

In Reply Refer To: MS 5231

March 29, 1993

ARCO Oil and Gas Company
Attention: Mr. Dennis Sustala
Post Office Box 1346
Houston, Texas 77251

Gentlemen:

Reference is made to the following plan received March 15, 1993:

Type Plan - Initial Plan of Exploration
Lease - OCS-G 13761
Block - 789
Area - Mustang Island
Activities Proposed - Wells A through E

In accordance with 30 CFR 250.33, this plan is hereby deemed submitted and is now being considered for approval.

Your control number is N-4456 and should be referenced in your communication and correspondence concerning this plan.

Sincerely,

(Orig. Sgd.) Kent E. Stauffer

For
D. J. Bourgeois
Regional Supervisor
Field Operations

bcc: Lease OCS-G 13761 POD File (MS 5032)
MS 5034 w/public info. copy of the plan
and accomp. info.

DTrocquet:cic:03/22/93:POECOM

NOTED - SCHEXNAILDRE

NOTED - SCHEXNAILDRE

Office of
Program Services
APR 1 1993
Information Services
Section

ARCO Oil and Gas Company

Post Office Box 1346
New Orleans, Texas 77001
Telephone (713) 584-6615

Attn: Dennis Sustaia
Regulatory Compliance and
Environmental Department



March 11, 1993

Mr. Daniel Bourgeois
Regional Supervisor
Office of Field Operations
Minerals Management Service
Gulf of Mexico OCS Regions
1201 Elmwood Park Boulevard
New Orleans, LA 70123-2394

Re: Plan of Exploration (POE)
Mustang Island Block 789
OCS-G 13761

Dear Mr. Bourgeois:

ARCO Oil and Gas Company, a Division of Atlantic Richfield Company, hereby submits five proprietary copies and four public information copies of a Plan of Exploration (POE) for West Mustang Island Block 789. Mustang Island Block 789 was leased by Murphy Oil and Gas Company in the August, 1992, Gulf of Mexico Oil and Gas Sale. ARCO Oil and Gas Company was recently designated as the operator of this lease in March, 1993. The proposed exploratory activities include the drilling of five wells in Block 789. Drilling of the first exploratory well is scheduled to begin about April 15, 1993, subject to approval of this plan and subsequent Permit to Drill.

A review of the geophysical and archaeological reports for this block show the absence of drilling hazards at the proposed locations. In addition, the proposed sites show no evidence of archaeological remains, terrestrial or nautical, that might possibly be considered significant according to the criteria of the National Register of Historic Places.

If you need any further information in your review, please call me at (713) 584-6615.

Sincerely,

Dennis Sustaia
Sr. Regulatory Compliance Coordinator

cc: Lake Jackson District
File MI 789 Gen Lse
w/f - DRS

PUBLIC INFORMATION COPY

ARCO Oil and Gas Company
A Division of Atlantic Richfield Company

PLAN OF EXPLORATION

For
Mustang Island 789



This Plan of Exploration for, OCS-G 13761, was prepared in accordance with 30 CFR 250.33, Notice to Lessees 83-3, Letters to Lessees dated October 12, 1988 and September 5, 1989, and Department of Interior Secretarial Order 2974, revised January 19, 1977.

Mustang Island Block 789 was leased by Murphy Oil and Gas Company in the August, 1992, Gulf of Mexico Oil and Gas Sale. ARCO Oil and Gas Company was recently designated as the operator of this lease in March, 1993. The proposed exploratory activities include the drilling of five wells in Block 789. Drilling of the first exploratory well is scheduled to begin about April 15, 1993, subject to approval of this plan and subsequent Permit to Drill. The proposed well locations and spud dates are as follows.

Well Location <u>Block 789</u>	Surface Location	Depth PTVD	Water Depth	Drilling Days	Anticipated Spud Date
A X: 2545715.32' Y: 700319.75' BHL:	8100' FEL & 2450' FSL		119'	45	April 15, 1993
B: X: 2544415.32' Y: 700369.75' BHL:	9400' FEL & 2500' FSL		118'	45	June 1, 1993
C X: 2546631.31' Y: 702169.75' BHL:	7500' FEL & 4300' FSL		118'	45	July 15, 1993
D X: 2543175.32' Y: 700159.75' BHL:	5200' FWL & 2300' FSL		116'	45	September 1, 1993
E X: 2544275.32' Y: 698569.75' BHL:	6300' FWL & 700' FSL		118'	45	October 15, 1993

Additional exploratory drilling must be predicated upon the need to define reservoir limits and/or structures. The installation of platforms, producing facilities, and pipelines are contingent upon the success of the proposed wells. Other exploratory activities which may be conducted under this plan are a wellbore velocity survey and soil boring.

The exploratory wells in Blocks 789 will be drilled using a rig such as the mobile offshore drilling unit (MODU), Teledyne 20. This is a Bethlehem mat supported mobile jackup drilling rig with a cantilevered skid unit. The rig is capable of drilling to 25,000 foot depths in 17 feet to 250 feet of water. A schematic of the rig is attached with a description of the safety and pollution-prevention equipment system. ARCO Oil and Gas Company supervisory drilling personnel are trained in blowout prevention and control procedures.

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SUPPORTING INFORMATION FOR PLAN OF EXPLORATION
MUSTANG ISLAND BLOCK 789

1. A structure map showing the proposed well locations is attached.
2. The water depth across the blocks varies from 105 feet to 127 feet. The seafloor dips toward the southeast. A map showing the proposed well locations and bathymetry is attached.
3. A shallow hazards geophysical survey was conducted on board the M/V El Topografo August 6-7 and 10-11, 1990. John E. Chance & Associates, Inc. conducted the survey for Hardy Oil & Gas USA Inc. A Hazards Report and maps were prepared by Mr. Robert Callahan Geophysicist and an Archeological Assessment was prepared by Mr. Robert J. Floyd Marine Archeologist. Geophysical systems employed during the survey included O.R. E. Pinger Profiler, E.G. & G. SMS-960 Side Scan Sonar, GeoMetrics Proton Magnetometer, SPV-16 Velocimeter, S.S.I. T-Watergun with 24 channel DFS-V Digital Field System.

The seafloor slopes gently to the southeast across Block 789, Mustang Island Area, and water depths range from 105 to 137 feet. Dip rates range from 4 to 7 feet/mile (.04 - .08 degrees). No shoals, banks, or reef complexes were encountered within the survey area.

Pinger profiles reveal an average 20-25 feet of near horizontal strata directly beneath the seafloor. The lateral margins of the Late Wisconsin erosional features could not be determined due to attenuation of the pinger signal at about the depth of the Pleistocene-Holocene horizon. Watergun records show slopes to the southeast in Block 789 from 478 to 558 feet. The structural trend generally reflects seaward dipping, subparallel beds of the submerged continental shelf. Natural hazards such as seismic amplitude anomalies and near seafloor faults, were not observed on the subbottom data collected.

An unidentified non-magnetic object, protruding approximately 8 feet above the seafloor, was observed at 200 feet north of Shotpoint 32.2, line 15. Thirty five unidentified magnetic anomalies, with amplitudes ranging from 3 to 200 gammas, were detected. The unidentified magnetic anomalies are believed to represent ferrous debris buried below the seafloor or too small to be acoustically detected. These areas will be avoided during lease operations.

An Archeological Assessment was prepared by Mr. Robert J. Floyd Marine Archeologist. The Archeological assessment indicated that side scan sonar data and file reports do not show the remains of shipwrecks. Block 789 is considered to have a low probability for historic shipwrecks. However, unidentified anomalies that could not be correlated to side scan sonar data will be avoided during lease activities.

The area was reviewed for evidence of possible zones of prehistoric archeological material. The Pleistocene horizon in the area was exposed for thousands of years to the subaerial weathering conditions associated with the glacial advance in North America. River terraces and the interior slopes of broad stream beds could have been occupied by prehistoric humans during low water stages, and the remains of these seasonal occupations may have been buried beneath alluvium which accumulated during the pluvial seas. However, this surface was exposed to the erosive forces of wave action which limits the probability that any archeological material may be preserved along the buried Pleistocene surface. In addition, the 70 to 80 feet of Holocene overburden precludes the recovery of prehistoric archeological remains in this area. The upper Holocene beds could not have been inhabited by prehistoric human groups.

All of the proposed well locations are at least 300 feet from any detected known or unknown magnetic anomaly, known structures, faults, probable gas zones, or any other anomalies discussed in the hazard reviews. Actual lines of data may be obtained from Mr. Nat Usher, ARCO geophysicist. Actual lines of data may be obtained from Mr. Nat Usher with ARCO Oil and Gas Company. Mr. Usher can be reached at (713) 584-3214.

4. b. ARCO has an Oil Spill Contingency Plan which was approved by the MMS on August 11, 1988. Spill reporting procedures and a list of company personnel responsible for pollutant spill cleanup are contained in the Oil Spill Contingency Plan. ARCO's onshore base in Ingleside will be used for support during the proposed drilling operations and in the event of an oil spill. Clean Gulf Associates (CGA) has oil spill cleanup equipment available for use by ARCO, as a member company. The equipment is stored at Grand Isle, Venice, Cameron, Houma, Theodore and Intercoastal City, Louisiana and at Galveston, Texas City, Port Aransas, and Fulton, Texas.

(1) Gas and condensate production is expected to be found on this lease. Should a spill occur a Fast Response Unit would be obtained from the Clean Gulf Associates inventory to remove oil from the ocean in order to prevent or minimize any potential shoreline impacts. As indicated in ARCO's Oil Spill Contingency Plan additional equipment for the removal of oil at sea and for shoreline cleanup would be obtained from CGA as needed for the particular situation. The location of the Clean Gulf Association FRU which would respond to a spill from the Mustang Island area is in Port Aransas, Texas. Block 789 is approximately 32 miles from the Ingleside shorebase and 22 miles from the Port Aransas CGA base.

(2) Response time to Block 789 is estimated at 9.7 hours. Response time is estimated as follows. All travel times are based on boat speed of 10 mph.

I. Procurement Time: (Maximum Time of Categories A,B, or C):..... 6.0 hrs

- A. Locate & move boat to CGA base 1 hr.
- B. Transport Contract labor to base 6 hr.
- C. Travel time for CGA Supervisor 4 hr.

II. Loadout of Equipment: 1.0 hrs

III. Transportation Time From CGA base to Site:..... 2.2 hrs

IV. Equipment Deployment Time:..... .5 hrs

TOTAL RESPONSE TIME..... 9.7 HRS.

(3) Site-specific review of the planned activities have been conducted using the methodology employed in the Letter to Lessees and Operators (LTL) dated November 4, 1991, which addresses updated launch area maps and oil spill trajectory probability tables. According to these maps the proposed drilling location is in launch site W-3 and probabilities for landfall of spilled oil within 10 days are as follows:

<u>Percent Chance</u>	<u>Land Segment</u>	<u>Segment Name</u>
2%	3	Kenedy, TX
8%	4	Kleberg, TX
17%	5	Nueces, TX
22%	6	Aransas, TX
12%	7	Calhoun, TX

A review of Texas Biological Maps No. 1, and 2 included in the CGA Manual Volume II indicate that the Southwest coastal areas known as land segments 3 through 7 to be mainly recreational beaches interspersed with marshes, fish and shellfish nursery grounds and unique botanical areas, natural areas, federal and state lands and refuges and areas of ecological concern. Endangered species include the Bald Eagle, Peregrine Falcon and American Alligator, Brown Whooping Crane, Jaguarundi, SeaTurtle, and West Indian Manatee. Also in the area are the Padre Island National Seashore, the Laguna Madre, Mustang Island Shore Natural Area, St. Joseph Island Marsh, Matagorda Island Natural Area, Matagorda Island Marsh and Matagorda Bay Underwater District. Also in the area predicted for landfall of oil are lesser-known recreational beaches, state lands and parks, wildlife sanctuaries and refuges, natural areas, barrier islands, marshes, oyster beds and sites listed in the National Register of Historic Places.

Response modes for onshore protection and cleanup are referenced in the CGA Manual Volume II, on the pages immediately following the above mentioned maps of biological sensitivity. Priority for a shoreline cleanup would be given to environmentally sensitive areas which would be cleaned using these recommended methods as outlined in the CGA Manual Volume II.

5. No new or unusual technology is to be utilized for the proposed exploratory drilling on Blocks 789.
6. An Archeological Assessment including the review of Terrestrial and Nautical Archeological potentials as required by Lease Stipulation No. 1, was prepared by Mr. Robert J. Floyd Marine Archeologist. The Archeological assessment indicated that Block 789 is considered to have a low probability for historic shipwrecks and a low probability for prehistoric archeological materials. As required by Stipulation No. 3, ARCO assumes all risks as described by language in paragraphs (a) of Stipulation No. 3 which occur in connection with activities planned for these blocks and to control electromagnetic emissions as required by the commander of the warning area W-228.
7. Effluent waters, deck drainage, formation waters, and drilling fluids will be disposed of according to the stipulations of the U.S. Environmental Protection Agency's National Pollutant Discharge Elimination System (NPDES) General Permit GMG 290000. Water based drilling fluid and cuttings which meet the NPDES General Permit toxicity limitation of a 96 hr LC50 of greater than 30,000 ppm will be discharged overboard. Other water based muds and oil based muds will either be transported back to shore for reclamation or disposal at an approved commercial facility or will be disposed by annular injection in an offshore well on the lease. No waste products which contain oil will be disposed of into the Gulf of Mexico.

During the proposed drilling on this lease wastes likely to be generated per well include 2514 bbls drilling fluid and 3197 bbls cuttings estimated based on drilling a 30" hole to 450', 26" hole to 1000', 17-1/2" hole to 4500', and a 12-1/4" hole to TD based on the depth of the deepest proposed well. If waterbased fluid is used the mud and cuttings will be discharged overboard at rates of less than 1000 BPD. A list of typical mud system additives is attached.

Also generated will be an estimated 12 bbls/day sanitary waste, 160 bbls/month deck drainage from rainfall and equipment and drilling deck washings. Sanitary wastes will be treated onboard with U.S. Coast Guard approved sanitation treatment facilities. Deck drainage will be routed through a skimming system to remove any free oil. No waste will be discharged that contains free oil.

Domestic wastes and any chemicals generated will be brought to shore for disposal at a commercial facility.

8. ARCO Oil and Gas Company, a Division of Atlantic Richfield Company, hereby requests that in accordance with 30 CFR 250.67(c) the above area be classified as "Zones where the absence of H₂S has been confirmed." Based on information drawn from drilling activity at Mustang Island Block 762, Wells No. A-1, through A-6, and Block 757 Wells No. B-1 & B-2, the proposed activities will be conducted in areas that we recommend be classified as "Zones where the absence of H₂S has been confirmed". None of these wells have encountered the presence of H₂S gas in quantities greater than or equal to 20 ppm, and the Mustang Island Wells will be completed in equivalent stratigraphic units.

9. A Certificate for Coastal Zone Consistency is not required for drilling offshore of the State of Texas.

10. Air Emissions:

Source of Emissions

MODU TELEDYNE MOVIBLE 20

3 - EMD SR12EW1W 1620 hp diesel engines on main generators

2 - GMC 8V-71N diesel engines drive cement unit

1 - GMC 4-71T diesel engine powers electric logging unit

A rig schematic showing point sources of air emissions is attached.

Total Emissions for Block 789, Wells A, B, C, D & E

	lb/day	ton/yr
Nitrogen Oxides (NO _x)	1208	220.5
Sulfur Oxides (SO _x)	141	25.7
Volatile Organic Compounds (VOC)	322	58.8
Particulates (TSP)	32	5.8
Carbon Monoxides (CO)	121	22.1

Emission Exemptions:

As per the guidelines contained in 30 CFR 250.45(d) Exemption Formulas the activities described in this Plan are below the exemption levels. The emission exemptions are calculated as follows based on the distance of 23.15 miles from Blocks 789 to USCGS benchmark "POGY".

$$\text{NO}_x, \text{SO}_x, \text{VOC, TSP} = 33.3 \text{ (23.15 miles) TPY} \\ = 771 \text{ TPY}$$

$$\text{CO} = 3400 \text{ (23.15 miles)}^{2/3} \text{ TPY} \\ = 27617 \text{ TPY}$$

Calculation of Projected Emissions:

Emission Factors¹ -

Nitrogen Oxides (NO _x)	24.0 lb / 1000 hp-hr
Sulfur Oxides (SO _x)	2.8 lb / 1000 hp-hr
Volatile Organic Compound (VOC)	0.63 lb / 1000 hp-hr
Particulates (TSP)	2.4 lb / 1000 hp-hr
Carbon Monoxide (CO)	6.4 lb / 1000 hp-hr

1 - Table 3.4-1 Emissions Factors for Stationary Large Bore Diesel Fueled Engines, EPA Report AP-42

Assumptions

Drilling time per well	45 days		
Percent of time with 3 generators at 25% power		25%	
Total BHP-HRS for generators at 25%			334 M BHP-HRS
Percent of time with 3 generators at 75% power		75%	
Total power usage at 75%			3007 M BHP-HRS
Cement pump operating time at 195 BHP or less		30 hrs	
(2 hr/week testing BOP, 5 hr/casing string)			
Cement pump power usage			6 M BHP-HRS
Logging unit operating time			
GIH - idling @ 90 BHP		30 hrs	
POH - variable @ 120 BHP		30 hrs	
Logging unit power useage			328 M BHP-HRS
Total HP-HRS for diesel powered engines for 5 wells			18375 M BHP-HRS

Calculation of Projected Emissions

Nitrogen Oxides (NO _x)	$24 \text{ lb/ M HP-hr} \times 18375 \text{ M HP-hr} \times 0.0005 \text{ ton/lb}$ $= 220.5 \text{ T NO}_x$
Sulfur Oxides (SO _x)	$2.8 \text{ lb/ M HP-hr} \times 18375 \text{ M HP-hr} \times 0.0005 \text{ ton/lb}$ $= 25.7 \text{ T SO}_x$
Carbon Monoxides (CO)	$6.4 \text{ lb/ M HP-hr} \times 18375 \text{ M HP-hr} \times 0.0005 \text{ ton/lb}$ $= 58.8 \text{ T CO}$
Volatile Organic Compounds (VOC)	$0.63 \text{ lb/ M HP-hr} \times 18375 \text{ M HP-hr} \times 0.0005 \text{ ton/lb}$ $= 5.8 \text{ T VOC}$
Particulates (TSP)	$2.4 \text{ lb/ M HP-hr} \times 18375 \text{ M HP-hr} \times 0.0005 \text{ ton/lb}$ $= 22.1 \text{ T TSP}$

11. A Environmental Report is not required.

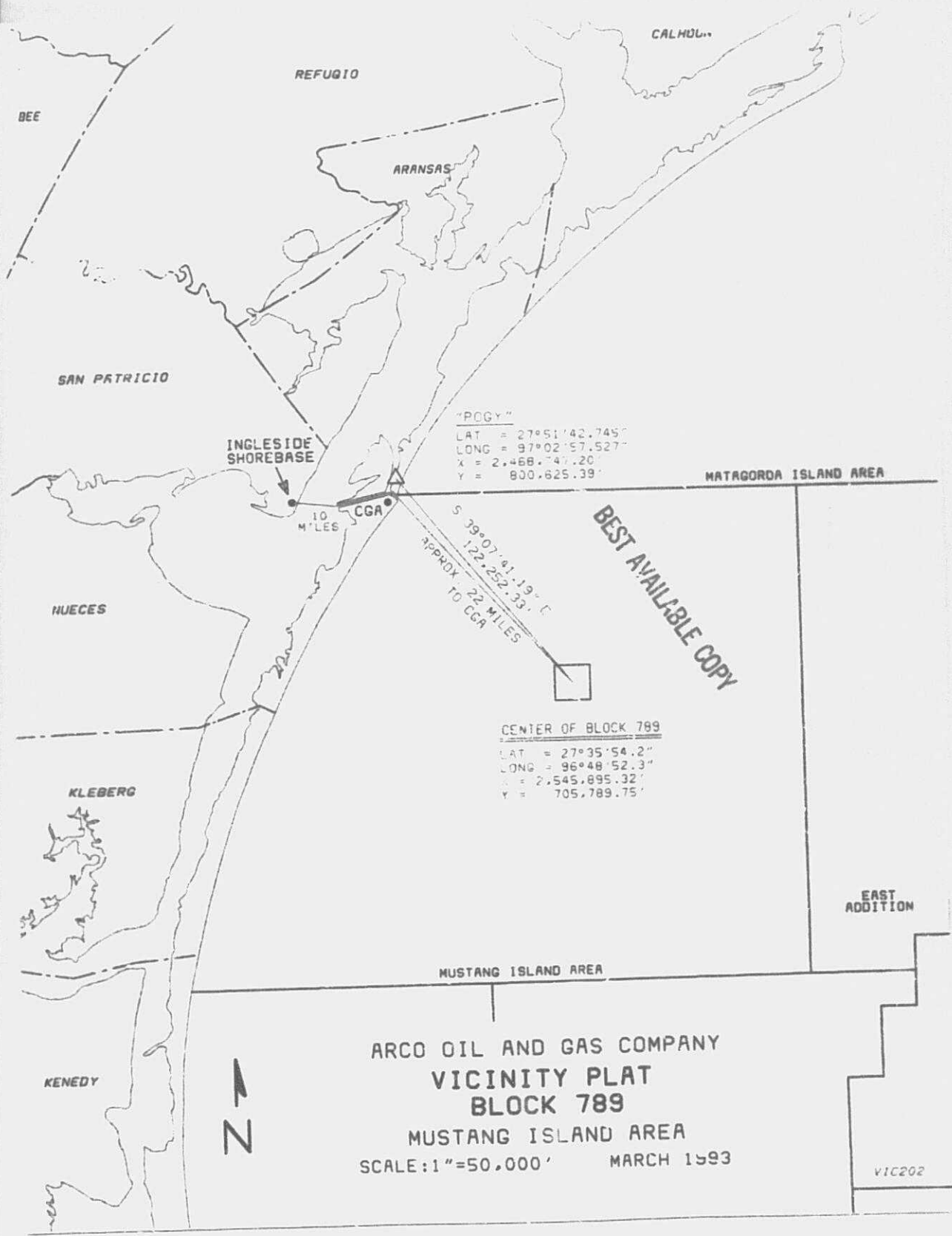
12. Mustang Island Block 789 is located approximately 32 miles from ARCO Oil and Gas Company's Ingleside shorebase. No new facilities are expected to be required to support the proposed drilling operations. The frequency of helicopter flights for transportation of drilling and contract personnel to the blocks during drilling operations is estimated to be 10 round trips per week. During drilling activities one workboat will average about 1.5 round trips per week. Workboats are typically 160' to 200' in length and travel up to 9 knots in open waters. A utility boat may also be used to supplement the workboat as needed. Utility boats are somewhat smaller than workboats, generally only 100' to 110' in length. A crewboat will also be utilized for the weekly crew change during times when helicopter travel is restricted due to weather. Crew boats are generally 110' to 120' in length with aluminum hull and travel at about 20 knots. A Vicinity Plat is attached for reference which shows the likely route for travel between the shorebase and the two blocks.

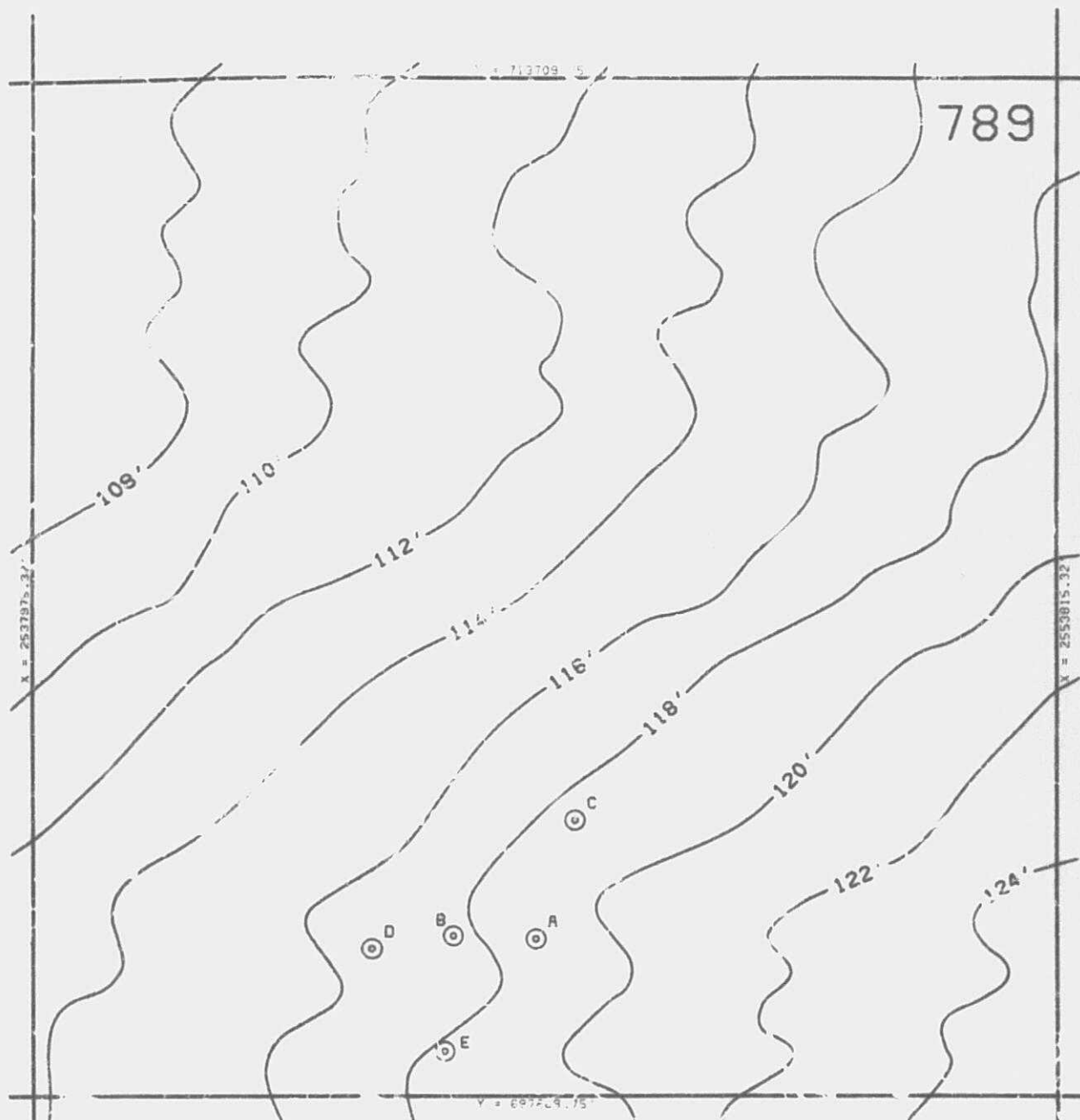
13. Water depth in Blocks 789 is less than 400 meters; therefore, no effect on chemosynthetic communities is likely.

14. Common Depth Point seismic lines will be submitted upon request.

15. The authorized representative of Atlantic Richfield Company to whom questions regarding this Plan may be addressed is:

Dennis Sustala
Sr. Regulatory Compliance & Environmental Coordinator
P.O. Box 1346
Houston, TX 77251
(713) 584-6615





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ARCO OIL AND GAS COMPANY
BATHYMETRY PLAT
BLOCK 789

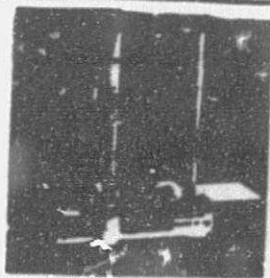
MUSTANG ISLAND AREA

SCALE: 1"=2000'

MARCH 1993

TELEDYNE 20

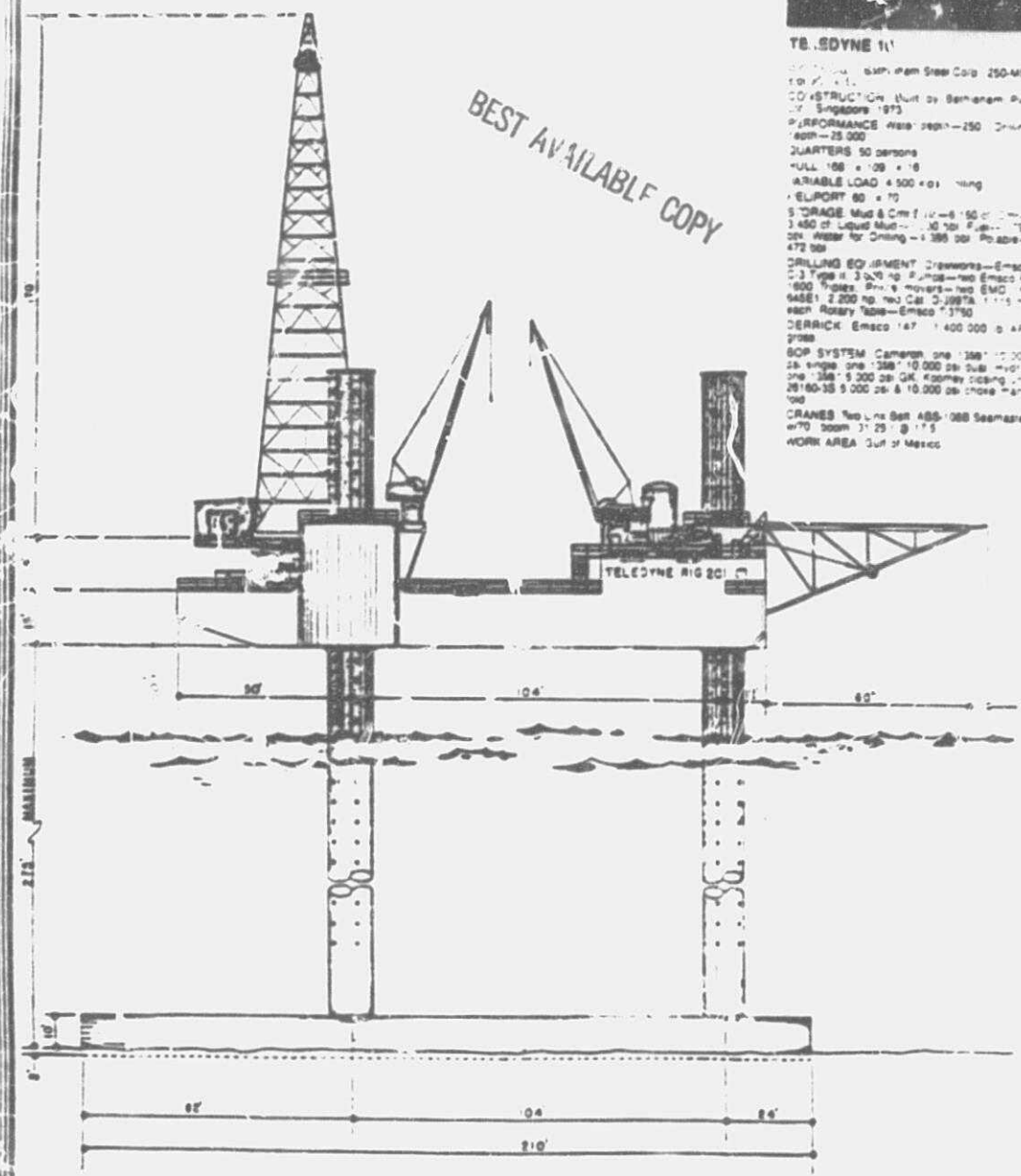
CONSTRUCTION Built by Farnham
Shedding Corp 1982
STORAGE Mud & Cement Bulk—4,480 cu yd Liquid
Mud—1,688 bbl Water for Drilling—4,693 bbl Potable—124 bbl
DRILLING EQUIPMENT Drawworks—Emasco
C-3 Type H 3,000 hp Pumps—Emasco Type
ed. #3 1,600 Prime Movers—3 EMD
SR125 W 1,920 hp each Rotary Table—
Emasco 3,750 Net 1/2 speed gearbox
CRANES Two Line Bait 485-218A Seasmaster
w/70 boom 51' 45" @ 20
OTHER DATA 1 piece of Teledyne 18
WORK AREA Gulf of Mexico



TELEDYNE 11

CONSTRUCTION Built by Farnham Steel Corp 250-MB
101' x 11'
CONSTRUCTION Built by Bethlehem Steel
Singapore 1973
PERFORMANCE Wire depth—250 Drilling
Rate—25,000
QUARTERS 50 persons
FULL 108' x 108' x 16
VARIABLE LOAD 4,500 x 01' 11" 11" 11"
EQUIPMENT 80' x 70'
STORAGE Mud & Cement Bulk—4,480 cu yd
3,480 cu yd Liquid Mud—1,688 bbl Water for Drilling—
4,693 bbl Potable—124 bbl
DRILLING EQUIPMENT Drawworks—Emasco
C-3 Type H 3,000 hp Pumps—two Emasco #
1,600 Prime Movers—two EMD #
64551 2,200 hp two Cat 3196TA 1,115 hp
each Rotary Table—Emasco 3,750
DERRICK Emasco 147' 1,400,000 lb API
grade
BOP SYSTEM Cameron one 138" 10,000
psi single one 138" 10,000 psi dual hydraulic
one 138" 5,000 psi GK 400may closing unit
28160-35 5,000 psi & 10,000 psi choke man-
ual
CRANES Two Line Bait 485-108B Seasmaster
w/70 boom 51' 25" @ 17.5
WORK AREA Gulf of Mexico

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MUD PRODUCTS FOR USE OFFSHORE

PRIMARY

MUD COMPONENT DESCRIPTION

CHEMICAL NAME

APPLICATION

Barite*	Barium sulfate	For increasing mud weight up to 20 ppg.
Bentonite*	Naturally occurring clay	Viscosity and filtration control in waterbase muds.
Attapulgit*	Naturally occurring clay	Viscosifier in waterbase muds.
Phosphate	Sodium tetraphosphate	Thinner for low pH freshwater muds.
Mined Lignite*	Lignite	Dispersant, emulsifier and supplementary additive for fluid loss control.
Causticized Lignite	NaOH treated Lignite	1-6 ratio caustic-lignite dispersant, emulsifier, and supplementary fluid loss additive.
Modified Lignosulfonate	Sodium Lignosulfonate	Dispersant and fluid loss control additive for waterbase muds.
Blended Lignosulfonate Compound	Compound of chemical	Blended multi-purpose dispersant, fluid loss agent and inhibitor for unique mud systems.
CMC	Sodium Carboxymethyl	For fluid loss control and barite suspension in waterbase muds.
Detergent (Biodegradable)	Compound of vegetable oil	Used in waterbase muds to aid in dropping solids, emulsifies oil, reduces torque, and minimizes bit-balling.
Caustic Soda	Sodium Hydroxide NaOH	For pH control in waterbase muds.
Soda Ash	Sodium Carbonate	For treating out calcium sulfate in low pH muds.
Sodium Bicarbonate	Sodium Bicarbonate	For treating out calcium sulfate or cement in high pH muds.
Desco	Sulfur Metholate Quebracho	Dispersant and fluid loss control additive for waterbase mud.
HPA	Polyacrylamide Polyacrylate Polymer	Encapsulating polymer for waterbase mud.
Solvent	Sulfonated Blown Asphalt	Fluid loss control in waterbase muds.

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**MUD COMPONENT
DESCRIPTION**

CHEMICAL NAME

APPLICATION

Asbestos Fibers*

Asbestos

Viscosifier for fresh or saltwater muds.

Nut Shells: Fine

Natural materials

Most often used to prevent lost circulation.

Ground Mica*

Mica

Used for prevention of lost circulation.

Combination of granules,
flakes, and fibrous
materials of various sizes in
one sack.

None

Used where large crevices or fractures are
encountered.

Sodium Chromate

Sodium Chromate

Used in waterbase muds to prevent high temper-
ature gelation.

TERTIARY

Oil Soluble Surfactants

None

Non-weighted fluid for spotting to free differ-
entially stuck pipe.

Blend of fatty acids,
sulfonates, and Asphaltic
materials.

None

Invert emulsion that may be weighted to
desired density for spotting to free
differentially stuck pipe.

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