DATE 9-28-82

TO: OMS-2-2

FROM: OS-7-1

Supplemental Plan of ~~Exploration~~ Development/Production, Lease OCS-G 1608 and 2137
SP Blk 60
9.28.82
Arco Oil + Gas Co.

Control No. S-0966.

WORD_JOSEPH

ARCO Oil and Gas Company
South Louisiana District
Post Office Box 51408, Oil Center
Lafayette, Louisiana 70505
Telephone 318 264 4000

J. R. Pollock
Offshore District Engineer

1982 SEP 30 PM 12:56

September 23, 1982

Deputy Minerals Manager for
Offshore Operations Support (OS)
Minerals Management Service
Gulf of Mexico OCS Region
Post Office Box 7944
Metairie, Louisiana 70010 - 7944

Reference: Supplemental Development/Production Plan
OCS-G 1608 South Pass Block 60
OCS-G 2137 South Pass Block 60
South Pass Block 61 Field

Dear Sir:

In accordance with letter OS-7-1 from the Deputy Minerals Manager for Offshore Operations Support ten copies (5 proprietary) of the Supplemental Development/Production Plan (POD/Ps) for OCS-G 1608 and 2137 leases in South Pass Block 61 Field are hereby submitted in compliance with applicable provisions of 30 CFR 250.34. A POD check list is included in front of the exhibits for reference.

The continued development of OCS-G leases 1608 and 2137 will take place from our existing South Pass Block 60 Platforms A, D, and E. Exhibits 1 and 2 are the location maps for these leases and platforms. Our development activities will be the drilling of 11 wells from Platform E, 7 wells from Platform A and 1 well from Platform D. These wells will be completed and put on production through existing production facilities on South Pass Block 60 Platforms A, B, C, D, E, and F as they are drilled. All production will be sold through existing pipelines. In accordance with OCS Order No. 5, all individual wells will have surface controlled surface and subsurface safety valves installed. Exhibit #3 includes the drilling schedule, the coordinates of the surface and bottom hole locations, and true vertical depths of these wells. The bottom hole locations, TVD's and drilling schedule are only an estimate, which may be revised in the future after further evaluation of downhole data and subsequent drilling in an effort to optimize development. The approximate bottom hole locations for these thirteen wells are plotted on the spider map of the South Pass Block 61 Field (See Attachment 1). The total time for this proposed work is estimated at 1.6 years. The life of the reserves to be developed by these wells is estimated at 15 to 20 years.

Two drilling rigs will be used to carry out this development plan. The H & P 91 rig will perform the E Platform work and the "MARC" rig will be used on both A and D platforms. These rigs are self contained, modular platform rigs common to usage in the Gulf of Mexico. (See Exhibit #4, drawing of a typical self-contained drilling platform). All rig equipment which use potentially pollutant type materials in their operation will be equipped with drip pans. All engines, pumps, buildings, and pipe pack areas will have curbing with collection lines tied into the platform's disposal system. To prevent pollution of the Gulf of Mexico, all necessary prevention equipment and control features such as drip pans, curbs, drain lines, and sumps will be utilized in accordance with OCS Order No. 7. Cuttings and mud will be disposed of in the prescribed manner outlined in OCS Order No. 7. In the event that oil base muds are used during drilling operations a cuttings washer will be installed (See Exhibit #5). During drilling operations, diverter systems, blowout preventers, and well control equipment will be provided and maintained in accordance with OCS Order No. 2 (See Exhibits #6 and #7). Attached as Exhibit 8 (pages 1-4) is a list of the available mud additives.

Should there be an occurrence of pollution at the platform site, control and cleanup procedures will be implemented according to the approved "Oil Spill Contingency Plan" submitted on July 13, 1982, and approved by MMS on July 26, 1982. Atlantic Richfield Company is a member of Clean Gulf Associates which has response bases at Venice, Grand Isle, Intracoastal City, and Cameron in Louisiana. The response time of Clean Gulf Associates is within approximately 12 hours.

The existing onshore facilities at Venice, Louisiana serve as the operations base for drilling and production. This base consists of a docking facility, warehouse, yard, heliport, parking lot, and office which is used to supply the needed logistic, communication, and supervisory support. Crew boats, supply boats, and helicopters which support the platforms are coordinated from this base. Private radios and micro-wave channels and a regular telephone are installed. This shore base facility has dispatchers on duty 24 hours a day and a base coordinator.

Exhibit 9 (pages 1-4) is a copy of the calculations for air emissions for both the H & P 91 and "MARC" rigs.

Five of the ten copies of this Supplemental Development Plan include geological structure maps (Attachments 2-11), and two representative cross sections of the OCS-G 1608 and OCS-G 2137 leases (Attachments 12 and 13), which we request be held confidential as we believe the data to be exempt from disclosure under the Freedom of Information Act (5 U.S.C. 552) and implementing regulations (43 CFR Part 2).

If further data or clarification is required, please call me at Tel# (318) 264-4450.

Sincerely,

ARCO OIL AND GAS COMPANY

J. R. Pollock

J. R. Pollock

JCT/sls

Attachments

POD CHECK LIST

DESCRIPTION

✓ Description of work to be performed

SCHEDULE

✓ Commencement date

✓ Time to complete each phase

✓ Total time to complete the work proposed

LOCATION

✓ Location map of the lease block(s) relative to the shore line

✓ Description of onshore base facilities, LOCATION Venice, Louisiana

✓ Location map showing platform(s) location(s) - (non-proprietary)

GEOLOGICAL AND GEOPHYSICAL DATA

NA Identification of geological hazards

NA Archaeological report submitted

NA Surface location relative to anomalies

✓ Structure maps (proprietary)

✓ Cross Section (proprietary)

✓ Spider Map

✓ Depth: TVD and BHL (for each well)

OIL SPILL INFORMATION

✓ Oil spill plan referenced

✓ Base of operations

✓ Deployment time

OTHER

✓ List of mud additives

NA Production rate

✓ Estimated life of reserves

NA Water depth

✓ Description of drilling rig if applicable indicating pollution prevention equipment

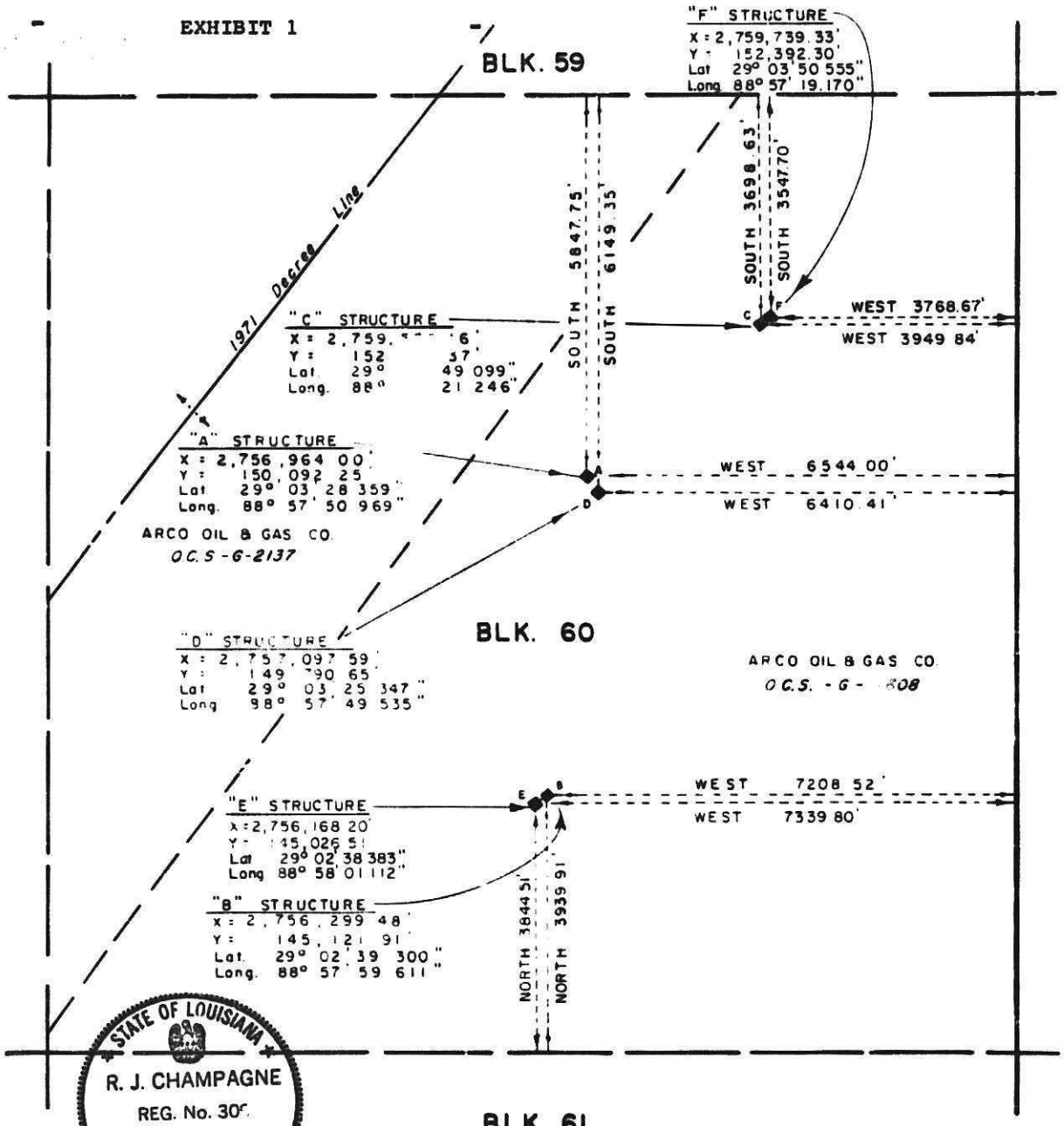
NA Description of the size, length, route, tie-in points and burial depth of proposed pipelines including a pipeline plat

✓ Calculations for air emissions

NA Environmental report if applicable

NA CZM Consistency if applicable

EXHIBIT 1



STATE OF LOUISIANA
R. J. CHAMPAGNE
REG. No. 309
REGISTERED
LAND SURVEYOR

I hereby certify that the above structures are correct.

R. J. Champagne

Registered Land Surveyor No. 309
State of Louisiana
John E. Chance & Associates, Inc.

PUBLIC INFORMATION PLAT

ARCO OIL & GAS CO.
A DIVISION OF ATLANTIC RICHFIELD CO.
OCS-G-1608 STR. A, B, C, D, E & F

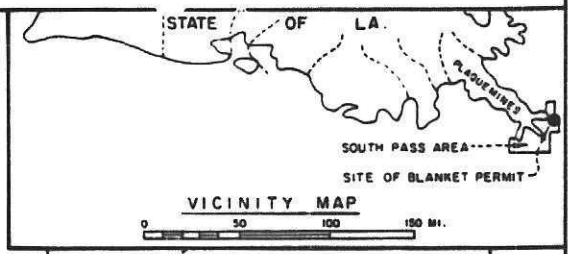
PERMIT PLAT

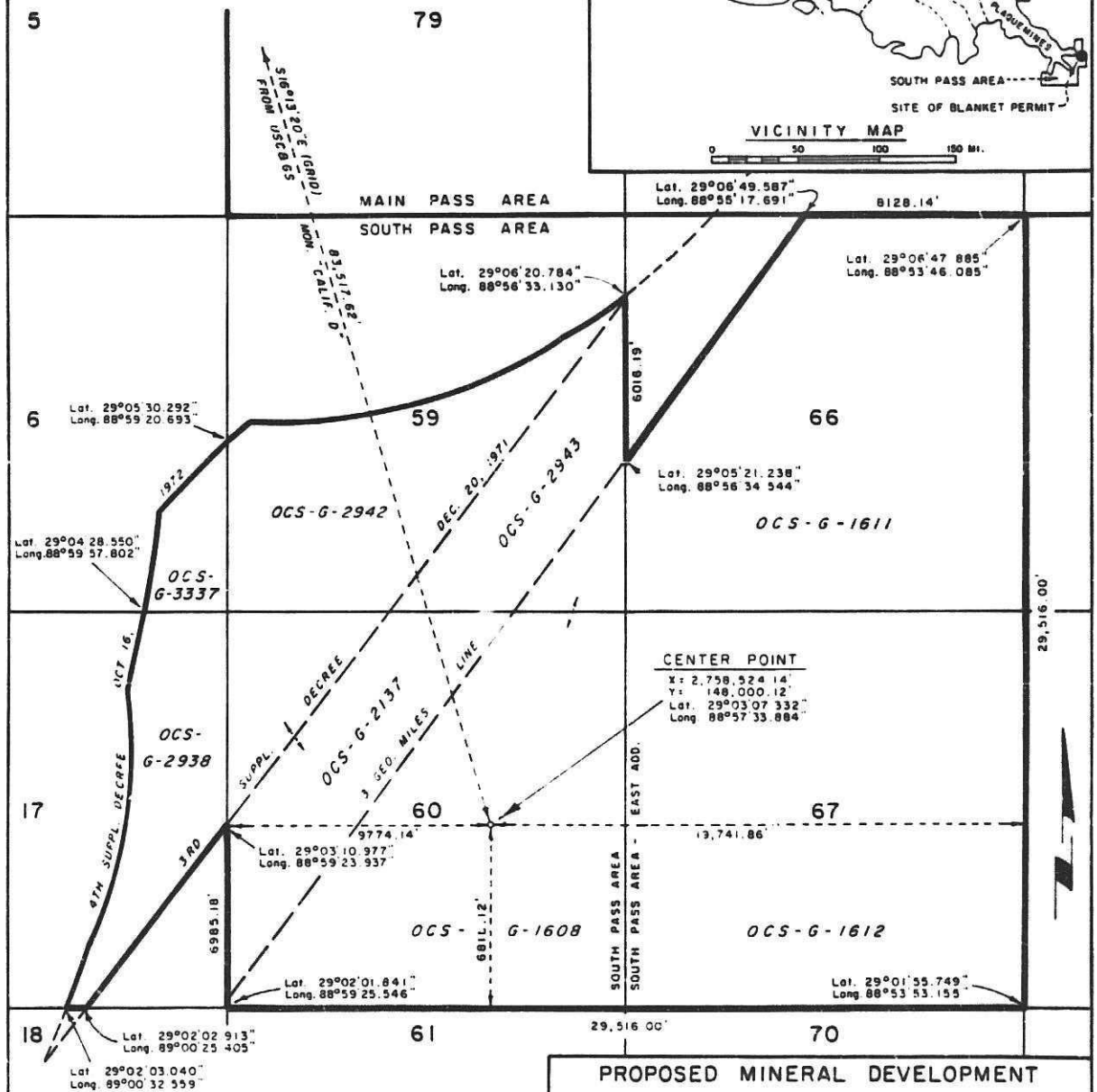
SOUTH PASS AREA

SCALE: 1" = 2000' 5/4/82

- EXHIBIT 2 -

PERMIT NO. 1394





MASTER SHEET

0 5000 10,000 FT
SCALE

SHEET 1 OF 3

PROPOSED MINERAL DEVELOPMENT

SOUTH PASS AREA

GULF OF MEXICO

APPLICATION BY ARCO OIL & GAS COMPANY
A DIVISION OF ATLANTIC RICHFIELD CO

AUG 10, 1967 (REV 11/4/74, 9/10/80, 5/12/81) LAFAYETTE, LA.

Exhibit 3

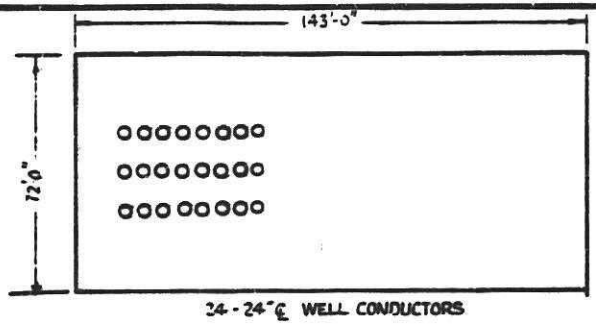
Rig	Well	BHL Lambert Coordinates X	Y	TVD (FT)	Estimated Spud Date	Estimated Completion Date
H & P 91 Rig	OCS-G 1608 E-9	2,749,528	142,031	11,000	08/24/82	10/15/82
	OCS-G 1608 E-12	2,752,500	145,282	9,200	01/01/82	02/16/83
	OCS-G 1608 E-13	2,755,150	146,782	6,500	02/16/83	03/29/83
	OCS-G 1608 E-14	2,755,350	144,582	7,000	03/29/83	05/09/83
	OCS-G 1608 E-11	2,755,550	147,382	8,200	05/09/83	06/24/83
	OCS-G 1608 E-15	2,755,550	143,382	7,500	06/24/83	08/08/83
	OCS-G 1608 E-16	2,756,050	145,782	6,000	08/08/83	09/17/83
	OCS-G 1608 E-17	2,756,350	142,282	7,000	09/17/83	11/16/83
	OCS-G 2137 E-18	2,750,235	150,041	9,300	11/16/83	01/15/83
	OCS-G 1608 E-19	2,755,450	146,082	6,500	01/15/84	03/01/84
	OCS-G 2137 E-20	2,749,750	144,182	10,000	03/01/84	05/01/84
"MARC" Rig	OCS-G 2137 D-29	2,749,050	152,840	9,500	04/01/83	11/01/83
	OCS-G 1608 A-38	2,755,964	149,292	5,500	11/01/83	12/01/83
	OCS-G 2137 A-39	2,752,964	150,392	7,500	12/01/83	01/15/84

Surface Locations:

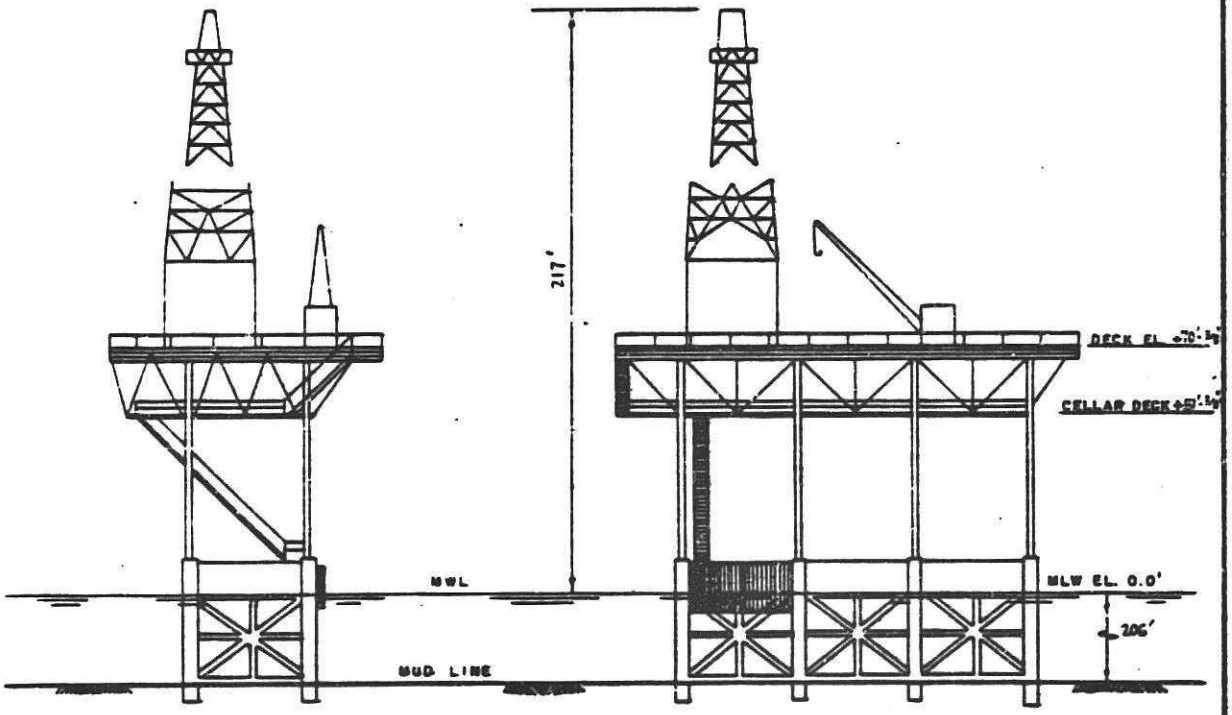
A Platform Location X=2,756,964 Y=150,092

D Platform Location X=2,757,098 Y=149,791

E Platform Location X=2,756,168 Y=145,027



PLAN



END ELEVATION

SIDE ELEVATION

TYPICAL SELF-CONTAINED DRILLING PLATFORM

PROPOSED MINERAL DEVELOPMENT
SOUTH PASS AREA
GULF OF MEXICO
APPLICATION BY ATLANTIC RICHFIELD CO.
LAFAYETTE, LA.

CUTTINGS FALL INTO THE WASH TANK EQUIPPED WITH A MUD TANK MIXER. As the wash solution is circulated over the double-deck shale shaker, clean cuttings are discharged for disposal and the wash solution returns to the tank. When the wash solution becomes contaminated, the system is completely shut down for a few minutes to allow the oily particles to settle. Because some erosion of the cuttings does occur during the washing process and because oil surrounds these eroded particles, the contaminant settles rather than floats. The integrity of the oil-mud is maintained in the washing process and its density is always greater than that of water. When the sediment has accumulated on bottom, a small pump moves it through a hose back to the drilling fluid, and the system is ready to start up again.

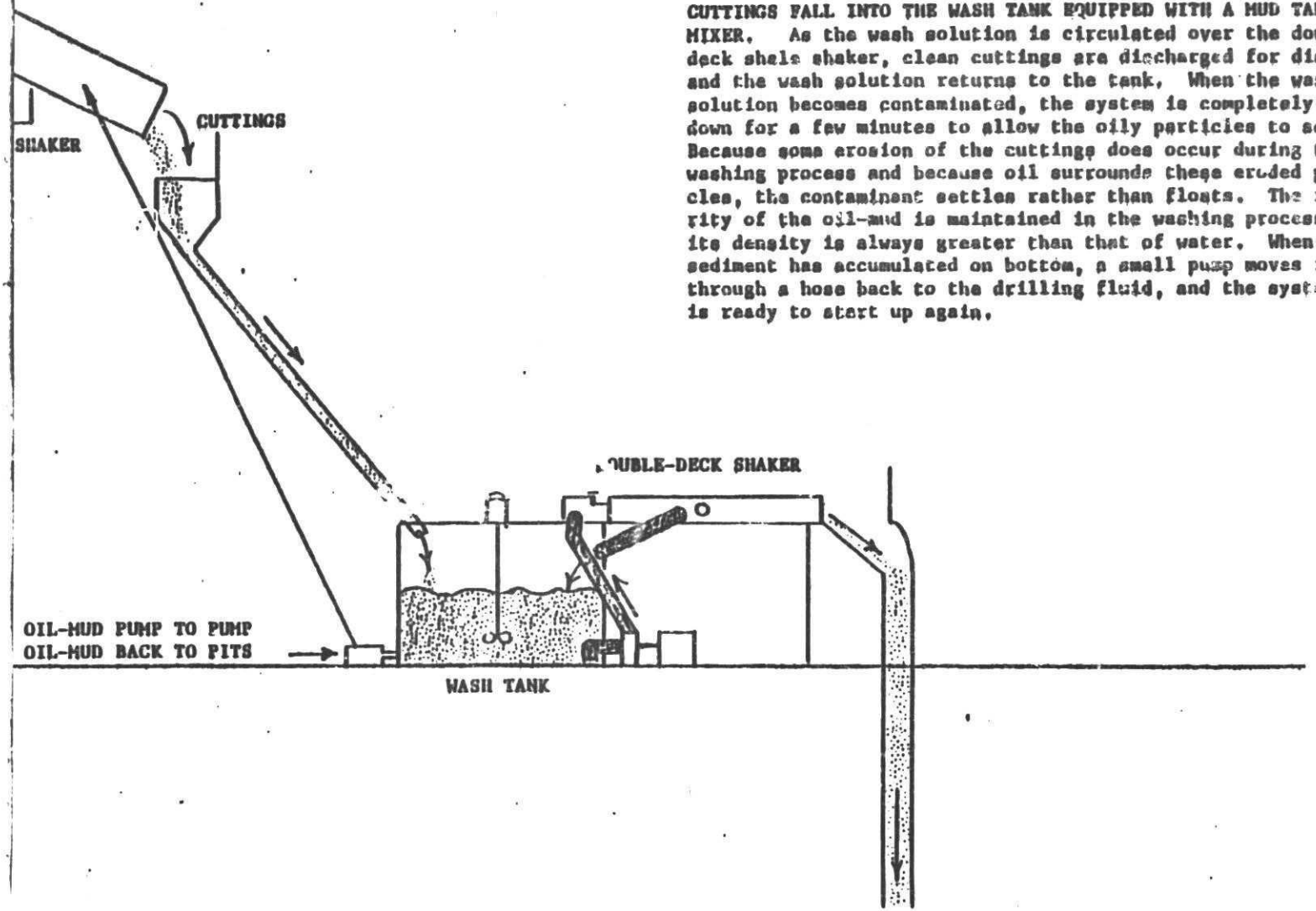
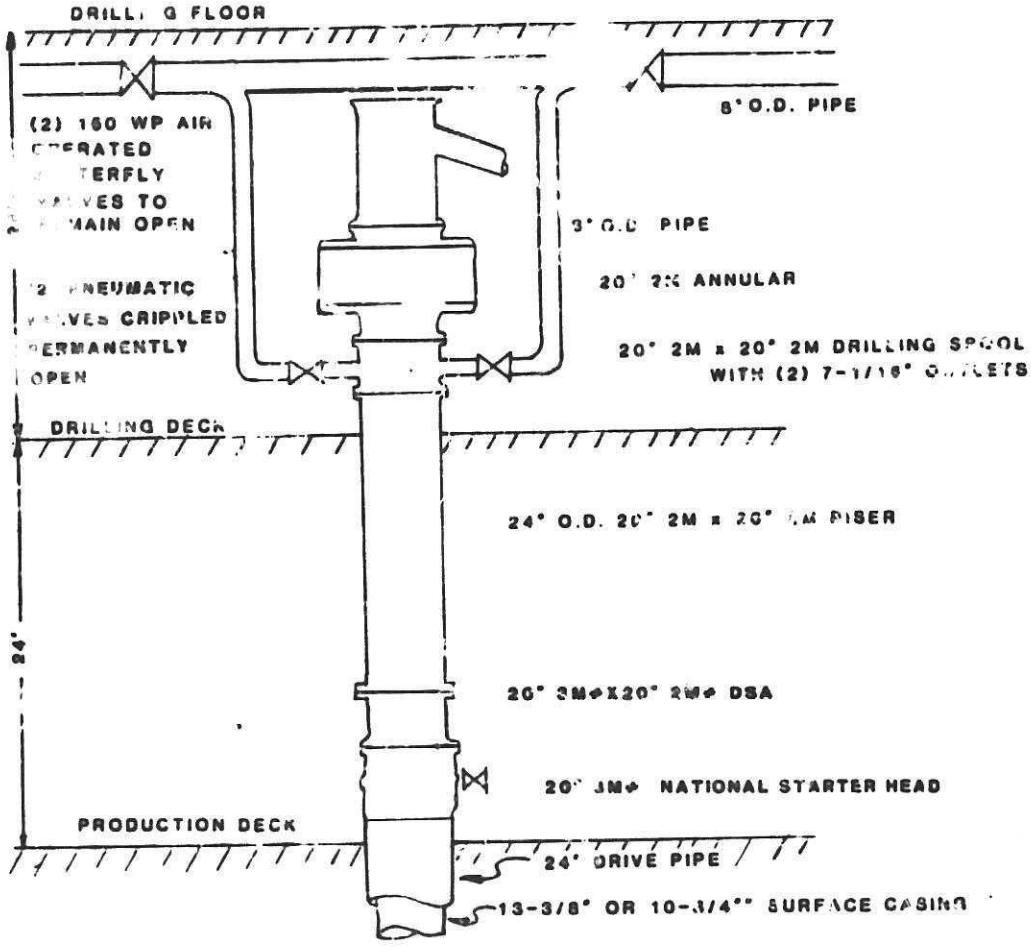


EXHIBIT 5

EXHIBIT 6

SP BLK 31 "E" PLATFORM NO. 31

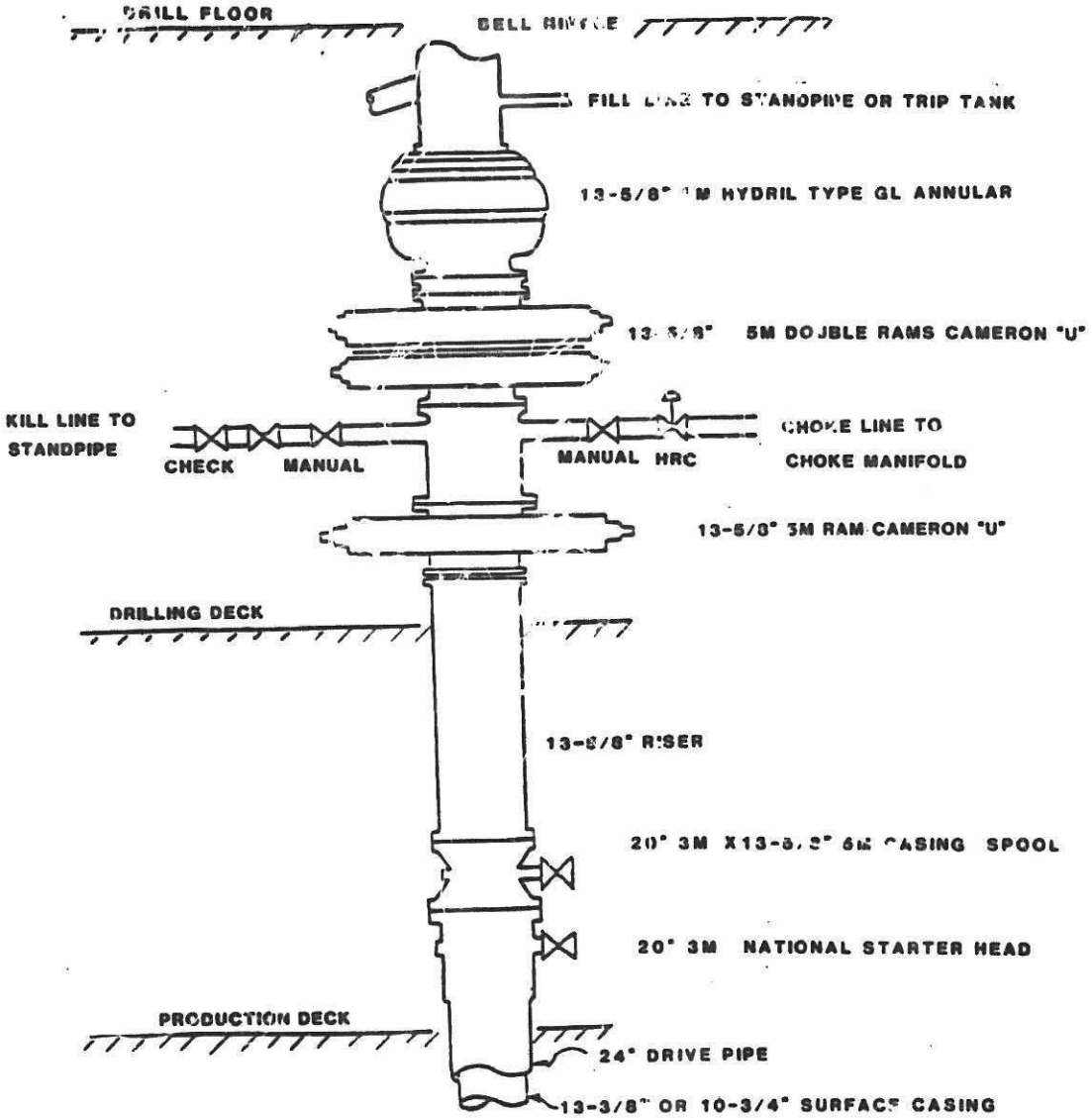


OPERATION

THIS DIVERTER SYSTEM [illegible] BE INSTALLED FROM THE START UNTIL SURFACE CASING IS LANDED. ALL DIVERTER VALVES WILL REMAIN OPEN AT ALL TIMES. LINES WILL BE FLUSHED OUT DAILY. AT THE FIRST SIGN OF A KICK, THE DRILLER WILL CLOSE THE ANNULAR PREVENTER AND WELL FLUIDS WILL BE AUTOMATICALLY DIVERTED. DEPENDING ON PREVAILING WIND CONDITION AND SIZE OF KICK, ONE DIVERTER LINE MAY THEN BE CLOSED.

EXHIBIT 7

SP D'K 61 E" PLATFORM H&P 91



Description or Principal Component	IMCO SERVICES	Baroid	Magcobar	Milchem	Primary Applications
WEIGHTING AGENTS AND VISCOSIFIERS					
Barite	IMCO BAR	Baroid	Magcobar	Mil-Bar	For increasing mud weight to 22 ppg.
Calcium Carbonate	IMCO WATE		Lo-Wate	W.O. 30 W.O. 50	For increasing weight of oil muds up to 19.8 ppg.
Bentonite	IMCO GEL	Aquagel	Magcogel	Milgel	Viscosity and filtration control in water-base muds.
Sub-Bentonite	IMCO KLAY	Baroco	High Yield Blended Clay	Green Band Clay	For use when larger particle size is desired for viscosity and filtration control.
Attapulgite	IMCO BRINEGEL	Zeogel	Salt Gel	Salt Water Gel	Viscosifier in saltwater muds.
Beneficiated Bentonite	IMCO HYE	Quick-Gel	Kwik-Thik	Super-Col	Quick viscosity in fresh-water, upper-hole muds with minimum chemical treatment.
Asbestos Fibers	IMCO SHURLIFT	Flosal	Visquick	Flosal	Viscosifier for fresh-water or saltwater muds.
Bacterially Produced Polymer	IMCO XC	XC Polymer	Duovis	XC Polymer	Viscosifier and fluid-loss control additive for low-solids muds.
Sepiolite	IMCO DUROGEL				Viscosifier in all water-base muds, especially high-temperature drilling fluids.
DISPERSANTS					
Sodium Tetraphosphate	IMCO PHOS	Barafos	Magco-Phos	Oil Fos	Thinner for low pH fresh-water muds where temperatures do not exceed 180°.
Sodium Acid Pyrophosphate	SAPP	SAPP	SAPP	SAPP	For treating cement contamination.
Quebracho Compound	IMCO QBT	Tannex	M-C Quebracho	Tanco	Thinner for fresh-water and lime muds.
Modified Tannin	DESCO	Desco	Desco	Desco	Thinner for fresh-water and saltwater muds alkalized for pH control.
Processed Lignite	IMCO LIG	Carbonox	Tann A Thin	Ligco	Dispersant, emulsifier and supplementary fluid-loss additive for fluid-loss control.
Causticized Lignite	IMCO THIN	CC-16	Causlig	Ligcon	1-6 ratio caustic-lignite dispersant, emulsifier and supplementary fluid-loss additive.
Modified Lignosulfonate	IMCO VC-10	Q-Broxin	Spersene	Uni-Cal	Dispersant and fluid-loss control additive for water-base muds.
Blended Lignosulfonate Compound	IMCO RD-111				Blended multi-purpose dispersant, fluid-loss agent and inhibitor for IMCO RD-111 mud systems.
Chrome-Free Lignosulfonate	IMCO RD-2000			X-KB Thin	Dispersant and fluid-loss control additive for water-base muds.
FLUID-LOSS REDUCERS					
Organic Polymer	IMCO PERMALOID	DEXTRID			Controls fluid loss in water-base systems.
Pregelatinized Starch	IMCO LOID	Impermex	My-Lo-Jel	Milstarch	Controls fluid loss in saturated salt water, and lime muds.
Sodium Carboxymethyl Cellulose	IMCO CMC (Regular)	Cellex (Regular)	Magco CMC (Regular)	Milchem CMC (Med-Vis)	For fluid-loss control and barite suspension in water-base muds.
Sodium Carboxymethyl Cellulose	IMCO CMC (Hi-Vis)	Cellex (Hi-Vis)	Magco CMC (Hi-Vis)	Milchem CMC (Hi-Vis)	For fluid-loss control and viscosity building in low-solids muds.
Polyanionic Cellulosic Polymer	DRISPAC	Drispac	Drispac	Drispac	Fluid-loss control additive and viscosifier in salt muds.
Polyanionic Cellulosic Polymer	DRISPAC SUPERLO	Drispac Superlo	Drispac Superlo	Drispac Superlo	Primary fluid-loss additive, secondary viscosifier in water-base muds.
*Sodium Polyacrylate	IMCO SP 101				Fluid-loss control in calcium-free low solids and nondispersed muds.

*Cypan and WL-100 are sold by American Cyanamid and Rotary Engineering, respectively.

Exhibit 8

COMPARABLE MUD PR[illegible]ADE NAMES (Continu

Description or Principal Component	IMCO SERVICES	Baroid	Magcobar	Milchem	Primary Application
LUBRICANTS, DETERGENTS, EMULSIFIERS, AND SURFACTANTS					
Extreme Pressure Lubricant	IMCO EP LUBE	EP Mud Lube	Bit Lube	Lubri-Film	Used in water-base muds to impart extreme pressure lubricity
Processed Hydrocarbons	SOLTEX	Soltex	Soltex	Soltex	Used in water-base muds to lower downhole fluid loss and minimize heaving shale.
Water Dispersible Asphalts	IMCO HOLECOAT		STABIL-HOLE	ITI-WD	Lubricant and fluid-loss reducer for water-base muds that contain no diesel or crude oil.
Oil Dispersible Asphalts	IMCO MUD OIL	Baroid Asphalt	Pave-A-Hole	Carbo-Seal	Lubricant and fluid-loss reducer for water-base fluids that contain diesel or crude oil.
Oil Soluble Surfactants	IMCO FREEPIPE	Skot-Free	Pipe Lax	Petrocote	Nonweighted fluid for spotting to free differentially stuck pipe.
Detergent	IMCO MD	Con Det	D-D	Milchem MD	Used in water-base muds to aid in dropping sand. Emulsifies oil, reduces torque and minimizes bit balling.
Blend of Anionic Surfactants	IMCO SWS	Trimulse	Salinex	Atlosol & Atlosol S	Emulsifier for saltwater and freshwater muds.
An Organic Entity Neutralized with Amines	IMCO LUBRIKLEEN	Torq Trim	DOS-3	Mil-Plate 2	Supplies the lubricating properties of oils without environmental pollution.
Blend of Fatty Acids, Sulfonates, and Asphaltic Materials	IMCO SPOT	SF 100			Invert emulsion that may be weighted to desired density for placement to free differentially stuck pipe.
DEFOAMERS, FLOCCULANTS, AND BACTERICIDES					
Aluminum Stearate	Aluminum Stearate	Aluminum Stearate	Aluminum Stearate	Aluminum Stearate	Defoamer for lignosulfonate muds
Liquid Surface-Active Agent	IMCO DEFOAM L				Defoamer for all water-base muds.
Surface-Active Dispersible Liquid Defoamer	IMCO FOAMBAN	W200 W300		LD-7	All-purpose defoamer.
Flocculating Agent	IMCO FLOC	Barafloc	Floxit	Separan	Used to drop drilled solids where clear water is desirable for a drilling fluid.
Blended Solutions	IMCO CIDE				Bactericide used to prevent fermentation.
LOST CIRCULATION MATERIALS					
Fibrous Material	IMCO FYBER	Fibertex	Mud Fiber	Mil-Fiber	Filler as well as matting material.
Nut Shells: Fine	IMCO PLUG	Wall-Nut	Nut-Plug	Mil-Plug	Most often used to prevent lost circulation.
Medium	IMCO PLUG	Wall-Nut	Nut-Plug	Mil-Plug	Used in conjunction with fibers or flakes to regain lost circulation.
Coarse	IMCO PLUG	Wall-Nut	Nut-Plug	Mil-Plug	Used where large crevices or fractures are encountered.
Ground Mica: Fine	IMCO MYCA	Micatex	Magco-Mica	Milmica	Used for prevention of lost circulation.
Coarse	IMCO MYCA	Micatex	Magco-Mica	Milmica	Forms a good mat at face of wellbore.
Cellophane	IMCO FLAKES	Jel Flake	Cell-O-Seal	Milflake	Used to regain lost circulation.
Combination of granules, flakes, and fibrous materials of various sizes in one sack.	KWIKSEAL	Kwik-Seal	Kwik-Seal	Kwik-Seal	Used where large crevices or fractures are encountered.

COMPARABLE MUD PRODUCTS BY TRADE NAMES (Continued)

Description or Principal Component	IMCO SERVICES	Baroid	Magcobar	Milchem	Primary Application
SPECIALTY PRODUCTS					
Bentonite Extender	IMCO GELEX	Benex	Benex	Benex	Increases yield of bentonite to form very low-solids drilling fluid.
Inhibiting Agent	IMCO IE PAC				Imparts high-temperature fluid-loss control, temperature stability and increased inhibition.
Synergistic Polymer Blend	IMCO POLY Rx		Resinex		Rheological stabilization and filtration control.
Biodegradable Surfactant	IMCO FOAMANT				Foaming agent in air or mist drilling.
High-Temperature Polymer	IMCO DRILTHERM				High-temperature fluid-loss control.
Multipurpose Polymer	IMCO POLYSAFE				Polymer for fluid-loss control.
COMMERCIAL CHEMICALS					
Sodium Chromate	Sodium Chromate	Sodium Chromate	Sodium Chromate	Sodium Chromate	Used in water-base muds to prevent high-temperature gelation.
Sodium Hydroxide	Caustic Soda	Caustic Soda	Caustic Soda	Caustic Soda	For pH control in water-base muds.
Sodium Carbonate	Soda Ash	Soda Ash	Soda Ash	Soda Ash	For treating out calcium sulfate in low pH muds.
Sodium Bicarbonate	Sodium Bicarbonate	Sodium Bicarbonate	Sodium Bicarbonate	Sodium Bicarbonate	For treating out calcium sulfate or cement in high pH muds.
Barium Carbonate	Barium Carbonate	Anhydrox	Barium Carbonate	Barium Carbonate	For treating out calcium sulfate (pH should be above 10 for best results).
Calcium Sulfate	Gypsum	Gypsum	Gypsum	Gypsum	Source of calcium for formulating gyp muds.
Calcium Hydroxide	Lime	Lime	Lime	Lime	Source of calcium for formulating lime muds.
Sodium Chloride	Salt	Salt	Salt	Salt	For saturated salt muds and resistivity control.
Chrome Alum (chromic chloride)	Chrome Alum	Chrome Alum	Chrome Alum	Chrome Alum	For use in cross-linking XC Polymer systems.
OIL-MUD ADDITIVES					
Primary Emulsifier	IMCO KENOL-S (L) and IMCO KEN-X Conc. #1(L)	Invermul	Vertoil	Carbo-Tec (D) and Carbo-Tec (L)	Primary additives to form stable water-in-oil emulsion.
Viscosifier and Gelling Agent	IMCO KEN GEL and IMCO KEN-X CONC.#2	Gel-Tone and Petro-Tone	VG-69	Carbo-Gel	Provides viscosity, weight suspension, and filtration control.
High-Temperature Stabilizer	IMCO KEN-X Conc. #3	Duratone HT.	DV-22 and DV-33		Improves emulsion under high-temperature conditions.
Stabilizes Borehole Conditions	IMCO VR				Stabilizes running shale, improves emulsion, weight suspension, and fluid loss under high-temperature conditions.
CORROSION INHIBITORS					
Zinc Compound	IMCO SULF-X II				For use as a hydrogen sulfide scavenger in water-base and oil-base muds.
Liquid Corrosion Inhibitor	IMCO CRACK CHEK				Prevent stress cracking of drill strings in an H_2S environment.
A Catalyzed Ammonium Bisulfite	IMCO XO_2	Coat 177	A-202		For use as an oxygen scavenger.
Filming Amine	IMCO X-CORR				Corrosion inhibitor.

Description or Principal Component	IMCO SERVICES	Baroid	Magcobar	Milchem	Primary Application
CORROSION INHIBITORS (Continued)					
Filming Amine	IMCO PERMAFILM				Corrosion inhibitor.
Organic Polymer	IMCO SCALECHEK				Scale inhibitor.
Calcium Oxide	IMCO KENOX				Calcium source for saponification.
Fatty Acid Emulsifier	IMCO KEN SUPREME Conc. A		Oilfaze		Primary emulsifier and stabilizer for oil-base drilling fluids.
Emulsion Stabilizer	IMCO KEN SUPREME Conc. B		DG-55		Imparts gels, contributes to viscosity for weight suspension, and provides filtration control.
Specially Modified Saponified Fatty Acid Chemicals	IMCO KEN PAK	SF-100			Gelling agent for formulating high-gelation casing packs.
Wetting Agent and Dispersant	IMCO KEN CAL-L				Wetting agent and dispersant for oil muds for the reduction and/or stabilization of viscosity.

NOTES

Exhibit 9

ARCO OIL & GAS COMPANY

A DIVISION OF

ATLANTIC RICHFIELD COMPANY

SOUTH PASS BLOCK 60

SUPPLEMENTAL PLAN OF DEVELOPMENT/PRODUCTION

PLATFORM "E"

OCS-G-1608

AIR EMISSIONS DATA REPORT

SEPTEMBER 22, 1982

SUMMARY OF OPERATIONS

As identified in the supplemental Plan of Development and Production (POD&P), ARCO Oil & Gas Company proposes to drill 10 additional wells from Platform "E" in South Pass Block 60. This platform is located approximately 5 miles from shore or S 14 09' 29" E 85,716.14' from USC & GS Mon. "CALIFORNIA D".

The H&P 91 rig will be used to drill the wells from Platform "E". This self-contained platform rig has four Caterpillar G-399 natural gas fired prime movers rated at 870 BHP each. During normal drilling operations, two engines will be on-line. The rig cranes are Unit Mariner 500's which each contain a 3 cyclinder General Motors diesel engine rated at 96 BHP. The cement unit consists of two Halliburton HT-400 pumps, each driven by a GMC 8V-71N diesel engine rated at 333 BHP. The cement mixer is driven by a GMC 3-71N diesel rated at 120 BHP. Some wireline operations can be expected and would typically require 70 BHP GIH and 85 BHP POOH using a Cummins 378-C-155 diesel engine.

Also identified in the supplemental POD&P is a "MARC" rig (Minimum Area Rig Concept) which will drill 1 well from "D" Platform and 2 from "A" Platform also in block 60. Emissions from this rig will essentially be the same as H&P 91 since this is also an H&P rig. The only difference would be the crane which will be large since it is used for moving the other rig sections. This crane is a Unit Mariner 650-H which contains a GM 8V-92N diesel engine rated at 355 BHP.

TYPICAL SELF-CONTAINED PLATFORM RIG

Note: Applies to both rigs with exception of crane units.

1. Prime Movers - Four V-16 Caterpillar G-399's

   Natural gas fired, 870 BHP each. Average of two are used 75% of the time for drilling operations at 75% load. Same two operate at 25% load the other 25% of the time (non-drilling operations). Engine efficiency is 80% (assumed).

2a. Rig Cranes - Two Unit Mariner 500's

   3 Cylinder General Motors diesel engines, 96 BHP each. Normally only one crane operates at a time and does so intermittantly. Total usage averages to approximately 30% for one engine.

b. MARC Rig Crane - Unit Mariner 650-H

   GM 8V-92N diesel engine, 355 BHP, used 30% of the time, operates at 50% load.

3. Cementing Unit

a. Two GM 8V-71N diesel engine driven pumps, 333 rated BHP, 230 continuous BHP, average of 5% actual use at continuous rating.

b. One GM 3-71N diesel cement mixer, 90 rated BHP, 67 continuous BHP, average of 5% actual use at continuous rating.

4. Wireline Unit

   Cummins 378-C-155 diesel engine, 90 BHP GIH - 50% of the time, 85 BHP POOH - 50% of the time, average 4 days/well (each 2 months), total of 24 days/year.

5. Emergency Rig Generator

   Caterpillar D-379 V-8 diesel, 715 continuous BHP at 1300 RPM, used for emergency back-up, not figured in emission totals.

EMISSION CALCULATIONS (#/yr)
(based on EPA's AP-42 data)

Prime Movers

2 x 870 BHP x 80% x 75% x $\frac{18}{24}$ hr. x 365 days = 285,795 HP/yr.

285,795	x 24 #/1000 HP-HR.	NO_x =	6859.08 #/yr.
"	x 3.1 "	CO =	885.96 "
"	x .004 "	SO_2 =	1.14 "
"	x ---- "	TSP =	------
"	x 9.7 "	TMC =	2772.21 "

2 x 870 BHP x 80% x 25% x $\frac{6}{24}$ hr. x 365 days = 31,755 HP/yr.

31,755	x 24 #/1000 HP-HR	NO_x =	762.12 #/yr.
"	x 3.1 "	CO =	98.44 "
"	x .004 "	SO_2 =	.13 "
"	x ---- "	TSP =	------
"	x 9.7 "	THC =	308.02 "

Rig Cranes

1 x 67 BHP x 30% x 365 = 7336.5 HP/yr.

7336.5	x .030837 #/HP-HR	NO_x =	226.24 #/yr.
"	x .006674 "	CO =	48.96 "
"	x .0020507 "	SO_2 =	15.04 "
"	x .0022026 "	TSP =	16 16 "
"	x .002467 "	THC =	18.10 "

MARC Rig Crane

1 x 355 BHP x 30% x 365 x 50% = 19,436.25

19,436.25	x .030837 #/HP-HR	NO_x =	599.36 #/yr
"	x .006674 "	CO =	129.78 "
"	x .0020507 "	SO_2 =	39.88 "
"	x .0022026 "	TSP =	42.83 "
"	x .002467 "	THC =	47.97 "

Cementing Unit

a. 2 x 230 BHP x 5% x 365 = 8395 HP/yr.

8395	x .030837 #/HP-HR	NO_x = 258.88	#/yr.
"	x .006674 "	CO = 56.03	"
"	x .0020507 "	SO_2 = 17.22	"
"	x .0022026 "	TSP = 18.49	"
"	x .002467 "	THC = 20.71	"

b. 1 x 67 BHP x 5% x 365 = 1222.75 HP/yr.

1222.75	x .030837 #/HP-HR	NO_x = 37.71	#/yr
"	x .006674 "	CO = 8.16	"
"	x .0020507 "	SO_2 = 2.51	"
"	x .0022026 "	TSP = 2.69	"
"	x .002467 "	THC = 3.02	"

Wireline Unit

1 x 70 x $\frac{12}{24}$ hr. x 24 = 840 HP/yr.

840	x .030837 #/HP-HR	NO_x = 25.90	#/yr.
"	x .006674 "	CO = 5.61	"
"	x .0020507 "	SO_2 = 1.72	"
"	x .0022026 "	TSP = 1.85	"
"	x .002467 "	THC = 2.07	"

1 x 85 x $\frac{12}{24}$ x 24 = 1,020 HP/yr.

1,020	x .030837 #/HP-HR	NO_x = 31.45	#/yr.
"	x .006674 "	CO = 6.81	"
"	x .0020507 "	SO_2 = 2.09	"
"	x .0022026 "	TSP = 2.25	"
"	x .002467 "	THC = 2.52	"

AIR EMISSIONS DATA

Exemption Formulas:

(1) 33.3 D for NO_x, SO_2, TSP, VOC each

(2) 3400 $D^{2/3}$ for CO

Where, D = distance from shore defined as landward of the mean high water mark.

Maximum Allowables

(1) 33.3 x 5 = 166.5 tons/year each of NO_x, SO_2, TSP, VOC

(2) 3400 x $5^{2/3}$ = 9,941.66 tons/year for CO

EPA AP-42 EMISSION FACTORS

	NATURAL GAS FUELED INTERNAL COMBUSTION ENGINE (#/1000 HP-HR)	DIESEL FUELED INTERNAL COMBUSTION ENGINE (#/HP-HR)
NO_x	24	.030837
CO	3.1	.006674
SO_2	.004	.0020507
TSP	----	.0022026
*THC	9.7	.002467

Note: Total Hydrocarbons (THC) as methane and non-methane.

COMPARABLE MUD PRODUCTS BY TRADE NAMES (Continued)

Description or Principal Component	IMCO SERVICES	Baroid	Magcobar	Milchem	Primary Application
CORROSION INHIBITORS (Continued)					
Filming Amine	IMCO PERMAFILM				Corrosion inhibitor.
Organic Polymer	IMCO SCALECHEK				Scale inhibitor
Calcium Oxide	IMCO KENOX				Calcium source for saponification.
Fatty Acid Emulsifier	IMCO KEN SUPREME Conc. A		Oilfaze		Primary emulsifier and stabilizer for oil-base drilling fluids.
Emulsion Stabilizer	IMCO KEN SUPREME Conc. B		DG-55		Imparts gels, contributes to viscosity for weight suspension, and provides filtration control.
Specially Modified Saponified Fatty Acid Chemicals	IMCO KEN PAK	SF-100			Gelling agent for formulating high-gelation casing packs.
Wetting Agent and Dispersant	IMCO KEN CAL-L				Wetting agent and dispersant for oil muds for the reduction and/or stabilization of viscosity.

NOTES

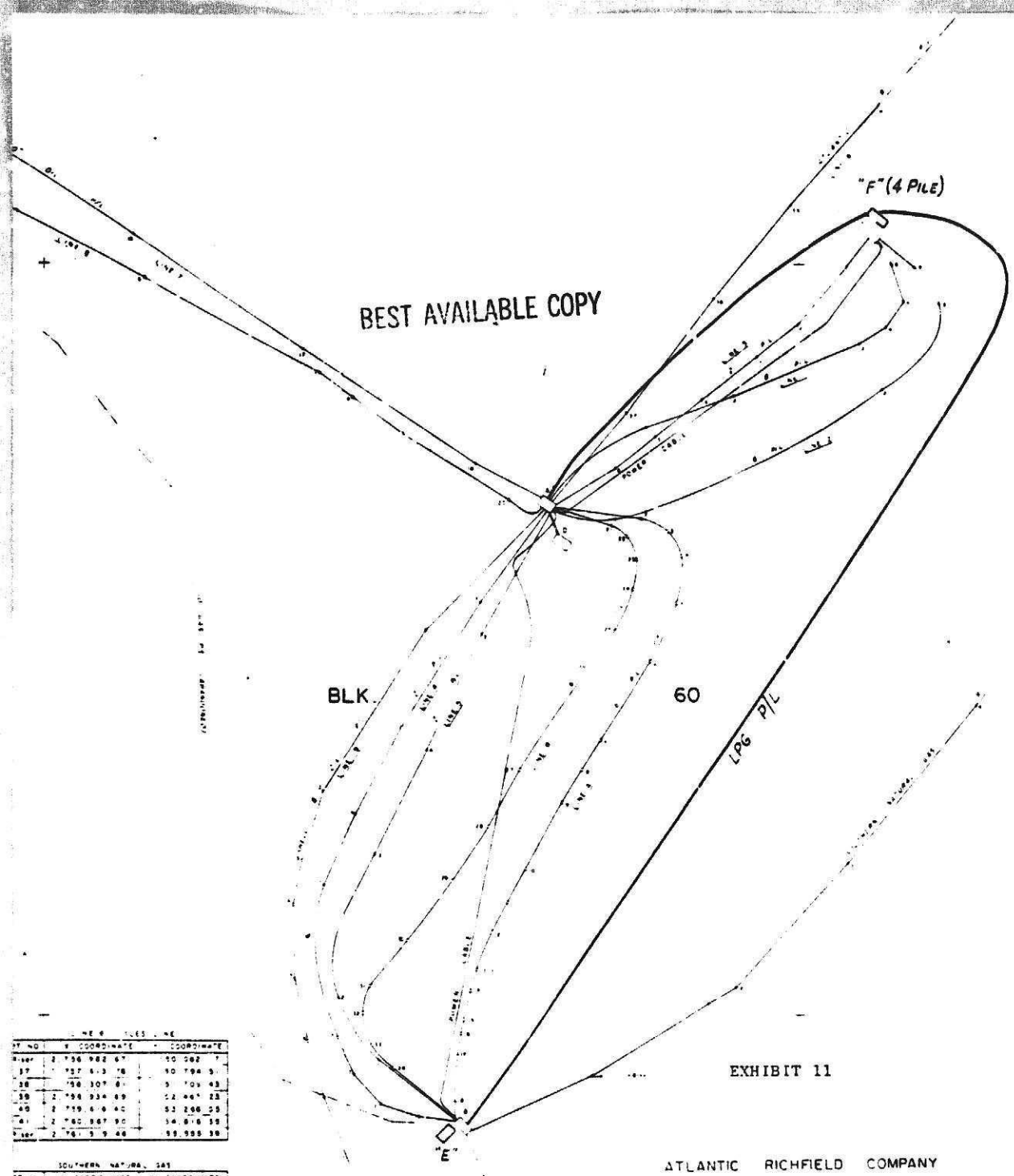


EXHIBIT 11

ATLANTIC RICHFIELD COMPANY

FACILITIES MAP OF

BLOCK 60

SOUTH PASS AREA

SCALE 1" = 1000' 2/8/76

ARCO Oil and Gas Company
South Louisiana District
Post Office Box 51406, Oil Center Station
Lafayette, Louisiana 70505
Telephone 318 264 4000

Clovis C. Lowe, Jr.
Offshore District Engineer

June 25, 1980

Mr. J. Rogers Pearcy
U. S. Geological Survey
P. O. Box 7944
Metairie, LA 70010

Dear Mr. Pearcy:

Enclosed is a report on the projected differential emissions for our proposed enhanced oil recovery project in South Pass Block 61 Field. This data is supplemental to our previous submittal of June 6, 1980. I believe this should provide the remaining necessary data for you to process the proposed modification as per recent conversations with Mr. Elgin Landry and you. However, please advise if any additional data is required or further clarification need be provided.

Sincerely,

ATLANTIC RICHFIELD COMPANY

Clovis C. Lowe, Jr.
Offshore District Engineer

sb

Enclosure

AIR EMISSIONS DATA

Exemption Formulas:

(1) 33.3 D, each, for NO_x, SO_2, TSP, VOC

(2) 3400 D2/3 for CO

where, D = distance from shore defined as landward of the mean high water mark.

Note: This distance could be judged to be as little as 7 miles, although landward of the mean high water mark is ambiguous terminology and hard to define. The nearest practical distance (which we have used in these formulas) for this reason and because it is the nearest inhabited area is 13 miles to Port Eads.

Maximum Allowables at 13 miles:

(1) 33.3 x 13 = 399.6 tons/year, each, for NO_x, SO_2, TSP, VOC

(2) $3400 \times 13^{2/3}$ = 18,797.5 tons/year for CO

Maximum Allowables at 7 miles:

(1) 33.3 x 7 = 233.1 tons/year, each for NO_x, SO_2, TSP, VOC

(2) $3400 \times 7^{2/3}$ = 12,441.64 tons/year for CO

Fuel Content: 98% C_1
.5% CO_2
.5% N_2
1.0% C_2
NO SULPHUR CONTENT

SUMMARY OF OPERATIONS

The operations proposed in the supplemental plan is an Enhanced Oil Recovery (EOR) project in South Pass Block 61 Field. This tertiary recovery project will involve injection of natural gas and natural gas liquids (NGL's) on Platform "F" for miscible displacement of crude oil which will require two 250 horsepower pumps (Waukesha H-2475G) and three 750 horsepower internal combustion engine driven compressors to compress the gas for injection (Waukesha L-7042GU). Additionally one 3500 horsepower turbine compressor will be located on Platform "E", which will boost the outlet gas from the cryogenic plant to provide gaslift gas, fuel and suction to the injection compressors.

EMISSION FACTORS AND TOTALS

	Horse-power	*BACT Emission Factors (#/hr.) NO_x	CO	TSP	THC	SO_2	Quantity
Waukesha H-2475C	250	5.5	5.5	-	1.1	-	2
Waukesha L-7042GU	750	16.5	16.5	-	3.3	-	3
Centaur Turbine	3500	17.6	7.68	-	2.4	-	1

TOTAL EMISSIONS (tons/yr.) NO_x	CO	TSP	THC	SO_2
48.18	48.18	-	9.64	-
216.81	216.81	-	43.35	-
77.09	33.64		10.51	-
342.08	298.63	-	63.50	-

*Based on manufacturer's emission factors.

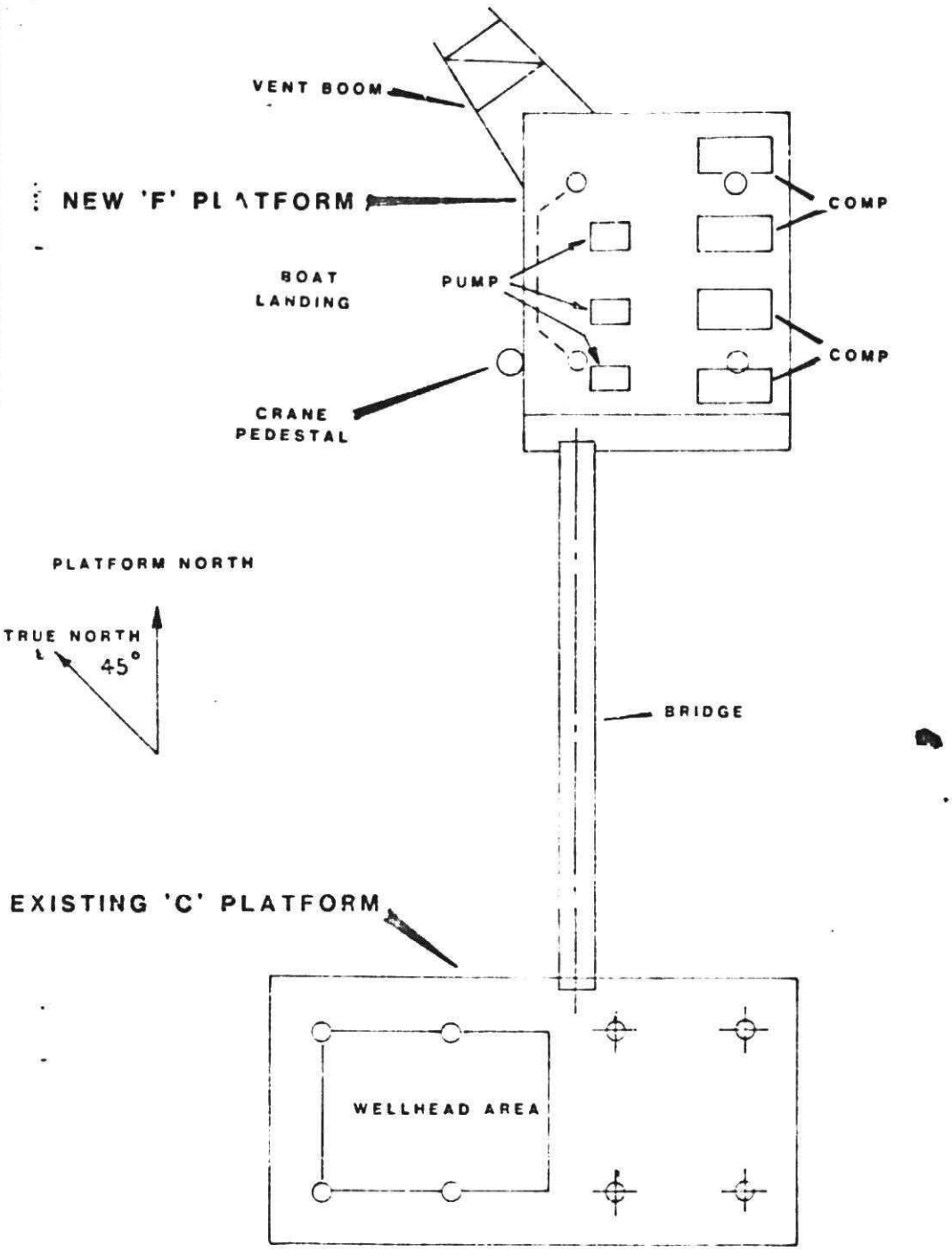
NATURAL GAS-FIRED
INTERNAL COMBUSTION ENGINE
(#/1000 HP-HR)

	EPA's AP-42 Emission Factors	**Manufacturer's Emission Factors
NO_x	24	22
CO	3.1	22
SO_2	.004	-
TSP	-	-
*THC	9.7	4.4

NATURAL GAS-FIRED
TURBINE ENGINE
(#/1000 HP-HR)

	A's AP-42 Emission Factors	Manufacturer's Emission Factors
NO_x	2.9	4.09
CO	1.1	2.19
SO_2	.004	-
TSP	-	-
*THC	.2	.69

*Total Hydrocarbons (THC) as methane and non-methane.
**These factors are representative of an adjusted fuel ratio which meets BACT.



ATLANTIC RICHFIELD CO

SOUTH PASS BLOCK 60

'F' PLATFORM

4468

ARCO Oil and Gas Company
South Louisiana District
Post Office Box 51408, Oil Center
Lafayette, Louisiana 70505
Telephone 318 264 4000

Mike W. Mitchell
Offshore District Engineer

May 24, 1983

Deputy Minerals Manager for
Offshore Operations Support (OS)
Minerals Management Service
Gulf of Mexico OCS Region
Post Office Box 7944
Metairie, Louisiana 70010-7944

Attn: Dave Patz or Mike Joseph

REFERENCE: Supplemental Plan of Development/Production
Control Number S-0966
South Pass Block 61 Field

Gentlemen:

The above referenced Supplemental Plan of Development/Production (POD/P) for South Pass Block 61 Field requires both revision and supplement as described below. The following leases are affected:

OCS-G 1608 South Pass Block 59 and 60
OCS-G 2137 South Pass Block 60
OCS-G 2943 South Pass Block 59

In accordance with letter OS-7 dated October 22, 1981 from the Deputy Conservation Manager for Offshore Operations Support, eight copies (5 proprietary) of this POD/P are hereby submitted in compliance with applicable provisions of 30 CFR 250.34. A POD/P checkiist is included in front of the exhibits for reference.

REVISED PLANS

There are currently five wells off of 'E' Platform, two wells off of 'A' Platform and one off of 'D' Platform remaining to be drilled on our approved Supplemental POD/P dated September 23, 1983 (Plan Control Number S-0966) for South Pass Block 61 Field. Three of these wells require revision.

The first is OCS-G 1608 E-11. This well will be drilled to the same bottomhole location as approved in the POD/P. The revision is required because the well will be used as an enriched gas injector for enhanced oil recovery purposes.

The remaining two wells requiring a revision are the OCS-G 2137 E-18 and OCS-G 1608 A-38. These wells will be drilled to the same bottomhole location as approved in the POD/P but their surface locations need to be revised. We now plan to drill these wells from our 'D' Platform . The OCS-G 2137 E-18 will now be called the OCS-G 2137 D-33. The OCS-G 1608 A-38 will now be called the OCS-G 1608 D-34.

With the above revisions, the remaining wells to be drilled will now be four wells off of 'E' Platform, one well off of 'A' Platform and three wells off of 'D' Platform.

The location plats for the leases and platforms, drilling schedule, and spider map for the above revisions are included in Exhibits 1, 2, 3 and 4. These exhibits also include the information for the supplemental development plans described in the next section of this writeup.

SUPPLEMENTAL PLANS

Twenty additional wells are proposed for OCS-G leases 1608, 2943 and 2137 from our existing South Pass Block 60 Platforms A, D, and E. Exhibits 1 and 2 are the location maps for these leases and platforms. Ten wells will be drilled from Platform E, five wells from Platform A and five wells from Platform D. Current plans are for one of the 'E' Platform wells and one of the 'A' Platform wells to initially be used as enriched gas injectors for enhanced oil recovery purposes. The other wells will be put on production as they are drilled and completed. No new facilities, pipelines or platforms will be required. Coordinates for the surface and bottom hole locations, true vertical depths, and a projected drilling schedule for both the supplemental and remaining approved wells are given in Exhibits 3 and 4. The information in these two exhibits are only an estimate, which may be revised in the future in an effort to optimize development. The approximate bottom hole locations for the wells are plotted on the spider map of the South Pass Block 61 Field (See spider map). The total time for this proposed work is estimated at 1.5 years. The life of the reserves to be developed by these wells is estimated at 15 to 20 years.

Two drilling rigs will be used to drill the wells. The H&P 91 rig will perform the E Platform work and the H&P 101 rig will be used on both A and D platforms. These rigs are self contained, modular platform rigs common to usage in the Gulf of Mexico. (See Exhibit 5.) Drip pans, curbs, drains and sumps are designed into the rigs and platforms for pollution control. Cuttings and mud will be disposed of in the prescribed manner outlined in OCS-Order No. 7. In the event that oil base muds are used during drilling operations, a cuttings washer will be installed (See Exhibit 6). During drilling operations, diverter systems, blowout preventers, and well control equipment will be provided and maintained in accordance with OCS Order No. 2. (See Exhibits 7 and 8.) Attached as Exhibit 9 (pages 1-4) is a list of the available mud additives. In accordance with OCS-G Order 5 all wells will have surface controlled surface and subsurface safety valves installed.

In the event of a spill, ARCO will implement its approved Oil Spill Contingency Plan which is on file with MMS and updated annually. ARCO is a member of Clean Gulf Associates which can provide spill response within approximately 12 hours from bases at Venice, Grand Isle, Intracoastal City and Cameron in Louisiana.

The base of operations for our offshore activities is in Venice, Louisiana. The base consists of a docking facility, warehouse, heliport, offices and living quarters and a parking lot. A base coordinator and a dispatcher are on duty at all times to coordinate movement of materials and personnel by boat and helicopter which service the platforms. Communications include private radios, microwave channels and regular telephones.

Incremental air emissions expected as a result of these supplemental activities are given in Exhibit 10. Rig engine data has been submitted in previous Supplement S-0966 and is hereby referenced.

Five of the eight copies of this POD/P include geological structure maps of the I, UJ, LJ, UK, LK, LK2, UL, ML, LL, UM, MM and Basal M Sands and two representative cross sections of the OCS-G 1608 and OCS-G 2137 leases, which we request be held confidential as we believe the data to be exempt from disclosure under the Freedom of Information Act (5 U.S.C. 552) and implementing regulations (43 CFR Part 2).

If further data or clarification is required, please call me at telephone number (318) 264-4362.

Sincerely,

ARCO OIL AND GAS COMPANY

Mike W. Mitchell

M. W. Mitchell

RFM-35

attachment

POD CHECK LIST

DESCRIPTION

✓ Description of work to be performed

SCHEDULE

✓ Commencement date

✓ Time to complete each phase

✓ Total time to complete the work proposed

LOCATION

✓ Location map of the lease block(s) relative to the shore line

✓ Description of onshore base facilities, LOCATION Venice, Louisana

✓ Location map showing platform(s) location(s) - (non-proprietary)

GEOLOGICAL AND GEOPHYSICAL DATA

NA Identification of geological hazards

NA Archaeological report submitted

NA Surface location relative to anomalies

✓ Structure maps (proprietary)

✓ Cross Section (proprietary)

✓ Spider Map

✓ Depth: TVD and BHL (for each well) -

OIL SPILL INFORMATION

✓ Oil spill plan referenced

✓ Base of operations

✓ Deployment time

OTHER

✓ List of mud additives

NA Production rate

✓ Estimated life of reserves

NA Water depth

✓ Description of drilling rig if applicable indicating pollution prevention equipment -

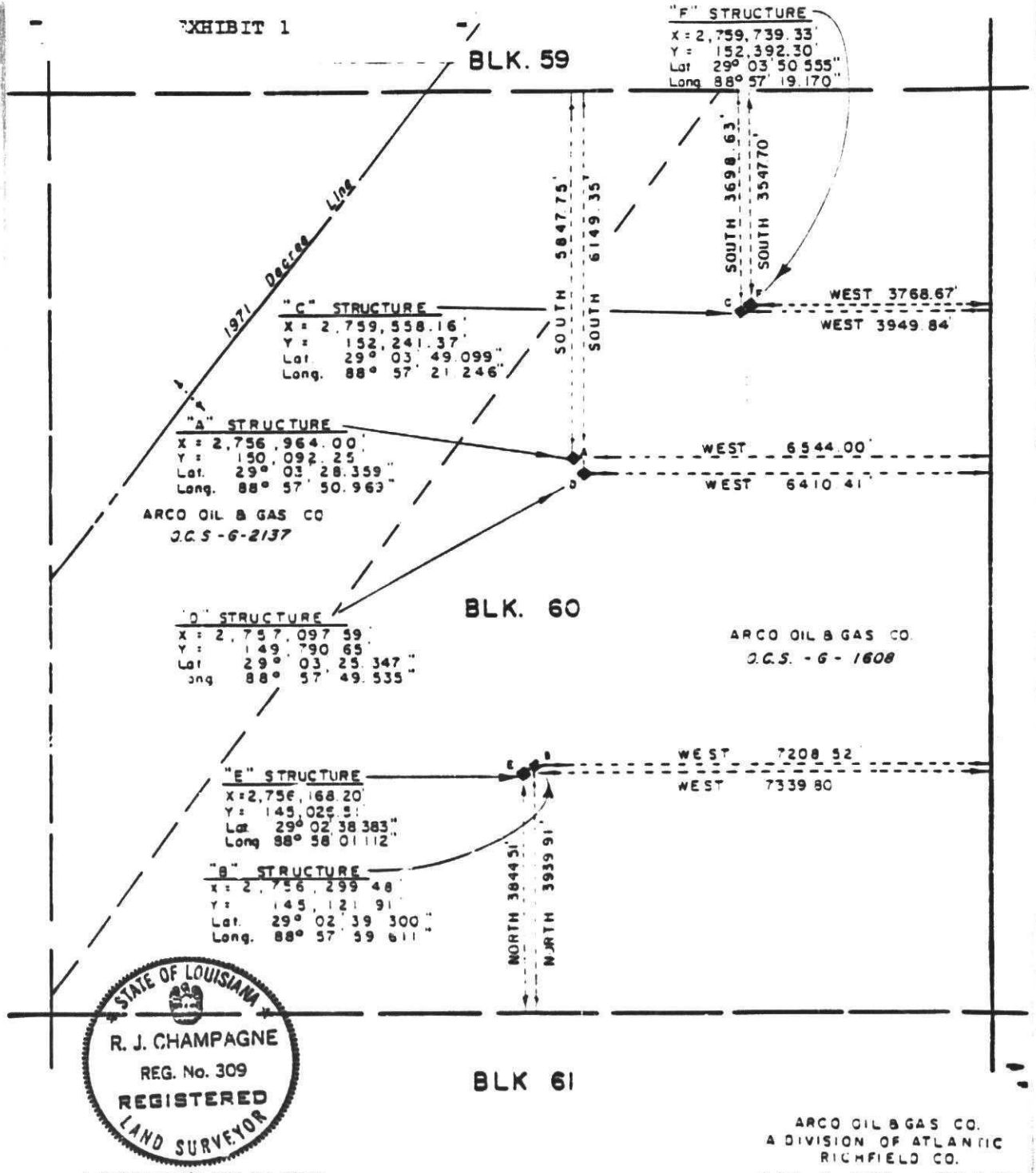
NA Description of the size, length, route, tie-in points and burial depth of proposed pipelines including a pipeline plat

✓ Calculations for air emissions

NA Environmental report if applicable

NA CZM Consistency if applicable

EXHIBIT 1



STATE OF LOUISIANA
R. J. CHAMPAGNE
REG. No. 309
REGISTERED
LAND SURVEYOR

I hereby certify that the above structures are correct

R. J. Champagne

Registered Land Surveyor No 309
State of Louisiana

PUBLIC INFORMATION PLAT

ARCO OIL & GAS CO.
A DIVISION OF ATLANTIC RICHFIELD CO.

O.C.S.-G- 1608 STR A, B, C E & F

PERMIT PLAT

SOUTH PASS AREA

SCALE 1" = 2000'

EXHIBIT 2

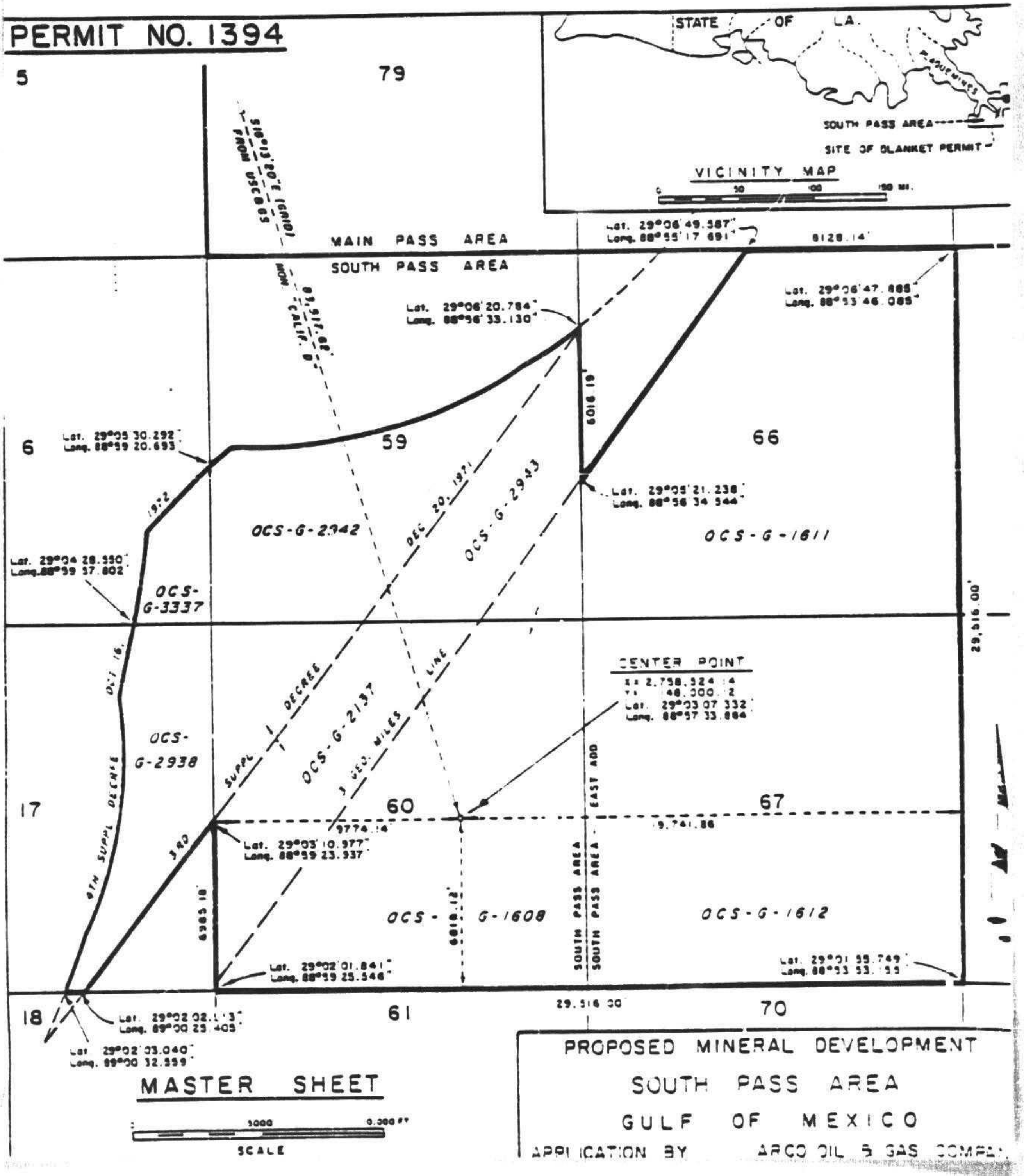

PERMIT NO. 1394
5
79
STATE OF LA.
PLAQUEMINES
SOUTH PASS AREA
SITE OF BLANKET PERMIT
VICINITY MAP
0 50 100 150 MI.
S16°13'02" E (GRID) FROM USC&GS
MON. "CALIF. B" 83,515.08'
MAIN PASS AREA
SOUTH PASS AREA
Lat. 29°06'49.587"
Long. 88°55'17.691"
6128.14'
Lat. 29°06'47.885"
Long. 88°53'46.085"
Lat. 29°06'20.784"
Long. 88°56'33.130"
6016.19'
6
59
66
Lat. 29°05'30.292"
Long. 88°59'20.693"
1972
OCS-G-2942
DEC 20, 1971
OCS-G-2943
Lat. 29°05'21.238"
Long. 88°56'34.544"
OCS-G-1611
Lat. 29°04'28.550"
Long. 88°59'37.802"
OCS-G-3337
29,516.00'
OCT 16,
SUPPL DECREE
3 GEO. MILES LINE
CENTER POINT
X = 2,758,324.14
Y = 148,300.12
Lat. 29°03'07.332"
Long. 88°57'33.884"
OCS-G-2938
OCS-G-2137
4TH SUPPL DECREE
17
60
67
EAST ADD
9774.14'
19,741.86'
3RD
Lat. 29°03'10.977"
Long. 88°59'23.937"
6985.18'
6016.12'
SOUTH PASS AREA
SOUTH PASS AREA
OCS-G-1608
OCS-G-1612
Lat. 29°02'01.841"
Long. 88°59'25.546"
Lat. 29°01'55.749"
Long. 88°53'33.155"
18
61
70
29,516.00
Lat. 29°02'02.113"
Long. 89°00'25.405"
Lat. 29°02'03.040"
Long. 89°00'32.559"
MASTER SHEET
5000 0,000 FT
SCALE
PROPOSED MINERAL DEVELOPMENT
SOUTH PASS AREA
GULF OF MEXICO
APPLICATION BY ARCO OIL & GAS COMPANY

EXHIBIT 3
E Platform Drilling Schedule for
Revised and Supplemental Wells

Rig	Well	BHL Lambert Coordinates X	BHL Lambert Coordinates Y	TVD (FT)	Estimated Spud Date	Estimated Completion Date
H & P 91 Rig	OCS-G ~~2038~~ 1608 E-11**	2,755,550	146,842	6,200	06/15/83	07/09/83
H & P 91 Rig	OCS-G 1608 E-18	2,751,421	141,732	9,700	07/10/83	08/13/83
H & P 91 Rig	OCS-G 1608 E-20	2,752,700	142,132	9,200	08/14/83	09/17/83
H & P 91 Rig	OCS-G 1608 E-21	2,751,950	144,582	9,600	09/18/83	10/22/83
H & P 91 Rig	OCS-G 1608 E-22	2,752,350	145,082	9,500	10/23/83	11/26/83
H & P 91 Rig	OCS-G 1608 E-23**	2,753,300	145,732	8,500	11/27/83	12/31/83
H & P 91 Rig	OCS-G 1608 E-24*	2,749,750	144,182	10,000	01/01/84	02/04/8
H & P 91 Rig	OCS-G 1608 E-25	2,753,400	144,382	9,300	02/05/84	03/10/84
H & P 91 Rig	OCS-G 1608 E-26	2,750,750	142,832	9,300	03/11/84	04/14/84
H & P 91 Rig	OCS-G 1608 E-27*	2,755,550	143,382	7,500	04/15/84	05/12/84
H & P 91 Rig	OCS-G 1608 E-28	2,754,750	142,482	6,000	05/13/84	06/16/84
H & P 91 Rig	OCS-G 1608 E-29	2,756,400	143,582	6,500	06/17/84	07/21/84
H & P 91 Rig	OCS-G 2137 E-30*	2,755,350	144,582	7,000	07/22/84	08/25/84
H & P 91 Rig	OCS-G 1608 E-31	2,752,250	143,782	9,500	08/26/84	09/29/84

Surface Locations:

E Platform Location X = 2,756,168 Y = 145,027

* The BHL of these wells were on approved supplemental POD/P dated 9/23/82 (Plan Control #S-0966). The well name changes result from a revised drilling program.
** Enriched gas injection well

EXHIBIT 4
A & D Platform Drilling Schedule for
Revised and Supplemental Wells

Rig	Well	BHL Lambert Coordinates X	BHL Lambert Coordinates Y	TVD (FT)	Estimated Spud Date	Estimated Completion Date
H & P 101 Rig	OCS-G 2137 D-29*	2,749,050	152,840	9,500	06/03/83	07/24/83
H & P 101 Rig	OCS-G 2137 D-31	2,754,525	149,750	8,100	08/04/83	09/03/83
H & P 101 Rig	OCS-G 2943 D-32	2,756,850	157,140	6,850	09/20/83	10/31/83
H & P 101 Rig	OCS-G 2137 D-33*	2,750,235	150,041	9,300	11/12/83	12/21/83
H & P 101 Rig	OCS-G 1608 D-34*	2,755,964	149,292	5,500	01/01/84	01/31/84
H & P 101 Rig	OCS-G 2137 D-35	2,749,200	145,842	9,200	02/01/84	03/06/84
H & P 101 Rig	OCS-G 2943 D-36	2,756,850	156,790	7 [illegible]0	03/07/84	04/03/84
H & P 101 Rig	OCS-G 2137 D-37	2,750,250	154,240	[illegible],100	04/04/84	05/04/84
Demobe Rig and Move to A Platform						
H & P 101 Rig	OCS-G 1608 A-38**	2,757,625	[illegible]	4,500	05/13/84	06/09/84
H & P 101 Rig	OCS-G [illegible]137 A-39*	2,752,964	150,352	7,500	06/10/84	07/07/84
H & P 101 Rig	OCS-G 1608 A-40	2,757,435	[illegible]1,190	4,600	07/08/84	08/04/84
H & P 101 Rig	OCS-G 2137 A-41	2,753,340	[illegible]2,065	7,300	09/16/84	10/20/84
H & P 101 Rig	OCS-G 1608 A-42	2,756,250	150,875	5,100	10/21/84	11/17/84
H & P 101 Rig	OCS-G 1608 A-43	2,755,950	149,310	5,200	11/18/84	12/22/84

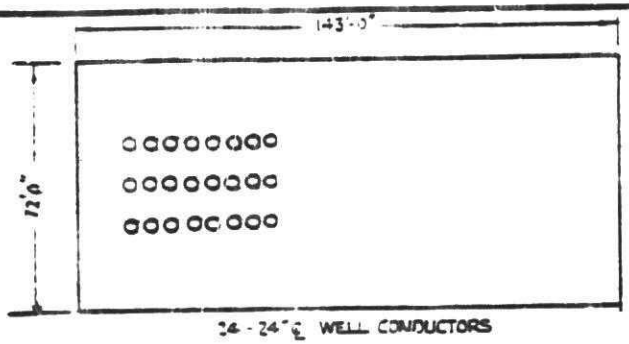
Surface Locations:

A Platform Location X = 2,756,964 Y = 150,092

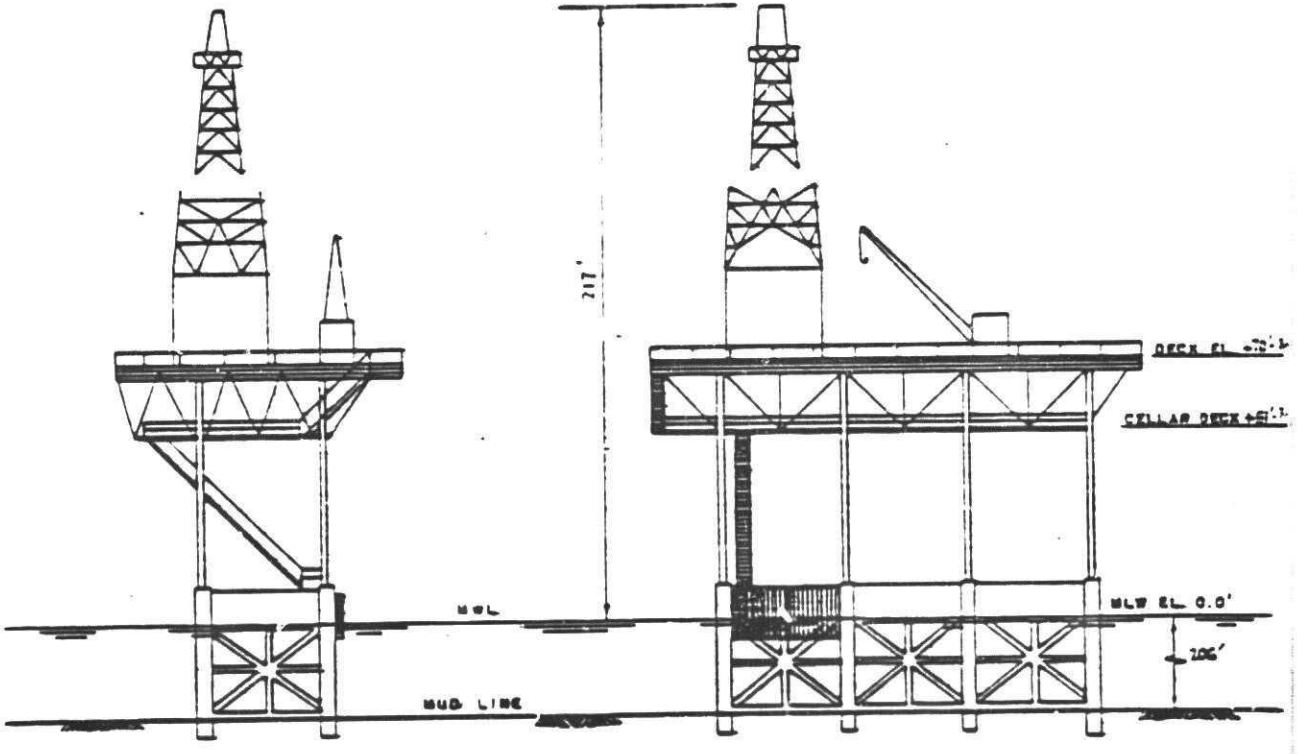
D Platform Location X = 2,757,098 Y = 149,791

* The BHL of these wells were on approved supplemental POD/P dated 9/23/82 (Plan Control #S-0966). The well name changes result from a revised drilling program.
** Enriched gas injection well.

EXHIBIT 5



PLAN



END ELEVATION

SIDE ELEVATION

TYPICAL SELF-CONTAINED DRILLING PLATFORM

PROPOSED MINERAL DEVELOPMENT
SOUTH PASS AREA
GULF OF MEXICO
APPLICATION BY ATLANTIC RICHFIELD CO.

CUTTINGS FALL INTO THE WASH TANK EQUIPPED WITH A MUD TANK MIXER. As the wash solution is circulated over the double deck shale shaker, clean cuttings are discharged for disposal and the wash solution returns to the tank. When the wash solution becomes contaminated, the system is completely shut down for a few minutes to allow the oily particles to settle. Because some erosion of the cuttings does occur during the washing process and because oil surrounds these eroded particles, the contaminant settles rather than floats. The integrity of the oil-mud is maintained in the washing process as its density is always greater than that of water. When sediment has accumulated on bottom, a small pump moves it through a hose back to the drilling fluid, and the system is ready to start up again.

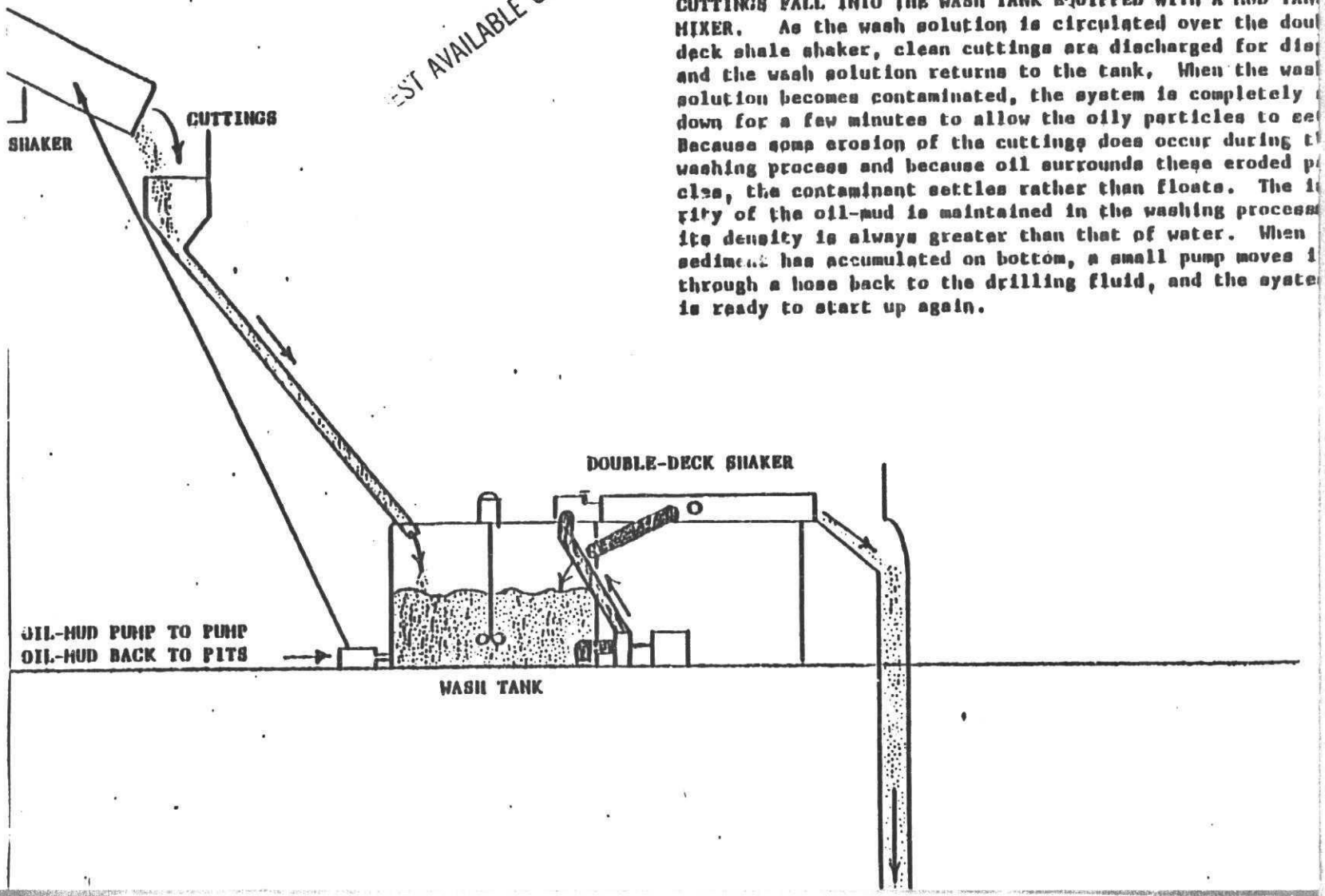
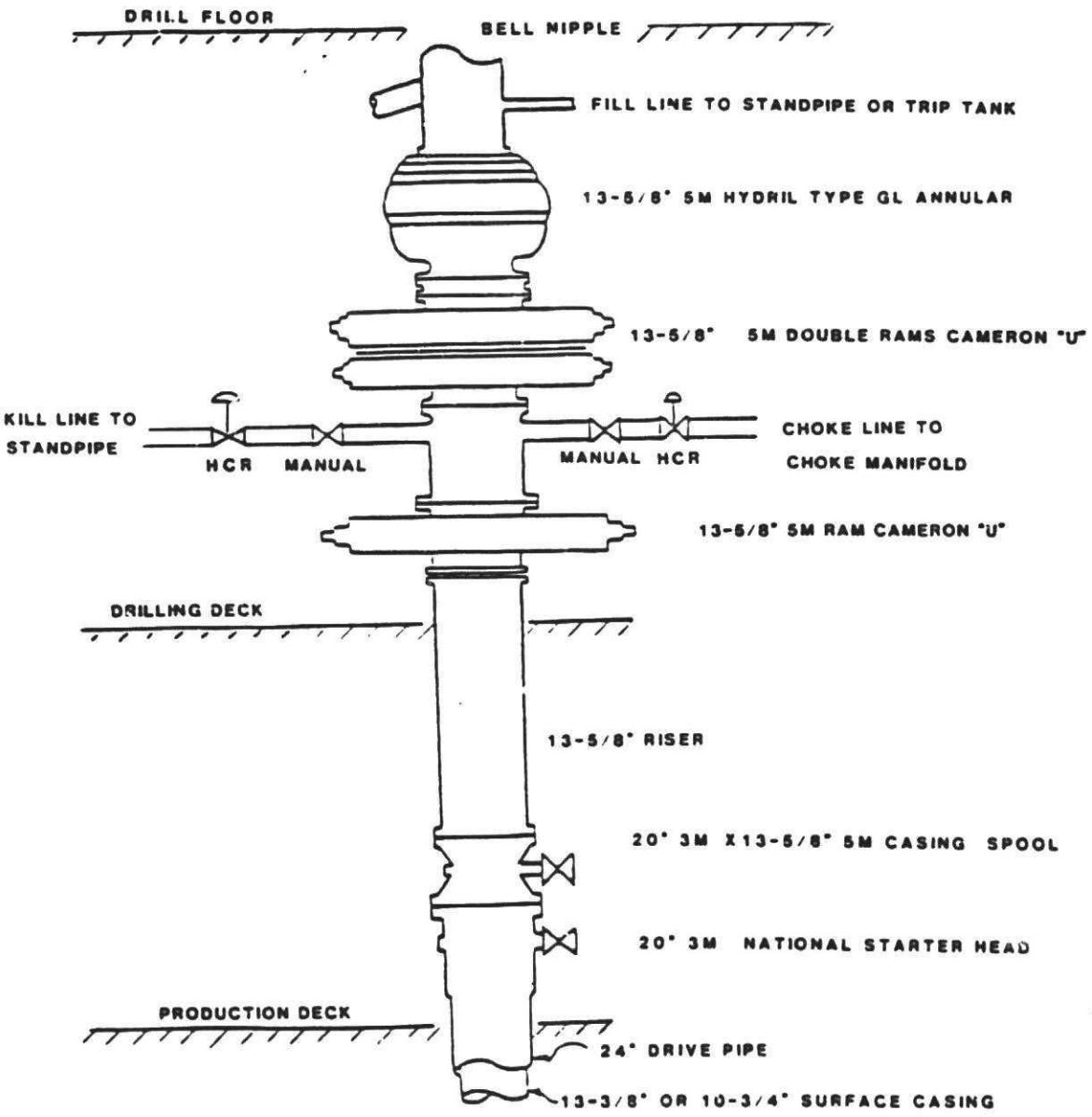
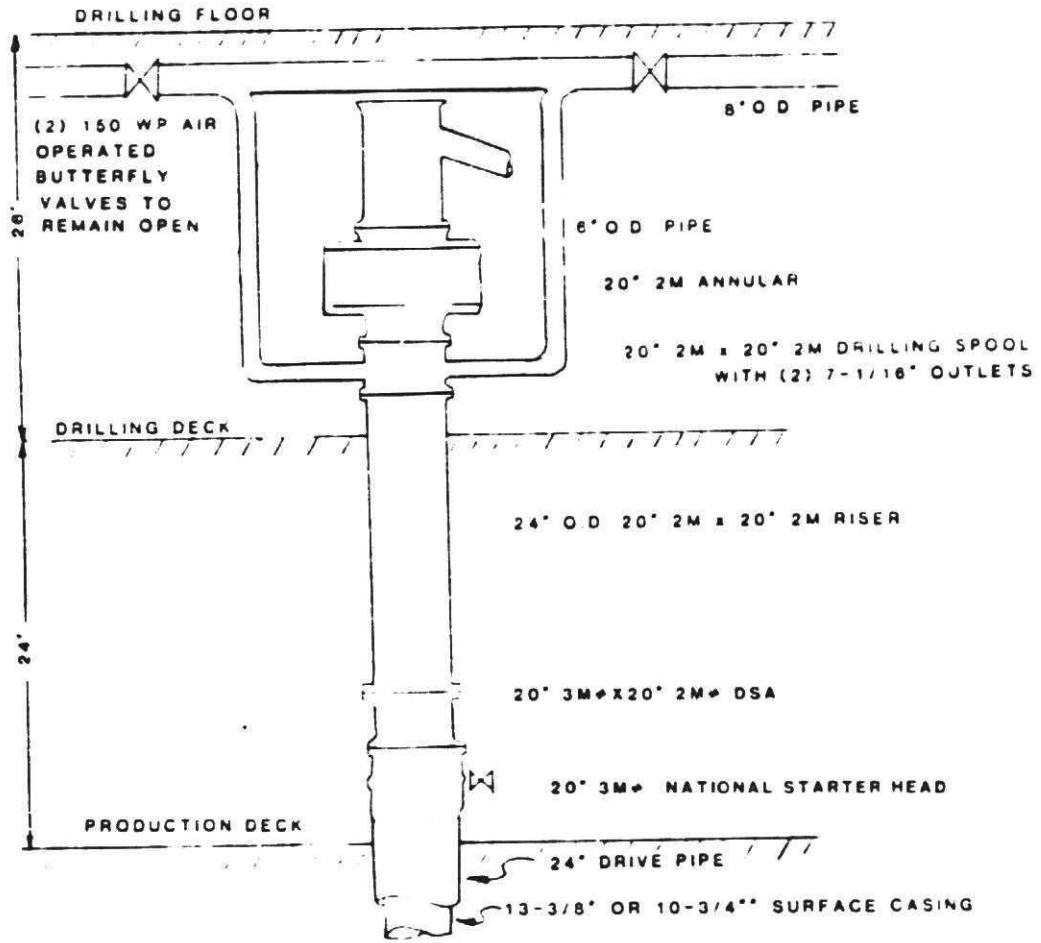


EXHIBIT 7

SP BLK 61 "E" PLATFORM H&P 91



SP BLK 61 "E" PLATFORM H&P 91



OPERATION

THIS DIVERTER SYSTEM WILL BE INSTALLED FROM THE START UNTIL SURFACE CASING IS LANDED. ALL DIVERTER VALVES WILL REMAIN OPEN AT ALL TIMES. LINES WILL BE FLUSHED OUT DAILY. AT THE FIRST SIGN OF A KICK, THE DRILLER WILL CLOSE THE ANNULAR PREVENTER AND WELL FLUIDS WILL BE AUTOMATICALLY DIVERTED. DEPENDING ON PREVAILING WIND CONDITION AND SIZE OF KICK, ONE DIVERTER LINE MAY THEN BE CLOSED.

Description or Principal Component	IMCO SERVICE				Primary Applications
WEIGHTING AGENTS AND VISCOSIFIERS					
Barite	IMCO BAR	Baroid	Magcobar	Mil-Bar	For increasing mud weight up to 20 ppg.
Calcium Carbonate	IMCO WATE		Lo-Wate	W.C. 30 W.O. 50	For increasing weight of oil muds up to 10.8 ppg.
Bentonite	IMCO GEL	Aquagel	Magcogel	Milgel	Viscosity and filtration control in water-base muds.
Sub-Bentonite	IMCO KLAY	Baroco	High Yield Blended Clay	Green Band Clay	For use when larger particle size is desired for viscosity and filtration control.
Attapulgite	IMCO BRINEGEL	Zeogel	Salt Gel	Salt Water Gel	Viscosifier in saltwater muds.
Beneficiated Bentonite	IMCO HYB	Quick-Gel	Kwik-Thik	Super-Col	Quick viscosity in fresh-water, upper-hole muds with minimum chemical treatment.
Asbestos Fibers	IMCO SHURLIFT	Flosal	Visquick	Flosal	Viscosifier for fresh-water or saltwater muds.
Bacterially Produced Polymer	IMCO XC	XC Polymer	Duovis	XC Polymer	Viscosifier and fluid-loss control additive for low-solids muds.
Sepiolite	IMCO DUROGEL				Viscosifier in all water-base muds, especially high-temperature drilling fluids.
DISPERSANTS					
Sodium Tetraphosphate	IMCO PHOS	Barofos	Magco-Phos	Oil Foe	Thinner for low pH fresh-water muds where temperatures do not exceed 180°.
Sodium Acid Pyrophosphate	SAPP	SAPP	SAPP	SAPP	For treating cement contamination.
Quebracho Compound	IMCO QBT	Tannex	M-C Quebracho	Tanco	Thinner for fresh-water and lime muds.
Modified Tannin	DESCO	Desco	Desco	Desco	Thinner for fresh-water and saltwater muds alkalized for pH control.
Processed Lignite	IMCO LIG	Carbonox	Tann A Thin	Ligco	Dispersant, emulsifier and supplementary additive for fluid-loss control.
Causticized Lignite	IMCO THIN	CC-16	Caustilig	Ligcon	1-6 ratio caustic-lignite dispersant, emulsifier and supplementary fluid-loss additive.
Modified Lignosulfonate	IMCO VC-10	Q-Broxin	Spersene	Uni-Cal	Dispersant and fluid-loss control additive for water-base muds.
Blended Lignosulfonate Compound	IMCO RD-111				Blended multi-purpose dispersant, fluid-loss agent and inhibitor for IMCO RD-111 mud systems.
Chrome-Free Lignosulfonate	IMCO RD-2000			X-KB Thin	Dispersant and fluid-loss control additive for water-base muds.
FLUID-LOSS REDUCERS					
Organic Polymer	IMCO PERMALOID	DEXTRID			Controls fluid loss in water-base systems.
Pregelatinized Starch	IMCO LOID	Impermex	My-Lo-Jel	Milstarch	Controls fluid loss in saturated salt water, and lime muds.
Sodium Carboxymethyl Cellulose	IMCO CMC (Regular)	Cellex (Regular)	Magco CMC (Regular)	Milchem CMC (Med-Vis)	For fluid-loss control and barite suspension in water-base muds.
Sodium Carboxymethyl Cellulose	IMCO CMC (Hi-Vis)	Cellex (Hi-Vis)	Magco CMC (Hi-Vis)	Milchem CMC (Hi-Vis)	For fluid-loss control and viscosity building in low-solids muds.
Polyanionic Cellulosic Polymer	DRISPAC	Drispac	Drispac	Drispac	Fluid-loss control additive and viscosifier in salt muds.
Polyanionic Cellulosic Polymer	DRISPAC SUPERLO	Drispac Superlo	Drispac Superlo	Drispac Superlo	Primary fluid-loss additive, secondary viscosifier in water-base muds.

COMPARABL EXHIBIT 9 S (Continu

Descripti of or Principal Component	IMCO SERVICES	Baroid	Magcobar	Milchem	Primary Application
LUBRICANTS, DETERGENTS, EMULSIFIERS, AND SURFACTANTS					
Extreme Pressure Lubricant	IMCO EP LUBE	EP Mud Lube	Bit Lube	Lubri-Film	Used in water-base muds to impart extreme pressure lubricity
Processed Hydrocarbons	SOLTEX	Soltex	Soltex	Soltex	Used in water-base muds to lower downhole fluid loss and minimize heaving shale.
Water Dispersible Asphalts	IMCO HOLECOAT		STABIL-HOLE	ITI-WD	Lubricant and fluid-loss reducer for water-base muds that contain no diesel or crude oil.
Oil Dispersible Asphalts	IMCO MUD OIL	Baroid Asphalt	Pave-A-Hole	Carbo-Seal	Lubricant and fluid-loss reducer for water-base fluids that contain diesel or crude oil.
Oil Soluble Surfactants	IMCO FREEPIPE	Skot-Free	Pipe Lax	Petrocote	Nonweighted fluid for spotting to free differentially stuck pipe.
Detergent	IMCO MD	Con Det	D-D	Milchem MD	Used in water-base muds to aid in dropping sand. Emulsifies oil, reduces torque and minimizes bit-balling.
Blend of Anionic Surfactants	IMCO SWS	Trimulso	Selinex	Attosol & Attosol S	Emulsifier for saltwater and fresh-water muds.
An Organic Entity Neutralized with Amines	IMCO LUBRIKLEEN	Torq Trim	DOS-3	Mil-Plate 2	Supplies the lubricating properties of oils without environmental pollution.
Blend of Fatty Acids, Sulfonates, and Asphaltic Materials	IMCO SPOT	SF 100			Invert emulsion that may be weighted to desired density for placement to free differentially stuck pipe.
DEFOAMERS, FLOCCULANTS, AND BACTERICIDES					
Aluminum Stearate	Aluminum Stearate	Aluminum Stearate	Aluminum Stearate	Aluminum Stearate	Defoamer for lignosulfonate muds
Liquid Surface-Active Agent	IMCO DEFOAM L				Defoamer for all water-base muds.
Surface-Active Dispersible Liquid Defoamer	IMCO FOAMBAN	W200 W300		LD-7	All-purpose defoamer.
Flocculating Agent	IMCO FLOC	Barafloc	Flokut	Separan	Used to drop drilled solids where clear water is desirable for a drilling fluid.
Blended Solutions	IMCO CIDE				Bactericide used to prevent fermentation.
LOST CIRCULATION MATERIALS					
Fibrous Material	IMCO FYBER	Fibertex	Mud Fiber	Mil-Fiber	Filler as well as matting material.
Nut Shells: Fine	IMCO PLUG	Wall-Nut	Nut-Plug	Mil-Plug	Most often used to prevent lost circulation.
Medium	IMCO PLUG	Wall-Nut	Nut-Plug	Mil-Plug	Used in conjunction with fibers or flakes to regain lost circulation.
Coarse	IMCO PLUG	Wall-Nut	Nut-Plug	Mil-Plug	Used where large crevices or fractures are encountered.
Ground Mica: Fine	IMCO MYCA	Micatex	Magco-Mica	Milmica	Used for prevention of lost circulation.
Coarse	IMCO MYCA	Micatex	Magco-Mica	Milmica	Forms a good mat at face of wellbore.
Cellophane	IMCO FLAKES	Jel Flake	Cell-O-Seal	Milflake	Used to regain lost circulation.
Combination of granules, fibrous material various	KWIKSEAL	Kwik-Seal	Kwik-Seal	Kwik-Seal	Used where large crevices or fractures are encountered.

EXHIBIT 9

COMPARABLE MUD PRODUCTS BY TRADE NAMES (Continued)

Description or Principal Component	IMCO SERVICES	Baroid	Magcobar	Milchem	Primary Application
SPECIALTY PRODUCTS					
Bentonite Extender	IMCO GELEX	Benex	Benex	Benex	Increases yield of bentonite to form very low-solids drilling fluid.
Inhibiting Agent	IMCO IE PAC				Imparts high-temperature fluid-loss control, temperature stability and increased inhibition.
Synergistic Polymer Blend	IMCO POLY Rx		Resinex		Rheological stabilization and filtration control.
Biodegradable Surfactant	IMCO FOAMANT				Foaming agent in air or mist drilling.
High-Temperature Polymer	IMCO DRILTHERM				High-temperature fluid-loss control.
Multipurpose Polymer	IMCO POLYSAFE				Polymer for fluid-loss control.
COMMERCIAL CHEMICALS					
Sodium Chromate	Sodium Chromate	Sodium Chromate	Sodium Chromate	Sodium Chromate	Used in water-base muds to prevent high-temperature gelation.
Sodium Hydroxide	Caustic Soda	Caustic Soda	Caustic Soda	Caustic Soda	For pH control in water-base muds.
Sodium Carbonate	Soda Ash	Soda Ash	Soda Ash	Soda Ash	For treating out calcium sulfate in low pH muds.
Sodium Bicarbonate	Sodium Bicarbonate	Sodium Bicarbonate	Sodium Bicarbonate	Sodium Bicarbonate	For treating out calcium sulfate or cement in high pH muds.
Barium Carbonate	Barium Carbonate	Anhydrox	Barium Carbonate	Barium Carbonate	For treating out calcium sulfate (pH should be above 10 for best results).
Calcium Sulfate	Gypsum	Gypsum	Gypsum	Gypsum	Source of calcium for formulating gyp muds.
Calcium Hydroxide	Lime	Lime	Lime	Lime	Source of calcium for formulating lime muds.
Sodium Chloride	Salt	Salt	Salt	Salt	For saturated salt muds and resistivity control.
Chrome Alum (chromic chloride)	Chrome Alum	Chrome Alum	Chrome Alum	Chrome Alum	For use in cross-linking XC Polymer systems.
OIL-MUD ADDITIVES					
Primary Emulsifier	IMCO KENOL-S (L) and IMCO KEN-X Conc. #1(L)	Invermul	Vertoil	Carbo-Tec (D) and Carbo-Tec (L)	Primary additives to form stable water-in-oil emulsion.
Viscosifier and Gelling Agent	IMCO KEN GEL and IMCO KEN-X CONC. #2	Gel-Tone and Petro-Tone	VG-69	Carbo-Gel	Provides viscosity, weight suspension, and filtration control.
High-Temperature Stabilizer	IMCO KEN-X Conc. #3	Duratone HT	DV-22 and V-33		Improves emulsion under high-temperature conditions.
Stabilizes Borehole Conditions	IMCO VR				Stabilizes running shale, improves emulsion, weight suspension, and fluid loss under high-temperature conditions.
CORROSION INHIBITORS					
Zinc Compound	IMCO SULF-X II				For use as a hydrogen sulfide scavenger in water-base and oil-base muds.
Liquid Corrosion Inhibitor	IMCO CRACK CHEK				Prevent stress cracking of drill string in an H_2S environment.
A Catalyzed Ammonium Bisulfite	IMCO XC_2	Cost 777	A-202		For use as an oxygen scavenger.

COMPARABLE

Description or Principal Component	IMCO SERVICES	Baroid	Magcobar	Milchem	Primary Application
CORROSION INHIBITORS (Continued)					
Filming Amine	IMCO PERMAFILM				Corrosion inhibitor.
Organic Polymer	IMCO SCALECHEK				Scale inhibitor.
Calcium Oxide	IMCO KENOX				Calcium source for saponification.
Fatty Acid Emulsifier	IMCO KEN SUPREME Conc. A		Oilfaze		Primary emulsifier and stabilizer for oil-base drilling fluids.
Emulsion Stabilizer	IMCO KEN SUPREME Conc. B		DG-55		Imparts gels, contributes to viscosity for weight suspension, and provides filtration control.
Specially Modified Saponified Fatty Acid Chemicals	IMCO KEN PAK	SF-100			Gelling agent for formulating high-gelation casing packs.
Wetting Agent and Dispersant	IMCO KEN CAL-L				Wetting agent and dispersant for oil muds for the reduction and/or stabilization of viscosity.

NOTES

EXHIBIT 10

ARCO OIL AND GAS COMPANY

A DIVISION OF

ATLANTIC RICHFIELD COMPANY

SOUTH PASS BLOCK 61 FIELD

SUPPLEMENTAL PLAN OF DEVELOPMENT/PRODUCTION

PLATFORMS "A", "D", AND "E"

OCS-G-1608 - SOUTH PASS BLOCK 59 & 60

OCS-G-2[illegible] - SOUTH PASS BLOCK 60

OCS-G-2943 - SOUTH PASS BLOCK 59

AIR EMISSIONS DATA REPORT

MAY 24, 1983

SUMMARY OF OPERATIONS

As identified in the supplemental Plan of Development and Production (POD&P), ARCO Oil and Gas Company proposes to drill 20 additional wells from platforms "A", "D" and "E" in South Pass Block 61 Field. The platforms, are located approximately 5 miles from shore or S 14° 09' 29" E 85,716.14' from USC&GS Mon. "CALIFORNIA D".

Two rigs which were described in the previous supplement will also be used to drill these wells. The H&P 91 will drill 10 wells from platform "E" while the H&P 101 will drill 5 wells from platform "A" and 5 wells from platform "D". Both are self-contained platform rigs with four Caterpillar G-399 natural gas-fired prime movers rated at 870 BHP each. During normal drilling operations two engines will be on line. The H&P 91 rig crane is a Unit Mariner 500 which contains a 3 cylinder General Motors diesel engine rated at 96 BHP. The H&P 101 has a Unit Mariner 650-H with a GM 8V-92N diesel engine rated at 355 BHP. The cement unit on each rig consists of two Halliburton HT-400 pumps, each driven by a GMC 8V-71N diesel engine rated at 333 BHP. The cement mixer is driven by a GMC 3-71N diesel rated at 120 BHP. Wireline operations would typically utilize a Cummins 378-C-155 diesel engine with 70 BHP GIH and 85 BHP POOH.

Emission totals are given in tons/yr. on the following page. The total time for this proposed work is 1.5 years. Workovers will be performed between wells as the schedule permits. Therefore the emissions have been calculated as continuous rather than strictly on a per well basis.

EMISSION TOTALS
2 Rigs

	NO_x	CO	SO_2	TSP	THC
H&P 91 Prime Movers (2)	6,859.09*	885.96	1.14	—	2,772.21
H&P 101 Prime Movers (2)	6,859.09*	885.96	1.14	—	2,772.21
H&P 91 Prime Movers (2)	762.12**	98.44	.13	—	308.02
H&P 101 Prime Movers (2)	762.12**	98.44	.13	—	308.02
H&P 91 Rig Crane	226.24	46.96	15.04	16.16	18.10
H&P 101 Rig Crane	599.36	129.78	39.88	42.83	42.97
H&P 91 Cement Pump Unit	258.88	56.03	17.22	18.49	20.71
H&P 101 Cement Pump Unit	258.88	56.03	17.22	18.49	20.71
H&P 91 Cement Mixer	37.71	8.16	2.51	2.69	3.02
H&P 101 Cement Mixer	37.71	8.16	2.51	2.69	3.02
H&P 91 Wireline (GIH)	25.90	5.61	1.72	1.85	2.07
H&P 101 Wireline (GIH)	25.90	5.61	1.72	1.85	2.07
H&P 91 Wireline (POOH)	31.45	6.81	2.09	2.25	2.52
H&P 101 Wireline (POOH)	31.45	6.81	2.09	2.25	2.52
#/year	16,775.90	2,300.76	104.54	109.55	5,970.15
tons/year	8.39	1.15	.05	.05	2.99
Allowables (tons/year)	(166.5)	(9,941.66)	(166.5)	(166.5)	(166.5)

* Prime Movers in Drilling Mode

** Prime Movers in Non-Drilling Mode

EFD/clh/B

COMPARA[illegible]LE MUD PRODUCTS BY TRA[illegible] NAMES

Description or Principal Component	IMCO SERVICES	Baroid	Magcobar	Milchem	Primary Application
WEIGHTING AGENTS AND VISCOSIFIERS					
Barite	IMCO BAR	Baroid	Magcobar	Mil-Bar	For increasing mud weight up to 20 ppg.
Calcium Carbonate	IMCO WATE		Lo-Wate	W.O. 30 W.O. 50	For increasing weight of oil muds up to 10.8 ppg.
Bentonite	IMCO GEL	Aquagel	Magcogel	Milgel	Viscosity and filtration control in water-base muds.
Sub-Bentonite	IMCO KLAY	Baroco	High Yield Blended Clay	Green Band Clay	For use when larger particle size is desired for viscosity and filtration control.
Attapulgite	IMCO BRINEGEL	Zeogel	Salt Gel	Salt Water Gel	Viscosifier in saltwater muds.
Beneficiated Bentonite	IMCO HYB	Quick-Gel	Kwik-Thik	Super-Col	Quick viscosity in fresh-water, upper-hole muds with minimum chemical treatment.
Asbestos Fibers	IMCO SHURLIFT	Flosal	Visquick	Flosal	Viscosifier for fresh-water or saltwater muds.
Bacterially Produced Polymer	IMCO XC	XC Polymer	Duovis	XC Polymer	Viscosifier and fluid-loss control additive for low-solids muds.
Sepiolite	IMCO DUROGEL				Viscosifier in [illegible] water-base muds, especially high-temperature drilling fluids.
DISPERSANTS					
Sodium Tetraphosphate	IMCO P[illegible]OS	Barafos	Magco-Phos	Oil Fos	Thinner for low pH fresh-water muds where temperatures do not exceed 180°.
Sodium Acid Pyrophosphate	SAPP	SAPP	SAPP	SAPP	For treating cement contamination.
Quebracho Compound	IMCO QBT	Tannex	M-C Quebracho	Tanco	Thinner for fresh-water and lime muds.
Modified Tannin	DESCO	Desco	Desco	Desco	Thinner for fresh-water and saltwater muds alkalized for pH control.
Processed Lignite	IMCO LIG	Carbonox	Tann A Thin	Ligco	Dispersant, emulsifier and supplementary additive for fluid-loss control.
Causticized Lignite	IMCO THIN	CC-16	Caustilig	Ligcon	1-6 ratio caustic-lignite dispersant, emulsifier and supplementary fluid-loss additive.
Modified Lignosulfonate	IMCO VC-10	Q-Broxin	Spersene	Uni-Cal	Dispersant and fluid-loss control additive for water-base muds.
Blended Lignosulfonate Compound	IMCO RD-111				Blended multi-purpose dispersant, fluid-loss agent and inhibitor for IMCO RD-111 mud systems.
Chrome-Free Lignosulfonate	IMCO RD-2000			X-KB Thin	Dispersant [illegible] fluid-loss control additive for wate[illegible] muds.
FLUID-LOSS REDUCERS					
Organic Polymer	IMCO PERMALOID	[illegible]XTRID			Controls fluid loss in water-base systems.
Pregelatinized Starch	IMCO LOID	Impermex	My-Lo-Jel	Milstarch	Controls fluid loss in saturated salt water, and lime muds.
Sodium Carboxymethyl Cellulose	IMCO CMC (Regular)	Cellex (Regular)	Magco CMC (Regular)	Milchem CMC (Med-Vis)	For fluid-loss control and barite suspension in water-base muds.
Sodium Carboxymethyl Cellulose	IMCO CMC (Hi-Vis)	Cellex (Hi-Vis)	Magco CMC (Hi-Vis)	Milchem CMC (Hi-Vis)	For fluid-loss control and viscosity building in low-solids muds.
Polyanionic Cellulosic Poly[illegible]	DRISPAC	Drispac	Drispac	Drispac	Fluid-loss control additive and viscosifier in salt muds.
Polyanionic Cellulosic Polymer	DRISPAC SUPERLO	Drispac Superlo	Drispac Superlo	Drispac Superlo	[illegible]mary fluid-lo[illegible] [illegible]dditive, secondary viscosifier in wat[illegible] [illegible]s muds.
*Sodium Polyacrylate	IMCO SP-101				Fluid-loss contr[illegible] [illegible]-free low solids and nond[illegible] [illegible]ds.

*Cypan and W[illegible]-100 are sold by American Cyanamid and Rotary Engineering, respectively.

COMPARABLE MUD PRODUCTS BY TRADE NAMES (Continued)

Description or Principal Component	IMCO SERVICES	Baroid	Magcobar	Milchem	Primary Application
LUBRICANTS, DETERGENTS, EMULSIFIERS, AND SURFACTANTS					
Extreme Pressure Lubricant	IMCO EP LUBE	EP Mud Lube	Bit Lube	Lubri-Film	Used in water-base muds to impart extreme pressure lubricity
Processed Hydrocarbons	SOLTEX	Soltex	Soltex	Soltex	Used in water-base muds to lower downhole fluid loss and minimize heaving shale.
Water Dispersible Asphalts	IMCO HOLECOAT		STABIL-HOLE	ITI-WD	Lubricant and fluid-loss reducer for water-base muds that contain no diesel or crude oil.
Oil Dispersible Asphalts	IMCO MUD OIL	Baroid Asphalt	Pave-A-Hole	Carbo-Seal	Lubricant and fluid-loss reducer for water-base fluids that contain diesel or crude oil.
Oil Soluble Surfactants	IMCO FREEPIPE	Skot-Free	Pipe Lax	Petrocote	Nonweighted fluid for spotting to free differentially stuck pipe.
Detergent	IMCO MD	Con Det	D-D	Milchem MD	Used in water-base muds to aid in dropping sand. Emulsifies oil, reduces torque and minimizes bit-balling.
Blend of Anionic Surfactants	IMCO SWS	Trimulso	Salinex	Atlosol & Atlosol S	Emulsifier for saltwater and freshwater muds.
An Organic Entity Neutralized with Amines	IMCO LUBRIKLEEN	Torq Trim	DOS-3	Mil-Plate 2	Supplies the lubricating properties of oils without environmental pollution
Blend of Fatty Acids, Sulfonates, and Asphaltic Materials	IMCO SPOT	SF 100			Invert emulsion that may be weighted to desired density for placement to free differentially stuck pipe.
DEFOAMERS, FLOCCULANTS, AND BACTERICIDES					
Aluminum Stearate	Aluminum Stearate	Aluminum Stearate	Aluminum Stearate	Aluminum Stearate	Defoamer for lignosulfonate muds
Liquid Surface-Active Agent	IMCO DEFOAM L				Defoamer for all water-base muds.
Surface-Active Dispersible Liquid Defoamer	IMCO FOAMBAN	W200 W300		LD-7	All-purpose defoamer.
Flocculating Agent	IMCO FLOC	Barafloc	Floxit	Separan	Used to drop drilled solids where clear water is desirable for a drilling fluid.
Blended Solutions	IMCO CIDE				Bactericide used to prevent fermentation.
LOST CIRCULATION MATERIALS					
Fibrous Material	IMCO FYBER	Fibertex	Mud Fiber	Mil-Fiber	Filler as well as matting material.
Nut Shells: Fine	IMCO PLUG	Wall-Nut	Nut-Plug	Mil-Plug	Most often used to prevent lost circulation.
Medium	IMCO PLUG	Wall-Nut	Nut-Plug	Mil-Plug	Used in conjunction with fibers or flakes to regain lost circulation.
Coarse	IMCO PLUG	Wall-Nut	Nut-Plug	Mil-Plug	Used where large crevices or fractures are encountered.
Ground Mica: Fine	IMCO MYCA	Micatex	Magco-Mica	Milmica	Used for prevention of lost circulation.
Coarse	IMCO MYCA	Micatex	Magco-Mica	Milmica	Forms a good mat at face of wellbore.
Cellophane	IMCO FLAKES	Jel Flake	Cell-O-Seal	Milflake	Used to regain lost circulation.
Combination of granules flakes and fibrous materials of various sizes in one sack.	KWIKSEAL	Kwik-Seal	Kwik-Seal	Kwik-Seal	Used where large crevices or fractures are encountered.

COMPARABLE MUD PRODUCTS BY ... (Continued)

Description or Principal Component	IMCO SERVICES	Baroid	Magcobar	Milchem	Primary Application
SPECIALTY PRODUCTS					
Bentonite Extender	IMCO GELEX	Benex	Benex	Benex	Increases yield of bentonite to form very low-solids drilling fluid.
Inhibiting Agent	IMCO IE PAC				Imparts high-temperature fluid-loss control, temperature stability and increased inhibition.
Synergistic Polymer Blend	IMCO POLY Rx		Resinex		Rheological stabilization and filtration control.
Biodegradable Surfactant	IMCO FOAMANT				Foaming agent in air or mist drilling.
High-Temperature Polymer	IMCO DRILTHERM				High-temperature fluid-loss control.
Multipurpose Polymer	IMCO POLYSAFE				Polymer for fluid-loss control.
COMMERCIAL CHEMICALS					
Sodium Chromate	Sodium Chromate	Sodium Chromate	Sodium Chromate	Sodium Chromate	Used in water-base muds to prevent high-temperature gelation.
Sodium Hydroxide	Caustic Soda	Caustic Soda	Caustic Soda	Caustic Soda	For pH control in water-base muds.
Sodium Carbonate	Soda Ash	Soda Ash	Soda Ash	Soda Ash	For treating out calcium sulfate in low pH muds.
Sodium Bicarbonate	Sodium Bicarbonate	Sodium Bicarbonate	Sodium Bicarbonate	Sodium Bicarbonate	For treating out calcium sulfate or cement in high pH muds.
Barium ...onate	Barium Carbonate	Anhydrox	Barium Carbonate	Barium Carbonate	For treating out calcium sulfate (pH should be above 10 for best results).
Calcium Sulfate	Gypsum	Gypsum	Gypsum	Gypsum	Source of calcium for formulating gyp muds.
Calcium Hydroxide	Lime	Lime	Lime	Lime	Source of calcium for formulating lime muds.
Sodium Chloride	Salt	Salt	Salt	Salt	For saturated salt muds and resistivity control.
Chrome Alum (chromic chloride)	Chrome Alum	Chrome Alum	Chrome Alum	Chrome Alum	For use in cross-linking Polymer systems.
OIL-MUD ADDITIVES					
Primary Emulsifier	IMCO KENOL-S (L) and IMCO KEN-X Conc. #1(L)	Invermul	Vertoil	Carbo-Tec (D) and Carbo-Tec (L)	Primary additives to form stable water-in-oil emulsion.
Viscosifier and Gelling Agent	IMCO KEN GEL and IMCO KEN-X CONC.#2	Gel-Tone and Petro-Tone	VG-69	Carbo-Gel	Provides viscosity, weight suspension, and filtration control.
High-Temperature Stabilizer	IMCO KEN-X Conc. #3	Duratone HT	DV-22 and DV-33		Improves emulsion under high-temperature conditions.
Stabilizes Borehole Conditions	IMCO VR				Stabilizes running shale, improves emulsion, weight suspension, and fluid loss under high-temperature conditions.
CORROSION INHIBITORS					
Zinc Compound	IMCO SULF-X II				For use as a hydrogen sulfide scavenger in water-base and oil-base muds.
Liquid Corrosion Inhibitor	IMCO CRACK CHEK				Prevent stress cracking of drill strings in an H_2S environment.
A Catalyzed Ammonium Bisulfite	IMCO XO_2	Coat 777	A-202		For use as an oxygen scavenger.
Filming Amine	IMCO X-CORR				Corrosion inhibitor.

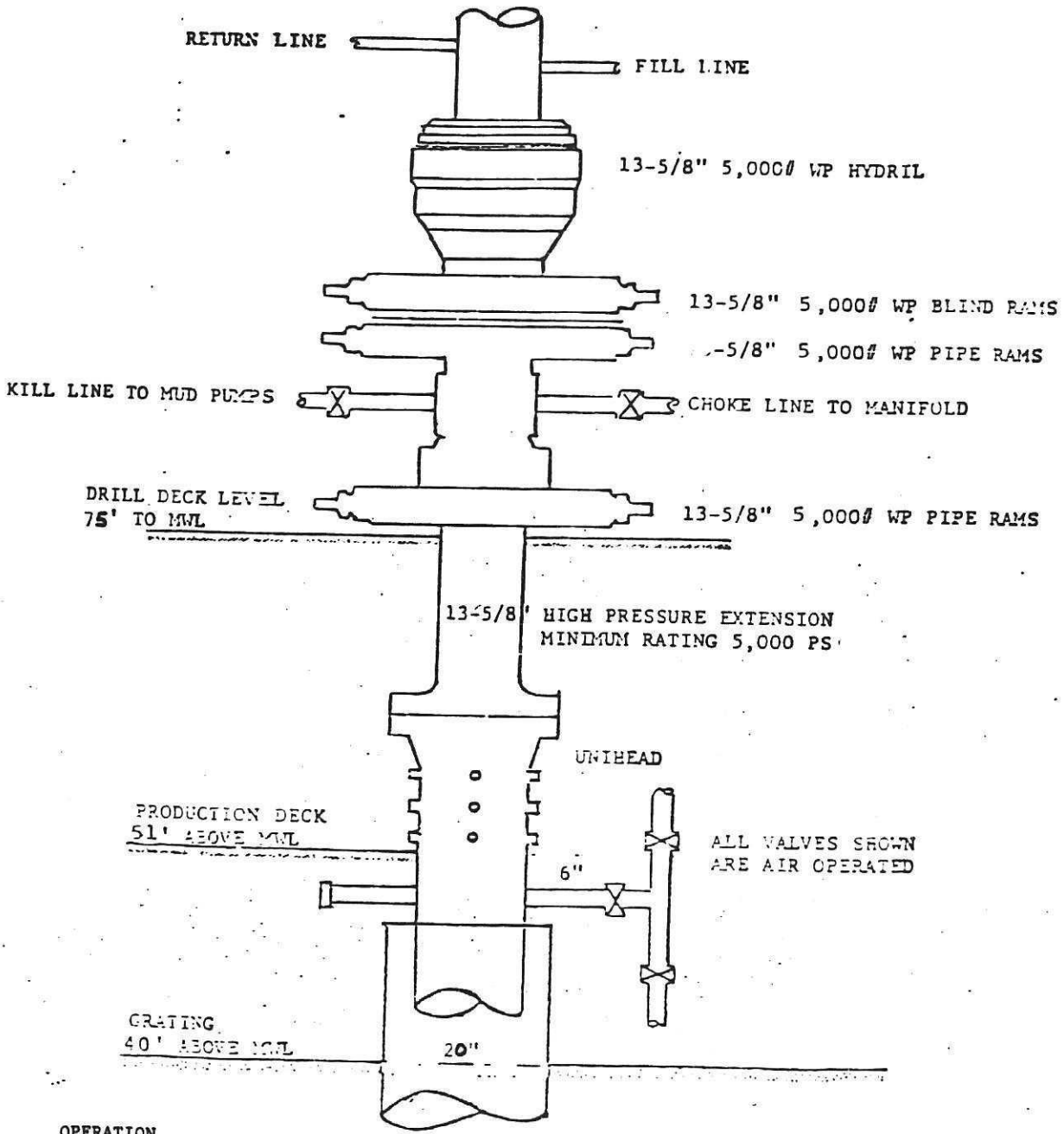
COMPARABLE [illegible] PRODUCTS BY TRADE NA[illegible]ES (Continued)

Description or Principal Component	IMCO SERVICES	Baroid	Magcobar	Milchem	Primary Application
CORROSION INHIBITORS (Continued)					
Filming Amine	IMCO PERMAFILM				Corrosion inhibitor.
Organic Polymer	IMCO SCALECHEK				Scale inhibitor.
Calcium Oxide	IMCO KENOX				Calcium source for saponification.
Fatty Acid Emulsifier	IMCO KEN SUPREME Conc. A		Oilfaze		Primary emulsifier and stabilizer for oil-base drilling fluids.
Emulsion Stabilizer	IMCO KEN SUPREME Conc. B		DG-55		Imparts gels, contributes to viscosity for weight suspension, and provides filtration control.
Specially Modified Saponified Fatty Acid Chemicals	IMCO KEN PAK	SF-100			Gelling agent for formulating high-gelation casing packs.
Wetting Agent and Dispersant	IMCO KEN CAL-L				Wetting agent and dispersant for oil muds for the reduction and/or stabilization of viscosity.

NOTES

DIVERTER SYSTEM (CASE 2)

Exhibit 9

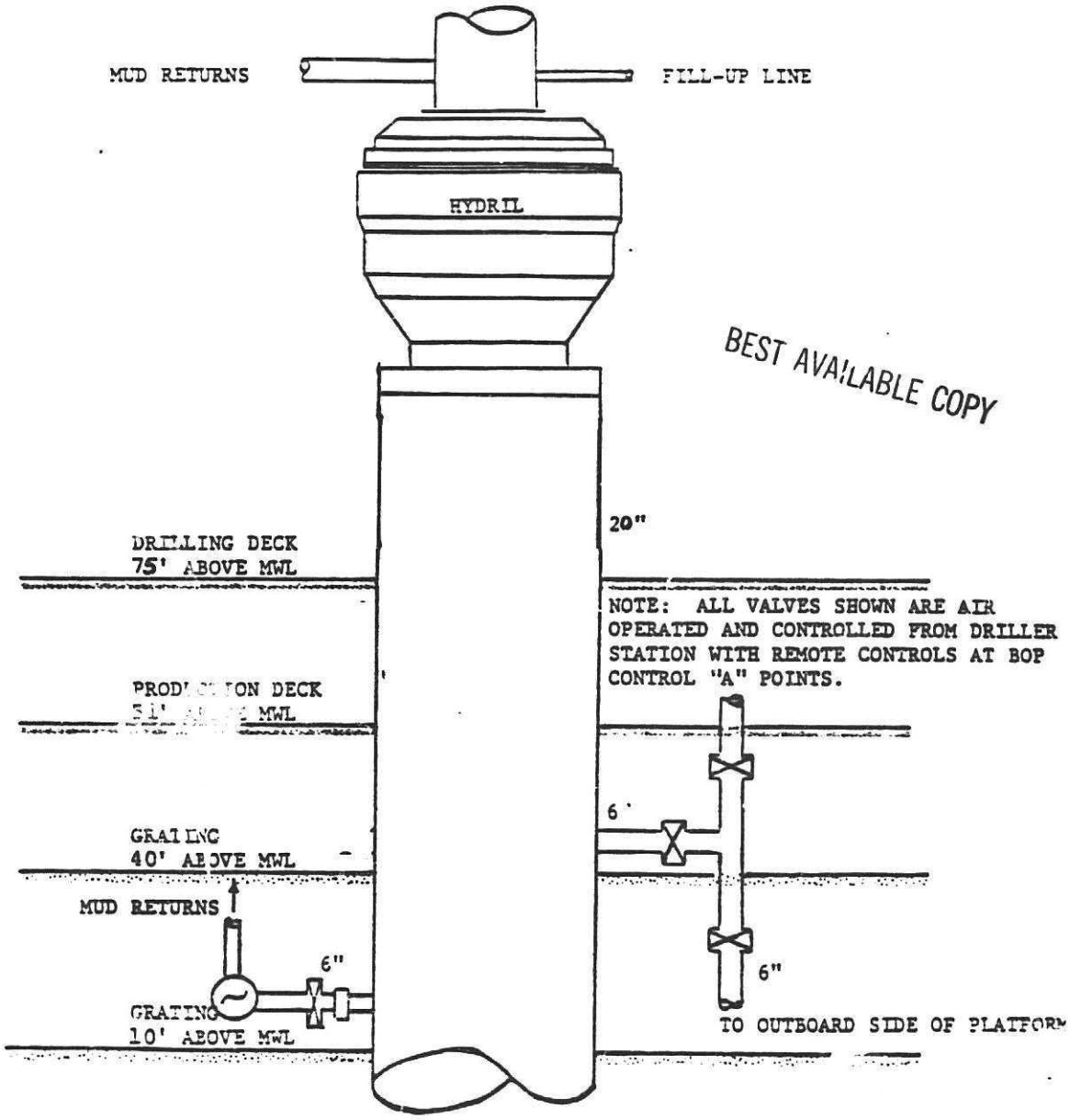


OPERATION

AT THE FIRST SIGN OF A KICK, WHICH WILL BE AN INCREASE IN MUD PIT VOLUME AND/OR AN INCREASE IN FLOW RATE, THE DIVERTER LINE DOWNWIND OF THE RIG WILL BE OPENED. THIS BOP WILL BE CLOSED TO DIVERT THE WELL FLUIDS AWAY FROM THE PLATFORM. THE DIVERTER LINE SHOULD ALWAYS BE OPENED BEFORE CLOSING THE BOP TO PREVENT FLOW AROUND THE BASE OF THE DRIVE PIPE.

STRUCTURAL DIVERTER (CASE 1)

Exhibit 10



OPERATION

AT THE FIRST SIGN OF A KICK, WHICH WILL BE AN INCREASE IN MUD PIT VOLUME AND/OR AN INCREASE IN FLOW RATE, THE DIVERTER LINE DOWNWIND OF THE RIG WILL BE OPENED. THIS BOP WILL BE CLOSED TO DIVERT THE WELL FLUIDS AWAY FROM THE PLATFORM. THE DIVERTER LINE SHOULD ALWAYS BE OPENED BEFORE CLOSING THE BOP TO PREVENT FLOW AROUND THE BASE OF THE DRIVE PIPE.

EXHIBIT 11

EPA AIR EMISSIONS DATA

A. Summary of Operations

ARCO Oil and Gas Company's leases in the South Pass Block 61 Field encompasses (in part or in whole) Blocks 6, 17, 59 61, 66 and 67. We currently operate six (6) platforms in Block 60 and one (1) platform in Block 67. The proposed platform "G" will be located in Block 60 adjacent to existing "A" and "D" platforms, approximately 13 miles from shore.

Construction of platform "G" will require relocating the platform deck and production equipment from the Block 67 "A" platform onto a new jacket. A new platform deck and limited production equipment will be installed on the Block 67 "A" platform. Development drilling on the new platform "G" will be conducted using the H&P 90 natural gas fueled drilling rig. Development drilling and well maintenance work on Block 67 "A" platform will be conducted by the H&P 101 natural gas fueled drilling rig.

Both rigs are self-contained platforms rigs having similar equipment which consists of:

1. Four V-16 Caterpillar G-399 Engines

   Natural gas fueled, 870 BHP each. Average of two are used 75% in drilling mode at 75% load, 25% non-drilling mode at 25% load. Assume 80% engine efficiency.

2. Crane - Unit Mariner 650-H

   GM 8V-92N diesel engine, 355 BHP. Used 30% of the time and operates at 50% load.

3. Cementing Unit

   a. Two GM 8V-71N diesel engine driven pumps, 333 rated BHP, average of 5% actual use at continuous rating.

   b. One GM 3-71N diesel cement mixer, 90 rated BHP, 67 continuous BHP, average of 5% actual use at continuous rating.

4. Wireline Unit

   Cummins 378-C-155 diesel engine, 90 BHP GIH - 5% of the time, 85 BHP POOH - 50% of the time, average 4 days/well (each 2 months). Total of 24 days/year.

5. Emergency Rig Generator

   Caterpillar D-379 V-8 diesel, 715 continuous BHP at 1300 RPM, used for emergency back-up. Not figured into total emissions.

CJT/3/2

Proposed platform "G" would have the same platform engines presently on Block 67 "A" platform which would consist of:

1. Two Solar Saturn 1000 HP turbines to drive the generators (one continuous, one backup).

2. One 12V-71 Detroit Diesel - fire pump rated at 504 BHP, 335 continuous BHP. Used only in an emergency and is not figured in total emissions.

3. One Detroit Diesel 6-71 pump down pump rated at 200 BHP, with 142 continuous BHP and an average of 30% actual use.

The new platform deck replacing the Block 67 "A" platform deck would have the following platform engines:

1. 150 continuous BHP natural gas generator.

2. 335 continuous BHP diesel fire pump and 100 BHP emergency diesel generator used for emergency purposes only. Not figured into total emissions.

3. Detroit Diesel 6-71N crane rated at 200 BHP and 142 continuous BHP. Average actual use of 30%.

4. One pump down pump, rated at 200 BHP, 142 continuous BHP. (To be added at a later date).

B. Calculation of Emission Exemptions - Part 250.57.101

Exemption Formulas

1. 33.3 D for NO_x, SO_2, TSP, THC each

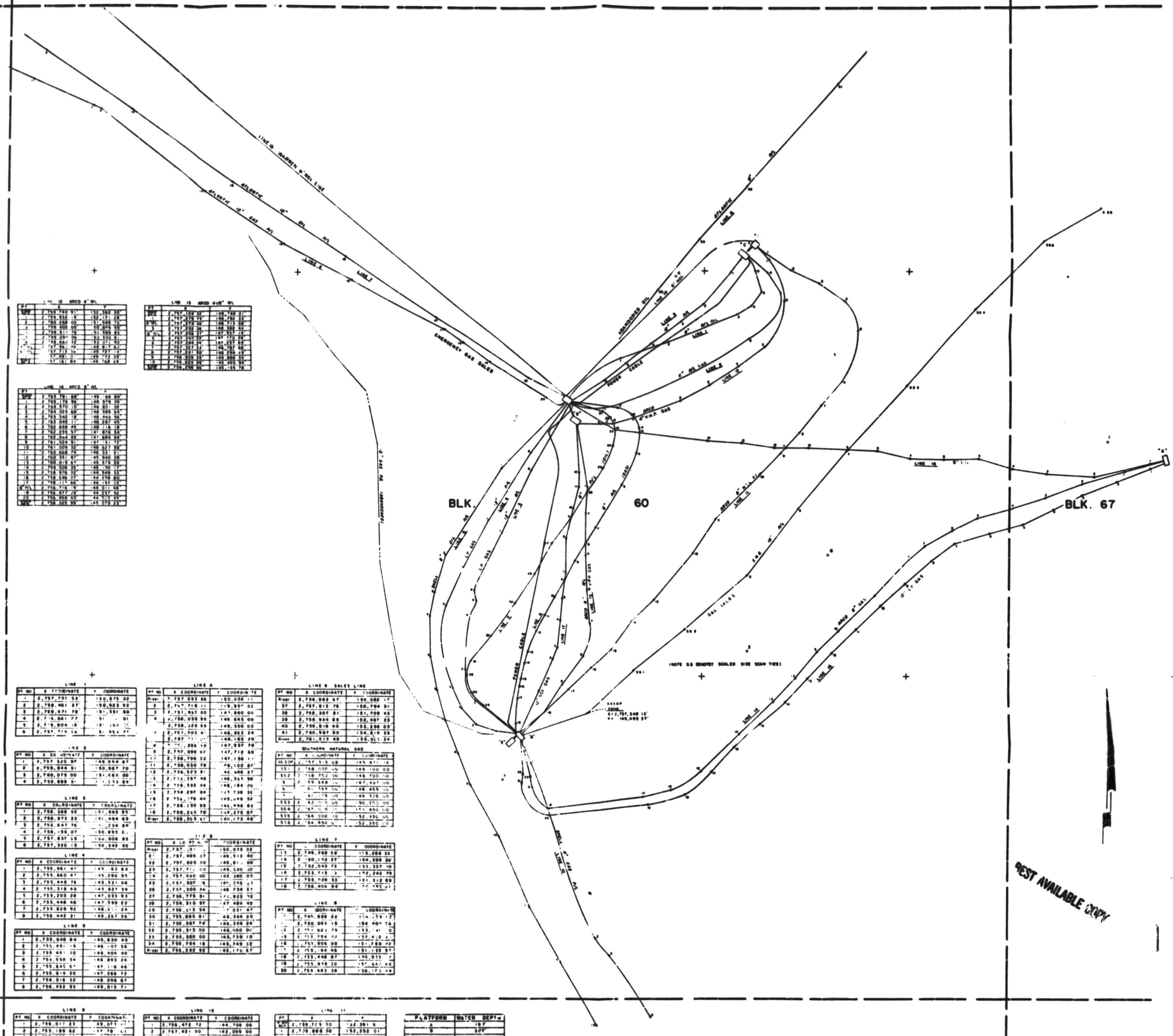
2. $3400\ D^{2/3}$ for CO

Where, D = distance from shore defined as landward of the mean high water mark.

Maximum Allowables

1. $33.3 \times 13 = 435.5$ tons/year each of NO_x, SO_2, TSP, THC

2. $3400 \times 13^{2/3} = 18,907.8$ tons/year for CO



LINE 15 ARCO 12" P/L

PT	X	Y
[illegible]	2,765,788 79	149,137 29
1	2,765,378 27	149,033 57
2	2,765,080 56	148,839 43
3	2,764,384 87	148,638 36
4	2,764,170 67	148,426 60
5	2,763,727 38	148,208 41
6	2,763,242 30	148,074 83
7	2,762,771 65	147,918 83
8	2,762,363 92	147,672 39
9	2,761,997 46	147,329 50
10	2,761,637 55	147,009 [illegible]
11	2,761,272 59	146,894 10
12	2,760,917 14	146,509 [illegible]
13	2,760,560 17	145,927 [illegible]
14	2,760,231 18	145,379 [illegible]
15	2,759,856 27	145,285 70
16	2,759,470 81	144,810 27
17	2,759,159 81	144,332 71
18	2,758,775 87	144,199 81
19	2,758,225 20	144,040 87
8" P/L	2,758,794 68	143,898 87
21	2,758,350 00	144,375 00
22	2,758,363 10	144,506 97
[illegible]	2,758,374 97	145,082 59

LINE 16 ARCO 8" P/L

PT	X	Y
[illegible]	2,765,778 54	149,176 39
1	2,765,362 99	149,140 62
2	2,764,746 08	148,948 71
3	2,764,054 24	148,991 70
4	2,763,554 58	149,084 79
5	2,763,057 58	149,214 44
6	2,762,539 76	149,208 01
7	2,762,048 46	149,218 08
8	2,761,564 90	149,333 66
[illegible] P/L	2,761,135 02	149,351 28
10	2,760,944 66	149,373 31
6" P/L	2,760,208 48	149,378 02
12	2,760,035 04	149,376 39
13	2,759,560 40	149,447 93
14	2,759,061 14	149,475 00
6" P/L	2,758,050 00	149,590 00
6" P/L	2,757,700 00	149,640 00
4" P/L	2,757,560 00	149,710 00
[illegible]	2,757,018 48	150,009 28

LINE 17 ARCO 12" P/L

PT	X	Y
[illegible]	2,756,295 18	145,137 46
1	2,756,574 66	145,781 49
2	2,756,778 97	146,269 07
3	2,756,847 67	146,419 59
4	2,756,886 38	146,823 32
5	2,756,917 50	147,148 69
6" P/L	2,756,948 23	147,419 69
7	2,756,963 75	147,531 69
8	2,756,956 31	148,034 00
6" P/L	2,757,037 57	148,338 61
10	2,757,070 31	148,478 56
11	2,757,192 02	148,793 98
12	2,757,150 47	149,006 72
[illegible]	2,757,113 08	149,748 23

LINE 12 ARCO 6" P/L

PT	X	Y
[illegible]	2,759,744 91	152,360 30
1	2,759,932 19	152,171 28
2	2,760,268 00	151,569 70
3	2,759,902 05	150,899 59
4	2,759,511 76	150,989 83
5	2,759,097 06	150,300 81
6	2,758,660 32	150,071 90
6" P/L	2,757,961 96	149,817 63
8" P/L	[illegible]757,713 56	149,727 14
[illegible]	[illegible]757,491 01	149,753 39
[illegible]	[illegible]757,161 84	149,768 24

LINE 13 ARCO 4 1/2" P/L

PT	X	Y
[illegible]	2,757,126 32	149,740 01
1	2,757,279 79	149,792 33
6" P/L	2,757,276 60	148,713 58
3	2,757,252 06	148,382 44
6" P/L	2,757,256 17	147,937 16
5	2,757,297 77	147,770 38
6	2,757,294 54	147,237 69
7	2,757,327 33	146,787 66
8	2,757,241 50	146,290 69
9	2,756,939 35	145,886 33
10	2,756,626 05	145,450 94
[illegible]	2,756,298 96	145,155 78

LINE 14 ARCO 8" P/L

PT	X	Y
[illegible]	2,765,781 68	149,168 64
1	2,765,176 96	148,979 05
2	2,764,570 10	148,801 02
3	2,764,029 68	148,589 65
4	2,763,542 18	148,443 56
5	2,763,046 11	148,287 45
6	2,762,698 45	148,116 18
7	2,762,255 57	147,876 34
8	2,762,044 49	147,684 94
9	2,761,524 91	147,151 72
10	2,761,009 52	146,627 90
11	2,760,668 74	146,331 21
12	2,760,351 67	145,940 39
13	2,760,019 69	145,579 59
14	2,759,508 35	145,100 17
15	2,758,976 32	144,549 33
16	2,758,546 07	144,298 80
17	2,758,117 66	144,157 03
8" P/L	2,756,716 19	144,011 66
19	2,756,477 28	144,357 92
20	2,756,458 65	144,505 49
[illegible]	2,756,329 99	145,070 23

LINE 1

PT NO	X COORDINATE	Y COORDINATE
1	2,757,757 52	150,675 02
2	2,758,461 27	150,923 92
3	2,759,471 70	151,351 60
4	2,7[illegible]5,661 77	[illegible] 01
5	2,7[illegible]9,804 [illegible]	[illegible]
6	2,757,71[illegible]	[illegible]

LINE 2

PT NO	X COORDINATE	Y COORDINATE
1	2,757,520 97	149,994 87
2	2,759,644 91	150,987 70
3	2,760,079 00	151,468 00
4	2,759,889 91	[illegible]533 89

LINE 3

PT NO	X COORDINATE	Y COORDINATE
1	2,759,360 92	151,965 95
2	2,758,973 23	151,494 65
3	2,758,647 76	[illegible]234 89
4	2,758,196 07	150,895 [illegible]
5	2,757,837 19	150,606 83
6	2,757,520 19	150,342 95

LINE 4

PT NO	X COORDINATE	Y COORDINATE
1	2,755,961 47	145,183 69
2	2,755,660 47	145,290 95
3	2,755,448 76	145,521 66
4	2,755,318 46	145,827 39
5	2,755,203 28	147,033 93
6	2,755,448 48	147,399 22
7	2,755,828 92	148,2[illegible] 24
8	2,756,442 21	149,267 56

LINE 5

PT NO	X COORDINATE	Y COORDINATE
1	2,755,840 84	145,630 45
2	2,755,491 19	146,107 56
3	2,755,491 20	146,404 40
4	2,755,550 54	146,893 24
5	2,755,645 6[illegible]	147,116 46
6	2,755,614 20	147,266 72
7	2,756,016 32	148,096 87
8	2,756,452 93	149,015 71

LINE A

PT NO	X COORDINATE	Y COORDINATE
Riser	2,757,033 60	150,058 11
2	2,757,718 11	149,99[illegible] 02
3	2,757,932 00	14[illegible],860 00
4	2,758,059 99	149,685 00
5	2,758,329 99	149,300 00
6	2,757,603 4[illegible]	148,882 24
7	2,757,[illegible]	148,189 20
8	[illegible],284 19	147,937 70
9	2,757,098 32	147,712 60
10	2,756,700 22	147,198 1[illegible]
11	2,756,650 79	[illegible]8,100 00
12	2,756,573 81	[illegible]46,680 27
13	2,756,397 40	146,351 98
14	2,756,333 46	146,184 00
15	2,756,297 64	14[illegible] 530 32
16	2,756,[illegible]78 44	145,046 58
17	2,756,199 95	145,990 01
18	2,756,246 78	149,275 87
Riser	2,756,365 21	140,173 40

LINE B

PT NO	X COORDINATE	Y COORDINATE
Riser	2,757,[illegible]	150,039 02
21	2,757,489 37	149,913 40
22	2,757,820 00	149,81[illegible] 00
23	2,757,71[illegible] 00	149,530 30
24	2,757,660 00	149,380 00
25	2,757,507 [illegible]	149,246 [illegible]
26	2,757,300 44	148,754 87
27	2,756,775 81	1[illegible],923 78
28	2,756,510 97	[illegible]47 484 42
29	2,756,215 54	[illegible]7 031 47
30	2,755,885 81	[illegible]46,564 20
31	2,755,567 74	146,206 28
32	2,755,515 00	146,000 00
33	2,755,380 00	145,730 00
34	2,755,764 18	145,549 32
Riser	2,756,302 93	145,170 67

LINE 6 SALES LINE

PT NO	X COORDINATE	Y COORDINATE
Riser	2,756,982 67	150,082 17
37	2,757,613 76	150,794 91
38	2,758,307 81	151,709 43
39	2,758,934 89	152,487 23
40	2,759,616 40	153,288 09
41	2,760,987 90	154,816 59
Riser	2,761,519 48	155,[illegible] 39

SOUTHERN NATURAL GAS

PT NO	X COORDINATE	Y COORDINATE
SS EOP	2,757,315 08	145 67[illegible] 16
SS1	2,758,000 00	146,100 00
SS2	2,758,750 00	146,700 00
5	2,759,648 00	147,497 00
6	[illegible]60,599 00	148,455 00
7	[illegible]61,[illegible]9 00	149,325 00
SS3	2,[illegible]62,000 00	150,200 00
SS4	2,[illegible]	151,450 00
SS5	2,764,000 10	152,450 00
SS6	2,764,890 [illegible]	152,350 00

LINE 7

PT NO	X COORDINATE	Y COORDINATE
13	2,749,268 58	155,288 33
14	2,750,148 27	154,599 26
15	2,752,043 73	153,337 10
16	2,753,715 [illegible]	152,243 79
17	2,755,029 33	151,312 89
18	2,756,406 94	[illegible] 395 07

LINE 8

PT NO	X COORDINATE	Y COORDINATE
[illegible]	2,749,928 69	15[illegible] 13
[illegible]	2,750,091 19	154 40[illegible] 26
14	2,7[illegible] 621 79	153,[illegible] 0
15	2,752,794 07	152,472 [illegible]
16	[illegible],755,806 00	151,788 42
17	2,755,164 46	151,139 97
18	2,755,440 87	150,933 [illegible]
19	2,755,859 20	15[illegible],542 68
20	2,758,883 38	150,1[illegible]3 44

LINE 9

PT NO	X COORDINATE	Y COORDINATE
1	2,756,017 23	[illegible]49,071 [illegible]
2	2,755,189 62	[illegible]
3	2,755,030 40	14[illegible] 234 [illegible]
4	2,754,972 81	144,667 86
5	2,754,986 60	144,290 13
6	2,755,076 77	145,789 82
7	2,755,201 86	145,[illegible] 44
8	2,755,400 23	144,967 19
9	2,755,579 82	144,[illegible]78 59
10	2,755,999 49	143,618 75
11	2,756,449 37	142,961 71
12	2,756,910 05	141,738 69
13	2,757,460 64	140,818 30

LINE 10

PT NO	X COORDINATE	Y COORDINATE
1	2,756,472 72	144,700 06
2	2,757,421 00	142,099 00
3	2,757,647 00	141,843 00
4	2,758,274 00	140,933 00

LINE 11

PT	X	Y
[illegible]	2,759,725 30	152,391 9[illegible]
1	2,759,888 30	152,252 01
2	2,760,267 20	152,013 18
3	2,760,679 81	[illegible],032 65
4	2,761,061 93	[illegible] 909 46
5	[illegible]761,270 73	151,125 59
6	2,761,057 39	150,394 94
7	2,760,755 80	150,[illegible]18 52
8	2,760,412 6[illegible]	[illegible],579 06
9	2,760,140 67	49,[illegible] 70
10	2,759,822 51	[illegible],074 30
11	2,759,181 66	[illegible] 535 04
12	2,758,665 37	14[illegible] 539 56
13	2,758,293 06	147,140 49
14	2,757,988 32	146,829 08
15	2,757,665 48	146,405 45
16	2,757,352 87	146,[illegible]39 81
17	2,757,019 00	145,629 60
18	2,758,888 97	145,505 9[illegible]
[illegible]	2,758,378 60	145,079 7[illegible]

PLATFORM	WATER DEPTH
A	197'
B	207'
C	189'
D	192'
E	206'
F	193'

Prepared By John E Chance & Associates, [illegible]

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OCS G 16022137

ATTACHMENT D

ATLANTIC RICHFIELD COMPANY

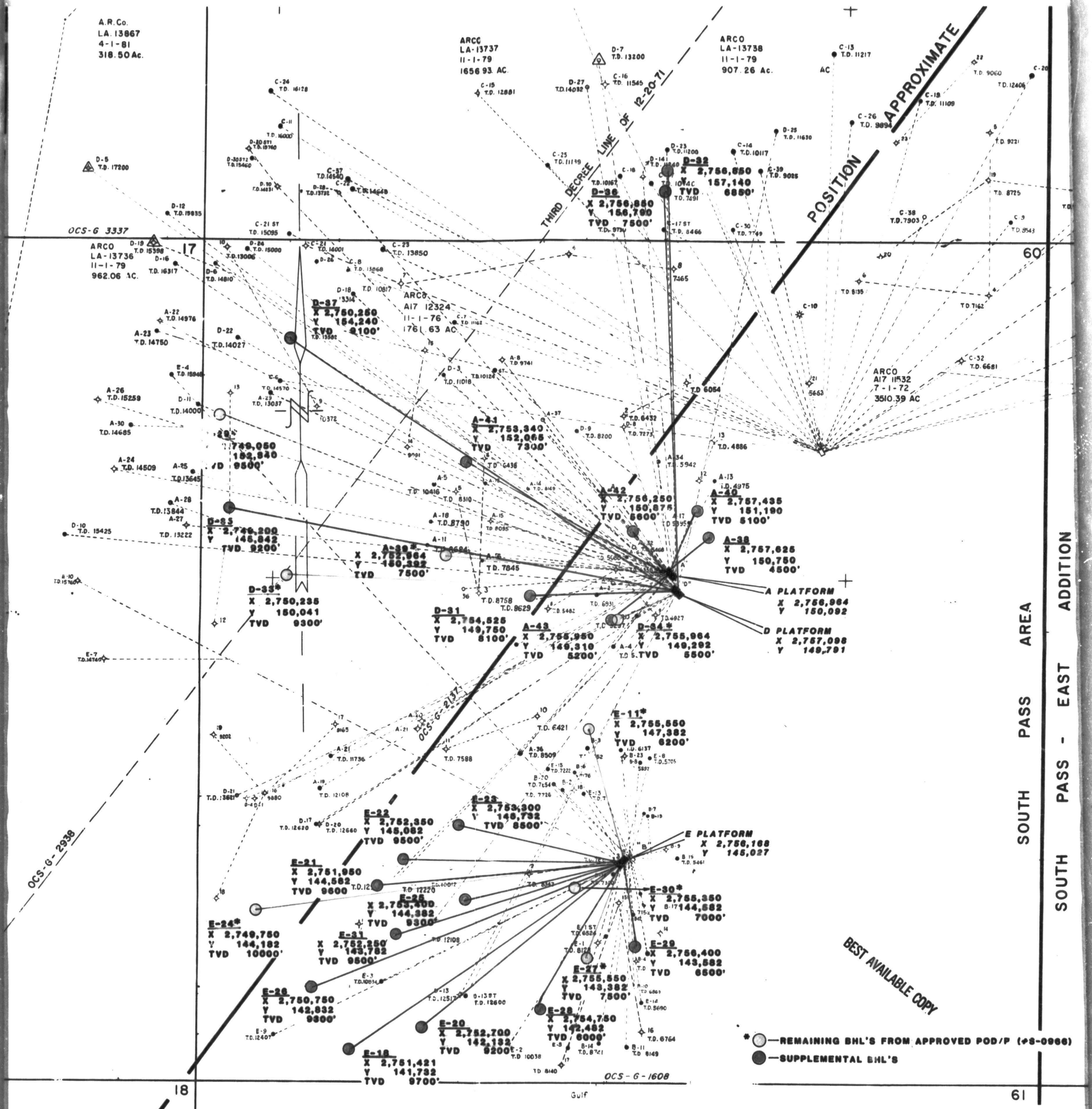
FACILITIES MAP OF BLOCK 60

SOUTH PASS AREA

600' 0 600'

?/8/76

16X



ARCO Oil and Gas Company

Division of Atlantic Richfield Company

South Louisiana District

AREA: EASTERN OFFSHORE

LOCATION: SOUTH PASS BLOCK 61 FIELD

HORIZON: ***SPIDER MAP***

SCALE: 0' 1000' 2000' CONTOUR INTERVAL: 20'

INTERPRETED BY: _____ DATE: 5-'83

DOCD #S0966

OCS G 1602 2137

OCS # on above 2 maps should read:

OCS G 1608

not 1602

C. EPA AP-42 Emission Factors

	NATURAL GAS FUELED INTERNAL COMBUSTION ENGINE (#/HP-HR)	DIESEL FUELED INTERNAL COMBUSTION ENGINE (#/HP-HR)	TURBINE ENGINE (#/HP-HR)
NO_x	0.024	0.030837	0.0029
CO	0.0031	0.006674	0.0011
SO_2	0.000004	0.0020517	0.000004
TSP	--	0.0022026	--
THC*	0.0097	0.002467	0.00020

* NOTE: Total Hydrocarbons (THC) as methane and non-methane

D. Calculation of Expected Air Emissions for South Pass Block 61 Field

Calculations have been performed assuming one year continuous operation of drilling rigs and platform engines on both proposed Block 60 "G" platform and modified Block 67 "A" platform. The expected incremental air emissions for this Supplemental Development in the South Pass Block 61 Field are equal to:

Total Incremental Expected Air Emissions (Tons/Year) for:

NO_x CO, SO_2, TSP, THC =

1. (Block 60 Platform "G" Air Emissions) plus

2. (Block 67 Platform "A" Air Emissions) less

3. (Block 67 Platform "A" Air Emissions Previously Permitted)

* * * * * * *

TABLE 1
Block 60 Platform "G" Air Emissions[4]

ENGINE	AVERAGE POWER (HP/HR)	NO_x	EMISSION TOTALS (TONS/YEAR) CO	SO_2[1]	TSP	THC
Prime Movers[2]	1366.5	143.65	18.55	--	--	58.066
Rig Emergency Generator[3]	(715)	(96.61)	(20.91)	(6.41)	(6.91)	(7.71)
Cement Unit	11.5	1.55	.31	.11	.11	.11
Cement Mixer	3	.32	.10	.03	.03	.04
Crane	28	3.88	.80	.25	.27	.30
Crane[3]	(28)	(3.78)	(.80)	(.25)	(.27)	(.30)
Platform Generator[5]	1000	12.70	4.82	--	--	.88
Fire Pump[3]	(335)	(45.25)	(9.79)	(3.01)	(3.	(.62)
Pump Down Pump	43	5.81	1.26	.39		
Emergency Generator[3]	(335)	(45.25)	(9.89)	(3.01)	(3	(3.
	TOTALS	167.91	25.84	.78	.0	69.

TABLE 2
Block 67 Platform "A" Air Emissions[4]

ENGINE	AVERAGE POWER (HP/HR)	NO_x	EMISSION TOTALS (TONS/YEAR) CO	SO_2[1]	TSP	THC
Prime Movers[2]	1366.5	143.65	18.55	--	--	58.06
Rig Emergency Generator[3]	(715)	(96.61)	(20.91)	(6.41)	(6.91)	(7.71)
Cement Unit	11.5	1.55	.31	.11	.11	.11
Cement Mixer	3	.32	.10	.03	.03	.04
Crane	43	5.92	1.22	.38	.41	.46
Platform Generator[2]	150	15.77	2.04	--	--	6.38
Fire Pump[3]	(335)	(45.25)	(9.79)	(3.01)	(3.23)	(3.62)
Pump Down Pump	43	5.81	1.26	.39	.41	.45
Emergency Generator[3]	(100)	(1.20)	(0.46)	--	--	(0.08)
	TOTALS	173.02	23.48	.91	.96	65.50

1 Analysis of natural gas indicates no sulfur content.

2 Natural gas fueled engines - use natural gas emission factor in calculation.

3 These engines essentially never used, so not included in totals.

4 The general quotation used to calculate the tabulated air emission values is provided on the final page of this section as well as an example of the use of the equation.

5 Use turbine engine emission factor.

TABLE 3

Air Emissions Previously Permitted for Block 67 "A" Platform

Air Pollutants	Air Emissions Previously Permitted for 1/ Block 67 "A" Platform and Natural Gas Fueled Drilling Rig
NO_x	167.8
CO	25.8
SO_2	0.8
THC	0.8
TSP	59.9

1/ Air emissions obtained from the Air Emissions Data Report for South Pass Block 67 "A" Platform Supplemental Plan of Development for Lease OCS-G-1611 and 1612, Blocks 66 and 67, South Pass Areas, approved on June 13, 1981.

TABLE 4

Total Expected and Allowable Air Emissions are Provided Below

Air Pollutants	(1) + (2) - (3) = Expected Incremental Air Emissions (Ton/Year): [60 "G" Platform] + [67 "A" Platform] - [67 "A" Platform Previously Permitted]	Allowables (Ton/Year)
NO_x	173.1	435.5
CO	23.5	18,797.8
SO_2	0.9	435.5
THC	1.0	435.5
TSP	65.5	435.5

NOTE THAT ALL EXPECTED AIR EMISSIONS
ARE BELOW ALLOWABLE AIR EMISSIONS

* * * * * * * * *

The general equation used for calculation of the tabulated expected air emissions in Tables 1 and 2 for a particular piece of equipment is given by:

(1) Expected Air Emissions (Tons/Year)

= [Continuous BHP of Equipment] x [% Actual Use]

x [Appropriate Air Emission Factor, lbs/HP-HR]

x [8760 Hours/Year] x [1/2000 lbs/ton]

The above equation reduces to:

(2) Expected Air Emissions (Tons/Year)

= [Average Power of Equipment] x [Appropriate Air Emission Factor]

x [4.38]

An example of the use of equation (2) is given below:

The expected yearly air emissions of NO_x in tons/year for the platform generator on proposed "G" platform is:

Expected NO_x Air Emissions = [1000 (HP/HR)] x [0.0029 (lbsNO_x/HP-HR)]

x 4.38

From Generator on "G" Platform = 12.70 tons/year of NO_x air emissions

* * * * * *

A.

ENVIRONMENTAL REPORT

FOR

SUPPLEMENTAL DOCD

SOUTH PASS BLOCK 61 FIELD

ARCO OIL AND GAS COMPANY

A DIVISION OF

ATLANTIC RICHFIELD COMPANY

Contact:

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P. O. Box 51408, OCS

Lafayette, Louisiana 70505

(318) 264-4000

October 1984

C O N T E N T S

A. Rig Activity (Drilling, Workovers, Sand Washing, etc.)

1. Under normal conditions, oil and gas will be produced in conjunction with drilling or workover operations on an offshore platform. These simultaneous operations will be conducted with proper preplanning and provisions for safe operations.

2. When appropriate during simultaneous operations, consideration will be given at the outset to shutting in all or at least nearby producing wells (completions, and setting well plug(s) or closing surface controlled subsurface safety valves).

3. Swabbing and drillstem testing will not be initiated at night, except with the prior approval of the District Production and Drilling Superintendent.

4. Smoking is permitted on platforms only on specifically designated areas. Platform supervisor may designate times when no smoking is allowed anywhere on the platform.

5. When moving heavy equipment, shut in wells that could be damaged if the equipment falls, and consideration given to setting plugs or closing surface controlled subsurface safety valves and bleeding down wells and lines in the area.

6. During rigging-up or rigging-down operations, shut in all wells which could be endangered.

7. Store BOP's in a safe position when not in use to prevent accidental falling and possible injury or damage.

B. Wireline Work

1. When wireline work is to be performed on a well, the lubricator should be tested before going in the hole with the wireline tools. The lubricator should be of sufficient length to enclose the entire length of the running tool string.

2. Blind ram blowout preventers shall be installed below the lubricator and checked for condition prior to use.

3. Insure proper support is provided for the wireline lubricator.

4. For wells with over 1,000 PSI tubing pressure, purge the lubricator of air before pressuring up.

5. Whenever more than one wireline operation is in progress on a structure, a Production Foreman or other designated competent person, will be on the platform and will coordinate all activities initially and periodically check on the operation.

C. Lifting and Major Construction Activities

1. When performing major lifts or moving rigs (including all lifts requiring use of a derrick barge) over or near wellheads, set

plugs or close surface controlled subsurface safety valves in all wells and bleed down wells. If lifts are over open areas only, wells, vessels and pipelines need not be shut-in; however, the District Production Supervisor or his/her representative shall be present when major lifts are involved.

2. All lines containing hydrocarbons shall be adequately rotated or bled down when performing major lifts. All pipeline safety valves shall be in operation. Lines flowing across a platform may be left in service provided the scraper-traps or any portion of the line is not endangered by the lift. No scraper-trap will be opened during these operations.

3. Install guides where possible to prevent heavy lifts from swinging into and damaging wells and/or producing equipment.

4. Every effort shall be maintained during anchoring operations to avoid endangering pipelines and submarine cables. If doubt exists regarding pipeline location, the lines in question should be buoyed or bled down during anchoring operations.

5. Helicopter landings and take-offs are prohibited during crane operations whenever movement of the crane could interfere with the helicopter flight path. Booms should be cradled or laid down when not in use to insure safety of personnel and equipment.

D. Welding, Burning and Hot Tapping Safe Practices and Procedures Plan

1. Applicability

The following requirements apply to all:

a. Offshore mobile-drilling units during the drilling mode.

b. Mobile workover units during any drilling, completion, recompletion, remedial, repair, stimulation, or other workover activities.

c. OCS platforms, structures, artificial islands or other installation during any drilling, completion, workover, or production operations including any installations which contain a well open to a hydrocarbon bearing zone.

The following plans will also be followed when conducting any major construction operations:

2. Welder Qualification Standards

a. Hydrocarbon Piping and Vessels - All burning and welding on hydrocarbon equipment will be performed by welders qualified in accordance with the latest edition of the ASME Boiler and Pressure Vessel Code, Section IX or ANSI B31.3 or B31.4 as appropriate. Prior to the commencement of operations, the ARCO supervisor shall verify that the welder or welders are certified.

b. Welding Other than Hydrocarbon Piping and Vessels - Any burning or welding on anything other than hydrocarbon equipment shall be performed by personnel acceptable to the ARCO supervisor. They shall be fully aware of all safety regulations and the contents of this plan.

3. Safe Welding Areas

Prior to welding or burning operations, an approved safe welding area shall be established. The National Fire Protection Association Bulletin No. 51 B, "Cutting and Welding Processes", 1976 shall be used as a guide to establish these safe-welding areas. A drawing showing the location of these areas shall be prominently displayed on the facility. Welding which cannot be performed in the approved safe-welding area shall adhere to the following practices as required by OCS Order No. 5, Section 5.4.3.

a. Prior to the commencement of any welding or burning operations on a structure or mobile drilling rig, the designated person-in-charge at the installation shall inspect the qualification of the welder or welders to assure that they are properly qualified in accordance with the approved company qualification standards or requirements for welders. The person-in-charge and welders shall inspect the area in which the work is to be performed for potential fire and explosion hazards. After it has been determined that it is safe to proceed with the welding or burning operations, the person-in-charge shall issue a written authorization for the work (Appendix "A").

b. All welding equipment shall be inspected prior to beginning any welding or burning. Welding machines located on production or process platforms shall be equipped with spark arrestors and drip pans. Welding leads shall be completely insulated and in good condition: oxygen and acetylene bottles secured in a safe place; and hoses leak-free and equipped with proper fittings, gauges, and regulators.

c. During all welding and burning operations, one or more persons as necessary shall be designated as a Fire Watch. Persons assigned as Fire Watch shall not be members of the welding crew and shall have no other duties while actual welding or burning operations are in progress. If welding is to be done in an area which is not equipped with a gas detector the Fire Watch shall also maintain a continuous surveillance with a portable gas detector during welding.

d. Prior to any welding or burning, the Fire Watch shall have in his possession fire-fighting equipment in a condition ready to use.

e. No welding shall be done on containers, tanks, or other vessels which have contained a flamable substance unless the contents of the vessels have been rendered inert and determined to be safe for welding or burning by the designated person-in-charge.

f. In the event drilling, workover, or wireline operations are in progress on the platform, welding operations in other than approved safe-welding areas may be conducted only if the well(s) on which work is being done contain non-combustible fluids, and entry of formation hydrocarbons into the wellbore is precluded by a positive overbalance toward the formation.

g. All other producible wells shall be shut-in at the surface safety valves while welding or burning in the wellhead or production area.

4. Hot-Tapping

Hot-tapping pipelines or atmospheric vessels present additional exposure to personnel and plant operations. This should be considered and hot-taps requested only when it proves impractical to drain, depressure or tie into existing equipment, with normal procedures. Detailed procedures and requirements may be obtained by referencing the API standard PSD 2201, November, 1963. The following procedure will be followed for issuance of a hot-tap permit with certain restrictions.

a. Prior to requesting a permit for hot-tap work, Engineering will be requested to run a thickness test by instrument and issue a note stating the wall thickness and their recommendations.

b. Approval to proceed with the hot-tap will then be followed by the issuance of the Safe Work Permit.

RESTRICTIONS

1. When welding on a storage tank or other atmospheric vessel for hot-tapping, the liquid level must be 3 feet or more above the weld.

2. When welding on a liquid line, there must be flow through the line or the line must be full and vented to avoid pressure build-up.

3. When welding on gas lines, they must be flowing, preferably at reduced pressure.

4. If the welding is on a vapor line, there must be a flow through the line. The oxygen content of the vapor line must be below the explosive limits of the contained gas.

5. In the event CONTRACTORS perform the hot-tap, they must have a Contractor Tie-In Permit.

* * * * * *

EXHIBIT 3

South Pass Block 60 Platform G
Approximate Well Development Schedule

WELL	LEASE	ESTIMATED SPUD DATE
G-1	OCS-G 2943	7/12/85
G-2	OCS-G 2137	9/12/85
G-3	OCS-G 2137	11/12/85
G-4	OCS-G 2943	1/12/86
G-5	OCS-G 2137	3/12/86
G-6	OCS-G 2137	4/12/86
G-7	OCS-G 2137	5/12/86
G-8	OCS-G 1608	6/12/86
G-9	OCS-G 1608	7/12/86
G-10	OCS-G 1608	8/12/86
G-11	OCS-G 1608	9/12/86
G-12	OCS-G 1608	10/12/86
G-13	OCS-G 1608	11/12/86
G-14	OCS-G 2137	12/12/86
G-15	OCS-G 2137	1/26/87

B. DESCRIPTION OF PROPOSED ACTION

1. Transportation will include boats and helicopters presently operated in the South Pass Block 61 Field. Personnel transport is done almost exclusively by helicopter. One large helicopter will visit the rig daily. The South Pass Block 61 Field operates three crewboats (100') that make approximately ten runs per week each, and three workboats (165') that make an average of seven runs per week each, during drilling. A standby/utility boat is maintained in the field.

2. The base operations for all offshore activity out of this district is in Venice, Louisiana. This base consists of a docking facility, warehouse, yard, heliport, parking lot and office, which are used to supply the needed logistic, communication and supervisory support. Crewboats, supply boats and helicopters which support the platforms and rigs are coordinated from this base. Private radios, micro-wave channels and regular telephones are installed. This shore base facility has dispatchers on duty 24 hours a day and a base coordinator who is immediately available. Attachment "A" is a general location map of the base site and Attachment "B" is a layout of the base facilities

3. No new support facilities are expected as a result of this activity.

4. Platform G is to be constructed by separating the existing platform deck from South Pass 67A platform, and setting it on a new jacket. A new platform deck will then be installed on 67A jacket. For further details, refer to the attached Supplemental DOCD.

5. Attachment "C" shows the location of the proposed activity in relation to the affected coastal states of Louisiana and Mississippi.

6. Produced crude oil and gas will be transported to shore through existing pipelines.

C. DESCRIPTION OF THE AFFECTED ENVIRONMENT AND IMPACTS

1. Physical and Environmental

a. Offshore oil and gas operations may impact commercial fisheries in the following ways: removal of sea floor from use; underwater obstruction; oil pollution; pipelines. Specifics on how these impacts may occur are addressed in the FEIS Sale 58 at pp. III 39, 40, 41. In this and other FEIS's, impacts are mainly discussed in

terms of development and production activities. A main concern has been the effects of drilling muds and cuttings. Numerous studies have been conducted (Gulf of Mexico, mid-Atlantic, Tanner Bank, Cook Inlet, Beaufort Sea, etc.) to examine the water column, benthic environment, sediment chemistry, and bioaccumulation in various organisms.

Several recent reports which address fate and effects of drilling muds are: Dames and Moore, 1981; Petrazzuolo, 1981; Ayers, 1981; and Jackson et al., 1981. These reports were submitted to the U.S. EPA as background data for the issuance of NPDES permits and in Environmental Reports (Exploration) submitted, as part of a Minerals Management Service requirement for offshore exploratory drilling.

In the event of an oil spill, commercial fishing activities would be inhibited in order to avoid contamination of fishing equipment, vessels and catch. However, the frequency and magnitude of such spills is minimal. Supporting this, Mertens (1973) refers to Environmental Impact Statement Hearing, August 1972. "Despite the presence of the oil industry in this area, the fishing catch has risen markedly in that period and presently is greater than any other fishing in the United States." (FEIS Lease Sale 36, Vol. II pp.168-169). (FEIS Lease Sales A-66 and 66, page 68).

Assumptions about the characteristics, fates and effects of a typical Gulf of Mexico oil spill are addressed in the Regional FEIS at pp. 276-[illegible].

b. Shipping (transit lanes, anchorage areas, fairways, etc.)

The fairway system in the Gulf (see visual No. 11, Regional FEIS, January 1983) cuts across many lease blocks. The lease blocks and parts of blocks that lie within the fairways are subject to certain constraints. Although oil and gas resources can be exploited through directional drilling, no structure may be placed in a fairway. Pipelines can only cross perpendicular to a fairway and they must be entrenched where this occurs. (See Regional FEIS, January 1983, pp. 16, 402, 403, 420).

Ships, of course, do not always use these fairways and this increases the possibility of a collision with drilling rigs, permanent platforms, or vessels attending these platforms. The most serious environmental hazard involving offshore structures and shipping could occur in the case of an oil tanker colliding with a platform.

To minimize the chance of this type of accident, navigational aids such as fog horns and beacons are installed on offshore MODUs (Mobile Offshore Drilling Units) as per U.S. Coast Guard regulations.

Stationary offshore structures such as rigs and platforms may function as navigational aids for small boat operators, and thus have a beneficial impact. Also in Louisiana, lives have been saved by the presence of offshore platforms when pleasure boat crews and passengers were forced to abandon their craft during storms or following boat accidents.

No fairways are present in South Pass Block 61 field.

c. Small Craft Pleasure Boating, Sport Fishing and Recreation

Offshore mineral development in the past 25 years has led to the erection of over 100 major platforms and 4,000 individual structures in the Gulf of Mexico, most of which are in the central Gulf off the coast of Louisiana. Some areas have become widely recognized over the years as having a special interest to fishermen, scuba divers and marine researchers because they serve as breeding grounds and artificial reefs. Now most of the offshore fishing in the central and western Gulf, except big game fishing, is focused around petroleum structures and designated artificial reefs.

Extensive testimony and evidence have been received that overall oil and gas operations have a favorable impact on sport fishing activities. The favorable impact is the result of sport fish population enhancement due to the artificial reef effect of offshore platforms. In the open sea, offshore platforms provide both food and cover in areas that are largely devoid of these essentials. (FEIS Lease Sale 36, Vol. II, page 189).

Background and statistics on the offshore "rig fishing" phenomenon is discussed on page 439 of the January 1983 Final Regional Environmental Impact Statement.

A "REEFS (Recreation, Environmental Enhancement and Fishing in the Seas) Task Force has been created by the Department of Interior (MMS News Release, August 5, 1983). The task force was created to "pave the way for aggressive movement towards a National Rigs-to-Reef program which will enhance fishery resource and improve recreational and sport fishing opportunities within America's

offshore marine environment." Under "Cumulative Impacts" the Regional FEIS states, "It is likely that continued and expanded oil and gas leasing in the CPA (Central Planning Area) will have a very high favorable impact on offshore marine recreational fishing in the next 10-50 years".

d. Cultural Resources - Known Archaeological or Historic Areas

The South Pass Block 61 Field is not in a known archaeological or historic area. A shallow hazards analysis has been done previously for the field and is discussed in the Supplemental DOCD.

e. Ecologically Sensitive Features

Although communities of anemones, limpets, mollusks, barnacles and other forms of marine/estuarine life which attach themselves to the substrate are prolific in California and New England, few of these animals have a wide distribution in Louisiana because of the predominantly soft-substrate beaches of the State. Those invertebrate sessile organisms which do colonize the jetties of the Mississippi River are largely protected from contact with oil resulting from a spill due to the gulfward movements of the river. (FEIS Lease Sale 36 Vol. II, pp. 146, 147 [C-4]).

The lease area is not situated in or near areas of biological significance. (See Visual No. 10 of Regional FEIS). No designated preservation areas exist near this block. Among the refuges and preserves to be found in coastal shorefront parishes of Louisiana are Sabine National Wildlife Refuge and Lacassine National Wildlife Refuge in Cameron Parish, Rockefeller Wildlife Refuge and Game Preserve in Cameron/Vermilion Parishes, the Paul J. Rainey and the Louisiana State Wildlife Refuge and Game Preserves in Vermilion Parish, the Russell Sage (Marsh Island) Wildlife Refuge and Game Preserve in Iberia Parish, Pt. Au Chien Wildlife Management Area in Terrebonne /Lafourche Parishes, Wisner Wildlife Management Area in Lafourche Parish, Bohemia Wildlife Management Area, Delta National Wildlife Refuge and Pass a Loutre Game and Fish Preserve all in Plaquemines Parish, and the Biloxi Wildlife Management Area and Breton Bird Refuge, both in St. Bernard Parish.

The South Pass Block 61 Field is located approximately 13 miles south of the Pass A Loutre Game and Fish Preserve.

No national marine or estuarine sanctuaries exist near the proposed development area.

f. South Block 61 Field contains many pipelines and cables as depicted in attachment D. No new pipelines to shore are expected as a result of this proposal.

g. No other known mineral deposits of commercial importance occur within the lease area.

h. All ocean dumping is regulated by the Marine Protection, Research, and Sanctuaries Act of 1972, as amended, on October 15, 1973 (38 FR 28610 et seq.). A revised version of the regulations became effective on February 10, 1977 (43 FR 2450-2462). These regulations require a U.S. EPA permit for all ocean dumping of industrial wastes and municipal sludge materials. The Federal regulation 40 CFR 228 lists the designated ocean areas where wastes may be disposed. Further, EPA publishes an annual report entitled Ocean Dumping in the United States.

U.S. EPA has one designated deepwater disposal area in the Gulf of Mexico. Two smaller sites used for the dumping of liquid industrial wastes in the Gulf have been inactive for several years and their designation has lapsed. The large site in the Western Gulf of Mexico is an incineration site for the burning of liquid chemical wastes, e.g., PCB, DDT, trichloral ethylene, etc. The permit has expired, but it is up for redesignation.

Oil and gas development will not have any impact upon EPA's sites due to its distance from shore and the mobility of the disposal ship within the permitted area.

i. Several federally listed endangered and threatened species inhabit the coastal and offshore areas of the Gulf region. Six endangered marine mammals (five whales and the Florida manatee), the key deer, two threatened and three endangered marine turtles, the threatened alligator and endangered crocodile, and seven endangered species of birds were selected as representative of endangered and threatened species that could be affected by offshore or onshore activities resulting from OCS oil and gas development in the Gulf.

Five federally endangered whale species occur within the Central and Eastern Gulf. These include the fin, humpback, right, sei, and sperm whales. Generally, these larger cetaceans occur in continental slope and deep oceanic waters. Recently, sperm whales have been sighted near the Louisiana Delta.

No federally listed endangered or threatened species are known to occur in the Central and Eastern Gulf areas.

Concluding statements found in appendix "B" of the Regional FEIS from both the Fish and Wildlife Service and National Marine Fisheries Service attest that "leasing and exploration activities are not likely to jeopardize the continued existence of the Endangered or Threatened species of the Gulf Region or result in the destruction or adverse modification of their Critical Habitats if the probability of oil spills from exploration are considered to be near zero and as long as existing support bases are sufficient to handle anticipated exploration activities." (See Regional FEIS, pp. 182-185, 324-326, 413-414, 884-891 and Visual No. 11).

2. Socio-Economics

a. Employment

The economic activity that has occurred in the areas bordering the Gulf of Mexico has been a significant part of the total economic activity of the nation. Business activity in these states has shown resistance to depressing forces present in the national economy. The increase in domestic oil prices has led to a substantial increase in energy production-related activities in general over the already well established pattern. The FEIS for Lease Sale Number 58/58A (12) provides extensive quantitative data regarding this subject.

Table III-9 (regional FEIS, p. 191) reflects the historic indicators for the labor force and unemployment in the Gulf region. In 1970, the regional unemployment rate was just below that of the United States; in 1980, the regional rate was well below the comparable U.S. figure.

b. Location and Size of the Related Population and Industrial Centers and Existing Community Services

ARCO's base is located in Venice, Louisiana from where personnel and supply movements are coordinated. However, the whole coastal area from New Orleans to Corpus Christi with its well established character of energy-related industries and supplies will provide the necessary services required for the operations associated with this plan. The FEIS for Lease Sales Number 58/58A (12) provides extensive information on the population employment and industrial centers in the area.

Table III-16 (Regional FEIS, p. 196) shows population changes in the Gulf region for 1960, 1970 and 1980 when growth over this period was substantial. Except for Alabama's 1960-1970 change, all states experienced growth rates well above national level.

c. Public Opinion of the Proposed Action

The general feeling of the citizens of the area adjacent to the Gulf of Mexico is favorable towards the development of energy-related industries in view of the continued job availability, even in economically depressed times in other areas of the USA.

D. UNAVOIDABLE ADVERSE IMPACTS

(See FEIS Lease Sale 58, Volume 1, pp. V - 1, 2, 3)
(See FEIS Lease Sale 36, Vol. II, pp. VI - 281-291)
(See FEIS Lease Sale 41, Vol. II, pp. V - 565-576)
(See Regional FEIS, VOl. I, pp. 427-430)

"All unavoidable adverse impacts that will be sustained by the natural environment as a result of routine operations will be relatively localized in their effects. Many will be followed by unhindered natural recovery within relatively short time periods. A massive oil spill could result in short-term severe and widespread damage of major consequence. However, the probability that such a massive spill will occur is very low".

E. REFERENCES

a. Environmental Impact Statement, OCS Sales A66 and 66, 1980

b. Environmental Impact Statement, OCS Lease Sale 58, 1978

c. Environmental Impact Statement, OCS Lease Sale 36, 1974

d. Environmental Impact Statement, OCS Lease Sale 41, 1976

e. Final Regional Environmental Impact Statement, January 1983

F. GUARANTEES

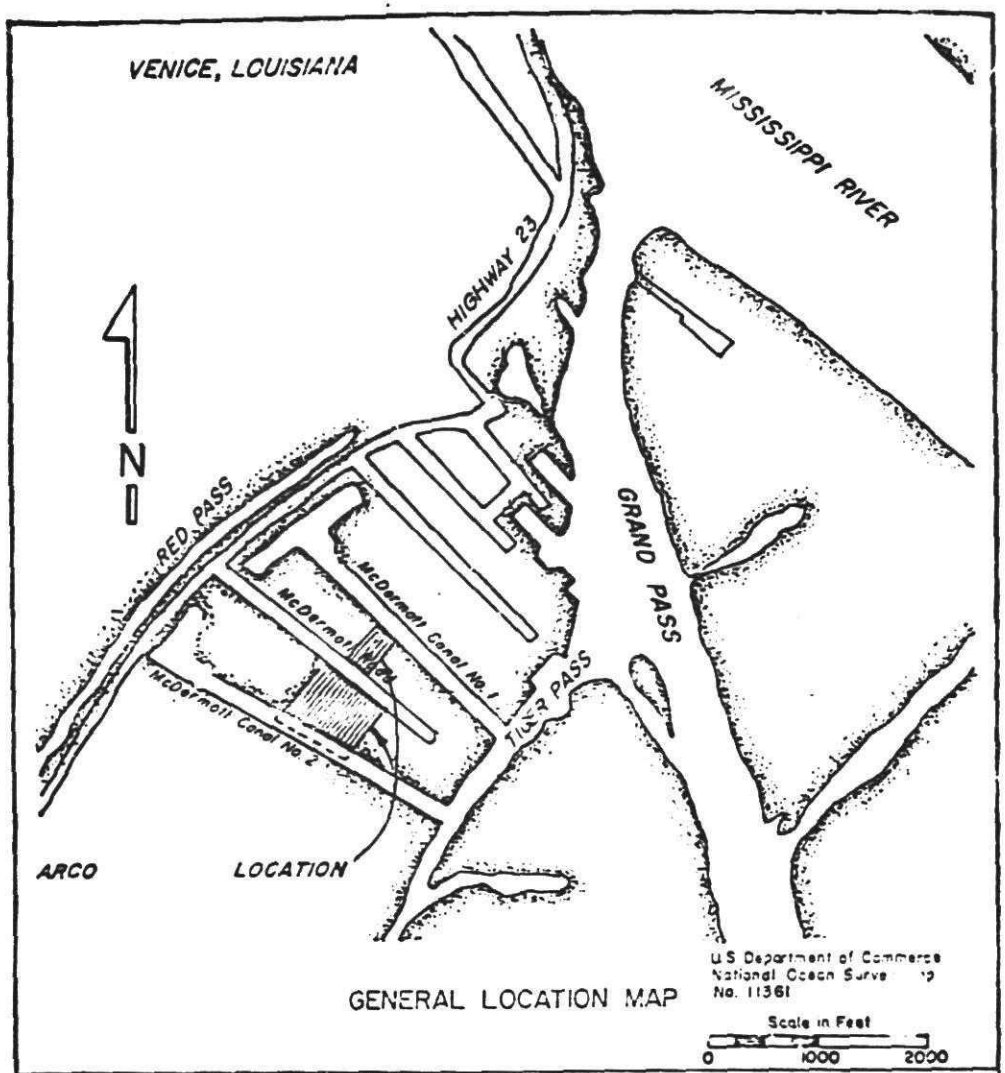
The proposed activity will be carried out and completed with the guarantee of the following items:

a. The best available and safest technologies will be utilized throughout the project. This includes meeting all applicable requirements for equipment types, general project layout, safety systems, and equipment and monitoring systems.

b. All operations will be covered by a MMS approved oil spill contingency plan.

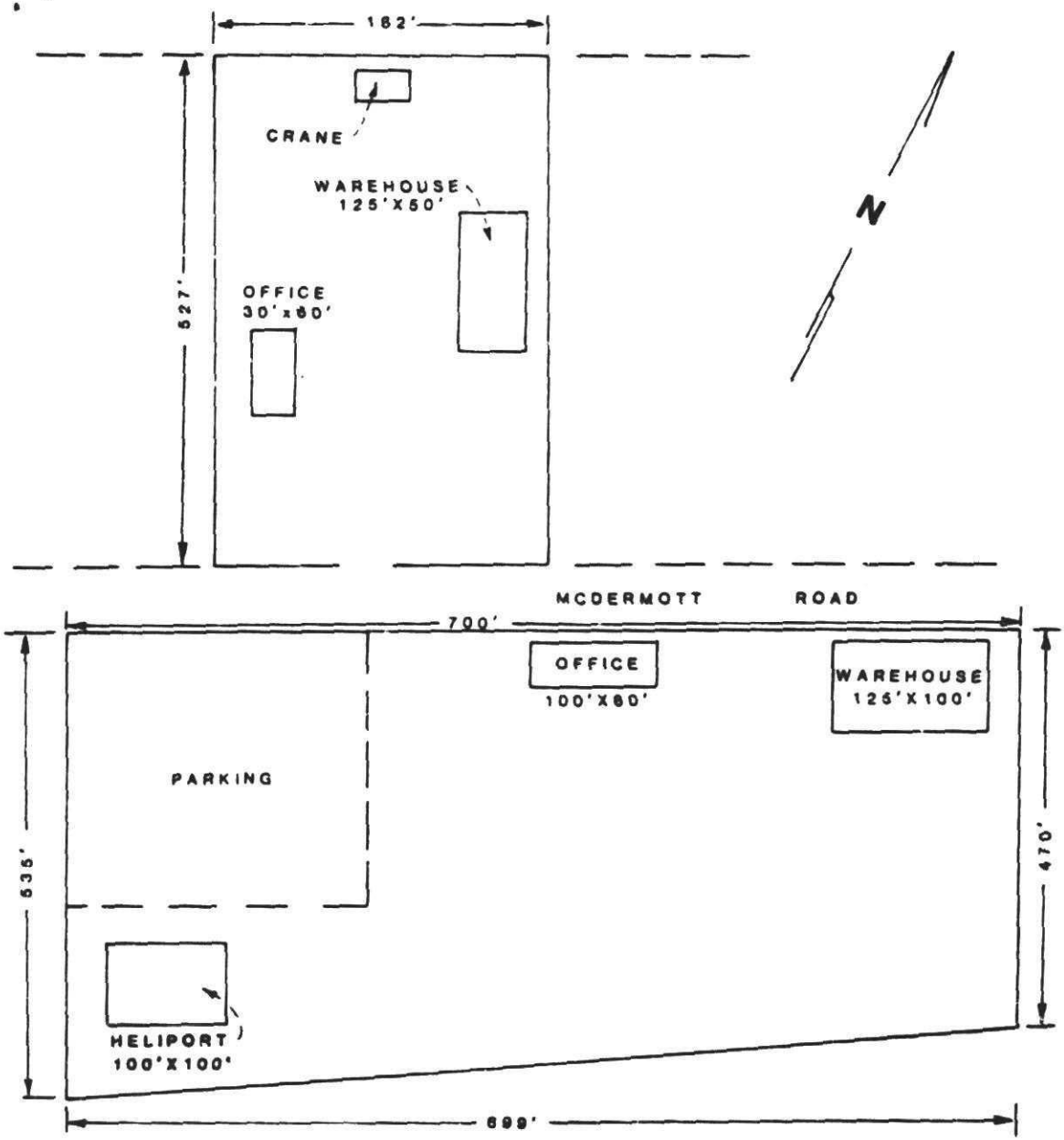
c. All applicable Federal, State, and local requirements regarding air emissions and water quality and discharge for the proposed activities, as well as any other permit conditions, will be complied with.

ATTACHMENT A. GENERAL LOCATION MAP FOR
VENICE SHORE BASE



	ARCO OIL AND GAS COMPANY
ARCO OIL AND GAS COMPANY	In: McDERMOTT CANAL NO. 2 At: PLAQUEMINES PARISH State: LOUISIANA

ATTACHMENT B. VENICE BASE FACILITY LAYOUT

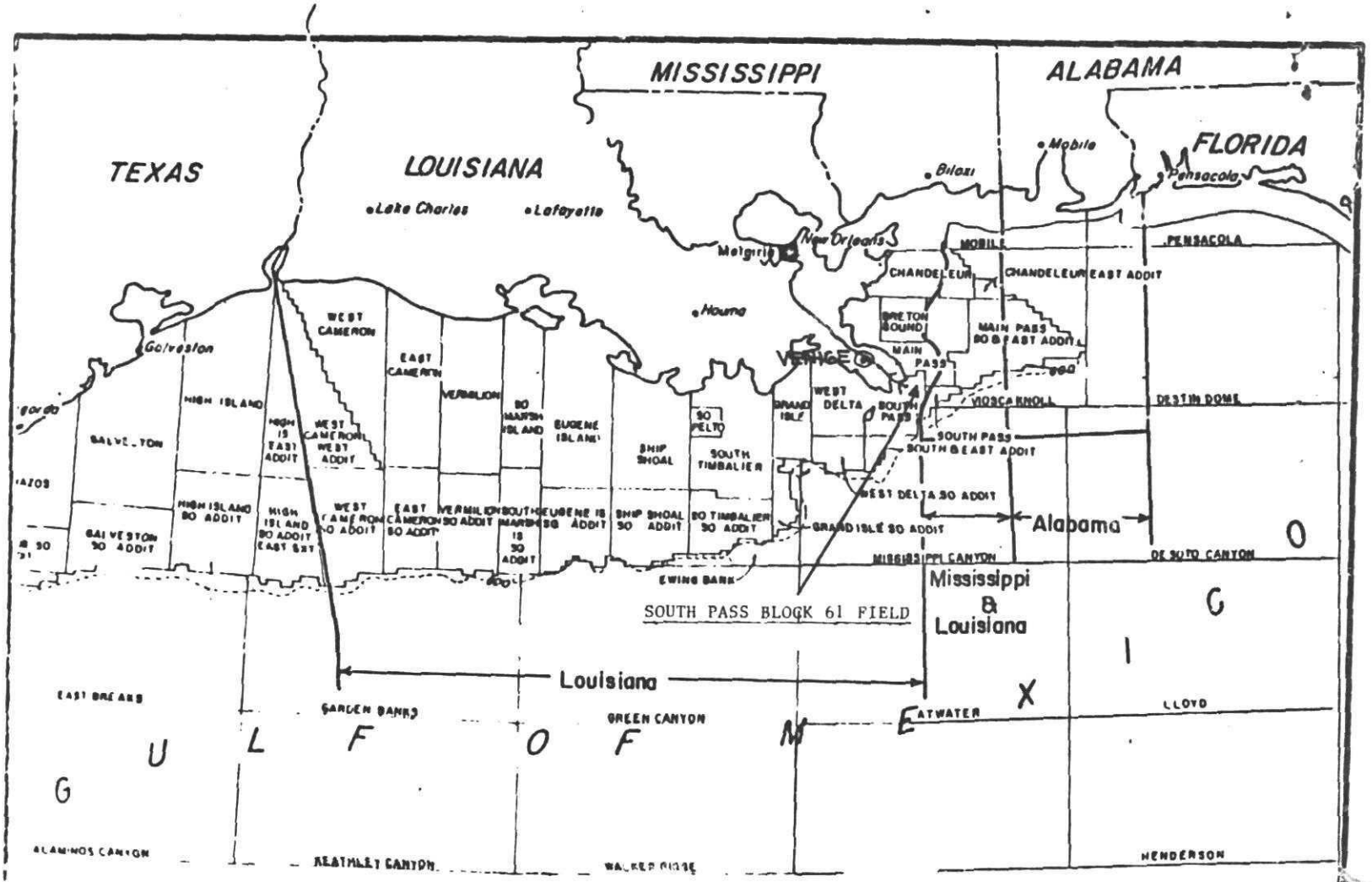


ARCO OIL & GAS CO.

VENICE BASE

NOT TO SCALE

NOV., 1980



ATTACHMENT C. LOCATION OF ACTIVITY IN RELATION TO AFFECTED COASTAL ZONE