values chosen:

<u>Pullutant</u>	<u>Grams/BHP-HR</u>
NO _x	18.3
SO ₂	1.49
Hydrocarbon	0.62
CO	2.88
Particulate	0.20

(2) Operation of equipment data from several rigs was reviewed to obtain % useage. Based on this review, the following data was utilized in preparing emissions estimates. This data is probably conservative, because it was assumed that engines were operating at all times at rated horsepower:

<u>Engine Application</u>	<u>Average Yearly % Use</u>
Main Engine	74
Emerg. Engine	0.5
Primary Crane	7
Back Up Crane	3
Fork Lift	3
Cement Unit	3
Logging Unit	1
Welding Unit	2
Desander/Desilter	10
Cold Start Air Comp.	2
Rig Air Comp.	10
Main Mud Pump	50
Mud Mix Unit	10
Draw works	60
Bulk Air Comp.	3

Basis For Calculations of Gaseous emissions of
Boats + Helicopters and Crane at Supply Base
for Rig Related Operations

I. Boats: Equiped with two V 12 marine engines and two generators,
Lbs/Hour

CO 6.8	Hydrocarbon 2.5	No _x 31.4	SO ₂ 2.1	Particules 2.3
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II. Helicopter: For transportation of men. Size 206
Lbs/Hour

CO .5	Hydrocarbon .1	No _x 2.2	SO ₂ 14.2	Particules .2
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III. Supply Base - Crane - with GM 6-71 diesel engine with 228 BHP
driving a 30 ton crane

CO 3.77	Hydrocarbon .35	No _x 9.18	SO ₂ .47	Particules .5
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**ENVIRONMENTAL REPORT
FOR
PLAN OF EXPLORATION**

U. S. GEOLOGICAL SURVEY

JUL 21 1983

Ship Shoal Area

Block 166

Lease OCS-G-5549

OPERATIONS
SUPPORT
GULF OF MEXICO REGION METAIRIE, LA.

**Prepared For
ODECO Oil & Gas Company**

**Prepared By
C.H. Fenstermaker & Associates
P.O. Box 52106
Lafayette, Louisiana 70505**

WELL NOS. 1 & 2

July 18, 1983

**Office of
Management Support**

SEP 12 1983

Company Contact

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Records Management

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SECTION 1.0
DESCRIPTION OF PROPOSED ACTION

A. TRANSPORTATION MODES

Proposed exploration activities in Ship Shoal Block 166 will involve the drilling of two oil and/or gas wells from ODECO's "Ocean Pride" jack-up rig in a water depth of approximately 55 feet. Operations at these wells will be serviced by marine vessels from Dulac, LA and by helicopter from Houma, LA. A description of the type and sequence of activities to be conducted, the drilling vessel, and travel modes, routes, and frequencies is provided in Section II, Section III, Section VII, and Section X of the Plan of Exploration (POE).

B. SUPPORT BASES AND PERSONNEL REQUIREMENTS

A discussion of the onshore support bases to be used for the proposed activity is provided in Section VII of the POE.

Personnel required in the exploration phase are outlined below:

1. Onshore Employment. The Dulac and Houma areas are established centers for drilling and producing operations, both onshore and offshore. Accordingly, it is expected that personnel required for routine onshore activities will be readily available. The proposed exploration activities are not expected to create any requirement for new or additional workers in the Dulac and Houma areas.
2. Offshore Employment. Approximately 54 to 68 offshore service personnel will be needed to drill the two proposed wells in Block 166. This includes 14 to 18 people for transportation crews which will be contracted locally, and 40 to 50 individuals furnished by ODECO for drilling crews. The latter will consist of positions such as toolpushers, drillers, derrickmen, motormen, floormen, crane operators, roustabouts, electricians, welders, and galley men.

A Socioeconomic Data Base Report addressing ODECO's OCS activities will be submitted when the Minerals Management Service's (MMS) requirements are finalized.

C. NEW SUPPORT FACILITIES

As described earlier, existing onshore facilities at Dulac and Houma will provide much, if not all, of the necessary supplies to conduct the proposed activity. In addition, other service industries have been established throughout coastal Louisiana in past years which can provide further services, if necessary. Therefore, no new land acquisition or construction of new support facilities is expected as a result of the proposed activity in Ship Shoal Block 166.

D. NEW OR UNUSUAL TECHNOLOGY

There are no new or unusual operating procedures that will be used during the proposed exploratory drilling activity which may affect coastal waters.

E. MAPS

Figure 1 depicts the location of Ship Shoal Area, Block 166, in relation to the Louisiana coastal zone. Figure 2 shows the surface locations from which the two proposed wells will be drilled in Block 166.

F. MEANS, ROUTES, QUANTITIES, AND DESTINATION OF PRODUCTION

This discussion is not applicable since the proposed activity is a Plan for Exploration.

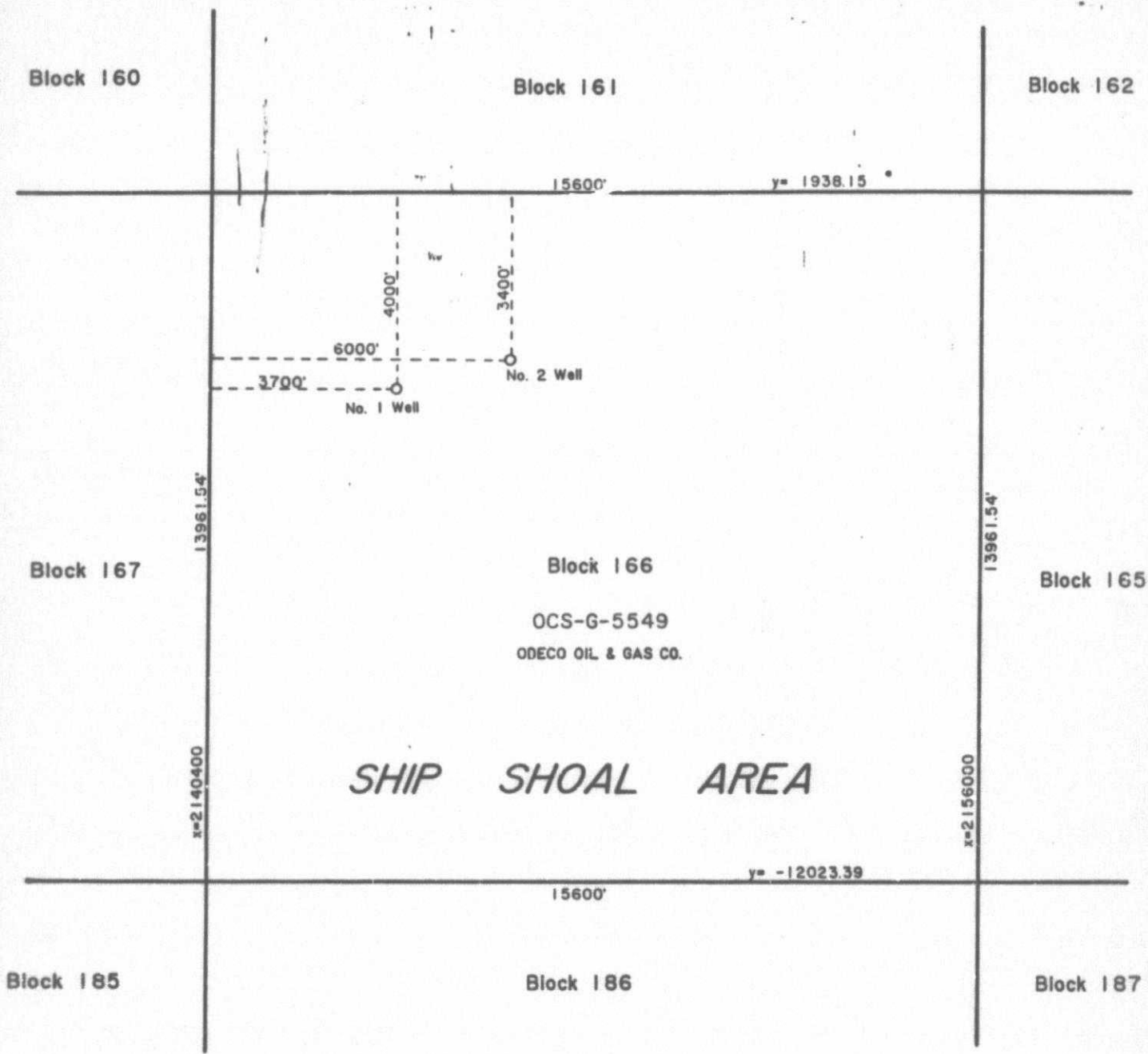


Figure 2. Proposed Surface Locations of Wells No. 1 & 2, Ship Shoal Area

Block 166



SECTION 2.0
DESCRIPTION OF AFFECTED ENVIRONMENT AND IMPACTS

A. PHYSICAL AND ENVIRONMENTAL

1. Commercial Fishing. Ship Shoal Block 166 is located within the National Marine Fisheries Service Zone Grid 14, which extends from Calliou Bay on the west to Barataria Bay on the east then south to the outer limits of the Continental Shelf. This zone is a moderately productive fishery region in the Gulf of Mexico. When considering the zone as a whole, menhaden, unclassified industrial fish, and shrimp comprise the largest volume of all the fisheries. Off the coast of Louisiana, the shrimp industry is the principal fishery in terms of value. Ship Shoal Block 166 is located in that area designated as the white shrimp center of abundance. This block is also within that area reported as a principal industrial bottomfish harvest area and a hook and line fishing area. Major open oyster harvest areas near the proposed activity lie approximately 30 statute miles to the north in Terrebonne Parish (BLM 1979, pp. II-66 and 67, and Visual No. 5; MMS 1983, Visual No. 4).

No kelp harvesting or mariculture occurs in or near Ship Shoal Block 166.

No significant long-term impact on the area's commercial fisheries should result from the proposed activity. Short-term effects will include temporary losses of sea bottom and degraded water quality within and around the immediate vicinity of the rig, primarily because of increased turbidities during drilling activities (Monaghan et al. 1976). Increased turbidities and suspended solids concentrations will occur on a temporary basis as the result of installation and removal of the jack-up rig. Additionally, discharges of drilling muds and cuttings during exploration activities will create a turbidity plume and cause increases in suspended solids. Studies have shown that background seawater suspended solids concentrations occur within approximately 1,000m of the discharge point (Monaghan et al. 1976; Ayers 1980). Field investigations in offshore areas in Texas have shown that drilling fluid discharges may result in increases of trace metals in bottom sediments, with concentrations decreasing with increased distances from the point of discharge (BLM 1978b, pp. 105 and 114). In a review of available literature, Ayers (1980) and Neff (1980) concluded that discharges of drilling fluids have no measurable long- or short-term effects on marine life and minimal effects on water quality.

Discharges of domestic and sanitary wastewater will be treated in accordance with OCS Order No. 7 and EPA NPDES effluent limitations guidelines, which will result in a negligible effect on water quality.

Statistics available for the Gulf of Mexico indicate that for the period 1964-1981 a total of 100 blowouts had occurred, with only 9 blowouts resulting in losses of oil and/or distillates. Further, most blowouts producing spillages were associated with production activities and not with exploration as proposed herein. Data available for 1967-1980 showed that drilling operations accounted for less than 6% of known oil spillage into the Gulf. Other records for 1964-1981 revealed that in the event spillages should occur they will be less than 50 barrels in quantity 99% of the time and less than one barrel 89% of the time (BLM 1981, pp. 266-270). No significant impact is expected on commercial nekton because of the low probability of accidental spillages, mitigative measures that will be taken to contain and cleanup any releases of hydrocarbons and the ability of these organisms to avoid areas of disturbance.

Due to the distance of the proposed activity from the oyster grounds and the Calliou Bay-Barataria Bay complex and the lack of pipeline construction to onshore areas, no impacts are anticipated on the oyster beds or to the nursery areas found in the estuaries north of Ship Shoal Block 166.

In addition, commercial trawlers will have to avoid the area around the rig to prevent fouling their nets in drilling equipment.

2. Shipping. Ship Shoal Block 166 is not located within the boundaries of any shipping fairway, transit lane, or anchorage area (BLM 1978a, Visual No. 1; MMS 1983, Visual No. 11). Therefore, no impacts on shipping should occur although vessels will have to avoid the area of the drilling rig.
3. Small Craft Pleasure Boating, Sport Fishing, Recreation. It has been estimated that about 100,000 recreational boats utilize the offshore waters of the central and western Gulf. Nearly all of these boaters are thought to be recreational fishermen. In studies of recreational fishing, it was found that the annual catch has averaged approximately 70 kg (kilograms) per fisherman. Most of the fishing activity occurs in nearshore waters or in inland bays and sounds; however, party and charter boats do venture out farther in the Gulf. Party boats will often anchor near an artificial reef, while charter boats will usually spend more time trolling. Grunts, croakers, sea trout, drums, snappers, etc., comprise the majority of the volume of fishes caught in the OCS waters (BLM 1974, p. 187; BLM 1978a, pp. II-57 to II-59). In the wetlands and bays north of

the Ship Shoal Area, sport fishing for species such as spotted seatrout, red drum, and croaker; and crabbing and shrimping are common recreational pastimes. Waterfowl hunting is popular in the coastal marshes, and more passive forms of recreation are enjoyed by some in the form of activities such as camping, boating and birdwatching. As shown on Visual No. 4 by BLM (1979), developed or undeveloped/proposed state and federal park areas include the Edward Douglas White State Park in Lafourche Parish, the Jean Lafitte Park in Jefferson Parish, the Grand Isle State Park in Jefferson Parish, and the Isle Dernieres State Park in Terrebonne Parish, LA.

As discussed under the section for commercial fisheries above, no long-term detrimental impacts should occur on sport fisheries in offshore, nearshore, or estuarine areas. Some short-term effects (e.g., increased turbidities and suspended solids) will take place in and around the jack-up rig during rig installation/removal and while drilling, but these effects have not been shown to be significant. No permanent impacts on the sport fisheries should occur in the event of a blowout due to the mitigative features of rapid implementation of the Oil Spills Contingency Plan, and the species ability to avoid areas of disturbance. No adverse effects are envisioned on the recreational facilities described above.

Some beneficial effects are expected to take place with the installation of the rig through attraction of sport fishes to the submerged structure (BLM, 1979; pp. 111-18,19).

No detrimental impacts to recreational opportunities are expected from air emissions projected for the proposed activity on either inshore or offshore areas.

4. Cultural Resources. A cultural resources and multi-sensor engineering survey of the lease area are presently being conducted, and the results will be submitted to the MMS upon completion of the report. Pending culmination of the survey, a complete evaluation of the potential impact of the proposed activity on cultural resources cannot be made. However, it is known from Visual No. 4 (BLM 1980) that no shipwrecks have been reported in Block 166, although one has been reported in Ship Shoal Block 167. Further, should any anomalies be recorded in the lease area which might indicate the presence of significant cultural resources, ODECO will take appropriate action, where deemed necessary or as required, to preclude adverse impacts to significant entities.
5. Ecologically Sensitive Features. A general description and impact evaluation of ecologically sensitive features is provided on the following pages under pertinent headings.

- (a) Wildlife Refuges and Preserves. State and Federal wildlife refuges and preserves found along the Louisiana coast, which are within a 50-mile radius of Ship Shoal Block 166 and Dulac, LA, are shown in Table 1. No impacts on these areas will occur from the proposed activity.

Table 1

WILDLIFE REFUGES AND PRESERVES

Name	Ownership	Approximate Distance From Dulac-Houma LA*	Approximate Distance From Ship Shoal Block 166*
Attakapas Wildlife Management Area	State	55 miles NW- 45 miles NW	85 miles NNW
Point au Chien Wildlife Management Area	State	20 miles NE- 20 miles SE	60 miles NNE
Wisner Wildlife Management Area	State	40 miles ESE 45 miles SE	50 miles NE
Salvador Wildlife Management Area	State	45 miles NE 30 miles NE	80 miles NNE

*Statute miles.

Source: Brunett and Wills (1978), BLM (1979, Visual No. 5), MMS (1983, Visual No. 4), Bicentennial Edition of the Official Map of Louisiana.

- (b) Marine and Estuarine Sanctuaries. Based on information shown on Visual No. 7 (BLM 1979), the nearest protected area of biological significance to Ship Shoal Block 166 is Ewing Bank in Blocks 335, 336, 337, 350 and 351, Ship Shoal South Addition. This reef lies approximately 35 miles SSE of the proposed activity and will not be impacted. Although not shown on this map as protected areas, the estuaries found north (Calliou Bay-Barataria Bay complex) of Block 166 are considered sensitive and important ecosystems. As stated earlier, no impact is expected on these significant areas.

- (c) Areas of Particular State Concern. The Louisiana Coastal Resources Program Final Environmental Impact Statement (Office of Coastal Zone Management and Louisiana Department of Natural Resources 1980), and in particular Chapter V: Special Management Areas, was consulted to determine the areas of concern. In general, these areas include the Marsh Island Wildlife Refuge and Game Preserve, Louisiana Offshore Oil Port, barrier islands, areas of high erosion, wetland areas suitable for enhancement by freshwater diversion, Lake Pontchartrain Basin, the Port of New Orleans, special areas of rapid delta growth, and special corridor areas. Due to the distance of Ship Shoal Block 166 and the shore bases in Dulac and Houma, LA, from many of these areas, existing development in the vicinity of the shore bases, and the lack of need for any facility expansion, no adverse impacts should occur on these areas of particular state concern.
- (d) Breeding and Spawning Grounds, Migration Routes. The proposed activity should not appreciably disrupt breeding habitats, spawning grounds or migration routes of nektonic organisms due to their ability to avoid areas of disturbance. Less motile species will not be affected unless they occur in the region of disturbance such as areas with increased turbidities.
- (e) Wetlands. Marshes are found throughout the coastal region of Louisiana. North of Ship Shoal Block 166 and in the Houma area these wetlands are generally characterized by saline marshes adjacent to the Gulf of Mexico, and a gradation to brackish, intermediate and fresh types as one moves inland (Chabreck and Linscombe 1978).
- No detrimental effects to these wetlands are expected from the proposed activity due to the distance of Ship Shoal Block 166 from the coast (about 30 statute miles), to the fact that exploration will be conducted instead of production, and as the result of utilization of existing shorebase facilities.
- (f) Oyster Reefs. The location of major oyster reefs and anticipated impacts were discussed previously in Section 2.0.a.(1) Commercial Fishing. As mentioned, no impacts are expected, especially since no pipelines into the Louisiana coastal zone will be constructed with the proposed activity. This applies not only to major oyster grounds but also to those less commercially significant reefs which are located throughout Louisiana's water bottoms.

6. Existing Pipelines and Cables. As shown on Figure 3, a 26-inch gas pipeline runs north-south through the central part of the lease area and a 24-inch gas pipeline extends through the southeastern portion of the block (the approximate position of these pipelines was obtained from the pipeline section of the MMS). Both of the proposed well locations are found more than 500 feet away from these facilities and no problems are expected.

Based on the above information, no adverse impacts to or from existing pipelines will occur. As pointed out in Section 2.0.A.4. Cultural Resources, an engineering survey of the lease has not yet been completed which would identify other shallow drilling hazards. However, appropriate action will be taken by ODECO, where deemed necessary or as required, to avoid any adverse effects to or from any reported hazards.

7. Other Mineral Uses. No oil or gas is presently being produced from Ship Shoal Block 166, nor are other mineral resources such as sulphur or salt known to occur. The proposed activity will not affect any minerals extraction in nearby leases.
8. Ocean Dumping Activities. EPA approved ocean dumping sites are located at 27 degrees 12 minutes North to 27 degrees 28 minutes North and 94 degrees 28 minutes West to 94 degrees 44 minutes West, and 28 degrees 00 minutes North to 28 degrees 10 minutes North and 89 degrees 15 minutes West to 89 degrees 30 minutes West.

Additionally, an approved site for disposal of primarily organochlorine wastes is found at the following location: 27 degrees 06 minutes 12 seconds North, 93 degrees 24 minutes 15 seconds West; 26 degrees 32 minutes 24 seconds North, 93 degrees 15 minutes 30 seconds West; 26 degrees 19 minutes 00 North, 93 degrees 56 minutes 00 seconds West; and 26 degrees 52 minutes 40 seconds North, 94 degrees 04 minutes 40 seconds West (BLM, 1979; p. II-46 and Visual No. 5). All of these areas are situated south of the outer limits of the Continental Shelf and will not affect or be affected by exploration activities at Ship Shoal Block 166.

The Corps of Engineers maintains sites in the Gulf for disposal of dredged materials from navigation channels along the Louisiana coast. These disposal areas are located in the vicinity of the channels and will not be impacted by the proposed activity, nor will they in any way affect the project (BLM 1979; pp. II-46, 47).

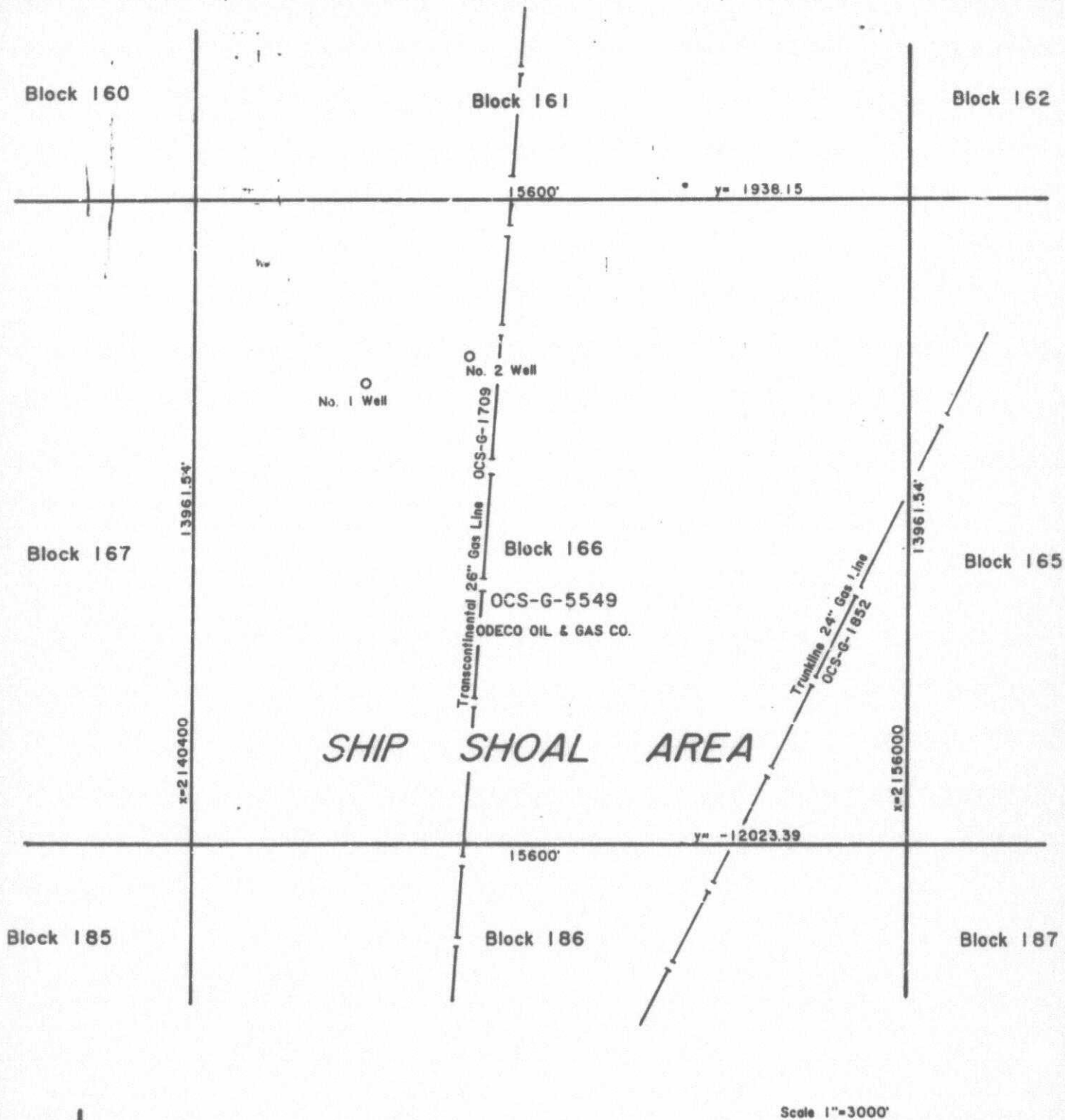


Figure 3 Location of Existing Pipelines within Ship Shoal Area

Block 166

N

9. Endangered or Threatened Species. Endangered or threatened species that are presumed or known to occur in the area which might be affected by the proposed activity include some species of aquatic mammals and reptiles. Terrestrial or semi-aquatic species are not discussed herein because no onshore or nearshore impacts are expected to result from the exploratory operations in Ship Shoal Block 166. No facility expansion is required, and all transportation will originate from Dulac and Houma, LA, and will utilize existing navigation channels or the airways. Additionally, no pipelines will be constructed from Ship Shoal Block 166 to the Louisiana coast line with the proposed activity. Therefore, habitats for resident transient species such as the American alligator, Arctic peregrine falcon, brown pelican, and bald eagle will not receive any additional impact than already occurs in the region around Dulac and Houma.

Endangered aquatic mammals include the sei, finback, blue, right, humpback, and sperm whales. These species occur in the central and western Gulf of Mexico, but adequate information concerning their population status and migration patterns in the Gulf does not exist (BLM 1978a, p. II-40; BLM 1978b, p. II-52; BLM 1978c, p. II-44; BLM 1979, p. II-41). However, it is known that the proposed wells in Ship Shoal Block 166 will be located in about 55 feet of water, which is shallow water for these large mammals. In light of this fact, it is expected that little, if any, impact will occur to these species from the proposed activity.

Five species of sea turtles comprise the endangered reptiles in the area of Ship Shoal Block 166: (1) loggerhead, (2) green, (3) Kemp's Ridley, (4) hawksbill, and (5) leatherback. The entire nesting population of Kemp's Ridley sea turtle is presently limited to Rancho Nuevo, Tamaulipas, Mexico, although attempts are presently being made to establish a nesting colony on Padre Island Seashore off the Texas coast. One authenticated nesting record was made for the loggerhead on Padre Island in 1979. Nesting for the loggerhead and other three species is normally limited to the Florida coast (U.S. Fish and Wildlife Service 1983; BLM 1978a, p. II-49; BLM 1978b, p. II-52; BLM 1978c, p. II-44; BLM 1979, p. II-41).

Although no definitive studies have been made on the impacts of drill cuttings and muds, certain cumulative impacts could occur from ingestion of these materials by turtles (see Section VIII of the POE for a description of the mud components). Effects of

lesser significance include those associated with marine traffic to Ship Shoal Block 166, and the possible occurrence of turtles near the rig and its associated disturbances. The greatest potential impact to the endangered reptiles would occur during a blowout when suspended solid levels would increase and discharges of oil/condensates would occur. These possible effects will be lessened by evaporation and breakdown of the oil/condensates and rapid implementation of the Oil Spills Contingency Plan, which is discussed in Section IV of the POE. Evaluations of available data by the BLM (1979, pp. III-23 to III-26) indicate that the lack of information on impacts of oil and gas operations on marine turtles precludes an ultimate assessment for these species.

B. SOCIOECONOMIC

A Socioeconomic Data Base Report will be prepared by ODECO Oil & Gas Company following issuance of the final requirements by the MMS. As indicated earlier, the proposed activity is not expected to create a significant impact on socioeconomic conditions in Louisiana since no facility expansion will be required or new personnel employed other than through the transportation contractors.

SECTION 3.0 UNAVOIDABLE ADVERSE IMPACTS

Exploration activities at Well Nos. 1 & 2, Ship Shoal Block 166, will have certain effects that are unavoidable. These include increases in turbidities and suspended solids associated with the installation and removal of the jack-up rig and discharges of drilling muds and cuttings. These actions are expected to adversely impact planktonic and some benthic communities within the area of disturbance through water quality degradation or burial with the release of muds and cuttings. In the event of a well blowout, potential impacts include alteration of community structures and mortalities within the area of influence. The magnitude of this impact will be diminished by evaporation and breakdown of crude oil/condensates at the water surface-atmosphere interface and in the water column, and rapid deployment of clean-up measures described in the Oil Spills Contingency Plan (see Section IV in the POE).

Air quality in the vicinity of the rig will be affected, but will be local in extent and quickly dissipated by climatic conditions. This action also applies to points along travel routes used by surface vessels and aircraft, but air quality will be degraded to a lesser degree because these emission sources will be in transit the majority of the time. These impacts are not considered significant; quantification of these emissions is provided in Section X of the POE. Should a blowout or spillage of oil/condensates occur, air quality degradation would be minimal unless a fire was to occur. In the event of a fire, local air quality would be degraded but no effect is anticipated on land resources or human quality (BLM 1979, p. V-1).

Discharges of sanitary waste will have a negligible effect on water quality and associated biota since they will be treated in accordance with OCS Order No. 7 and EPA NPDES effluent limitations guidelines.

No unavoidable adverse impacts are expected to occur on coastal activities or resources within the state of Louisiana such as commercial fishing, shipping, recreational opportunities, cultural entities, ecologically sensitive features, and endangered or threatened species.

Final definitive statements cannot be made on the effects of the proposed activity to cultural resources and other shallow hazards within the lease area, pending completion of the multi-sensor engineering survey. However, ODECO will take appropriate action, where deemed necessary or as required, to preclude any adverse impacts to or from these entities.

Based on the long-term beneficial effects (i.e., supply of new energy reserves for the economy and security of the United States) which will result from potential production, and the current environmental safeguards, it is felt that the minor nature of the adverse impacts described above are justified with regard to the exploration activities proposed for Well Nos. 1 & 2, Ship Shoal Block 166. Drill cuttings and mud could be transported to shore, but this is not considered cost feasible and would augment the potential for long-term impacts to freshwater resources within the state through disposal in pits or landfill areas. Air emissions could be eliminated, as could the potential for a blowout, by not conducting the drilling operations, but this is also not considered a practicable solution to the Nation's energy problems.

SECTION 4.0
STATEMENTS OF GUARANTEE

The proposed activity will be carried out and completed by ODECO Oil & Gas Company with the guarantee of the following items:

- 1.) The best available and safest technologies will be utilized throughout the project. This includes meeting all applicable requirements for equipment types, general project layout, safety systems, and equipment and monitoring systems.
- 2.) All operations will be covered by a MMS-approved oil spill contingency plan.
- 3.) All applicable Federal, state and local requirements regarding air emissions and water quality and discharge for the proposed activities, as well as any other permit conditions, will be complied with.

SECTION 5.0 CONSISTENCY CERTIFICATION

The Federal Office of Coastal Zone Management approved Louisiana's Coastal Zone Management Plan in September, 1980. Review of the Final Environmental Impact Statement, particularly Chapter II and Chapter V, Section C, and comparison with the findings in sections 1.0 through 4.0 in this Environmental Report show that the proposed activity at Ship Shoal Block 166, will be conducted in a manner consistent with the coastal management program.

The Consistency Certification form is found on the following page.

COASTAL ZONE MANAGEMENT
CONSISTENCY CERTIFICATION

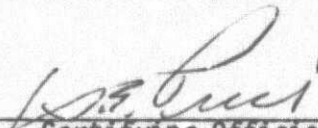
Plan of Exploration
Type of Plan

Ship Shoal Area, Block 166
Area and Block

OCS-G-5549
Lease Number

The proposed activities described in detail in this Plan comply with the State of Louisiana approved Coastal Management Program and will be conducted in a manner consistent with such Program.

ODECO Oil & Gas Company
Lessee or Operator


Certifying Official

JUL 19 1983
Date

SECTION 6.0
REFERENCES

- Ayers, R.C. 1980. Comments on the Fate and Effects of Drilling Discharges in the Marine Environment. In connection with Senate Bill S-211g, "Gulf of Mexico Bank Protection Act," Joint Hearing: Committee on Commerce, Science, and Transportation; Subcommittee on Energy Resources and Materials Production, U.S. Senate. Washington, D.C. March 25, 1980.
- Brunett, L. and D. Willis. 1978. A Guide to Wildlife Management Areas. Louisiana Department of Wildlife and Fisheries. Wildlife Education Bulletin No. 116. 100pp.
- Bureau of Land Management. 1974. Final Environmental Impact Statement Proposed 1974 OCS Oil and Gas Lease Sale 34. New Orleans, Louisiana.
- Bureau of Land Management. 1978a. Final Environmental Impact Statement Proposed 1978 OCS Oil and Gas Lease Sale 51. New Orleans, Louisiana.
- Bureau of Land Management. 1978b. Final Environmental Impact Statement Proposed 1978 OCS Oil and Gas Lease Sale 65. New Orleans, Louisiana.
- Bureau of Land Management. 1978c. Final Environmental Impact Statement Proposed 1978 OCS Oil and Gas Lease Sale 45. New Orleans, Louisiana.
- Bureau of Land Management. 1979. Final Environmental Impact Statement Proposed 1979 OCS Oil and Gas Lease Sale 58. New Orleans, Louisiana.
- Bureau of Land Management. 1980. Final Environmental Impact Statement Proposed 1980 OCS Oil and Gas Lease Sales A62 and 62. New Orleans, Louisiana.
- Bureau of Land Management. 1981. Final Environmental Impact Statement Proposed 1981 Oil and Gas Lease Sales 67 and 69. New Orleans, Louisiana.
- Chabreck, R.H. and G. Linscombe. 1978. Vegetative Type Map of the Louisiana Coastal Marshes. Louisiana Department of Wildlife and Fisheries, New Orleans, Louisiana.

- C.H. Fenstermaker & Associates. 1982. Environmental Report for Exploration, Vermilion Area, Block 43. Prepared for Transco Exploration Company, Houston, TX. 18pp.
- C.H. Fenstermaker & Associates. 1982. Environmental Report for Exploration, Viosca Knoll Area, Block 987. Prepared for Phillips Petroleum Company, Houston, TX. 18pp.
- C.H. Fenstermaker & Associates. 1982. Environmental Report for Exploration, West Cameron Area, Block 153. Prepared for ODECO Oil and Gas Company, New Orleans, LA. 19pp.
- C.H. Fenstermaker & Associates. 1983. Environmental Report for Exploration, Ship Shoal Area, Block 134. Prepared for ODECO Oil and Gas Company, New Orleans, LA. 19pp.
- Minerals Management Service. 1983. Final Regional Environmental Impact Statement Proposed 1983 OCS Oil and Gas Lease Sales 72, 74 and 79. New Orleans, Louisiana. 131pp.
- Monaghan, P.H., C.D. McAuliffe, and F.T. Weiss. 1976. Environmental Aspects of Drilling Muds and Cutting from Oil and Gas Extraction Operations in Offshore and Coastal Waters. Sheen Technical Subcommittee, Offshore Operators Committee, New Orleans, Louisiana 50pp.
- Neff, J.M. 1980. Review of the Toxicity and Biological Effects of Used Offshore Drilling Fluids to Marine Animals. In Connection with Senate Bill S-211g, "Georges Bank Protection Act," Joint Hearing: Committee on Commerce, Science, and Transportation; Subcommittee on Energy Resources and Material Production, U.S. Senate. Washington, D.C. March 25, 1980.
- Office of Coastal Zone Management and Louisiana Department of Natural Resources. 1980. Louisiana Coastal Resources Program Final Environmental Impact Statement. U. S. Department of Commerce, National Oceanic and Atmospheric Administration, Washington, D.C., and Coastal Management, Louisiana Department of Natural Resources, Baton Rouge, Louisiana. 190pp. + appendices.
- U.S. Fish and Wildlife Service. 1983. Endangered and Threatened Species of the Southeastern United States. Office of Endangered Species, Region 4, Atlanta, GA.
- U.S. Fish and Wildlife Service. 1980. Endangered Species of Texas and Oklahoma, 1980. Albuquerque, New Mexico.