

**EXPLORATORY PLAN
BEAUFORT SEA, DIAPIR FIELD AREA
OCS-Y LEASE SALE NO. 71
0261, 0262, 0272, 0274, 0279
0280 AND 0296**

**EXXON CO., U.S.A.
(A DIVISION OF EXXON CORPORATION)
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HOUSTON, TEXAS 77001**

AREA FILE

FILE COPY

MAY, 1983

VOLUME 1

C: 9/30/1988 T: 10/1/1993 D: 10/1/2063
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1101-02 (a)(2)

BEAUFORT SEA, DIAPIR FIELD AREA

LEASE SALE NO. 71

OCS-Y 0261, 0262, 0272, 0274,
0279, 0280 and 0296

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OFFSHORE FIELD OPERATIONS

AUG 16 1983

ANCHORAGE, ALASKA

EXXON COMPANY, U. S. A.

(a division of Exxon Corporation)

P. O. Box 4279

Houston, Texas 77001

July 18, 1983

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*Includes Proprietary Information

I.

EXPLORATION PLAN

BEAUFORT SEA, DIAPIR FIELD AREA

LEASE SALE NO. 71

OCS-Y 0261, 0262, 0272, 0274,
0279, 0280 and 0296

EXXON COMPANY, U. S. A.

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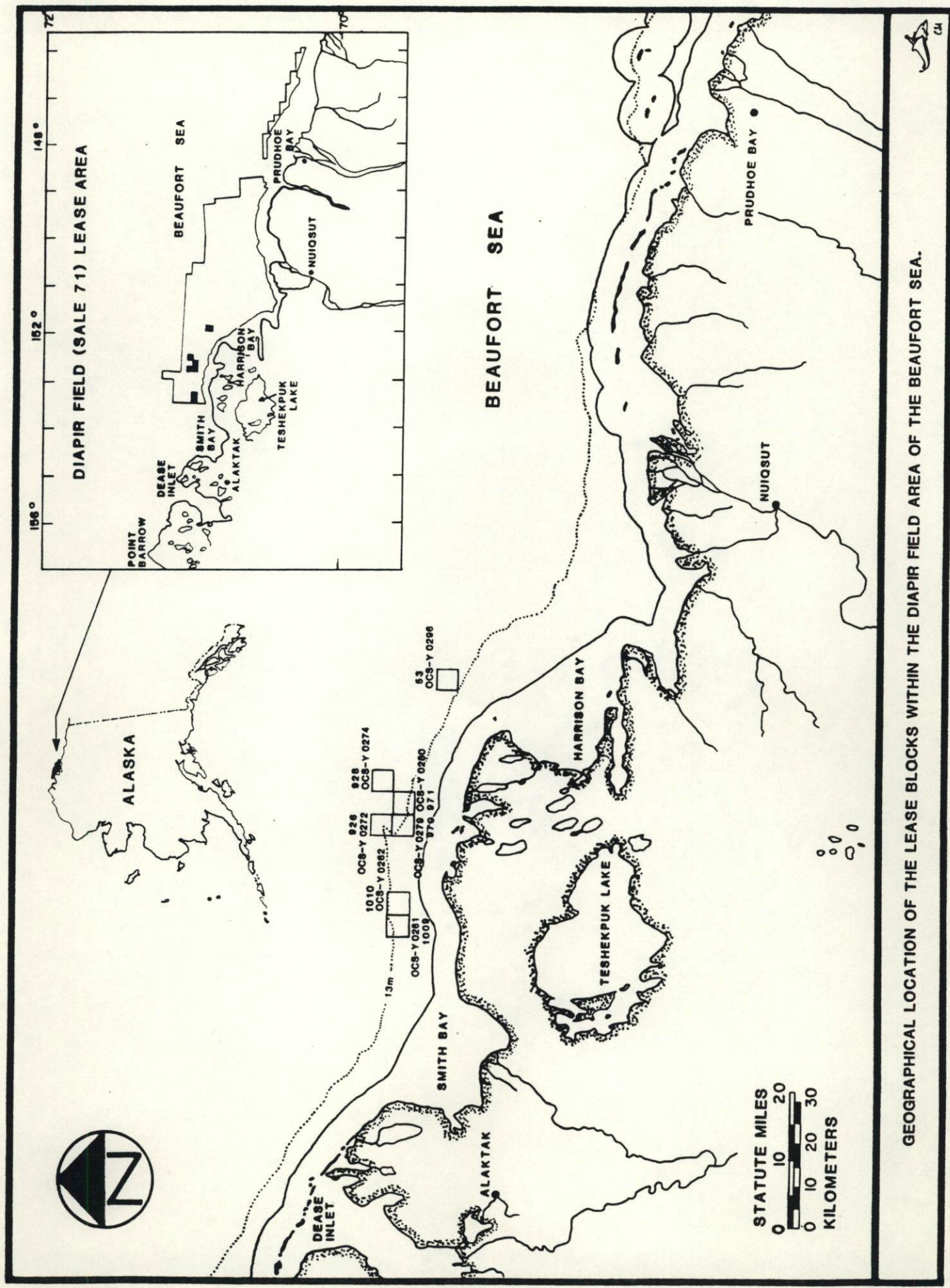
I. EXPLORATION PLAN

Introduction

Pursuant to 30 CFR 250.34, Exxon Corporation submits this Exploration Plan for leases in the Cape Simpson - Cape Halkett portion of the OCS Sale No. 71 area.

Within the designated area, Exxon Corporation currently holds ten year term oil and gas leases shown on Figure A acquired December 1, 1982 on Federal leases OCS-Y 0261, 0262, 0272, 0274, 0279, 0280 and 0296, in Diapir Field area (blocks 1009, 1010, 0926, 0928, 0970, 0971 and 0950 respectively). Extensive geological and geophysical surveys have been conducted in the lease area. These data along with subsurface geologic data obtained from the wells drilled in the NPR-A, Olaktak Point area to the south and the Prudhoe Bay area to the east, provide evidence that these leases may be sites of potential hydrocarbon accumulations. Exxon proposes to explore and evaluate this possibility according to the procedures outlined in this Exploration Plan.

Exxon proposes to use fill island construction or a Concrete Island Drilling System (CIDS) to perform appropriate exploratory drilling. If the fill island method is used, material may be obtained from Regional Corporation lands within the present boundaries of the National Petroleum Reserve - Alaska (NPR-A), from existing



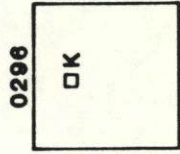
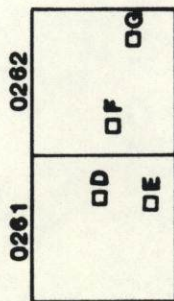
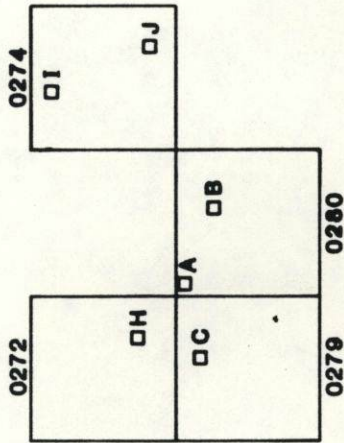
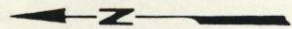
GEOGRAPHICAL LOCATION OF THE LEASE BLOCKS WITHIN THE DIAPIR FIELD AREA OF THE BEAUFORT SEA.

EXXON COMPANY, U.S.A.
 EXPLORATORY PLAN
 BEAUFORT SEA, DIAPIR FIELD AREA



□ = DRILL SITE

BEAUFORT SEA



POGIK BAY

ALASKA

Figure B

deposits at the Colville River near Nuiqsat, from presently active Alaska State approved gravel mines in the Prudhoe area, or from other areas.

Minimum activity under this proposal would be the drilling of one well to approximately 9300 feet (2835 meters) from a single drillsite. Maximum drilling activity under this Plan could utilize as many as eleven drill sites (Figure B) on the seven leases, and would not exceed twenty two wells (average of 2 wells/drill-site, Table A). Drilling and testing time per well is estimated to be about three months.

EXXON COMPANY, U. S. A.
EXPLORATORY PLAN
BEAUFORT SEA, DIAPIR FIELD AREA
DRILLSITES

| <u>Location</u> | <u>Lease</u> | <u>Lease Line Calls</u> | <u>UTM 5 Coordinates</u> | | <u>Latitude</u> | <u>Longitude</u> |
|-----------------|--------------|-------------------------|------------------------------|-------------|-----------------|------------------|
| | | | <u>X</u> | <u>Y</u> | | |
| A | 0280 | 1300'FWL; 800'FNL | 1,673,213' | 25,857,416' | 71°02'12.60"N | 152°43'27.81"W |
| B | 0280 | 6500'FEL;4200'FNL | 1,681,161' | 25,854,016' | 71°01'38.75"N | 152°39'27.95"W |
| C | 0279 | 2600'FNL;6800'FEL | 1,665,113' | 25,855,616' | 71°01'55.21"N | 152°47'33.05"W |
| D | 0261 | 7350'FNL;4600'FEL | 1,588,573' | 25,850,866' | 71°01'07.06"N | 153°26'06.99"W |
| E | 0261 | 2850'FSL;5200'FEL | 1,587,973' | 25,845,318' | 71°00'12.44"N | 153°26'23.90"W |
| F | 0262 | 6800'FSL;3200'FWL | 1,596,373' | 25,849,268' | 71°00'51.85"N | 153°22'10.94"W |
| G | 0262 | 4700'FSL;3200'FEL | 1,605,721' | 25,847,168' | 71°00'31.69"N | 153°17'28.16"W |
| H | 0272 | 4200'FSL;4450'FEL | 1,667,463' | 25,862,416' | 71°03'02.02"N | 152°46'21.20"W |
| I | 0274 | 2200'FNL;6400'FWL | 1,694,061' | 25,871,764' | 71°04'32.52"N | 152°32'53.88"W |
| J | 0274 | 2850'FSL;4450'FEL | 1,698,959' | 25,861,066' | 71°02'46.90"N | 152°30'28.05"W |
| K | 0296 | 4100'FNL;7550'FWL | 1,773,951' | 25,822,620' | 70°56'18.90"N | 151°53'00.04"W |

Table A

I. A. Schedule for the prompt and efficient exploration of potential accumulations of hydrocarbons.

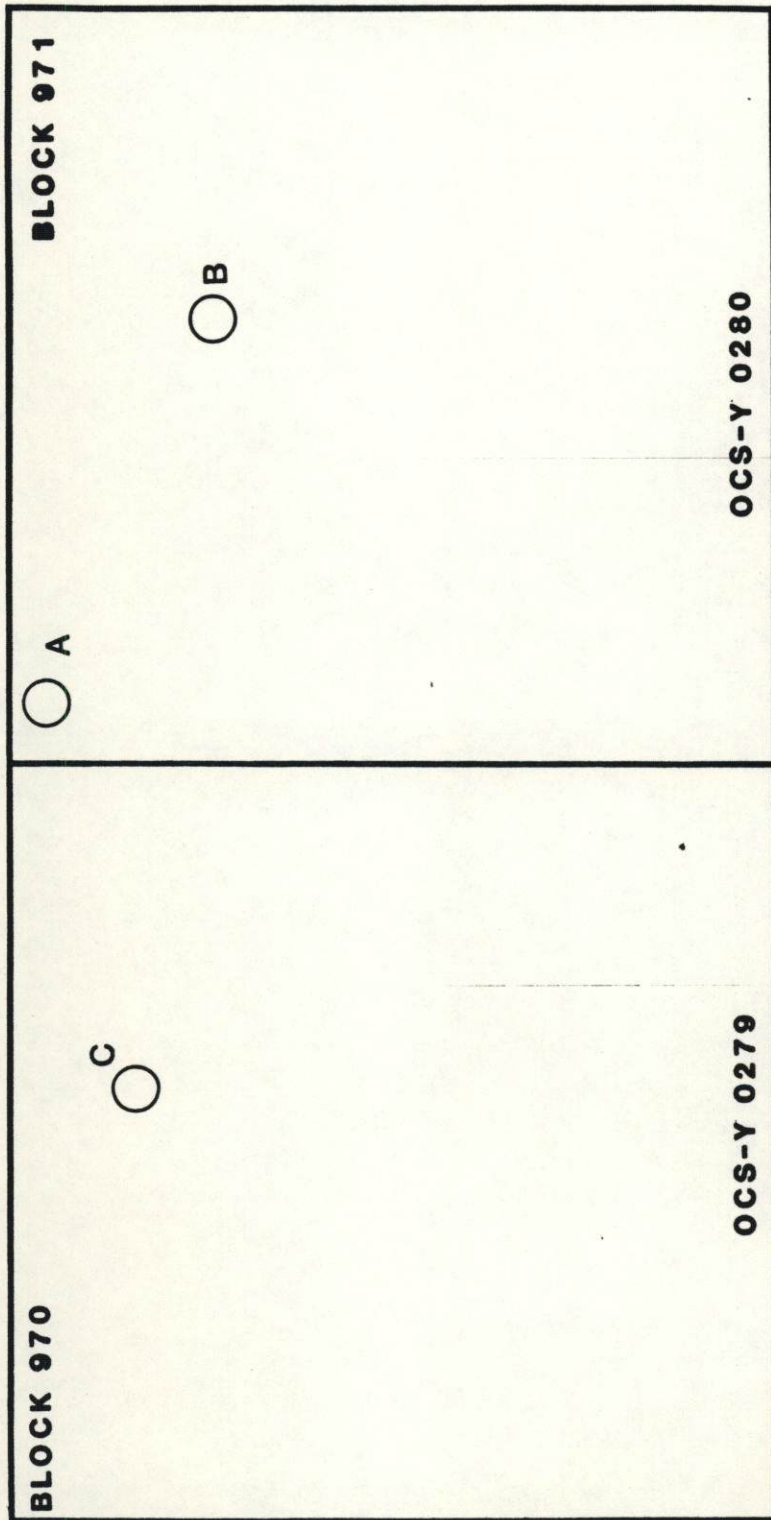
Considerable flexibility must be afforded to exploratory drilling schedules, so that plans may be adjusted as new data are obtained. Each subsequent exploratory well is largely dependent on geologic information obtained from the immediate preceding well.

1. The initial well in this plan will be drilled from one of these alternate drillsites as described below and shown in Figure C:

| Location | Block | Tract | Lease | Water Depth | Lease Lines | Surface Location | |
|----------|-------|-------|--------|----------------|--------------------|---------------------------------|--------------------------------------|
| | | | | | | Lat/Long | X/Y |
| A | 971 | 58 | Y-0280 | $\pm 14M(45')$ | 1300'FWL; 800'FNL | 71°02'12.60"N 152°43'27.81"W | X=1,673,213 Y=25,857,416 UTM 5 |
| B | 971 | 58 | Y-0280 | $\pm 14M(45')$ | 6500'FEL; 4200'FNL | 71°01'38.75"N 152°39'27.95"W | X=1,681,161 Y=25,854,016 UTM 5 |
| C | 970 | 57 | Y-0279 | $\pm 14M(45')$ | 2600'FNL; 6800'FEL | 71°01'55.21"N 152°47'33.05"W | X=1,665,113 Y=25,855,616 UTM 5 |

This initial well is presently planned as a straight hole to approximately 9300' (MD & TVD) requiring about 90 days to drill and test.

Following appropriate approvals, if fill island construction is used at the first location, construction activity would initiate in December, 1983; through-the-ice emplacement would start in mid January, 1984. Drilling operations would commence as soon as the island is complete.



EXXON CO., U.S.A.
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 EXPLORATORY PLAN

ALTERNATE SITES FOR INITIAL DRILLING LOCATIONS

SCALE: 1" 4000' 2/28/83

Figure C

If the CIDS is used, it is planned to emplace the unit on location in August, 1984, and begin drilling operations in November, 1984.

The drilling rig(s), to be used to explore the area covered by this plan, will be typical of those currently under contract. Pool Arctic Alaska's (PAA) Rig No. 4 is under contract and is presently planned for use for the initial well.

2. Subsequent to the first well, other wells may be directionally drilled from the same surface location. Conceivably, a maximum of 11 gravel island or CIDS sites with 22 wells might be needed to facilitate complete geological evaluation and description.
3. Decisions of whether or not, and when, to drill a subsequent well(s) will be made within a reasonable period of time following the evaluation of geologic data provided by each succeeding well. Such future operations will be further conditioned upon the availability of appropriate drilling equipment and drilling season limitations.

Other information, which may bear upon the decision to drill additional wells, will be obtained from

wells drilled in adjacent areas and from additional seismic control programs.

4. Schedule Revision

This schedule will be revised as necessary to efficiently evaluate the commercial potential of the leases prior to the lease expiration date which is December 1, 1992.

I. B. Description Of Drilling Operations

1. Drill Site

a. Artificial Island/Concrete Island Drilling System

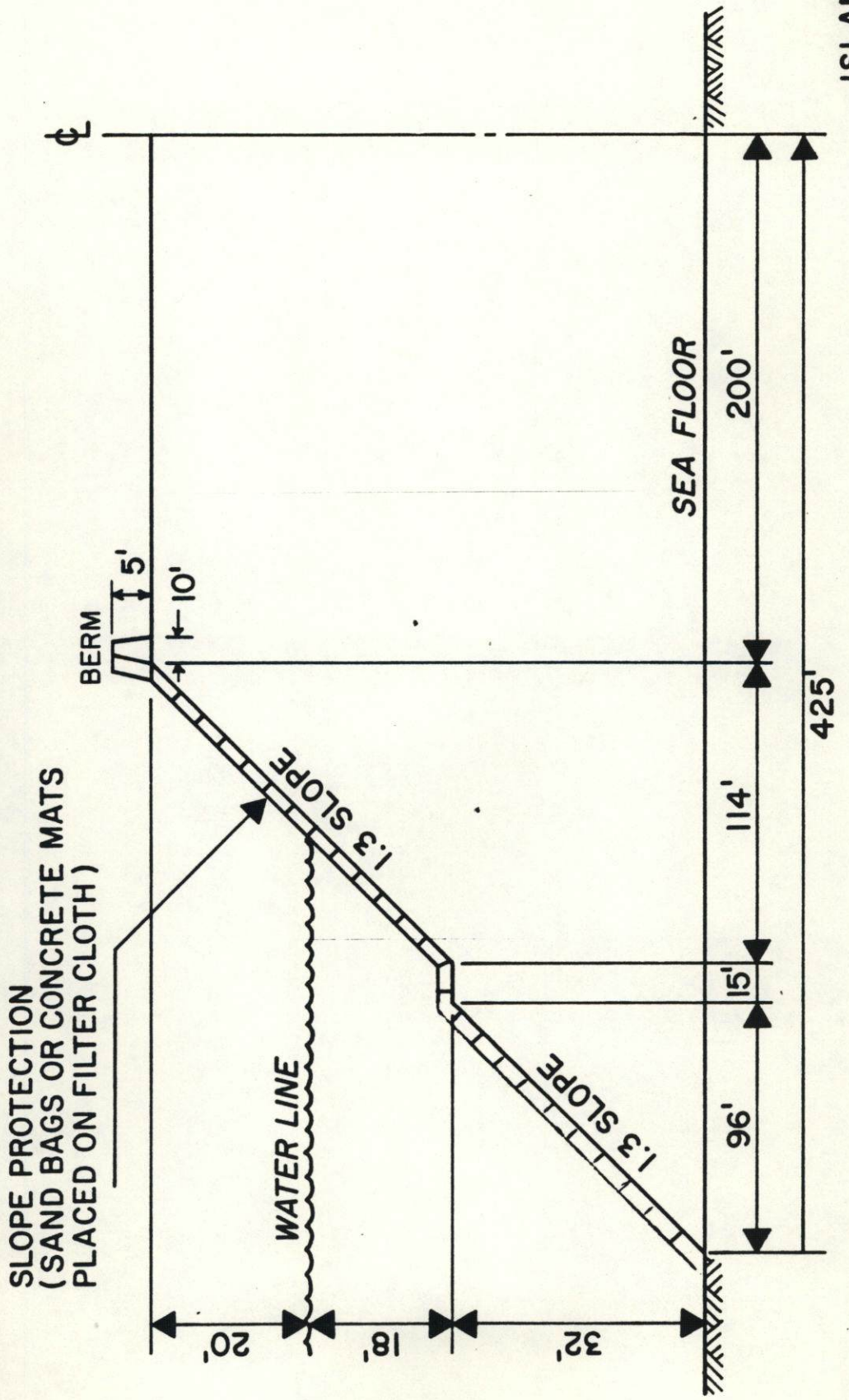
Drilling operations for the proposed plan will be conducted from either an island constructed of fill material or a CIDS placed in approximately 50 feet of water.

b. Fill Island

Onshore fill construction material would be trucked over ice roads to the proposed site. The island will be designed as a two-well location and will have a diameter of 400 feet at 20 feet above mean high water. Approximately 1,200,000 cubic yards of fill material will be required, which will provide a side-wall slope of 1:3. The slope will be suitably monitored and protected from waves and ice motion; this protection will be maintained during the useful life of the island. Figure 1 shows a cross section of the proposed drill-site. The island design, construction, and monitoring will be certified in accordance with the requirements of MMS OCS Order No. 8.

Figure 2 shows the layout of equipment and facilities for the proposed island.

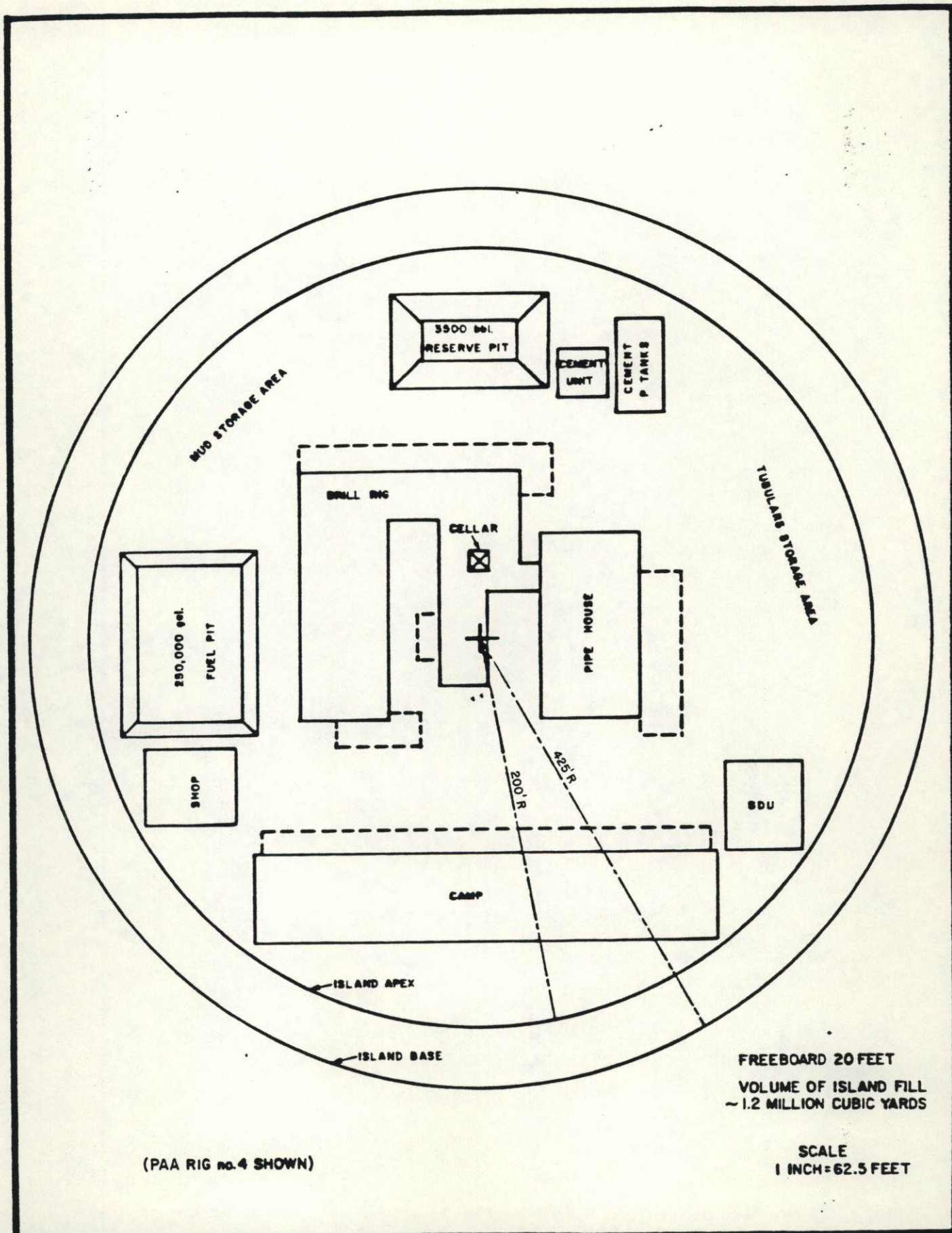
CROSS SECTION
 CIRCULAR ISLAND DRILL SITE
 BEAUFORT SEA SALE 71 AREA
 EXXON Co. U.S.A.



ISLAND
 SYMMETRICAL
 ABOUT
 CENTER LINE

SCALE: VERTICAL 1" = 20'
 HOR. 1" = 60'

FIGURE 1



(PAA RIG no. 4 SHOWN)

FREEBOARD 20 FEET
 VOLUME OF ISLAND FILL
 ~ 1.2 MILLION CUBIC YARDS

SCALE
 1 INCH = 62.5 FEET

FIGURE 2. TYPICAL DRILLSITE LAYOUT.



A self-contained camp facility for housing 70 people will be provided together with utilities including a potable water supply, a sewage treatment plant, and an incinerator unit.

A fuel area will be constructed with an impermeable lining and a fill berm which will contain any possible loss of fuel from the steel fuel tanks.

In addition to the fuel area, there will be a lined reserve mud pit which will be used for emergency discharge of fluids. This pit will normally be kept dry to maximize storage capacity.

c. Concrete Island Drilling Systemm (CIDS)

The CIDS, as shown on the Figure 3 drawing, is a submersible mobile offshore drilling unit designed for water depths of 30-50 feet in the Beaufort Sea. Construction of the vessel will be in accordance with applicable USCG and ABS requirements; the MMS will inspect the CIDS prior to emplacement. Third party verification may be required. Discharges from this unit will be in accordance with the NPDES general permit approved for this area.

The CIDS provides a deck area of 291' x 274' for the installation of a modified arctic land

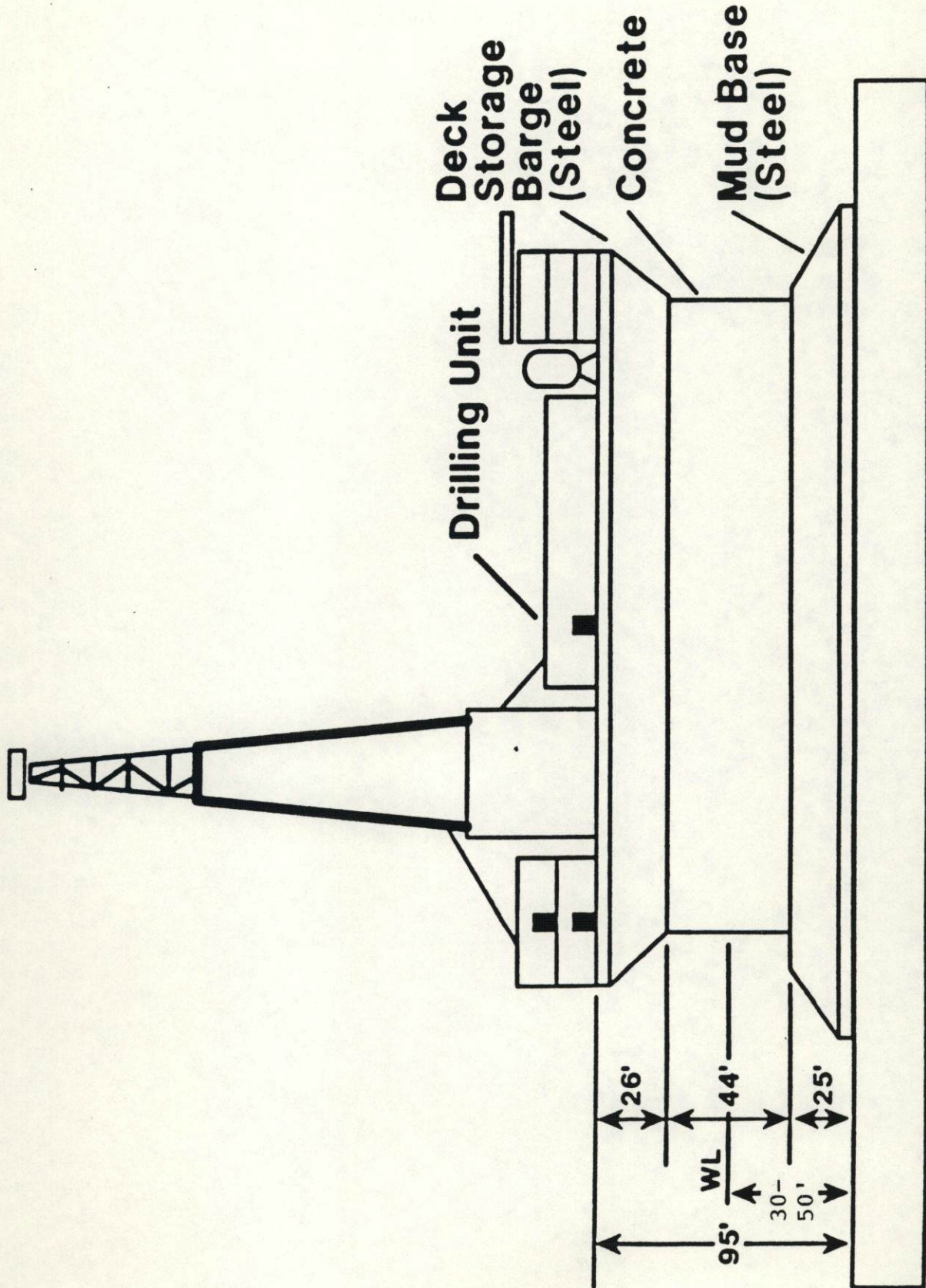


FIGURE 3 CONCRETE ISLAND DRILLING SYSTEM (CIDS).



rig and a three story camp. Storage capacity will be provided on board for all supplies required for four months of drilling operations. Resupply of the vessel may be provided by helicopter, Rolligons, air cushion vehicles, barges, or other similar vessels.

The CIDS is designed as a gravity type structure to resist sea ice movements. It will, however, be equipped with three water monitor nozzles with a capacity of 10,000 gallons per minute each. These may be used to induce a buildup of grounded ice rubble on the windward side of the vessel to minimize the sea ice forces exerted against the hull. An extensive onboard monitoring system to measure ice pressures and forces on the vessel and of settling will also be provided. A separate monitoring system to measure sea ice pressures against the grounded ice barrier will also be installed.

d. Pollution Prevention and Control Equipment and Procedures

Pollution prevention receives priority second only to safety of personnel and is assured through awareness and training of personnel, good housekeeping, maintaining adequate prevention and clean-up equipment at the site and at the supply base, and reliable communication and supply facilities.

Equipment and procedures are detailed in the Contingency Plan which is a part of the Exploration Plan.

e. Sewage treatment, fresh water source, rig discharges

Exxon will maintain a State-approved sewage treatment plant at the drill site. Treated gray water and sewage effluent water will be used for drilling mud or discharged in compliance with an applicable NPDES permit. A desalination plant to provide as much as 430 bpd of fresh water will be installed. It is anticipated that the drill site equipment and discharge procedures will be in compliance with appropriate lease stipulations and permits. Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NPDES) permits are anticipated to address concentrated sea water from the desalination plant, drilling system discharges, etc.

I. B. 2. Drilling Equipment

The drilling rig to be used for this proposed exploration is not known at this time, but it is anticipated that Arctic Alaska Drilling Company Rig No. 4 will be used, depending upon when the drilling can be initiated. This rig is designed and built to withstand and remain operational in the extreme adverse arctic conditions found in the Beaufort Sea. Any substitute rig will be similarly equipped.

PAA Rig No. 4 is an arctic drilling rig capable of drilling to 20,000 feet. All outside walls of the rig enclosure (including the pipe rack house, walk and ramp) are insulated from ground level to 10' above the derrick floor. Windwalls extend on up to 50' high around the derrick floor.

The piperack house is equipped with an automatic hydraulic pickup and lay-down machine powered by a 75 hp motor and can handle up to 50' lengths of 10" drill collars and 20" casing. 12,000' of 9-5/8" casing can be racked in this house and the 5" drill string either laid down or left standing in the derrick.

Included with the rig is an insulated heated shop building with separate mechanic, electrician, and welder areas. Overall size is 36' wide x 48' long x 17' high with four personnel doors and a 16' wide

x 16 high vehicle door. The shop is equipped with work benches, a drill press, anvils, vises, grinders, welding equipment, and a 5 ton overhead electric crane.

Following is a listing of major rig and drilling equipment:

a. Specifications and Capacities

- o Prime Movers - Five Caterpillar D-398, 900 HP diesel engines driving five 700 KW AC generators, a total of 3375 KW or 4500 brake HP.
- One Caterpillar diesel 3304 "cold start" and stand-by generator with residential spark arresting mufflers.
- o Drawworks - Oilwell E2000, 2000 HP with V-200 Parkersburg brake powered by two 1000 HP electric motors. Motors and brake cooling systems used for heating substructure area.
- o Derrick and Substructure - Dreco; M14225-1330; "Slingshot"; 1,300,000#GNC; 900,000# casing capacity; 500,000# set back; 25' wide legs x 142' under crown working space.
- o Crown Block - Oilwell 500 ton, seven 60" x 1-3/8" sheaves.
- o Traveling Block - Oilwell; B-500, 500 ton, six 60" x 1-3/8" sheaves.

- o Hook - BJ, 5500, 500 ton, dynaplex,
automatic positioner hook.
- o Swivel - Oilwell; PC-500, 500 ton, goose
neck tapped for 2" free point access.
- o Bails - BJ, 350 ton.
- o Rotary Table - Oilwell; B-375, 37-1/2"
opening, driven from drawworks.
- o Drill Pipe - 5" 19.5#/ft. U. S. S. IEU
grade G-105 and S 135 tubes, with HTCO 5"
extra hole tool joints, 6-1/2" OD with
smooth hardfacing and AMF TK-34 internal
plastic coat. 10,750' is G-105 rated 554,000
lb. tensile and 10,750 is S-135 rated 712,000
lb. tensile.
- o Pipe Handling Equipment -
VARCO iron roughneck
Power slips
Hand slips
Kelly spinner
Drilco easy torque
- o Accessories -
Mathey 20,000' hydraulic wireline unit
10,000 lb. air winch
2-5,000 lb. derrick booms

2-personnel elevators

Geronimo derrickman escape device

Geronimo derrick climber

S & S, Crown-O-Matic protection device

b. Driller's Control Center

- o Totco Driller's Console with gauges and indicators for:

String weight

Rotary torque

Rotary RPM

Tong torque

Easy torque

Iron Roughneck

Flow-show

Tank volume totalizer

Hole-fill indicator

Pump strokes per minute

Tank gain/loss

- o Totco eight-pen recorder for:

String weight

Trip time

Penetration

Rotary torque

Pump pressure

Pump strokes per minute

PVT

- o Totco circular record for trip tank
- o Koomey BOP control console
- o Cameron automatic stroke control console
- o Diverter Controls
- o Communications equipment as follows:
 - 16 AD open all station intercom
 - 3 RCS closed circuit TV cameras (shale shaker room, mud mixing room, pump room, and derrick floor areas covered)
 - 3 TV screens (driller's dog house, tool pusher's office, company man's office).
- o Main BOP Stack; 10,000# WP:
 - 1 - Hydril GK 13 5/8" - 5000 psi WP annular BOP with studded top and hub-clamp bottom connections, fast change locking bonnet.
 - 3 - Hydril 13 5/8 " - 10,000 psi WP single gate BOP's with top and bottom hub-clamp connections, each with one 3" flanged side outlet. All gates equipped with automatic-ram-locks.
 - 1 - Shaffer drilling spool, 13 5/8" - 10,000 psi WP top and bottom hub-clamp connections with one 3" flanged side outlet equipped with two 3" 10,000 psi WP valves (one hydraulic) for line to choke assembly.

See attached Figure 2 for BOP schematic and Figure 3 for a typical test program.

(OCS-Y 0191 Well No. 1)

o Control and test equipment

1 - NL Koomey seven station, 3000 psi WP BOP accumulator control system, with 20-11 gallon accumulator bottles (220 gal, capacity), 280 gallon fluid reservoir, 20 HP electric triplex pump at 8.7 GPM at 3000 psi, two air pumps 3.5 GPM each at 3000 psi as first back-up with remote electric control console behind driller on derrick floor.

c. Mud Treating

- o Mud Pumps - Two Oilwell A-1700, 1700 HP, triplex single acting pumps, each driven by two 900 brake HP traction motors. Pumps are equipped with 5000 psi WP discharge manifold to kill line and stand pipe system, Demco shear relief valves, TOTCO mud gauges, Hydril pulsation dampeners. Pump suctions are super charged.
- o Shale Shaker - Brandt Engineering Co. double shale shaker with dual decks and screens.
- o Mud Degasser - SWACO vacuum type degasser
- o Mud Cleaners - Two Brandt Engineering Co. "combination" 400 gpm cleaners and/or desilters

- o Centrifuge - Pioneer Mark I, 100 gpm with four feed pumps
- o Mud Blender - Two Pioneer sidewinder cyclonic
- o Mud Agitators and Mud Guns
- c. Mud Treating
 - o Mud Tanks -
 - 1000 bbl active tanks
 - 350 bbl storage
 - 80 bbl trip tank
- d. Blowout Prevention Equipment
 - o Diverter - One 20" Hydril MSP - 2000 psi WP annular BOP with flanged bottom and studded top with 10-3/4" diverter system, diverter opens to one of two diverter lines when 20" annular is closed. See attached Figure 1 for schematic and operating procedure.
 - 1 - National 10,000 psi WP single acting triplex test pump driven by 50 HP AC motor complete with tank, gauges, by-pass valves, manifold, hoses and controls.
 - o Accessory Equipment
 - Hydril 10,000 psi upper Kelly cock.
 - Hydril 10,000 psi 3-1/2" & 5" lower Kelly cock.
 - Hydril 10,000 psi 3-1/2" & 5" floor valves.
 - Flocon 10,000 psi 3-1/2" & 5" inside BOP.

EXPLOSION PLAN

BLOWOUT PREVENTION PROGRAM

EQUIPMENT DESCRIPTION

DIVERTER

20", 2000 psi WP Annular Preventer with 10-3/4" diverter system and hydraulically operated main valve and two manually operated branch valves.

BLOWOUT PREVENTERS

One - 5,000 psi WP annular preventer.

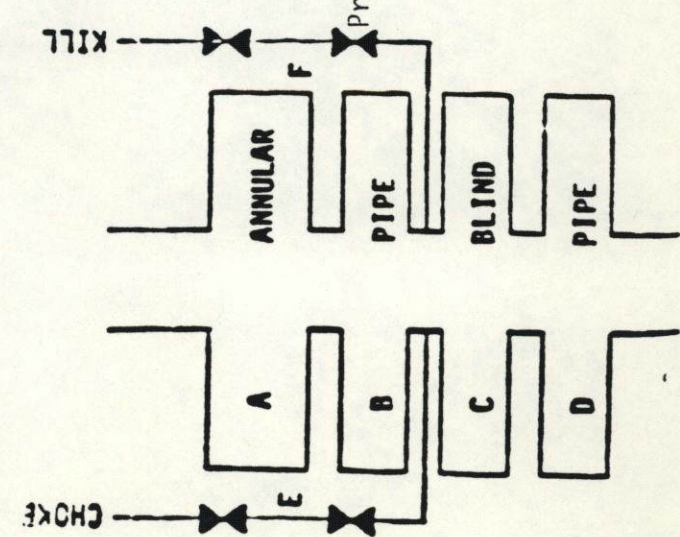
One - 13-5/8", 5,000 psi drilling spool with two side outlets equipped with 4" choke line and 3" kill line each with one 5,000 psi manual valve and one 5,000 psi hydraulic valve (remote control).

Three - 13-5/8", 5,000 psi WP single preventers with ram locks equipped with pipe and blind rams.
Hydraulic accumulator BOP control unit, 3,000 psi system with one remote control panel.

BOP CONTROL SYSTEM

SURFACE MANIFOLD

5,000 psi choke manifold system with two hand adjustable chokes and one hydraulic adjustable choke with a remote control panel.



BOP TEST PROGRAM

1. Initial BOP Nipple Up Test - A to 3500 B, C, D, E, and F to 5000 psf. following low pressure test.
2. Additional Testing as follows:

| Casing | Size | Wt. Grade | Min. Yield | 70% Min. Yield | Antic. Surf. Press. | Planned Test Pressures | | |
|------------|--------|-----------|------------|----------------|---------------------|------------------------|-----------|------------|
| | | | | | | Casing | Pipe Rams | Blind Rams |
| Surface | 13-3/8 | 72# L-80 | 5380 | 3766 | 1834 | 1000 | 1834 | 3500 |
| Production | 7" | 26# N-80 | 7240 | 5068 | 3162 | 2046 | 3162 | 3500 |

Baker floats DC float subs.

Substructure 50 ton overhead BOP handling system.

e. Choke System

Unitized 10,000 psi WP choke assembly consisting of a 4" straight through, one 3" Swaco hydraulic adjustable choke, two Thornhill-Craver 3" API manual adjustable chokes with two 10,000 psi WP valves up stream of each above function. Drillers remote console on rig floor and proper gauges and sensors both on rig floor and at the manifold. An Exxon designed mud/gas separator will be installed.

f. Kill Line System -

10,000 psi WP kill assembly consisting of two 10,000 psi valves (one manually operated and one remotely operated) off of the drill spool to a cross with a connection for the mud pumps and a connection for a high pressure pump. See attached Figure 5 schematic.

g. Water and fuel Storage:

- o 1000 bbl total water storage
- o 7400 bbl total diesel storage in double wall tanks

- o 1000 gallon gasoline tank for pickups
- o 250 gallon forklift - portable diesel fuel tank for fueling up machinery/trucks on rig moves.

h. Air Compressors and Heating

- o Two Sullair series 12-5A0 single stage rotary screw air compressors driven by 50 HP AC motors, rated 200 cfm at 125 psi WP.
- o Two Keewanee 100 HP boilers, automatic diesel fired and water level control.
- o 30 Stardozik Ruffneck steam heaters driven by 1/2 HP AC motors.
- o Two Tioga 3,500,000 BTU indirect automatic fired diesel space heaters.
- o All heat will be salvaged from the D-398 prime mover cooling system (creating 1,500,000 BTU each under 75 percent load) and force distributed into the rig housing with additional fans to distribute heat turbulence in large areas such as the substructure and rack house complex.

i. Safety Systems and Alarms

o Drilling Safety Alarms include:

Pit level indicator alarm

Mud return indicator alarm

H₂S detector and alarm (mud logger) system

Combustible gas detector and alarm system

o Camp Safety Alarms include:

Heat and smoke detector and alarms

Manual general fire alarm

DIVERTER OPERATING PROCEDURE

- o The manual valve to the reserve pit should always be open. The overboard diverter valve should remain closed unless the wind direction makes diverting toward the reserve pit hazardous. When the overboard valve is open, close the reserve pit valve.

- o Before spudding, blow air through the diverter system to ensure that there is no blockage. Water or mud is not to be pumped through the system, since it will be difficult to ensure complete drainage of the lines.

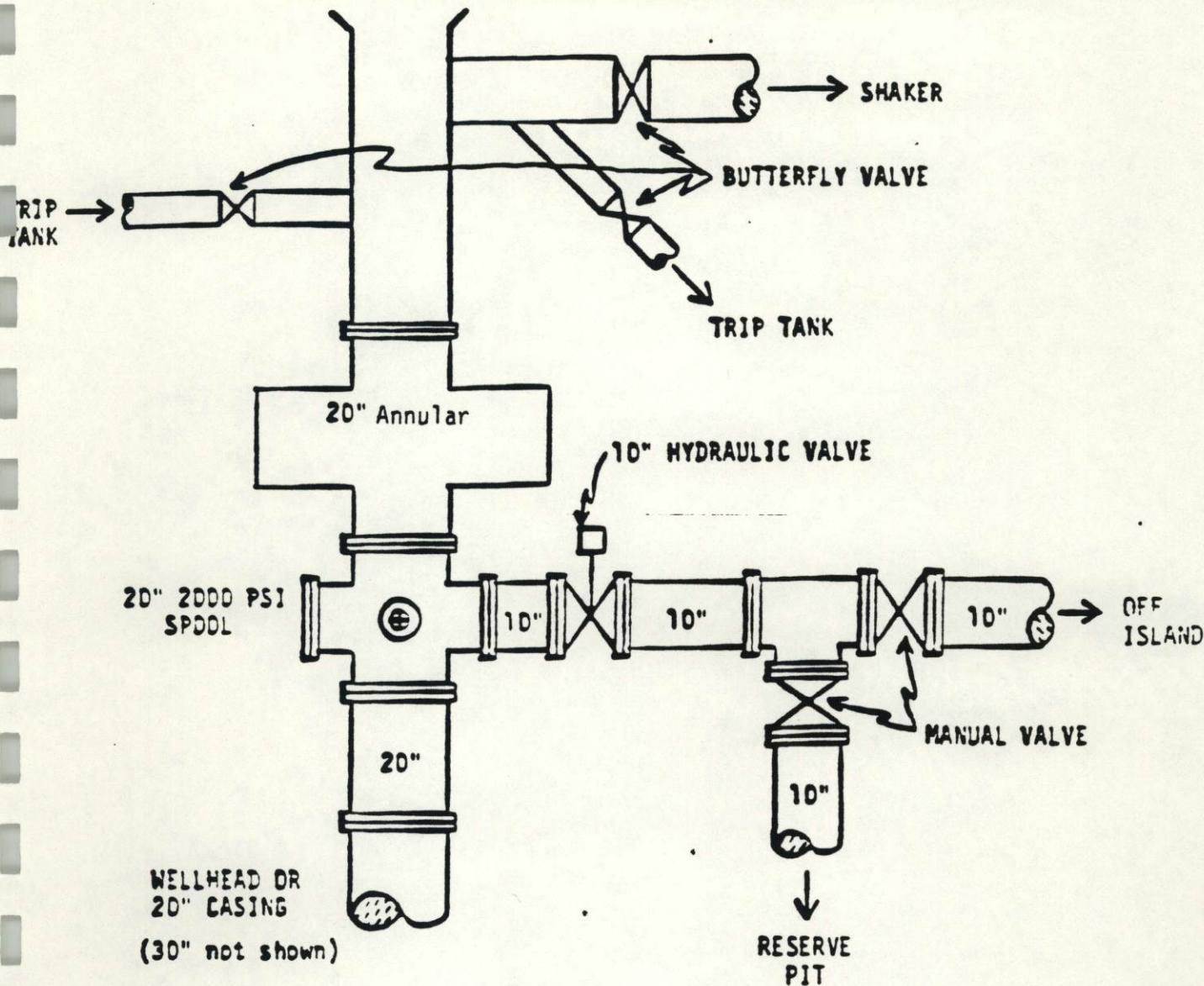
- o Run operational and crew tests on each tour. Open the hydraulically operated valve and close the annular preventer. If tied into the same closing line, insure that the diverter line valve opens before the annular closes.

Drain the riser and annular preventer below the diverter side outlet before testing to prevent liquids from entering the diverter lines.

- o If the well flows, immediately close the annular preventer, which will simultaneously open the diverter valve. Pump mud at the maximum possible rate.

DIVERTER SYSTEM

FOR USE ON 30" STRUCTURAL AND 20" CONDUCTOR CASING



OPERATING PROCEDURE

The diverter system consists of a 20" annular preventer, one 10" hydraulically* operated main valve, two 10" manually operated branch valves, and a 10" diverter line. The annular preventer and main diverter valve are hydraulically actuated together from one BOP control so the main diverter valve automatically opens before the annular is closed. The manual valve to the reserve pit will remain open at all times while the overboard valve will remain closed.

In a well control situation, the annular preventer will be closed, automatically opening the main diverter valve. The well will initially be diverted to the reserve pit, although if conditions warrant, the well can be diverted off the island.

*Justification for OCS Order No. 2 variance and request for departure will be included in the APD.

If all the available mud is pumped and diverted, pump water at 1 BPM to keep the drill pipe open. Run the desalination unit at the maximum rate and keep the temperature above 60°F. If feed water temperature falls below 50°F, displace the drill pipe with diesel and stop pumping. This will avoid freezing and hydrates. Do not do this without concurrence of the Drilling Operations Superintendent.

While pumping water, mix 12 ppg mud. When ready, pump the mud down the well at the maximum possible rate.

- o Under no circumstances is the well to be shut-in at the surface.

CASING DESIGN CRITERIA

Conductor - 20" @ 800'

- Burst - Considers gas gradient to the surface causing lost returns at the show assuming maximum expected leakoff gradient. External fluid weight 9.0 ppg..

Casing Design Surface Pressure (CDSP)

$$\begin{aligned} \text{CDSP} &= (\text{Max. shoe leakoff gradient} - \text{gas gradient}) \times \text{casing depth} \\ &= (11.5 \times .052 - 0.10) 800' \\ &= 398 \text{ psi} \end{aligned}$$

- Minimum Exxon Safety Factors

| | |
|----------|-------|
| Burst | 1.312 |
| Collapse | 1.00 |
| Tension | 1.50 |

- The 20" casing is not designed to provide protection against permafrost freezeback and thaw subsidence. This protection is provided by the 13-3/8" casing.
- The diverter system will be nipped up on the 20" casing and the well would not be shut in on the conductor.

Surface - 13-3/8" @ 3500'

- Burst - Considers gas kick of sufficient intensity and volume to cause lost returns assuming maximum expected leakoff gradient and casing filled with gas. External fluid weight 9.0 ppg.

Casing Design Surface Pressure (CDSP)

$$\begin{aligned} \text{CDSP} &= (\text{Max. shoe leakoff gradient} - \text{gas gradient}) \times \text{casing depth} \\ &= (12.0 \times .052 - 0.1) 3500 \\ &= 1834 \text{ psi} \end{aligned}$$

Collapse - Considers surface pressure = 0 psi, internal fluid gradient = .1 psi/ft. and external fluid weight = 10.5 ppg.

Maximum Collapse Pressure (MCP)

$$\begin{aligned} \text{MCP} &= (\text{External fluid gradient} - \text{internal fluid gradient}) \text{ casing} \\ &\quad \text{depth} - \text{surface pressure} \\ &= (10.5 \times .052 - .1) 3500 - 0 \\ &= 1561 \text{ psi} \end{aligned}$$

- Permafrost Freezeback - considers maximum external collapse gradient of 1.44 psi/ft and minimum internal fluid weight of 9.0 ppg.

Maximum Collapse Pressure (MCP)

$$\begin{aligned} \text{MCP} &= (\text{Max. external gradient} - \text{min. fluid gradient}) \text{ max. permafrost depth} \\ &= (1.44 - 9.0 \times .052) 1300' \\ &= 1361 \text{ psi} \end{aligned}$$

- Permafrost Thaw Subsidence - 13-3/8" 72#/ft L-80 butt post yield strain performance exceeds the requirements for Prudhoe Bay Field rules, based on worst case well spacing.

- Exxon Minimum Safety Factors

Burst 1.312
Collapse 1.00
Tension 1.50

- Permafrost protection is provided by the surface casing.

Production - 7" @ 9300'

- Burst - considers shut-in gas well surface pressure and formation pressure of 11.0 ppg.

Casing Design Surface Pressure (CDSP)

$$\begin{aligned} \text{CDSP} &= (\text{Max. anticipated formation gradient} - \text{gas gradient}) \text{ casing depth} \\ &= (10.0 \times 0.52 - 0.18) 9300' \\ &= 3162 \text{ psi} \end{aligned}$$

- Collapse - considers surface pressure = 0 psi, internal fluid weight = 0 ppg, and formation pressure = 11.0 ppg.

Maximum Collapse Pressure (MCP)

$$\begin{aligned} \text{MCP} &= (\text{Formation gradient} - \text{internal fluid gradient}) \text{ casing depth} - \text{surface pressure} \\ &= (11.0 \times .052 - 0) 9300' - 0 \\ &= 5320 \text{ psi} \end{aligned}$$

- Exxon Minimum Safety Factors

Burst 1.312
Collapse 1.125
Tension 1.50

EXPLORATION PLAN AND WELL INFORMATION

PROPOSED CASING AND CEMENTING PROGRAM

| HOLE SIZE (IN) | CASING TYPE | CASING OD (IN) | SETTING DEPTH* (FT) | | WEIGHT #/FT | GRADE | THREAD | SAFETY** FACTOR | | | CEMENT - KIND AND QUANTITY |
|----------------|-------------|--------------------|---------------------|------|----------------------------------|--------------|------------------|-----------------|---|---|--|
| | | | FROM | TO | | | | B | C | T | |
| 36 | STRUCTURAL | 36 X 32 X 28 | 100 | 150 | Insulated Refrigerated Conductor | | | | | | Permafrost to surface. |
| 26 | CONDUCTOR | 20 | 700 | 900 | 106.5 | K-55 | BTC | X | X | X | Permafrost to surface. |
| 17-1/2 | SURFACE | 13-3/8 | 3300 | 3500 | 72 | L-80 | BTC | X | X | X | TOC 200' inside conductor casing. Class G |
| 8-1/2 | PRODUCTION | 7 | 8300 | 9300 | 26 32 | N-80 N-80 | LTC & BTC LTC | X | X | X | TOC 500' above potential HC zone Class G |

3.1 BOP AND CASING DESIGN CRITERIA FOR ANTICIPATED SURFACE PRESSURE

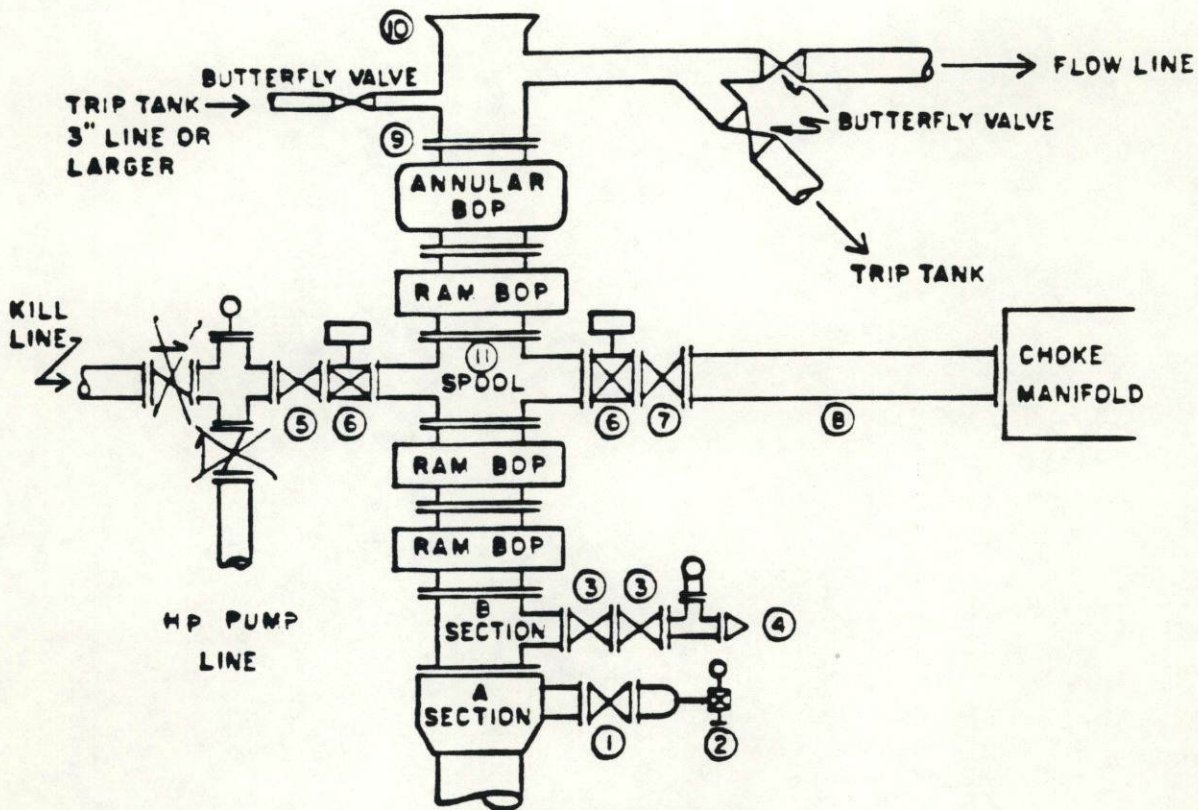
Surface Casing: Ant. Surf. Press. = [(Est. PIT) .052 - Gas Gradient] Casing Depth RKB (TVD)
 Surface Csg: Ant. Surf. Press. = [(12.0) .052 - 0.1 psi/ft] (3500) = 1834 psi

Production Casing at TD: Ant. Surf. Press. = [(Est. PP) .052 - Gas Gradient] Casing Depth RKB (TVD)
 Production Csg: Ant. Surf. Press. = [(10.0) .052 - 0.18] (9300) = 3162 psi

Safety Factors used where checked:
 Burst (B) - 1.312 applied against minimum internal yield pressure.
 Collapse (C) - 1.0 applied against minimum collapse pressure.
 Tension (T) - 1.50 applied against ultimate joint strength.

Estimated water depth: 50 feet; estimated RKB to water line: 55 feet.

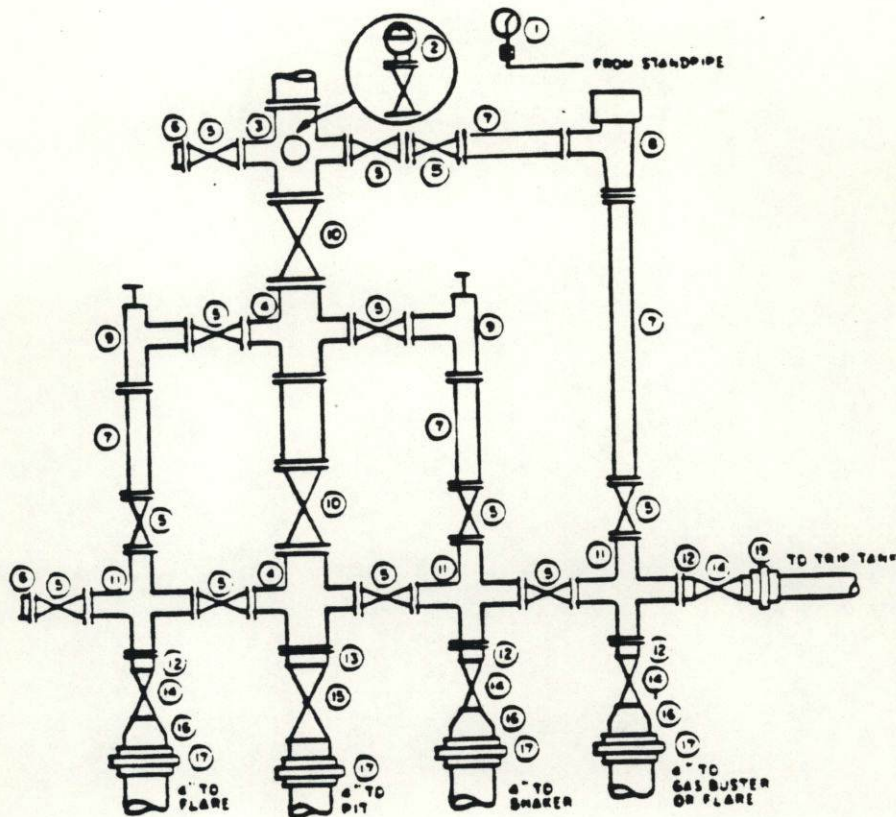
ARRANGEMENT OF A FOUR-BOP STACK



COMPONENT SPECIFICATIONS

1. Flanged plug or gate valve - 2" size - same working pressure as 'A' section.
2. Screwed tapped bullplug with needle valve and pressure gauge.
3. Flanged plug or gate valve - 2" size - same working pressure as top of 'B' section.
4. Flanged tee with pressure gauge and/or connection to casing pressure gauge on hydraulic choke control panel.
5. Flanged plug valve - 2" minimum size - HOWCO "Lo Torc" or equivalent.
6. Flanged hydraulically controlled gate valve.
7. Flanged plug valve - 4" minimum size - HOWCO "Lo Torc" or equivalent.
8. Flowline from spool to choke manifold - 4" minimum size - all connections must be flanged or welded.
9. Connection at top of annular preventer must be equipped with an API ring groove, API ring gasket, and API companion flange on bell nipple. All flange studs must be installed.
10. The ID of the bell nipple and companion flange must not be less than the ID of the BOP stack.
11. Spool-24" height with 2 flanged side outlets - 4" and 2" minimum ID.

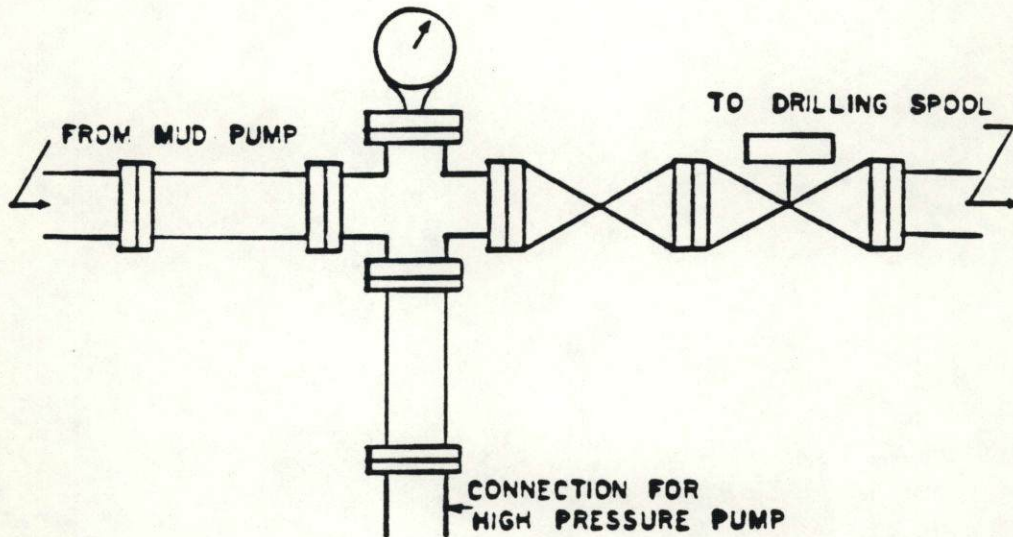
ARRANGEMENT OF 5000 PSI 3 CHOKE MANIFOLD



COMPONENT DESCRIPTION

1. Accurate Pressure Gauge (Martin Decker or equal) for measuring standpipe pressure. This gauge must be installed on a flexible Martin Decker or equal sealed line with a working pressure rating equal to that of the BOP stack.
2. Diaphragm type Pressure Gauge and gate or plug valve - 2" minimum size - flanged to 5 way cross or to tee and valve installed between cross and first valve.
3. Flanged or Studded Cross - 4" x 4" x 2" x 2" x 2".
4. Flanged or Studded Cross - 4" x 4" x 2" x 2".
5. Flanged Plug or Gate Valve - 2" minimum size.
6. Blind Flange.
7. Flanged Spacer Spool - 2" minimum size and 18" minimum length.
8. Flanged Hydraulic Choke - 2" minimum size.
9. Flanged Manually-adjustable Choke equipped with tungsten carbide stems and seats. Seats to be 1" size.
10. Flanged Plug or Gate Valve - 4" minimum size.
11. Flanged or Studded Cross - 2" x 2" x 2" x 2".
12. Companion Flange with Screwed Nipple - 2" minimum size.
13. Companion Flange with Screwed Nipple - 4" minimum size.
14. Screwed Plug or Gate Valve - 2" minimum size.
15. Screwed Plug or Gate Valve - 4" minimum size.
16. Screwed Swage - 2" x 4".
17. Screwed Unions - 4" minimum size, flat face, hammer type.
18. Screwed Bullplug with Screwed 1/2" Needle Valve for obtaining a flowing fluid sample.
19. Screwed Union with Nipple - 2" minimum size, flat face, hammer type.

ARRANGEMENT OF 5000 PSI
BOP KILL LINE



1. Kill line should be attached to drilling spool
2. All lines, valves and fittings shall be nominal 2" steel and have a rated working pressure at least equal to the working pressure of the BOP stack.
3. All lines shall be tested to rated working pressure of stack.
4. Kill lines should be welded or flanged
5. An outlet outboard of the two kill line valves may be provided to tie in an auxiliary pump.

j. Mud Logging

An Analyst's unit (Schlumberger, Inc.) will be installed on the first well under this plan. Similar units will be used on subsequent wells.

o Gas Detection and Alarm System -

The hydrocarbon gas detection and alarm system is a catalytic hot wire/thermal conductor system installed on the rig floor with gas trap located in the shale-shaker. The system provides automatic calibration at drill pipe connections, records data either in units of gas (30 units = 1%) or in percentage and has preselected alarm levels. Additionally, it provides a standby hot wire, a standby sample pump alarm for equipment failures, and four alarms (one on the drilling floor, one in the mud logging unit and two in supervisors' quarters).

o H₂S Detection and Alarm System -

The H₂S (Hydrogen Sulfide) monitoring system is dual with fully adjustable warning and alarm levels. Modules are located in the mud logging unit and are continuous reading with indicating meters graduated from 0 to 100 parts per million H₂S, four locations

are continuously monitored for H^2S , (1) a "mud duck" system checks pH and H_2S levels as an early indicator in the mudline, at the shaleshaker, and the mud mixer, (2) a lead-acetate system records levels under the bell nipple. When preselected levels are detected, alarms are displayed in the mud logging unit, the driller's panel, and two supervisors' quarters.

I. B. 3. Fire Fighting and First Aid Equipment

o Camp

Automatic extinguisher over kitchen stove

10 - Ansul LT 30# hand extinguishers

1 - Ansul LT 150# wheel mounted extinguisher
hose and reel.

o Rig

40 - Ansul LT 30# hand extinguisher

1 - Ansul LT 150# wheel mounted extinguisher
and hose.

o First Aid

MSA First Aid Kit

MSA evacuation basket litters with blankets

6 - MSA gas masks with oxygen tanks

I. C. 1. Geophysical Operations

The types of geophysical operations contributing to and a part of this Plan are: a. CDP (Common Depth Point) Seismic Surveys, b. Velocity Surveys, and c. High Resolution Shallow Hazard Surveys.

a. CDP Seismic Surveys

It is probable that further seismic surveys will be conducted in the area concurrent with island emplacement and then later concurrent with exploratory drilling. A conventional ice crew seismic survey conducted with an appropriate geophone cable and non-dynamite energy source would be employed. A description of a typical ice crew geophysical field data acquisition operation is included in Sections I. C. 2-4, following.

b. Velocity Surveys

Velocity surveys are anticipated for each exploratory well. They are obtained in the following manner: a specially designed geophone is lowered into the borehole at various predetermined depths; it receives acoustical signals from an air gun energy source that is either suspended within a fluid filled tank or in a shallow hole adjacent to the wellbore and transmits these signals back to recording equipment at the surface via a conductor

cable. In the case of directionally drilled bore holes, primacord laid on a steel plate would be the energy source.

c. Shallow Hazard Surveys

High resolution geophysical surveys completed by a coring program were conducted during the 1982-83 winter to investigate potential shallow geologic hazards to planned operations as well as to contribute to an investigation of sea floor rock habitats. No additional geophysical surveys of this nature are anticipated.

2. Equipment for Typical Ice Crew

- 1 Texas Instruments DFS V, 96 channel recording instruments complete with all necessary accessories such as ERC-10 camera, RLS 240-M roll-along switch, TI-SRS shooting control system, radios, and test equipment.
- 1 Texas Instruments FT-1, field computer for final diversity stack and final zero or minimum phase correlation.
- 5 Texas Instruments TR-3 Vibrators
- 350 Strings of geophones each with 12 GSC-20D, 10 Hz geophones to be used 2 strings per trace.

1 Wilde T-2 Theodolite with rods, chains, and marking devices.

Food service supplies.

Spare parts.

1 TT 200 6 x 6 wheeled recording vehicle.

1 ARDCO 6 x 6 wheeled vibrator tender.

4 TT 100 4 x 4 wheeled or tracked cable and geophone carriers.

1 TT 100 4 x 4 wheeled survey vehicle.

1 M-114 tracked survey vehicle.

1 TT 100 4 x 4 crane equipped camp vehicle.

1 M-115 tracked ice check vehicle with auger drill.

1 GN-110 tracked ice check vehicle with Mayhew top drive drill.

5 Texas Instruments High Frequency, Force-2, TR-3 wheeled vibrators.

1 45 person camp complete with all bedding, tools, utensils, generators, and spare parts (fiberglass houses - skid mounted).

6 D-7 Caterpillar tractors or equivalent 13,000 gallon fuel storage capacity.

2 Motorola Mini-Ranger Survey Systems.

4 Self erecting 60 foot survey towers.

- 1 Administrator
- 1 Camp Attendant
- 1 Cook

Safety equipment to include two-way radios.

Fuel, lubricants, field magnetic tapes, and other expendable supplies.

Air and ground support for line scouting and crew supply.

Instrument and survey field service support.

3. Personnel in a Typical Geophysical Ice Crew

- 1 Operations Supervisor (may supervise more than one crew)
- 1 Party Manager
- 1 Instrument Engineer
- 1 Instrument Engineer Assistant
- 12 Recording helpers and line truck drivers
- 1 Surveyor
- 2 Mini-Ranger operators
- 1 Survey helper
- 2 Mechanics
- 1 Mechanics helper
- 1 Vibrator mechanic
- 5 Vibrator operators

1 Administrator
 1 Camp Attendant
 1 Cook
 1 Cook's Helper
 6 Tractor operators
 39 TOTAL

I. C. 4. Data Acquisition Parameters

| | |
|--|------------------------------|
| Number of groups, cable/geophone | 96 |
| Group Interval | 200 feet |
| Number of geophone locations per group | 24 |
| Number of geophone elements per location | 1 |
| Distance between vibration points | 440 feet/ 200 feet |
| Fold of CDP coverage | 24/48 |
| Number of sweeps per shotpoint | Variable |
| Recording sample period | 4 milliseconds |
| Low cut recording filter | 12 Hz at 36 Db per octave |
| High cut recording filter | 85 Hz |
| Shotpoint offset from near group | Variable |
| Shotpoint offset from far group | Variable |

I. D. Proprietary Data

This section is composed of information considered proprietary by the lessee. These data include structural and stratigraphic interpretations based on available geophysical and geologic data, a description of potentially productive intervals, interpreted seismic sections, RMS velocity scans, and other information pertinent to the evaluation of the petroleum potential of the area.

This information has been bound separately, in three volumes (II-A, II-B, and II-C), and marked: "Exxon Proprietary for M. M. S. Use Only".

I. E. Safety Meetings, Training Procedures and Drills

1. Safety Meetings

Weekly safety meetings will be conducted for the crews to discuss accidents, their causes, and corrective action.

2. Fire Drills

Fire drills will be conducted weekly for all crew members. The duty assignments and fire stations for assigned personnel will be posted in conspicuous places about the rig.

3. Pollution Prevention and Control Drills and Training

o The oil spill response operating team will participate in at least one drill each year as set forth in the contingency plan and as required in OCS Order No. 7.

o The oil spill response operating team will receive training with pollution control equipment and in procedures as set forth in the contingency plan and as required in OCS Order No. 7. Records of such training will be maintained on the rig.

4. Training For Rig Personnel

The training requirements referenced in OCS Order 2 (GSS-OCS-T1) require that Company and contractor

supervisory drilling personnel (including drillers, derrickmen and rotary helpers) be trained in well control methods and procedures and in abnormal pressure detection. Personnel will be trained as required above in either approved Company or industry schools when drilling is commenced. BOP drills will be conducted as outlined in GSS OCS T-1.

A list of personnel and their completed training will be maintained on the rig and will be available upon request.

I. F. Proposed Mud Program

The attached Table I shows an example mud program for the Diapir Field wells. Included in the table is a list of (a) the basic mud components, (b) additives normally utilized, and (c) special purpose additives rarely used.

a. Basic Mud Components

The basic mud components are those which are used almost daily and along with water, comprise by far the major portion of the mud composition. Safety and environmental technical bulletins for the generic mud components are available. Table III lists generic mud types and their component ranges for mud programs that will likely be used during the Exploration Program in the area.

Planned minimum quantities of basic mud materials maintained at the drill site will meet or exceed the requirements of M. M. S. Order 2. Table 2, attached, reflects the minimum and planned requirements for an example 9,000-foot well shown in Figure 1. Each rig has a variable liquid mud system capacity, but will generally be 1000-1500 barrels.

b. Mud Additives

The additives listed under item (b) on Table I are all common chemicals. They are used to adjust

the pH of the mud system or to precipitate out carbonate ion or cement contamination. When added to the mud they have essentially no influence on toxicity in the receiving water.

c. Special Purpose Additives

Those special purpose additives listed on Table 1 are used in very small amounts and are either inert (mica, nut hulls, copolymer beads) or non-toxic in the concentrations used (aluminum stearate, and zinc carbonate, etc.)

It is anticipated that an approved EPA NPDES discharge permit addressing mud and cuttings will be in effect prior to the start of drilling operations. Otherwise, the following procedure is planned:

1. Maximum use would be made of mud solids control equipment to keep the volume of excess mud to a minimum. In Exxon's Environmental Report, it is stated that an estimated 1875 bbls. of cuttings and 1688 bbls. of drilling mud will be disposed of from a typical 9300 foot well.
2. Cuttings would be stored on location for disposal at an approved site.

3. Excess mud would be stored on location for disposal at an approved site or for disposal in a casing annulus injection zone. This latter procedure is similar to that used on Exxon's Alaska State Duck Island Unit Wells No. 1 and No. 2 (and OCS-Y 0191 wells No. 1 and No. 2) which proved to be effective.

Mud tests will be performed as described in the Arctic OCS Order No. 2 or more frequently, as dictated by conditions. Procedures will be as outlined in the API Recommended Practices for Standard Procedure for Testing Drilling Fluids (API RP 13B).

Permafrost is expected to be encountered from about 45 feet to at least 150 feet and possibly to approximately 1150' feet RKB in the exploratory wells to be drilled in this area. Although no gas-charged sediments were found to a depth of 185 feet in a coring program conducted at the initial site, possible hydrates have been noted by USDI within the OCS Sale 71 area. It is therefore planned to carefully monitor mud temperatures and gas content while drilling surface hole. A mud log unit will be in operation from the mud line to TD and a flow diverter will be installed on both the 30-inch and 20-inch casing. If indications gas hydrates are detected, mud temperatures will be controlled by cold water additions to reduce

melting and penetration rate will be limited to reduce gas concentration in the mud. The planned surface casing depth of 3200-3500 feet is expected to cover all potential gas hydrate zones. A shallow hazards analysis will be conducted at each well location to determine the presence or absence of all shallow hazards, including any indications of hydrates.

MUD PROGRAM

EXAMPLE WELL
BEAUFORT SEA, DIAPIR FIELD AREA

| Well Depth - RXD | Mud Weight - ppg | Viscosity | Water Loss |
|------------------|------------------|-----------|------------|
| 0-2000 | 8.8 - 9.5 | - | - |
| 2000-3500 | 9.3 - 9.8 | 6 - 20 | < 20 |
| 3500-7000 | 9.5 - 10.0 | 7 - 20 | < 20 |
| 7000-8000 | 10.0 - 10.5 | 8 - 20 | < 15 |
| 8000- TD | 10.5 - 11.0 | 8 - 20 | < 15 |

Typical

MUD COMPONENTS*

A. Basic Mud Components:

- Attapulgite (Saltwater Dispersible Clay)
- Carite (Barium Sulfate)
- Bentonite (Sodium Montmorillonite Clay)
- Lignosulfonate (Chrome Lignosulfonate)
- Lignite (Leonardite-brown Coal)
- Caustic Soda (Sodium Hydroxide)
- XG Polymer (Xanthan gum Biopolymer)
- Ben-ex (Polymer, Flocculant and Clay Extender)
- Callex a MC (Carboxymethyl Cellulose)
- Dexsrid (Organic Polymer)

B. Mud Additives:

- Soda Ash (Sodium Carbonate)
- SAPP (Sodium Acid Pyrophosphate)
- Sodium Bicarbonate
- Lime (Calcium Hydroxide)

C. Special Purpose Additives:

Surfactants:

- Pipe Lax (Naptha Base Surfactant)
- Lubra-Glide (Copolymer Beads)
- Torque-Trim (Vegetable Oil Base)
- Black Magic (Oil Base Surfactant)

Lost Circulation Material:

- Mica
- Mut Nalls

Defoaming Agents:**

- Aluminum Stearate
- Octal Alcohol Defoamers

H₂S Scavenger

- Zinc Carbonate

Viscosifiers
Quik-Gel (High Yield Sodium Montmorillonite Clay)

Bactericides
Aldicide (Microbicide)

**Will not be discharged from the site

**Cottonseed oil will be used in trace amounts to enhance the effectiveness of the defoaming agents.

TABLE 1

EXAMPLE 9300 -FOOT WELL

BEAUFORT SEA, DIAPIR FIELD AREA

BASIC COMPONENTS - CONCENTRATION - AMOUNT

| <u>Material</u> | <u>Mud Concentration ppb</u> | <u>No. Sacks Per 100 bbls Mud</u> | <u>No. Sacks Required to Build Active Volume</u> Based on 2200 bbl Active System | <u>Planned Minimum No. Sacks on Site</u> |
|-------------------------------|------------------------------|-----------------------------------|---|--|
| <u>Surface Casing</u> | | | | |
| 3500' RKB Depth | | | | |
| 9.8 ppg MW | | | | |
| 17-1/2" Hole | | | | |
| Barite | 63 | 63 | 2800 | 2800 |
| Bentonite | 21 | 21 | -- | 400 |
| Lignosulfonate | 1 | 2 | 44 | 50 |
| Lignite | 1 | 2 | 44 | 50 |
| Caustic Soda | 1 | 2 | 8 | 20 |
| <u>Intermediate Csg Depth</u> | | | | |
| RKB | | | | |
| ppg MW | | | | |
| Barite | | | | |
| Bentonite | | | | |
| Lignosulfonate | | | | |
| Lignite | | | | |
| Caustic Soda | | | | |
| <u>Total Depth</u> | | | <u>Based on 2100-bbl Active System</u> | |
| 9300' RKB | | | 2850 | 2850 |
| 11.0 ppg MW | | | -- | 550 |
| 8-1/2" Hole | | | 42 | 50 |
| Barite | 113 | 113 | | 50 |
| Bentonite | 21 | 21 | | 20 |
| Lignosulfonate | 2 | 4 | | |
| Lignite | 1 | 2 | | |
| Caustic Soda | 1-1/2 | 3 | 7 | |

The proposed rig has the following mud system capacities: 1000-bbl Active Pits and 90-bbl trip tank.

TABLE 2

Table 3
PROPOSED MUD SYSTEMS

1. Seawater Polymer Mud

| <u>Component</u> | <u>#/BBL</u> |
|-------------------------------|--------------|
| Attapulgate or Bentonite Clay | 10 - 50 |
| Caustic | 0.5 - 3 |
| XC Polymer | 0 - 2 |
| Drilled Solids | 20 - 100 |
| Barite | 0 - 50 |
| Soda Ash/Sodium Bicarb | 0 - 2 |
| Lime | 0 - 2 |
| SAPP | 0 - 1/4 |
| Seawater | As Needed |

2. Lightly Treated Lignosulfonate Freshwater/Seawater Mud

| <u>Component</u> | <u>#/BBL</u> |
|-----------------------------|--------------|
| Bentonite | 10 - 50 |
| Barite | 0 - 180 |
| Caustic | 1 - 3 |
| Lignosulfonate | 2 - 6 |
| Lignite | 0 - 4 |
| Cellulose Polymer | 0 - 2 |
| Drilled Solids | 20 - 100 |
| Soda Ash/Sodium Bicarbonate | 0 - 2 |
| Lime | 0 - 2 |
| Seawater/Freshwater | ~1:1 ratio |

3. Lignosulfonate Freshwater Mud

| <u>Component</u> | <u>#/BBL</u> |
|-----------------------------|--------------|
| Bentonite | 10 - 50 |
| Barite | 0 - 450 |
| Caustic | 2 - 5 |
| Lignosulfonate | 4 - 15 |
| Lignite | 2 - 10 |
| Drilled Solids | 20 - 100 |
| Cellulose Polymer | 0 - 2 |
| Soda Ash/Sodium Bicarbonate | 0 - 2 |
| Lime | 0 - 2 |
| Freshwater | As Needed |

4. Lime Mud

| <u>Component</u> | <u>#/BBL</u> |
|-----------------------------|--------------|
| Lime | 2 - 20 |
| Bentonite | 10 - 50 |
| Lignosulfonate | 2 - 15 |
| Lignite | 0 - 10 |
| Barite | 25 - 180 |
| Caustic | 1 - 5 |
| Drilled Solids | 20 - 100 |
| Soda Ash/Sodium Bicarbonate | 0 - 2 |
| Freshwater | As Needed |

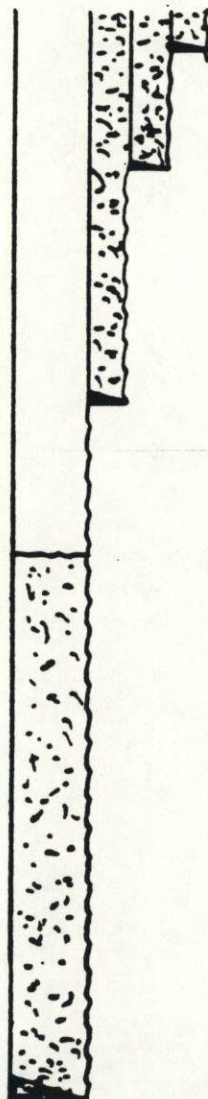
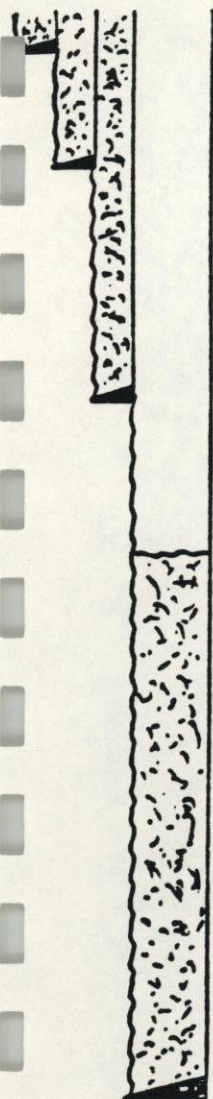
5. Nondispersed Mud

| <u>Component</u> | <u>#/BBL</u> |
|------------------|--------------|
| Bentonite | 5 - 15 |
| Acrylic Polymer | 0.5 - 2 |
| Barite | 25 - 180 |
| Drilled Solids | 20 - 70 |
| Freshwater | As Needed |

6. Spud Mud (slugged intermittently with seawater)

| <u>Component</u> | <u>#/BBL</u> |
|-----------------------------|--------------|
| Attapulgate or Bentonite | 10 - 50 |
| Lime | 0.5 - 1 |
| Soda Ash/Sodium Bicarbonate | 0 - 2 |
| Caustic | 0 - 2 |
| Barite | 0 - 50 |
| Seawater | As Needed |

FIGURE 1
 BEAUFORT SEA, DIAPIR FIELD AREA
 TYPICAL WELLBORE SKETCH
 SHOWING CASING DEPTHS AND HOLE SIZES
WELLBORE & CASING DESIGN SKETCH



30" Structural @ + 200' RKB (100' BML)

20" 106.5# K-55 BTC Conductor
 @ ± 800 RKB (700 BML)

13-3/8" 72# L-80 BTC Surface Casing
 @ ± 3500 RKB (3400 BML)

TOC 500' above potential HC zones

7" Production casing @ + 9300' RKB

3600' 26# N-80 BTC

3800' 26# N-80 LTC

1900' 32# N-80 LTC

I. G. Proposed Sampling Program

1. The mud loggers will be responsible for the following for drill cuttings from surface to total depth:
 - a. Four sets of washed and dried cuttings will be caught and packaged at 30' intervals until drilling slows down to where 10' intervals can be collected. (Two sets for Exxon, one set for the MMS.)
 - b. Four sets of unwashed cuttings will be caught at 30' intervals and placed in cloth bags, then packaged in plastic bags. (Three sets for Exxon, one set for the MMS.)
 - c. Two sets of canned cuttings, for geochemical analysis, caught at 10' intervals and canned at 100' intervals. Complete canning procedures are in instructions to mud loggers. (One set for Exxon, one set for MMS.)
2. Sample distribution will be as follows:
 - a. One set of washed and dried cuttings, one set of unwashed cuttings, one set of canned samples will be sent to Exxon in Houston.
 - b. One set of washed and dried cuttings, one set of unwashed cuttings, one set of canned samples will be sent to the MMS.

3. Sidewall cores

It is anticipated that a number of sidewall cores will be taken in selected potential reservoir intervals for purposes of determining porosity and permeability, verifying lithologies in specific intervals, and detecting hydrocarbons. In addition, some sidewall cores may be taken from shale intervals for paleontological analysis.

4. Conventional Cores

Where considered necessary, conventional diamond cores may be taken to provide reservoir engineering as well as petrographic and petrologic data. Approximately 200' of conventional coring is anticipated while drilling the first well under this Plan.

I. H. Geological and Environmental Information

1. Marine Technical Services, (MTS) of Stafford, Texas conducted a multi-channel high resolution geologic survey between February 17 and March 22, 1983 for Exxon Company, U. S. A. The program covered portions of leases OCS-Y 0279 and 0280. Forty-three miles of multi-channel high resolution seismic reflection data were acquired. Bathymetric lead-line soundings were made about every 300 feet, through shot holes drilled in the ice canopy. Interpretations of this data were made by Harding-Lawson of Navato, California. The services multiple objectives were to provide geologic information to supplement foundation coring and diver observation programs for shallow hazard and engineering assessment of the three potential sites on the two leases. The sea floor at the first proposed location, is a stiff clay, cut by recent ice gouges. Otherwise it is smooth, flat, and free of any obstructions and slope instabilities. Near-surface conditions are assessed as favorable as indicated by geophysical data, diver observations and coring data. The report and data for the multi-channel, high resolution channel were submitted to the M. M. S. as a part of the Environmental Report support.

It, and as additional specific fill island/CIDS and well locations are made, planned specific sites will be reviewed for such features as the presence of strudel scour, ice gouge, permafrost, and acoustic anomalies that may reflect biogenic or petrogenic gas.

2. Regional maximum environmental conditions.

- a. Waves - Surface waves occur in the subject area only during the summer open water period. Maximum positive surges of up to ten feet occur in September and October; winter surges, even in the presence of complete ice cover, are common to heights of three feet. Rarely, swells reach 2.1 meters with storm wave heights of three meters (USDI, 1979, p. 44).
- b. Wind - Maximum surface wind 81 mph (seasonal variations in winds at Barter Island, Alaska, USCOE, 1980, p. - 364).
- c. Current - Current velocities are about 3.5% of wind speeds, typically 15 to 20 cm/sec. In winter, under ice velocities are always lower than 5 cm/sec. (USACOE, 1980, p. 3-34).
- d. Ice - Ice forms in late September to early October, increases to a thickness of 2 meters by

April; river overflowing of fast ice takes place in late May with breakup usually in late June. The retreat of ice from the shore during summer is usually about the 100 meter (328 feet) isobath.

- e. Permafrost - Relict permafrost probably underlies the entire area of the subject leases. At the site of the first proposed exploratory well, the top of the permafrost is about 45 feet below the sea floor.
- f. Seismic motion - Seismic activity in the subject area is very low. Artificial island/CIDS technology is considered adequate to preclude such ground acceleration in the Plan area as a major potential hazard to exploratory operations.
- g. Severe Weather - Severe weather should present no significant hazard to exploratory operations on fill islands. It may cause temporary interruptions of transportation and suspensions for personnel safety.

I. I. Environmental Training Program

An environmental training program (ETP) will be given to all personnel directly involved with the exploratory activities of the Plan in compliance with OCS Sale 71 stipulations. This program is designed to inform each such person, including Exxon supervisors, managers, agents, contractors and sub-contractors of environmental, sociological, and cultural concerns that they might impact in the Plan area as well as training in arctic survival. The program is divided into two parts: a basic program for all personnel working at or visiting the drilling site, and a more detailed program for supervisory personnel.

The ETP is being prepared by an industry task force (chaired by Sohio) for submittal, review and approval by the MMS prior to initiation of activities within the OCS Sale 71 area.

Video tape presentations will be introduced and expanded by discussion given by a qualified instructor. Broadly, the purpose of such training is to mitigate possible impacts from Plan activities by stimulation of personnel sensitivity and understanding of local values, customs, and lifestyles as well as to

facilitate recognition of and to inculcate the need for protection of archeological, geological, and biological resources.

Subjects included in the ETP are:

1. Physical environment with examples of potential negative impacts for avoidance:
 - o Description and explanation of coastal plane geomorphology, its topography and formation processes.
 - o Permafrost and significance of tundra protection.
 - o Arctic coastal processes of wind, wave, current, ice, and thermal erosion and their effect on natural and man made features.
 - o Sea ice cycles, distribution, movement, and potential impacts on transportation and structures.
 - o Climate with significance of daylight seasonality, wind chill factor, blowing snow, temperature inversions, and surficial freeze-up/break-up effects.
2. Biological environment and concerns for marine and onshore flora and fauna including identification and discussion of:
 - o Major common biologic forms including lemmings, caribou, fox, bears, seal, whale,

water fowl, and raptors, their seasonal habits and habitat.

- o Potential impacts such as noise, motion, destruction of food/cover, oil spills, siltation and disposal of wastes and potential effects of each.
- o Interactions of the producer/consumer web.

3. The Inupiat people and their traditions, work habits, and values:

- o The close interrelationship between the Inupiat, the harsh arctic environment, and their vital subsistence resources.
- o Potential impacts to conservation of the "old ways", to food/clothing supply and to archeological resources such as grave sites, middens, or historic structures.

4. Arctic Survival:

- o Clothing and supplies, trip itineraries, basic first aid, cold weather physiological hazards, shelter preparations, water supply, heat conservation, fire building, carnivores and insects, direction guides and distress signals.

I. J. Coastal Zone Management Certification

The proposed activity complies with Alaska's Coastal Management Program and will be conducted in a manner consistent with such program.

II

CONTINGENCY PLAN

BEAUFORT SEA, DIAPIR FIELD AREA

OCS LEASE SALE NO. 71

OCS-Y 0261, 0262, 0272, 0274, 0279, 0280 and 0296

EXXON COMPANY, U.S.A.

(a division of Exxon Corporation)

P. O. Box 4279

Houston, Texas 77001

July 18, 1983

CONTINGENCY PLAN

BEAUFORT SEA, DIAPIR FIELD AREA

OCS-Y 0261, 0262, 0272, 0274, 0279, 0280 and 0296

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Section (1)

SCOPE AND OBJECTIVE OF PLAN
BEAUFORT SEA, DIAPIR FIELD AREA
OCS-Y 0261, 0262, 0272, 0274, 0279, 0280 and 0296

I. Scope

The scope of this Contingency Plan is outlined below and is intended to cover the OCS leases listed above:

- A. To define normal operating procedures to be followed during move, drilling, testing, and related operations undertaken in the areas listed.
- B. To detail all necessary special procedures and precautions to be followed during critical operations such as fuel transfer, well testing, etc.
- C. To outline preliminary plans for containment of pollutants should an oil spill occur.
- D. To describe action to be taken in the event of an uncontrolled oil spill, either major or minor, including:
 - 1. Governmental agency notification and requirements.
 - 2. Designation of authority.
 - 3. Immediate spill control response actions.
 - 4. Location cleanup plans.

5. Mobilization procedure for ABSORB personnel and equipment.
 6. Disposal of recovered fluids and materials.
- E. To outline remedial actions to be taken in the event of uncontrolled well flow.
- F. To outline the procedure for securing the wellbore and evacuating personnel from the drill site in the event ice forces threaten lateral displacement of the artificial island/CIDS.
- G. To outline H₂S detection and monitoring equipment requirements and personnel and well safety procedures. H₂S is not expected to be present in any of the formations to be penetrated at this location, but monitoring and safety equipment will be available on location to provide personnel safety and to permit safe control of the well in the event H₂S is detected.

II. Objectives

The objectives of the attached plans are:

- A. Ensure the safety of all personnel involved in operations in the area.
- B. Minimize the environmental impact of operations.

- C. Comply with all current federal, state, and local regulations in effect, including local regulations and stipulations in effect.
- D. Protect the integrity of the rig, location, and ancillary equipment.

The rules and procedures set out in this document are to be followed by all operations personnel, support personnel, and visitors on-site at the well locations in the area. It will be the Exxon Drilling Superintendent's responsibility to see that environmentally sound practices are followed on this well. The procedures outlined in this document are to be considered minimum standards for operation. It is up to all personnel involved to conduct their work in a manner minimizing environmental impact.

In compliance with federal regulations, a copy of this document shall be available for inspection at all times at the drill site.

In addition to this plan, Exxon's Alaskan Beaufort Sea Oil Spill Contingency Plan has been prepared by its Anchorage drilling section. This manual contains more detailed procedures and information for dealing with all types of emergencies that may be encountered during exploration drilling activities. This manual also serves to avoid placing repetitious material such as phone lists, equipment brochures, etc., in each individual Drilling Well Program. This manual has been submitted to the MMS.

III. Personnel and Organization

A. Normal Operations

During normal operations (i.e., drilling, testing, abandonment, and move operations) the primary goal of all personnel shall be to prevent system upsets and pollutant discharges. Specific responsibilities are:

1. Exxon Anchorage Engineering - Responsible for review and dissemination of information regarding applicable government regulations and development of procedures necessary to ensure regulatory compliance. Engineering is also responsible for developing technology for clean operations.
2. Exxon Drilling Superintendent - Responsible for daily activities including support operations for rig supply, construction, etc. The Exxon Superintendent is also responsible for ensuring that all personnel are aware of regulations and procedures pertinent to their activities.
3. Contract Superintendent - Responsible for the maintenance of the rig and training of crews to ensure sound operations.

4. Ancillary Contractors - Responsible for knowing and following procedures applicable to their individual operations.

B. Emergency Operations

During emergency operations (i.e., uncontrolled well flow, oil spill, etc.) the main effort should be toward minimizing the effect of pollutant discharges. Major areas of responsibility are:

1. Headquarters Drilling - Responsible for overall management of drilling efforts, including well control and relief well operations. Will advise Anchorage Drilling regarding action required to comply with federal, state, and local statutes.
2. Anchorage Operations Manager - Has overall responsibility for emergency response team. Transmits pertinent data to Western Division Management.
3. Anchorage Public Relations - Will act as the single point media contact.
4. Anchorage Drilling - Advises Management of the extent of the emergency. Additionally, will be responsible

for filing all reports required for regulatory compliance. Plan and carry out well control and relief well operations.

5. Exxon Drilling Superintendent - Advises Anchorage Drilling of situation and coordinates on-site efforts.
6. Contract Superintendent - Responsible for safety of contractor personnel and rig.

IV. Person in Charge of Overall Drilling Operations

Anchorage Exxon Drilling Manager - Mr. A. L. Hermann

Office telephone: 907/263-3752

Residence telephone: 907/276-4562

Section (2)

POLLUTION CONTROL PLAN
BEAUFORT SEA, DIAPIR FIELD AREA
OCS-Y 0261, 0262, 0272, 0274, 0279, 0280 and 0296

I. Objective

The following plan outlines actions and procedures considered essential to conduct operations while minimizing exposure to pollution. These plans should be supplemented by the experience and knowledge of those involved in the operation.

II. Location

Drilling island locations and/or CIDS will be designed and built to accommodate the rig, camp, and necessary supplies for extended drilling operations. The locations will have a freeboard minimum of 20 feet which is designed to resist ice override and lateral movement and is above the maximum indicated waves and tide based on observations along the surrounding coast.

Figure 1 shows the drilling island proposed for the probable first well, OCS-Y 0280, Well No. 1. Island diameter is 425 feet, which is large enough to permit drilling two exploration wells if necessary. If it is desired to later use this island for production purposes, it can be enlarged to meet this need. Note that in addition to the 20-foot freeboard, a 5-foot berm is planned for the perimeter of the island. Filter fabric and sand bag slope protection is also planned to control slope erosion.

Figure 2 shows the transportable CIDS that is proposed as an alternative to the drilling island. The CIDS freeboard at the first well site will be about 50 feet. The drilling rig and associated equipment and supplies will either be trucked over ice roads to the location, barged during the summer open water period or transported by helicopter, rolligon or air cushion vehicle.

III. General Site Details

Figure 3 shows an approximate rig layout for a drilling island. The location and operating plan will be designed to provide containment of all drilling operation effluents that could be considered as pollutants. An impermeable sheet will be placed under the drilling rig to collect and divert any liquid waste for proper disposal. In addition to this, drip pans and other containment measures will be provided under the engines and rig machinery. Good housekeeping will be stressed on all parts of the location, with emphasis on minimizing contamination of the peripheral drainage from the island. Fuel will be stored in steel tanks located on an impermeably lined area inside a gravel berm. Sewage and kitchen waste water will be processed through a state-approved biological treating system with excess sludge being incinerated and the disinfected liquid contained in a steel holding tank. Treated effluent may be used as drill water, if needed. If an EPA General Discharge Permit is approved,

liquid wastes may be discharged to the Beaufort Sea in accordance with permit conditions. Otherwise liquids will be injected subsurface or transported onshore for approved disposal. A lined reserve pit will provide space for emergency discharge of fluids, if required, and will normally be kept dry to maximize standby storage capacity. While some reserve pit capacity will be available in CIDS, the volume will be limited.

Additional precautions will be taken to prevent drainage of hydrocarbons to the sea. Any spills will be cleaned up as soon as possible. Spill contaminated snow will be incinerated on site or hauled to disposal site on shore. The surface of a drilling island, if used, will be thoroughly cleaned after clearing the island of all drilling equipment.

Since there are no natural containment traps at this offshore location, mechanical devices including spill booms and skimming equipment outlined in the Oil Spill Containment and Cleanup Plan would be used to contain an open water spill. After freezeup, snow surrounding the location would stop the spread of any potential pollutants.

IV. On-site Spill Response Team

Selected members of the drilling and roustabout crew, under supervision of the Exxon Drilling Superintendent, will be designated as the On-Site Spill Response Team. This team, along

with on-site Exxon and contract drilling supervisors, will be given periodic instruction in all phases of pollution control including the following:

- A. Pollution prevention and good rig and location housekeeping practices.
- B. Pollution detection methods under various climatic conditions.
- C. Control and containment methods for toxic spills under various climatic conditions including drills in using the items of containment and cleanup equipment listed below.
- D. Cleanup and proper disposal procedures.

Alaska Clean Seas (ACS) Manuals will serve as training references for this instruction along with Exxon's Alaskan Beaufort Sea Oil Spill Contingency Plan (which includes a separate handbook of salient features and information essential to workers on-site). The latter manual contains a more complete description of the On-Site Spill Response Team's assignment, duties, and training.

The On-Site Team will be responsible for investigating and handling all minor spills, both on location and between Deadhorse and the location. This team will be able to handle most minor operational spills of oil, which will be collected with sorbent material and disposed of by incineration. At the

discretion of the Exxon Drilling Superintendent, additional labor crews and material can be mobilized from Deadhorse to assist the Spill Team in cleanup.

For spills beyond the capability of the On-Site Team to contain or to clean up, the Exxon North Slope Oil Spill Response Team, as outlined in the Exxon Alaskan Beaufort Sea Oil Spill Contingency Plan, will be activated to the degree required by the severity of the spill up through complete loss of control and blowout of well.

V. Available Equipment and Materials

To allow for deployment of pollution control equipment and construction of dikes, berms, and other structures, the following equipment will be maintained on location and at Deadhorse:

| <u>On Site</u> | <u>At Deadhorse***</u> |
|---|-----------------------------|
| 1 Caterpillar 966 Front Loader* | Front End Loaders |
| 1 Caterpillar D-7 Bulldozer* | Rolligons |
| 1 Spill Containment Boom** (1,000 feet long) | Belly Dumps |
| 1 Oil Skimmer** | Boats, Barges, and Tugs |
| | Labor Crews |
| | Graders, Bulldozers, Trucks |
| | Ditching Machines |
| | Co-op Equipment |

*Provided for drilling islands.

**Summer drilling only.

*** Equipment available at Deadhorse is expected to require 12 to 48 hours to mobilize to the location, dependent upon weather conditions and the time of year.

In addition to the equipment shown above, the following construction and absorbent materials will be maintained on location to combat oil spills:

- polyethylene sheeting and plastic bags
- 10 rolls - 5/8" x 3' x 150' absorbent sheeting
- barite
- bentonite
- lost circulation materials (walnuts hulls, cellulose, etc.)
- contrifugal pumps and hoses

To supplement on-site capability, additional spill cleanup equipment including oil mops and sorbent materials can be dispatched from Deadhorse to the drillsite within 12 to 48 hours. Also, additional personnel and equipment can be rapidly mobilized from the ACS organization, of which Exxon is a member.

VI. General Operations Procedures

A. Site Surveillance

Under normal drilling operations the Exxon Drilling Superintendent will be responsible for conducting frequent reviews of the drill site to ensure that equipment maintenance is kept up to standards and that proper on-site procedures are followed. The items to be checked during site surveillance include, but are not limited to:

1. Mechanical condition of tankage, lines, and pumps.
2. Correct positioning of flowline valves.
3. Operation of relief valves.
4. Fluid levels in drip pans, containment pits, etc.
5. Condition of drains (ensure clean and unfrozen).
6. General condition and cleanliness of rig.
7. Condition of spill removal equipment and material.
8. Proper operation of sewage treatment facilities.
9. Snow removal status.
10. Check outer edges of location to be sure no seepage from pad.

In addition, the following procedure will be followed while operating on these locations:

1. The Exxon Drilling Superintendent will designate "Briefing Areas" where all personnel will meet in case of emergency and where emergency equipment will be kept.
2. The site will be equipped with an Exxon operated radio system.
3. A list of current emergency telephone numbers and a map of the local area will be maintained by the Drilling Superintendent.

B. Injection Procedures

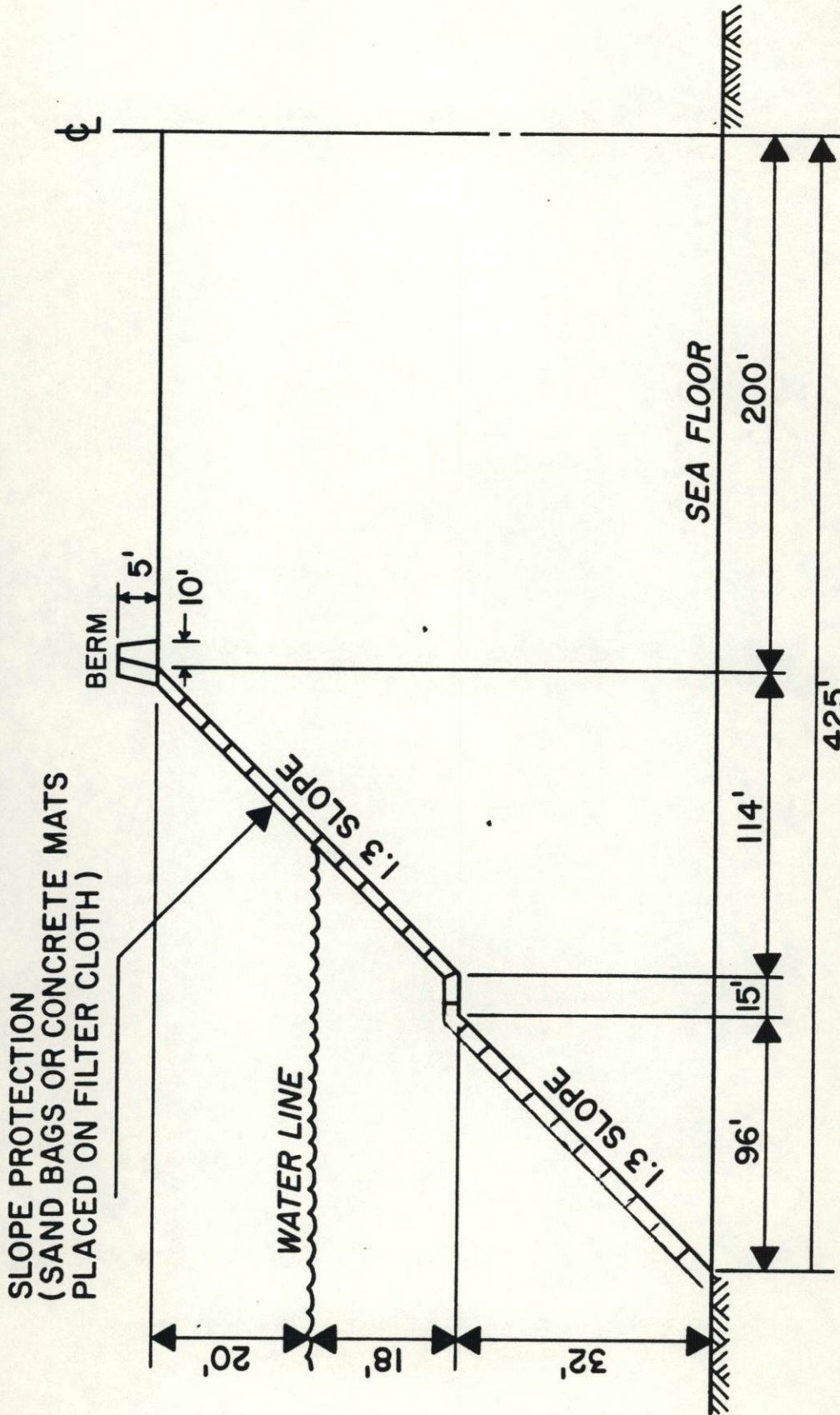
In the event that an NPDES permit allowing the discharge of approved drilling muds is not available, an important feature of the drilling plan (when a drilling island* is used) will be to provide 13-3/8" x 9-5/8" annular injection capability. The well casing program would be designed to set 13-3/8" surface casing through the major gravel sections and below any possible freshwater zones. A 9-5/8" intermediate casing would be cemented to isolate the salt-water sand sections from below the surface casing shoe to approximately 7,000 feet for injection of lube oil, excess mud, melt water in the case of summer operations, waste waters, and well test liquids.

The following procedures would be followed:

1. After the 9-5/8" casing string is set, injectivity tests will be conducted down the 13-3/8" x 9-5/8" annulus using drilling mud and make-up water, limiting injection pressure to below the casing collapse and/or below surface line pipe and pump burst ratings. An injection pump will be used to inject all fluids.
2. Record daily the fluid injected into the well.
3. Prior to injecting any fluid down the annulus, notify the Drilling Superintendent.

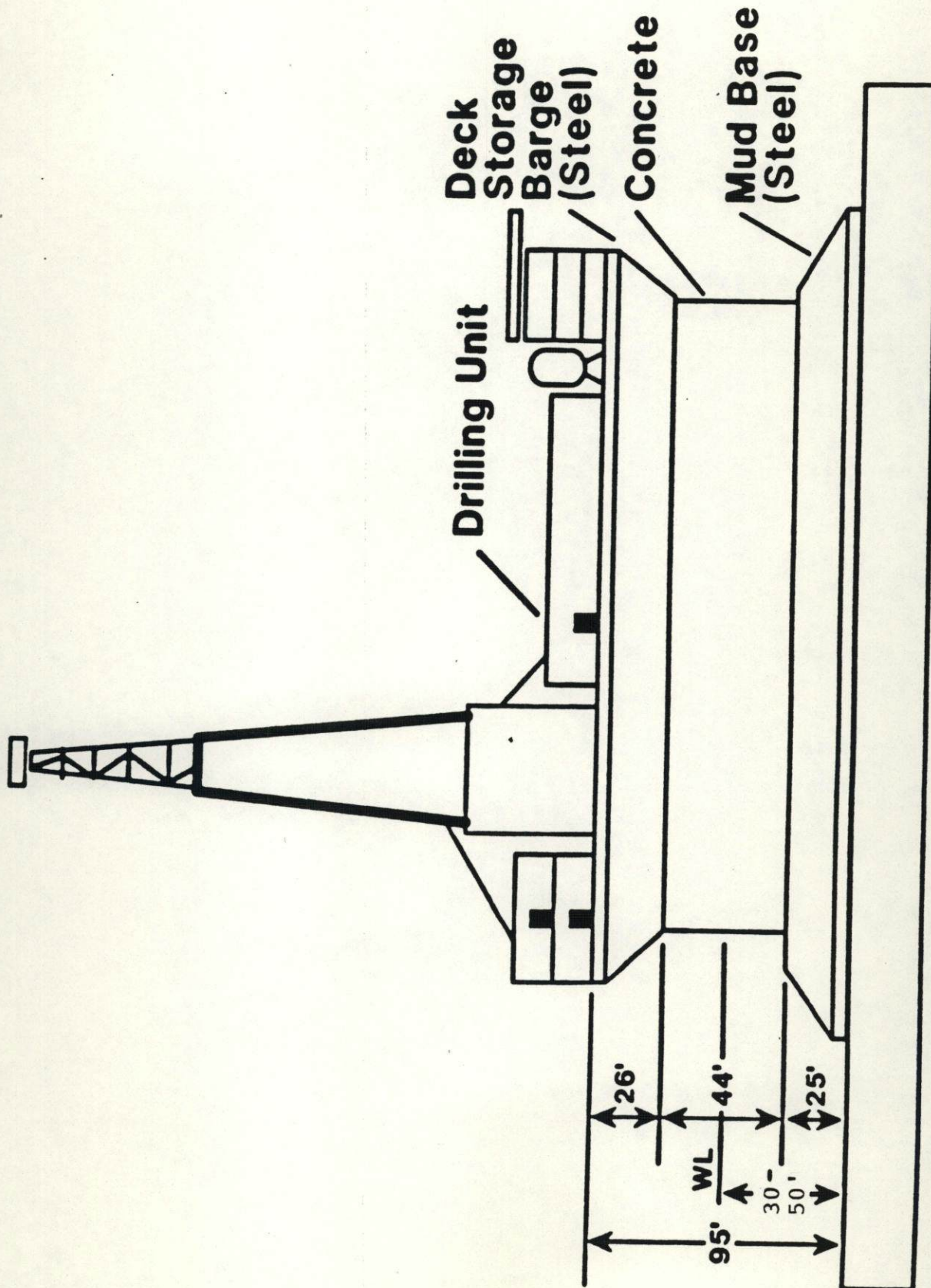
* BOP and rise arrangement preclude adoption of this procedure with the CIDS.

CROSS SECTION
 CIRCULAR ISLAND DRILL SITE
 BEAUFORT SEA SALE 71 AREA
 EXXON Co. U.S.A.



SCALE: VERTICAL 1" = 20'
 HOR. 1" = 60'

FIGURE 1



Deck
Storage
Barge
(Steel)

Drilling Unit

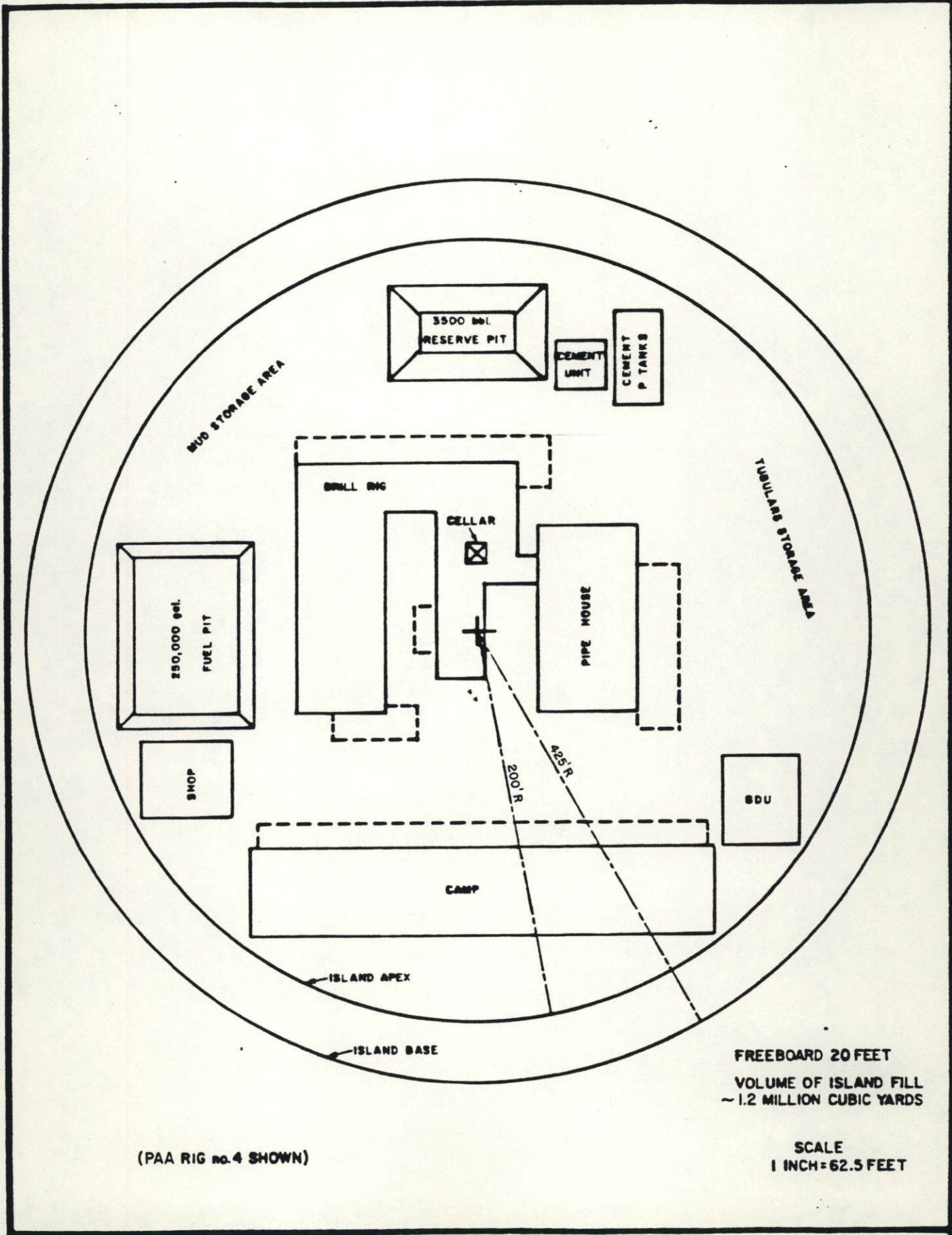
Concrete

Mud Base
(Steel)

26'
44'
25'
95'
WL
30'
50'

FIGURE 2 CONCRETE ISLAND DRILLING SYSTEM (CIDS).





(PAA RIG no. 4 SHOWN)

FREEBOARD 20 FEET
VOLUME OF ISLAND FILL
~1.2 MILLION CUBIC YARDS

SCALE
1 INCH=62.5 FEET

FIGURE 2. TYPICAL DRILLSITE LAYOUT.



Section (3)

CRITICAL OPERATIONS AND CURTAILMENT PLAN
BEAUFORT SEA, DIAPIR FIELD AREA
OCS-Y 0261, 0262, 0272, 0274, 0279, 0280 and 0296

Certain operations performed in drilling are more critical than others with respect to well control and for the prevention of fire, explosion, oil spills, and other discharges or emissions. The following list details those operations and the conditions under which they are to be terminated.

1. Fuel Transfer Procedures

Operations involving fuel transfer are critical in that mistakes occurring at this time will likely lead to an oil spill. It is the Drilling Superintendent's responsibility to ensure that proper procedures are implemented during each fuel transfer. A detailed procedure checklist will be provided and is to be followed before fueling operations commence. General guidelines for these operations are:

- A. Ensure by testing or inspection that all equipment and lines are in proper working order. Lines are to be pressure tested to 1.5 times the maximum anticipated transfer pressure during initial rig up.
- B. Review procedures with all personnel involved to ensure that everyone knows his job.

- C. Double check that all valves are positioned correctly before transfer begins.
- D. Make a visual inspection of equipment once transfer begins. Keep track of volumes and pressures during pumping. Shut down operations immediately at the first sign of pressure loss or leakage.

II. Well Testing

Well testing operations require careful planning and safe procedures to keep the risk of an oil spill at a very low level. It is the Drilling Superintendent's responsibility to ensure that the following special procedures are carried out during well testing:

- A. Ensure that all test vessels are inspected prior to testing. In addition, flowlines should be tested to 5,000 psi to assure pressure integrity.
- B. Review test procedures and equipment operations with all involved personnel just prior to start of the test. Ensure that everyone knows his job assignment.
- C. Double check positions of flowline valves prior to commencing testing.

- D. Check equipment for leaks after testing is initiated. Monitor pressures and flow rates during the test. Shut down operation immediately at any indication of leakage.

III. Drilling in Close Proximity to Another Well

Not anticipated unless a second well is drilled at the location. In that event, the first wellbore will be plugged and abandoned in accordance with OCS Arctic Order 3 prior to spud. Also, the necessary surveys and precautions will be taken to avoid intersecting the existing wellbore.

IV. Running and Cementing Casing

The following guidelines shall apply:

- A. Careful monitoring for well flow should be taken during the last trip in the hole with drill pipe.
- B. The mud weight shall be greater than, or at least equal to, that with which the last drilling took place.
- C. Check for normal hole fill-up and mud displacement on trip out of hole and while going in hole with casing.
- D. Monitor flow line returns while displacing or cementing.

E. Good care of hole conditions shall prevail.

Running casing will not be started if the well is not static.

V. Cutting and Recovering Casing

A. Prior to cutting any casing, the absence of annulus pressure will be verified.

B. After cutting, the well will be carefully monitored for well flow. The well will be static prior to pulling the casing out of the hole.

C. The mud weight shall be equal to or greater than the mud weight used to drill the interval at the depth of the cut.

D. Casing will be pulled at a slow enough speed to prevent swabbing and to ensure normal hole fill-up.

VI. Logging or Wireline Operations

The drilling mud shall be adequate to contain any exposed formations. The well will be monitored and kept full at all times.

Logging shall not be initiated until the hole is stable (no lost circulation) and mud is not being gas cut.

VII. Well Completion Operations

The Exploratory Drilling Plan for these offshore wildcats covers only the drilling and evaluation phase. If well completion is anticipated at a later date, the well will be plugged and temporarily abandoned in accordance with OCS Arctic Order No. 3.

VIII. Drilling Into Abnormal Pressure Zones

Abnormal pressure is not anticipated while drilling to the planned total depths in this Plan; however, a mud logging unit will be on location and the usual abnormal pressure indicators will be monitored at all times below structural casing.

IX. Determining Formation Pressure Integrity

Formation pressure integrity tests will be run after setting conductor, surface, and protective casing strings to ensure that formations are competent for the planned mud weight program. No problems are anticipated with lost returns in this area.

X. Drilling Below Conductor Pipe

Well control contingency plans will be in effect while drilling below the conductor pipe. Drilling will be discontinued if:

- A. Minimum quantities of mud material on board are less than those reserved for emergency use as shown in the Mud Program section of the Application for Permit to Drill.
- B. Blowout prevention equipment as outlined in OCS Arctic Order No. 2 fails the testing requirements of said Order.

XI. Plugging and Abandonment

Plans are to plug and abandon wells in accordance with OCS Arctic Order No. 3. Plugging will not commence if the well is not under control. Blowout prevention equipment will not be removed before placing surface plug.

XII. Encountering H₂S

H₂S is not expected in the planned area of operations, but if it is encountered, drilling will be stopped and measures taken as described in the H₂S Contingency Plan contained in Section (7).

XIII. Drilling Structural and Conductor Casing Holes

The mud logging unit with gas and H₂S detectors will be in operation from spud at the mud line to total depth, and the mud vacuum degasser will be available for use, if needed. In the event gas is detected, drilling will be stopped and flow checks will be conducted. If necessary, mud weight will be increased to control the well.

Section (4)

OIL SPILL CONTAINMENT AND CLEANUP PLAN
AND EMERGENCY SITUATION CONTINGENCIES
BEAUFORT SEA, DIAPIR FIELD AREA
OCS-Y 0261, 0262, 0272, 0274, 0279, 0280 and 0296

I. Objectives

The purpose of this section is to outline action to be taken in the event of an oil spill on the locations included in this Exploration Plan.

- A. Notification and compliance with all regulatory agencies.
- B. Spill cleanup procedures.
- C. Recovered fluids disposal procedures.
- D. Coastline Sensitivity Atlas.

II. Notification Requirements

In the event of an oil spill, the Exxon Drilling Superintendent shall immediately contact the Anchorage Drilling office and issue a report including the following information:

- A. Date and time spill occurred or was first observed.
- B. Where spill occurred and present location.

- C. Estimate of amount and type of material spilled.
- D. Environmental conditions (temperature, wind, etc.).
- E. Description of area likely to be affected.
- F. Cause of spill.
- G. Action taken to combat spill.

Anchorage Drilling will be responsible for making contact with Headquarters Drilling, Law, and all required governmental agencies. General procedures for Anchorage Drilling to follow in this regard are:

- A. Contact U.S. Coast Guard by telephone and notify that spill has occurred and is being investigated, only if the spill threatens to enter any navigable waters (lakes, streams, ocean and/or ice).
- B. Contact MMS by telephone for spills reaching navigable waters, if the well is outside the three-mile limit.
- C. Notify Headquarters Drilling of the spill providing available details.
- D. Notify Alaska Department of Environmental Conservation by telephone for spills within three-mile limit.

III. Oil Containment Plan

A. Before Freezeup (Summer Operations)

In the event that an oil spill occurring before freezeup at the location cannot be contained on the drill site or in the contingency pit and pollutants reach open water, the following steps will be taken to contain the oil spill:

1. Stop the spill at its source unless it is the result of an uncontrolled blowout, in which case see Uncontrolled Blowout Plan.
2. Mobilize all equipment required to contain the spill fluid.
3. Ascertain the direction of current and winds (general direction in which the spill is moving) for trajectory analysis.
4. Using boats, deploy the spill containment boom to surround the spilled fluids, block the fluid flow, and collect the spilled fluids. As the 1,000 feet of boom will not surround the entire perimeter of the island, it will be necessary to place the boom to block the expected path of spill migration. A typical deployment diagram is shown in Figure 4.

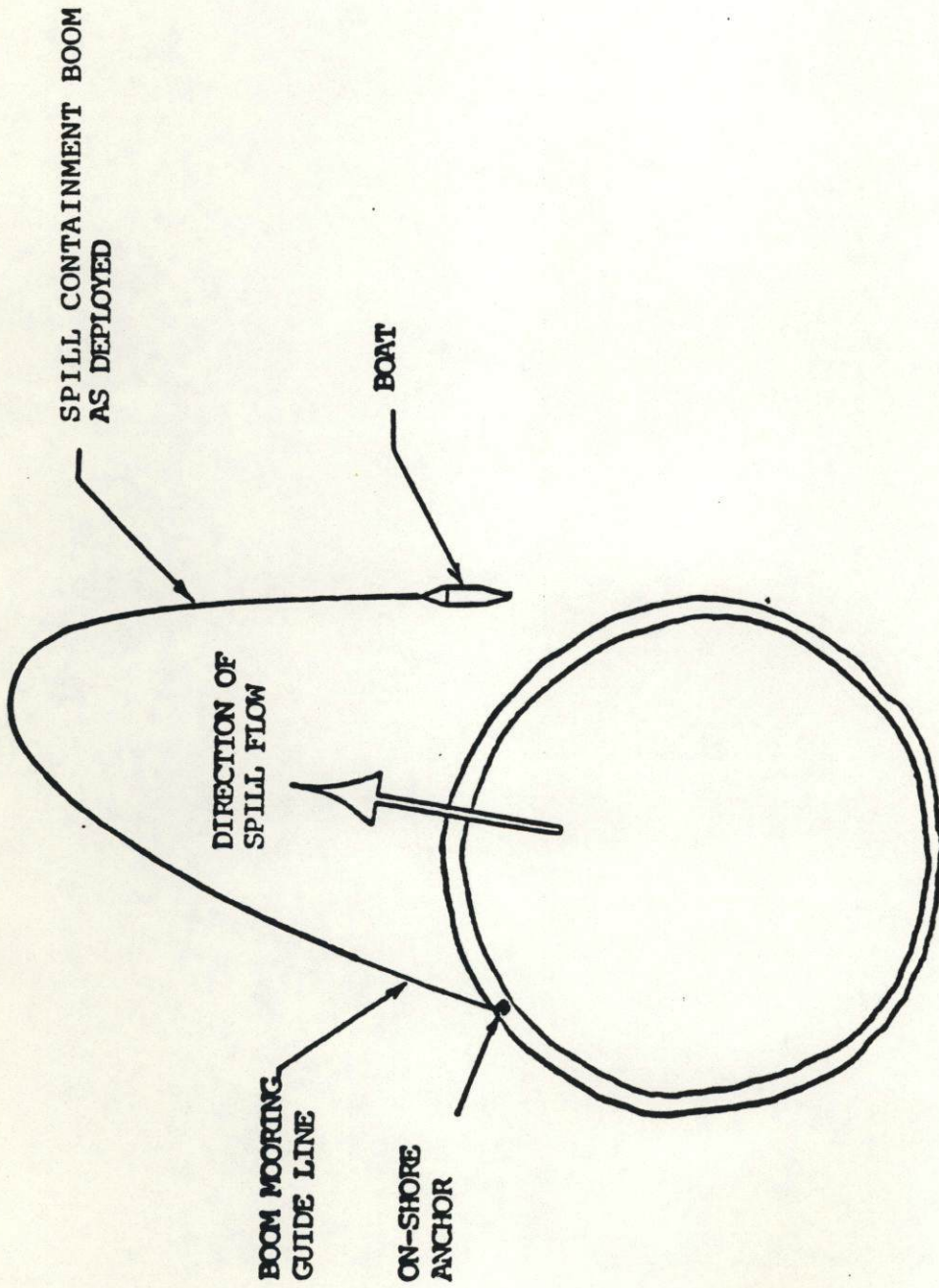


FIGURE 4
TYPICAL DEPLOYMENT OF THE
SPILL CONTAINMENT BOOM
(SUMMER OPERATIONS ONLY)

5. Once the spill containment boom is in place, deploy the oil skimmer directing it into the location of the highest oil concentration.
6. Make a sweep periodically of the outside perimeter of the containment boom to assess whether any oil has escaped to open water.
7. Mop up any residual fluids with absorbent materials and recover all contaminated ice, snow, and gravel, placing contaminated materials in containers for disposal.

B. During Freezeup

During freezeup limited operations may be possible to contain and mop up spilled fluids depending upon the extent of the ice cover and ice conditions.

1. If sufficient ice leads exist to allow navigation of small boats in and through open ice, the following procedures may be initiated:
 - a. Deployment of the spill containment boom may be feasible if open water exists around the drill site area.
 - b. The oil skimmer may be deployed in large ice leads to mop up isolated spills.

- c. Sorbent materials should be used where applicable to clean up oil spilled in small ice leads.
 - d. An oil mop can be used in conjunction with a small boat to recover floating oil slicks in ice leads.
2. If sufficient ice leads do not exist and/or only a thin continuous ice layer exists, the general perimeter of the spill should be staked trajectory analyzed and movement of the spill area closely monitored. In this case, the procedure will be to allow the ice pack to freeze sufficiently so that equipment and personnel can be mobilized for cleanup procedures identified in the after freezeup section.

NOTE: SAFETY OF PERSONNEL IS A MAJOR CONSIDERATION WHILE CONDUCTING CLEANUP OPERATIONS DURING THE PERIOD OF FREEZEUP. PERSONNEL SHOULD NOT OPERATE ON ICE PACKS HAVING QUESTIONABLE INTEGRITY OR ON FREE-FLOATING ICE-BERGS.

C. After Freezeup (Consolidated ice pack existing.)

After freezeup the primary defense outside the island perimeter will be the naturally occurring snow on top of the ice. Recent information indicates this is preferable to

building a snow berm around the location for limiting the spread of a spill and for preventing the spill from getting under the ice.

Cleanup operations after freezeup should be aided by the increased viscosity of fluids at low temperatures. Recovered fluids and contaminated cleanup materials (snow, ice, absorbents, etc.) should be placed in steel containers for disposal.

D. Spill Cleanup Procedures

The spill cleanup efforts at the locations will be directed toward returning the affected area to as near natural state as possible. Minor spillage of fluid will be cleaned by use of absorbent materials and recovery of contaminated materials such as gravel, etc. These soaked materials will be placed in containers for future disposal. Major oil spillage will be handled by use of conventional skimming equipment. Snow, absorbent materials, and other contaminated materials will be recovered and processed by incineration.

IV. Coastline Sensitivity Atlas

The ACS organization has completed an Alaskan Beaufort Sea Oil Spill Response Considerations manual which shows locations and

rankings of sensitive areas, along with specific methods to protect each area from an oil spill. Two types of areas are considered: biologically sensitive areas such as fish spawning and bird nesting areas, etc., and socially and economically sensitive areas such as settlements, subsistence hunting, and commercial or sport hunting and fishing areas.

Oil spill contingency plans for each well location will contain a description of any sensitive areas that will be affected by the exploration operations and will include appropriate countermeasures to minimize the environmental impact of a spill.

V. Emergency Situation Contingencies

In the unlikely event of loss or disablement of the drilling rig, numerous rigs are presently stacked and available for replacement in the vicinity of Prudhoe; a current inventory will be maintained during operational periods. Similarly, should damage or loss of support craft such as trucks, helicopters or air cushion vehicles be experienced, replacements from available sources in Prudhoe Bay will be deployed.

Anticipated hazards within the area of the proposed exploratory activity include freezeup of the sea ice in October and breakup of the sea ice in May; design and maximum ice forces in the winter are discussed in the island/CIDS design criteria (submitted separately). No shallow geohazards unique to the site

have been identified. A thorough discussion of the character of the seabed and substrate for OCS-Y 0279 and 0280 are included in a geohazards report prepared by Harding Lawson Associates (submitted under separate cover on 7/13/83); additional discussion of the geotechnical characteristics of the substrate is contained in the Platform Verification CVA report(s) to be submitted separately.

Section (5)

UNCONTROLLED BLOWOUT (RELIEF WELL) PLAN BEAUFORT SEA, DIAPIR FIELD AREA OCS-Y 0261, 0262, 0272, 0274, 0279, 0280 and 0296

I. Scope

This section of the Contingency Plan covers action to be taken to initiate relief well operations in the event of an uncontrolled blowout in the area of operations. The possibility of this occurring is considered extremely low because of the extensive precaution to be taken to prevent loss of well control. This section does not address control of pollution resulting from the blowout; this is dealt with in Section (2) of this Contingency Plan, and in Exxon's Alaskan Beaufort Sea Oil Spill Contingency Plan, and the ACS manuals.

II. Well Ignition

The blowout well will be ignited at the discretion of the on-site Exxon Drilling Superintendent if there is immediate danger to personnel. Otherwise, the well will be ignited for safety and to limit the potential for environmental impact only after discussion with Exxon management and the proper governmental agencies.

III. Equipment and Supply Mobilization

In the event of a blowout, all equipment necessary for constructing the relief well pad would be mobilized from Prudhoe

to the location. The equipment used and transportation method will depend upon the time of the year and availability. The ACS manual contains comprehensive lists of construction companies located at Prudhoe. A drilling rig will also be located at this time and planned for mobilization as soon as the pad is available. With the high level of drilling activity at Prudhoe and anticipated industry cooperation, it is anticipated that a suitable rig can be obtained without undue difficulty. Numerous rigs are presently stacked in the vicinity of Prudhoe; crews are readily available. If necessary, a Herc transportable rig could be flown in from another area. Appropriate current inventories will be maintained throughout operational periods.

Depending on the time of year the blowout occurred, it may be necessary to obtain a helicopter transportable rig. Supplies and equipment required for drilling the relief well would be obtained and located at a staging area at Deadhorse to permit rapid transportation to the location as soon as the relief well pad was completed. Relief well tubulars and wellheads will be kept at the Exxon Deadhorse warehouse facility.

It is anticipated that most rig and supply movement will take place over ice roads in the winter or by tug and barge during the summer season. During the periods of breakup and freezeup, all transportation will be by airplane, helicopter, or possibly air cushion vehicles.

IV. Relief Well Location

The optimum location for a relief well pad is dependent upon several factors existing at the time of the blowout, including blowout well depth and both current and projected wind and current conditions at the location. An attempt would be made to place the location in minimum water depth at a distance from the blowout well to provide optimum directional drilling parameters for the relief well. In case the blowout well was directional, an attempt would be made to locate the relief well pad such that the relief well could be drilled as a straight hole to intercept the blowout wellbore. In all cases, the relief well pad would be placed a sufficient distance from the blowout well to ensure personnel and equipment safety for the duration of the planned drilling program. It is anticipated that the relief well pads would be located in water depth similar to the original drilling location.

V. Pad Construction

In the winter, an island large enough to accommodate the drilling rig and kill equipment would be constructed, through the ice, using construction techniques similar to those used for other fill islands. All available equipment that could be used efficiently would be utilized. As soon as pad size is large enough to support the drilling rig and associated drilling support equipment, the rig and equipment may be mobilized to the pad over ice roads, ice conditions permitting.

During open water periods, a relief well island drill site would be constructed utilizing barges and tugs to transport construction material from the Prudhoe Bay West Dock or the Oliktok Dock to the location. Depending principally upon open water/ice conditions, the average construction period is estimated to be in the range of four to five months.

During periods of breakup and freezeup, pad construction would not be attempted until such time as conditions were safe for personnel and equipment to operate. In this case, all supplies, equipment, and materiel necessary for construction would be assembled at the nearest staging point such that construction could begin immediately when safe to do so.

Section (6)

EMERGENCY ISLAND EVACUATION PLAN
BEAUFORT SEA, DIAPIR FIELD AREA
OCS-Y 0261, 0262, 0272, 0274, 0279, 0280 and 0296

I. Scope

The island drill site locations planned for the subject area are designed in accordance with industry experience in the Canadian and Alaskan Beaufort Sea and will be certified as required by OCS Arctic Order No. 8. Additionally, any CIDS used will meet all applicable MMS, USCG and ABS requirements. With the ice loading expected, these structures should not be displaced laterally at any time. Despite this, various physical parameters of the fill islands, CIDS and adjacent ice (including pressure, stresses and ice movement) will be included in monitoring program. Such a program will be conducted on at least the first and possibly additional locations. Ice monitors will be installed as soon as ice conditions are safe for personnel to operate. Protection from wave override will be afforded to the fill islands by its working surface height (approximately 20 feet) above sea level and a five foot sandbag berm; minimum freeboard for the CIDS will be in the range of 30+ feet.

II. Emergency Plan

The potential for island or CIDS movement or shearing exists primarily during the late winter season when high winds direct

the sea ice pack against the structure. Sea ice forces adjacent to the drill site (and on the CIDS) will be continuously monitored. If this force should reach a predetermined critical level, an alarm will be activated so that timely action could be taken to shut in the well and evacuate the island.

In the event of this emergency, the following steps will be followed in the priority listed:

- A. Pull pipe to the lowermost casing shoe and set a storm packer with back pressure valve at 100 feet BML. Hang pipe on storm packer. (Note: Storm packers shall be maintained on location for the 13-3/8" and 9-5/8" [if used] casing strings throughout the period before and during freezeup.)
- B. Pull out of the hole and lay down the drill string and packer running tools. Close and manually lock the blind ram preventer and drain the BOP stack and lines.
- C. Demobilize and secure the camp and evacuate all personnel with the exception of a skeleton crew to complete operations listed below.

Section (7)

H₂S CONTINGENCY PLAN

BEAUFORT SEA, DIAPIR FIELD AREA

OCS-Y 0261, 0262, 0272, 0274, 0279, 0280 and 0296

I. Scope

Although no H₂S is expected, certain precautionary measures are to be taken for personnel and well safety in case H₂S is unexpectedly encountered. This plan describes the precautions and actions to be taken for this possibility.

II. General Requirements

A. Briefing Areas

Two briefing areas will be designated at each location. The Exxon Drilling Superintendent on location will designate which briefing area is to be used depending on wind direction.

B. Wind Indicators

Windssocks, streamers, or other devices will be positioned around the location such that they can be seen from the rig floor and from any position around the location.

C. H₂S Detectors

Continuous recording/monitoring-type H₂S detectors complete with visual and audio alarms will be monitored at all times by mudlogging personnel from the mud line to total depth. Detectors will be located at the bell nipple, shale shaker, mud pits, driller's stand and in the living quarters. Alarms will be set to go off when detectors sense an H₂S concentration in excess of 5 ppm.

D. Mud Treatment and Checks

In the event the mud becomes contaminated with sulfides, a supply of "Milgard" (100% zinc carbonate) or an equivalent scavenger will be available in Deadhorse in sufficient quantity to treat the entire mud system with 2 lbs. per barrel.

Below protective casing, daily mud checks will be made to determine the presence of sulfides in the mud using a Garrett Gas Train or equivalent.

E. Well Site Communication

Portable two-way radios will be provided on location in order to permit rapid communication between supervisory personnel in case of an emergency.

F. Safety Equipment

The following minimum safety equipment will be provided at each location considered in this Plan:

1. Sufficient air breathing equipment will be available to provide immediate access to all personnel. Spare bottles will be provided.
2. Hand-held H₂S detectors with refill tubes for both H₂S and SO₂.
3. Vapor tester (explosimeter).
4. H₂S lead acetate ampoule detectors.
5. Resuscitator with spare oxygen bottles.
6. Rope and harness sets for going into H₂S areas.
7. Stokes litter or equivalent.

III. Training Requirements

Periodic on-site instruction and training will be given to rig crews in the following areas:

- A. Toxic effects of H₂S and SO₂ gas and the need for the "buddy system" when dealing with H₂S.
- B. Proper use of breathing apparatus and safety equipment and location of such equipment.
- C. Emergency well procedures and drills.
- D. First aid with particular emphasis on the physiological effects of H₂S.

IV. H₂S Emergency Procedures

- A. If at any time as much as 10 ppm of H₂S is detected, the following steps will be taken:
 - 1. The person detecting the H₂S must immediately notify the Driller. He must then notify the Exxon Drilling Superintendent and contract Toolpusher.

The Exxon Superintendent and contract Toolpusher will bring portable gas detectors to the rig floor in order to find the source of H₂S.

- 2. Upon notification of the emergency, the Driller will shut down mud pumps and continue to rotate the drill pipe.

3. The rig floor and supervisory personnel will immediately put on gas masks. All other personnel will immediately leave the area and go to the upwind briefing or other safe area.
4. The contract Toolpusher will alert all personnel that an H₂S emergency exists. He should be prepared to shut off the forced air circulation system in the living quarters.
5. The Mud Engineer will run a sulfide determination on the flowline mud.
6. A maximum effort must be made by supervising personnel to resolve the cause of the H₂S and to suppress the H₂S as quickly as possible. Drilling must not proceed until the cause of the H₂S is determined and the well is circulated. Rig floor and mud pit personnel will keep breathing equipment on while monitoring this circulation.
7. The contract Toolpusher will make sure all nonessential personnel are out of the potential danger area, i.e., mud pit area, mudlogger unit, mud storage room, etc. All persons who remain in the potential danger areas must utilize the "buddy system."

8. The Exxon Drilling Superintendent in charge will notify the Exxon Operations Superintendent of current conditions and actions taken.
 9. The on-duty Exxon Drilling Superintendent will see that all monitoring devices are functioning properly and reading accurately and will increase gas monitoring activities with portable Drager units.
 10. The Exxon Drilling Superintendent in charge will notify all approaching vehicles and helicopters to stay upwind and to be prepared to evacuate nonessential personnel.
 11. The Exxon Drilling Superintendent in charge will alert the Deadhorse dispatcher to assure continuous radio watch. The Minerals Management Service and U.S. Coast Guard must also be notified.
- B. If the H₂S concentration exceeds 20 ppm (from an increase in gas cut mud) and the well is not attempting to flow, the following steps will be taken:
1. The person detecting the H₂S must immediately notify the Driller. He must then notify the Exxon Drilling Superintendent and contract Toolpusher.
 2. Driller will shut down mud pumps and continue to rotate drill pipe.

3. The rig floor and supervisory personnel will immediately put on air breathing units. Any other personnel in the high concentration area should hold their breath and evacuate to a safe area.
4. Once air breathing equipment is on, the Driller should:
 - a. Stop rotary.
 - b. Pick up kelly above rotary table.
 - c. Be ready to hang off and close the BOP's if necessary.
 - d. If well control problems develop, shut in the well.
5. The contract Toolpusher will alert all personnel that an H₂S emergency exists. He must shut off the forced air circulation system in the living quarters.
6. All personnel not listed above must report to the upwind safe briefing area for further instructions from the off-duty Toolpusher or Supervisor. If you are located on the downwind side of the rig when the alarm is sounded, hold your breath and proceed to the upwind safe briefing area.
7. Always put on a portable air breathing mask before proceeding to assist one affected by the gas and utilize

the "buddy system." If the affected person is stricken in a high concentrated area, put on a safety belt with 50 feet of tail line and obtain standby assistance before entering the area. Always use the "buddy system" when entering possible contaminated areas.

8. The Exxon Drilling Superintendent in charge will notify all approaching vehicles and helicopters to stay upwind and to be prepared to evacuate nonessential personnel.
9. Notify dispatcher to alert heliport and establish 24 hour watch. Notify appropriate state agencies in addition to MMS and USCG.
10. DO NOT PANIC.

C. The Exxon Supervisor and contract Toolpusher will assess the situation and assign duties to each person to bring the situation under control. When the severity of the situation has been determined, all persons will be advised. The Exxon Supervisor and contract Toolpusher will:

1. Direct corrective action.
2. Notify the Exxon Operations Superintendent in Anchorage on action being taken.