

**EXPLORATORY PLAN
BEAUFORT SEA, BEECHEY POINT AREA
OCS-Y 0189, 0190, 0191, 0192 AND 0193**

**EXXON CO., U. S. A.
(A DIVISION OF EXXON CORPORATION)
P.O. BOX 4279
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OPERATOR FOR UNION AND ARCO

**RECEIVED
DEPUTY CONSERVATION MGR.
OFFSHORE FIELD OPERATIONS**

DEC 22 1980

**CONSERVATION DIVISION
U.S. GEOLOGICAL SURVEY
ANCHORAGE, ALASKA**

FOR GOVERNMENT USE ONLY

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EXPLORATION AND CONTINGENCY PLANS

BEAUFORT SEA, BEECHY POINT

USGS MAP DESIGNATION BEECHY POINT, UTM ZONE 6

OCS-Y 0189, 0190, 0191, 0192, & 0193

Exxon Company., U.S.A., et al.
(a division of Exxon Corporation)

P. O. Box 4279
Houston, Texas 77001

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*Includes Proprietary Information

EXPLORATION PLAN

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I. EXPLORATION PLAN

Pursuant to 30 CFR 250.34 "The Lessee shall submit Exploration Plans to the Supervisor for approval." Exxon Corporation, as Operator for Union and ARCo, is submitting this Exploration Plan for leases in the Beechy Point portion of the Joint Federal State Beaufort Sea Sale area.

Within the designated area, Exxon Corporation currently holds joint oil and gas leases with Union and ARCo on Federal leases OCS-Y 189, 190, 191, 192, and 193 (in Beechy Point, UTM Zone 6, Blocks 654, 656, 608-610, 652-56, 698, 699, and 743). Extensive geological and geophysical surveys and a rock habitats investigation have been conducted on this lease. These, along with subsurface geologic data obtained from the wells drilled in the Duck Island area to the south, provide evidence that these leases may be sites of potential hydrocarbon accumulations. We propose to explore and evaluate this possibility according to the procedures outlined in this Plan.

It is to be understood that the type and sequence of exploration activities outlined herein must, of necessity, have considerable latitude and flexibility as work progresses and new data is acquired. For example, the subsurface geologic information acquired, as each well is drilled and evaluated, is the most salient data, dictating any future specific proposals of well and gravel drilling island locations. Exploratory prospect evaluation and ultimate reservoir description is always a dynamic, iterative process.

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

1. Exxon, as Operator, now plans to construct one gravel island and drill one exploratory well.

<u>Lease No.</u>	<u>Well</u>	<u>Surface Location</u>	<u>Projected BH Location</u>	<u>Projected Measured Depth</u>	<u>Proposed TVD</u>	<u>Estimated Drilling/ Testing Time</u>	<u>Water Depth</u>
OCS-Y 0191	1	1842' FNL & 667' FWL Beechy Point, Block 654 Lat 70°23' 11.15"N Long 147°53' 29.15"W X = 1,530,848' Y = 25,620,154' UTM Zone 6	Same	12,500	12,500	150 days	18 ft.

2. It is Exxon's intention to implace the first gravel island immediately after approval of this Exploration Plan, and begin the drilling of the first well identified above within 10 months thereafter. Decisions of whether or not, and when, to drill subsequent well(s) will be made within a reasonable period of time following the evaluation of geologic data provided by this well. Such future operations will be further conditioned upon the availability of appropriate drilling equipment and drilling season limitations (Federal Lease Stipulation No. 8).

Subsequent to the first well, other wells may be directionally drilled from the same surface location. It is projected that up to eight 12,900'+ wells and surface locations may possibly be necessary to evaluate the commercial hydrocarbon potential of the subject leases. Conceivably, a maximum of ten gravel islands with over 100 wells might be needed to facilitate complete geological evaluation and description - such a maximum is highly unlikely.

3. Other information, which may bear upon our decision to drill additional wells, will be obtained from wells drilled in adjacent areas by Exxon or other operators (See listing in Environmental report, Appendix IV) and the additional planned seismic control programs.
4. The drilling rig(s), to be used to explore the area covered by this plan, will be typical of those currently in use in the Beaufort Sea area currently under contract. Arctic Alaska's Rig No. 4 is under contract and is presently planned for use for OCS-Y 0191 Well No. 1.
5. The expiration date of the leases covered by this Plan is July 1, 1990.
6. The stated schedule is deemed sufficient to efficiently evaluate the commercial hydrocarbon potential of these leases prior to the stated expiration date.

7. The contents of this section will be updated every six months or within 30 days after completion of each well drilled. If there is no change within the six-month period, an update would simply state "No Change".

I.B. DESCRIPTION OF DRILLING OPERATIONS

I.B.1 Drill Site

a. Artificial Island

Drilling operations for the proposed plan will be conducted from a gravel island constructed in approximately 18 feet of water during the winter of 1980-81. Gravel will be obtained from an approved gravel mine near Prudhoe/Deadhorse and trucked over ice roads to the proposed site. The island will be designed as a two-well location and will have a diameter of 480 feet at 11 feet above mean high high water. Approximately 301,000 cubic yards of gravel will be required which will provide a side-wall slope of 1:3. The slope will be suitably protected from waves and ice motion. See attached drawing (Figure 1) which is from Exxon's Department of the Army permit application. The island design and construction will be certified in accordance with the requirements of USGS Order No. 8.

b. Island Facilities

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

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 incinerator unit.

A fuel area will be constructed with an impermeable lining and a gravel berm which will contain any possible loss of fuel from the double walled 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. 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.

Exxon will maintain on the island a state approved sewage treatment plant at the drill site. Gray water and treated sewage effluent water will be used for rig wash and water for drilling mud. Presently under consideration is a plan to use a desalination plant to provide as much as 1100 bpd of fresh water. In the event such a unit is installed, an EPA National Pollutant Discharge Elimination Permit will be obtained for the slightly concentrated seawater effluent which would be discharged to the ocean.

There will be no discharge of any other liquid from the site since sewage and sanitary waste effluent and waste mud will be retained as necessary in a steel storage tank and injected into a subsurface disposal zone provided in the drilling and casing program for the well. Burnable waste will be incinerated at the site with a state of Alaska approved oil fired incinerator and solid waste and junk material will be transported ashore to an approved site for disposal. Minor equipment spills will be cleaned up on the site and materials burned or transported ashore.

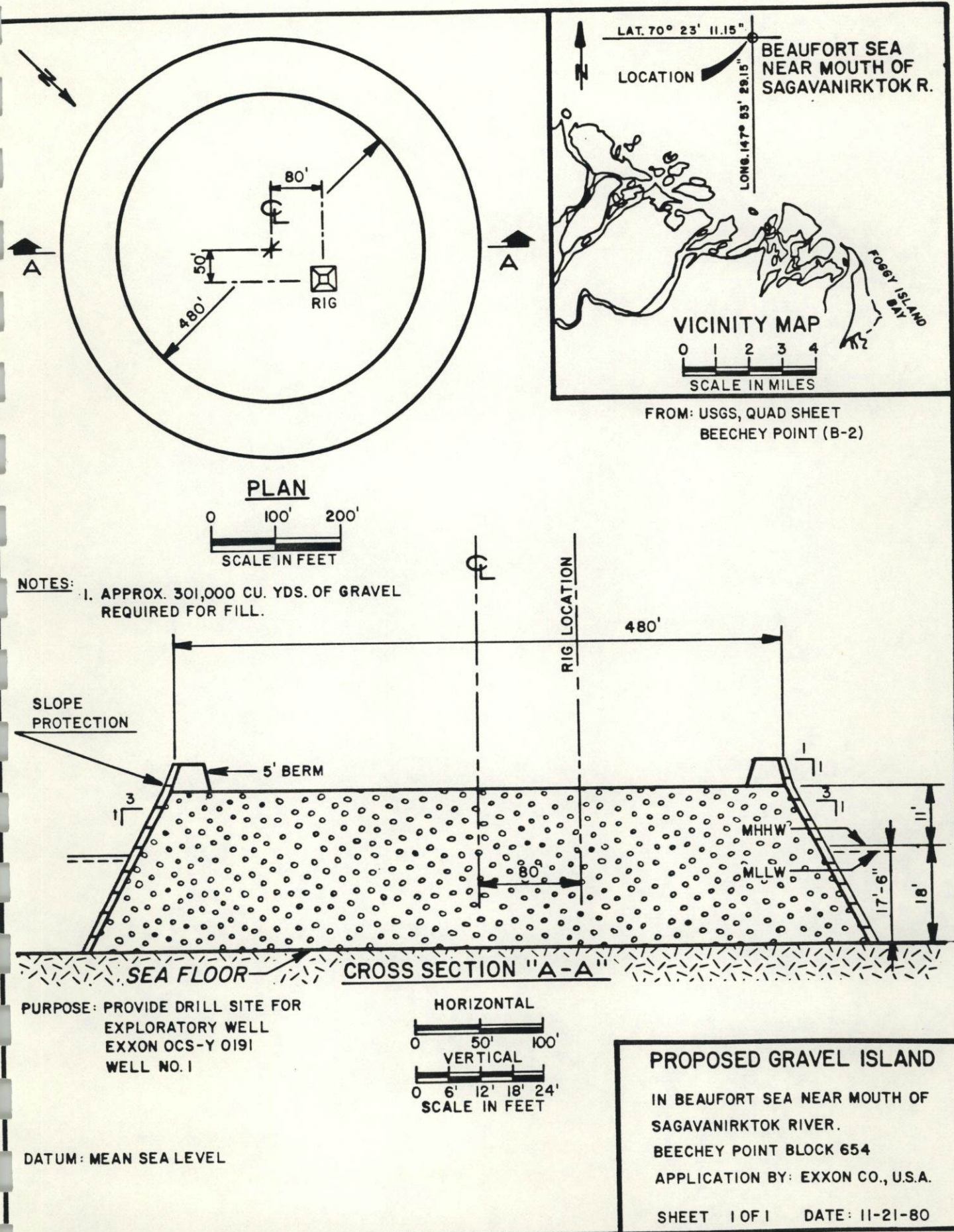


Figure 1

EXAMPLE

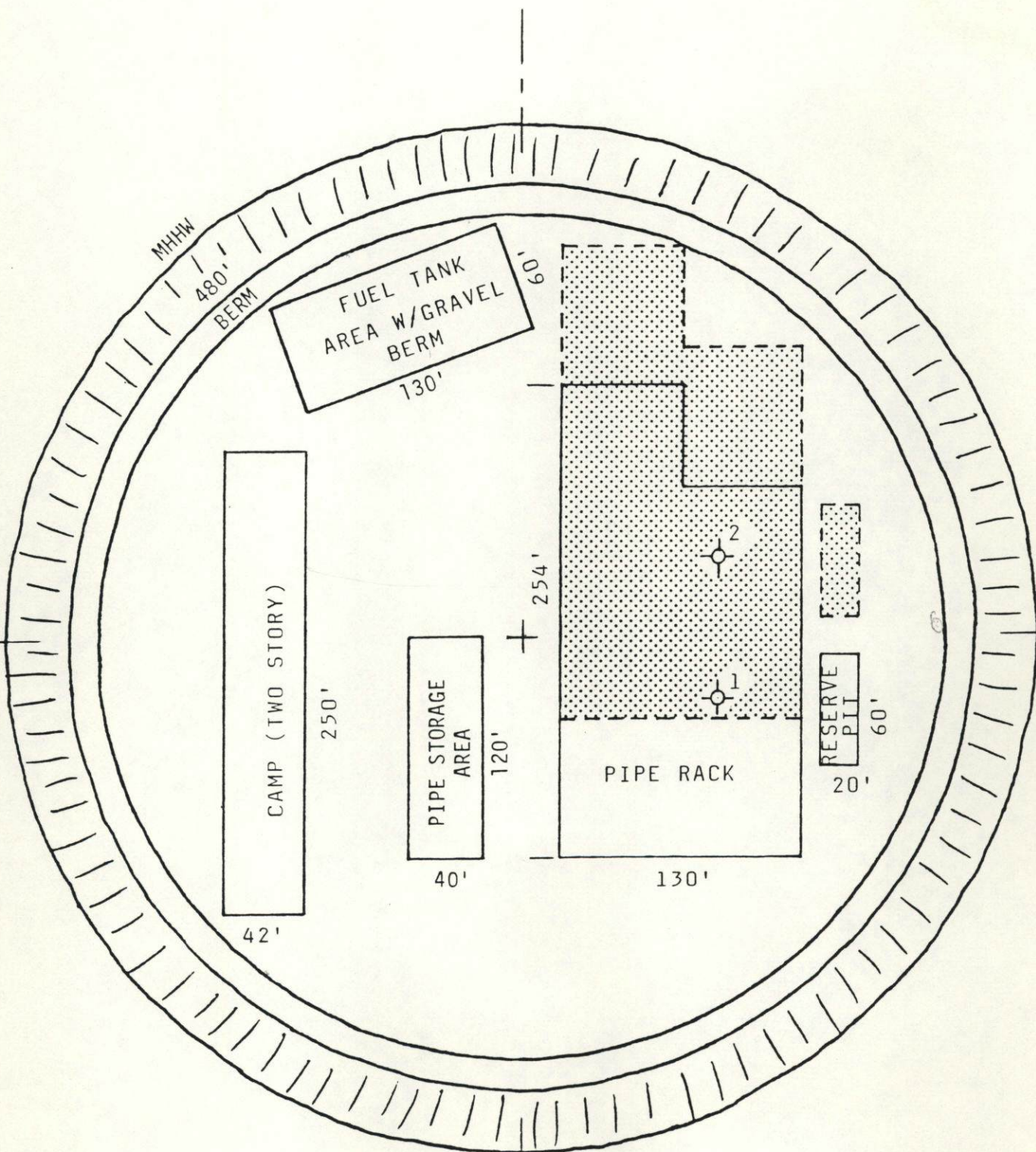


FIGURE 2

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. Any substitute rig will be similarly equipped.

AADCO 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 pick-up 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

- 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.

- Rigdrive - General Electric; AC/DC SCR system and motor control distribution center, all pressurized with controlled atmosphere. Six GE 752 DC motors are controlled from the drillers console position.
- 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.
- 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.
- Crown Block - Oilwell 500 ton, seven 60" x 1-3/8" sheave.
- Traveling Block - Oilwell; B-500, 500 ton, six 60" x 1-3/8" sheaves.
- Hook - BJ, 5500, 500 ton, dynaplex, automatic positioner hook.
- Swivel - Oilwell; PC-500, 500 ton, goose neck tapped for 2" free point access.
- Bails - BJ, 350 ton.
- Rotary Table - Oilwell; B-375, 37-1/2" opening, driven from drawworks.

- 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 hard-facing 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.
- Pipe Handling Equipment -
 - VARCO iron roughneck
 - Power slips
 - Hand slips
 - Kelly spinner
 - Drilco easy torque
- 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

- Totco Driller's Console with gauges and indicators for:
 - String weight
 - Rotary torque
 - 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

- Totco eight-pen recorder for:

String weight

Trip time

Penetration

Rotary torque

Pump pressure

Pump strokes per minute

PVT

- Totco circular record for trip tank
- Koomey BOP control console
- Cameron automatic choke control console
- Diverter Controls
- Communications equipment as follows:

16 AD open all station intercom

3 RCA 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).

- 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 flanged valves (one hydraulic) for kill line and one 4" flanged side outlet with two 4" - 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)

- 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, 6-275 CF nitrogen bottles as second back-up with remote electric control console behind driller on derrick floor.

d. Mud Treating

- 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.
- Shale Shaker - Brandt Engineering Co. double shale shaker with dual decks and screens.
- Mud Degasser - SWACO vacuum type degasser
- Mud Cleaners - Two Brandt Engineering Co. "combination" 400 gpm cleaners and/or desilters
- Centrifuge - Pioneer Mark I, 100 gpm with four feed pumps.
- Mud Blender - Two Pioneer sidewinder cyclonic
- Mud agitators and mud guns
- Mud Tanks -
 - 1000 bbl active tanks
 - 350 bbl storage
 - 80 bbl trip tank

e. Blowout Prevention Equipment

- 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.

• 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.

Baker floats for DC float subs.

Substructure 50 ton overhead BOP handling system.

f. 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. See attached Figure 4 schematic.

g. 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 muds pumps and a connection for a high pressure pump. See attached Figure 5 schematic.

h. Water and Fuel Storage:

- 1000 bbl total water storage
- 7400 bbl total diesel storage in double wall tanks.
- 1000 gallon gasoline tank for pickups
- 250 gallon forklift-portable diesel fuel tank for fueling up machinery/trucks on rig moves.

i. Air Compressors and Heating

- Two Sullair series 12-5AO single stage rotary screw air compressors driven by 50 HP AC motors, rated 200 cfm at 125 psi WP.
- Two Keewanee 100 HP boilers, automatic diesel fired and water level control.
- 30 Stardozik Ruffneck steam heaters driven by 1/2 HP AC motors
- Two Tioga 3,500,000 BTU indirect automatic fired diesel space heaters.
- 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.

j. Safety Systems and Alarms

- 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

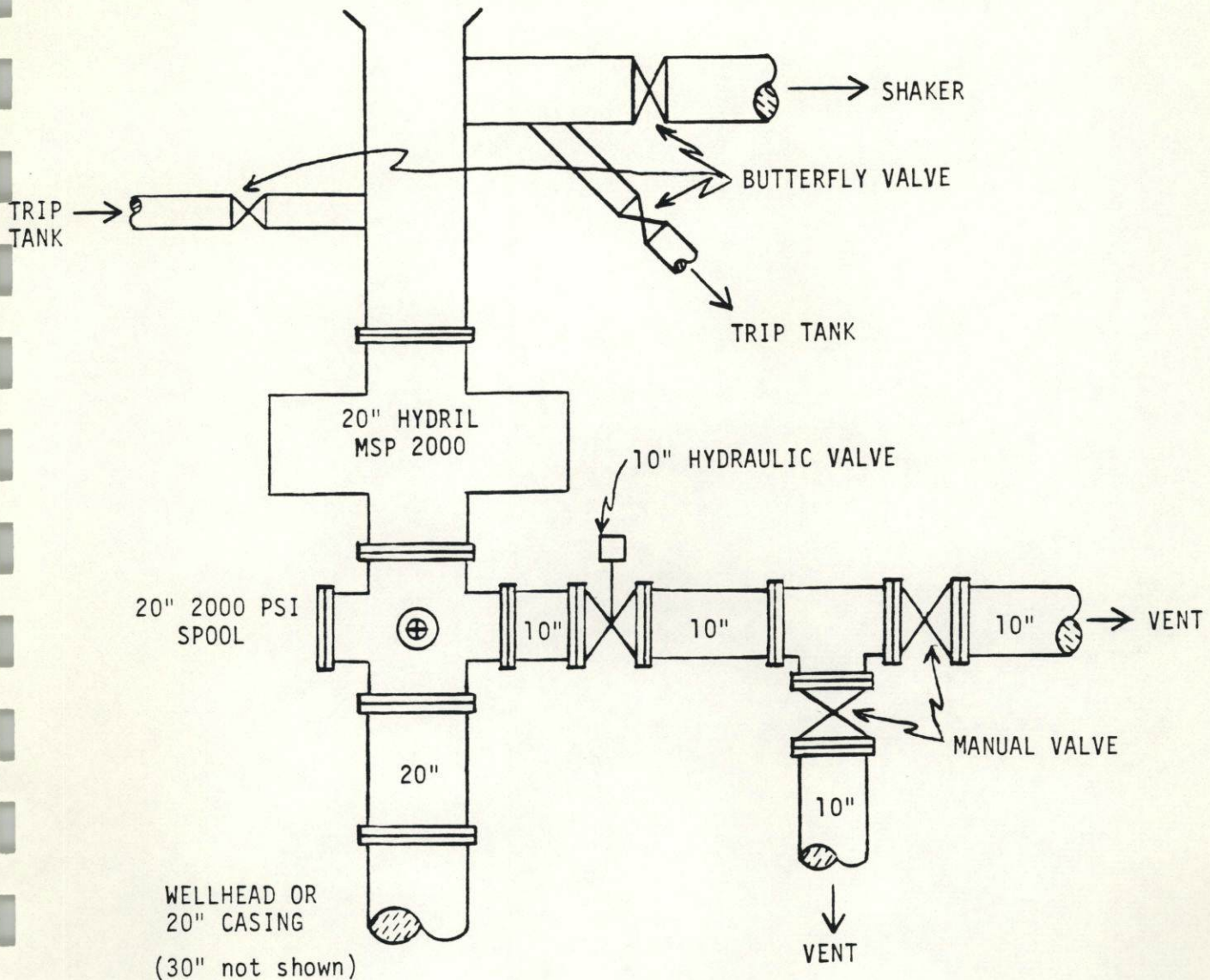
- Camp safety alarms include:

Heat and smoke detector and alarms

Manual general fire alarm

DIVERTER SYSTEM

For Use on 30" Structural and 20" Conductor Casing

OPERATING PROCEDURE

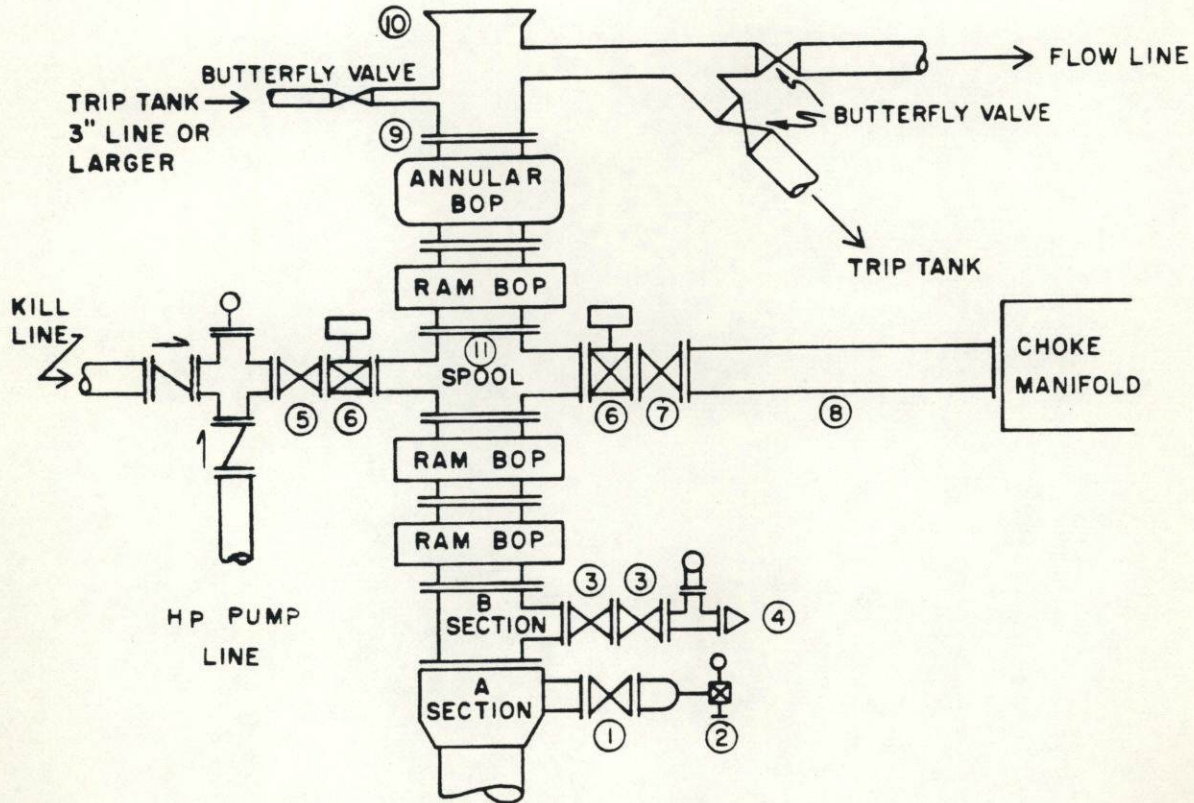
Diverter system has one-10" hydraulically operated main valve and two-10" manually operated branch valves. Diverter and main valve controls are interlocked. The main valve is normally closed and the diverter and branch valves are normally open while drilling.

In a Well Control Situation:

1. Close Hydril diverter which automatically opens main valve
2. Close upwind branch valve

Figure 1

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.

Figure 2

EXPLORATION PLAN

AADCO Rig No. 4

BLOWOUT PREVENTION PROGRAM

EQUIPMENT DESCRIPTION	
DIVERTER	20", 2000 psi WP Hydril MSP Annular Preventer with 10-3/4" Diverter System and hydraulically operated ball valves.
BLOWOUT PREVENTERS	<p>One - 5,000 psi WP Hydril GK Annular Preventer.</p> <p>One - 13-5/8", 10,000 psi WP Hydril X Single Preventer with ram locks equipped with pipe rams.</p> <p>One - 13-5/8", 10,000 psi Shaffer Drilling Spool with two side outlets equipped with 4" choke line and 3" kill line each with one 10,000 psi manual valve and one 10,000 psi shut hydraulic valve.</p> <p>Two - 13-5/8", 10,000 psi WP Hydril X Single Preventers with ram locks equipped with pipe & blind rams.</p> <p>Koomey Hydraulic Accumulator BOP Control Unit, 3,000 psi system with one remote control panel.</p>
BOP CONTROL SYSTEM	10,000 psi choke manifolding system with two Thornhill-Craver hand adjustable chokes and one Swaco hydraulic adjustable choke.
SURFACE MANIFOLD	

BOP TEST PROGRAM

1. Initial BOP Nipple Up Test - A to 3500 B, C, D, E, and F to 5000 psi. 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 Rams	Pipe Blind Rams	Annular
Surface	13-3/8	72	L-80	5,560	3,892	1,744	1,000	5,000	NA	3,500
Prot.	9-5/8	47	Soo-95	7,160	5,012	3,696	2,310	5,000	NA	3,500
Prod.	9-5/8	47	Soo-95	7,160	5,012	3,990	2,750	5,000	NA	3,500

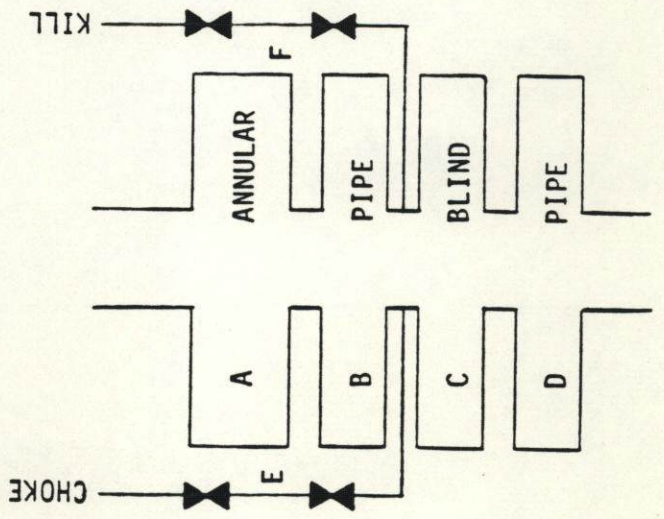
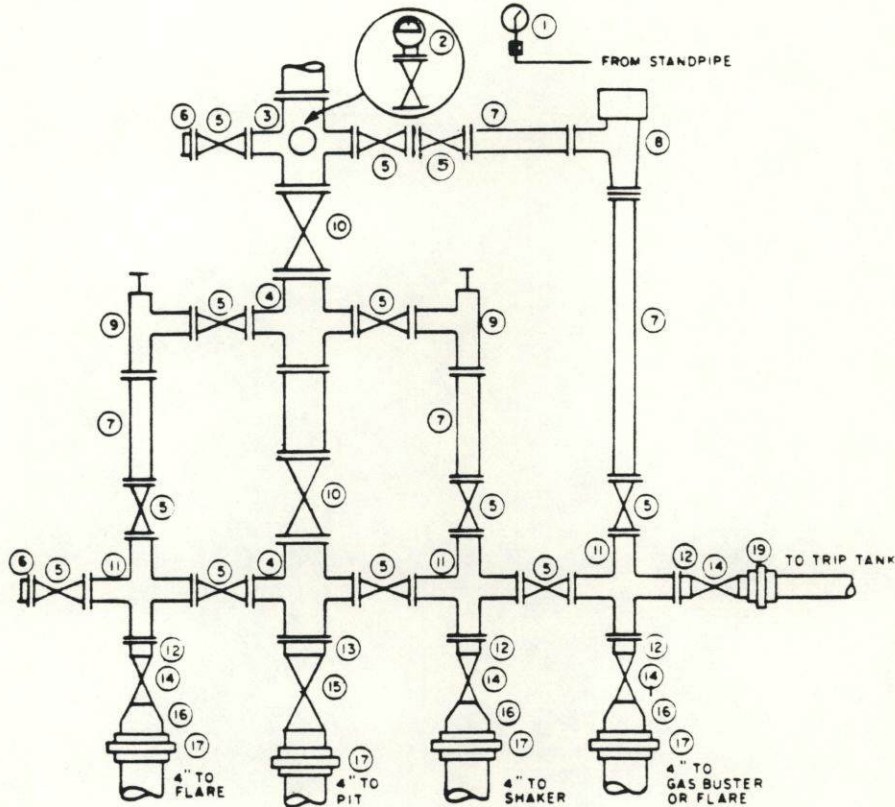


Figure 3

ARRANGEMENT OF 10000 PSI 3 CHOKE MANIFOLD

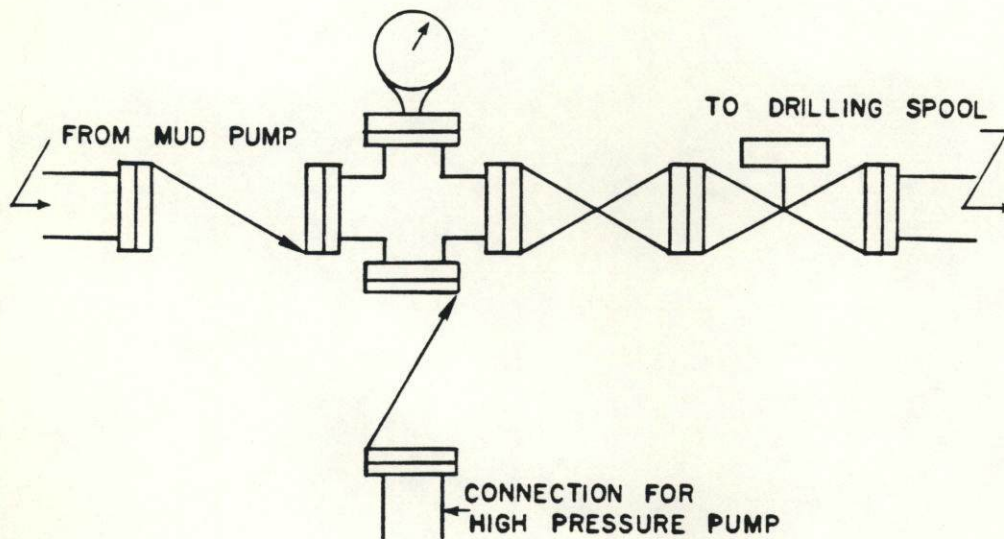


COMPONENT DESCRIPTION

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".
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.

Figure 4

ARRANGEMENT OF 10000 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 check valve may be provided to tie in an auxiliary pump.

Figure 5

TOTAL CONCEPT SYSTEM

The
Analysts.



THE ANALYSTS:
Pioneers in Applied Technology for
Drilling and Formation Evaluation

The Analysts are well known as the pacesetters in wellsite evaluation and monitoring technology. We developed the first computerized logging system for instantaneous analysis of drilling parameters to be operated at the drilling site. Our expertise in technological applications extends through all levels of our services, from the Physical Formation Log to our Total Concept System. And today, The Analysts' proven techniques set the standard for the entire industry.

To be the best in the industry requires more than just hardware. People are required to monitor and employ all equipment. And our people are very special.

Starting with full-time recruiters in the United States and the United Kingdom, the qualifications of our personnel are carefully screened. University training, college background or a high level of field experience are our criteria. But before an Analyst goes to work for any customer, he undergoes a rigorous, scheduled classroom and field training program in logging techniques and drilling practices; further, he is thoroughly educated in the function of every piece of equipment employed by The Analysts, from basic gas detection equipment through the most sophisticated minicomputers and peripheral hardware. In addition, every employee spends months in field training under the direct supervision of a senior member of our field staff.

The educational process continues as our personnel obtain field experience. Attendance at regularly scheduled seminars and workshops permits us to maintain a high standard of excellence. Our continuing education program assures our customers that Analysts' field personnel are thoroughly familiar with the state of the art in geological evaluation, engineering technology and computer applications—anywhere in the world.

Much can be said about our advanced technology, software, development engineering and design of equipment and our worldwide experience, but our greatest asset is our highly skilled people. We think you'll agree.



THE ANALYSTS' INSTANTANEOUS DRILLING EVALUATION LOG (IDEL): An In-Depth Look

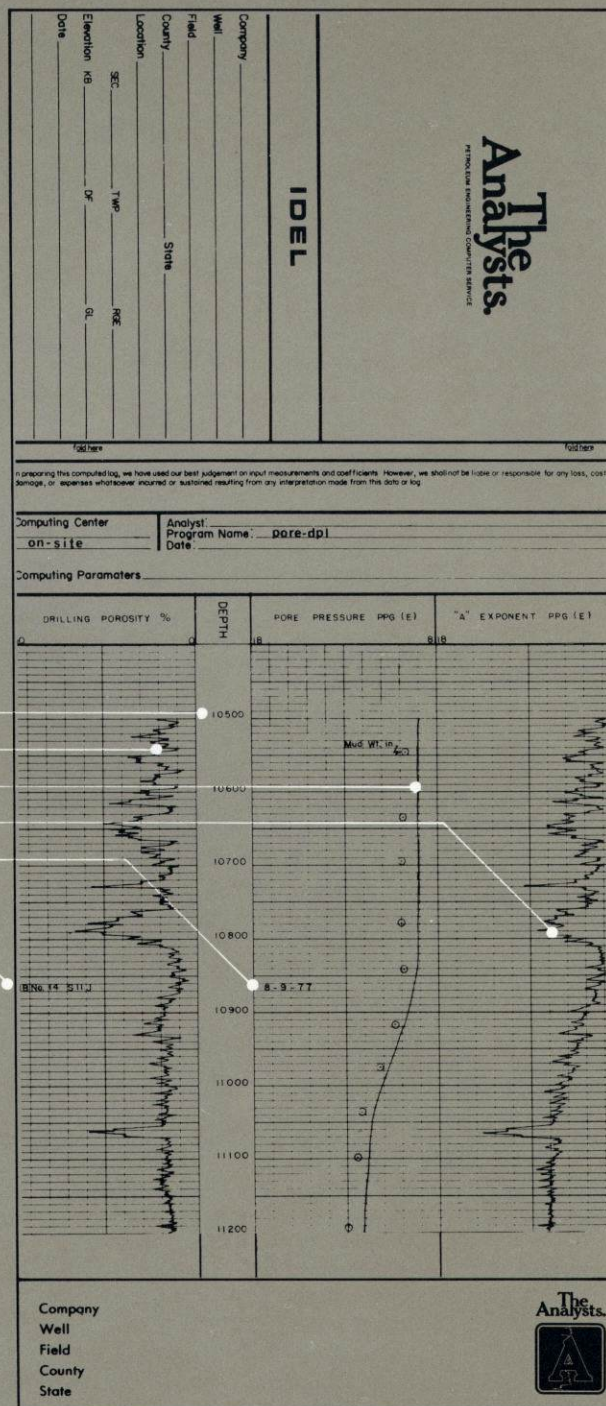
The Analysts' IDEL system was the first computerized, on-site logging system commercially available in the field. Many attempts to employ computer systems aboard rigs had previously been made. Reliable data acquisition systems, digital storage of all basic information and the capability to access all histological information were but some of the problems to be overcome. Since one of the primary motivational forces behind the original formation of The Analysts was to apply technological expertise in the drilling phase of field operations, it should be no surprise that we developed the first operational system.

Accumulation of information, detailed digital data and sophisticated mini-computer systems are a way of life today. It remains imperative that sophisticated software be employed to utilize the information accumulated. This is the point at which the differences in the various techniques are obvious. The Analysts' IDEL system is still the only technique in the world that instantly analyzes each foot of hole independently, without repeated manual adjustments. The program is designed to automatically compensate for bit wear, weight on bit, rotary speed, lithological variations and other parameters critical to accurate determination of formation porosity and pore pressure.

The system has been proven applicable regardless of geographical location or geological complexity. Logs presented instantaneously in the Gulf of Alaska, Gulf of Mexico, Gulf of Oman, North Sea, South China Sea, Beaufort Sea, Pacific Ocean, Atlantic Ocean, Indian Ocean, North America, South America, Africa, Europe and Asia demonstrate the versatility of the system. No trend lines, no adjustments for different geographical locations, no offset information are required to utilize the IDEL log on any well.

The formation porosity and pore pressure analysis are based on established drilling response theory, integrated with basic bit performance theory. Millions of feet of detailed drilling data have been accurately analyzed, verifying the basic theories applied in the software system. No major modification of the analytical technique has been necessary since its initial development, further supporting the validity of its theoretical basis. No other method of drilling data analysis can provide accurate, independent confirmation of porosity and pore pressure during the drilling process. The result is information which is distinctly unique as well as accurate. We think you will be pleased.

- Depth
- Drilling Porosity
- Pore Pressure
- "A" Exponent
- Calendar Date
- Bit Data

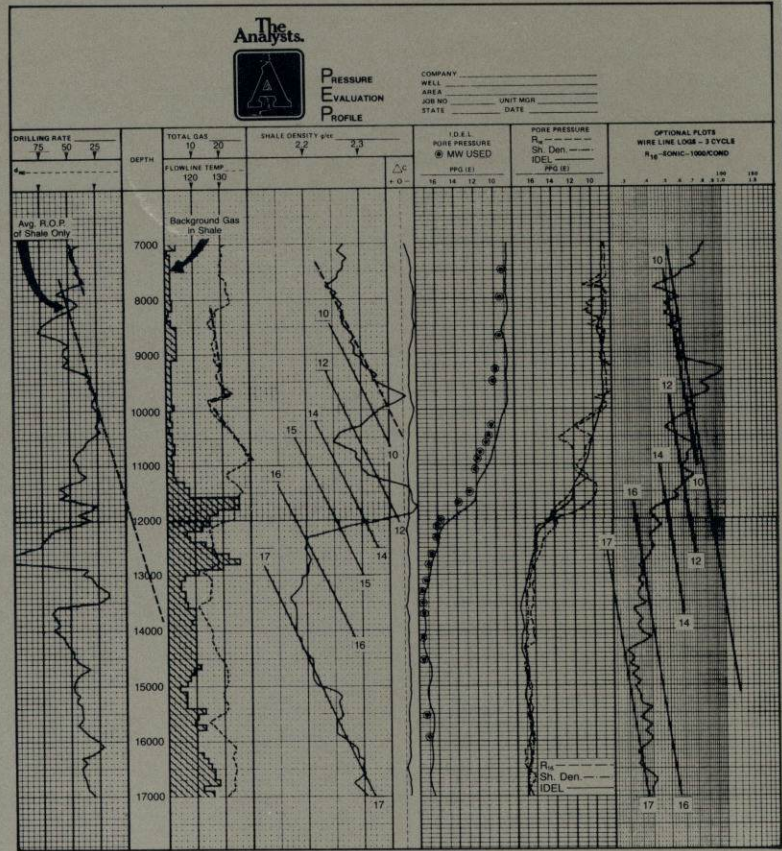
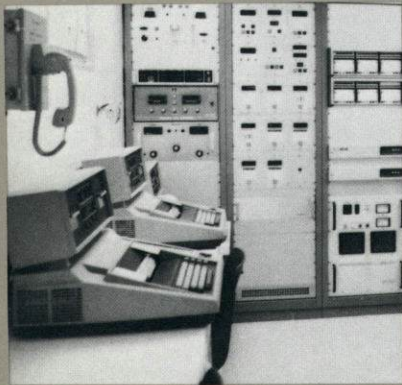


**PRESSURE EVALUATION
PROFILE LOG (PEP):
A Unique Look**

Pressure detection is of primary concern in all drilling environments. Practically every drilling problem is pressure related either because of pressure increases or pressure reductions. For this specific reason it is mandatory that we implement every technique and parameter currently utilized in the industry in our attempt to accurately determine the pressure of the formation in which we are drilling.

The Analysts have introduced the Pressure Evaluation Profile Log (PEP log) to satisfy the demand for all parameters being plotted in one presentation. The vertical scale has been compressed to 1/1000. Correspondingly, the horizontal scale has been expanded. As a result, any movement in any parameter becomes an anomalous flag to alert you to potential problems.

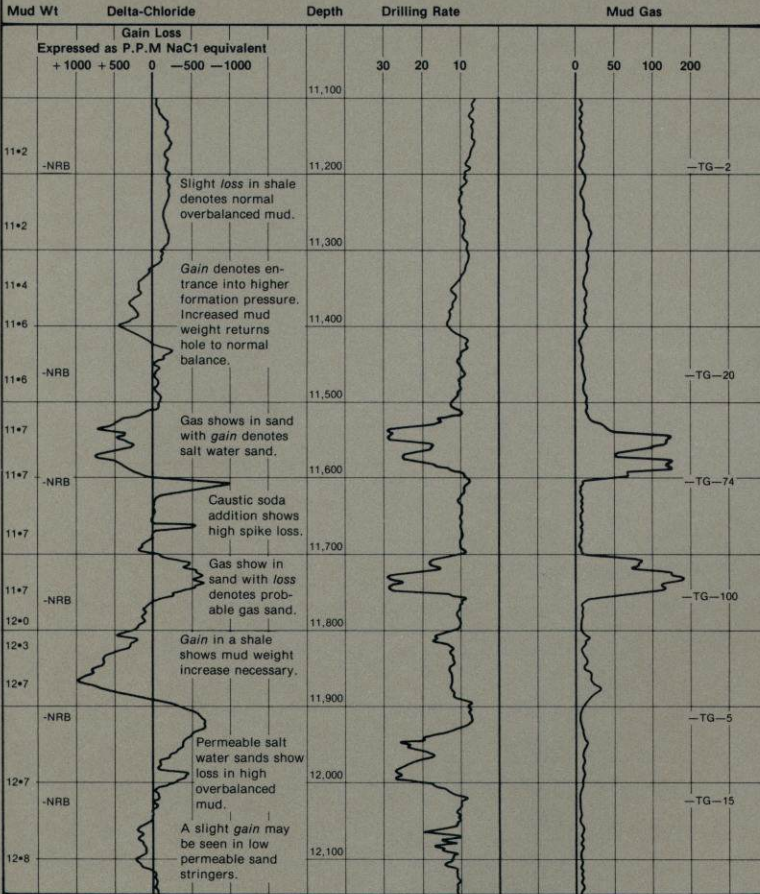
Our PEP log was designed for two specific objectives: one, to offer a working log for the logging engineers on location to be able to spot potential pressure problems as they occur, and two, to offer a log from which it is easy to communicate our reasons for our interpretations. We think that you will find this unique log format a useful tool for complete pore pressure analysis.



DELTA CHLORIDE LOG



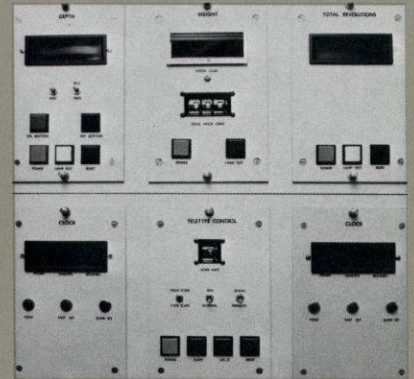
COMPANY _____
 WELL _____
 LOCATION _____
 STATE _____ DATE _____
 JOB NO. _____ UNIT MANAGER _____



DELTA CHLORIDE LOG:
 A Different Look

Delta Chloride Logging has been a basic pressure detection tool for several years. The basic system measures the conductivity of the drilling fluid as it is pumped into the well and at the surface after being circulated through the annulus. Compensating the conductivity readings for temperature changes encountered during the complete circulation and expressing the resulting values in parts per million sodium chloride equivalent makes it possible to establish a companion basis.

The technique of Delta Chloride Logging lends itself to automation. Using temperature-compensated probes to generate digital values for conductivity measurements makes the conversion to sodium chloride equivalents relatively simple. Plotting the values in their correct relative positions on the depth scale selected for the well provides a sensitive tool for pressure determination.



**TOTAL CONCEPT:
The Complete Look**

The Analysts' Total Concept System unifies the Physical Formation Log, the IDEL log and the PEP log, as well as any number of auxiliary services, into one easily applied system. This comprehensive monitoring approach to basic formation evaluation and detailed drilling data analysis is the most sophisticated system available today. All parameters monitored can be digitally displayed, recorded in analog or digital form and analyzed during the drilling process, while circulating or during trips.

The Modular Digital Scanning Unit is designed for versatility and flexibility. Modules are interchangeable, and each is its own analog to digital converter. Uninterruptible power supplies ensure that every job is continuous so that all information is current and directly applicable. This is particularly important when the software is not trend-oriented; rather, each data point must stand on its own merits.

The extensive experience and technological expertise of the world's first and largest company providing computerized monitoring systems assures you that The Analysts' Total Concept System is the most proven and reliable logging service in the world today. Contact your local Analysts' representative for a complete discussion of services and techniques.

A variety of specialized analytical programs is available, either as a part of the computerized IDEL system or as a stand-alone auxiliary system. Use of the DEC 1103 system allows a tremendous flexibility in the available routines. Additions of terminals capable of magnetic tape functions, floppy disk storage systems and core memory expandable in increments of 4K allow the hardware to expand to a 28K useable internal memory and almost unlimited external memory. Plotters, CRT's and other peripheral equipment can be added to produce a thoroughly comprehensive and flexible hardware system.

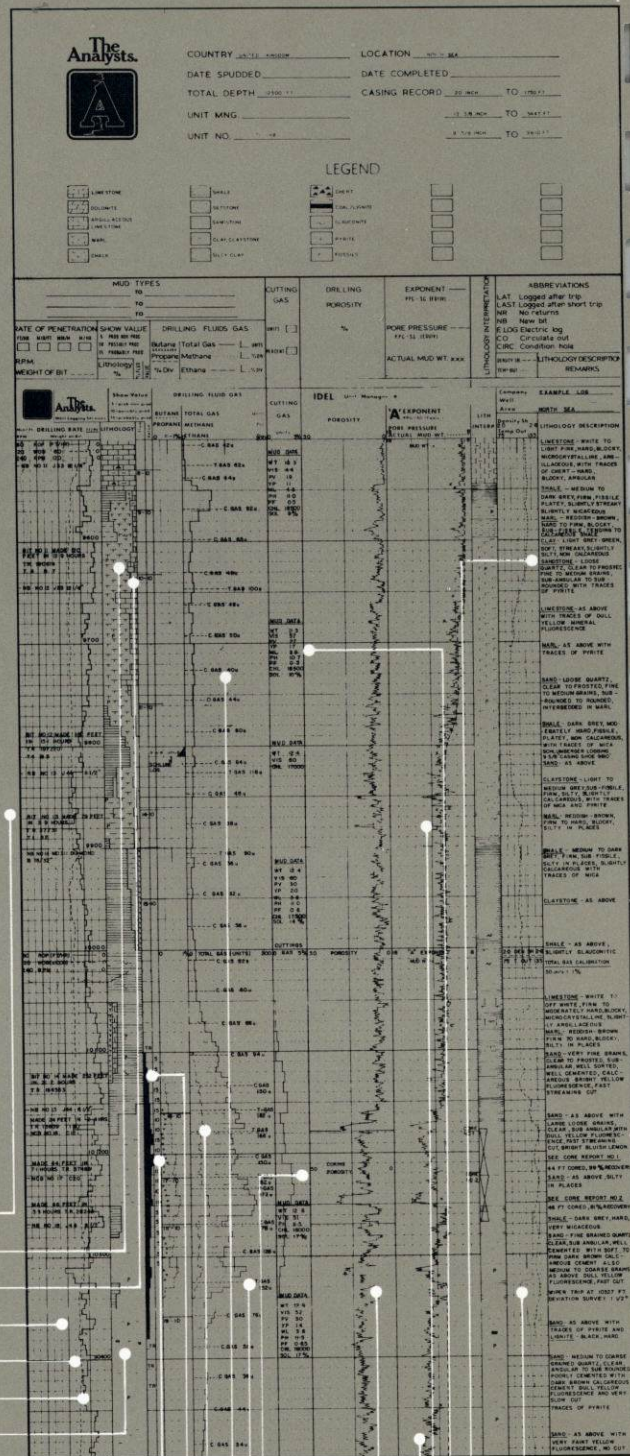
Because our software routines are designed for conversational input, they can be loaded easily and used by your personnel in the field to analyze properties considered critical to a particular well. Should the need arise, a simple

modification is available to allow your personnel on location to program the computers themselves. Some of our auxiliary programs include:

- ECD calculation—equivalent circulating density
- "d" Exponent—calculates "d" exponent and modified "d" exponent
- FRAC pressure calculation—FRAC gradient calculated by three methods
- HYDRO—selection of optimum bit nozzle size
- BIT HYDRO—evaluation of hydraulic program for the well
- KILL program—calculates mud weight, hole volumes and casing pressure for circulating a 'kick'
- PORLOG—compares density of sonic porosities to core porosities; computes formation matrix, fluid matrix, etc.
- PORSAT—calculates porosity, water saturation (Archie, Humble, & Patchett equations) from one porosity tool and one resistivity for clean and shaly sands
- SAND SHALE—water saturation analysis of shalesands to determine hydrocarbon content
- SWAB/SURGE pressure analysis—calculates maximum pipe velocities permissible

In addition to a standard set of auxiliary programs, other programs are available from the Analysts' comprehensive program library.

- Bit Data
- Lithology Description
- Calendar Date
- RPM
- Weight on Bit
- Drilling Rate
- Depth
- Show Evaluation
- % Fluorescence
- Combustible Gas Analysis
- Connection Gas
- Trip Gas
- Cuttings Gas
- Drilling Porosity
- Pore Pressure
- "A" Exponent
- Drilling Fluid Properties
- Formation Bulk Density
- Flow Line Temperature



c. Mud Logging

An Analysts unit (Schlumberger, Inc.) will be installed on OCS-Y 0191 No. 1. 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 \cong 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 H₂S, 1) a "mud duck" system checks pH and H₂S 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 drillers panel, and two supervisors quarters.

I.B.3 Fire Fighting and First Aid Equipment

- Camp -
Automatic extinguisher over kitchen stove
10 - Ansul LT 30# hand extinguishers
1 - Ansul LT 150# wheel mounted extinguisher hose
and reel.
- Rig -
40 - Ansul LT 30# hand extinguisher
1 - Ansul LT 150# wheel mounted extinguisher and
hose.
- 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. high resolution shallow hazard surveys, and c. velocity surveys.

- a. CDP Seismic Surveys - It is probable that further seismic surveys will be conducted in the area concurrent with island construction 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.

1. Geophysical Operations, Cont'd.
 - c. Shallow hazard surveys - High resolution geophysical surveys were conducted during the summer of 1980 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
 - 30 Seismic cables, 75 conductor pairs each, with 12-110 foot interval geophone connectors each, useable for any group interval that is a multiple of 110 feet
 - 1 TT 200 6X6 wheeled recording vehicle
 - 1 ARDCO 6X6 wheeled vibrator tender
 - 4 TT 100 4X4 wheeled or tracked cable and geophone carriers
 - 1 TT 100 4X4 wheeled survey vehicle
 - 1 M-114 tracked survey vehicle
 - 1 TT 100 4X4 crane equipped camp vehicle
 - 1 M-115 tracked ice check vehicle with auger drill

2. Equipment for Typical Ice Crew, Cont'd.

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

Food service supplies

Spare parts

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

3. Personnel in a Typical Geophysical Ice Crew,
cont'd.

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	220 feet
Number of geophone locations per group	24
Number of geophone elements per location	1
Distance between vibration points	440 feet/220 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, as "Volume 2", and marked: "Exxon Proprietary for U.S.G.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

- 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.
- 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) 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 Beaufort Sea 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 comprise by far the major portion of the mud composition. Safety and environmental technical bulletins for the basic mud components are available but are not included since, as described later, there will be no drilling mud discharges from the site. Table III lists basic mud types and 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 USGS Order 2. Table 2, attached, reflects the minimum and planned requirements for an example 12,500-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.

c. Special Purpose Additives

Those special purpose additives listed on Table I 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.)

There will be no discharge of either drilling mud or drill cuttings from the site. Cuttings will be stored on location and transported ashore for disposal at an approved site. Maximum use will be made of mud solids control equipment to keep the volume of excess mud to a minimum. Prior to setting 9-5/8" casing, any excess mud will be stored on location or will be transported ashore and disposed of at an approved site. Following setting 9-5/8" casing, injectivity will be established down the 13-3/8" x 9-5/8" annulus and all excess mud will be disposed of in this manner. This is the same procedure as used on Exxon's Alaska St. Duck Island Unit Wells No. 1 and No. 2 which proved to be effective. In Exxon's Environmental Report it is stated that an estimated 2500 bbls. of cuttings and 2250 bbls. of drilling mud will be disposed of from

a typical well.

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 to approximately 1,000 feet RKB in the Exploration wells to be drilled in this area. None of the wells nearby this area are known to have encountered gas hydrates. Exxon's Duck Island No. 1 located just outside this area to the south had permafrost to approximately 1500 feet RKB but did not encounter gas hydrates. It is 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 of 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 2,800 feet is expected to cover all potential gas hydrate zones. A shallow hazards survey will be conducted at each well location to determine the presence or absence of all shallow hazards, including any indications of hydrates.

TABLE I
MUD PROGRAM
EXAMPLE WELL

BEAUFORT SEA, BEECHEY POINT AREA

Hole Depth - RKB	Mud Weight - ppg	Viscosity	Water Loss
ML - 1,000	8.8 - 9.0	-	-
1,000 - 2,800	9.0 - 9.3	-	-
2,800 - 9,000	9.0 - 9.5	6 - 12	<20
9,000 - 10,500	9.5 - 10.0	8 - 15	<15
10,500 - 12,500	9.8 - 10.0	9 - 15	<15

Typical

MUD COMPONENTS*

A. Basic Mud Components:

Attapulgate (Saltwater Dispersible Clay)
Barite (Barium Sulfate)
Bentonite (Sodium Montmorillonite Clay)
Lignosulfonate (Chrome Lignosulfonate)
Lignite (Leonardite-brown Coal)
Caustic Soda (Sodium Hydroxide)
XC Polymer (Xanthum gum Biopolymer)
Ben-ex (Polymer, Flocculant and Clay Extender)
Cellex & CMC (Carboxymethyl Cellulose)
Dextrid (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 (Naphtha Base Surfactant)
Lubra-Glide (Copolymer Beads)
Torque-Trim (Vegetable Oil Base)
Black Magic (Oil Base Surfactant)

Lost Circulation Material:

Mica
Nut Hulls

Defoaming Agents:**

Aluminum Stearate
Octal Alcohol Defoamers

H₂S Scavenger

Zinc Carbonate

Viscosifiers

Quik-Gel (High Yield Sodium Montmorillonite Clay)

Bacteriacides

Aldacide (Microbiocide)

*Will not be discharged from the site - will be injected into 13-3/8" x 9-5/8" annulus or will be properly disposed of ashore.
**Cottonseed oil will be used in trace amounts to enhance the effectiveness of the defoaming agents.

NOTE: See Table III for list of mud types and for the range of components which might be used during the drilling program.

TABLE 2

MINIMUM QUANTITIES OF MUD MATERIALS FOR EMERGENCY USE
EXAMPLE 12,500-FOOT WELL

BEAUFORT SEA, BEECHEY POINT 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 2 ppg Based on 1900-bbl Active System</u>	<u>Planned Minimum No. Sacks on Site</u>
<u>Surface Casing</u> 2800' RKB Depth 9.3 ppg MW 17-1/2" Hole				
Barite	42	42	2050	2050
Bentonite	21	21	-	400
Lignosulfonate	1	2	40	40
Lignite	1	2	40	40
Caustic Soda	1	2	20	20
<u>Intermediate Csg Depth</u> 10,500' RKB Depth 10.0 ppg MW 12-1/4" Hole			<u>Based on 2600-bbl Active System</u>	
Barite	80	80	2860	2860
Bentonite	21	21	-	600
Lignosulfonate	2	4	60	60
Lignite	1	2	60	60
Caustic Soda	1	2	30	30
<u>Total Depth</u> 12,500' RKB Depth 10.0 ppg MW 8-1/2" Hole			<u>Based on 1900-bbl Active System</u>	
Barite	80	80	2090	2090
Bentonite	21	21	-	430
Lignosulfonate	2	4	40	40
Lignite	1	2	40	40
Caustic Soda	1-1/2	3	30	30

The proposed rig has the following mud system capacities: 1000-bbl Active Pits, 350-bbl Reserve Pits, and 80-bbl trip tank.

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

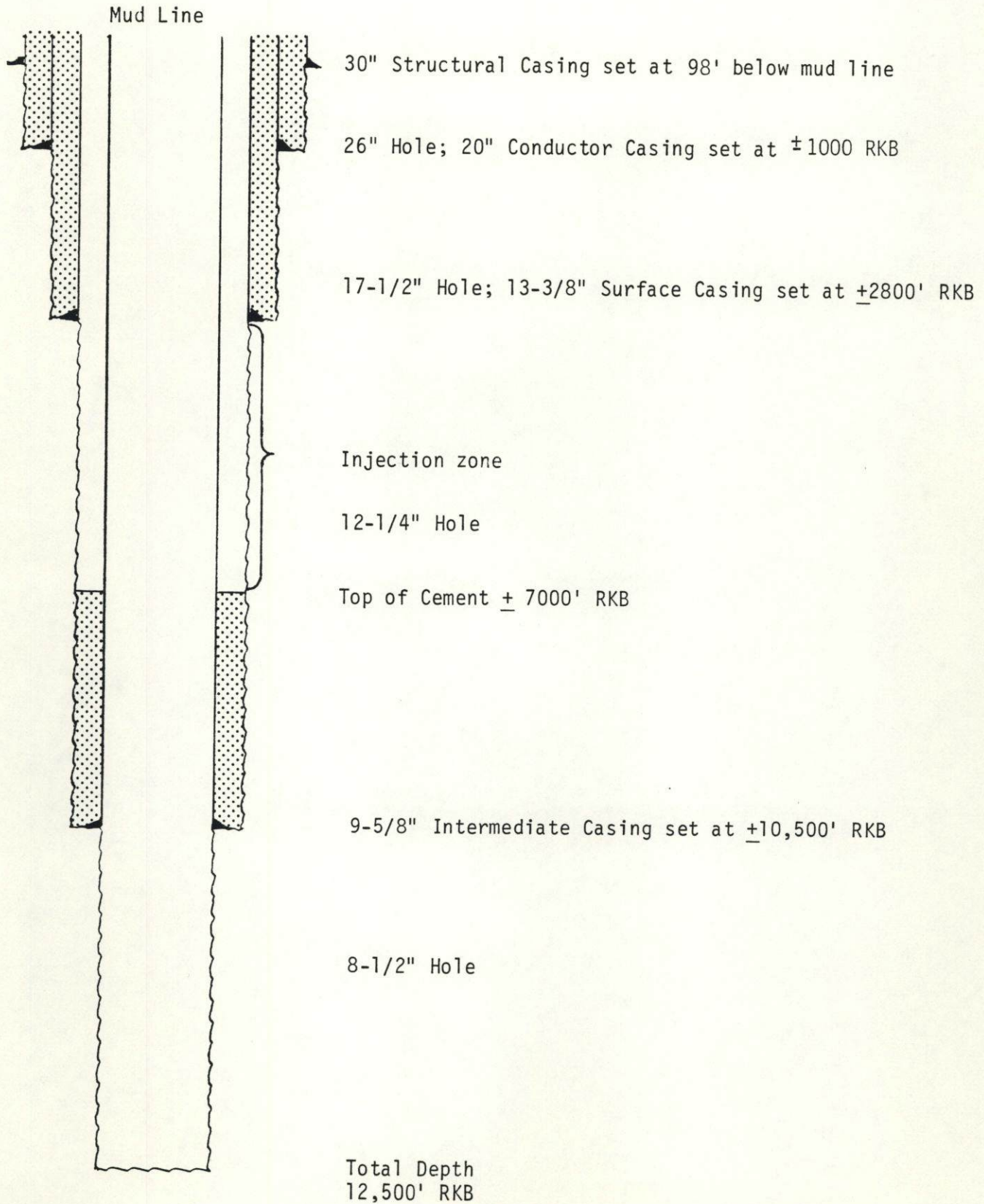
<u>Component</u>	<u>#/BBL</u>
Bentonite	5 - 15
Acrylic Polymer	0.5 - 2
Barite	25 - 180
Drilled Solids	20 - 70
Freshwater	As Needed

6. Spud Mud (slugged intermittently with seawater)

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

BEAUFORT SEA, BEECHEY POINT AREA

Typical Well Bore Sketch
Showing Casing Depths and
Hole Sizes



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 USGS.)
 - 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 USGS.)
 - 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 USGS.)
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 USGS.

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 300' of conventional coring is anticipated while drilling OCS-Y 0191 No. 1.

I. H. Geological and Environmental Information

1. Harding-Lawson Associates conducted a multi-sensor high resolution survey in June 1980, for Exxon Company, U.S.A., as Operator of offshore leases OCS-Y 0189 through 0193 and selected adjacent Alaska state leases. The report and data for this survey were submitted to the USGS as a part of the Environmental Report supporting this Plan. The survey's multiple objectives were to provide geologic information to supplement a foundation coring program for shallow hazard and engineering assessment of the area and to investigate rock habitats on the sea floor as such habitats relate to local biological communities. Field acquisition was performed utilizing concurrently the Klein Associates kHtz sea floor mapping side scan sonar system, a high resolution Raytheon RTT-1000 depth recorder and 7.0 kHz subbottom profiler and a Van Reenan Mono-Pulser subbottom profiling system. The sea floor of the proposed location for the gravel island for OCS-Y 0189 No. 1 (H-L shot-point No. 2777) is smooth and free of any obstructions and slope instabilities; near-surface conditions are assessed from both geophysical and core data as favorable. If, and as additional specific gravel islands and well locations are made, planned specific sites will be reviewed for such features as the presence of strudel scour, ice gouge, sand waves, 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 the summer open water period. Because of the barrier islands and remaining sea ice, the fetch is limited; therefore, the heights are usually less than 50 cm. Rarely, swells reach 2.1 meters with storm wave heights of 3 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 in November-December, river flooded in late May with breakup usually in late June.
 - e. Permafrost - Relict permafrost underlies the entire area of the subject leases. At the site of OCS-Y 0191 Well No. 1, the top of the permafrost is 9 meters below the sea floor.

2. Regional maximum environmental conditions, Cont'd.

- f. Seismic motion - Seismic activity in the subject area is very low. Gravel island technology has been in the past, and is presently, 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 gravel islands. It may cause temporary interruptions of transportation and suspensions for personnel safety.

I. I. Environmental Training Program

An environmental training program will be given to all personnel directly involved with the exploratory activities of the Plan. The program is designed to inform each such person, including Exxon supervisors, managers, agents, contractors and subcontractors of environmental, sociological, and cultural concerns that they might impact in the Plan area as well as training in arctic survival.

As reviewed and found satisfactory by the Joint Federal/State Biological Task Force, the program includes video tape presentations prepared under the direction of Mobil, SOHIO, and Exxon. The tapes are 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 this program are:

1. Physical environment with examples of potential negative impacts for avoidance:
 - o Description and explanation of coastal plain 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 freezeup/breakup 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, 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.

Although the program as presently constituted is satisfactory, an edited revision, prepared under the auspices of the Alaska Oil and Gas Association is planned for Industry-wide application.

CONTINGENCY PLAN

BEAUFORT SEA, BEECHY POINT

USGS MAP DESIGNATION BEECHY POINT, UTM ZONE 6

OCS-Y 0189, 0190, 0191, 0192, & 0193

Exxon Company., U.S.A., et al.

(a division of Exxon Corporation)

P. O. Box 4279

Houston, Texas 77001

December 1980

CONTINGENCY PLAN
BEAUFORT SEA, BEECHEY POINT
OCS-Y 0189, 0190, 0191, 0192, and 0193

UTM Zone 6

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Section (1)

SCOPE AND OBJECTIVE OF PLAN
BEAUFORT SEA, BEECHEY POINT
OCS-Y 0189, 0190, 0191, 0192, and 0193

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, including preliminary plans for construction of an additional relief well location.
- F. To outline the procedure for securing the wellbore and evacuating personnel from the location in the event ice forces cause lateral displacement of the gravel island.
- 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, an Exxon North Slope Emergency Manual is currently being prepared by Anchorage Drilling. This manual will contain more detailed procedures and information for dealing with all types of emergencies that may be encountered during exploration drilling activities on the North Slope. This manual also will serve to avoid placing repetitious material such as phone lists, equipment brochures, etc., in each individual Drilling Well Program. When completed, this manual will be submitted to the USGS, if requested.

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, BEECHEY POINT OCS-Y 0189, 0190, 0191, 0192, and 0193

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.

Gravel island locations will be designed and built to accommodate the drilling rig, camp, and necessary supplies for a winter drilling operation. The locations will have a freeboard of 11 feet which is designed to resist ice override and lateral movement and is above the maximum indicated tide based on observations along the surrounding coast.

Figure 1 shows the island proposed for the first well, OCS-Y 0191 Well No. 1. Island diameter is 480 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 11-foot freeboard, a 5-foot berm is planned for the perimeter of the island. Slope protection is also planned to control slope erosion. The rig and associated equipment and supplies will either be trucked over ice roads to the location or will be barged during the summer open water period.

III. General Site Details.

Figure 2 shows an approximate rig layout. 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 double-walled 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, with excess being injected as described below. A lined reserve pit will provide space for emergency discharge of fluids, if required, and will normally be kept dry to maximize storage capacity.

Additional precautions will be taken to prevent drainage of hydrocarbons to the sea. After freezeup, the surface of the island will be sprayed with water to form an impervious ice seal. This should prevent liquids spilled

on the surface from draining downward into the gravel fill. Also, any spills will be cleaned up as soon as possible. Snow contaminated by toxic substances will be incinerated on site or hauled to a disposal site on shore. The island surface 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 will be used to contain an open water spill. After freezeup, the natural snow surrounding the location will be used to 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 different climatic conditions.
- C. Control and containment methods for toxic spills under different climatic conditions including drills in using the various items of containment and cleanup equipment listed below.
- D. Cleanup and proper disposal procedures.

The ABSORB Manual will serve as a good training manual for this instruction along with the Exxon North Slope Emergency Manual which is under preparation. The latter manual will contain 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 previously mentioned Exxon North Slope Emergency Manual, will be activated to the degree required by the severity of the spill up through complete loss of control and blowout of a 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
	ABSORB Co-op Equipment

*Summer drilling only.

**Equipment available at Deadhorse is expected to require 6 to 12 hours to mobilize to the location, dependent upon weather conditions.

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 (Walnut hulls, cellulose, etc.)
 Centrifugal Pumps and Hoses

Additional spill cleanup equipment including oil mops and sorbent materials can be mobilized from Anchorage to Deadhorse within 4 to 6 hours. Also, additional personnel and equipment can be rapidly mobilized from the Alaskan Beaufort Sea Oil Spill Response Body (ABSORB) 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:

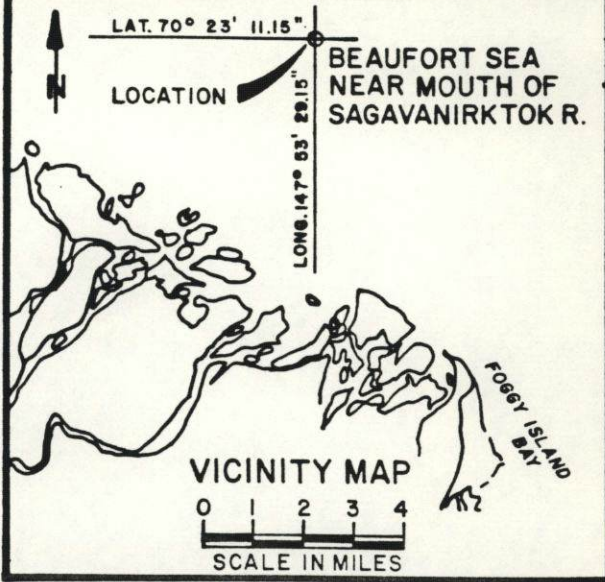
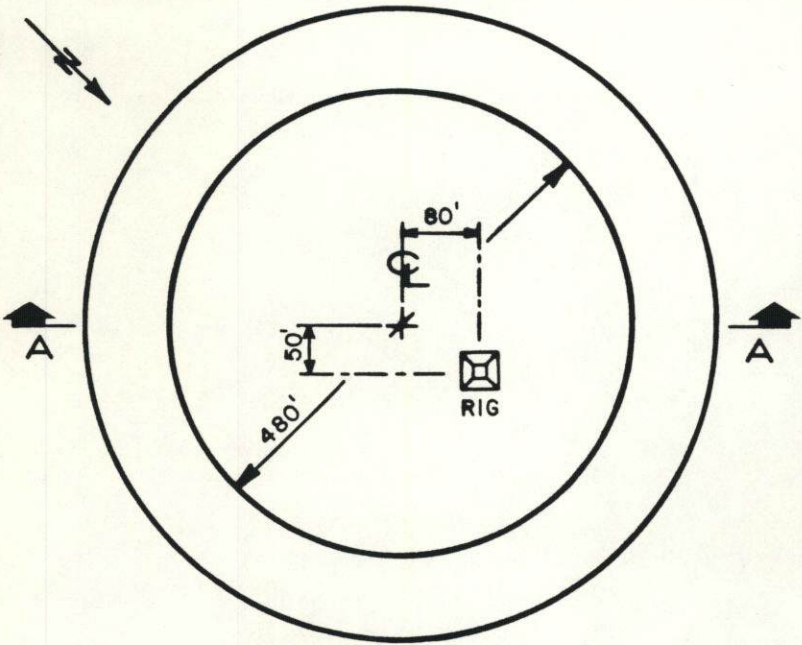
1. The Exxon Drilling Superintendent will designate "Briefing Areas" where all personnel will meet in case of emergency and where emergency equipment will be kept.
2. The site will be equipped with an Exxon operated radio system.
3. A list of current emergency telephone numbers and a map of the local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

B. Injection Procedures.

A primary feature of the drilling plan will be to provide 13-3/8" x 9-5/8" annular injection capability. The well casing program is designed to set 13-3/8" surface casing through the major gravel sections and below any possible freshwater zones. The 9-5/8" protective casing will be cemented to isolate the saltwater 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.

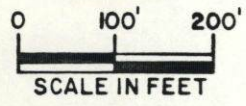
The following procedures will be followed:

1. After the 9-5/8" casing string is set, injectivity tests will be conducted down this 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. The injection pump will be used to inject all fluids.
2. Use the supplied forms to record daily the fluid injected into the well.
3. Prior to injecting any fluid down the annulus, notify the Drilling Superintendent.

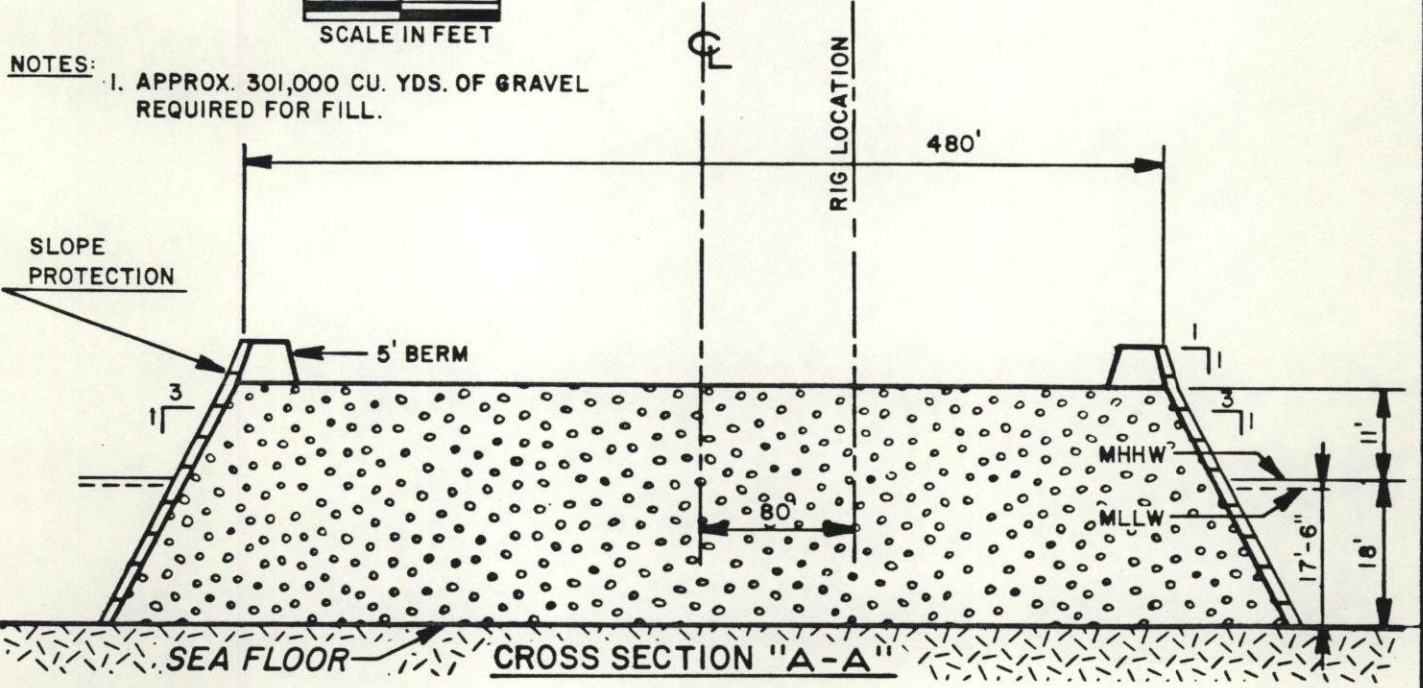


FROM: USGS, QUAD SHEET
BEECHY POINT (B-2)

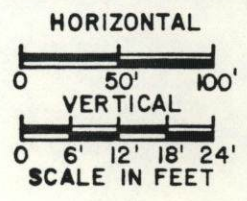
PLAN



NOTES:
1. APPROX. 301,000 CU. YDS. OF GRAVEL
REQUIRED FOR FILL.



PURPOSE: PROVIDE DRILL SITE FOR
EXPLORATORY WELL
EXXON OCS-Y 0191
WELL NO. 1



DATUM: MEAN SEA LEVEL

PROPOSED GRAVEL ISLAND
IN BEAUFORT SEA NEAR MOUTH OF
SAGAVANIRKTOK RIVER.
BEECHY POINT BLOCK 654
APPLICATION BY: EXXON CO., U.S.A.
SHEET 1 OF 1 DATE: 11-21-80

FIGURE 1
Page 8

EXAMPLE
RIG LAYOUT

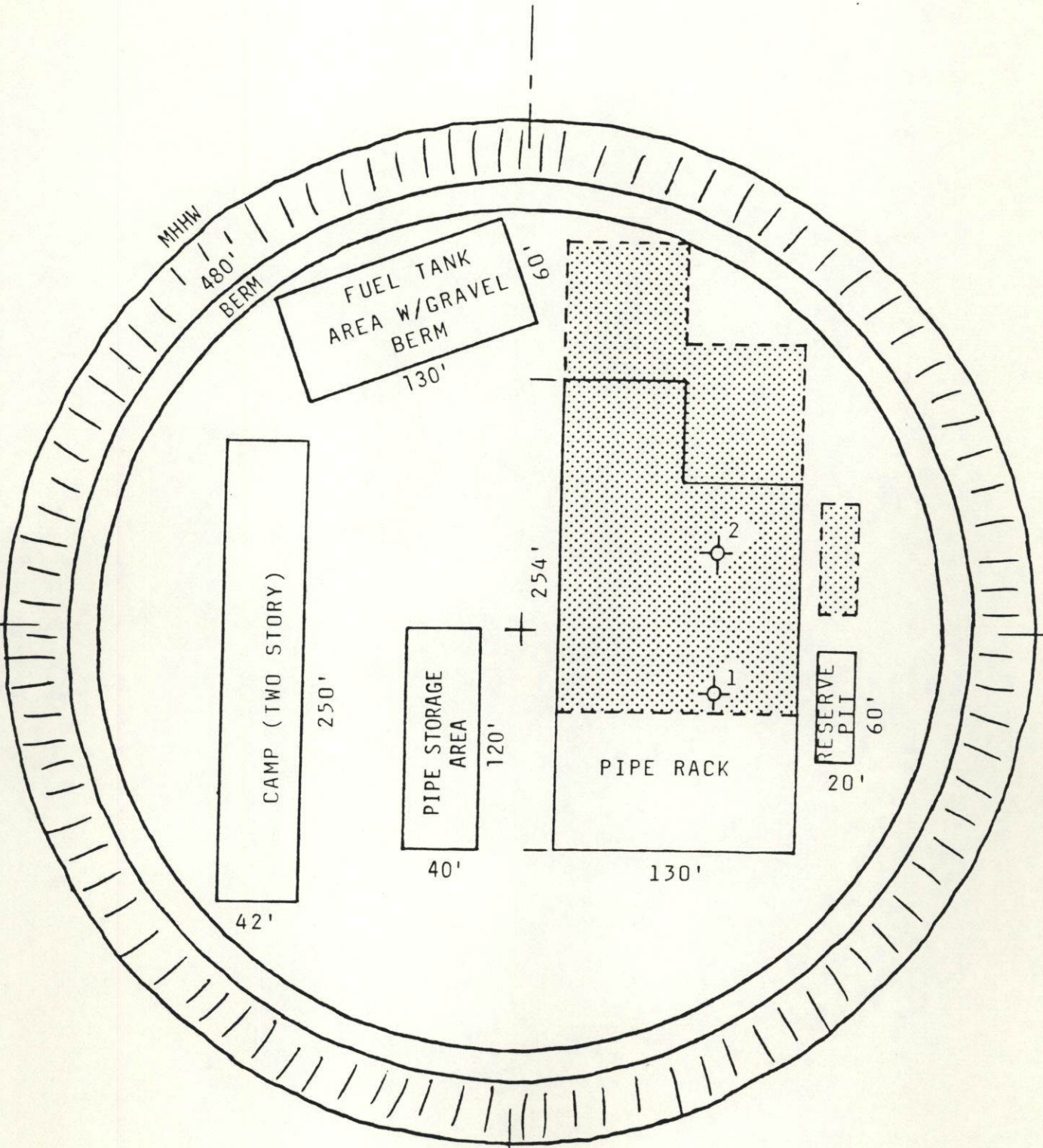


FIGURE 2
Page 9

Section (3)

CRITICAL OPERATIONS AND CURTAILMENT PLAN BEAUFORT SEA, BEECHEY POINT OCS-Y 0189, 0190, 0191, 0192, and 0193

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.

I. 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 before each transfer begins. Lines are to be pressure tested to 1.5 times the maximum anticipated transfer pressures.
- 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 an acceptably low level. No open-hole drill stem testing will be performed in exploratory wells. Any necessary test work will be accomplished utilizing a production-type test through casing. 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 hitting 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 depth in this well; 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 possibility of encountering shallow biogenic gas-bearing zones in the depth range of 60-115 feet BML over portions of the planned exploration area is recognized, and appropriate safety measures will be provided. 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
BEAUFORT SEA, BEECHEY POINT
OCS-Y 0189, 0190, 0191, 0192, and 0193

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 USGS 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 (general direction in which the spill is moving).
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 the attached Figure 3.
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 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 ICEBERGS.

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 ABSORB Organization is currently preparing a Coastline Sensitivity Atlas which will show locations and rankings of sensitive areas, along with specific methods to protect each area from an oil spill. Two types of areas are to be considered as follows: 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. Target date for completion of this atlas is mid-1981, which is prior to anticipated spud date of any wells in the exploration area.

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.

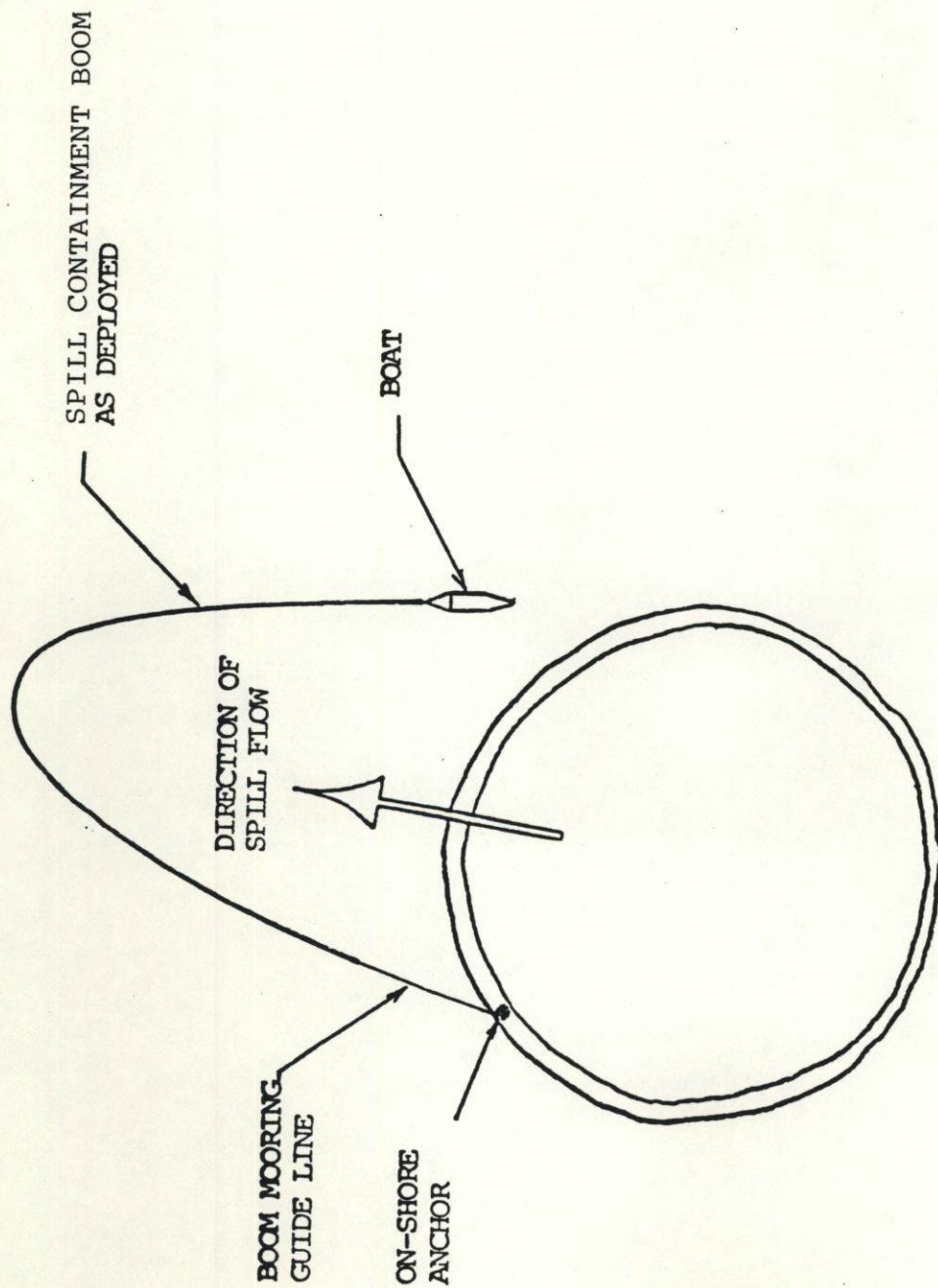


FIGURE 3
TYPICAL DEPLOYMENT OF THE
SPILL CONTAINMENT BOOM
(SUMMER OPERATIONS ONLY)

Section (5)

UNCONTROLLED BLOWOUT (RELIEF WELL) PLAN
BEAUFORT SEA, BEECHEY POINT
OCS-Y 0189, 0190, 0191, 0192, and 0193

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 deal with control of pollution resulting from the blowout. This is dealt with in Section (2) of the plan and in the Exxon North Slope Emergency Manual and the ABSORB Manual.

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 immediately mobilized from Prudhoe to the location. The equipment used and transportation method will depend upon the time of the year and availability. The ABSORB 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. If necessary, a rig under contract to Exxon could be transported from the Pt. Thomson area, or, as a last resort, a Herc transportable rig could be flown into Deadhorse from another area.

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. Gravel for the relief well pad will also be available at a nearby location.

It is anticipated that most rig and supply movement will take place over existing ice roads 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. In this nearshore area, currents are strongly influenced by wind direction. Wind patterns have been recorded on a monthly basis at the Prudhoe airport. 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 will be placed a sufficient distance from the blowout well to ensure personnel and equipment safety for the duration of the anticipated drilling program. It is anticipated that in most cases the relief well pads would be located in water depth similar to the original pad.

V. Pad Construction.

After freezeup a gravel location large enough to accommodate the drilling rig and kill equipment would be constructed using construction techniques similar to those used for the original pad. 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. Pad size could then be expanded as necessary to accommodate the kill equipment and fluids which will not be required until the relief well is drilled to TD. Another possibility, depending on timing, is that the kill equipment could be brought to the location on barges after breakup.

During open water periods, a relief well gravel location would be constructed utilizing the proven technique of using barges and tugs to transport the gravel from the Prudhoe Bay West Dock to the location.

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 material 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, BEECHEY POINT
OCS-Y 0189, 0190, 0191, 0192, and 0193

I. Scope.

The gravel island 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. With ice loading expected under normal conditions, these islands are not expected to be displaced laterally at any time. Despite this, an ice pressure and ice movement monitoring 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.

II. Emergency Plan.

The potential for island movement or shearing exists primarily during the period preceding freezeup. During this period, high winds could direct the sea ice pack against the location, causing the island to be displaced laterally. In this situation the integrity of the well would be in question due to shearing above the mud line level. It is anticipated that sufficient time would be available to complete actions to seal the well and evacuate the location, ensuring prevention of pollution to the environment and safety of personnel.

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" 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.
- D. With sufficient time available and annulus injection capability established, all fuel (with the exception of a minimal supply) shall be injected subsurface to restrict the quantity which could be spilled to the environment. Contents of the sewer plant and other miscellaneous liquids should be injected and all unnecessary fuel lines should be drained. Upon completion of injection, displace annulus with drilling fluid. Secure the rig and evacuate all remaining personnel.

Section (7)

H₂S CONTINGENCY PLAN BEAUFORT SEA, BEECHEY POINT OCS-Y 0189, 0190, 0191, 0192, and 0193

I. Scope.

Although an examination of well records within a 10-mile perimeter of the subject area has shown an absence of H₂S in the formations to be penetrated by the wells drilled under this plan, 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, 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 the location:

1. Personnel air breathing equipment sufficient for the on-duty rig crew, all supervisory personnel on location, and the Mud Engineer. 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:

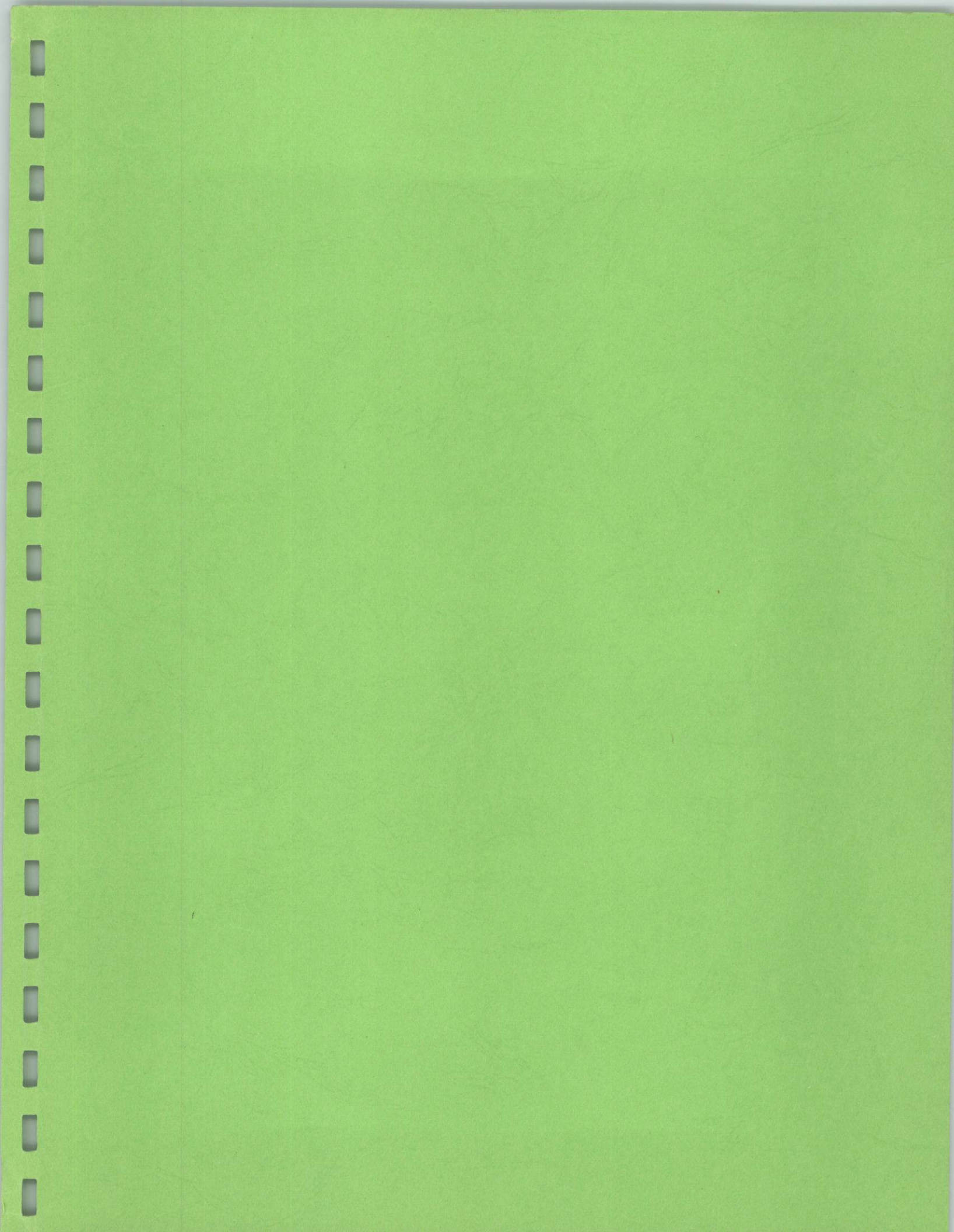
1. The person detecting the H₂S must immediately notify the Driller. He must then notify the Exxon Drilling Superintendent and contract Toolpusher.

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 U.S. Geological Survey 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 USGS 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.



**EXPLORATORY PLAN
BEAUFORT SEA, BEECHEY POINT AREA
OCS-Y 0189, 0190, 0191, 0192 AND 0193**

**EXXON CO., U. S. A.
(A DIVISION OF EXXON CORPORATION)
P.O. BOX 4279
HOUSTON, TEXAS 77001**

OPERATOR FOR UNION AND ARCO

Released to public file
Name: JS Date: NOV 1 2018

RECEIVED
DEPUTY CONSERVATION MGR.
OFFSHORE FIELD OPERATIONS

JAN 12 1981

CONSERVATION DIVISION
U.S. GEOLOGICAL SURVEY
ANCHORAGE, ALASKA

~~EXXON PROPRIETARY - FOR USGS USE ONLY~~

DECEMBER 1980

VOLUME 2

0189

EXPLORATION PLAN

BEAUFORT SEA, BEECHY POINT

USGS MAP DESIGNATION BEECHY POINT, UTM ZONE 6

Figures 1-9

Exxon Company, U.S.A. et al.
(a division of Exxon Corporation)

P. O. Box 4279
Houston, Texas 77001

Released to public file
Name: SS Date: NOV 1 2018

December 1980

VOLUME II

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1. Figure I, depicts, to the best of our knowledge at this time, the structural configuration of the Pre-Mississippian and Pre-Cretaceous unconformity surface. These interpreted unconformities and normal faulting are considered the primary trapping mechanism for potential hydrocarbon bearing zones below 9000 feet. The OCS-Y 0191, Well No. 1 is planned to penetrate prospective Sadlerochit and upper Endicott sands before reaching total depth in lithologic basement metasediments below the Pre-Mississippian unconformity.

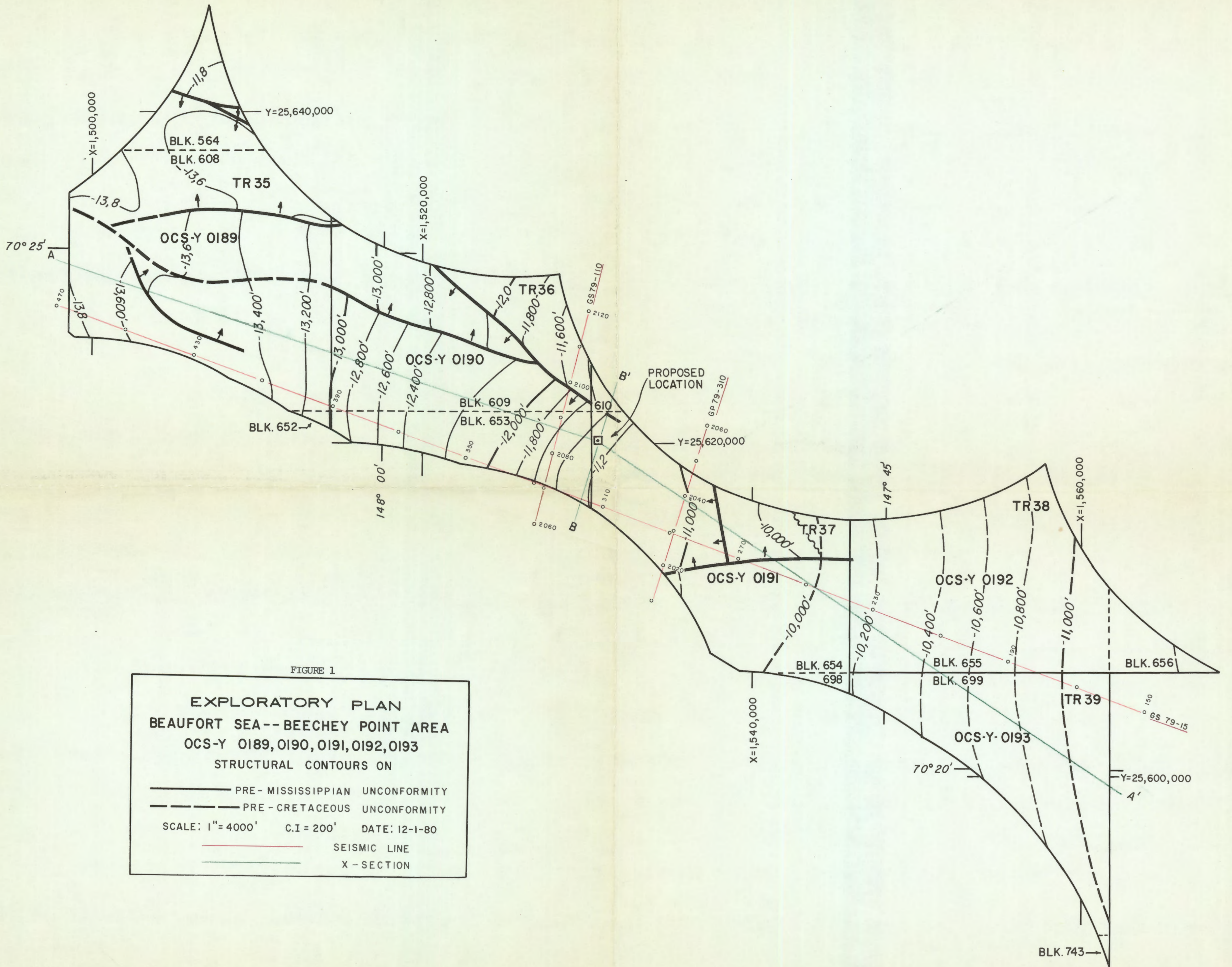


FIGURE 1

EXPLORATORY PLAN
BEAUFORT SEA--BEECHEY POINT AREA
OCS-Y 0189, 0190, 0191, 0192, 0193
STRUCTURAL CONTOURS ON

——— PRE - MISSISSIPPIAN UNCONFORMITY
 - - - PRE - CRETACEOUS UNCONFORMITY

SCALE: 1" = 4000' C.I. = 200' DATE: 12-1-80

——— SEISMIC LINE
 ——— X - SECTION

2. Figures 2 and 3 are structural cross sections constructed adjacent to the lines of the three CDP seismic sections.

ATTACHMENT
EXPLORATORY PLAN
OCS-Y-0189, 0190, 0191, 0192, 0193

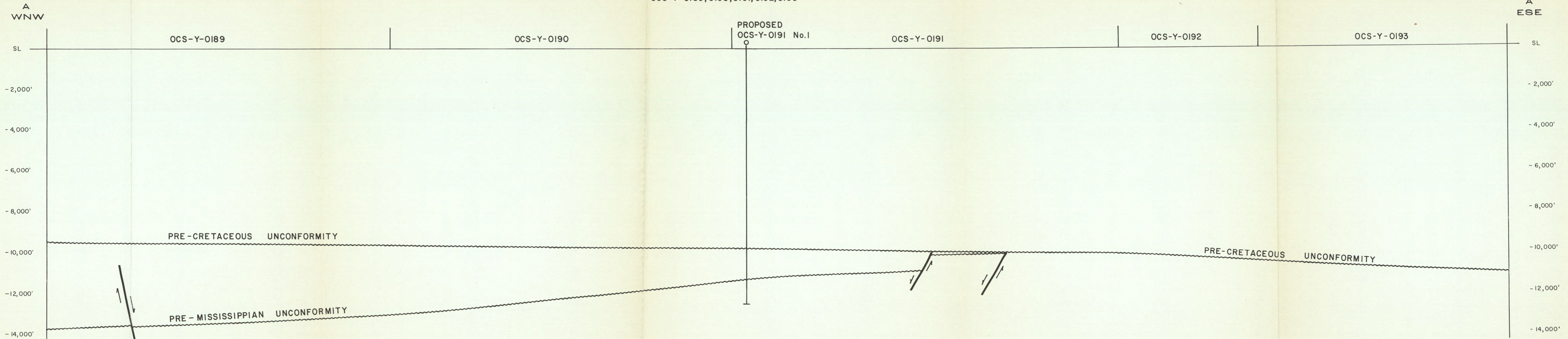


FIGURE 2
EXXON CORPORATION
OCS-Y-0189, 0190, 0191, 0192, 0193
BEAUFORT SEA -- BEECHY POINT AREA
ESE - WNW CROSS SECTION
SCALE: 1" = 2000' DATE: 12-1-80

**ATTACHMENT
EXPLORATORY PLAN
OCS-Y-0189,0190,0191,0192,0193**

**B
SSW**

**B'
NNE**

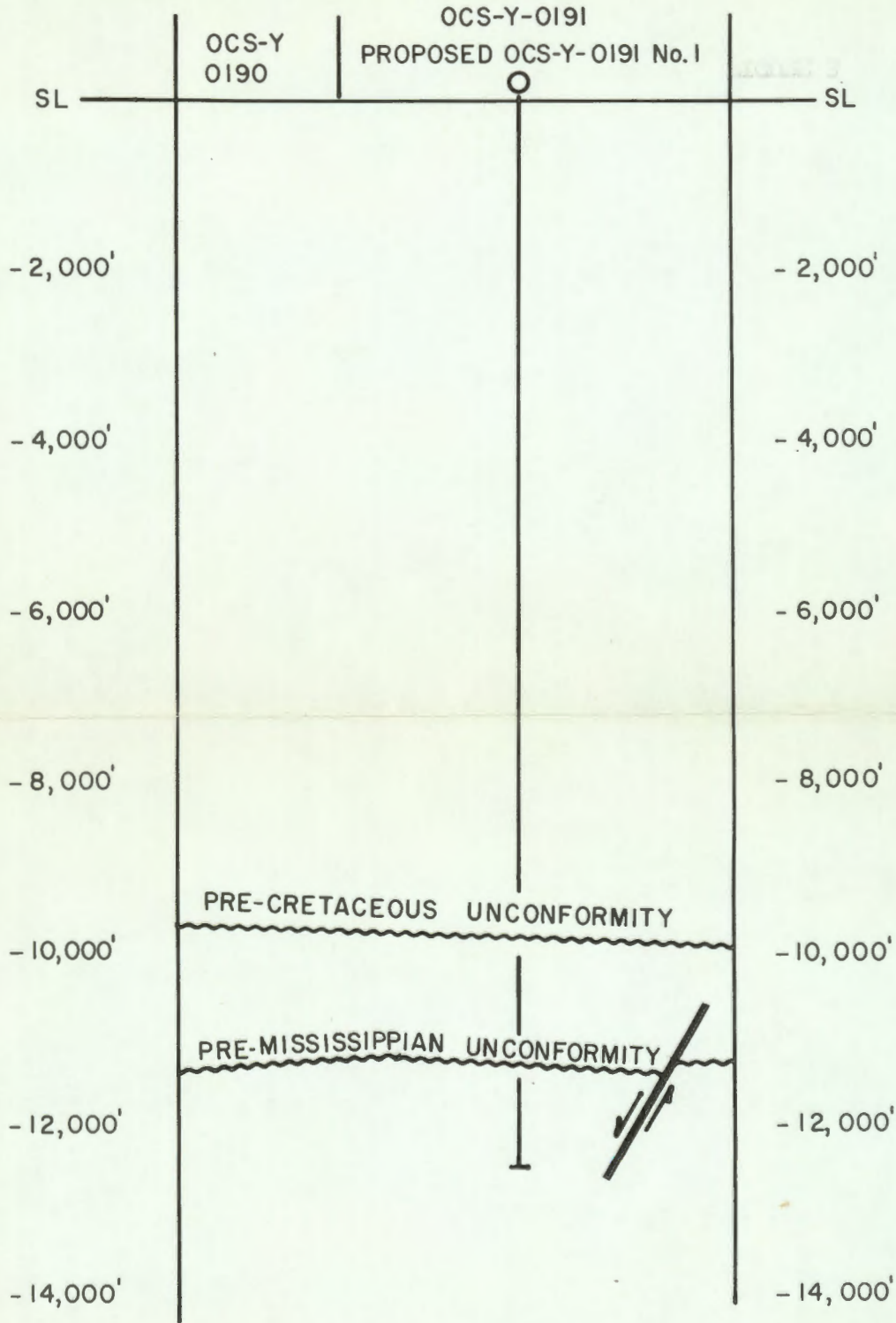


FIGURE 3

**EXXON CORPORATION
OCS - Y - 0189, 0190, 0191, 0192, 0193
BEAUFORT SEA -- BEECHEY POINT AREA
NNE -- SSW CROSS SECTION**

SCALE: 1" = 2000'

DATE: 12-1-80

3. Figures 4, 5, and 6 are seismic sections GS79-15, GS79-110 and GP79-310, which intersect near the location of Well OCS-Y 191, No. 1, and are representative of the Plan area.

LINE GS 79-151

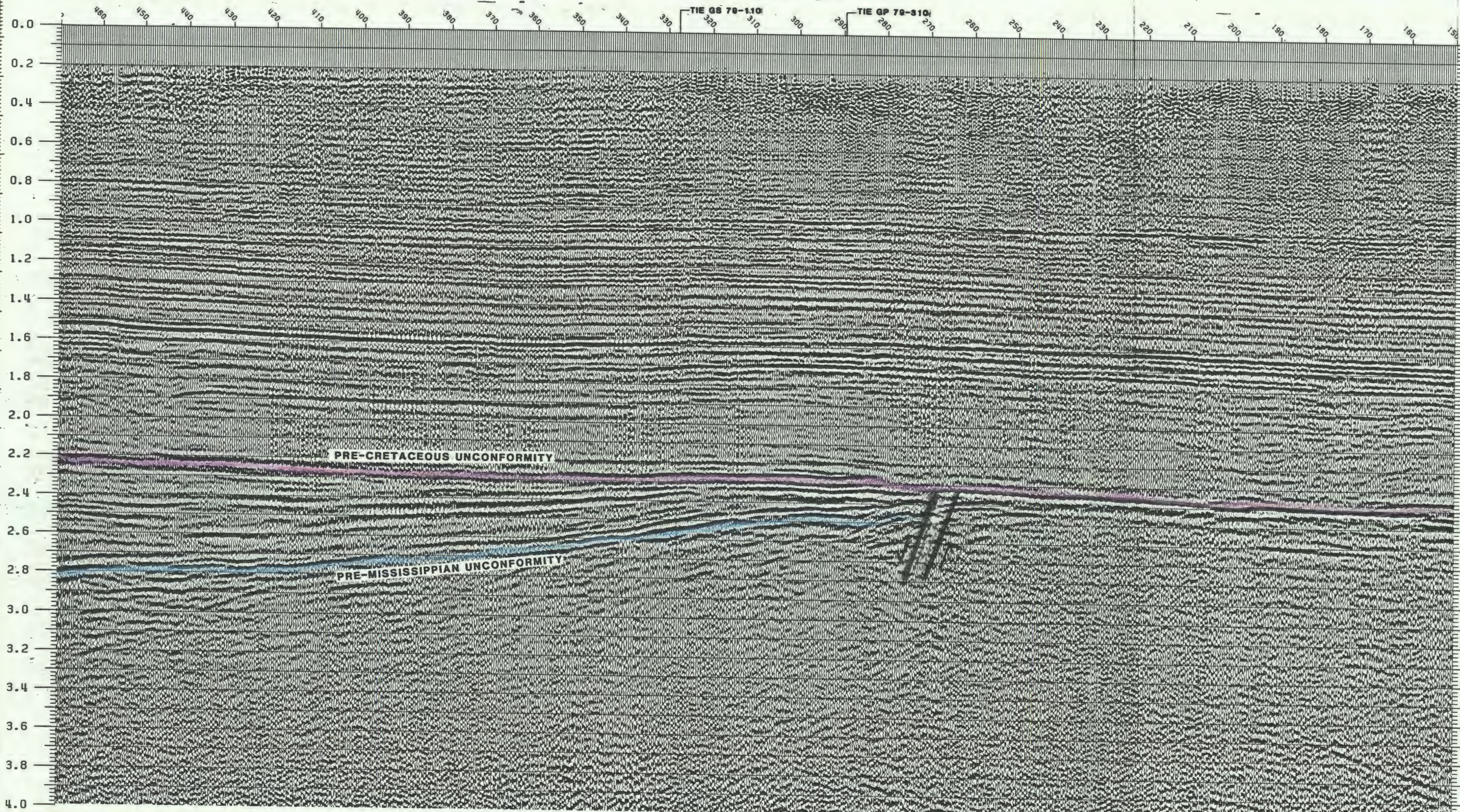


FIGURE 4
MILE

EXXON
EXXON EXPLORATION
DATA PROCESSING CENTER
HOUSTON, TEXAS

LINE GS7915 AREA #50800
PART DATE 02/16/80
OCS# MILES OF LINE

FIELD RECORDING

AREA: NORTH SLOPE ALASKA - BEARFOOT SEA
RECORDED BY G.S.I. PTT 1183 APR 1978
ENERGY SOURCE-AIR GUNS 500 CU. IN.
4 HOLES, 3 GUNS PER HOLE
RECORDING FILTER = 12/30-124/72
48 CHANNELS TYPE CABLE=ORNG
SEIS/GAP=9 IN.LINE, SPACING=24.5 FT
GROUP INT=220 FT. S.P. INT=220 FT

FT/W →
SP 1 48
1650 10360
RECORDING CONFIG. SP-1650-11900
DISTANCES IN [] FEET [] METERS

RECORDING INSTRUMENTS

SYSTEM MCS IV NO. CHANNELS 48
FORMAT 8 TRACK GAIN TYPE IEP
RECORD LENGTH 5 SEC. SAMPLE RATE 2 MS.
RECORD FILTERS 12 HZ SLOPE 36 DB/OCTAVE
HI 12 HZ SLOPE 22 DB/OCTAVE

FIELD POLARITY: COMPRESSORIAL WAVE
RECORDED AS VALUES

PROCESSING SEQUENCE

DEFAULT
 DATUM S.I. DATUM VEL 5000 FT/SEC
 STATICS/MIXED RESIDUAL
 STATICS
 GAIN: EXPONENTIAL GEOCOR
 TRUE AMP
 VERTICAL SUPERSTATION TO 1
 DIRECTION TO MS.
 DECON BEFORE STACK, DESIGNATION 531
OPERATOR LENGTH MS.
 FILTER:
 VELOCITY ANALYSIS: GSI
 20 FOLD STACK 50 INTERVAL 118
 DECON AFTER STACK, 10-50HZ SHARPEN
OPERATOR LENGTH 150 MS.
 FILTER: IVEFILTER
 INVSCH2
 INVSCH3

 TRACE NORMALIZE
 AGC MS.

ORIGINAL DISPLAY

1.330 IN./24 TR. 88.0 TRACES/MILE
COMPRESSORIAL WAVE ON SECTION
PRESET GAIN: 00 0
0 XVR BASE 5.000 IN/SEC
STATICS: _____
ADJ. TO _____ TOTAL _____ MS.
DIRECTION OF PLOT RIGHT INV _____

REMARKS

10-50 HZ SHARPEN
10-50 HZ & D.D. 15-50 HZ & 1.2 SEC
RESIDUAL STATICS STACK TAPES
FROM G.S.I.
LIB. LOC. (OUT) 8008AS
TAPE NAME (OUT) 85GDFG
TIME 03.30.4 DATE 198/80

LINE GS 79-110

Sta	Ym	Ys	Ym	Ys	Ym	Ys	Ym	Ys	Ym	Ys
12	8347	32	8170	114	8539	106	8696	110	8852	11
16	7374	278	7374	262	7471	330	7370	170	8228	51
18	7070	402	7070	406	7058	838	7038	650	7311	96
20	7242	1014	7149	1034	7086	1062	7088	1026	7022	111
22	7503	1270	7372	1262	7346	1346	7396	1326	7393	131
24	7947	1590	7748	1610	7788	1658	7822	1674	7849	161
26	8412	1830	8248	1890	8273	2322	8981	1930	8315	241
28	8931	2270	8821	2350	8106	2556	9555	2418	9284	304
30	9654	2554	9393	2614	9398	3000	10291	2590	9553	368
32	10037	3032	10252	3242	10535	4000	11295	3041	10235	404
34	10509	3637	11047	4024	11347	5000	11856	3604	10888	504
36	11605	4000	11389	5000	11963	6000	12216	4000	11220	604
38	12215	5000	12047	6000	12369			5000	11803	604
40	12606	6000	12467					6000	12176	

FIGURE 5

1 MILE

SSW

NNE



EXXON EXPLORATION
DATA PROCESSING CENTER
HOUSTON, TEXAS

LINE GS79110 AREA #50NR06
PART 10F1 DATE 04/26/79
OCS# _____ MILES OF LINE _____

FIELD RECORDING

RECORDED BY G.S.I. PATY 1173, MAR 1979
VIBROSEIS USING 4 VIBRATORS
6 TO 18 SWEEPS, 11 SECONDS LONG
SWEEP FREQ. 8 TO 65 HZ, 16 SEC RECORDS
24-10 HZ GEOS/GROUP INLINE, 96 STATIONS
GROUP INT 220 FT, S.P. INT 440 FT

NNE

SP

1 48 49 96

10340 1100 10340

RECORDING CONFIG. 10890-550-SP-550-10890
DISTANCES IN FEET METERS

RECORDING INSTRUMENTS

SYSTEM DFS V NO. CHANNELS 96
FORMAT SEG X GAIN TYPE JFP
RECORD LENGTH 5 SEC. SAMPLE RATE 4 MS.
RECORD FILTERS SLO 8 HZ SLOPE 18 DB/OCTAVE
HI 90 HZ SLOPE 22 DB/OCTAVE

FIELD POLARITY: COMPRESSIONAL WAVE
RECORDED AS NEG VALUES

PROCESSING SEQUENCE

- DEMULT _____
- DATUM S.L. DATUM VEL 10000 FT/SEC
- STATICS: _____
- STATICS: _____
- GAIN: EXPONENTIAL GEORCOR
 EXP. _____
- VERTICAL SUMMATION _____ TO 1
- BINMATION TO 4 MS.
- DECON BEFORE STACK: _____
OPERATOR LENGTH _____ MS.
- FILTER: _____
- VELOCITY ANALYSIS: HIREZ 2/MILE
- 24 FOLD STACK SB INTERVAL 110
- DECON AFTER STACK: 10-50HZ SHAPECON
OPERATOR LENGTH 150 MS.
- FILTER: TVFILT
- CONGAI-CONSTA
- IVSCALE
- IVSCALE
- _____
- _____
- _____
- TRACE NORMALIZE _____
- AGC _____ MS.

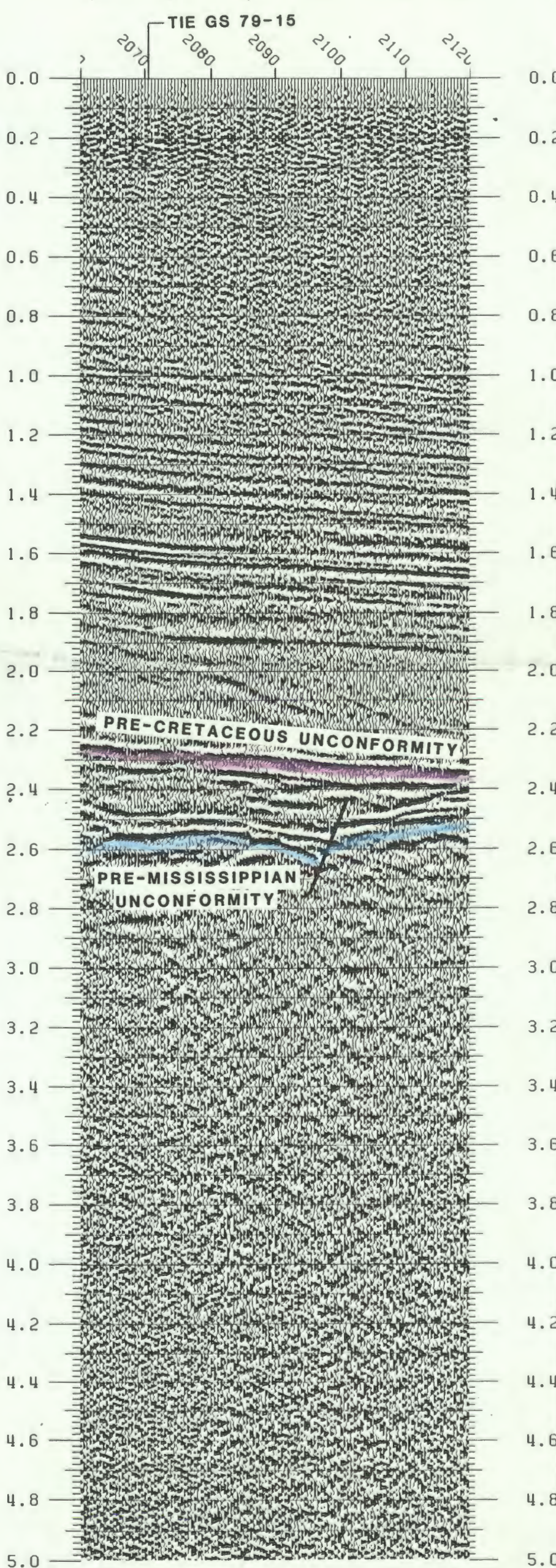
ORIGINAL DISPLAY

1.000 IN./24 TR. 48.0 TRACES/MILE
COMPRESSIONAL WAVE ON SECTION
PRESET GAIN: DB4
0 %VA BASE 3.750 IN/SEC
STATICS: _____
ADJ. TO _____ TOTAL _____ MS.
DIRECTION OF PLOT LEFT INV _____

REMARKS

RESIDUAL STATICS
10-50 HZ SHAPECON
TVF 20-55HZ @ 0.0, 10-55HZ @ 1.2 SEC

LIB. LOC. (OUT) 027K54
TAPE NAME (OUT) BS16PFG0
TIME 00.53.3 DATE 116/79



GP 79-310

IN	TIME	IN	TIME	IN	TIME	IN	TIME
134	8380	142	8674	114	8683	49	9317
210	7912	170	8385	238	8214	186	8873
486	7200	578	7024	502	7366	375	7847
806	7164	1034	7068	1162	7263	630	7359
990	7229	1258	7443	1418	7573	1042	6951
1222	7472	1394	7576	1730	7971	1322	7188
1614	7926	1714	8075	2350	8010	1656	7687
1770	8087	2290	8070	2570	8218	1850	7909
2182	8848	2462	9361	3293	10376	2346	8765
2430	9505	3032	10147	4278	11628	2558	9037
3024	10694	3553	10888	5000	12185	3014	10091
3553	11452	4452	11841	6000	12712	4041	11647
4000	11910	5000	12230			5000	12436
5000	12605	6000	12739			6000	12962

TIE GS 79-15

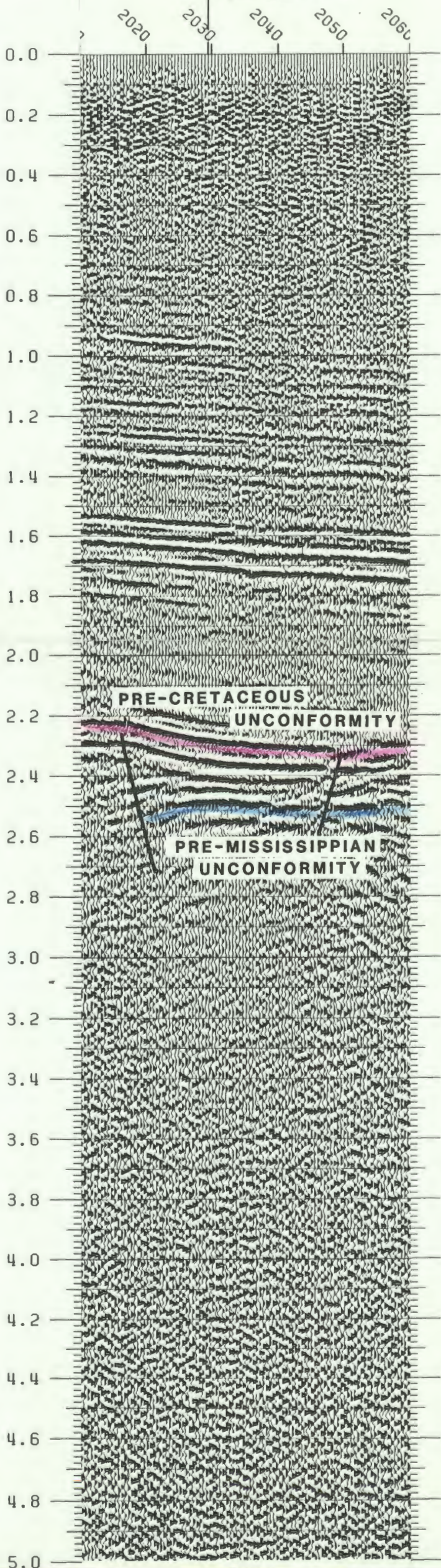


FIGURE 6

MILE

SSW
2001
SP

EXXON

NNE
2319
SP

EXXON EXPLORATION
DATA PROCESSING CENTER
HOUSTON, TEXAS

LINE GP79310 AREA #SON806
PART 10F1 DATE 04/27/79
OCS# MILES OF LINE

FIELD RECORDING

RECORDED BY G.S.I. PATY 1173, MAR 1979
VIBROSEIS USING 4 VIBRATORS
6 TO 18 SWEEPS, 11 SECONDS LONG
SWEEP FREQ. 8 TO 65 HZ, 16 SEC RECORDS
24-10 HZ GEOS/GROUP INLINE, 96 STATIONS
GROUP INT 220 FT, S.P. INT 440 FT

SSW

SP

1 48 49 96

10340 1100 10340

RECORDING CONFIG. 10890-550-SP-550-10890
DISTANCES IN FEET METERS

RECORDING INSTRUMENTS

SYSTEM DES V NO. CHANNELS 96
FORMAT SEG X GAIN TYPE IEP
RECORD LENGTH 5 SEC. SAMPLE RATE 4 MS.
RECORD FILTERS LO 8 HZ SLOPE 18 DB/OCTAVE
HI 90 HZ SLOPE 22 DB/OCTAVE

FIELD POLARITY: COMPRESSIONAL WAVE
RECORDED AS NEG VALUES

PROCESSING SEQUENCE

- 1 DEMULT
- DATUM S.L. DATUM VEL 10000 FT/SEC
- STATICS:
- STATICS:
- GAIN: EXPONENTIAL GEOCOR
- 2 EXP.
- VERTICAL SUMMATION TO 1
- BINOM TO 4 MS.
- DECON BEFORE STACK: OPERATOR LENGTH MS.
- FILTER:
- 3 VELOCITY ANALYSIS: HIREZ 2/MILE
- 5 24 FOLD STACK SB INTERVAL 110
- 7 DECON AFTER STACK: 10-50HZ SHAPECON OPERATOR LENGTH 150 MS.
- 8 FILTER: IVFILT
- 4 CONGAT-COMSTA
- 6 TVSCALE
- 9 TVSCALE
-
-
-
-
- TRACE NORMALIZE
- AGC MS.

ORIGINAL DISPLAY

1.000 IN./24 TR. 48.0 TRACES/MILE
COMPRESSIONAL WAVE ON SECTION
PRESET GAIN: DAY
0 %VA BASE 3.750 IN/SEC
STATICS:
ADJ. TO TOTAL MS.
DIRECTION OF PLOT RIGHT INV

REMARKS
RESIDUAL STATICS
10-50 HZ SHAPECON
IVF 20-55HZ @ 0.0, 15-40HZ @ 1.2 SEC

LIB. LOC. (OUT) 017C43
TAPE NAME (OUT) BS#GPF60
TIME 23.42.0 DATE 11/7/79

4. Figures 7, 8, and 9 are RMS velocity scans for the three CDP lines, SP 2019 GP79-310, SP 2031 GP79-310, and SP 2043 GP79-310 respectively.

FIGURE 7

HSDN = 651 ASGZ = 0
 SPID = -2019 STAL = -1

SP 2019
 Line GP 79-310

BN = 651
 = 77422
 PART 1 OF 1
 SPID = -2019
 Y = 0
 EN = 20
 STCR = -1
 ROPD = 71500
 LCT = 1
 DRTE = 04/27/79
 SCD 550 TO 8470
 LINE = GP79310
 STCR CODE = #50NR06
 ME 10 8380 25 50 75 100 150 200 250 300 350 400 450 500 550 600 650 700
 MD 8380 8380 8380 8380 8380 8287 7979 7811 7682 7553 7424 7295 7198 7192 7187 7181 7176
 ME 750 800 850 900 950 1000 1050 1100 1150 1200 1250 1300 1350 1400 1500 1700
 MD 7170 7164 7179 7196 7214 7238 7343 7395 7447 7503 7561 7619 7676 7792 7908 8013
 ME 1800 1900 2000 2100 2200 2300 2400 2500 2600 2700 2800 2900 3000 3200 3400 3600 3800
 MD 8140 8325 8509 8694 8893 9157 9422 9643 9843 10043 10243 10443 10643 10944 11234 11499 11704
 ME 4000 4200 4400 4600 4800 5000 5500 6000
 MD 11303 12048 12187 12326 12465 12604 12826 13047

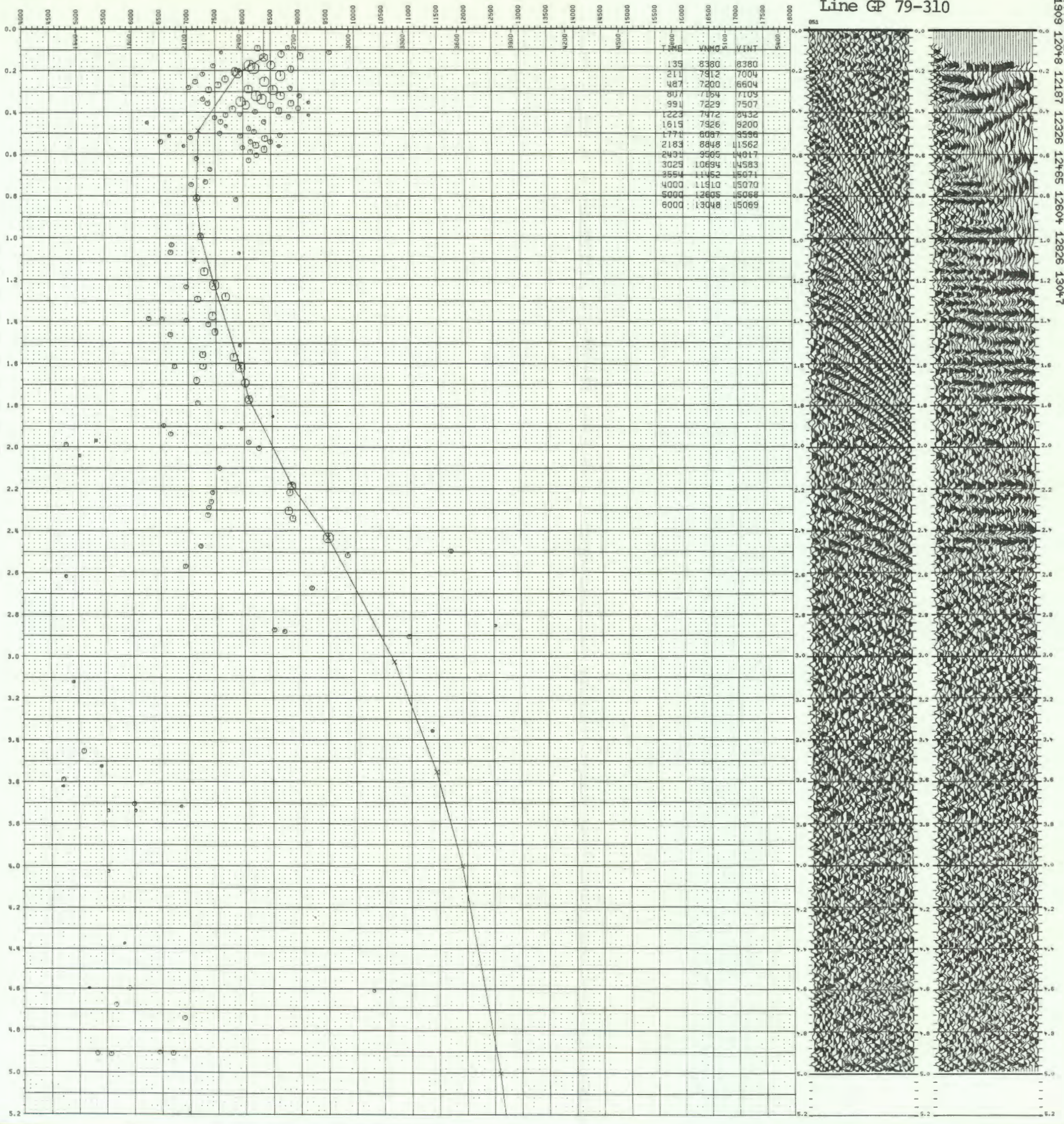


FIGURE 8

ASBN = 627 ASGZ = 0
 SPID = -2031 STAL = -1

SP 2031
 Line GP 79-310

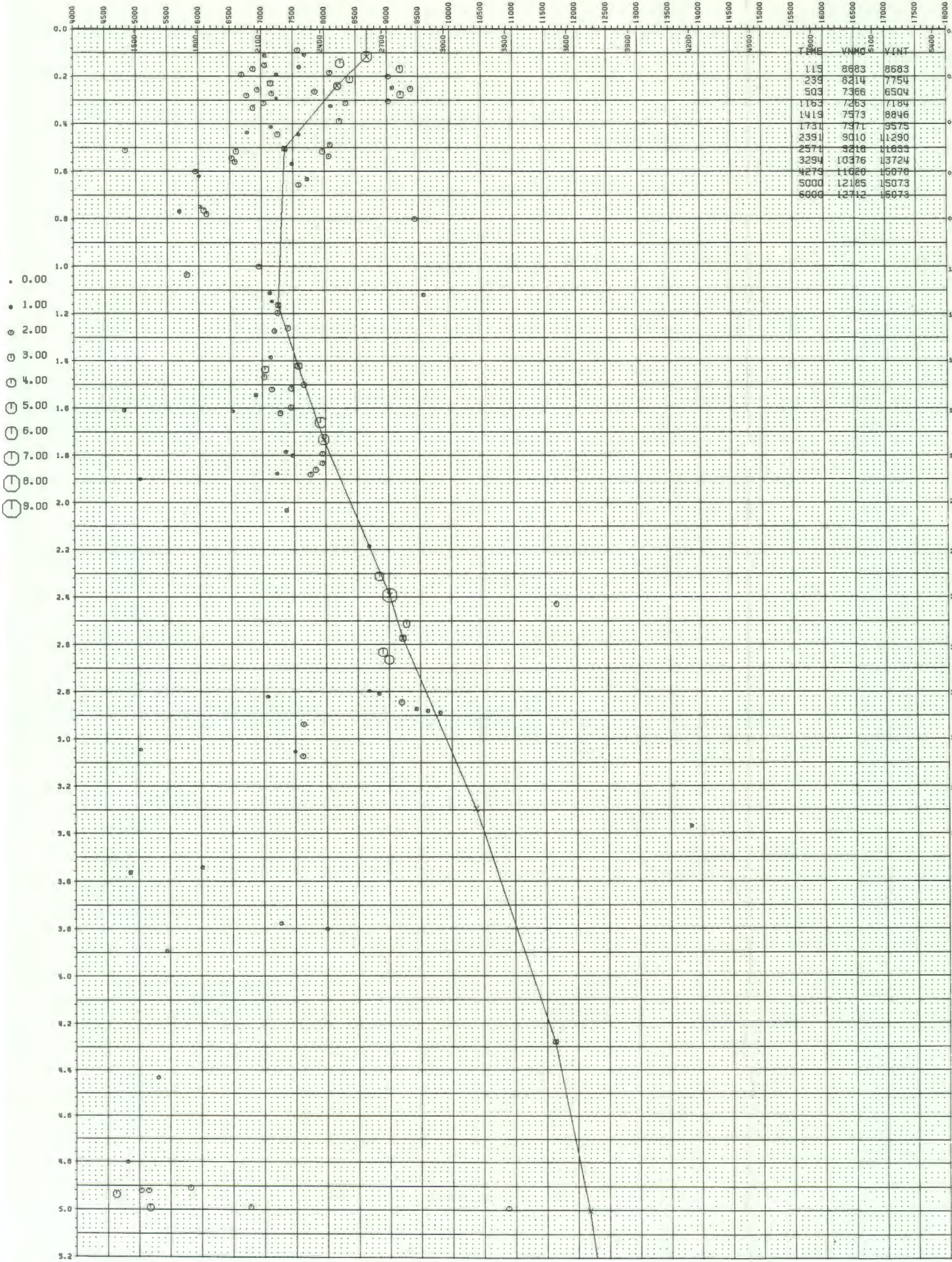
ASBN = 627 SPID = -2031 EN = 19
 X = 74902 Y = 0
 PART 1 OF 1
 STCR = -1 RDPD = 68860 LCT = 1 DATE = 04/27/79
 RER CODE = #50NR06 SGD 550 TO 10890
 LINE = GP79310

TIME	UNID	TIME	UNID	TIME	UNID	TIME	UNID
10	8674	25	8674	50	8674	75	8674
80	8674	100	8674	150	8601	200	8298
250	8121	300	7954	350	7787	400	7621
450	7454	500	7287	550	7120	600	7030
650	7035	700	7026	750	7026	800	7035
800	7045	850	7050	900	7054	950	7059
1000	7051	1050	7064	1100	7093	1150	7176
1200	7176	1250	7260	1300	7344	1350	7427
1400	7427	1450	7483	1500	7531	1550	7583
1600	7583	1650	7621	1700	7621	1750	7621
1800	7621	1850	7621	1900	7621	1950	7621
2000	7621	2050	7621	2100	7621	2150	7621
2200	7621	2250	7621	2300	7621	2350	7621
2400	7621	2450	7621	2500	7621	2550	7621
2600	7621	2650	7621	2700	7621	2750	7621
2800	7621	2850	7621	2900	7621	2950	7621
3000	7621	3050	7621	3100	7621	3150	7621
3200	7621	3250	7621	3300	7621	3350	7621
3400	7621	3450	7621	3500	7621	3550	7621
3600	7621	3650	7621	3700	7621	3750	7621
3800	7621	3850	7621	3900	7621	3950	7621
4000	7621	4050	7621	4100	7621	4150	7621
4200	7621	4250	7621	4300	7621	4350	7621
4400	7621	4450	7621	4500	7621	4550	7621
4600	7621	4650	7621	4700	7621	4750	7621
4800	7621	4850	7621	4900	7621	4950	7621
5000	7621	5050	7621	5100	7621	5150	7621
5200	7621	5250	7621	5300	7621	5350	7621
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6000	7621	6050	7621	6100	7621	6150	7621
6200	7621	6250	7621	6300	7621	6350	7621
6400	7621	6450	7621	6500	7621	6550	7621
6600	7621	6650	7621	6700	7621	6750	7621
6800	7621	6850	7621	6900	7621	6950	7621
7000	7621	7050	7621	7100	7621	7150	7621
7200	7621	7250	7621	7300	7621	7350	7621
7400	7621	7450	7621	7500	7621	7550	7621
7600	7621	7650	7621	7700	7621	7750	7621
7800	7621	7850	7621	7900	7621	7950	7621
8000	7621	8050	7621	8100	7621	8150	7621
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8400	7621	8450	7621	8500	7621	8550	7621
8600	7621	8650	7621	8700	7621	8750	7621
8800	7621	8850	7621	8900	7621	8950	7621
9000	7621	9050	7621	9100	7621	9150	7621
9200	7621	9250	7621	9300	7621	9350	7621
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9600	7621	9650	7621	9700	7621	9750	7621
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10600	7621	10650	7621	10700	7621	10750	7621
10800	7621	10850	7621	10900	7621	10950	7621
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11200	7621	11250	7621	11300	7621	11350	7621
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19200	7621	19250	7621	19300	7621	19350	7621
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21600	7621	21650	7621	21700	7621	21750	7621
21800	7621	21850	7621	21900	7621	21950	7621
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23200	7621	23250	7621	23300	7621	23350	7621
23400	7621	23450	7621	23500	7621	23550	7621
23600	7621	23650	7621	23700	7621	23750	7621
23800	7621	23850	7621	23900	7621	23950	7621
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25400	7621	25450	7621	25500	7621	25550	7621
25600	7621	25650	7621	25700	7621	25750	7621
25800	7621	25850	7621	25900	7621	25950	7621
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27600	7621	27650	7621	27700	7621	27750	7621
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28600	7621	28650	7621	28700	7621	28750	7621
28800	7621	28850	7621	28900	7621	28950	7621
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29200	7621	29250	7621	29300	7621	29350	7621
29400	7621	29450	7621	29500	7621	29550	7621
29600	7621	29650	7621	29700	7621	29750	7621
29800	7621	29850	7621	29900	7621	29950	7

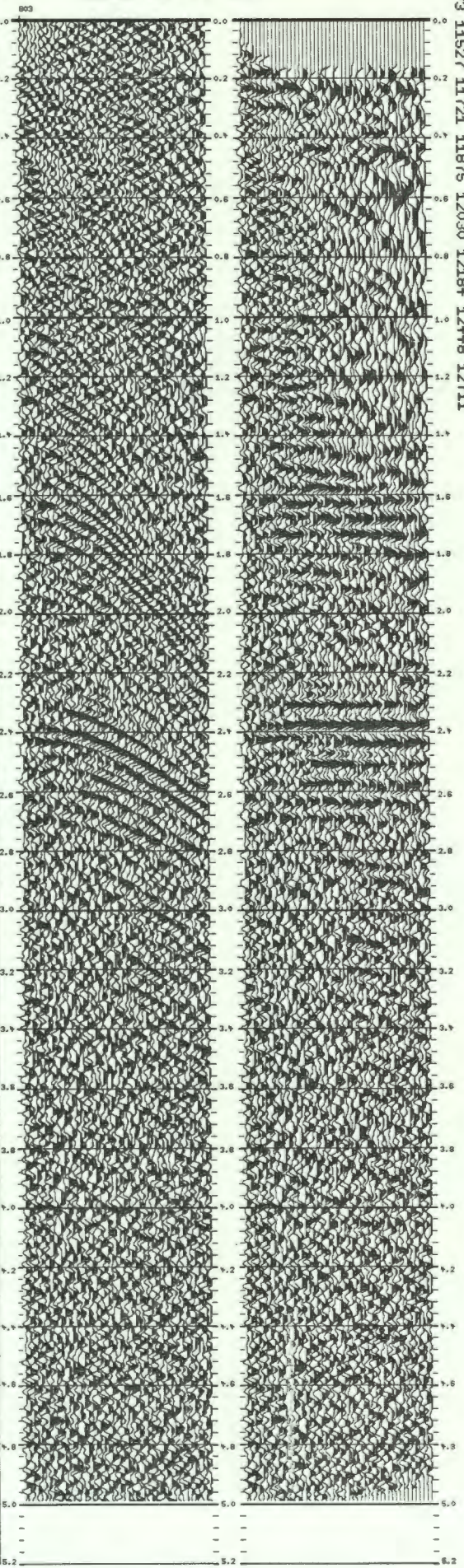
FIGURE 9

ASBN = 603 ASGZ = 0
 SPID = -2043 STAL = -1

SP 2043
 Line GP 79-310



TIME	VNMO	VINT
111	8683	8683
235	8214	7754
505	7366	6504
1163	7263	7184
1419	7973	8846
1731	7971	9575
2391	9010	11290
2571	8218	11633
3294	10376	13724
4273	11628	15878
5000	12185	15073
6000	12712	16073



ASBN = 603 SPID = -2043 EN = 18
 X = 72163 STCR = -1 ROPD = 66220 LCT = 1 DATE = 04/27/79
 PART 1 OF 1 Y = 0 AREA CODE = #50NR06 SCD 550 TO 10890
 LINE = GP79310

TIME	VNMO	VINT
10	8683	8683
25	8683	8683
50	8683	8683
75	8683	8683
100	8683	8683
150	8550	8361
200	8178	8178
250	8018	7857
300	7857	7696
350	7696	7536
400	7536	7376
450	7376	7358
500	7358	7350
550	7350	7343
600	7343	7335
700	7335	7331
1800	8237	8394
1900	8394	8551
2000	8551	8709
2100	8709	8866
2200	8866	9020
2300	9020	9135
2400	9135	9264
2500	9264	9424
2600	9424	9584
2700	9584	9744
2800	9744	9905
2900	9905	10225
3000	10225	10510
3200	10510	10784
3400	10784	11019
3600	11019	11271
3800	11271	11527
4000	11527	11721
4200	11721	11975
4400	11975	12230
4600	12230	12484
4800	12484	12711
5000	12711	12948
5200	12948	13185
5400	13185	13422
5600	13422	13659
5800	13659	13896
6000	13896	14133
6200	14133	14370
6400	14370	14607
6600	14607	14844
6800	14844	15081
7000	15081	15318
7200	15318	15555
7400	15555	15792
7600	15792	16029
7800	16029	16266
8000	16266	16503
8200	16503	16740
8400	16740	16977
8600	16977	17214
8800	17214	17451
9000	17451	17688
9200	17688	17925
9400	17925	18162
9600	18162	18399
9800	18399	18636
10000	18636	18873
10200	18873	19110
10400	19110	19347
10600	19347	19584
10800	19584	19821
11000	19821	20058
11200	20058	20295
11400	20295	20532
11600	20532	20769
11800	20769	21006
12000	21006	21243
12200	21243	21480
12400	21480	21717
12600	21717	21954
12800	21954	22191
13000	22191	22428
13200	22428	22665
13400	22665	22902
13600	22902	23139
13800	23139	23376
14000	23376	23613
14200	23613	23850
14400	23850	24087
14600	24087	24324
14800	24324	24561
15000	24561	24798
15200	24798	25035
15400	25035	25272
15600	25272	25509
15800	25509	25746
16000	25746	25983
16200	25983	26220
16400	26220	26457
16600	26457	26694
16800	26694	26931
17000	26931	27168
17200	27168	27405
17400	27405	27642
17600	27642	27879
17800	27879	28116
18000	28116	28353
18200	28353	28590
18400	28590	28827
18600	28827	29064
18800	29064	29301
19000	29301	29538
19200	29538	29775
19400	29775	30012
19600	30012	30249
19800	30249	30486
20000	30486	30723
20200	30723	30960
20400	30960	31197
20600	31197	31434
20800	31434	31671
21000	31671	31908
21200	31908	32145
21400	32145	32382
21600	32382	32619
21800	32619	32856
22000	32856	33093
22200	33093	33330
22400	33330	33567
22600	33567	33804
22800	33804	34041
23000	34041	34278
23200	34278	34515
23400	34515	34752
23600	34752	34989
23800	34989	35226
24000	35226	35463
24200	35463	35700
24400	35700	35937
24600	35937	36174
24800	36174	36411
25000	36411	36648
25200	36648	36885
25400	36885	37122
25600	37122	37359
25800	37359	37596
26000	37596	37833
26200	37833	38070
26400	38070	38307
26600	38307	38544
26800	38544	38781
27000	38781	39018
27200	39018	39255
27400	39255	39492
27600	39492	39729
27800	39729	39966
28000	39966	40203
28200	40203	40440
28400	40440	40677
28600	40677	40914
28800	40914	41151
29000	41151	41388
29200	41388	41625
29400	41625	41862
29600	41862	42099
29800	42099	42336
30000	42336	42573
30200	42573	42810
30400	42810	43047
30600	43047	43284
30800	43284	43521
31000	43521	43758
31200	43758	43995
31400	43995	44232
31600	44232	44469
31800	44469	44706
32000	44706	44943
32200	44943	45180
32400	45180	45417
32600	45417	45654
32800	45654	45891
33000	45891	46128
33200	46128	46365
33400	46365	46602
33600	46602	46839
33800	46839	47076
34000	47076	47313
34200	47313	47550
34400	47550	47787
34600	47787	48024
34800	48024	48261
35000	48261	48498
35200	48498	48735
35400	48735	48972
35600	48972	49209
35800	49209	49446
36000	49446	49683
36200	49683	49920
36400	49920	50157
36600	50157	50394
36800	50394	50631
37000	50631	50868
37200	50868	51105
37400	51105	51342
37600	51342	51579
37800	51579	51816
38000	51816	52053
38200	52053	52290
38400	52290	52527
38600	52527	52764
38800	52764	53001
39000	53001	53238
39200	53238	53475
39400	53475	53712
39600	53712	53949
39800	53949	54186
40000	54186	54423
40200	54423	54660
40400	54660	54897
40600	54897	55134
40800	55134	55371
41000	55371	55608
41200	55608	55845
41400	55845	56082
41600	56082	56319
41800	56319	56556
42000	56556	56793
42200	56793	57030
42400	57030	57267
42600	57267	57504
42800	57504	57741
43000	57741	57978
43200	57978	58215
43400	58215	58452
43600	58452	58689
43800	58689	58926
44000	58926	59163
44200	59163	59399
44400	59399	59636
44600	59636	59873
44800	59873	60110
45000	60110	60347
45200	60347	60584
45400	60584	60821
45600	60821	61058
45800	61058	61295
46000	61295	61532
46200	61532	61769
46400	61769	62006
46600	62006	62243
46800	62243	62480
47000	62480	62717
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47400	62954	63191
47600	63191	63428
47800	63428	63665
48000	63665	63902
48200	63902	64139
48400	64139	64376
48600	64376	64613
48800	64613	64850
49000	64850	65087
49200	65087	65324
49400	65324	65561
49600	65561	65798
49800	65798	66035
50000	66035	66272