In Reply Refer To: MS 5231 January 17, 1996

Norcen Explorer, Inc.
Attention: Ms. Sharon H. Koudelka
200 WestLake Park Boulevard
Suite 800
Houston, Texas 77079-2653

Gentlemen:

Reference is made to the following plan received January 9, 1996:

Type Plan - Initial Plan of Exploration
Lease - OCS-G 15242
Block - 118
Area - Eugene Island
Activities Proposed - Wells A through E

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

Your control number is N-5278 and should be referenced in your communication and correspondence concerning this plan.

Sincerely,

(Orig. Sgd.) Donald C. Howard

Donald C. Howard
Regional Supervisor
Field Operations

bcc: Lease OCS-G 15242 POD File (MS 5032)
MS 5034 w/public info. copy of the plan
and accomp. info.

MTolbert:cic:01/12/96:POECOM

NOTED-SCHEXNAILDRE

PUBLIC
INFORMATION

PLAN OF EXPLORATION

NORCEN EXPLORER, INC.

EUGENE ISLAND AREA BLOCK 118

OCS-G-15242

OFFSHORE LOUISIANA

DECEMBER 8, 1995

LIST OF ATTACHMENTS

A. Vicinity Plat, Location Plat

B. Jack-up Rig Schematic, BOP and Diverter Schematics

C. Geologic Structure Map , Shallow Hazard Analysis, Bathymetry Map

D. Drilling Fluids List

E. Coastal Zone Consistency Certification, Air Quality Report, Environmental Report

PLAN OF EXPLORATION

EUGENE ISLAND AREA BLOCK 118

OCS-G-15242

OFFSHORE LOUISIANA

Pursuant to the requirements of 30 CFR 250.33, Norcen Explorer, Inc. submits the following Initial Plan of Exploration for Eugene Island Area Block 118.

I. EXPLORATION ACTIVITY

Norcen Explorer, Inc. proposes to use a jack-up rig to drill five wells in Eugene Island Area Block 118. Information regarding these wells is as follows:

Well Name	Surface Location	Bottomhole Location	TVD	WD	Lambert Coordinates	Days to Drill
A	3000' FNL 2200' FWL	PROP. INFO.	PROP. INFO.	35.0'	X = 1,927,089.20' Y = 121,906.78'	75
B	2600' FNL 3900' FWL	PROP. INFO.	PROP. INFO.	35.5'	X = 1,928,789.20' Y = 122,306.78'	75
C	4100' FNL 3400' FWL	PROP. INFO.	PROP. INFO.	36.3'	X = 1,928,289.20' Y = 120,606.78'	75
D	300' FNL 2100' FWL	PROP. INFO.	PROP. INFO.	33.5'	X = 1,926,989.20' Y = 124,606.78'	75
E	2800' FNL 7100' FWL	PROP. INFO.	PROP. INFO.	35.5'	X = 1,931,989.20' Y = 122,106.78'	75

Attachment A contains a vicinity map that depicts the location of Eugene Island Area Block 118 in relation to the coast of Louisiana and a location plat that depicts the well locations in relation to the lease lines. The wells will be drilled sequentially, and the anticipated spud date for Well A is February 15, 1996. If commercial quantities of hydrocarbons are discovered, Norcen Explorer, Inc. proposes to install single well caissons at the surface locations of the proposed wells and to install flowlines from the proposed caissons to the existing Eugene Island Area Block 107 "A" Platform. A Development Operations Coordination Document addressing this proposed activity will be submitted for approval prior to the installation of these facilities.

II. DRILLING RIG, SAFETY, AND POLLUTION PREVENTION INFORMATION

Norcen Explorer, Inc. proposes to utilize a jack-up rig to drill the proposed wells. A schematic drawing of a jack-up rig similar to the one to be utilized for this proposed activity is included in Attachment B. Schematics for a typical BOP and diverter are also included in Attachment B. The actual rig specifications for the rig to be used will be submitted with the application for Permit to Drill for each well.

Safety and pollution prevention will be accomplished during drilling operations through the use of adequately designed casing programs; blowout preventers, diverters, and other associated well equipment of adequate pressure rating to control anticipated pressures; mud monitoring equipment and sufficient mud volumes to insure well control; and properly trained supervisory personnel. Pursuant to Coast Guard regulations, fire drills and abandon ship drills will be conducted, and navigational aids, lifesaving equipment, and all other shipboard safety equipment will be installed and maintained.

III. GEOPHYSICAL AND GEOLOGIC INFORMATION

A structure map which depicts the productive formations of the proposed wells is included in Attachment C of this document. As stated in the Shallow Hazard Analysis which is also included in Attachment C, no shallow drilling hazards are anticipated during the drilling of the proposed wells. As depicted on a Bathymetry Map which is also included in Attachment C, water depths at the proposed surface locations range from approximately 33- to 36-feet.

IV. OIL SPILL INFORMATION

Norcen Explorer, Inc. is a member of Clean Gulf Associates (CGA), and would utilize CGA equipment in the event of an oil spill in Eugene Island Area Block 118. CGA is an oil spill cooperative which owns and maintains a large inventory of oil spill clean-up equipment. Norcen Explorer, Inc.'s Regional Oil Spill Contingency Plan was submitted in accordance with 30 CFR 250.42(a-i) and has been approved. CGA spill recovery equipment suitable for spills in the Gulf of Mexico is identified in the plan.

In the event of a spill, the primary location for the procurement of clean-up equipment would be the CGA stockpile at Intracoastal City, Louisiana. Additional cleanup equipment could be mobilized from the Cameron, Grand Isle, Venice, and Houma, Louisiana CGA stockpile areas. The Intracoastal City, Louisiana stockpile area is located approximately 66 miles from the block.

In accordance with LTL dated October 12, 1988, clarified by LTL dated September 5, 1989, the following estimation of times for procurement, mobilization, transportation, and deployment of oil spill response equipment is provided:

Procurement Time - It is estimated that 3 hours will be required to secure a support vessel and personnel for mobilization of the oil spill response equipment from the Intracoastal City, Louisiana CGA stockpile area.

Equipment Load Out Time - The time required to transfer the equipment to the transportation vessel will be approximately 2 hours.

Travel Time - Based on a transit speed of approximately 10 knots, it is estimated that 9 hours would be required to move the equipment from Intracoastal City, Louisiana to the deployment site. This time frame includes approximately 4 hours transit time from Intracoastal City to open water.

Equipment Deployment - The time required to initiate clean up operations once the transportation vessel arrives at the spill site is estimated to be 1 hour.

The Minerals Management Service published Oil-Spill Risk Estimates for Proposed Lease Sales 142 & 143 (USDOI, MMS, 1992). The results of that analysis as it related to Eugene Island Area Block 118 and a brief description of the Oil Spill Risk Analysis Model are summarized in the following paragraphs.

Five hundred hypothetical oil spill trajectories, that collectively represented both the general trend and the variability of winds and currents in the area of analysis, were developed for each of the four seasons of the year. These trajectories were simulated for each of the potential launch sites. Movement of the oil slick for each spill was simulated as a series of displacements resulting from the influence of winds and currents at three hour increments. The simulations continued until the hypothetical spill hit land, moved out of the study area, or thirty days elapsed. Potential landfall sites were established by dividing the coastline into 43 land segments corresponding to county and/or parish boundaries.

The oil slick trajectories simulated by the referenced oil spill model represent hypothetical pathways and do not consider any containment, cleanup, dispersion, or weathering processes that might affect the quantity or properties of a slick that would contact an environmental resource. Weathering and decay of the slick can be inferred by noting the time elapsed before the slick encounters the target resource. Three time periods are presented by the model (3, 10, and 30 days) to indicate oil weathering and to facilitate oil spill response planning. The probability that an oil spill will contact various environmental targets and land segments if it occurs within a specific launch site is provided by the model.

Eugene Island Area Block 118 falls in Launch Site C36. The probabilities (expressed as percent chance) that a spill occurring in this block will contact land segments at 10 days are listed below:

10 Days

Land Segment Affected	Probability
Land Segment 14 - Iberia Parish, Louisiana	5%
Land Segment 15 - St. Mary Parish, Louisiana	11%
Land Segment 16 - Terrebonne Parish, Louisiana	27%

The environmental resources that are located within these land segments are depicted on Louisiana Map 6 of Section V, Volume II of the CGA Operations Manual. The biologically sensitive areas depicted on these maps are identified and protection response modes are suggested on pages V-103.0a through V-112.2. The recommended response strategies to protect these resources are presented on pages VI-1.0b through VI-23.0 of Section VI, Volume II of the CGA Operations Manual.

V. LEASE STIPULATIONS

The Archaeological Resources Stipulation has been invoked in Eugene Island Area Block 118 (OCS-G-15242). The following discussion addresses the actions taken by Norcen Explorer, Inc. to satisfy the requirements of that stipulation.

Stipulation No. -- Archaeological Resources Stipulation

(a), (b), and (c) In response to the Archaeological Stipulation being invoked in the block, Norcen Explorer, Inc. contracted KC Offshore, L.L.C. to perform a Geophysical Survey and to prepare an Archaeological Assessment of Eugene Island Area Block 118. No site, building, structure, or object of historical significance was identified by the remote sensing instruments utilized during that survey. Two copies of that report are attached to the Plan of Exploration. Norcen Explorer, Inc. will take no action that will adversely affect any archeological resource. If an archeological resource is discovered while conducting operations on the lease area, Norcen Explorer, Inc. will report the discovery immediately, and will make every reasonable effort to preserve the resource until the Regional Director advises how to protect it.

VI. SOLID AND LIQUID WASTES AND POLLUTANTS

The discharges generated at these proposed well locations by the drilling activities associated with this POE will be discharged as per NPDES discharge guidelines. Bioassay tests will be performed on the discharge effluents. Discharge rates will not exceed permit specifications.

All drill cuttings will be brought to the surface by the mud system and will be separated from the drilling fluid by shaker screens and centrifugal separators prior to discharging overboard. This discharge is composed of the cuttings, shaker washwater, and adhered drilling fluids. The projected amounts of this discharge are based on the size of the hole at each drilling interval, and are computed at 25 percent over the gauge hole at that interval. Drill cuttings

are assumed to comprise 50 percent of the discharge, washwater is assumed to comprise 42.5 percent, and adhered drilling fluids are assumed to comprise 7.5 percent. A list of drilling fluids to be utilized during the drilling operation is included as Attachment D.

Drilled solids and liquids discharge volumes for a typical well are listed below:

		Volumes/Well		
Drilling Interval	Hole Size	Drilled Solids	Shaker Washwater	Adhered Drilling Fluids
0- 1000'	26.00"	821 bbls	698 bbls	123 bbls
1000- 4600'	17.50"	1339 bbls	1138 bbls	201 bbls
4600-10500'	12.25"	1075 bbls	914 bbls	161 bbls
10500-13500'	8.50"	263 bbls	224 bbls	39 bbls
13500-18500'	6.25"	237 bbls	201 bbls	36 bbls

Batch discharges of drilling fluids will be limited to 500 barrels per hour. This limitation should only need to be imposed upon the completion of drilling operations.

Solids wastes; typically paper, plastic, cloth, and metal, will be collected and transported to shore for disposal at an approved disposal facility. Solid wastes generated from the transportation vessels, normally just garbage, will be collected and returned to shore for disposal with the drilling rig refuse. Scrap metal and other metal wastes will be recycled or sold as scrap and will not be shipped to a disposal facility with the other refuse.

Sanitary wastes will be treated in approved marine sanitation devices as required by the Clean Water Act. All biodegradable wastes, such as kitchen food scraps, will be comminuted or ground and discharged in accordance with Annex V of MARPOL 73/78.

Hazardous wastes from the drilling rig, such as paint, or paint thinner, will be collected in sealed metal containers and transported to an approved disposal site in accordance with RCRA guidelines.

VII. H_2S AREA CLASSIFICATION

Previous wells drilled in Eugene Island Area Block 118 have shown no evidence of H_2S. Norcen Explorer, Inc., therefore, requests that Eugene Island Area Block 118 be classified as a "Zone where the absence of H_2S has been confirmed".

VIII. CERTIFICATE OF COASTAL ZONE CONSISTENCY

A Certificate of Coastal Zone Consistency is included in Attachment E.

IX. CALCULATION OF AIR EMISSIONS

Projected air emissions resulting from activities described in this document have been calculated and are included as Attachment E. A facility schematic that the depicts the height of emissions above sea level is also included in Attachment E.

X. ENVIRONMENTAL REPORT

An Environmental Report has been prepared for the proposed activity and is included as Attachment E.

XI. SUPPORT BASE

Eugene Island Area Block 118 is located approximately 23 miles from the coast of St. Mary Parish, Louisiana. An existing facility in Morgan City, Louisiana will serve as the operations base for the Eugene Island Area Block 118 exploration activities. This shore base is located approximately 52 miles from Eugene Island Area Block 118. The shore base will serve the following functions: loading point for tools, equipment and machinery to be delivered to the drilling rig, transportation base, and temporary storage area for materials and equipment. The base is equipped with cranes and loading docks necessary for safe operations. Twenty-four hour a day contact with offshore personnel is maintained by full time dispatchers at the shore base. The existing onshore facilities and support personnel are sufficient to support the proposed operations without modification or expansion.

XII. SURETY BOND REQUIREMENTS

In accordance with the amendment of 30 CFR Part 256 surety bond requirements applicable to OCS lessees and operators, Norcen Explorer, Inc. submitted an area-wide bond in the amount of $3,000,000.00 to the Minerals Management Service, New Orleans, Louisiana.

XIII. COMPANY CONTACT

Any inquiries regarding this plan may be addressed to Ms. Sharon Koudelka, Norcen Explorer, Inc., 200 Westlake Park Boulevard, Suite 800, Houston, Texas 77079-2653, 713/597-2493.

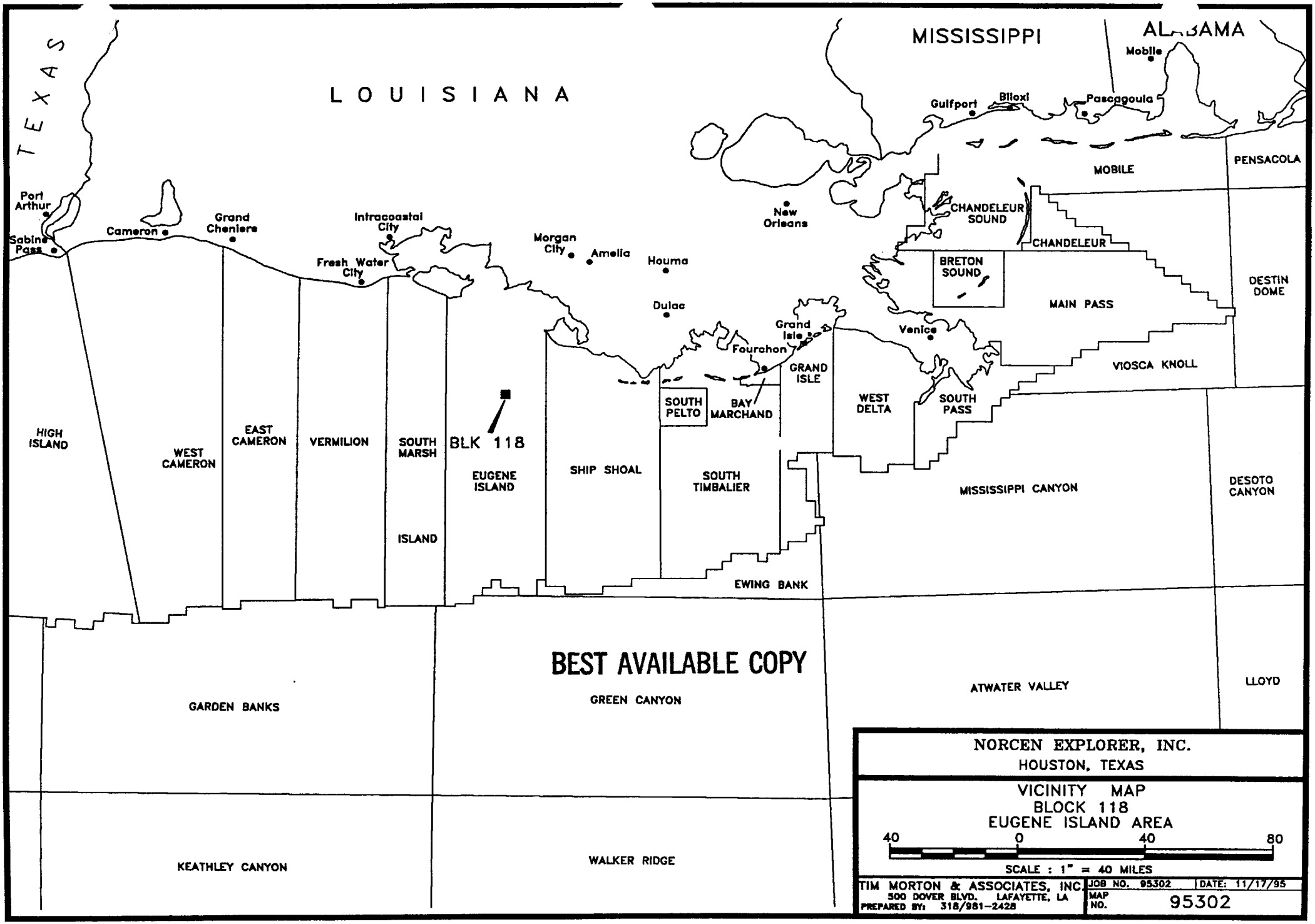
LITERATURE CITED

U. S. Department of Interior, Minerals Management Service
1992 Final Environmental Impact Statement, Gulf of Mexico, Sales 142 and 143, Central and Western Planning Areas, Volume I: Sections 1 through IV.C. Prepared by Minerals Management Service, Gulf of Mexico OCS Region, New Orleans, Louisiana.

ATTACHMENT A

VICINITY PLAT

LOCATION PLAT



NORCEN EXPLORER, INC.
HOUSTON, TEXAS

VICINITY MAP
BLOCK 118
EUGENE ISLAND AREA

40 0 40 80

SCALE : 1" = 40 MILES

TIM MORTON & ASSOCIATES, INC.
500 DOVER BLVD. LAFAYETTE, LA
PREPARED BY: 318/981-2428

JOB NO. 95302 DATE: 11/17/95

MAP NO. 95302

NORCEN EXPLORER, INC.
OCS-G-15241

107

D

B

A

E

C

NORCEN EXPLORER, INC.
OCS-G-15242

117

BLK. 118

119

Proposed Locations

LOC'N.	CALLS		X	Y	LATITUDE	LONGITUDE
A SURF.	3,000' FNL	2,200' FWL	1,927,089.20'	121,906.78'	29° 00' 06.08"	91° 33' 41.00"
B SURF.	2,600' FNL	3,900' FWL	1,928,789.20'	122,306.78'	29° 00' 10.08"	91° 33' 21.87"
C SURF.	4,100' FNL	3,400' FWL	1,928,289.20'	120,606.78'	28° 59' 55.22"	91° 33' 27.46"
D SURF.	300' FNL	2,100' FWL	1,926,989.20'	124,606.78'	29° 00' 32.81"	91° 33' 42.19"
E SURF.	2,800' FNL	7,100' FWL	1,931,989.20'	122,106.78'	29° 00' 08.16"	91° 32' 45.83"

127

LA SOUTH ZONE
NAD 27 CLARKE 1866

N

NORCEN EXPLORER, INC.
OCS-G-15242

PLAN OF EXPLORATION

PROPOSED LOCATIONS

EUGENE ISLAND AREA BLOCK 118

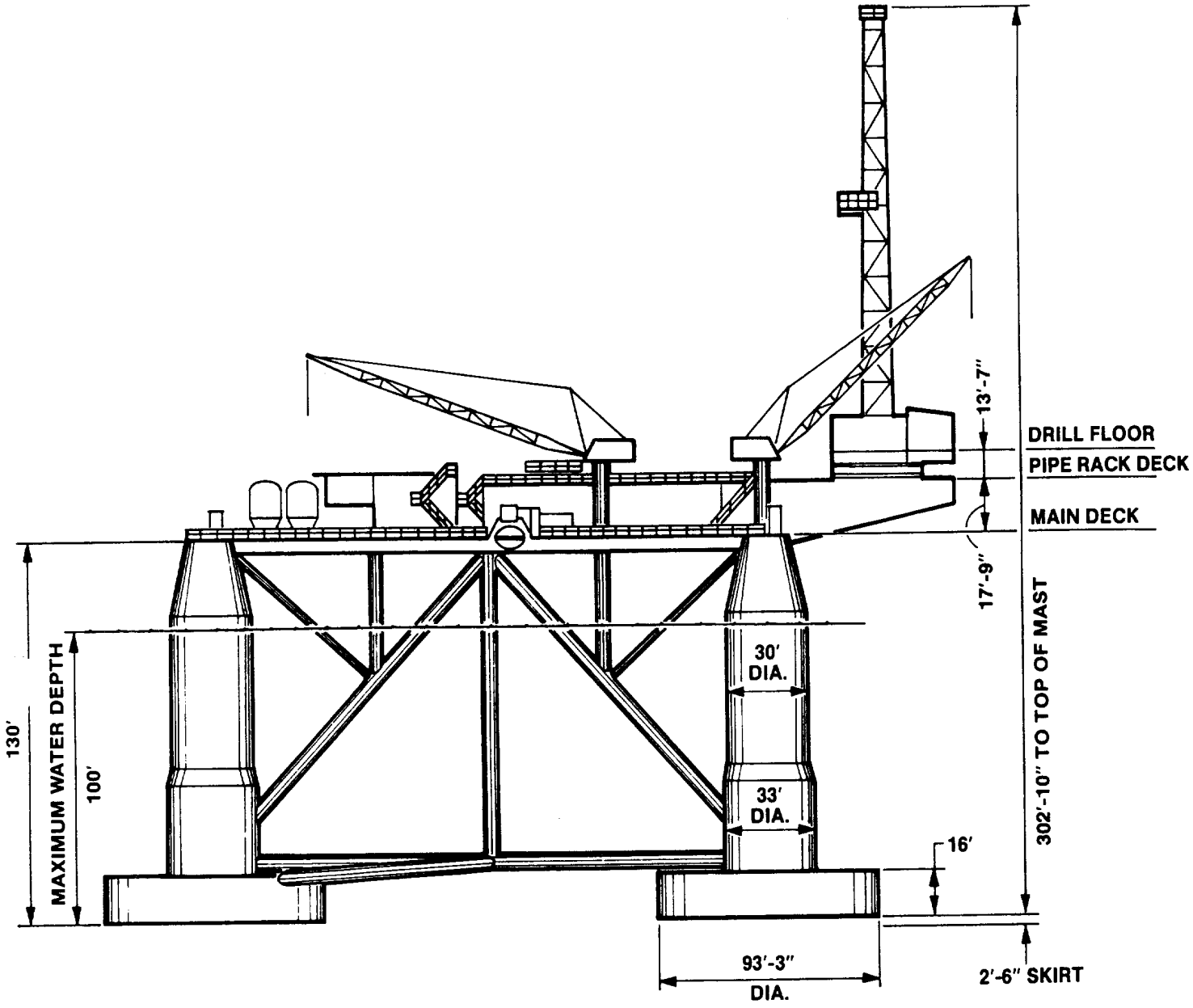
SCALE: 1" = 2000' 11/10/95

Prepared by:
JOHN E. CHANCE & ASSOCIATES, INC.
FILE 118POE

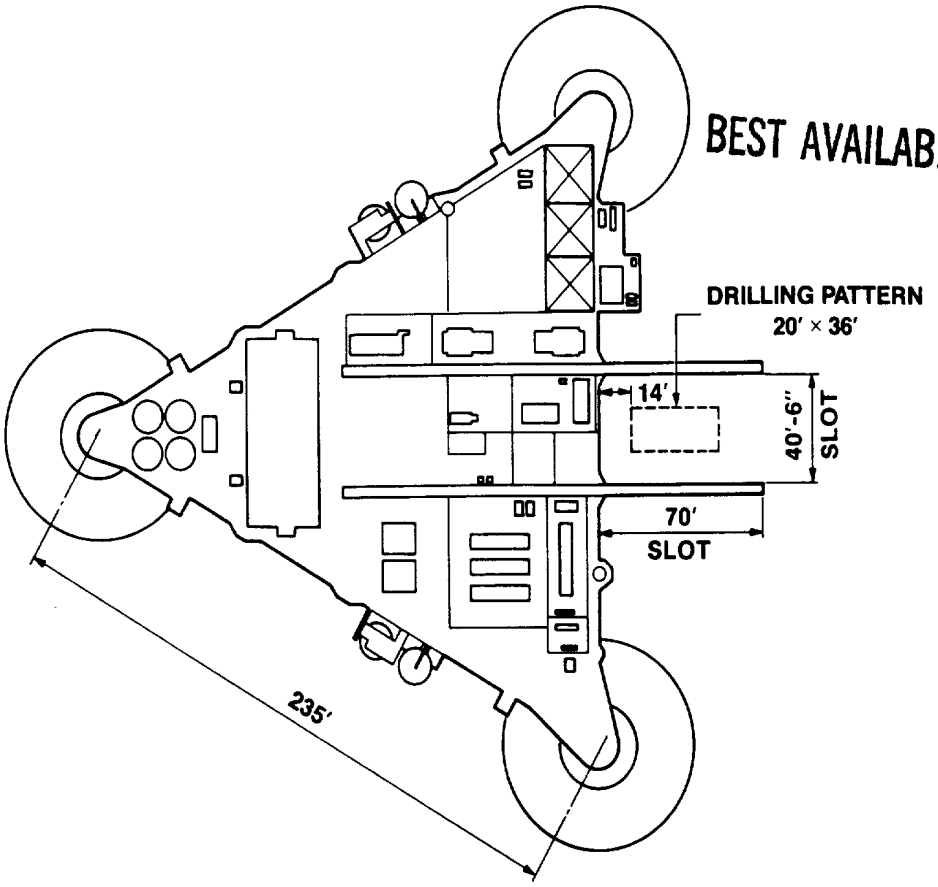
ATTACHMENT B

JACK-UP RIG SCHEMATIC

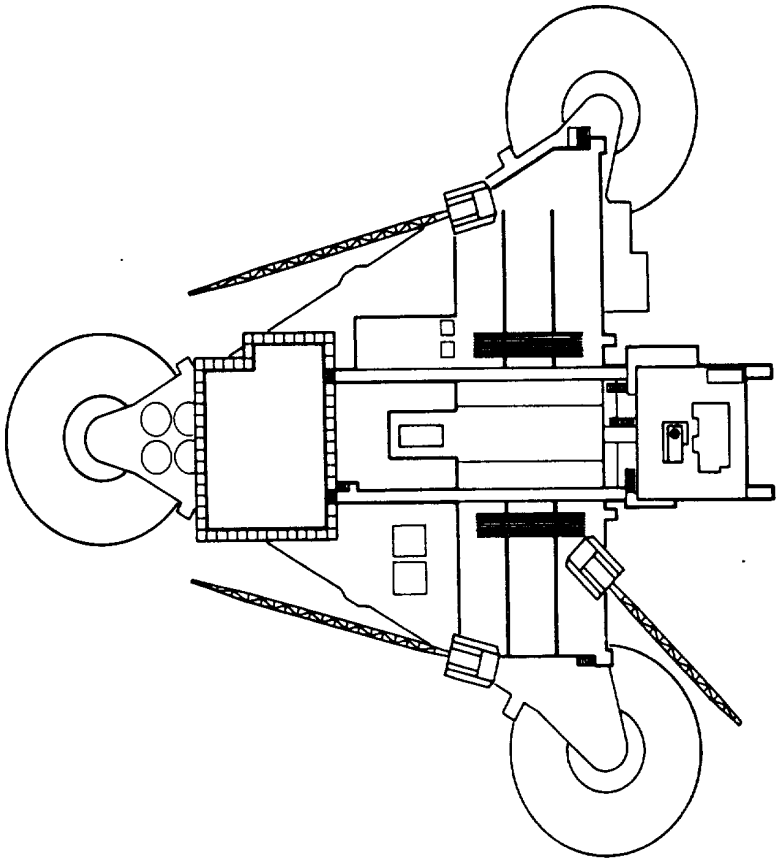
RIG BOP AND DIVERTER SCHEMATICS



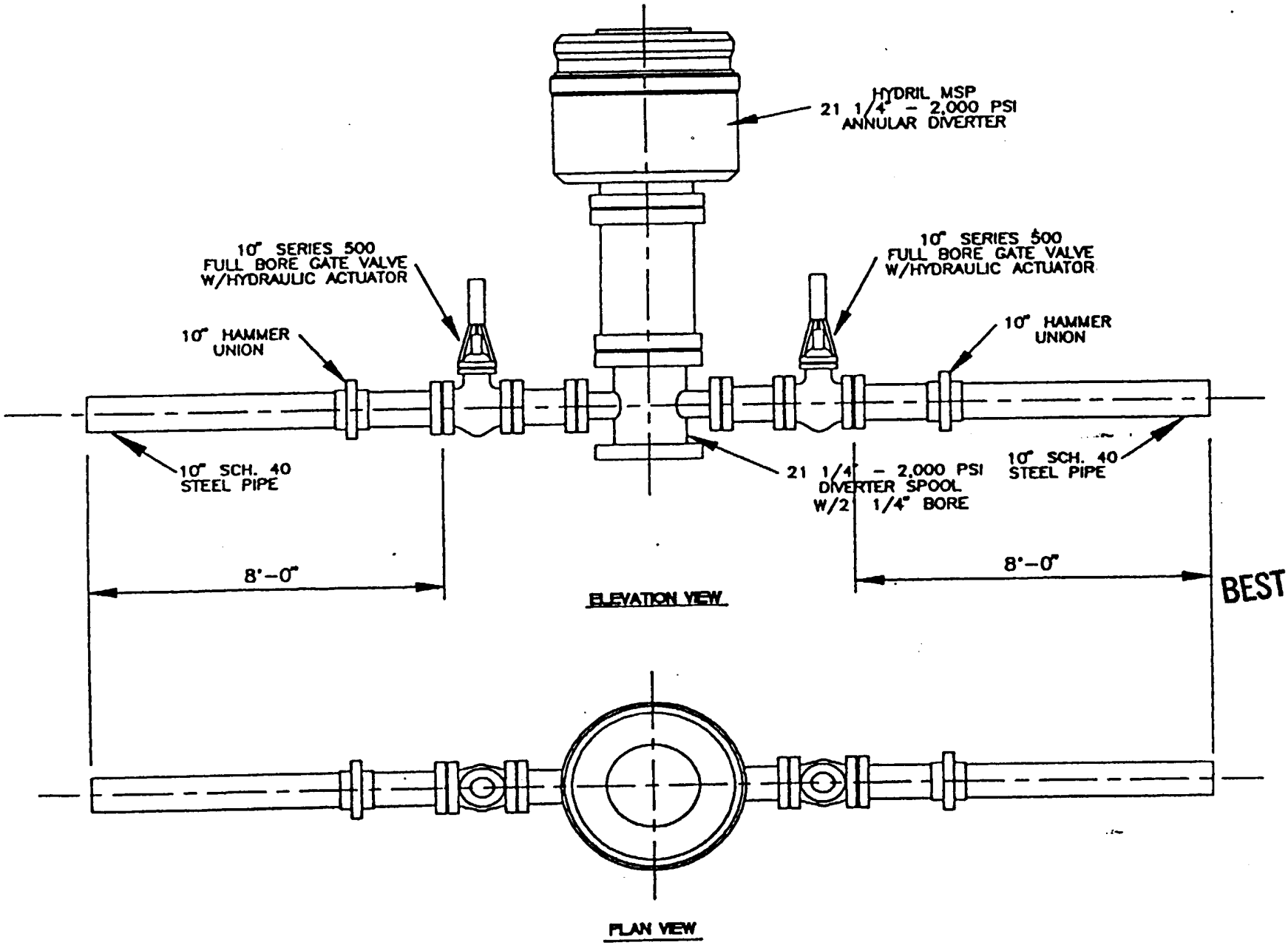
ELEVATION



MAIN DECK



PIPE RACK DECK



BEST AVAILABLE COPY

NOBLE DRILLING CORPORATION

NOBLE

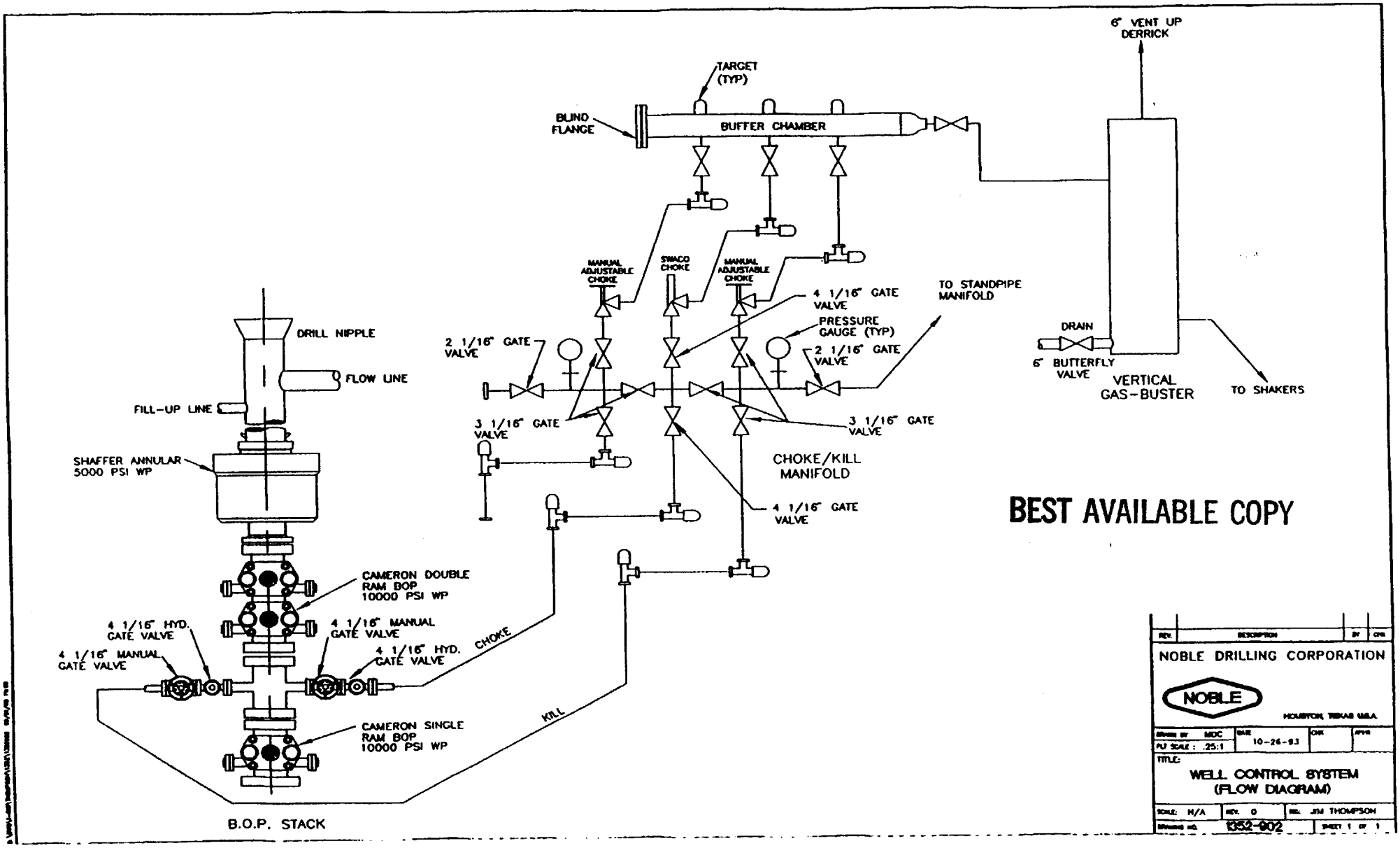
HOUSTON, TEXAS U.S.A.

DRAWN BY MDC	DATE 9-29-93	CHK	APP'D
PLT SCALE = .5:1			

TITLE:

DIVERTER SYSTEM

SCALE N/A	REV. 0	APP'D JIM THOMPSON
DRAWING NO. 1382-001		SHEET 1 OF 1


6" VENT UP DERRICK
TARGET (TYP)
BLIND FLANGE
BUFFER CHAMBER
MANUAL ADJUSTABLE CHOKE
SWACO CHOKE
MANUAL ADJUSTABLE CHOKE
4 1/16" GATE VALVE
TO STANDPIPE MANIFOLD
PRESSURE GAUGE (TYP)
2 1/16" GATE VALVE
2 1/16" GATE VALVE
DRAIN
6" BUTTERFLY VALVE
VERTICAL GAS-BUSTER
TO SHAKERS
DRILL NIPPLE
FLOW LINE
FILL-UP LINE
SHAFFER ANNULAR 5000 PSI WP
3 1/16" GATE VALVE
3 1/16" GATE VALVE
CHOKE/KILL MANIFOLD
4 1/16" GATE VALVE
CAMERON DOUBLE RAM BOP 10000 PSI WP
4 1/16" HYD. GATE VALVE
4 1/16" MANUAL GATE VALVE
4 1/16" MANUAL GATE VALVE
4 1/16" HYD. GATE VALVE
CHOKE
KILL
CAMERON SINGLE RAM BOP 10000 PSI WP
B.O.P. STACK
BEST AVAILABLE COPY
NOBLE DRILLING CORPORATION
NOBLE
HOUSTON, TEXAS U.S.A.
DRAWN BY MDC
DATE 10-26-93
PLT SCALE : .25:1
TITLE:
WELL CONTROL SYSTEM (FLOW DIAGRAM)
SCALE: N/A
REV. 0
APP. JIM THOMPSON
DRAWING NO. 1352-902
SHEET 1 OF 1

ATTACHMENT C

GEOLOGIC STRUCTURE MAP

SHALLOW HAZARD ANALYSIS

BATHYMETRY MAP

GEOLOGIC STRUCTURE MAP

PROPRIETARY INFORMATION

NORCEN EXPLORER, INC.
SHALLOW HAZARDS ANALYSIS
PROPOSED WELL SITES A, B, C, D, E
EUGENE ISLAND BLOCK 118
OCS-G-15,242

Eugene Island Block 107 was the subject of a high resolution geophysical survey by KC Offshore in September of 1995. This survey also included Eugene Island Block 107, to the north. During the survey echosounder, magnetometer, side-scan sonar, subbottom profiler and analog sparker data were collected. KC Offshore submitted a geohazards report, including a Cultural Resource Assessment to Norcen in November of 1995. These analyses were bound together into one volume with 1:12,000 scale maps. Dr. Thomas Neurauter was responsible for the geohazards interpretation while Mr. Robert Floyd prepared the archaeological assessment.

The following assessments are based on the interpretations of KC Offshore and a review of the data in the immediate vicinity of the proposed wells.

Well Site "A" 3000 ft from the North line
2200 ft from the West line

The water depth at this location is approximately 35 feet. The seafloor slopes to the south at an inclination of 1 foot per 2000 feet or 0.05%. A Transco 20-inch pipeline is located 850 feet to the southeast of this location. Unidentified magnetic anomalies exist 800 feet to the southwest and 1400 feet to the north-northwest. These anomalies are not likely to be disturbed by drilling at this site.

The seabed sediments are likely to be soft, clayey silts. The soil strength will increase gradually with depth. A high amplitude reflector exists at approximately 6 feet beneath the mudline. Firm clays with some sand are likely beneath this interface. Small concentrations of biogenic gas are likely, but will not be at pressures greater than hydrostatic.

No channel cuts are observed in the immediate area of this proposed drill location. Also, no high amplitude,"bright spot" reflections are observed at depth on the analog sparker records.

Well Site "B" 2600 ft from the North line
3900 ft from the West line

The water depth at this location is 35.5 feet. The seafloor slopes to the south at an inclination of 1 foot per 2000 feet. or 0.05%. The Transco 20-inch pipeline is 500 feet to the southeast. Unidentified magnetic anomalies exist 700 feet to the north and 900 feet to the southwest. These anomalies are not likely to be disturbed by drilling at this site.

The seabed sediments are likely to be soft, clayey silts. The soil strength will increase gradually with depth. A high amplitude reflector exists at approximately 10 feet beneath the mudline. Firm clays with some sand are likely beneath this interface. Small concentrations of biogenic gas are likely but will not be at pressures greater than hydrostatic.

No high amplitude "bright spots" indicative of shallow gas are noted on the analog sparker data.

Well Site "C" 4100 ft from the North line
3400 ft from the West line

The water depth at this location is approximately 36.3 feet. The seafloor slopes to the southeast at an inclination of 1 foot per 1100 feet or 0.1%. A Transco 20-inch pipeline is located 600 feet to the northwest of this location. No unidentified magnetic anomalies exist within 1300 feet of this location.

The seabed sediments are likely to be soft, clayey silts. The soil strength will increase gradually with depth. A high amplitude reflector exists at approximately 10 feet beneath the mudline. Firm clays with some sand are likely beneath this interface. Small concentrations of biogenic gas are likely but will not be at pressures greater than hydrostatic.

No channel cuts are observed in the immediate area of this proposed drill location. Also, no high amplitude,"bright spot" reflections are observed at depth on the analog sparker records.

Well Site "D" 300 ft from the North line
2100 ft from the West line

The water depth at this location is approximately 33.5 feet. The seafloor slopes to the south at an inclination of 1 foot per 1100 feet or 0.1%. The Transco 20-inch pipeline is located over 3000 feet from this location.

Unidentified magnetic anomalies exist 350 feet to the north-northwest and 250 feet to the south-southwest. These anomalies will probably not be disturbed by the installation of a drilling rig.

The seabed sediments are likely to be soft, clayey silts. The soil strength will increase gradually with depth. A high amplitude reflector exists at approximately 10 feet beneath the mudline. Firm clays with some sand are likely beneath this interface. Small concentrations of biogenic gas are likely but will not be at pressures greater than hydrostatic.

No channel cuts are observed in the immediate area of this proposed drill location.

Also, no high amplitude,"bright spot" reflections are observed at depth on the analog sparker records.

Well Site "E" 2800 ft from the North line
7100 ft from the West line

The water depth at this location is approximately 35.5 feet. The seafloor slopes to the south at an inclination of 1 foot per 2000 feet or 0.05%. The Transco 20-inch pipeline is located 1150 feet to the northwest of this location. No unidentified magnetic anomalies exist within 1900 feet of this site.

The seabed sediments are likely to be soft, clayey silts. The soil strength will increase gradually with depth. A high amplitude reflector exists at approximately 12 feet beneath the mudline. Firm clays with some sand are likely beneath this interface. Small concentrations of biogenic gas are likely but will not be at pressures greater than hydrostatic.

No channel cuts are observed in the immediate area of this proposed drill location. Also, no high amplitude,"bright spot" reflections are observed at depth on the analog sparker records.

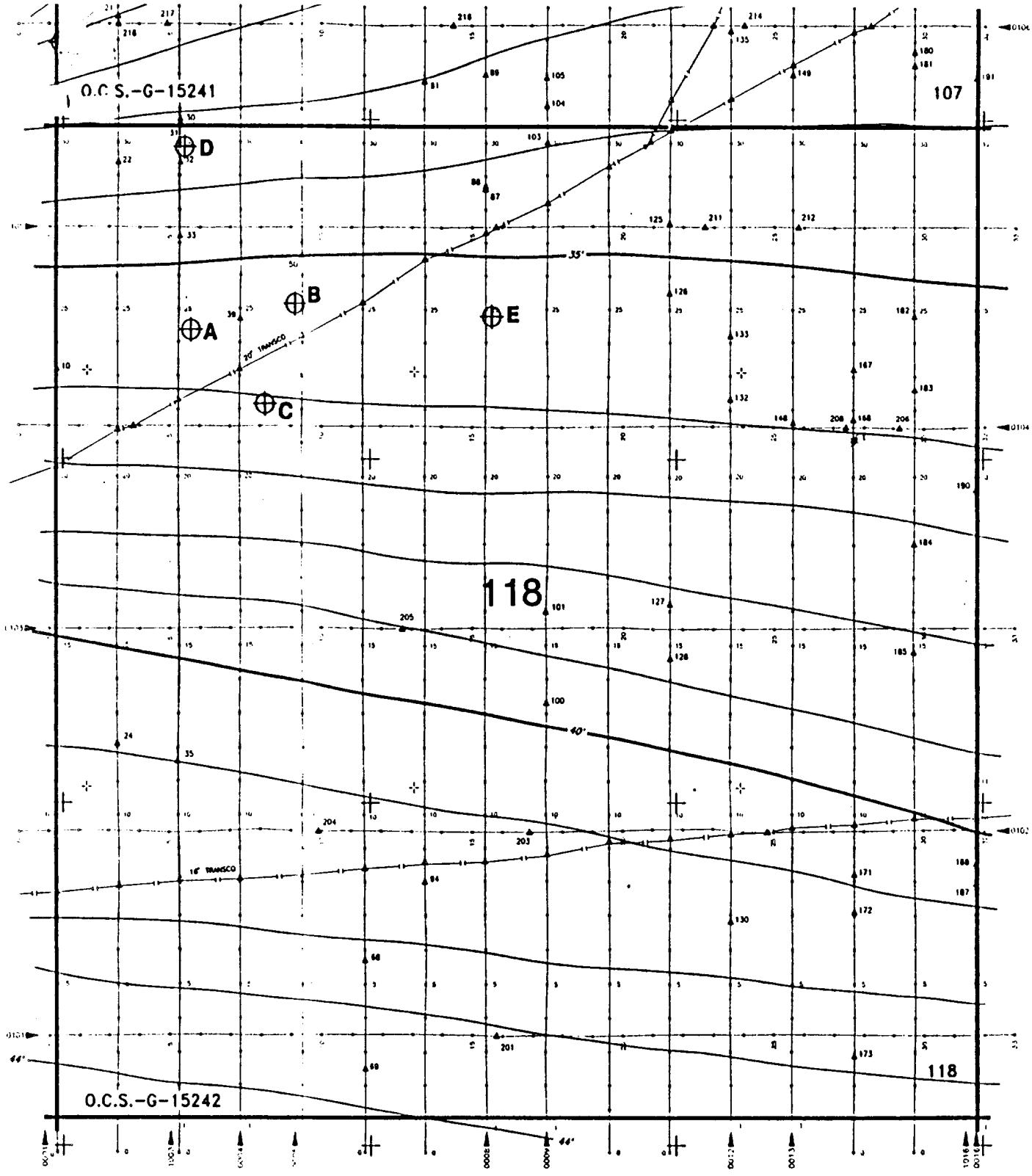
CONCLUSION

The proposed well locations in Eugene Island Block 118 should encounter suitable foundation conditions. No surface obstructions are detected in the immediate area of these sites. Also, no indications of shallow gas are noted on the analog sparker data.

Assessment Prepared by:

Thomas W. Neurauter

Thomas W. Neurauter, Ph.D.
on behalf of GeoTex Company
November 14, 1995



1,000 0 1,000 2,000

SCALE IN FEET

1' CONTOUR INTERVAL

LEGEND:

- SURVEY TRACK AND POSITION FIX
- SURVEY DIRECTION AND LINE NO.
- PLATFORM (NOT TO SCALE)
- WELL (ABANDONED)
- PIPELINE (EXISTING)
- TAP
- UNIDENTIFIED MAGNETIC ANOMALY (SEE TABLE)
- MAGNETIC TIE ON PIPELINE

SEE FIGURE 1 FOR GENERAL NOTES

GEOPHYSICAL SURVEY

BATHYMETRIC AND SEAFLOOR FEATURES MAP

BLOCKS 107 & 118
EUGENE ISLAND AREA
OFFSHORE LOUISIANA

NORCEN EXPLORER, INC.

KC OFFSHORE, L.L.C.
AN ENERVEC COMPANY
36499 PERKINS RD., PRAIRIEVILLE, LOUISIANA 70769

DRN DLN	PREP TWN	CAL TAO	APP 340	FILE NO 11-5-148-08E			
CHK 37L	CHK 83b	CHK 37L	DATE 11-7-95	FIG NO.	MAP 1 OF 3		

ATTACHMENT D

DRILLING FLUIDS LIST

MUD SYSTEM COMPONENT LISTING

PRODUCT NAME	APPLICATION	DESCRIPTION
Aluminum Stearate	Defoamer	Aluminum Stearate $Al(C_{18}H_{35}O_2)_3$
Bac Ban	Preservative	Isothiazolin mixture
Calcium Chloride	Weighting Agent	Calcium Chloride $CaCl_2$
Cane Fiber	Loss Circulation	Sugar cane fiber (bagasse)
Caustic Potash	PH control	Potassium hydroxide (KOH)
Caustic Soda	PH control	Sodium hydroxide (NaOH)
Caustilig	Thinner	Causticized lignite
Cedar Fiber	Loss Circulation	Shredded cedar, cellulose
Congor 101	Corrosion Inhibitor	Blend of tall oil and alcohol
Congor 202	Corrosion Inhibitor	Blend of amines and alcohol
Congor 303	Corrosion Inhibitor	Blend of alkyl diamines
Congor 404	Corrosion Inhibitor	Salt of phosphate ester
Cottonseed Hulls	Loss Circulation	Cotton seed hulls
Defoam X	Defoamer	Blend of glycols and stearate
Desco	Thinner	Sulfomethylated tannin/dichromate
Diaseal M	Loss Circulation	Diatomaceous earth
Drillaid Selec Floc	Flocculant	Anionic polymer
Drispac	Fluid Loss Control	Cellulose Gum
Durogel	Viscosifier	Sepiolite clay
Fer-Ox	Weighting Agent	Iron oxide; hematite ($Fe_2 O_3$)
Flakes	Loss Circulation	Cellophane $(C_6 H_{10} O_5)_n$
Floxit	Flocculant	Polyacrylamide $(C_3 H_5 NO)_x$
Gelex	Viscosifier	Sodium polyacrylate
Gelite	Viscosifier	Saponite ($Al_2 MgO_8Si_2$)
Gypsum	Shale Control	Calcium sulfate ($CaSO_4.2H_2O$)
Ironite Sponge	Corrosion Inhibitor	Iron oxide ($Fe_2 O_4$)
K-17	Thinner	Metal salt of lignite with potassium hydroxide
Kleen Up	Surfactant	Blend of surfactants

Kwik Seal	Loss Circulation	Blend of nut shells, cellophane and wood fibers
Kwik-Thik	Viscosifier	Bentonite, polyacrylamide blend
Lime	PH Control	Calcium hydroxide [$Ca(OH)_2$]
Liquid $CaCl_2$	Weighting Agent	Calcium chloride, liquid ($CaCl_2$)
Lo-Wato	Weighting Agent	Calcium carbonate ($CaCO_3$)
Lube-106	Lubricant	Blend of alcohol and esters
Lube-153	Lubricant	
M-I Bar	Weighting Agent	Barium sulfate ($BaSO_4$)
M-I CMC	Fluid Loss Control	Sodium carboxymethylcellulose
M-I Cal	Viscosifier	Sodiummontmorillonite (bentonite)
M-I Mica	Loss Circulation	Mica
Melanex-T	Thinner	Melanin polymer derivative
My-Lo-Jel	Fluid Loss Control	Pregelatinized starch
Nut Plug - All Grades	Loss Circulation	Ground nut shells
Oxygen Scavenger	Corrosion Inhibitor	Ammonium bisulfite solution
Pheno-seal	Loss Circulation	Chipped formica
Phos	Thinner	Sodium tetraphosphate
Pipelax	Spotting Fluid	Blend of surfactants dispersed in an aromatic process oil
Pipelax SF	Spotting Fluid	Blend of surfactants and low toxicity hydrocarbons
Polypac	Fluid Loss Control	A high grade carboxymethyl cellulose
Poly-Plus (liquid)	Polymer	A liquid anionic polyelectrolyte with mineral oil
Polysal	Fluid Loss Control	A modified potato starch
Polyseal	Loss Circulation	A blend of mixed fibers and cellophane
Quebracho 60/40	Thinner	Tannin
Resinex	Fluid Loss Control	Copolymer of a lignite and a sulfonated phenol, formaldehyde urea resin
Safe Link	Viscosifier	A blend of salt, polymer and lignosulfonate
Salt	Weighting Agent	Sodium chloride (NaCl)

Salt Gel	Viscosifier	Attapulgite clay
SAPP	Thinner	Sodium acid pyro-phosphate ($Na_2 H_2 P_2 O_7$)
Shale Chek	Shale Control	A blend of amines and glycol
Soda Ash	PH Control	Sodium carbonate ($Na_2 CO_3$)
Sodium Bicarbonate	PH Control	Sodium bicarbonate ($NaHCO_3$)
Soltex	Lubricant	Sodium asphalt sulfonate
SP-101	Fluid Loss Control	Sodium polyacrylate
Spersene	Thinner	Chrome lignosulfonate
Spersene CF	Thinner	Chrome free lignosul-fonate
Sulf-X Plus	Corrosion Inhibitor	Zinc oxide blend
Tackle	Thinner	A polyacrylamide blend
Tannathin	Thinner	Oxidized lignite (naturally occurring)
Thermpac UL	Fluid Loss Control	Sodium carboxymethyl starch
XP-20	Thinner	Oxidized chrome lignite

NOTE:

The product names are from M-I Drilling Fluids. These product names may differ depending on the actual company selected to provide drilling fluid products.

ATTACHMENT E

COASTAL ZONE CONSISTENCY CERTIFICATION

AIR QUALITY REPORT

ENVIRONMENTAL REPORT

COASTAL ZONE MANAGEMENT CONSISTENCY CERTIFICATE

PLAN OF EXPLORATION

GULF OF MEXICO

FOR

EUGENE ISLAND AREA BLOCK 118

SUBMITTED TO:

MS. SHARON KOUDELKA

REGULATORY TECHNICIAN

NORCEN EXPLORER, INC.

200 WESTLAKE PARK BOULEVARD, SUITE 800

HOUSTON, TEXAS 77079-2653

(713/597-2493)

NOVEMBER 21, 1995

PREPARED BY:

TIM MORTON & ASSOCIATES, INC.

REGULATORY & ENVIRONMENTAL CONSULTANTS

PROJECT NO. 95-303

COASTAL ZONE MANAGEMENT

CONSISTENCY CERTIFICATION

EXPLORATION

.....

Type of Plan

EUGENE ISLAND AREA BLOCK 118

.....

Area and Block

The proposed activities described in detail in the attached Plan of Exploration comply with Louisiana's approved Coastal Management program and will be conducted in a manner consistent with such Program.

Arrangements have been made to publish Public Notices regarding the proposed activity no later than ..1/3/95..... with THE ADVOCATE, the official journal of Louisiana, and with the FRANKLIN BANNER, the official journal of St. Mary Parish.

NORCEN EXPLORER, INC.

.....

Lessee or Operator

Sharon N Kondelka

.....

Certifying Official

Dec 8, 1995

.....

Date

Public Notice of Federal Consistency Review of a Proposed Exploration Plan (POE) by the Coastal Management Division/Louisiana Department of Natural Resources for the Plan's Consistency with the Louisiana Coastal Resources Program.

Applicant:	Norcen Explorer, Inc. 200 Westlake Park Blvd., Suite 800 Houston, Texas 77079
Location:	Eugene Island Area, OCS-G-15242 Block 118 Lease offering date May 10, 1995
Description:	Proposed Plan of Exploration for the above area provides for the exploration for oil and gas. Exploration activities shall including drilling from a jack-up rig and transport of drilling crews and equipment by helicopter and cargo vessels from an onshore base located at Morgan City, Louisiana. No ecologically sensitive species or habitats are expected to be located near or affected by these activities.

A copy of the plan described above is available for inspection at the Coastal Management Division Office located on the 10th floor of the State Land and Natural Resources Bldg., 625 North 4th Street, Baton Rouge, Louisiana. Office hours: 8:00 a.m. to 5:00 p.m., Monday through Friday. The public is requested to submit comments to the Coastal Management Division, Attention: OCS Plans, P. O. Box 44487, Baton Rouge, La. 70804-4487. Comments must be received within 15 days of the date of this notice or 15 days after the Coastal Management Division obtains a copy of the plan and it is available for public inspection. This public notice is provided to meet the requirements of the NOAA Regulations on Federal Consistency with approved Coastal Management Programs.

AIR QUALITY REVIEW

FOR

EUGENE ISLAND AREA BLOCK 118

OCS-G-15242

NORCEN EXPLORER, INC.

200 WESTLAKE PARK BOULEVARD, SUITE 800

HOUSTON, TEXAS 77079-2653

PREPARED BY:

TIM MORTON & ASSOCIATES, INC.

REGULATORY & ENVIRONMENTAL CONSULTANTS

JOB NO. 95-302

NOVEMBER 17, 1995

GULF OF MEXICO AIR EMISSION CALCULATIONS

General

This document (MMS.WK3) was prepared through the cooperative efforts of those professionals in the oil industry including the API/OOC Gulf of Mexico Air Quality Task Force, who deal with air emission issues. This document is intended to standardize the way we estimate an air emission inventory for Plans of Exploration (POE) and Development, Operations, Coordination Documents (DOCD) approved by the Minerals Management Service (MMS). It is intended to be thorough but flexible to meet the needs of different operators. This first sheet gives the basis for the emission factors used in the emission spreadsheet as well as some general instructions. This file contains 8 sheets: A,B,C,D,E,F,G,& H. A is the Instruction Sheet, B is the Title Sheet, C is the Factors Sheet, D,E,F, & G are the Emission Spreadsheets and H is the Summary Sheet. These sheets will describe and calculate emissions from an activity.

Title Sheet

The Title Sheet requires input of the company's name, area, block, OCS-G number, platform and/or well(s) in the necessary lines. This data will automatically be transferred to the spreadsheet and summary sheet.

Factor Sheet

The emission factors were compiled from the latest AP-42 references or from industry studies if no AP-42 reference was available. Factors can be revised as more data becomes available. A change to this Factor Sheet will be automatically changed in Emission Spreadsheet.

The basis for the factors is as follows:

1. NG Turbines — Fuel usage scf/hr = HP X 9.524 (10,000 btu/HP-hr / 1050 btu/scf)
2. NG Engines — Fuel usage scf/hr = HP X 7.143 (7,500 btu/HP-hr / 1050 btu/scf)
3. Diesel — Fuel usage gals/hr = HP X 0.0483 (7,000 btu/HP-hr / 145,000 btu/gal)

Emission Factors

Natural Gas Prime Movers

1. TNMOC refers to total non-methane organic carbon emissions and these can be assumed equivalent to VOC emissions.
2. The sulfur content assumed is 2000 grains/mmscf (3.33 ppm). If your concentration is different then ratio your emission factor up or down.

Diesel-Fired Prime Movers

1. Diesel sulfur level 0.4% by wt
2. For boats use > 600 HP factors based on AP-42 Vol. II, Table II-3-3. Those figures closely match the above values. Include only the emissions from the boats within 25 mile radius of the well/platform.
3. For diesel engines <600 HP VOC emissions equal total HC emissions; for diesel engines>600 HP

VOC emissions equal non-methane HC emissions.

Heaters/Boilers/Firetubes/NG-Fired

1. NG Sulfur content is 2000 grains per million cu ft
2. VOCs emissions based on total non-methane HCs

Gas Flares

1. Flare is non-smoking
2. 1050 btu/cu. ft. for NG heating value
3. The sulfur content assumed is 2000 grains/mmscf (3.33 ppm). If your concentration is different then ratio your emission factor up or down or you may use the following formula

   H2S flared (lbs/hr) = Gas flared (cu ft/hr) X ppm H2S X 10E-06 X 34/379

   SOx emis (lbs/hr) = H2S flared (lbs/hr) X 64/34

Liquid Flares

1. Assume 1% by wt Sulfur maximum in the crude oil.
2. VOC equals non-methane HCs
3. Particulate emissions assumes Grade 5 oil.

Tanks

1. Tank emissions assumes uncontrolled fixed roof tank.

Fugitives

1. Fugitives are based on the 1993 Star Environmental Report. It requires that you count or estimate your components.

Glycol Dehydrator Vent

1. The dehydrated gas rate in SCF/HR must be entered in the spreadsheet. The emission factor is from the compilation of the Louisiana Survey and an average emissions per gas rate.

Gas Venting

1. The emission factor is based on venting unburned natural gas of average weight.

Emissions Spreadsheet

The emissions from an operation should be presented for a calendar year (1994, 1995, etc.). The operation may include drilling only or drilling in conjunction with other activities such as pipeline installation or production operations. For the first year use sheet D, for the second year use sheet E, third

use F, fourth use G and if you need more you will have to insert a sheet and copy the spreadsheet to the new sheet. The year (CELL D:A38) should be changed and the different operating parameters entered to calculate revised emissions for that subsequent year. The spreadsheet will calculate maximum fuel usage (UNIT/HR) using the known horsepower. It will assume maximum fuel usage is equal to actual fuel (UNIT/DAY) usage unless the actual fuel usage is known. If so, insert actual fuel usage in appropriate column. The emissions will be calculated as follows:

Emission rate (lb/hr) = (HP or fuel rate) X Emission Factor (Potential to emit)

Emissions (tpy)=Emission rate (lb/hr) X load factor(Act Fuel/Max Fuel) X hrsX daysX ton/2000 lbs (Actual emissions)

To customize the spreadsheet for your application you may want to delete lines for non-applicable equipment/activities or you can input "0" for the HP of equipment that does not apply. You may also need to copy/insert an entire line if more than one similiar type of equipment is present.

Also, the production equipment can be customized further by adding the use of the equipment behind each type of engine, i.e.,

Turbine
Turbine - Gas Compressor

Burner
Burner - Line Heater

Summary Sheet

The Summary Sheet is designed to show a proposed estimate of emissions from an activity over a future period of time. In this example ten years was chosen. Each row links to the corresponding emission calculation spreadsheet for that year. For example, Row 7 of the summary corresponds to the annual totals from Sheet D. Row 8 links to the second emission calculation spreadsheet, Row 9 to the third and Row 10 to the fourth. Row 11 - 16 will carry down the emissions from the last spreadsheet with an emission rate greater than zero. The Summary Sheet will always carry down the last non-zero emission total. For example, if emission calculations are done for the years 1994 and 1995, then the the 1995 total will be carried down through the year 2003. Row 17 of the summary sheet reflects the allowable for the air quality review exemption determination. If more or less years are needed you will will have to modify the spreadsheet.

Print Instructions

The table below lists macros that were written to print sheets A, C, D, E, F, G, & H.

\A - This macro prints 3 pages of instructions (sheet A).
\C - This macro prints the emissions factors sheet (sheet C).
\D - This macro prints the emissions calculations sheet (sheet D).
\E - This macro prints the emissions calculations sheet (sheet E).
\F - This macro prints the emissions calculations sheet (sheet F).
\G - This macro prints the emissions calculations sheet (sheet G).
\H - This macro prints the emissions calculations sheet (sheet H).
\X - This macro prints all sheets - A, C, D, E, F, G, & H.

To run one of these macros, hold down ALT and press the letter in the macro range name. For example, to run the macro \A, press ALT-a.

AIR EMISSION CALCULATIONS

Fuel Usage Conversion Factors	Natural Gas Turbines		Natural Gas Engines		Diesel Recip. Engine		REF.	DATE
	SCF/hp-hr	9.524	SCF/hp-hr	7.143	GAL/hp-hr	0.0483	AP42 3.2-1	4/76 & 8/84

Equipment/Emission Factors	units	TSP	SOx	NOx	VOC	CO	REF.	DATE
NG Turbines	gms/hp-hr		0.00247	1.3	0.01	0.83	AP42 3.2-2	4/93
NG 2-cycle lean	gms/hp-hr		0.00185	11	0.43	1.5	AP42 3.2-2	4/93
NG 4-cycle lean	gms/hp-hr		0.00185	12	0.72	1.6	AP42 3.2-2	4/93
NG 4-cycle rich	gms/hp-hr		0.00185	10	0.14	8.6	AP42 3.2-2	4/93
Diesel Recip. < 600 hp.	gms/hp-hr	1	0.931	14	1.12	3.03	AP42 3.3-1	4/93
Diesel Recip. > 600 hp.	gms/hp-hr	0.24	1.49	11	0.33	2.4	AP42 3.4-1	4/93
NG Heaters/Boilers/Burners	lbs/mmscf	5	0.6	140	2.8	35	AP42 1.4-1	4/93
NG Flares	lbs/mmscf		0.57	71.4	60.3	388.5	AP42 11.5-1	9/91
Liquid Flaring	lbs/bbls	0.42	6.6	2.3	0.01	0.21	AP421.3-1	4/93
Tank Vapors	lbs/bbl				0.03		E&P Forum	1/93
Fugitives	lbs/hr/comp.				0.000025		API Study	12/93
Glycol Dehydrator Vent	lbs/mmscf				6.6		La. DEQ	1991
Gas Venting	lbs/scf				0.0034			

AIR EMISSION CALCULATIONS

COMPANY	AREA	BLOCK	LEASE	PLATFORM	WELL	LATITUDE	LONGITUDE	CONTACT	PHONE	REMARKS
Norcen Explorer, Inc.	Eugene Island	118	15242	0	A, B, C, D & E	0	0	Sharon Koudelka	713/597-2493	0

OPERATIONS	EQUIPMENT		MAX. FUEL	ACT. FUEL	RUN TIME		POUNDS PER HOUR					TONS PER YEAR				
	Diesel Engines	HP	GAL/HR	GAL/D												
	Nat. Gas Engines	HP	SCF/HR	SCF/D												
	[illegible]	MMBTU/HR	SCF/HR	SCF/D	HR/D	DAYS	TSP	SOx	NOx	VOC	CO	TSP	SOx	NOx	VOC	CO
DRILLING AND COMPLETION	PRIME MOVER>600hp diesel	1320	63.76	1530.14	24	319	0.70	4.33	31.98	0.96	6.98	2.67	16.58	122.43	3.67	26.71
	PRIME MOVER>600hp diesel	1320	63.76	1530.14	24	319	0.70	4.33	31.98	0.96	6.98	2.67	16.58	122.43	3.67	26.71
	PRIME MOVER>600hp diesel	1320	63.76	1530.14	24	319	0.70	4.33	31.98	0.96	6.98	2.67	16.58	122.43	3.67	26.71
	CREWBOAT >600hp diesel	2000	96.60	2318.40	4	319	1.06	6.56	48.46	1.45	10.57	0.67	4.19	30.92	0.93	6.75
	SUPPLYBOAT >600hp diesel	2500	120.75	2898.00	6	319	1.32	8.20	60.57	1.82	13.22	1.26	7.85	57.97	1.74	12.65
	CRANE <600hp diesel	110	5.31	127.51	4	319	0.24	0.23	3.39	0.27	0.73	0.15	0.14	2.16	0.17	0.47
	WELDING MACHINE <600hp diese	50	2.42	57.96	4	319	0.11	0.10	1.54	0.12	0.33	0.07	0.07	0.98	0.08	0.21
	CEMENT SKID >600hp diesel	600	28.98	695.52	24	3	0.32	1.97	14.54	0.44	3.17	0.01	0.07	0.52	0.02	0.11
	TOW TUG>600hp diesel	4200	202.86	4868.64	12	6	2.22	13.78	101.76	3.05	22.20	0.08	0.50	3.66	0.11	0.80
	TOW TUG>600hp diesel	4200	202.86	4868.64	12	6	2.22	13.78	101.76	3.05	22.20	0.08	0.50	3.66	0.11	0.80
	TOW TUG>600hp diesel	7000	338.10	8114.40	12	6	3.70	22.97	169.60	5.09	37.00	0.13	0.83	6.11	0.18	1.33
1996	YEAR TOTAL						13.28	80.60	597.68	18.17	130.37	10.48	63.89	473.27	14.36	103.25
EXEMPTION CALCULATION	DISTANCE FROM LAND IN MILES											765.90	765.90	765.90	765.90	27786.67
	23.0															

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Tim Morton & Associates, Inc.

AIR EMISSION CALCULATIONS

COMPANY	AREA	BLOCK	LEASE	PLATFORM	WELL	LATITUDE	LONGITUDE	CONTACT		PHONE	REMARKS					
Norcen Explorer, Inc.	Eugene Island	118	15242	0	A, B, C, D & E	0	0	Sharon Koudelka		713/597-2493						
OPERATIONS	EQUIPMENT		MAX. FUEL	ACT. FUEL	RUN TIME		POUNDS PER HOUR					TONS PER YEAR				
	Diesel Engines	HP	GAL/HR	GAL/D												
	Nat. Gas Engines	HP	SCF/HR	SCF/D												
	[illegible]	MMBTU/HR	SCF/HR	SCF/D	HR/D	DAYS	TSP	SOx	NOx	VOC	CO	TSP	SOx	NOx	VOC	CO
DRILLING AND COMPLETION	PRIME MOVER>600hp diesel	1320	63.76	1530.14	24	281	0.70	4.33	31.98	0.96	6.98	2.35	14.61	107.84	3.24	23.53
	PRIME MOVER>600hp diesel	1320	63.76	1530.14	24	281	0.70	4.33	31.98	0.96	6.98	2.35	14.61	107.84	3.24	23.53
	PRIME MOVER>600hp diesel	1320	63.76	1530.14	24	281	0.70	4.33	31.98	0.96	6.98	2.35	14.61	107.84	3.24	23.53
	CREWBOAT >600hp diesel	2000	96.60	2318.40	4	281	1.06	6.56	48.46	1.45	10.57	0.59	3.69	27.23	0.82	5.94
	SUPPLYBOAT >600hp diesel	2500	120.75	2898.00	6	281	1.32	8.20	60.57	1.82	13.22	1.11	6.92	51.06	1.53	11.14
	CRANE <600hp diesel	110	5.31	127.51	4	281	0.24	0.23	3.39	0.27	0.73	0.14	0.13	1.91	0.15	0.41
	WELDING MACHINE <600hp diese	50	2.42	57.96	4	281	0.11	0.10	1.54	0.12	0.33	0.06	0.06	0.87	0.07	0.19
	CEMENT SKID >600hp diesel	600	28.98	695.52	24	3	0.32	1.97	14.54	0.44	3.17	0.01	0.07	0.52	0.02	0.11
	TOW TUG>600hp diesel	4200	202.86	4868.64	12	6	2.22	13.78	101.76	3.05	22.20	0.08	0.50	3.66	0.11	0.80
	TOW TUG>600hp diesel	4200	202.86	4868.64	12	6	2.22	13.78	101.76	3.05	22.20	0.08	0.50	3.66	0.11	0.80
	TOW TUG>600hp diesel	7000	338.10	8114.40	12	6	3.70	22.97	169.60	5.09	37.00	0.13	0.83	6.11	0.18	1.33
1997	YEAR TOTAL						13.26	80.60	597.58	18.17	130.37	9.27	56.60	418.56	12.70	91.32
EXEMPTION CALCULATION	DISTANCE FROM LAND IN MILES											765.90	765.90	765.90	765.90	27786.67
	23.0															

BEST AVAILABLE COPY

Tim Morton & Associates, Inc.

AIR EMISSION CALCULATIONS

COMPANY	AREA	BLOCK	LEASE	PLATFORM	WELL
Norcen Explorer, Inc	Eugene Island	118	15242	0	A, B, C, D & E

Year	Emitted Substance				
	TSP	SOx	NOx	HC	CO
1996	10.48	63.89	473.27	14.36	103.25
1997	9.27	56.50	418.56	12.70	91.32
Allowable	765.90	765.90	765.90	765.90	27786.67

Tim Morton & Associates, Inc.

ENVIRONMENTAL REPORT

FOR COASTAL MANAGEMENT CONSISTENCY DETERMINATION

PLAN OF EXPLORATION

GULF OF MEXICO

FOR

EUGENE ISLAND AREA BLOCK 118 (OCS-G-15242)

SUBMITTED TO:

MS. SHARON KOUDELKA

REGULATORY TECHNICIAN

NORCEN EXPLORER, INC.

200 WESTLAKE PARK BOULEVARD, SUITE 800

HOUSTON, TEXAS 77079-2653

(713/597-2493)

NOVEMBER 21, 1995

PREPARED BY:

TIM MORTON & ASSOCIATES, INC.

REGULATORY & ENVIRONMENTAL CONSULTANTS

PROJECT NO. 95-303

TABLE OF CONTENTS

LIST OF FIGURES

FIGURE

II. DESCRIPTION OF THE PROPOSED ACTION

This environmental report addresses the activity proposed by Norcen Explorer, Inc. for Eugene Island Area Block 118 (OCS-G-15242). The approximate location of the activity is presented on a general vicinity map of the Outer Continental Shelf (OCS) lease areas off the coast of Louisiana (Figure 1).

A jack-up rig will be utilized to drill five wells. The activities proposed by Norcen Explorer, Inc. for this block are addressed in the attached Plan of Exploration.

The proposed activities will be carried out by Norcen Explorer, Inc. with a guarantee of the following:

1. The best available and safest technologies will be utilized throughout the project. This includes meeting all applicable requirements for equipment types, general project layout, safety systems, equipment and monitoring systems.
2. All operations will be covered by a M.M.S. approved Oil Spill Contingency Plan.
3. All applicable Federal, State, and local requirements regarding air emissions, water quality, and discharge for the proposed activities, as well as any other permit conditions, will be complied with.

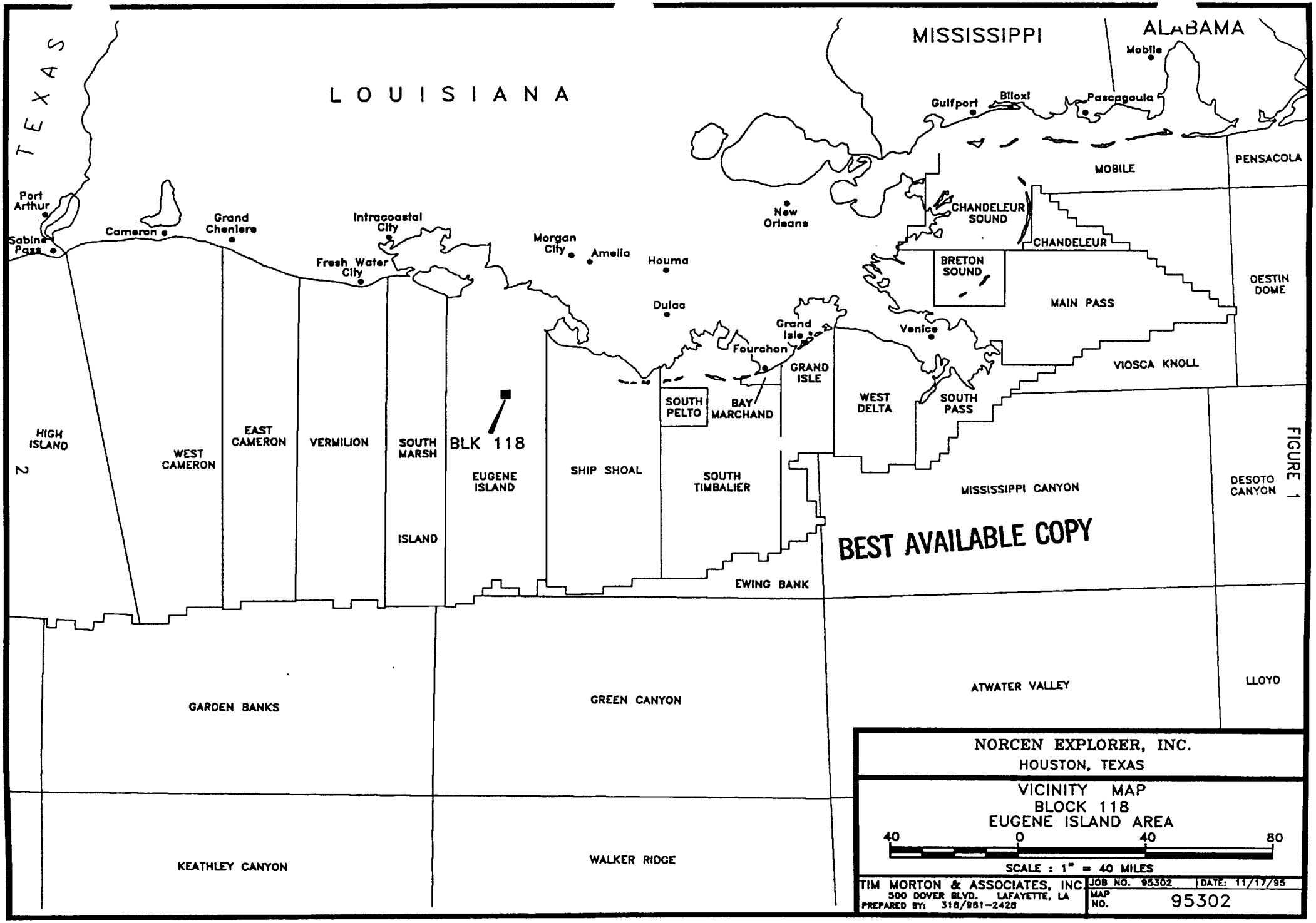
TEXAS
LOUISIANA
MISSISSIPPI
ALABAMA
Mobile
Gulfport
Biloxi
Pascagoula
Port Arthur
Sabine Pass
Cameron
Grand Chenier
Intracoastal City
Fresh Water City
Morgan City
Amelia
Houma
New Orleans
Dulac
Grand Isle
Venice
Fourchon
MOBILE
PENSACOLA
CHANDELEUR SOUND
CHANDELEUR
BRETON SOUND
MAIN PASS
DESTIN DOME
VIOSCA KNOLL
SOUTH PASS
WEST DELTA
GRAND ISLE
SOUTH PELTO
BAY MARCHAND
HIGH ISLAND
WEST CAMERON
EAST CAMERON
VERMILION
SOUTH MARSH ISLAND
BLK 118
EUGENE ISLAND
SHIP SHOAL
SOUTH TIMBALIER
EWING BANK
MISSISSIPPI CANYON
DESOTO CANYON
GARDEN BANKS
GREEN CANYON
ATWATER VALLEY
LLOYD
KEATHLEY CANYON
WALKER RIDGE
BEST AVAILABLE COPY
NORCEN EXPLORER, INC.
HOUSTON, TEXAS
VICINITY MAP
BLOCK 118
EUGENE ISLAND AREA
40 0 40 80
SCALE : 1" = 40 MILES
TIM MORTON & ASSOCIATES, INC.
500 DOVER BLVD. LAFAYETTE, LA
PREPARED BY: 318/981-2428
JOB NO. 95302
DATE: 11/17/95
MAP NO. 95302

FIGURE 1

A. Travel Modes, Routes, and Frequencies

Norcen Explorer, Inc. will operate out of service base facilities established in Morgan City, Louisiana. Norcen Explorer, Inc. proposes to utilize one helicopter, one supply boat, and one crew boat to support the Eugene Island Area Block 118 activities.

The helicopter will travel to the location a total of five times per week. The crew boat and the supply boat will both travel to the location a total of seven times per week.

Transportation vessels will utilize the most direct route from the Morgan City, Louisiana service base. However, because a vessel supporting the Eugene Island Area Block 118 exploration activities, as outlined in the Plan of Exploration, may be scheduled for other stops in the area, the exact route for each vessel on each particular trip cannot be predetermined.

B. Support Base and New Personnel

Norcen Explorer, Inc. will utilize support base facilities established in Morgan City, Louisiana. The Morgan City, Louisiana support base is located approximately fifty-two miles from the block.

Helicopter and marine facilities are currently available at the service base and are presently and continuously manned, therefore, no additional onshore employment is expected to be generated as a result of these activities.

The initial OCS Socio-Economic Data Base Report for the service base facilities utilized by Norcen Explorer, Inc. will be prepared for submission upon issuance of the specific parameters to be established by the DOI/MMS.

C. New Support Facilities

Exploration activities in Eugene Island Area Block 118 will not require the development of any new support facilities.

D. New or Unusual Technology

Exploration activities in Eugene Island Area Block 118 will not warrant utilizing any new or unusual technology that may affect coastal waters.

E. Location of the Proposed Activities

Eugene Island Area Block 118 is located approximately fifty-two miles from Morgan City, Louisiana and approximately twenty-three miles from the shore of St. Mary Parish, Louisiana. Figure 1 presents the location of the block in relation to the Louisiana coast, as well as the geographic relationship between other OCS lease areas and Eugene Island Area Block 118.

III. DESCRIPTION OF THE AFFECTED ENVIRONMENT AND IMPACTS

A. Physical and Environmental

1. Commercial Fishing

Louisiana is traditionally one of the top states in the nation in terms of commercial fisheries. In 1993, Louisiana's commercial landings amounted to 1,242,811,935 pounds worth $243,262,226 (USDC, NMFS, 1994). Nine families of finfish and shellfish represented 95 percent of the dockside value (dollars) of Louisiana's marine and estuarine commercial fishery landings.

The most valuable commercial species in Louisiana are the brown shrimp (Penaeus aztecus) and the white shrimp (P. setiferus), which together produce by far the greatest shrimp harvest in the Gulf of Mexico. Louisiana fishermen harvested 78,070,808 pounds (heads-on) of shrimp worth $110,816,447 in 1993 (USDC, NMFS, 1994). The brown shrimp dominates the Louisiana shrimp harvest, as it is the most abundant species in that region of the gulf (White and Boudreaux, 1977). Both the white shrimp and the brown shrimp are estuarine dependent and have similar life histories, with the major differences being the time and location that the various life stages begin and reach their maximum levels. Generally, spawning occurs offshore with the resulting larvae migrating inshore to develop in estuaries. Brown shrimp spawn from November to April in 30 to 120 meters of water, while white shrimp spawn from March to October in 8 to 34 meters (Benson, 1982). Juvenile and adult brown shrimp

migrate offshore from May to July, and white shrimp migrate between June and November (Benson, 1982).

The Eugene Island Area under consideration falls within the "high to moderate brown shrimp productivity area" (USDOI, MMS, 1986, Visual No. 2) wherein the possibility of shrimp fishing activity exists. Some documented impacts of petroleum exploration and production on the shrimp fishery include the removal of trawling space during the drilling and exploration phases and the possibility of fishing gear conflicts with existing well heads. These conflicts could result in loss of catch, loss of or damage to nets, vessel damage, and/or fishing downtime losses. Additional discussion of the impacts on the commercial fishing industry is contained in the Final Regional Environmental Impact Statement, Gulf of Mexico, Volume I, pages 327 to 332 (USDOI, MMS, 1983).

The Gulf menhaden (Brevoortia patronus) or "pogy" fish constitutes Louisiana's second most valuable fishery, accounting for 1,058,398,657 pounds worth $51,190,652 in 1993 (USDC, NMFS, 1994). Gulf menhaden spawn offshore from mid-October through March in 40 to 140 meters of water, with the larvae subsequently moving into shallow, low salinity estuaries from February to May (Benson, 1982). In the shallow estuaries, the larvae metamorphose into juveniles and change from being carnivores to filter-feeding omnivores. The juveniles and subadults migrate from the estuaries into offshore waters from December through February (Benson, 1982). Adults rarely venture far offshore (Hoese and Moore, 1977); indeed, about 93 percent of the commercial fishing effort for this species occurs within ten miles of shore (USDOI, MMS, 1983).

The activities as proposed are unlikely to have any adverse effect on the menhaden fishing as Eugene Island Area Block 118 lies outside the "Principle Menhaden Harvest Area" (USDOI, MMS, 1986, Visual No. 2).

Blue crabs (Callinectes sapidus) range from Nova Scotia to Uruguay and support the largest crab fishery in the United States (Marine Experiment Station, 1973). In 1993, 45,945,372 pounds of crabs worth $24,465,305 were landed in Louisiana (USDC, NMFS, 1994). Blue crabs inhabit shallow water and can be found in high salinity sounds, bays, and channels where they spawn from March through November, with a peak from May to September (Benson, 1982). The resulting planktonic larvae pass through several molts and stages before the juveniles drop to the bottom of the estuarine nurseries, where they remain throughout the year (Benson, 1982). The blue crab fishery will not be significantly affected by exploration activities in this block because these activities will be conducted offshore of the coastal and estuarine waters in which this fishery occurs.

The Eastern oyster (Crassostrea virginica) is most abundant in the Gulf of Mexico from Aransas Bay, Texas to Apalachicola Bay, Florida (Beccasio et al., 1982). Louisiana oystermen landed 10,314,823 pounds of oysters worth $17,143,973 in 1993. Oysters are Louisiana's fourth most valuable fishery (USDC, NMFS, 1994). Optimum conditions for oysters are found at salinities between 5 and 15 parts per thousand and water depths of 2.5 to 8 meters (Beccasio et al., 1982). Oysters spawn during the summer, and the free-swimming larvae attach and develop in the same estuarine habitat. The

activities proposed in Eugene Island Area Block 118 are not expected to have any impact on the oyster fishery in Louisiana.

In 1993, Louisiana landed a total of 6,071,695 pounds of tuna (Scombroidae) worth $14,869,966 (USDC, NMFS, 1994). Six species of tuna were commercially important to Louisiana. These included albacore (Thunnus alalunga), bluefin tuna (T. thynnus), little tunny (Euthynnus alletteratus), yellowfin tuna (T. albacares), bigeye tuna (T. obesus), and blackfin tuna (T. atlanticus).

Most species of tuna travel in schools and feed on smaller fish or squid. Most are highly regarded both as game fish and as food fish, with some species supporting extensive commercial fisheries (Hoese and Moore, 1977).

Tunas are mass spawners, so that the details of spawning behavior are difficult to observe. These fishes do not protect their eggs and young after spawning, but leave them scattered over the bottom, on aquatic plants, or drifting in the water (Moyle, 1993).

Scombroid fishes range around the world in tropical, temperate, and even cold seas (Herald, 1972). Tuna are sometimes found in shallow water, especially in places where deep water is immediately adjacent. The presence of tuna at the surface or at greater depths is determined by the water temperature as well as by the composition of the pelagic community (Herald, 1972). The activities proposed in Eugene Island Area Block 118 are not expected to have any impact on the tuna fishery in Louisiana.

Red snapper (Lutjanus campechanus) and Vermilion snapper (Rhomboplites aurorubens) accounted for the majority of the snapper landings in Louisiana which amounted to 2,406,526 pounds worth $4,358,039 in 1993 (USDC, NMFS, 1994). Snappers are common over or near banks, coral reefs and outcrops, submarine ridges, rocks, and man-made structures such as shipwrecks and offshore drilling platforms, especially offshore Louisiana (Benson, 1982; Hardy, 1978). Red snapper spawn in the Gulf of Mexico from June to Mid-September, in water depths of 16-37 meters, over bottoms of hard sand and shell with rocky reef areas; spawning may actually take place at the surface (Hardy, 1978). Little or no information is available about larval red snapper, but juveniles are typically found inshore in high salinity (24 to 40 ppt) water 9-91 meters in depth (Benson, 1982). The vermilion snapper has a life history and habits similar to the red snapper. The proposed activities should create a suitable habitat for snapper.

Louisiana harvested 7,992,820 pounds of striped mullet (Mugil cephalus) worth $3,730,185 in 1993 (USDC, NMFS, 1994). Mullets are one of the most abundant fishes in the Gulf of Mexico (Hoese and Moore, 1977). Mullet have been observed in Alabama inland as far as 607 kilometers from the Gulf, and offshore as far as 80 kilometers and as deep as 1,385 meters (Benson, 1982). Mullet spawn from October to May, and some females spawn more than once in a season (Benson, 1982). Larvae move inshore in the spring and the juveniles are found in the shallow areas of the estuaries. Offshore movement from the estuaries occurs during the fall (Beccasio et al., 1982). No impacts to mullets are anticipated as a result of the proposed activities.

The drums (Sciaenidae) are one of the three most abundant families of fishes in the Gulf of Mexico in terms of biomass, and they outnumber all other families in the number of species (Hoese and Moore, 1977). Three species of drums are commercially important to Louisiana. These include black drum (Pogonias cromis), spotted seatrout (Cynoscion nebulosus), and sand seatrout (C. arenarius). In 1993, Louisiana landed a total of 4,455,212 pounds of drums worth $3,318,964 (USDC, NMFS, 1994).

Typically, sciaenids are euryhaline species that spawn in shallow nearshore Gulf waters, producing larvae that enter coastal estuaries for development (Benson, 1982; Johnson, 1978; Hoese and Moore, 1977). Spotted seatrout spawn at night in deep channels and depressions adjacent to shallow flats, grass beds, and bayous in the estuary, from March to September with a peak from April through July (Benson, 1982). The larvae associate with bottom vegetation (predominantly sea grasses) or shell rubble in channel bottoms (Johnson, 1978). The juveniles spend at least their first 6 to 8 weeks on the nursery grounds, usually within 50 meters of the shoreline, until late fall when they move into the deeper parts of the estuary (Benson, 1982). Adult spotted seatrout rarely leave the estuaries (Benson, 1982).

Black drum spawn from February to April in or near tidal passes and in open bays and estuaries (Benson, 1982). The larvae are transported to shallow estuarine marshes, but may move to deeper estuarine waters or shallow waters off sandy beaches as large juveniles (Johnson, 1978). Adult migration is largely restricted to spring and fall movement through the passes between estuaries and nearshore environments (Beccasio et al., 1982).

Sand seatrout spawn from March to September offshore near passes and inlets to estuaries. Larvae migrate into shallow areas of the upper estuaries. Adults apparently move farther offshore than most members of the family (Benson, 1982). In the fall most adults and juveniles migrate to offshore waters (Benson, 1982). The activities proposed are not expected to have any impact on the drums in Louisiana.

The most common species of sharks found in the Gulf of Mexico include the tiger shark (Galeocerdo cuvier), blacknose shark (Carcharhinus acronotus), spinner shark (C. brevipinna), blacktip shark (C. limbatus), sandbar shark (C. plumbeus), Atlantic sharpnose shark (Rhizoprionodon terraenovae), and scalloped hammerhead (Sphyrna lewini) (Branstetter, 1981). A total of 2,698,050 pounds of shark worth $1,105,605 were landed offshore Louisiana in 1993 (USDC, NMFS, 1994).

The following discussion is summarized from Castro (1983). Shark reproduction is achieved through internal fertilization, usually during the months of June and July. Many species migrate to specific mating areas for this purpose. After a gestation period of ten to twelve months, sharks migrate to the nursery areas for the birth of small litters of large pups. These nursery areas are typically highly productive coastal or estuarine waters able to provide ample food for the growing pups.

Sharks are cold blooded and their body temperature usually corresponds to the temperature of the surrounding water. Each species lives within a relatively narrow temperature range determined by its metabolism. Many species

migrate to remain within their temperature tolerance limits. In general these migrations are directed northward and inshore during the summer and southward and offshore in the winter months. No impacts to sharks are expected as a result of the proposed activities.

2. Shipping

A designated shipping fairway is located approximately seventy-one miles south of Eugene Island Area Block 118. It is unlikely that marine vessels supporting this block will utilize the shipping fairway to gain access to the support base. The drilling rig and each of the marine vessels will be equipped with all U. S. Coast Guard required navigational safety aids.

3. Recreation

The open Gulf encompasses a broad expanse of saltwater which is utilized by numerous sports fishermen. Many fishermen charter boats to fish and sport dive in the northern Gulf. The states of Alabama, Mississippi, and Louisiana support approximately 120 charter boats which conduct fishing activities in the waters of the OCS (USDOI, MMS, 1983). Petroleum platforms provide recreation for fishermen and scuba divers because they act as artificial reefs attracting and establishing aquatic communities including highly sought after food and sport fishes. The reef effect created by petroleum platforms is well known and is evidenced by the numerous private boat owners who regularly fish at offshore facilities.

Offshore rigs and platforms serve as navigation points for small commercial and recreational marine craft. Manned drilling rigs and platforms can also provide a haven for small craft operators forced to abandon their vessels during storms. The installation and use of navigational aids, lifesaving equipment, and other safety requirements pursuant to Coast Guard regulations are standard procedure for drilling rigs and marine vessels utilized by Norcen Explorer, Inc.

4. Cultural Resources

Visual No. 4 from the Final Environmental Impact Statement (USDOI, MMS, 1986) indicates that Eugene Island Area Block 118 falls within the zone designated as an area with a high probability of historic and prehistoric cultural resources. An Archeological Assessment was included in the Geophysical Survey Report of Blocks 107 and 118, Eugene Island Area, prepared by KC Offshore, L.L.C. (1995), and the following has been extracted from that Assessment.

The lease block is adjacent to a high probability area for shipwrecks covering several blocks in the Eugene Island Area. The magnetometer and side scan sonar records were examined for evidence of shipwrecks. The magnetometer recorded 157 anomalies that did not correlate to the existing pipelines, abandoned well sites, and platform. The water is slightly deep for any ship to have run aground, and the geophysical data did not offer any strong indicators for shipwreck remains in the lease areas. Clustered anomalies should be noted

during lease development, particularly when planning pipeline routes and drill sites.

The subbottom profiles across Blocks 107 and 118 show an upper sequence of Holocene strata that are deltaic deposits with prominent distributary stream beds. The near-surface channels are continuous features trending NW to SE. This deltaic platform was exposed above sea level in the middle to late Holocene period. The channel features are more numerous in Block 107. There are natural levee features along these buried stream beds, and it is possible that these were inhabited by Paleo-Indians or Archaic tribes when this area was exposed as subaerial levees. Although these features cannot be definitively identified as to their archaeological significance, the margins of these plotted channels should be avoided when selecting drill sites because of possible differential compaction of the surrounding sediments and potential archaeological site occurrence from as late as 4,000 years B.P.

5. Ecologically Sensitive Features

Eugene Island Area Block 118 is located approximately twenty-three miles south of Atchafalaya Bay Wildlife Management Area and approximately thirty-one miles southeast of Shell Keys National Wildlife Refuge (USDOI, MMS, 1986, Visual No. 4). There are no other known ecologically sensitive areas near Eugene Island Area Block 118.

The Morgan City, Louisiana support base which will be utilized as the operations base for the Eugene Island Area Block 118 exploration activities is

located approximately thirty miles northeast of Marsh Island Wildlife Refuge (USDOI, MMS, 1986, Visual No. 3). In general, if all activities are executed as planned, the environmentally sensitive areas will not be affected.

The following discussion of wetlands is summarized from the Final Environmental Impact Statement for Proposed Gulf of Mexico OCS Lease Sales 147 and 150 (USDOI, MMS, 1993). Wetland habitat types occurring along the Gulf coast include fresh, brackish, and saline marshes; forested wetlands; and small areas of mangroves. Wetland habitats may occur along narrow bands or across broad expanses. They can support sharply delineated zones of different species, monotonous stands of a single species, or mixed communities of plant species.

Coastal wetlands are characterized by high organic productivity, high detritus production, and efficient nutrient recycling. Wetlands provide habitat for a great number and wide diversity of invertebrates, fish, reptiles, birds, and mammals. Wetlands are particularly important as nursery grounds for juvenile forms of many important fish species. The Louisiana coastal wetlands support over two-thirds of the Mississippi Flyway wintering waterfowl population and the largest fur harvest in North America.

Louisiana contains most of the Gulf coastal wetlands. These wetlands occur in two physiographic settings -- the Mississippi River Deltaic Plain and the Chenier Plain. Wetlands on the deltaic plain are situated on a series of overlapping riverine deltas that have extended onto the continental shelf during the past 6,000 years. The alluvial and organic-rich sediments found on

these areas are subject to high, natural-subsidence rates. The effects of subsidence are compounded by sea-level rise. Under natural conditions, sedimentation encourages vertical accretion of wetland areas and may offset the submergence and inundation that result from subsidence and sea-level rise. Historically, areas of the deltaic plain that were located near an active channel of the Mississippi River tended to build outward, and marsh areas tended to expand. At the same time, areas located near inactive, abandoned channels tended to deteriorate and erode as a result of the lack of sediment. Today, the Mississippi River is leveed, which greatly reduces the once natural formation of deltaic wetlands.

The Chenier Plain, located to the west of the Atchafalaya Bay in the western part of coastal Louisiana, is a series of separate ridges of shell and sand, oriented parallel or oblique to the Gulf Coast. These ridges are separated by progradational mudflats that are now marshes or open water. The mudflats were built during times when the Mississippi River channel was located on the western side of the deltaic plain or when minor changes in localized hydrologic and sedimentation patterns favored deposition in the Chenier Plain.

The deterioration of coastal wetlands, particularly in Louisiana, is an issue of concern. Several factors contribute to wetlands loss in coastal Louisiana. Sediment deprivation is a result of a 50 percent decrease in the suspended-sediment load of the river since the 1950's, the channelization of the river, and the primary cause, the construction of the flood protection levees. Subsidence and sea level rise have caused submergence of lower wetland areas. Construction of ring levees have allowed drainage and development of

extensive wetlands. Development activities in low areas, outside leveed areas, have caused the filling of wetlands. Construction of canals have converted wetlands to open water and upland spoilbanks. Canals and subsidence have also contributed to increased tidal influence and salinities in freshwater and low-salinity wetlands, which in turn has increased erosion and sediment export.

Wetlands and estuaries could be affected by OCS-related activities. These activities include construction of new onshore facilities in wetland areas; pipeline placement in wetland areas; vessel usage of navigation channels and access canals; maintenance of navigation channels; onshore disposal of OCS-generated oil-field wastes; and oil and chemical spills from both onshore and offshore OCS support activities. No direct wetland losses are anticipated as a result of the proposed activities.

6. Existing Pipelines and Cables

Two pipelines, a Transco 16-inch and a Transco 20-inch, were detected in Eugene Island Area Block 118 during the geophysical survey that was performed by KC Offshore, L.L.C. (1995). Norcen Explorer, Inc. is not aware of any cables located in this block.

7. Other Mineral Uses

There are no other known mineral resources located in or near Eugene Island Area Block 118.

8. Ocean Dumping

The major sources of ocean dumping related to OCS petroleum exploration activity are drilling fluids, or "muds", and drill cuttings. After the exploratory drilling in Eugene Island Area Block 118 is completed, Norcen Explorer, Inc. does anticipate dumping their excess water-based drilling fluids. If any oil-based mud is used in the drilling operations, it will be transported to shore for proper disposal.

Drill cuttings are brought up by the drilling mud and range in size from grains of sand to pebbles. These cuttings are separated and sifted and then disposed overboard. Treated domestic wastes and drill waters will also be disposed at the proposed drilling site. There will be no intentional discharge of any oily or hazardous materials in violation of DOI or EPA regulations.

9. Endangered or Threatened Species

Endangered or threatened species which might occur in Eugene Island Area Block 118 are northern right whale (Eubalaena glacialis), fin whale (Balaenoptera physalus), humpback whale (Megaptera novaeangliae), sei whale (B. borealis), sperm whale (Physeter macrocephalus), blue whale (B. musculus), Kemp's ridley turtle (Lepidochelys kempii), green turtle (Chelonia mydas), hawksbill turtle (Eretmochelys imbricata), leatherback turtle (Dermochelys coriacea), and loggerhead turtle (Caretta caretta) (USDOI, Region IV Endangered Species Notebook).

Endangered or threatened species expected to occur in the vicinity of the onshore base are bald eagle (Haliaeetus leucocephalus) and American alligator (Alligator mississippiensis) (USDOI, Region IV Endangered Species Notebook). Bald eagle nesting areas occur between Morgan City and Houma (Beccasio et al., 1982). The American alligator is classified as threatened in Louisiana due to similarity of appearance. This species is neither endangered nor threatened biologically in Louisiana and a regulated harvest is permitted under State Law (USDOI, Region IV Endangered Species Notebook). The presence of marine mammals in coastal Louisiana is considered sporadic and probably no resident populations exist. It is unlikely that onshore or exploration activities related to Eugene Island Area Block 118 will have any effect on the previously named species.

B. Socio-Economic Impacts

In accordance with DOI/MMS guidelines (OS-7-01), dated November 20, 1980, the initial OCS Data Base Report will be developed for submission on or before the prescribed due date. Subsequent Environmental Reports provided by Norcen Explorer, Inc. will address this data and related activity impacts as required.

IV. UNAVOIDABLE ADVERSE IMPACTS

The greatest threat to the natural environment is caused by inadequate operational safeguards that may cause or contribute to an oil spill or well blowout. These accidents can be greatly reduced in number by utilizing trained operational personnel and employing all available safety and pollution control systems. These measures are standard operating procedure for Norcen Explorer, Inc. Norcen Explorer, Inc. has an approved Oil Spill Contingency Plan.

It should be noted that most large crude oil and refined products spills have occurred during transportation and not during drilling or production operations. Furthermore, the probability of an oil spill occurring during exploratory drilling operations is low (Danenberger, 1976). Transportation and river runoff contribute an estimated 34.9 percent and 26.2 percent, respectively, to the hydrocarbon contamination of the world's oceans while offshore production activities account for only 1.3 percent (National Academy of Sciences, 1975). Natural seeps of petroleum and natural gas, which occur throughout the northern Gulf of Mexico (Zo Bell, 1954; Geyer, 1979), contribute an estimated 9.8 percent to the contamination of the world's oceans (National Academy of Sciences, 1975). Additionally, it was noted in the executive summary of a recent study of petroleum production platforms in the central Gulf of Mexico (Bedinger, 1981), that natural disturbances (i.e. river flooding and storms) can more greatly affect normal biological communities than the current industrial development of the Louisiana OCS. The preceding discussion is not intended to minimize the significance of major oil spills resulting from

petroleum exploration and production activities but is provided to establish a perspective relative to their probable occurrence.

Thirteen of the forty-six blow-outs on the OCS between 1971 and 1978 were associated with exploratory drilling activities, none of which released any oil to the marine environment (Danenberger, 1980). The IXTOC I spill of 1979, however, demonstrates that advanced drilling technology and available safety and pollution control systems are not infallible. Most spills are subjected to immediate containment and clean-up efforts. The ultimate fate of oil spilled in the marine environment is generally considered to be one or a combination of the following: evaporation and decomposition in the atmosphere, dispersal in the water column, incorporation into sediments, and oxidation by chemical or biological means (National Academy of Sciences, 1975).

The unavoidable adverse impacts that will occur as a result of the exploratory drilling and discharging of drilling fluids, domestic wastes, and treated sewage will be few in number and temporary in nature. The primary adverse impacts include a localized degradation of water and air quality in the vicinity of the drilling site, the potential obstruction to commercial and recreational fishing vessels, and the disruption and/or killing of benthic and/or pelagic organisms during location of the drilling rig and during disposal of muds, cuttings, and domestic wastes and sewage.

Discharging from the drill site is inevitable during OCS operations, particularly during exploration. Any materials that may contain oil or other hazardous materials, and therefore would have a much greater adverse impact on

the environment, will not be discharged intentionally. Any discharging will be done pursuant to all DOI and EPA regulations. The discharges to be disposed overboard as a result of the exploration activity will include domestic waste and sewage that is treated on the rig before discharging, drill cuttings, and excess water-based mud.

The environmental fate and effects of drilling muds and cuttings has been extensively addressed in a symposium (See Ayers et al., 1980 for detailed discussions). The discharging of drill cuttings and water-based mud will result in an increase in water turbidity, burial of benthic organisms, and possible toxic effects on marine organisms in the immediate vicinity of the drilling rig. A reduction in photosynthetic activity and plankton populations can also be expected as a result of discharging. It is expected, however, that pelagic and benthic organisms will repopulate the area rapidly after discharging if the effects are minimal and intermittent as expected.

Offshore activities generate a small but significant amount of air pollutants due to the emissions of diesel engines; therefore, the deterioration of air quality is unavoidable in an OCS operation area. In most instances, these emissions affect only the immediate exploration activity site and are rapidly dissipated by the atmosphere depending upon climatic conditions. An Air Quality Review Report has been prepared for Eugene Island Area Block 118 and is included as an attachment to the Plan of Exploration.

Commercial and recreational fishing would be affected by OCS development, but primarily in terms of inconvenience and interference. Although the

unavoidable adverse impacts could include some smothering of shellfish, snagging of trawl nets, reduction of area presently used for unrestricted fishing, and minimal finfish killing, commercial fishing activities would not be significantly affected, except in the unlikely event of an oil spill. An oil spill would result in serious economic losses due to the contamination of commercial fish species over a large area.

There is a remote possibility that offshore areas of historical, cultural, or biological significance could be damaged or destroyed by OCS exploration operations. Visual No. 3 from the Final Environmental Impact Statement (USDOI, MMS, 1986) indicates that no archeological, cultural, or historic areas are in the vicinity of Eugene Island Area Block 118. Norcen Explorer, Inc. will make every effort to avoid disturbing any historically, culturally, or biologically significant feature.

V. LITERATURE CITED

Ayers, R. C., N. L. Richards and J. R. Gould
1980 Proceedings of a symposium. Research on environmental fate and effects of drilling fluids and cuttings. Washington, D.C. 1,122 pp.

Beccasio, A. D., N. Fotheringham, A. E. Redfield, et. al.
1982 Gulf coast ecological inventory: user's guide and information base. Biological Services Program, U. S. Fish and Wildlife Service, Washington, D.C.: FWS/OBS-82/55. 191 pp.

Bedinger, C. A., Jr.
1981 Ecological investigations of petroleum production platforms in the central Gulf of Mexico. Volume III: Executive Summary. Submitted to the Bureau of Land Management, New Orleans, Louisiana. Contract No. AA551-CT8-17. 29 pp.

Benson, N. G., ed.
1982 Life history requirements of selected finfish and shellfish in Mississippi Sound and adjacent areas. U. S. Fish and Wildlife Service, Office of Biological Services, Washington, D.C.: FWS/OBS-81/51. 97 pp.

Branstetter, S.
1981 Biological notes on the sharks of the North Central Gulf of Mexico. Contrib. Mar. Sci. 24:13-34.

Castro, Jose I.
1983 The sharks of North American waters, Texas A & M Un. Press., College Station, 180 pp.

Danenberger, E. P.
1976 Oil spills, 1971 - 1975, Gulf of Mexico Outer Continental Shelf. Geological Survey Circular 741. 47 pp.

Danenberger, E. P.
1980 Outer Continental Shelf Oil and Gas Blowouts. U.S.G.S. Open-File Report. 80-101. 15pp.

Geyer, R. A.
1979 Naturally occurring hydrocarbon seeps in the Gulf of Mexico and Caribbean Sea. College Station, Texas: Texas A & M University Press.

Hardy, J. D. Jr.
1978 Development of fishes of the Mid-Atlantic Bight. Volume III: Aphredoderidae through Rachycentridae. U. S. Fish and Wildlife Service, Office of Biological Services, Washington, D. C.: FWS/OBS-78/12. 394 pp.

Herald, Earl S.
1972 Living fishes of the world. Doubleday & Company, Inc., Garden City, New York. 304 pp.

Hoese, H. D. and R. H. Moore
1977 Fishes of the Gulf of Mexico. Texas A & M University Press, College Station, Texas. 327 pp.

Johnson, G. D.
1978 Development of fishes of the Mid-Atlantic Bight. Volume IV: Carangidae through Ephippidae. U. S. Fish and Wildlife Service, Office of Biological Services, Washington, D. C.: FWS/OBS-78/112. 314 pp.

KC Offshore, L.L.C.
1995 Geophysical survey report, blocks 107 and 118, Eugene Island Area, offshore Louisiana, OCS-G-15241 and OCS-G-15242, for Norcen Explorer, Inc.

Marine Experiment Station
1973 Coastal and offshore environmental inventory Cape Hateras to Nantucket Shoals. Marine Publication Series No. 2, University of Rhode Island.

Moyle, Peter B.
1993 Fish: an enthusiast's guide. University of California Press, Berkeley and Los Angeles, California. 272 pp.

National Academy of Sciences
1975 Petroleum in the marine environment. Washington, D.C. 107 pp.

U. S. Department of Commerce, National Marine Fisheries Service
1994 Louisiana landings in 1993. Unpublished report. National Marine Fisheries Service, New Orleans, LA.

U. S. Department of the Interior, Fish and Wildlife Service
1976 Endangered and threatened species of the southeastern United States. Region IV, Atlanta, Georgia (periodically updated).

U. S. Department of the Interior, Minerals Management Service
1983 Final Regional Environmental Impact Statement, Gulf of Mexico. Vol. 1. Prepared by Minerals Management Service, Gulf of Mexico OCS Region, Metairie, Louisiana. 527 pp.

U. S. Department of the Interior, Minerals Management Service
1986 Final Environmental Impact Statement, Proposed Oil and Gas Lease Sales 110 and 112, Gulf of Mexico OCS Region, Prepared by Minerals Management Service, Gulf of Mexico OCS Region, New Orleans, Louisiana.

U. S. Department of the Interior, Minerals Management Service
1993 Final Environmental Impact Statement, Gulf of Mexico Sales 147 and 150: Central and Western Planning Areas, Volumes I through IV.C. Prepared by Minerals Management Service, Gulf of Mexico, OCS Region, New Orleans, Louisiana.

White, C. J. and C. J. Boudreaux
1987 Development of an areal management concept for Gulf penaeid shrimp. Louisiana Wildlife and Fisheries Commission, Technical Bulletin No. 22.

Zo Bell, C. E.
1954 Marine bacteria and fungi, Fisheries Bulletin 55 (89): 217 - 222.