INITIAL DEVELOPMENT OPERATIONS COORDINATION DOCUMENT

LLOYD RIDGE BLOCKS 1 AND 2
OCS-G 10486 AND OCS-G 10487

MONDO NW PROSPECT

OFFSHORE, ALABAMA

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PUBLIC
INFORMATION

ANADARKO PETROLEUM CORPORATION
INITIAL DEVELOPMENT
OPERATIONS COORDINATION DOCUMENT
LEASES OCS-G 10486 AND OCS-G 10487

LLOYD RIDGE BLOCKS 1 AND 2

APPENDIX A	Contents of Plan
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APPENDIX C	Geological, Geophysical, and H_2S Information
APPENDIX D	Biological and Physical Information
APPENDIX E	Wastes and Discharge Information
APPENDIX F	Oil Spill Information
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APPENDIX H	Environmental Impact Analysis
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Description, Objectives, and Schedule

Anadarko Petroleum Corporation is the designated operator of OCS-G 10486 and OCS-G 10487 Lloyd Ridge Blocks 1 and 2 respectively. To date, one well has been drilled under an Initial Exploration Plan (Control Number N-8098). The Lloyd Ridge Block 2 Well No. 1 was plugged and abandoned and sidetracked. It was renamed the Lloyd Ridge Block 1 Well No. 1 S/T 1 and is currently temporarily abandoned.

A Conservation Information Document (CID) is being prepared for submittal to MMS. A Preliminary Deepwater Operations Plan was submitted to MMS on May 20, 2005 and is pending approval.

Under this DOCD, Anadarko will complete three wells, the Lloyd Ridge Block 1 Well No. 1 S/T 1 and proposed wells, the Lloyd Ridge Block 1 Well No. 2 (IEP Location B) and the Lloyd Ridge Block 2 Well No. 2 (SEP Location F). These two wells will be drilled under the Initial and Supplemental Exploration Plans. Right-of-way and lease term pipelines with associated umbilicals will be installed and three wells will be placed on production. The host facility, Independence Hub, will be located in Mississippi Canyon Block 920, Offshore Alabama, and was provided for in the Atwater Valley Blocks 305 and 349 Initial DOCD.

The estimated date for commencement of production is July, 2007.

Location

Included as **Attachment A-1** is a map showing the locations of the wells and facilities. Additional well information is included in Appendix J on the Plan Information Form.

Drilling Unit

The proposed wells will be completed with the dynamically positioned (DP) drillship, Transocean SedcoForex's "Deepwater Millennium." For the purpose of the air quality review, the MMS maximum horsepower rating for a drillship will be used. Rig specifications will be made a part of the Applications for Permit to Modify.

These water depths require the latest state-of-the-art drilling/completion equipment. DP drillships are designed with double hulls and station-keeping systems to greatly minimize the chance of any problems associated with these vessels. Their storage capacities can reduce the number of loading/unloading cycles. Ships can be supplied at port and taken to location with sufficient supplies to complete multiple wells, if necessary.

Safety features on the drillship will include well control, pollution prevention, welding procedure, and blowout prevention equipment as described in Title 30 CFR Part 250, Subparts C, D, E, and G, and as further clarified by MMS Notices to Lessees, and current policy making invoked by the Minerals

Management Service, the U.S. Environmental Protection Agency, and the U.S. Coast Guard. The appropriate life rafts, life jackets, ring buoys, etc., as prescribed by the U.S. Coast Guard, will be maintained on the facility at all times.

In accordance with Title 30 CFR Part 250, Subpart O, Anadarko will ensure employees and contract personnel engaged in well control operations understand and can properly perform these duties.

Pollution prevention measures include installation of curbs, gutters, drip pans, and drains on deck areas to collect all contaminants and debris.

The rig is not set up for zero discharge. For example, most deck drains and some of the joints at the edge of the rig floor go overboard or into the moonpool, respectively. There is a dedicated drip pan under the rotary table. The pipe racks, mud pump room, sack store, and drill floor drains go to a holding tank, which is served by a dedicated oily water separator. The well test area, engine room, and other major machinery spaces drains all go to slops tanks, which are served by a large general-service, oily water separator. The containment devices are temporary. They are not meant for permanent storage of waste. On the rare occasion that they contain wastes, they are pumped, mopped, or cleaned within a short period of time. The chances of damage to a containment structure during such time as it contains wastes are exceedingly small. The rig has a Shipboard Oil Pollution Emergency Plan (SOPEP), which is reviewed and approved annually by the American Bureau of Shipping (ABS). The rig carries sufficient materials to deal with a one-barrel oil spill.

Anadarko proposes additional measures for safety, pollution prevention, and early spill detection beyond those required by 30 CFR 250, as outlined in Section 6 of Anadarko's Sub-Regional Oil Spill Response Plan.

Production Facilities

Production from Lloyd Ridge Blocks 1 and 2 will be transported to Anadarko's proposed Independence Hub in Mississippi Canyon Block 920. The Independence Hub is a column-based semi-submersible type hull structure that will process production from deepwater subsea tie-ins. The structure will be affixed to the seafloor in Mississippi Canyon Block 920 and will accommodate up to 16 right-of-way pipelines from subsea wells, and a 20-inch export pipeline. The structure will have a two-level deck with an 850 MMSCFD gas processing topsides facility.

The platform has an operating draft of 105 feet; displacement of 50,000 tons; and will include 12 polyester mooring lines, connecting to the unit's 12 suction pilings. The mooring system will be designed with the capability to hold the facility on location in 100-year hurricane or 100-year loop current conditions while meeting code strength requirements.

All mooring system components will be designed for an operating life of 20 years. Design life calculations shall include consideration of corrosion and fatigue.

The Independence Hub facilities are designed for an operating life of 20 years. The structure will be classed by the American Bureau of Shipping (ABS) as an A1 Floating Offshore Installation (FOI).

Enterprise Field Services, LLC will install a 20-inch natural gas and condensate right-of-way pipeline which will depart Independence Hub and travel approximately 140 miles to a termination point at a proposed West Delta Block 68 platform. Production from the various fields' subsea tiebacks will be transported to Independence Hub via an 8″ natural gas and condensate right-of-way pipelines with associated umbilicals.

The facilities will be designed, installed and operated in accordance with current regulations, engineering documents incorporated by reference, and industry practice in order to ensure protection of personnel, environment and the facilities. When necessary, maintenance or repairs that are necessary to prevent pollution of offshore waters shall be undertaken immediately.

The pollution prevention measures for the Independence Hub Facility include installation of curbs, gutters, drip pans, and drains on deck areas to collect all contaminants and debris.

The facility is gas production only, with some associated condensate. The produced water will be separated from the condensate as an aqueous phase combined with monoethylene glycol (MEG). The MEG will be purified in a proprietary reclaiming system, with the result being pure produced water being discharged overboard. The produced water being discharged overboard will meet the overboard testing requirements for oil and grease toxicity.

The facility is not set up for zero discharge. For example, the deck drains are routed to two open drain sump piles for removal of hydrocarbons. The facility has a Shipboard Oil Pollution Emergency Plan (SOPEP) which is reviewed and approved annually by the American Bureau of Shipping. The facility will carry sufficient materials to deal with a one barrel oil spill.

Supervisory and certain designated personnel on-board the facility are to be familiar with the effluent limitations and guidelines for overboard discharges into the receiving waters as outlined in the NPDES General Permit GMG290000.

Production safety equipment was designed, and is installed, used, maintained, and tested in a manner to assure the safety and protection of the human, marine, and coastal environments in accordance with 30 CFR 250 Subpart H. Anadarko will perform all installation and production operations in a safe and workmanlike manner, and will maintain all equipment in a safe condition, thereby ensuring the protection of lease and associated facilities, the health and safety of all persons, and the preservation and conservation of property and the environment. The appropriate life rafts, life jackets, ring buoys, etc., as prescribed by the U.S. Coast Guard, will be maintained on the facility at all times.

Any platform production facilities shall be protected with a basic and ancillary surface system designed, analyzed, installed, tested, and maintained in operating condition in accordance with the provisions of API RP 14C, Recommended Practice for Analysis, Design, Installation and Testing of Basic Surface Safety Systems for Offshore Production Platforms.

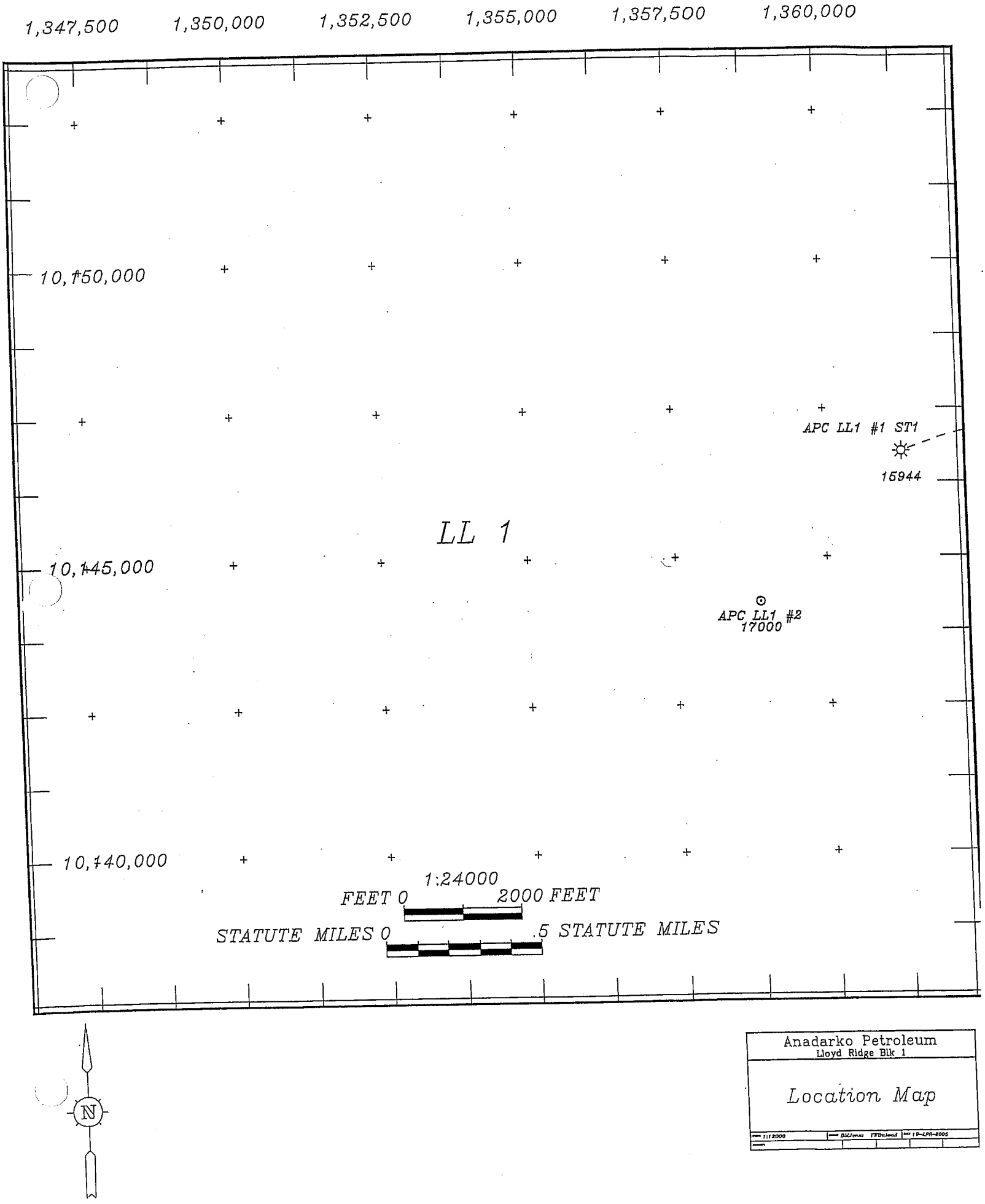
The Independence Hub is a manned structure, and will be identified and reported in accordance with the requirements of the U.S. Coast Guard and MMS.

The 8″ pipeline and the associated control umbilical will be permitted as a right-of-way pipeline.

The trees and pipeline system will be installed by dynamically positioned vessels that do not require anchors. The entire subsea production system is depicted on Facilities Layout drawings included as **Attachment A-2.**

No new nearshore or onshore pipelines or facilities will be constructed.

The facilities will be designed, installed, and operated in accordance with current regulations, engineering documents incorporated by reference, and industry practice in order to ensure protection of personnel, environment, and the facilities. When necessary, maintenance or repairs that are necessary to prevent pollution of offshore waters shall be undertaken immediately.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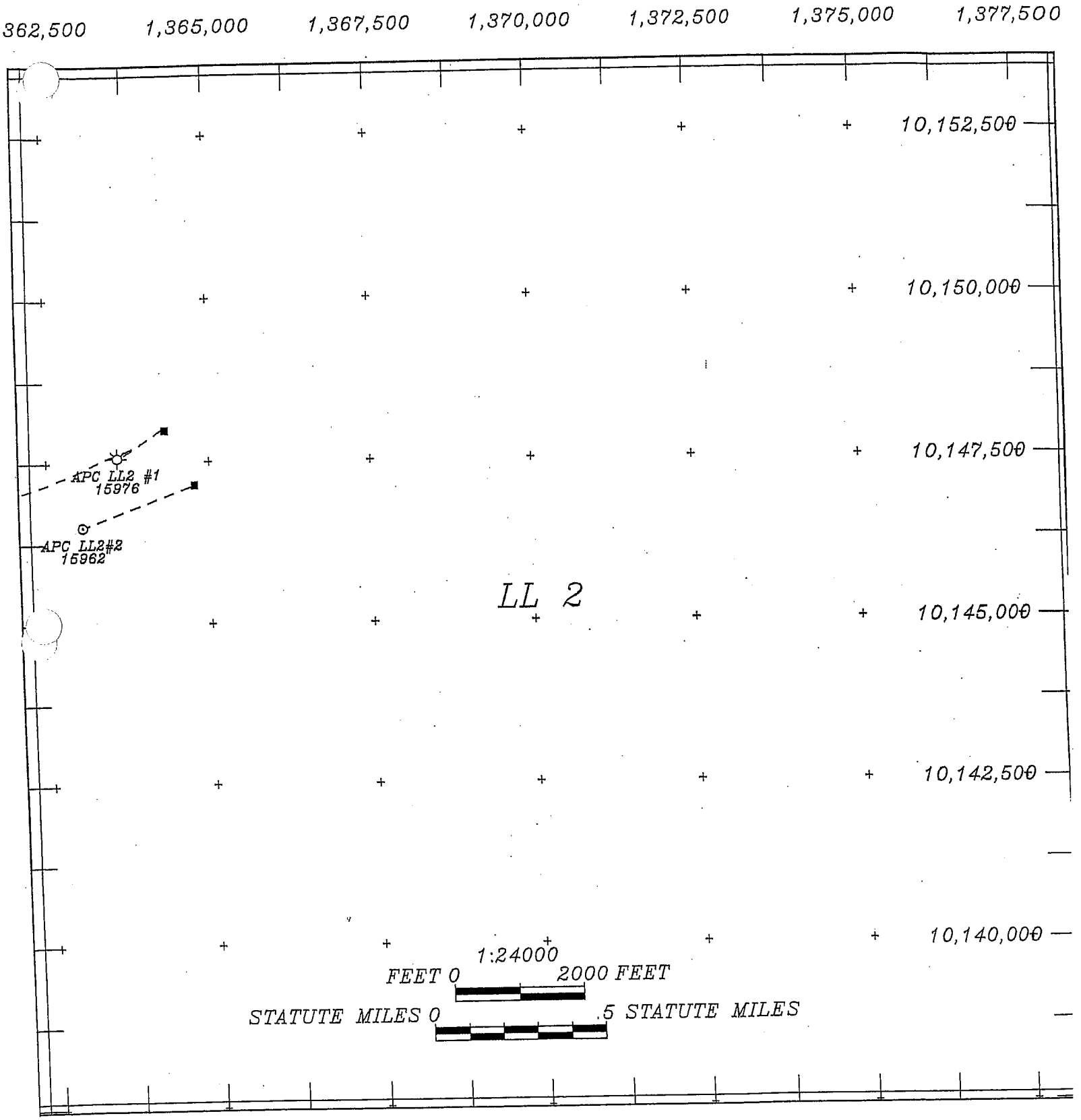
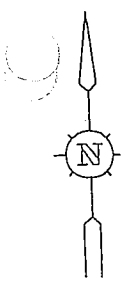
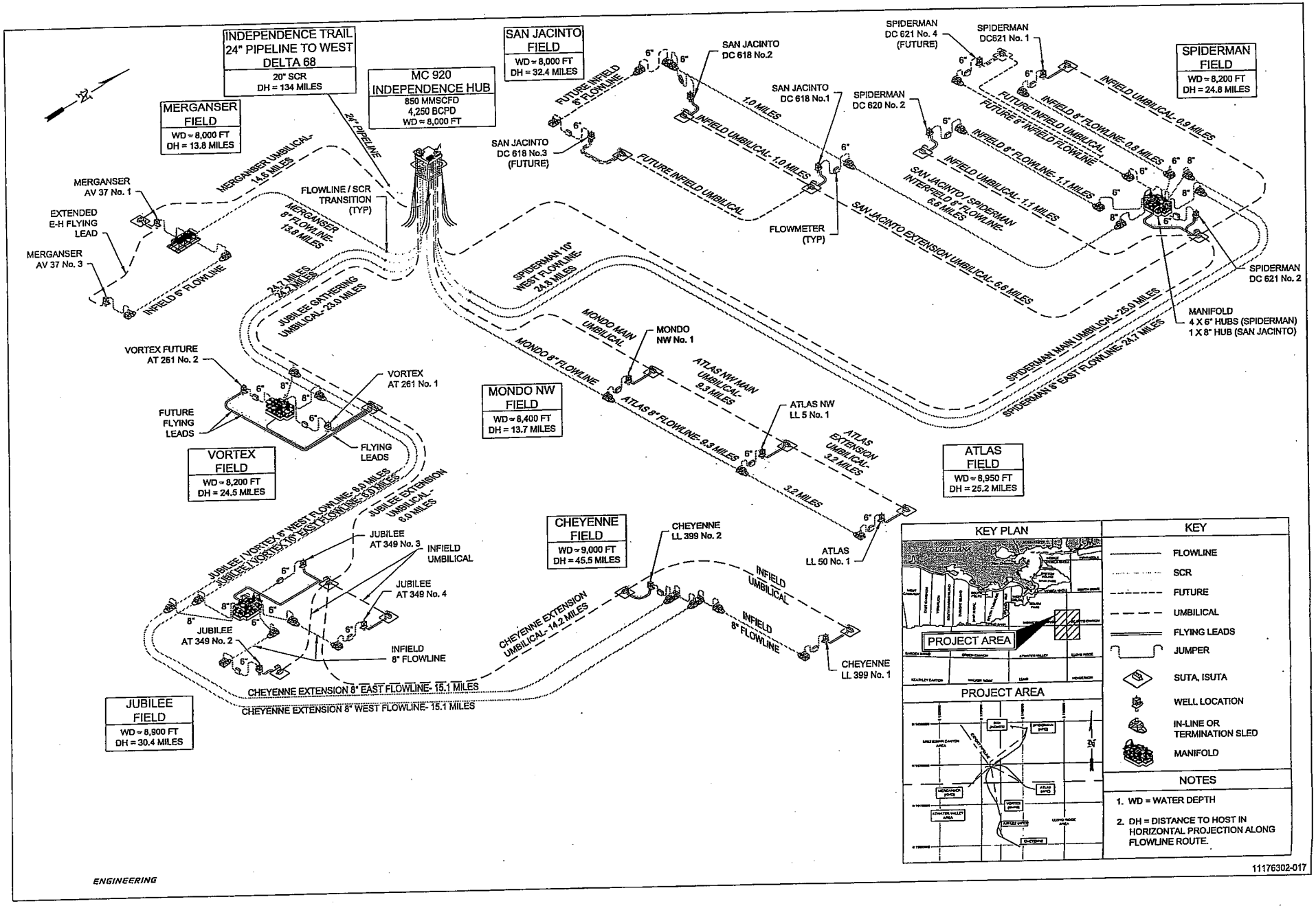
APC LL1 #1 ST1
15944
LL 1
APC LL1 #2
17000
1:24000
FEET 0
2000 FEET
STATUTE MILES 0
.5 STATUTE MILES
N
Anadarko Petroleum
Lloyd Ridge Blk 1
Location Map

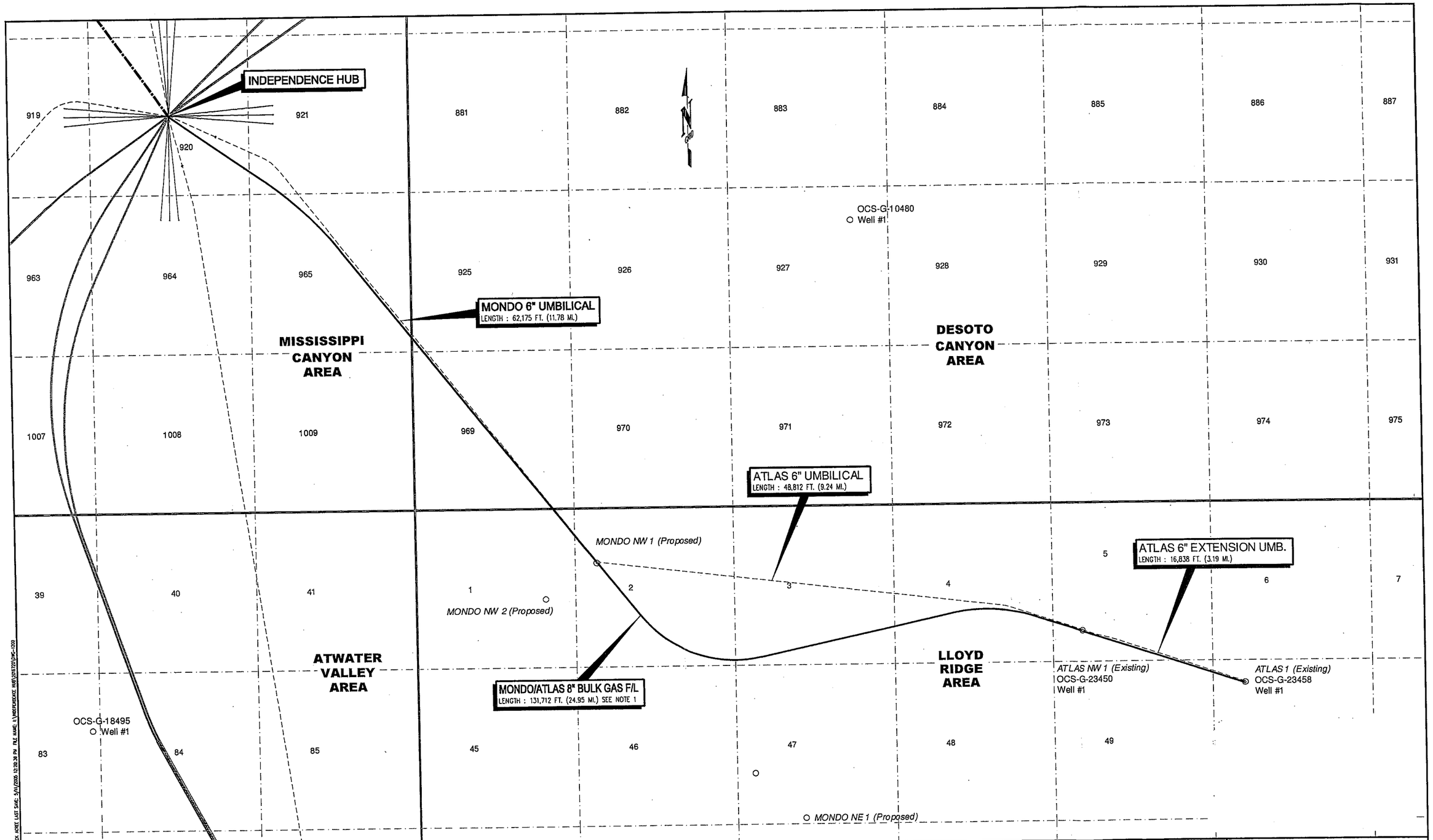




Anadarko Petroleum
Lloyd Ridge Blk 2

Location Map


INDEPENDENCE TRAIL
24" PIPELINE TO WEST DELTA 68
20" SCR
DH = 134 MILES
MC 920
INDEPENDENCE HUB
850 MMSCFD
4,250 BCPD
WD = 8,000 FT
SAN JACINTO FIELD
WD = 8,000 FT
DH = 32.4 MILES
SPIDERMAN FIELD
WD = 8,200 FT
DH = 24.8 MILES
MERGANSER FIELD
WD = 8,000 FT
DH = 13.8 MILES
VORTEX FIELD
WD = 8,200 FT
DH = 24.5 MILES
MONDO NW FIELD
WD = 8,400 FT
DH = 13.7 MILES
ATLAS FIELD
WD = 8,950 FT
DH = 25.2 MILES
CHEYENNE FIELD
WD = 9,000 FT
DH = 45.5 MILES
JUBILEE FIELD
WD = 8,900 FT
DH = 30.4 MILES
24" PIPELINE
MERGANSER UMBILICAL- 14.8 MILES
MERGANSER 6" FLOWLINE- 13.8 MILES
MERGANSER AV 37 No. 1
EXTENDED E-H FLYING LEAD
MERGANSER AV 37 No. 3
INFIELD 6" FLOWLINE
FLOWLINE / SCR TRANSITION (TYP)
24.7 MILES
25.3 MILES
JUBILEE GATHERING UMBILICAL- 23.0 MILES
SPIDERMAN 10" WEST FLOWLINE- 24.8 MILES
FUTURE INFIELD 8" FLOWLINE
SAN JACINTO DC 618 No.3 (FUTURE)
FUTURE INFIELD UMBILICAL
SAN JACINTO DC 618 No.2
INFIELD UMBILICAL- 1.0 MILES
1.0 MILES
SAN JACINTO DC 618 No.1
FLOWMETER (TYP)
SAN JACINTO EXTENSION UMBILICAL- 6.6 MILES
SPIDERMAN DC 620 No. 2
SAN JACINTO / SPIDERMAN INTERFIELD 8" FLOWLINE- 6.6 MILES
INFIELD UMBILICAL- 1.1 MILES
SPIDERMAN DC 621 No. 4 (FUTURE)
SPIDERMAN DC621 No. 1
FUTURE INFIELD UMBILICAL
FUTURE 8" INFIELD FLOWLINE
INFIELD 8" FLOWLINE- 1.1 MILES
INFIELD 8" FLOWLINE- 0.8 MILES
INFIELD UMBILICAL- 0.9 MILES
SPIDERMAN DC 621 No. 2
MANIFOLD
4 X 6" HUBS (SPIDERMAN)
1 X 8" HUB (SAN JACINTO)
SPIDERMAN MAIN UMBILICAL- 25.0 MILES
SPIDERMAN 8" EAST FLOWLINE- 24.7 MILES
MONDO MAIN UMBILICAL
MONDO NW No. 1
MONDO 8" FLOWLINE
ATLAS NW MAIN UMBILICAL- 9.3 MILES
ATLAS 8" FLOWLINE- 9.3 MILES
ATLAS NW LL 5 No. 1
ATLAS EXTENSION UMBILICAL- 3.2 MILES
3.2 MILES
ATLAS LL 50 No. 1
VORTEX FUTURE AT 261 No. 2
VORTEX AT 261 No. 1
FUTURE FLYING LEADS
FLYING LEADS
JUBILEE / VORTEX 8" WEST FLOWLINE- 9.0 MILES
JUBILEE / VORTEX 10" EAST FLOWLINE- 9.0 MILES
JUBILEE EXTENSION UMBILICAL- 6.0 MILES
JUBILEE AT 349 No. 3
INFIELD UMBILICAL
JUBILEE AT 349 No. 4
JUBILEE AT 349 No. 2
INFIELD 8" FLOWLINE
CHEYENNE EXTENSION UMBILICAL- 14.2 MILES
CHEYENNE LL 399 No. 2
INFIELD UMBILICAL
INFIELD 8" FLOWLINE
CHEYENNE LL 399 No. 1
CHEYENNE EXTENSION 8" EAST FLOWLINE- 15.1 MILES
CHEYENNE EXTENSION 8" WEST FLOWLINE- 15.1 MILES
KEY PLAN
PROJECT AREA
PROJECT AREA
KEY
FLOWLINE
SCR
FUTURE
UMBILICAL
FLYING LEADS
JUMPER
SUTA, ISUTA
WELL LOCATION
IN-LINE OR TERMINATION SLED
MANIFOLD
NOTES
1. WD = WATER DEPTH
2. DH = DISTANCE TO HOST IN HORIZONTAL PROJECTION ALONG FLOWLINE ROUTE.
11176302-017
ENGINEERING



NOTES:

1. ALL FLOWLINE AND UMBILICALS LENGTHS ARE PLAN VIEW ONLY. ADD 5000 ft. FOR TRUE LENGTH WITH SCR.
2. HOLD FOR TRUE LENGTH WITH UMBILICAL.

HORIZONTAL SCALE
1"=4000'
0 1000 2000 4000 8000

MAP EXPLANATION

MAP PROJECTION BASED UPON UNIVERSAL TRANSVERSE MERCATOR GRID SYSTEM, ZONE 16. (GRID UNITS IN FEET)
GEODETIC DATUM: NAD 1927, CLARKE 1866 SPHEROID.
ALL LATITUDE / LONGITUDE COORDINATES ARE BASED ON UNIVERSAL TRANSVERSE MERCATOR GRID SYSTEM, ZONE 16.

NO.	DATE	BY	REVISION DESCRIPTION
A	04/29/05	RKA	ISSUED FOR REVIEW AND COMMENT

THE INFORMATION PROVIDED ON THIS DRAWING IS NOT TO BE ACCEPTED AS VALID UNLESS AN ORIGINAL PROFESSIONAL ENGINEER'S STAMP IS INCLUDED IN THE SPACE PROVIDED AND THE STAMP IS ACCOMPANIED BY THE ORIGINAL DATE AND SIGNATURE OF THE ENGINEER.

ENGINEER'S STAMP:

DRAWN BY: R. ACREE
DATE: 04/29/05
CHECKED BY:
DATE:
APPROVED BY:
DATE:
PLOT SCALE: 1=4000
SCALE: 1"=4,000'
SCALE VALID FOR 8-1/2 DRAWING SHEET (11"x17")

INDEPENDENCE HUB

MC-920 INDEPENDENCE HUB DEVELOPMENT

ATLAS/MONDO
OVER ALL FIELD LAYOUT

JOB NO. 2016720
DWG NO. 2016720-AM-DWG-1200
REV. A

PLOT: Wednesday, May 11, 2005 12:24:10 PM BY: RICK ACREE LAST SAVE: 5/11/2005 12:20:38 PM FILE NAME: E:\INDEPENDENCE HUB\2016720\DWG-1200

APPENDIX B
GENERAL INFORMATION

Contact

Inquiries may be made to the following authorized representative:

Anadarko Petroleum Corporation
Attention: Judy Davidson
P.O. Box 1330
Houston, Texas 77251-1330
(832) 636-8766
judy_davidson@anadarko.com

Project Name

Mondo NW

Production Rates and Life of Reservoir

Life of Reserves	Est peak production	Est average production	Type

New or Unusual Technology

Anadarko proposes to use carbon rod technology in the dynamic sections of the pipeline umbilicals. This is considered to be a new application of this technology. Due to the extreme water depths at the project location, tensions in the dynamic portions of the umbilicals are correspondingly high. Historically, in cases where additional strength was required, steel rods have been added to the cross-sections; however, this methodology is inefficient due to the weight-to-strength ratio of steel. For the umbilicals, carbon fiber rod strength members are incorporated into the umbilical cross-section design to augment the axial strength without adding significant weight.
No new or unusual technology will be used for these development operations.

Bonding Information

The bonding requirements for the activities and facilities proposed in this DOCD are satisfied by area wide bond, furnished and maintained according to 30 CFR 256, subpart 1; NTL No. N2000-G16, "Guidelines for General Lease Surety Bonds," dated September 7, 2000.

Anadarko Petroleum Corporation (MMS 00981) has demonstrated oil spill financial responsibility for the facilities proposed in this DOCD according to 30 CFR 253, and NTL No. 99-N01, "Guidelines for Oil Spill Financial Responsibility for Covered Offshore Facilities," dated January 6, 1999.

Onshore Base and Support Vessels

Lloyd Ridge Blocks 1 and 2 are located approximately 106 miles from the Louisiana coastline, 155 miles from Alabama, and 189 miles from Florida. The blocks are located approximately 160 miles from the onshore support base in Port Fourchon, Louisiana and 180 miles from the helicopter base in Galliano, Louisiana. A Vicinity Plat showing the locations of Lloyd Ridge Blocks 1 and 2 relative to the Louisiana, Alabama, and Florida shorelines and the onshore base is included as **Attachment B-1**.

The existing onshore base in Port Fourchon, Louisiana, provides 24-hour service, a radio tower with a phone patch, dock space, equipment, and supply storage area, drinking and drill water, etc. The base serves as a vessel loading point for tools, equipment, and machinery, and as temporary storage for materials and equipment. The proposed operations do not require expansion or major modifications to the base. No future acquisitions or expansions of onshore facilities are anticipated.

Support vessels and travel frequency during the proposed activities are as follows:

Support Vessels	Weekly Estimate (Number) of Roundtrips	
	Completion	Production Operations
Crew Boat	8	
Supply Boat	4	4
Helicopter	14	14

The most practical, direct route from the shore base as permitted by the weather and traffic condition will be utilized.

The crewboat will be used to carry smaller supplies, such as groceries, to the drillship. The supply boat will be used to carry pipe and bulk supplies. The boats will normally move to Lloyd Ridge via the most direct route from Port Fourchon, Louisiana.

Helicopters stationed in Galliano, Louisiana, will be used for transporting personnel and small supplies, and will normally take the most direct route of travel between the Galliano, Louisiana, and the Lloyd Ridge Area when air traffic and weather conditions permit.

Personal vehicles will be the primary means of transportation to carry rig personnel from various locations to the Galliano or Port Fourchon area.

Lease Stipulations

The following stipulations are attached to Leases OCS-G 10486 and 10487, Lloyd Ridge Blocks 1 and 2.

Stipulation No. 1 provides for the protection of archaeological resources. Murphy Exploration submitted Geophysical Report No. 2403-2068-7 to MMS on November 10, 2004. The survey found no indication of manmade resources on these lease blocks, which are not located in a high probability area for cultural or historical resources.

Stipulation No. 3: Lloyd Ridge Blocks 1 and 2 are located within Eglin Water Test Area 3. The Air Armament Center, 101 West D Ave., Suite 222, Eglin AFB, Florida 32542-5492, will be contacted in

order to co-ordinate and control electromagnetic emissions, possible evacuations of personnel, and shut-in of operations during the proposed activities. Anadarko will notify the MMS and EWTA, prior to conducting operations, to implement the terms of this stipulation.

Stipulation No. 5 allows for the extension of a lease if there is a suspension or prohibition of operations due to interferences with scheduled military missions. Anadarko will comply with this stipulation if the military determines there is any interference from our operations.

In addition, Anadarko will operate in accordance with NTL 2003-G10 to minimize the risk of vessel strikes to protected species and will report observations of injured or dead protected species. Anadarko will operate in accordance with NTL 2003-G11 to prevent intentional and/or accidental introduction of debris into the marine environment.

Related OCS Facilities and Operations

Three 6″ lease term pipelines will transport gas production from the subsea wellheads to subsea manifolds The production will then be transported via a proposed 8″ right-of-way pipeline approximately 12 miles in length to the floating production system (FPS) located in Mississippi Canyon Block 920. The 8″ pipeline is designed to transport a maximum of 500 MMCFD per day. Actual production rates over the life of the reservoir are estimated to range from ___ to ___ MMCFD. Shut-in time for the subsurface valve at the wellhead is 45 seconds. Shut-in time for the board valve is 45 seconds.

An electro-hydraulic steel tube (super duplex) umbilical, used to control and monitor the subsea facilities, will connect the subsea facilities to a Master Control Station on the FPS. The main umbilical will end in a subsea termination assembly adjacent to the manifold location. From there, in-field umbilicals will connect to the in-field termination assemblies at the well locations. The following chemicals will be pumped through the umbilicals from the Independence Hub: MEG, Methanol, corrosion inhibitor, scale inhibitor, paraffin inhibitor and paraffin dispersant.

The 8″ pipeline and the associated control umbilical will be permitted as a right-of-way pipeline.

Transportation Information

The recombined gas and condensate will depart MC 920 Hub platform via a 20" pipeline, approximately 140 miles in length, and travel to a proposed valve platform located at WD 68.

Hydrocarbons will depart the West Delta Block 68 platform via a proposed 20" and 24" pipeline, respectively, to be installed by Tennessee Gas Pipeline. MMS approved the applications for both lines on March 29, 2005.

The 24" pipeline (Segment Number 15034) will terminate at a subsea tie-in on an existing Tennessee Gas line in Grand Isle Block 32, and be transported to an existing platform in Louisiana state waters. The 20" line (Segment Number 15033) will travel to the federal/state boundary line in West Delta Block 16 and continue to the aforementioned platform in Louisiana state waters.

Production will depart the existing platform in Louisiana state waters via a common line that terminates at Tennessee's onshore compression/separation/storage facility located at Port Sulphur, Louisiana.

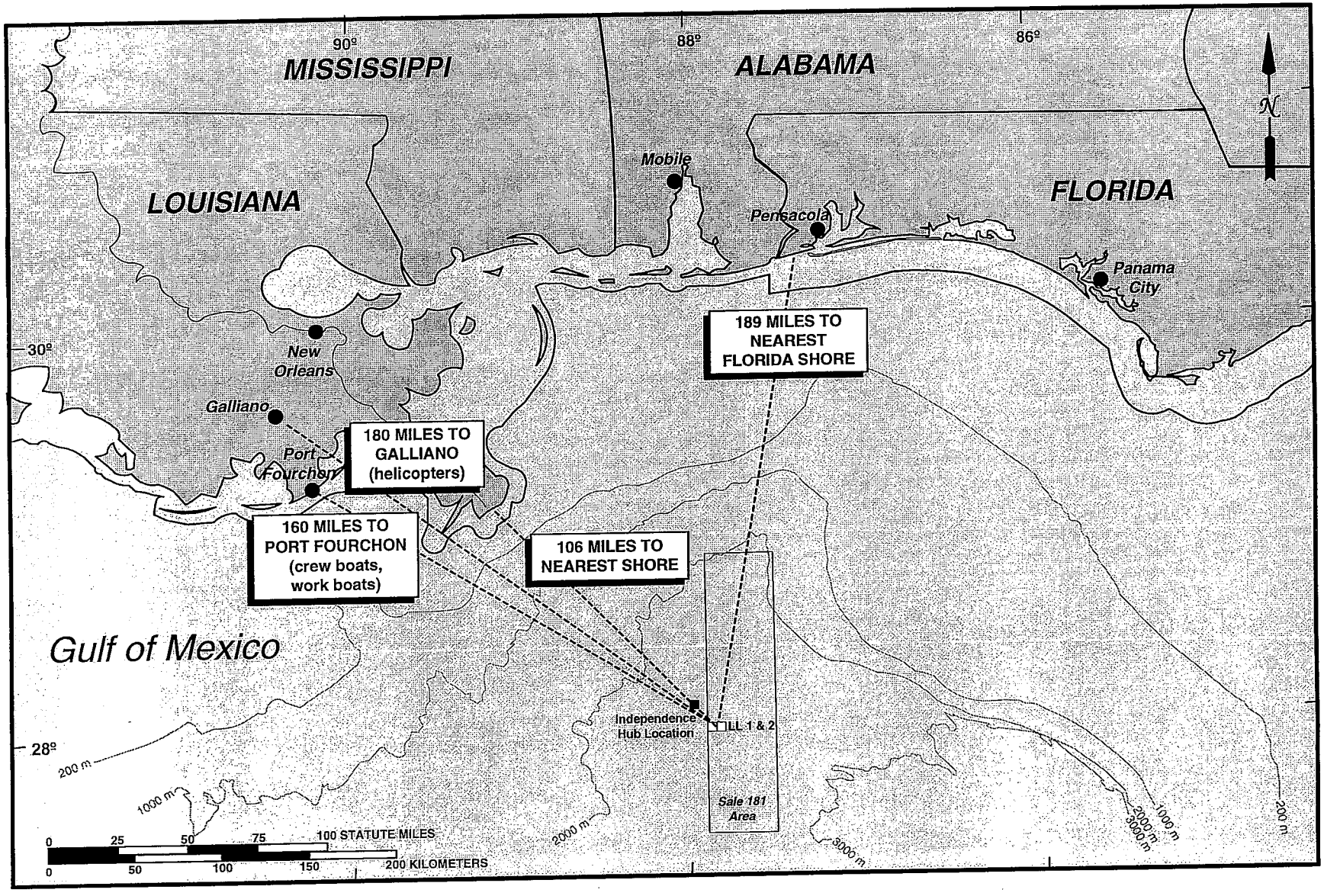
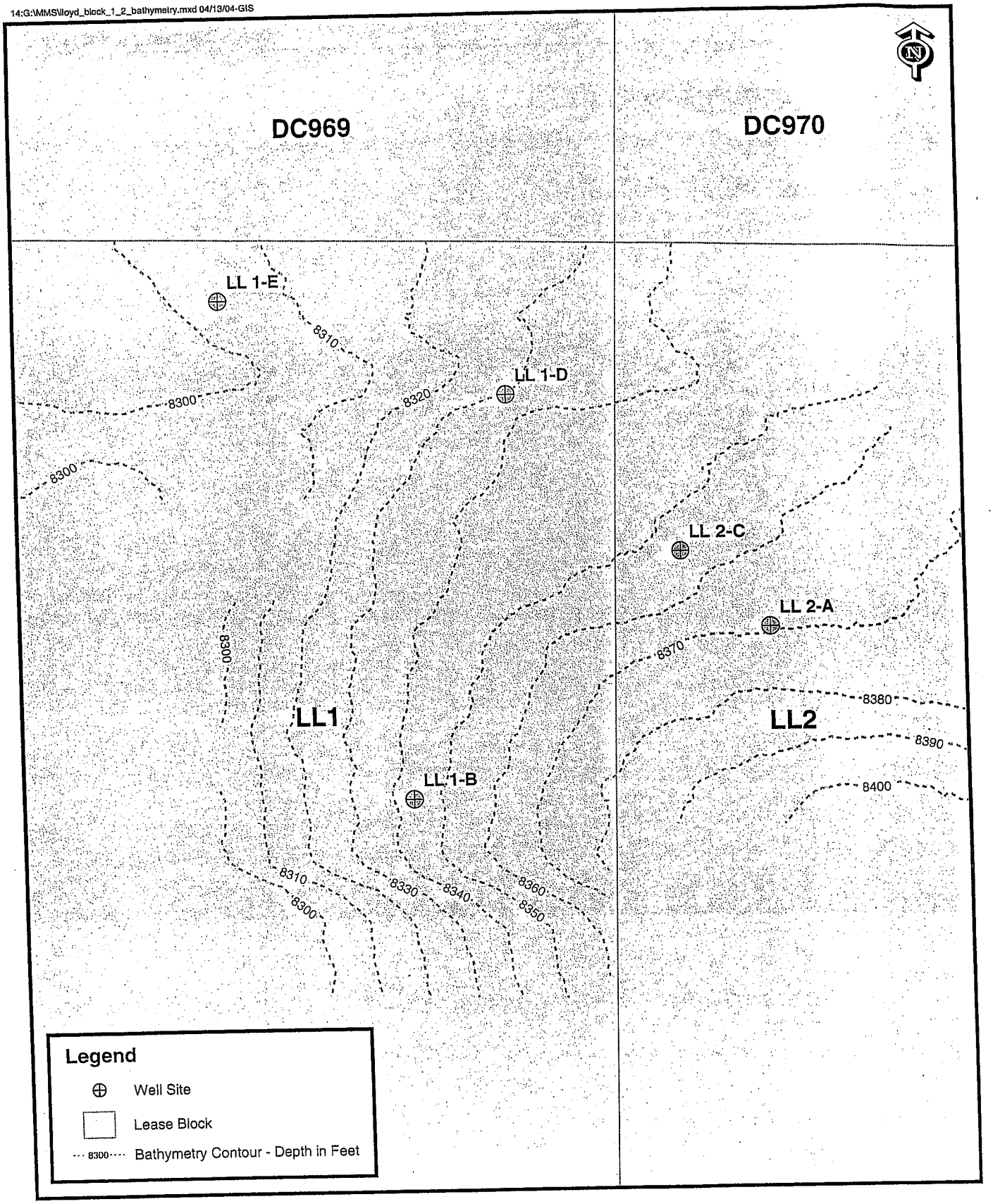


Figure 1. Location of Lloyd Ridge Blocks 1 and 2.

14:G:\MMS\lloyd_block_1_2_bathymetry.mxd 04/13/04-GIS



2,000 1,000 0 2,000 Feet

International Specialists in the Environment

Figure 2
Bathymetry and Well Sites

Murphy Exploration and Production Company
Initial Exploration Plan
Lloyd Ridge Blocks 1 and 2

APPENDIX C
GEOLOGICAL, GEOPHYSICAL, AND H_2S INFORMATION

Structure Contour Maps

Current structure contour maps drawn on the top of each prospective hydrocarbon sand, showing the entire lease block, the location of each proposed well, and the locations of geological cross-sections are included as **Attachment C-1**.

Interpreted 2-D and/or 3-D Seismic Lines

This information was submitted with the Initial Exploration Plan.

Geological Structure Cross-Sections

Not applicable for the proposed operations.

Shallow Hazards Report

A Shallow Hazards Report was previously submitted to MMS.

Shallow Hazards Assessment

The proposed operations will be conducted from previously approved surface locations.

High-Resolution Seismic Lines

The proposed operations will be conducted from previously approved surface locations.

Hydrogen Sulfide Information

MMS classified Lloyd Ridge Blocks 1 and 2 H_2S absent.

APPENDIX D
BIOLOGICAL AND PHYSICAL INFORMATION

Chemosynthetic Information

Activities proposed in this DOCD could disturb seafloor areas in water depths of 400 meters (1,312 feet) or greater; therefore, information for the potential of encountering chemosynthetic communities is included as follows:

Maps

No new drilling operations are proposed in this DOCD. Maps prepared using 3-D seismic data depicting bathymetry, seafloor, and shallow geological features, the surface locations of the three wells, and a radius circle of 1,500 feet around each proposed location were submitted previously in the Shallow Hazards Survey Report.

Analysis

Using 3-D seismic information, all seafloor features and areas that could be disturbed by the activities proposed in this plan have been identified. The likelihood of these proposed activities disturbing these seafloor and shallow geologic features is discussed in the following summary statement:

Existing Well Locations:
No Associated Anchors – No Disturbances within 1,500 feet of Chemosynthetic Communities

- No drilling operations are proposed in this DOCD; therefore, there will be no discharges of mud and/or cuttings.
- Features or areas that could support high-density chemosynthetic communities are **not** located within 500 feet of the surface locations of existing wells, the site of installation of the subsea trees.

Lease Flowlines, Manifolds, and Jumpers:
No Associated Anchors – No Disturbances between 250 and 500 feet of Chemosynthetic Communities

- Features or areas that could support high-density chemosynthetic communities are **not** located within 250 feet of any seafloor disturbances resulting from construction of the proposed flowlines, manifolds, and jumpers.

Topographic Features Information

The activities proposed in this plan will not affect a topographic feature.

Live Bottom (Pinnacle Trend) Information

These leases do not contain Live Bottom (Pinnacle Trend) Stipulations.

Remotely Operated Vehicle (ROV) Surveys

MMS did not invoke the ROV survey requirement for Lloyd Ridge Blocks 1 and 2. An ROV survey will not be required as no surface facilities will be installed on the blocks.

APPENDIX E
WASTES AND DISCHARGES INFORMATION

DISCHARGES

All discharges associated with development operations proposed in this plan will be in accordance with Minerals Management Service, U. S. Coast Guard and Environmental Protection Agency regulations.

Type of Waste	Amount to be Discharged	Maximum Discharge Rate	Treatment and/or Storage, Discharge Location and Discharge Method
Sanitary Wastes	233,600 gal/yr	640 gal/day	6″ overboard line hull southwest column (Note 1)
Domestic waste	1,226,400 gal/yr	3360 gal/day	6″ overboard line hull southwest column (Note 2)
Deck drainage	1,425,422 gal/yr	1,267,102 gal/day	2-66″ dia open drain sump caissons hull northeast and southwest columns (Note 3)
Uncontaminated fresh or seawater	18,250,000 gal/yr	5000 gal/min	16″ overboard caisson hull southwest column and 16″ overboard caisson hull southeast caisson (Note 4)
Desalinization Unit Water	5,533,400 gal/yr	15,160 gal/day	16″ overboard caisson hull southeast column (Note 5)
Uncontaminated bilge water	Up to 130 gpm into one sump pile	520 gal/min (emergency service only)	260 gal/min maximum only into each sump pile under emergency conditions. (Note 8)
Uncontaminated ballast water	2700 gal/min once a year for tank inspection	5400 gal/min (emergency service only)	Overboard discharge
Miscellaneous discharges to which treatment chemicals have been added	8,813,000,000 gal/year	29,376,000 gal/day	Seawater discharges to: 20″ overboard caisson on northwest hull column, 24″ overboard caisson northeast hull column and 16″overboard caisson on southeast hull column (Note 6)
Well treatment workover or completion fluids	Workover – 300 bbl/well Treatment – 250 bbl/well Completion – 3000 bbl/well	300 bbl/well	Discharge used fluids overboard, return excess to shore for credit

Note 1: Based on 40 men occupancy, 365 days/yr @ 10 flushes/day at 1.6 gal/flush

Note 2: Based on 40 men occupancy, 365 days/yr and 100 gal fresh water/day total per man less sanitary usage

Note 3: Based on Houma, LA, annual rainfall of 54″ and design rate of 2″/hr rate over main deck and hull columns with 10% coverage of production deck.

Note 4: Based on running both firewater pumps for 10 minutes per day 365 days per year, discharging 2500 gpm each overboard.

Note 5: Based on RO pump operating at 14 gpm, with 5000 gal/day fresh water production. Pump runs 365 days/yr.

Note 6: Based on 3-6800 gpm seawater lift pumps running 300 days per year

Note 7: Produced waters were included in the Atwater Valley Block 305/349 DOCD for the Independence Hub.

Note 8: Based on pumps in one active column running at full capacity. Pumps can be throttled to reduce flow as desired (air diaphragm pumps).

Disposal Table (Wastes to be Disposed of, Not Discharged)

Disposed wastes describe those wastes generated by the proposed activity that are disposed of by means other than by release into the water of the GOM at the site where they are generated. These wastes can be disposed of by offsite release, injection, encapsulation, or placement at either onshore or offshore permitted locations for the purposes of returning them back to the environment.

Type of Waste Approximate Composition	Amount*	Name/Location of Disposal Facility	Treatment and/or Storage, Transport and Disposal Method
Produced sand – Oil contaminated produced sand	400 bbls/y	Newpark Transfer Station (Venice, LA)	Transport in drums by vessel to shorebase for pickup.
Chemically treated Seawater/Freshwater – water to which chemical agents have been added.	20 bbl/well	U. S. Liquids, Fourchon, LA. or Newpark Environmental Services, Fourchon, LA.	Transport in barrels by vessel to shore base for pickup
Non-RCRA Exempt Solid Wastes/ Trash Plastic, paper, aluminum, food refuse	5 cubic meter/month	Galliano Waste Disposal, Galliano, LA.	Transport in disposal bags by vessel to shore base for pickup by municipal operations
Other RCRA – Exempt Wastes in Quantities > 50 bbl/month	NA	NA	NA
Hazardous Wastes in Reportable Quantities	NA	NA	NA
Norm Contaminated Wastes	NA	NA	NA

*Can be expressed as a volume, weight, or rate

APPENDIX F
OIL SPILL INFORMATION

Sub-Regional Oil Spill Response Plan

Anadarko is the only entity covered under the Gulf of Mexico Eastern Planning Area Sub-Regional Oil Spill Response Plan (Sub-Regional OSRP) approved by the Minerals Management Service on September 12, 2002, with the most recent amendment submitted February 9, 2005 and currently pending approval. Activities proposed in this DOCD will be covered by Anadarko's Sub-Regional OSRP.

Oil Spill Response Organizations Information

Anadarko's primary equipment provider is Clean Gulf Associates (CGA). The Marine Spill Response Corporation's (MSRC) Spill Team Area Responders (STARS) contractor network will provide the closest available personnel, as well as an MSRC supervisor, to operate the equipment.

Worst-Case Scenario Comparison

Activities proposed in this DOCD are considered far-shore (>10 miles from the shoreline). The worst-case discharge (WCD) proposed in this DOCD is calculated at 136 barrels of 43.1° condensate for a blowout of a well, or 13,812 barrels of 32.4° diesel from the largest single diesel storage tank rupture of the drillship.

Category	Proposed Activity WCD	Proposed Activity WCD	*Eastern Sub-Regional OSRP WCD	Eastern Sub-Regional OSRP WCD
Type of Activity	Blowout During Completion	Completion (Storage Tanks)	Production operations > 10 miles from shore	Drilling (Storage Tanks)
Spill Location (Area/Block)	LL 1 and 2	LL 1 and 2	DC 621	DC 621
Facility Designation	Wellbore	Drillship	SSWH	Drillship
Distance to Nearest Shoreline (miles)	106	106	97	97
Volume (barrels)	130 (wellbore)	13,812	456	13,812
	6 bbls (pipelines)		6 bbls (pipelines	
Type of Oil (crude, condensate, diesel)	Condensate	Diesel	Condensate	Diesel
API Gravity	43.1	32.4°	58	32.4°

*As there is not a worst-case discharge scenario for development/production operations for far-shore activities currently listed in Anadarko's Sub-Regional OSRP, the activities proposed in this DOCD do supersede the worst-case discharge scenario for development/production operations for far-shore activities from our approved Sub-Regional OSRP. Anadarko submitted these amendments to the Sub-Regional OSRP to the MMS GOMR on February 9, 2005.

Facility Tanks and Production Vessels

All facility tanks of 25 barrels or more:

Type of Storage Tank	Type of Facility	Largest Tank Capacity (bbls)	Number of Tanks	Total Capacity (bbls)	Fluid Gravity (API)
Fuel Oil (Marine Diesel)	Drillship	13,812	11	37,896	32.4°
Production	Subsea to Host PF	NA			

Spill Response Sites

Primary Response Equipment Location	Preplanned Staging Location
Houma, Louisiana	Port Fourchon, Louisiana

Diesel Oil Supply Vessels

Fuel for the drillship will be transported via a supply vessel as follows:

a. Size of fuel supply vessel:	230 feet
b. Carrying capacity of fuel supply vessel:	309,270 gallons
c. Frequency that fuel supply vessel will visit the facilities:	once per week
d. Routes that the fuel supply vessel will use to travel between the onshore support base and proposed facility:	6 miles from Port Fourchon to the mouth of Bayou Lafourche, then approximately 160 miles direct route through the open Gulf to Lloyd Ridge 1 and 2

Support Vessel Fuel Tanks

The estimated total storage capacity (maximum per class of vessel in the field at any given time) of fuel tanks on the vessels supporting activities in this Plan is as follows:

Types of Vessels	Number in Field Simultaneously	Estimated Maximum Fuel Tank Storage Capacity
a. Tug Boats	NA	NA

b. Supply Vessels	1	3500
c. Service Vessels	1	800
d. Crew Vessels	1	1500

Produced Liquid Hydrocarbons Transportation Vessels

Anadarko does not propose transfer of stored production and/or hydrocarbons from well testing activities under this DOCD.

Oil- and Synthetic-Based Drilling Fluids

NA

Oils Characteristics

Chemical and physical properties of the condensates, originating from these extremely dry gas reservoirs, were difficult to accurately characterize in the laboratory due to the high contamination of drilling fluids in the reservoir fluid samples. Results from the reservoir fluid analysis suggest that the reservoirs are expected to yield 2 BBL/MMCF for their producing lives.

Estimated API Gravity: 43.1
Estimated Bubble Point: 2940 psi
Estimated Viscosity: 1.89 cp@214 F
Anticipated Wax and Asphaltene Content: 4.6%

Anticipated Flash Stock Tank Liquid Analysis:

	Mole %	Weight
Hydrogen Sulfide	----------	----------
Carbon Dioxide	----------	----------
Nitrogen	----------	----------
Methane	0	
Ethane	0	
Propane	0.05	
Iso-butane	0	
n-butane	0	
Iso-pentane	0	
n-pentane	0.01	
Hexanes	0.01	
Heptanes Plus	99.93	

Anticipated Properties of Flash Gas:

Gas Calculated Specific Gravity (Air=1)	0.56
Gas Heat of Combustion (Btu/cuft@60F) Dry	1042

Gas Heat of Combustion (Btu/cuft@60F)Wet	1024
Gas Compressibility (@ 1atm & 60F) Z	0.9978

Blowout Scenario

The worst-case discharge scenario for the Mondo NW field development project is defined as an uncontrollable discharge to the surface through the 5-1/2" work string during completion operations in the reservoir. Since the proposed producing reservoir is currently behind pipe, this occurrence would likely take place after perforating operations. Mechanically speaking, this scenario assumes that the pipe rams function on the sub-sea BOP stack, but that the shear/blind rams, internal BOP and TIW systems fail. This would allow full wellbore fluid to move up the drillpipe and flow to atmospheric pressure at the surface of the drillship rig floor. It is also assumed that, due to the high rate of production expected during the uncontrollable flow period, the well would experience a failed gravel pack and eventually sand up within a week after the occurrence. The maximum condensate discharge is calculated to be 456 BCPD, or 3,192 barrels of condensate after a seven-day period.

Should a blowout occur, the formation types present in the GOM tend to bridge over in most cases. If the wellhead and BOP system are still in tact, wellbore intervention should be possible in as little as 7 to 10 days. In a relief well scenario, rig availability is typically not an issue. The time required to drill a relief well would be in the 30 to 60 day range depending on the well intersection depth.

Spill Response Discussion

For the purpose of NEPA analysis, the largest spill response originating from the proposed activity would be the loss of the largest diesel fuel storage tank from the drillship, or 13,812 barrels of diesel fuel with an API gravity of 32.4°. A discussion of the blowout scenario from this proposed activity is included in Anadarko's Sub-Regional OSRP.

Land Segment and Resource Identification

Trajectory of a spill and the probability of its impacting a land segment have been projected utilizing information in the MMS Oil Spill Risk Analysis Model (OSRAM) for the Eastern Gulf of Mexico as described in "Oil-Spill Risk Analysis: Gulf of Mexico Outer Continental Shelf (OCS), in Support of the Environmental Impact Statement (EIS) for Proposed Lease Sale 181" (OCS Report MMS 2001-007), using the average conditional probability for 3, 10, and 30 day impacts. Seasonal impacts were also considered. Lloyd Ridge Block 1 and 2 are located within Launch Area 8 of the OSRAM analysis. The results are shown in Table F-2.

The MMS OSRAM identifies a number of resources potentially affected by hydrocarbons occurring from a spill in Lloyd Ridge Blocks 1 and 2. For purposes of discussion, these resources are divided into three groups: offshore biological resources, coastal environments, and endangered and threatened species. These resources are identified in Anadarko's Eastern Planning Area Sub-Regional Oil Spill Response Plan.

Response

Anadarko will make every effort to respond to the worst-case discharge as effectively as possible. A description of the response equipment available to contain and recover the worst-case discharge is shown in Figure F-3. The list estimates individual times needed for procurement, load out, travel time to the site

and deployment. If appropriate, 5 sorties (10,000 gallons) from the DC-4 and 10 sorties (10,000 gallons) from each of the DC-3's should disperse approximately 8,571 barrels of oil.

For the purpose of response scenario discussion, the loss of the largest single tank on the drillship is assumed to be an instantaneous release. The estimated chemical and physical characteristics of diesel fuel are included in Figure F-1. An ADIOS model was run on a similar product (from the ADIOS oil catalog, a No. 2 fuel oil with an API gravity of 32.4°). The results indicate that 16% of the product would be evaporated/dispersed within 12 hours. Within 24 hours, 51% of the product would be evaporated/dispersed, leaving approximately 6,768 barrels on the water.

Anadarko's contingency plan for dealing with this worst-case discharge would be to activate its Spill Management Team and equipment resources as described in its Gulf of Mexico Eastern Planning Area Sub-Regional OSRP and provide continuous support for the duration of the event. Response resources are activated and supplemented according to need. These resources would remain engaged in the response until the incident is deemed complete or until released by Unified Command.

The following strategies may be employed:

1. Evacuate personnel, if necessary. Deploy Emergency Responders in an effort to preserve human life, if necessary.

2. Assess the damage and attempt to stop the source (if safe to do so) to reduce the amount of oil discharged.

3. Notify agencies.

4. Assess the amount of oil that has been spilled and calculate additional potential. A continuous aerial surveillance program would be used to assess the growth of the slick and the volume of oil on the water. Observations of the size of the slick on the water, combined with observations at the source, would be used to continually update the mass balance calculations. Additional potential to release fuel from the remaining tanks onboard would be determined by marine surveyors. Operations and Unified Command would continue to assess the adequacy of response equipment capacities based on this continually updated mass balance.

5. Convene Spill Management Team. Organize Unified Command and establish objectives and priorities.

6. Monitor the oil spill with aerial surveillance and obtain trajectories. If oil is seaward bound, away from land, discuss additional strategies with Unified Command.

7. If oil is moving in the direction of a shoreline, and weather conditions are favorable, request approval to utilize dispersants.

    a. Prior to commencing application operations, conduct an on-site survey in consultation with natural resource specialists to determine if any threatened or endangered species are present in the projected application area or otherwise at risk from dispersant application.

    b. Upon approval, mobilize one DC-4 and two DC-3's from Houma, with surveillance aircraft and spotter. Rotate aircraft, spraying the leading edge of the spill and working back to the

source. Monitor/sample for effectiveness (USCG SMART Team). Truck additional dispersants from Houston CGA stockpile to Houma, if necessary.

c. Dispersants are most effective when applied as soon after discharge as possible, since weathering of the oil decreases dispersant effectiveness. The estimated window of opportunity for most effective use of dispersants is within 48-72 hours post-release. The oil may still be dispersible after 72 hours on the water surface, but the effectiveness of dispersant use would likely be diminished after the oil has been on the water for more than three days. Ultimately, the USCG SMART monitoring protocol will be used to determine whether or not dispersant operations are effective.

d. Once the CGA HOSS barge is on location and in the skimming mode, dispersants would only be used on that portion of the oil that was not recovered by the mechanical recovery resources on-site.

8. Deploy offshore mechanical oil containment and recovery equipment. Attempt to recover as much oil at sea as possible, utilizing:

a. The CGA HOSS barge, positioned in a stationary mode, will be situated down-wind and down-current from location for long-duration, high-volume skimming. Based on average travel times, the HOSS barge could be on location within approximately 44 hours of the release. The de-rated skimming capacity of the HOSS barge alone is more than enough to recover 100% of the volume of oil released. However, only the oil encountered by a skimmer can be recovered. In order to maximize oil encounter rate, ocean boom will be deployed in a V-configuration in front of the HOSS barge to funnel oil to the skimmers. If necessary, temporary barges can be activated to support continuous skimming operations. (These barges arrive on-site at approximately the same time as the HOSS barge.) For an on-going release, multiple barges are deployed to provide for continuous off-loading of skimmer storage vessels and shuttling of recovered oil to an onshore waste handling facility. Sufficient barges are available to provide enough temporary storage for continuous recovery operations.

b. CGA's Fast Response Units (FRU) will arrive on-scene between 10 and 21 hours of the initial release. These skimmers operate downstream of the HOSS barge and are used to recover pockets and streamers of oil that may move past the large stationary skimmer. Each FRU has 200 barrels of on-board storage. Approval will be requested to decant water after gravity separation, through a hose forward of the skimmer, to optimize temporary storage capacity. A 43-inch Expandi-Boom will be utilized to concentrate oil so that it is thick enough to be skimmed.

9. Dispersants and FRU's would work daylight hours only. The HOSS barge can operate continuously, including night operations. All response vessels are designed to be able to remain offshore continuously throughout the response. Even if sea conditions prohibit effective skimming, these resources would remain offshore until skimming operations could be commenced again. Safety would remain the first priority.

10. Prepare Site-Specific Waste Management Plan, Site Safety Plan, Decontamination Plans, Communications and Medical Plans.

11. If oil becomes a threat to any shoreline, use data from the aerial surveillance, weather reports, and trajectories to direct onshore teams to deploy protection/containment boom, as written in Area Contingency Plans and as discussed with State and Federal On-scene Coordinators.

    a. Implement pre-designated strategies.

    b. Identify resources at risk in spill vicinity.

    c. Develop/implement appropriate protection tactics.

12. Establish Site-Specific Wildlife Rescue and Rehabilitation Plan.

The following types of additional support may be required for a blowout lasting 30 days.

- Additional OSRO personnel to relieve equipment operators
- Vessels for supporting offshore operations
- Field safety personnel
- Continued surveillance and monitoring of oil movement
- Helicopter, video cameras
- Infra red (night time spill tracking) capabilities
- Logistics needed to support equipment:
  - Parts, trailers, and mechanics to maintain skimmers and boom
  - Staging areas
  - Fueling facilities
  - Decontamination stations
  - Dispersant stockpile transported from Houston to Houma
  - Communications equipment and technicians
- Logistics needed to support responder personnel
  - Food
  - Berthing
  - Additional clothing/safety supplies
  - Decontamination stations
- Medical aid stations
- Safety personnel

Figure F-1

Worst Case Discharge Calculation
(Based on Fuel Storage Tank Rupture)

Calculations for On-Board Fuel Storage > 10 miles from shore:		**Blocks 1 and 2**
i.	Type of Storage Tanks	Diesel Fuel

ii.	Number of Tanks	11
iii.	Total Capacity, All Tanks	37,896 barrels
iv.	Largest Single Tank	13,812 barrels
v.	**WCD Total for Completion Operations (> 10 miles from shore)**	**13,812 barrels**

Figure F-2

Trajectory by Land Segment

Following are the average conditional probabilities (expressed as percent chance) that an oil spill starting at a particular launch area will contact an environmental resource or land segment within 3/10/30 days as included in the MMS Oil Spill Risk Analysis Model (OSRAM) in support of the Environmental Impact Statement (EIS) for Proposed Lease Sale 181 (OCS Report MMS 2001-007).

Area/Block	OCS-G	Launch Area	Land Segment and/or Resource	Conditional Probability (%)		
				3 days	10 days	30 days
Lloyd Ridge 1/2	23529	LA 08	U.S. Shorelines	-	7	34
Completion (106 miles from LA)		Eastern Planning Area	LOUISIANA/MISSISSIPPI/ALABAMA			
			Alabama State Offshore Waters	-	1	4
			Central Winter Menhaden Spawning Grounds	-	1	2
			Chandeleur Islands	-	1	5
			Flower Garden Banks	-	-	-
			Western Louisiana State Offshore Waters	-	5	11
			Eastern Louisiana State Offshore Waters	-	4	10
			Mississippi State Offshore Waters	-	-	2
			Mobile Bay	-	-	1
			Land Segment 11	-	-	1
			Land Segment 12	-	-	1
			Land Segment 13	-	-	1
			Land Segment 14	-	-	-
			Land Segment 15	-	-	-
			Land Segment 16	-	1	2
			Land Segment 17	-	1	2
			Land Segment 18	-	-	1
			Land Segment 19		2	3
			Land Segment 20		-	-
			Land Segment 21	-	1	3
			Land Segment 22	-	-	4
			Land Segment 23	-	-	3
			Land Segment 24	-	-	3
			FLORIDA			
			Big Bend Seagrass	-	-	3
			Dry Tortugas	-	-	-
			Florida Gulf Island National Seashore	-	-	3
			Florida Keys National Marine Sanctuary	-	-	1
			Florida Middle Ground	-	-	1
			Florida Panhandle State Offshore Waters	-	1	9
			Florida Peninsula State Offshore Waters	-	-	4
			Madison and Swanson Special Management Area	-	-	1
			Steamboat Lumps Special Management Area	-	-	1
			Land Segment 25	-	-	2
			Land Segment 26	-	-	2
			Land Segment 27	-	-	1
			Land Segment 28	-	-	1
			Land Segment 29	-	-	1
			Land Segment 30	-	-	-
			Land Segment 31	-	-	1
			Land Segment 32	-	-	1
			Land Segment 33	-	-	1
			Land Segment 34	-	-	-

			Land Segment 35	-	-	-
			Land Segment 36	-	-	-
			Land Segment 37	-	-	-
			Land Segment 38	-	-	-
			Land Segment 39	-	-	-
			Land Segment 40	-	-	-
			Land Segment 41	-	-	-
			Land Segment 42	-	-	-
			Land Segment 43	-	-	-

Figure F-3

WCD Scenario– BASED ON A SINGLE STORAGE TANK RUPTURE (106 miles from shore)
DP Drillship, Lloyd Ridge Blocks 1 and 2
13,812 bbls of diesel fuel oil, API Gravity 32.4°

Equipment Response Time to: Lloyd Ridge 1 and 2

	Equipment Type	Derated Capacity (BBLS)	Storage (BBLS)	No. of Units	Owner/Location	Initial Staging	Hours to Staging Area	TOTAL Time to Procure (1)	Time to Load Out (2)	Travel Time (Staging/ Spill) (3)	Time to Deploy (4)	TOTAL Estimated Response Time
A	DC 4 Spray Aircraft	--	--	1	ASI/Houma	Houma	0					
	DC 3 Spray Aircraft	--	--	1	ASI/Houma	Houma	0					
	Spotter Plane			1	ASI/Houma	Houma	0					
	Spotter Personnel			2	ASI/Houma	Houma	1	1	1	1	0	3
	Dispersant				CGA/Houma	Houma	0					
B	HOSS Barge	43,000	4,130	1	CGA/Houma	Houma	1					
	Operator			12	STARS*	Houma	2					
	Tugs			3	CENAC/Houma	Houma	4	4	2	37	1	44
C	FRU/Expandi-Boom	6,800	400	2	CGA/Fort Jackson	Venice	0.5					
	Operators			12	STARS*	Venice	2					
	Utility Boat			2	Vessel of Opp.	Venice	2					
	Crew Boat			2	Vessel of Opp.	Venice	2	2	1	15	1	19
D	FRU/Expandi-Boom	3,400	200	1	CGA/Pascagoula	Pascagoula	0					
	Operators			6	STARS*	Pascagoula	2					
	Utility Boat			1	Vessel of Opp.	Pascagoula	2					
	Crew Boat			1	Vessel of Opp.	Pascagoula	2	2	1	17	1	21
E	Grand Bay Response Vessel	5,000	65	1	CGA/Fort Jackson	Venice	0.5					
	Operators			3	STARS*	Venice	2	2	0.5	7.5	0	10
F	INITIAL SUPPORT											
	Spotter Helo	--	--	1	PHI/Venice	Spill Site	1	1	--	1	--	2
	Surveillance Helo	--	--	1	PHI/Venice	Spill Site	1	1	--	1	--	2
	Hand Held Radios	--	--	30	STARS*	Venice	1.5	1.5	--	1	--	2.5
	Ocean Barge		23,000	1	CENAC/Houma	Houma	4	4	0	37	1	42
	TOTAL	55,140	27,795									

*STARS contractor called out by MSRC

Figure F-3 *(continued)*

OPERATIONAL LIMITATIONS OF RESPONSE EQUIPMENT	
HOSS Barge	7 foot seas
FRU	4 foot seas
Expandi-Boom	6 foot seas, 20 knot winds
Dispersants	Winds more than 25 knots, Visibility less than 3 nautical miles, or Ceiling less than 1,000 feet

Pollution Prevention Measures

Anadarko does not propose safety, pollution prevention, or early spill detection measures beyond those required by 30 CFR 250. Best management practices for safety, pollution prevention, and early spill detection measures are discussed in Section 6 of the Sub-Regional OSRP.

APPENDIX G
AIR EMISSIONS INFORMATION

Air Emissions Information

Screen Procedures for DOCD's	Yes	No
Is any calculated Complex Total (CT) Emission amount (tons) associated with your proposed exploration activities more than 90% of the amounts calculated using the following formulas: $CT = 3400D^{2/3}$ for CO, and $CT = 33.3D$ for the other air pollutants (where D = distance to shore in miles)?		X
Do your emission calculations include any emission reduction measures or modified emission factors?		X
Does or will the facility complex associated with your proposed development and production activities process production from eight or more wells?	X	
Do you expect to encounter H_2S at concentrations greater than 20 parts per million (ppm)?		X
Do you propose to flare or vent natural gas in excess of the criteria set forth under 250.1105(a)(2) and (3)?		X
Do you propose to burn produced hydrocarbon liquids?		X
Are your proposed development and production activities located within 25 miles from shore?		X
Are your proposed development and production activities located within 200 kilometers of the Breton Wilderness Area?		X

An Air Quality Review is enclosed as **Attachment G-1.**

This information was calculated by: Judy Davidson
Anadarko Petroleum Corporation
(832) 636-8766
Judy_davidson@anadarko.com

Based on this data, emissions from the proposed activities will not cause any significant effect on onshore air quality.

GULF OF MEXICO AIR EMISSION CALCULATIONS
INSTRUCTIONS

General

This document (DOCD_AQ.XLS) was prepared through the cooperative efforts of those professionals in the oil industry including the API/OOC Gulf of Mexico Air Quality Task Force, and the Minerals Management service (MMS), who deal with air emission issues. This document is intended to standardize the way we estimate our potential air emissions for 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 file gives the basis for the emission factors used in the emission spreadsheet as well as some general instructions.
The following files, Title Sheet, Factors Sheet,Emissions Spreadsheet,and Summary Sheet 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. A sulfur content table was added in 1996. A change in this table will automatically revise the SOx factor which will revise emissions.

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 revise the ppm in the sulfur able immediately below the factors table.

Diesel-Fired Prime Movers

1. Diesel sulfur level 0.4% by wt. If your sulfur content is different change % wt. in the sulfur table.

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 the emissions from all vessels associated with your activities for their time of operation within a 25 mile radius of your facility.

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. The assumed NG Sulfur content is 2000 gr. per mcf(3.33 ppm). You may revise the sulfur content by changing the ppm in the sulfur table, if your content is different.

2. The VOCs emissions are based on total non-methane HCs.

Gas Flares

1. It is assumed that the flare is non-smoking.

2. A heating value of 1050 btu/cu. ft. for NG is assumed.

3. The sulfur content assumed is 2000 grains /mmscf (3.33 ppm). If your concentration is different then revise the ppm in the sulfur table, or you may use the following formula:

   H2S flared (lbs/hr) = Gas flared (cu ft/hr) X ppm H2S X 34/(379X1000000)

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

Liquid Flares

1. Assumes 1% by wt Sulfur maximum in the crude oil. Revise the percent sulfur in the sulfur table if your value is different.

2. VOCs equal non-methane HCs

3. Particulate emissions assumes Grade 5 oil.

Tanks

1. Tank emissions assumes uncontrolled fixed roof tank.

2. The EPA TANKS model is an acceptable alternative. If you use TANKS you must provide sufficient information for MMS to verify your results.

Fugitives

1. Fugitives are based on the 1995 Star Environmental Report. It requires that you count or estimate your components.The factor is based on average leak rate for light oil / gas facility.

Glycol Dehydrator Vent

1. The rate of the gas being dehydrated (throughput) 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.

<u>Emissions Spreadsheets</u> (EMISSIONS1 through EMISSIONS5)

The emissions from an operation should be presented for a calendar year (1999, 2000, etc.). The operation may include production only or production in conjunction with other activities such as drilling or construction operations. For additional years the Emissions Spreadsheet is renamed Emissions 2, 3, etc. The different operating parameters for each year should entered to calculate revised emissions for that 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 it is possible to delete lines for non-applicable

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. The first line (Row 7) of the summary sheet is linked to the yearly totals in the Emissions1 Spreadsheet. The second line (Row 8) is referenced to Emissions2 Spreadsheet. The third line (Row 9) is referenced to Emissions3, Row 10 to Emissions 4, Row 11 to Emissions 5. If more years of calculations are necessary to reach a constant then a spreadsheet can be copied and linked to the summary sheet for future years. Once emissions are constant the values are carried to the end of the ten year period.

The **Paperwork Reduction Act of 1995** (44 U.S.C. Chapter 35) requires us to inform you that MMS collects this information as part of an applicant's DOCD submitted for MMS approval. We use the information to facilitate our review and data entry for OCS plans. We will protect proprietary data according to the Freedom of Information Act and 30 CFR 250.196. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid Office of Management and Budget (OMB) control number. Responses are mandatory. The reporting burden for this form is included in the burden for preparing DOCDs. We estimate that burden to average 580 hours per response, including the time for reviewing instructions, gathering and maintaining the data, and completing and reviewing the form. Direct comments on the burden estimate or any other aspect of this form to the Information Collection Clearance Office, Mail Stop 4230, Minerals Management Service, 1849 C Street, N. W., Washington, DC 20240.

DOCD AIR QUALITY SCREENING CHECKLIST

OMB Control No. 1010-0049
OMB Approval Expires: August 31, 2006

COMPANY	Anadarko Petroleum Corporation
AREA	Lloyd Ridge
BLOCK	1 and 2
LEASE	OCS-G 10486/10487
PLATFORM	MC 920 "A"
WELL	LL 1 No. 1 ST1, LL 1 No. 2, LL 2 No. 2
COMPANY CONTACT	Judy Davidson
TELEPHONE NO.	832-636-8766
REMARKS	Complete 3 wells & install 3 lease pipelines

LEASE TERM PIPELINE CONSTRUCTION INFORMATION:

YEAR	NUMBER OF PIPELINES	TOTAL NUMBER OF CONSTRUCTION DAYS
2005		
2006		
2007	3	10
2008		
2009		
2010		
2011		
2012		
2013		
2014		
2015		

AIR EMISSION COMPUTATION FACTORS

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	PM	SOx	NOx	VOC	CO	REF.	DATE
NG Turbines	gms/hp-hr		0.00247	1.3	0.01	0.83	AP42 3.2-1& 3.1-1	10/96
NG 2-cycle lean	gms/hp-hr		0.00185	10.9	0.43	1.5	AP42 3.2-1	10/96
NG 4-cycle lean	gms/hp-hr		0.00185	11.8	0.72	1.6	AP42 3.2-1	10/96
NG 4-cycle rich	gms/hp-hr		0.00185	10	0.14	8.6	AP42 3.2-1	10/96
Diesel Recip. < 600 hp.	gms/hp-hr	1	1.468	14	1.12	3.03	AP42 3.3-1	10/96
Diesel Recip. > 600 hp.	gms/hp-hr	0.32	1.468	11	0.33	2.4	AP42 3.4-1	10/96
Diesel Boiler	lbs/bbl	0.084	2.42	0.84	0.008	0.21	AP42 1.3-12,14	9/98
NG Heaters/Boilers/Burners	lbs/mmscf	7.6	0.593	100	5.5	84	P42 1.4-1, 14-2, & 14	7/98
NG Flares	lbs/mmscf		0.593	71.4	60.3	388.5	AP42 11.5-1	9/91
Liquid Flaring	lbs/bbl	0.42	6.83	2	0.01	0.21	AP42 1.3-1 & 1.3-3	9/98
Tank Vapors	lbs/bbl				0.03		E&P Forum	1/93
Fugitives	lbs/hr/comp.				0.0005		API Study	12/93
Glycol Dehydrator Vent	lbs/mmscf				6.6		La. DEQ	1991
Gas Venting	lbs/scf				0.0034			

Sulfur Content Source	Value	Units
Fuel Gas	3.33	ppm
Diesel Fuel	0.4	% weight
Produced Gas(Flares)	3.33	ppm
Produced Oil (Liquid Flaring)	1	% weight

AIR EMISSION CALCULATIONS - FIRST YEAR

COMPANY	AREA	BLOCK	LEASE	PLATFORM	WELL		CONTACT	PHONE	REMARKS
Anadarko Petroleum Corp	Lloyd Ridge	1 and 2	OCS-G 10486/1	MC 920 "A"	LL 1 No. 1 ST1, LL 1 No. 2, LL 2 No. 2		Judy Davidson	832-636-8766	#REFI

OPERATIONS	EQUIPMENT	RATING	MAX. FUEL	ACT. FUEL	RUN TIME		MAXIMUM POUNDS PER HOUR					ESTIMATED TONS				
	Diesel Engines	HP	GAL/HR	GAL/D												
	Nat. Gas Engines	HP	SCF/HR	SCF/D												
	Burners	MMBTU/HR	SCF/HR	SCF/D	HR/D	DAYS	PM	SOx	NOx	VOC	CO	PM	SOx	NOx	VOC	CO
DRILLING	PRIME MOVER>600hp diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	PRIME MOVER>600hp diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	PRIME MOVER>600hp diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	PRIME MOVER>600hp diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	BURNER diesel	0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	AUXILIARY EQUIP<600hp diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(crew)	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(supply)	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(tugs)	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PIPELINE INSTALLATION	PIPELINE LAY BARGE diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SUPPORT VESSEL diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	PIPELINE BURY BARGE diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SUPPORT VESSEL diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(crew)	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(supply)	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FACILITY INSTALLATION	DERRICK BARGE diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MATERIAL TUG diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(crew)	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(supply)	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PRODUCTION	RECIP.<600hp diesel - Crane	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	RECIP <600 hp diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	RECIP.>600hp diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SUPPORT VESSEL diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	TURBINE nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	RECIP.2 cycle lean nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	RECIP.4 cycle lean nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	RECIP.4 cycle rich nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	BURNER nat gas	0	0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MISC.	BPD	SCF/HR	COUNT												
	TANK-	0			0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	FLARE-		0		0	0				0.00					0.00	
	PROCESS VENT-		0		0	0				0.00					0.00	
	FUGITIVES-			0.0		0				0.00					0.00	
	GLYCOL STILL VENT-		0		0	0				0.00					0.00	
DRILLING WELL TEST	OIL BURN	0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	GAS FLARE		0		0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
2005 YEAR TOTAL							0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EXEMPTION CALCULATION	DISTANCE FROM LAND IN MILES											3529.80	3529.80	3529.80	3529.80	76152.27
	106.0															

AIR EMISSIONS CALCULATIONS - SECOND YEAR

COMPANY	AREA	BLOCK	LEASE	PLATFORM	WELL	CONTACT	PHONE	REMARKS
Anadarko Petroleum Cor	Lloyd Ridge	1 and 2	OCS-G 10486/	MC 920 "A"	LL 1 No. 1 ST1, LL 1 No. 2, LL 2 No. 2	Judy Davidson	832-636-8766	#REFI

OPERATIONS	EQUIPMENT	RATING	MAX. FUEL	ACT. FUEL	RUN TIME		MAXIMUM POUNDS PER HOUR					ESTIMATED TONS				
	Diesel Engines	HP	GAL/HR	GAL/D												
	Nat. Gas Engines	HP	SCF/HR	SCF/D												
	Burners	MMBTU/HR	SCF/HR	SCF/D	HR/D	DAYS	PM	SOx	NOx	VOC	CO	PM	SOx	NOx	VOC	CO
COMPLETION	PRIME MOVER>600hp diesel	61800	2984.94	71638.56	24	120	43.56	199.83	1497.36	44.92	326.70	62.73	287.75	2156.19	64.69	470.44
	PRIME MOVER>600hp diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	PRIME MOVER>600hp diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	PRIME MOVER>600hp diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	BURNER diesel	0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	AUXILIARY EQUIP<600hp diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(crew)	3600	173.88	4173.12	6	137	2.54	11.64	87.22	2.62	19.03	1.04	4.78	35.85	1.08	7.82
	VESSELS>600hp diesel(supply)	3600	173.88	4173.12	10	69	2.54	11.64	87.22	2.62	19.03	0.88	4.02	30.09	0.90	6.57
	VESSELS>600hp diesel(tugs)	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PIPELINE INSTALLATION	PIPELINE LAY BARGE diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SUPPORT VESSEL diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	PIPELINE BURY BARGE diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SUPPORT VESSEL diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(crew)	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(supply)	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FACILITY INSTALLATION	DERRICK BARGE diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MATERIAL TUG diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(crew)	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp position tug	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp position tug	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp position tug	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel (supply)	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp tug barge piles	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp tug mooring	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp tug mooring	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PRODUCTION	RECIP.<600hp diesel - crane	0	0	0.00	0		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	RECIP.<600hp diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	RECIP.>600hp diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SUPPORT VESSEL diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	TURBINE nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	RECIP 2 cycle lean nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	RECIP 4 cycle lean nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	RECIP 4 cycle rich nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	BURNER nat gas	0	0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MISC.	BPD	SCF/HR	COUNT												
	TANK-	0			0	0				0.00					0.00	
	FLARE-		0		0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	PROCESS VENT-		0		0	0				0.00					0.00	
	FUGITIVES-			0.0		0				0.00					0.00	
	GLYCOL STILL VENT-		0		0	0				0.00					0.00	
DRILLING	OIL BURN	0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WELL TEST	GAS FLARE		0		0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
2006	YEAR TOTAL						48.63	223.11	1671.81	50.15	364.76	64.64	296.55	2222.14	66.66	484.83
EXEMPTION CALCULATION	DISTANCE FROM LAND IN MILES											3529.80	3529.80	3529.80	3529.80	76152.27
	106.0															

AIR EMISSIONS CALCULATIONS - THIRD YEAR

COMPANY	AREA	BLOCK	LEASE	PLATFORM	WELL		CONTACT	PHONE	REMARKS
Anadarko Petroleum Cor	Lloyd Ridge	1 and 2	OCS-G 10486/	MC 920 "A"	LL 1 No. 1 ST1, LL 1 No. 2, LL 2 No. 2		Judy Davidson	832-636-8766	#REF!

OPERATIONS	EQUIPMENT	RATING	MAX. FUEL	ACT. FUEL	RUN TIME		MAXIMUM POUNDS PER HOUR					ESTIMATED TONS				
	Diesel Engines	HP	GAL/HR	GAL/D												
	Nat. Gas Engines	HP	SCF/HR	SCF/D												
	Burners	MMBTU/HR	SCF/HR	SCF/D	HR/D	DAYS	PM	SOx	NOx	VOC	CO	PM	SOx	NOx	VOC	CO
COMPLETION	PRIME MOVER>600hp diesel	61800	2984.94	71638.56	0	0	43.56	199.83	1497.36	44.92	326.70	0.00	0.00	0.00	0.00	0.00
	PRIME MOVER>600hp diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	PRIME MOVER>600hp diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	PRIME MOVER>600hp diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	BURNER diesel	0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	AUXILIARY EQUIP<600hp diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(crew)	3600	173.88	4173.12	0	0	2.54	11.64	87.22	2.62	19.03	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(supply)	3600	173.88	4173.12	0	0	2.54	11.64	87.22	2.62	19.03	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(tugs)	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PIPELINE INSTALLATION	PIPELINE LAY BARGE diesel	54300	2622.69	62944.56	24	10	38.27	175.58	1315.64	39.47	287.05	4.59	21.07	157.88	4.74	34.45
	SUPPORT VESSEL diesel	3600	173.88	4173.12	24	10	2.54	11.64	87.22	2.62	19.03	0.30	1.40	10.47	0.31	2.28
	PIPELINE BURY BARGE diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SUPPORT VESSEL diesel	3600	173.88	4173.12	24	3	2.54	11.64	87.22	2.62	19.03	0.09	0.42	3.14	0.09	0.69
Lease Term 3 lines	VESSELS>600hp diesel(crew)	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LL 1 and 2	VESSELS>600hp diesel(supply)	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PRODUCTION	RECIP.<600hp diesel (crane)	490	23.667	568.01	2	184	1.08	1.58	15.11	1.21	3.27	0.20	0.29	2.78	0.22	0.60
	RECIP.<600hp diesel (crane)	490	23.667	568.01	2	184	1.08	1.58	15.11	1.21	3.27	0.20	0.29	2.78	0.22	0.60
	RECIP.<600hp diesel (fire pump)	420	20.286	486.86	1	184	0.93	1.36	12.95	1.04	2.80	0.09	0.12	1.19	0.10	0.26
	RECIP.<600hp diesel (fire pump)	420	20.286	486.86	1	184	0.93	1.36	12.95	1.04	2.80	0.09	0.12	1.19	0.10	0.26
	RECIP.>600hp diesel (aux gen)	1316	63.5628	1525.51	24	12	0.93	4.26	31.89	0.96	6.96	0.13	0.61	4.59	0.14	1.00
	RECIP.>600hp diesel (emer gen)	843	40.7169	977.21	24	12	0.59	2.73	20.43	0.61	4.46	0.09	0.39	2.94	0.09	0.64
	SUPPORT VESSEL diesel	3600	173.88	4173.12	18	26	2.54	11.64	87.22	2.62	19.03	0.60	2.74	20.52	0.62	4.48
	TURBINE nat gas	12362	117735.688	2825656.51	24	184		0.07	35.40	0.27	22.60		0.15	78.16	0.60	49.90
	TURBINE nat gas	12362	117735.688	2825656.51	24	184		0.07	35.40	0.27	22.60		0.15	78.16	0.60	49.90
	TURBINE nat gas	12362	117735.688	2825656.51	24	184		0.07	35.40	0.27	22.60		0.15	78.16	0.60	49.90
	TURBINE nat gas	12362	117735.688	2825656.51	24	184		0.07	35.40	0.27	22.60		0.15	78.16	0.60	49.90
	TURBINE nat gas	12362	117735.688	2825656.51	24	184		0.07	35.40	0.27	22.60		0.15	78.16	0.60	49.90
	TURBINE nat gas	7700	73334.8	1760035.20	24	184		0.04	22.05	0.17	14.08		0.09	48.68	0.37	31.08
	TURBINE nat gas	7700	73334.8	1760035.20	24	184		0.04	22.05	0.17	14.08		0.09	48.68	0.37	31.08
	TURBINE nat gas	7700	73334.8	1760035.20	24	184		0.04	22.05	0.17	14.08		0.09	48.68	0.37	31.08
	RECIP.2 cycle lean nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	RECIP.4 cycle lean nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	RECIP.4 cycle rich nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	BURNER nat gas	0	0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MISC.	BPD	SCF/HR	COUNT												
	TANK-	0			0	0				0.00					0.00	
	FLARE-		0		0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	PROCESS VENT-		0		0	0				0.00					0.00	
	FUGITIVES-			0.0		0				0.00					0.00	
	GLYCOL STILL VENT-		0		0	0				0.00					0.00	
DRILLING	OIL BURN	0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WELL TEST	GAS FLARE		0		0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
2007 YEAR TOTAL							100.05	446.94	3600.69	105.40	887.69	6.37	28.48	744.32	10.75	388.01
EXEMPTION CALCULATION	DISTANCE FROM LAND IN MILES											3529.80	3529.80	3529.80	3529.80	76152.27
	106.0															

AIR EMISSIONS CALCULATIONS - FOURTH YEAR

COMPANY	AREA	BLOCK	LEASE	PLATFORM	WELL		CONTACT	PHONE	REMARKS
Anadarko Petroleum Corp	Lloyd Ridge	1 and 2	OCS-G 10486/1	MC 920 "A"	LL 1 No. 1 ST1, LL 1 No. 2, LL 2 No. 2		Judy Davidson	832-636-8766	#REF!

OPERATIONS	EQUIPMENT	RATING	MAX. FUEL	ACT. FUEL	RUN TIME		MAXIMUM POUNDS PER HOUR					ESTIMATED TONS				
	Diesel Engines	HP	GAL/HR	GAL/D												
	Nat. Gas Engines	HP	SCF/HR	SCF/D												
	Burners	MMBTU/HR	SCF/HR	SCF/D	HR/D	DAYS	PM	SOx	NOx	VOC	CO	PM	SOx	NOx	VOC	CO
PIPELINE INSTALLATION	PIPELINE LAY BARGE diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SUPPORT VESSEL diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	PIPELINE BURY BARGE diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SUPPORT VESSEL diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(crew)	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(supply)	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FACILITY INSTALLATION	DERRICK BARGE diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MATERIAL TUG diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(crew)	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(supply)	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PRODUCTION	RECIP.<600hp diesel (crane)	490	23.667	568.01	2	156	1.08	1.58	15.11	1.21	3.27	0.17	0.25	2.36	0.19	0.51
	RECIP.<600hp diesel (crane)	490	23.667	568.01	2	156	1.08	1.58	15.11	1.21	3.27	0.17	0.25	2.36	0.19	0.51
	RECIP.<600hp diesel (fire pump)	420	20.286	486.86	1	52	0.93	1.36	12.95	1.04	2.80	0.02	0.04	0.34	0.03	0.07
	RECIP.<600hp diesel (fire pump)	420	20.286	486.86	1	52	0.93	1.36	12.95	1.04	2.80	0.02	0.04	0.34	0.03	0.07
	RECIP.>600hp diesel (aux gen)	1316	63.5628	1525.51	24	15	0.93	4.26	31.89	0.96	6.96	0.17	0.77	5.74	0.17	1.25
	RECIP.>600hp diesel (emer gen)	843	40.7169	977.21	24	15	0.59	2.73	20.43	0.61	4.46	0.11	0.49	3.68	0.11	0.80
	SUPPORT VESSEL diesel	3600	173.88	4173.12	18	52	2.54	11.64	87.22	2.62	19.03	1.19	5.46	40.93	1.23	8.93
	TURBINE nat gas	12362	117735.688	2825656.51	24	365		0.07	35.40	0.27	22.60		0.29	155.04	1.19	98.99
	TURBINE nat gas	12362	117735.688	2825656.51	24	365		0.07	35.40	0.27	22.60		0.29	155.04	1.19	98.99
	TURBINE nat gas	12362	117735.688	2825656.51	24	365		0.07	35.40	0.27	22.60		0.29	155.04	1.19	98.99
	TURBINE nat gas	12362	117735.688	2825656.51	24	365		0.07	35.40	0.27	22.60		0.29	155.04	1.19	98.99
	TURBINE nat gas	12362	117735.688	2825656.51	24	365		0.07	35.40	0.27	22.60		0.29	155.04	1.19	98.99
	TURBINE nat gas	7700	73334.8	1760035.20	24	365		0.04	22.05	0.17	14.08		0.18	96.57	0.74	61.66
	TURBINE nat gas	7700	73334.8	1760035.20	24	365		0.04	22.05	0.17	14.08		0.18	96.57	0.74	61.66
	TURBINE nat gas	7700	73334.8	1760035.20	24	365		0.04	22.05	0.17	14.08		0.18	96.57	0.74	61.66
	RECIP.2 cycle lean nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	RECIP.4 cycle lean nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	RECIP.4 cycle rich nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	BURNER nat gas	0	0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MISC.	BPD	SCF/HR	COUNT												
	TANK-	0			0	0				0.00					0.00	
	FLARE-		0		0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	PROCESS VENT-		0		0	0				0.00					0.00	
	FUGITIVES-			0.0		0				0.00					0.00	
	GLYCOL STILL VENT-		0		0	0				0.00					0.00	
DRILLING	OIL BURN	0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WELL TEST	GAS FLARE		0		0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
2008 - 2027 YEAR TOTAL							8.07	24.97	438.79	10.55	197.82	1.85	9.31	1120.67	10.13	692.07
EXEMPTION CALCULATION	DISTANCE FROM LAND IN MILES											3529.80	3529.80	3529.80	3529.80	76152.27
	106.0															

AIR EMISSIONS CALCULATIONS - FIFTH YEAR

COMPANY	AREA	BLOCK	LEASE	PLATFORM	WELL		CONTACT	PHONE	REMARKS
Anadarko Petroleum Corp	Lloyd Ridge	1 and 2	OCS-G 10486/1	MC 920 "A"	LL 1 No. 1 ST1, LL 1 No. 2, LL 2 No. 2		Judy Davidson	832-636-8766	#REF!

OPERATIONS	EQUIPMENT	RATING	MAX. FUEL	ACT. FUEL	RUN TIME		MAXIMUM POUNDS PER HOUR					ESTIMATED TONS				
	Diesel Engines	HP	GAL/HR	GAL/D												
	Nat. Gas Engines	HP	SCF/HR	SCF/D												
	Burners	MMBTU/HR	SCF/HR	SCF/D	HR/D	DAYS	PM	SOx	NOx	VOC	CO	PM	SOx	NOx	VOC	CO
DRILLING	PRIME MOVER>600hp diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	PRIME MOVER>600hp diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	PRIME MOVER>600hp diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	PRIME MOVER>600hp diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	BURNER diesel	0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	AUXILIARY EQUIP<600hp diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(crew)	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(supply)	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(tugs)	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PIPELINE INSTALLATION	PIPELINE LAY BARGE diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SUPPORT VESSEL diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	PIPELINE BURY BARGE diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SUPPORT VESSEL diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(crew)	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(supply)	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FACILITY INSTALLATION	DERRICK BARGE diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MATERIAL TUG diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(crew)	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(supply)	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PRODUCTION	RECIP.<600hp diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	RECIP.>600hp diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SUPPORT VESSEL diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	TURBINE nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	RECIP.2 cycle lean nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	RECIP.4 cycle lean nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	RECIP.4 cycle rich nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	BURNER nat gas	0	0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MISC.	BPD	SCF/HR	COUNT												
	TANK-	0			0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	FLARE-		0		0	0				0.00					0.00	
	PROCESS VENT-		0		0	0				0.00					0.00	
	FUGITIVES-			0.0		0				0.00					0.00	
	GLYCOL STILL VENT-		0		0	0				0.00					0.00	
DRILLING WELL TEST	OIL BURN	0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	GAS FLARE		0		0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
#VALUE! YEAR TOTAL							0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EXEMPTION CALCULATION	DISTANCE FROM LAND IN MILES											0.00	0.00	0.00	0.00	0.00
	0.0															

AIR EMISSION CALCULATIONS

OMB Control No. 1010-0049
OMB Approval Expires: August 31, 2006

COMPANY	AREA	BLOCK	LEASE	PLATFORM	WELL
Anadarko Petrol	Lloyd Ridge	1 and 2	OCS-G 10486/10487	MC 920 "A"	LL 1 No. 1 ST1, LL 1 N

Year	Emitted Substance				
	PM	SOx	NOx	VOC	CO
2006	64.64	296.55	2222.14	66.66	484.83
2007	6.37	28.48	744.32	10.75	388.01
2008	1.85	9.31	1120.67	10.13	692.07
2009	1.85	9.31	1120.67	10.13	692.07
2010	1.85	9.31	1120.67	10.13	692.07
2011	1.85	9.31	1120.67	10.13	692.07
2012	1.85	9.31	1120.67	10.13	692.07
2013	1.85	9.31	1120.67	10.13	692.07
2014	1.85	9.31	1120.67	10.13	692.07
2015	1.85	9.31	1120.67	10.13	692.07
2016	1.85	9.31	1120.67	10.13	692.07
2017	1.85	9.31	1120.67	10.13	692.07
2018	1.85	9.31	1120.67	10.13	692.07
2019	1.85	9.31	1120.67	10.13	692.07
2020	1.85	9.31	1120.67	10.13	692.07
2021	1.85	9.31	1120.67	10.13	692.07
2022	1.85	9.31	1120.67	10.13	692.07
2023	1.85	9.31	1120.67	10.13	692.07
2024	1.85	9.31	1120.67	10.13	692.07
2025	1.85	9.31	1120.67	10.13	692.07
2026	1.85	9.31	1120.67	10.13	692.07
2027	1.85	9.31	1120.67	10.13	692.07
Allowable	3529.80	3529.80	3529.80	3529.80	76152.27

APPENDIX H
ENVIRONMENTAL IMPACT ANALYSIS (EIA)

Included in this section as **Attachment H-1** is the Environmental Impact Analysis prepared in accordance with Appendix H of Notice to Lessees (NTL 2002-G08).

APPENDIX H
ENVIRONMENTAL IMPACT ANALYSIS (EIA)

Included in this section as **Attachment H-1** is the Environmental Impact Analysis prepared in accordance with Appendix H of Notice to Lessees (NTL 2002-G08).

Environmental Impact Analysis

INITIAL DEVELOPMENT OPERATIONS
COORDINATION DOCUMENT
Lloyd Ridge Area
Block 1 (OCS-G 10486)
Block 2 (OCS-G 10487)

May 2005

Prepared for:

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A. IMPACT-PRODUCING FACTORS

This Environmental Impact Analysis (EIA) evaluates development activities by Anadarko Petroleum Corporation in Lloyd Ridge (LL) Blocks 1 and 2. The Initial Development Operations Coordination Document (DOCD) provides for the subsea completion of three wells, the installation of lease term pipelines with associated umbilicals, and the production of the three wells as detailed in ***DOCD Appendix A***. Production from LL 1 and 2 will be transported by pipeline to Anadarko's proposed Independence Hub in Mississippi Canyon (MC) Block 920, a distance of approximately 12 miles.

Anadarko has applied for approval of the Independence Hub under a separate DOCD submitted for Atwater Valley (AT) Blocks 305 and 349. Installation of a right-of-way pipeline and an associated control umbilical connecting LL 1/2 to the Independence Hub will be permitted under a separate pipeline application. The Independence Hub and right-of-way pipeline are discussed in this EIA for information only, as they are not part of the DOCD.

Completion activities are expected to begin in April 2006 and require 40 days per well. Independence Hub installation is scheduled to begin in July 2006, with commencement of production planned for July 2007. Dates are tentative, and some activities overlap other activities.

The lease area is approximately 106 miles from the nearest coastline (Louisiana), 155 miles from Alabama, and 189 miles from Florida. The blocks are located approximately 160 miles from the onshore support base at Port Fourchon, Louisiana, and 180 miles from the helicopter base in Galliano, Louisiana (**Figure 1**). Water depths in the lease area range from about 2,542 to 2,551 m (8,343 to 8,369 ft). The Independence Hub location in MC 920 is in a water depth of about 2,438 m (8,000 ft), 90 miles southeast of the Louisiana coastline.

Table 1 is a matrix of impact-producing factors (IPFs) and potentially affected environmental resources. The table is based on the matrix provided by the Minerals Management Service (MMS) at
http://www.gomr.mms.gov/homepg/regulate/regs/ntls/EIAWorksheet.pdf.

An "X" in a particular table cell indicates that an IPF could affect a certain resource, and a dash (--) indicates no impact or negligible impact. Where there may be an effect, an analysis is provided in **EIA Section B**. For completeness, an "X" has been placed in the Accidents column for various coastal and other resources indicating potential impact, even though the detailed analysis indicates contact with spilled oil is unlikely. In accordance with MMS requirements, for those cells that are footnoted, a statement has been provided after the table as to the applicability of the proposed operations.

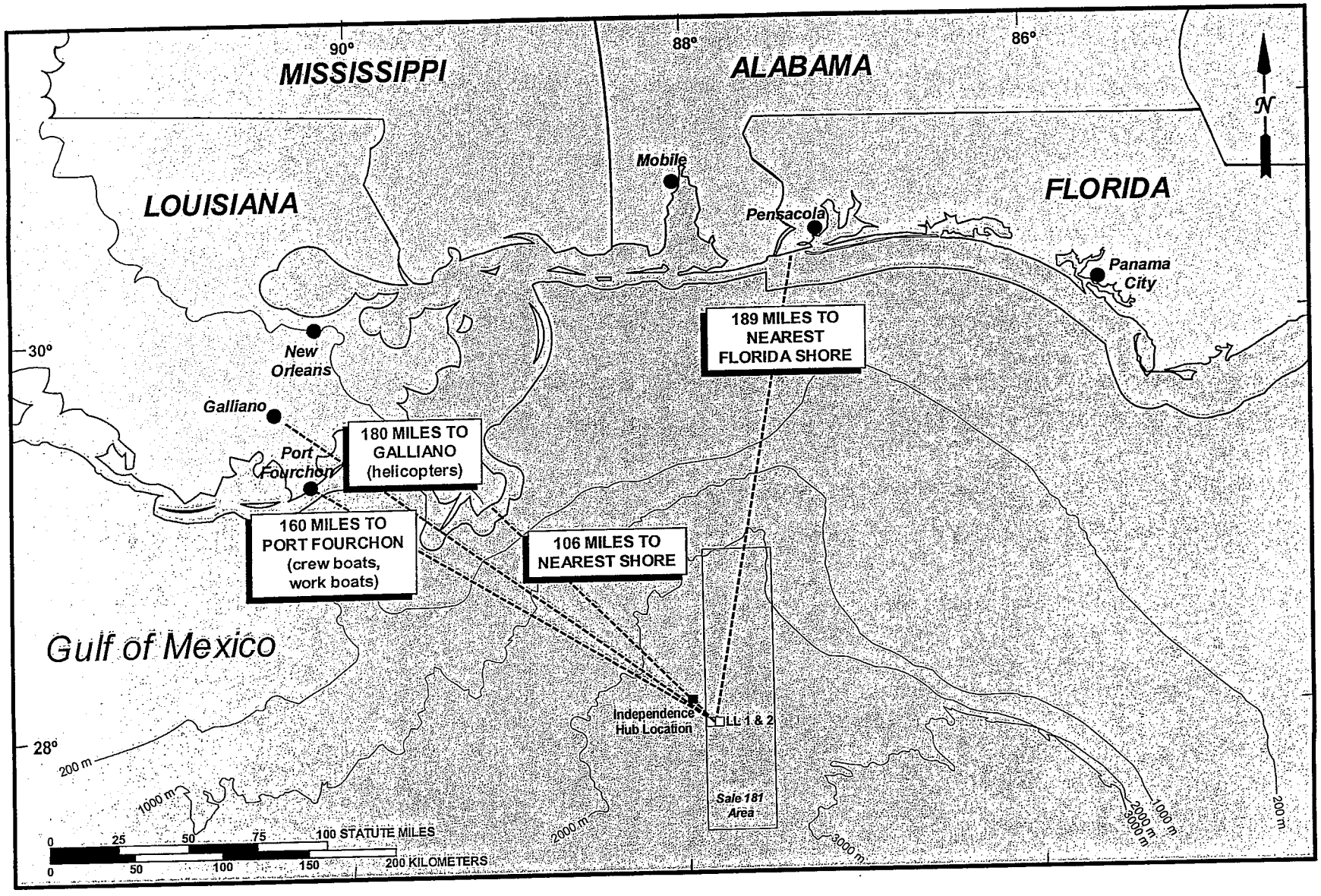

Figure 1. Location of Lloyd Ridge Blocks 1 and 2.

Table 1. Matrix of impact-producing factors and environmental resources.

Environmental Resources	Impact-Producing Factors						
	Physical Disturbances to the Seafloor	Presence of Structures	Air Emissions	Effluent Discharges	Marine Trash and Debris	Support Operations	Accidents
Site-Specific at Offshore Location							
Designated topographic features	--(1)	--	--	--(1)	--	--	--(1)
Pinnacle Trend area live bottoms	--(2)	--	--	--(2)	--	--	--(2)
Eastern Gulf live bottoms	--(3)	--	--	--(3)	--	--	--(3)
Chemosynthetic communities	--(4)	--	--	--	--	--	--
Water quality	--	--	--	X	--	X	X
Fisheries	--	X	--	--	--	--	X
Marine mammals	--	X(8)	--	--	X	X	X(8)
Sea turtles	--	X(8)	--	--	X	X	X(8)
Air quality	--	--	X(9)	--	--	X	X
Shipwreck sites (known/potential)	--(7)	--	--	--	--	--	--
Prehistoric archaeological sites	--(7)	--	--	--	--	--	--
Vicinity of Offshore Location							
Essential fish habitat	--	X	--	X	--	--	X(6)
Marine and pelagic birds	--	X	--	--	X	--	X
Public health and safety	--	--	--	--	--	--	--(5)
Coastal and Onshore							
Beaches	--	--	--	--	--	--	X(6)
Wetlands	--	--	--	--	--	--	X(6)
Shore birds & coastal nesting birds	--	--	--	--	--	X	X(6)
Coastal wildlife refuges	--	--	--	--	--	--	X(6)
Wilderness areas	--	--	--	--	--	--	X(6)
Other Resources							
Benthic communities	X	X	--	--	--	--	X
Pelagic communities	--	X	--	X	--	--	X
Offshore areas of concern	--	--	--	--	--	--	X
Gulf sturgeon (threatened fish)	--	--	--	--	--	--	X
Endangered beach mice and Florida salt marsh vole	--	--	--	--	--	--	X
Economics and demographics	--	--	--	--	--	--	--
Land use	--	--	--	--	--	--	--
Recreation and tourism	--	--	--	--	--	--	--
Public opinion	--	--	--	--	--	--	--
Coastal littoral processes	--	--	--	--	--	--	--
Navigation	--	--	--	--	--	--	--
Other uses of the area	--	--	--	--	--	--	--

Table Footnotes and Applicability:

(1) *Activities that may affect a marine sanctuary or topographic feature. Specifically, if the well or platform site or any anchors will be on the seafloor within the*
   (a) *4-mile zone of the Flower Garden Banks, or the 3-mile zone of Stetson Bank;*
   (b) *1,000-m, 1-mile, or 3-mile zone of any topographic feature (submarine bank) protected by the Topographic Features stipulation attached to an outer continental shelf (OCS) lease;*
   (c) *Essential Fish Habitat (EFH) criteria of 500 ft from any no-activity zone; or*
   (d) *Proximity of any submarine bank (500-ft buffer zone) with relief greater than 2 m that is not protected by the Topographic Features stipulation attached to an OCS lease.*

- This footnote is not applicable. The lease area is not within or near the stated distances of any topographic feature or no-activity zone. The geohazards evaluation indicates no submarine banks in the lease areas.

(2) *Activities with any bottom disturbance within an OCS lease block protected through the Live Bottom (Pinnacle Trend) stipulation attached to an OCS lease.*

- The lease area is not covered by the Live Bottom (Pinnacle Trend) stipulation. The geohazards evaluation indicates no hard bottom features in the lease area.

(3) *Activities within any Eastern Gulf OCS block where seafloor habitats are protected by the Live Bottom (Low-Relief) stipulation attached to an OCS lease.*

- The Live Bottom (Low-Relief) stipulation applies to Eastern Planning Area leases in water depths of 100 m or less; therefore, the leases are not covered by this stipulation.

(4) *Activities on blocks designated by the MMS as being in water depths 400 m or greater.*

- The lease area is located in water depths of 400 m or greater. However, the chemosynthetic community evaluation indicates that the potential for significant chemosynthetic communities is very low. No impacts on chemosynthetic communities are anticipated.

(5) *Exploration or production activities where H_2S concentrations greater than 500 ppm might be encountered.*

- This footnote is not applicable because MMS has determined LL 1 and 2 to be "H_2S absent."

(6) *All activities that could result in an accidental spill of produced liquid hydrocarbons or diesel fuel that you determine would impact these environmental resources. If the proposed action is located a sufficient distance from a resource that no impact would occur, the EIA can note that in a sentence or two.*

- Accidental hydrocarbon spills could affect the resources marked (X) in the matrix, and impacts are analyzed in **EIA Section B**. Due to the distance from shore, the anticipated spill weathering characteristics, and spill response measures, impacts on beaches, wetlands, shore birds and coastal nesting birds, and other coastal resources are considered highly unlikely.

(7) *All activities that involve seafloor disturbances, including anchor emplacements, in any OCS block designated by the MMS as having high-probability for the occurrence of shipwrecks or prehistoric sites, including such blocks that will be affected that are adjacent to the lease block in which your planned activity will occur. If the proposed activities are located a sufficient distance from a shipwreck or prehistoric site that no impact would occur, the EIA can note that in a sentence or two.*

- LL 1, LL 2, MC 920, and the lease blocks along the pipeline rights-of-way are not on the MMS list of blocks determined to have a high probability of archaeological resources. Therefore, no impacts on archaeological resources are expected.

(8) *All activities that you determine might have an adverse effect on endangered or threatened marine mammals or sea turtles or their critical habitats.*

- IPFs that may affect marine mammals, sea turtles, or their critical habitats include presence of structures, marine trash and debris, support operations, and accidents (oil spills). Impacts are analyzed in **EIA Section B**.

(9) *Production activities that involve transportation of produced fluids to shore using shuttle tankers or barges.*

- This footnote is not applicable (no transportation of produced fluids to shore using shuttle tankers or barges).

IPFs applicable to the proposed activity include physical disturbances to the seafloor, presence of structures, air emissions, effluent discharges, marine trash and debris, support operations, and accidents.

A.1 PHYSICAL DISTURBANCES TO THE SEAFLOOR

The wells will be completed with a dynamically positioned (DP) drillship similar to the Transocean SedcoForex "Deepwater Millennium." There will be no anchoring during completion operations.

Installation of subsea facilities in LL 1/2 will disturb the seafloor. Facilities to be installed include three subsea well trees, umbilical termination assemblies, and in-field flowlines and umbilicals. The subsea system will be installed by DP vessels that do not require anchors. According to MMS (2003a), installation of subsea infrastructure will cause bottom sediment disturbance in an area of about 2 ha per producing well. This would result in a total disturbed area of about 6 ha for the three wells in LL 1/2.

In terms of right-of-way pipelines, one 8-inch gas pipeline will extend from the lease area to the Independence Hub, a distance of about 12 miles. A DP lay barge would be used to install pipelines using the J-lay method, and therefore there would be no anchoring. The MMS (2001c) estimates that 0.32 ha of seafloor is disturbed per kilometer of deepwater pipeline installed. Assuming a pipeline length of approximately 19 km (12 miles), the bottom area disturbed would be 6 ha.

In MC 920, a small area of seafloor would be disturbed by the 12 suction pilings used to moor the Independence Hub. It is assumed that the total area of seafloor disturbance will be a few hectares.

A.2 PRESENCE OF STRUCTURES

The DP drillship Transocean SedcoForex "Deepwater Millennium" will be temporarily on site in LL 1/2 during completion operations. Seafloor structures that will remain in place in the lease area for the lifetime of the project include well trees, umbilical termination assemblies, and in-field flowlines and umbilicals. Structures outside the lease area will include the Independence Hub in MC 920 and right-of-way pipelines connecting the production wells to the Independence Hub. The Independence Hub in MC 920 will be a column-based semisubmersible type hull structure that will be affixed to the seafloor by 12 suction pilings.

In the upper water column, offshore structures will attract epipelagic fishes such as tunas, dolphin, billfishes, and jacks, which are commonly drawn to fixed and drifting surface structures (e.g., Holland et al., 1990; Higashi, 1994; Relini et al., 1994). At the seafloor, bottom-dwelling fishes and invertebrates may be attracted to the structure provided by subsea facilities, etc.

A.3 AIR EMISSIONS

DOCD Appendix G provides the Projected Air Quality Emissions Report prepared in accordance with MMS requirements. Included are drillship and support vessel emissions during completion operations, emissions from vessels (lay barge, tugs, support vessels) that will install subsea facilities in the lease area, and production-related emissions at the Independence Hub location. The projected annual emissions are below the exemption levels, and therefore no further analysis is required. A separate air quality calculation for the installation and operation of the Independence Hub has been submitted to the MMS in the DOCD for AT 305/349 and also shows projected emissions are below exemption levels.

A.4 EFFLUENT DISCHARGES

DOCD Appendix E summarizes wastes including quantities and methods of disposal. All offshore discharges will be in accordance with the National Pollutant Discharge Elimination System (NPDES) general permit issued by the U.S. Environmental Protection Agency (USEPA). Effluent discharges will include well completion fluids, sanitary and domestic wastes, deck drainage, uncontaminated freshwater or seawater, desalination brine, uncontaminated ballast and bilge water, and miscellaneous discharges.

Two other discharges are associated with the proposed action but are not included in ***DOCD Appendix E*** because they are covered under other permit applications. First, produced water discharges (if any) resulting from production in LL 1/2 would occur at the Independence Hub location and have been presented in the DOCD for AT 305/349. The discharges will be in accordance with NPDES permit requirements and are estimated to average 1,000 bbl/day. Second, following hydrostatic testing of the right-of-way pipelines, there will be a hydrotest discharge at the Independence Hub location. This discharge also will be in accordance with NPDES permit conditions.

A.5 MARINE TRASH AND DEBRIS

Solid waste is not expected to exceed 5 m^3 per month. Trash will be transported to shore and disposed of according to applicable regulations. Anadarko will adhere to MARPOL Annex V requirements, USEPA and U.S. Coast Guard (USCG) regulations, and MMS regulations and Notices to Lessees (NTLs) regarding solid wastes. MMS regulations prohibit operators from discharging containers and other similar materials (i.e., trash and debris) into the marine environment, and require durable identification markings on equipment, tools and containers (especially drums), and other material. USCG and USEPA regulations require that operators become proactive in avoiding accidental loss of solid waste items by developing waste management plans, posting informational placards, manifesting trash sent to shore, and using special precautions such as covering outside trash bins to prevent accidental loss of solid waste. MMS NTL 2003-G11 instructs operators to exercise caution in the handling and disposal of small items and packaging materials, requires posting of placards at prominent locations on offshore vessels and structures, and requires a marine trash and debris awareness training and certification process.

A.6 SUPPORT OPERATIONS

Port Fourchon will serve as the primary base for supplies and crews for development operations. This base is located 160 miles from the project area. Helicopters will be dispatched from Galliano, Louisiana. Expected travel frequency is listed below:

Support Vessel	Weekly Estimate (no. of round trips)	
	Completion Operations	Production
Crew Boat	8	--
Supply Boat	4	4
Helicopter	14	14

A.7 ACCIDENTS

Under "Accidents," an H_2S release was not considered as an IPF because MMS determined LL 1 and 2 to be "H_2S absent." Only oil spills and chemical spills are considered. For impact analysis, a large oil spill was represented by the Worst Case Discharge (WCD), calculated in the DOCD as 456 bbl of condensate for a well blowout or 13,812 bbl of diesel fuel from the rupture of the largest tank on the drillship.

Spill Probability. The probability of a major spill during offshore operations has been discussed in the Sale 181 and Sale 189/197 Environmental Impact Statements (EISs) (MMS, 2001a, 2003b). The Sale 181 EIS estimated that one to three blowouts could occur from all activities resulting from the sale (MMS, 2001a). The Sale 189/197 EIS estimated that one blowout could occur from all OCS program activities in the Eastern Planning Area between 2003 and 2042 (MMS, 2003b). Historically, most blowouts have not resulted in oil spills; of 151 well blowouts in the Gulf of Mexico from 1971 to 1995, 18 involved oil spills, with a total of 1,000 bbl of crude oil and condensate released (MMS, 2001a). The Sale 189/197 EIS estimated that no spills greater than 1,000 bbl would occur from OCS facilities in the Eastern Planning Area between 2003 and 2042 (MMS, 2003b).

Neither the Sale 181 EIS nor the Sale 189/197 EIS specifically estimates the probability of a large spill from a diesel tank rupture; however, this is considered a rare event. The historical record includes some such events in the Gulf of Mexico, but none for the period 1981-1999 (Anderson and LaBelle, 2000; MMS, 2001a).

Hypothetical oil spill trajectories were analyzed by the MMS for the Sale 181 EIS (MMS, 2001b). More recent trajectory analyses (Ji et al., 2002, 2004) are also discussed at the end of this subsection.

The Oil Spill Risk Analysis (OSRA) model is an extensive computer simulation of oil spill transport that uses realistic data for winds and currents. Of the 11 "launch areas" assumed for the Sale 181 OSRA modeling, Launch Area 08 includes LL 1 and 2 (**Figure 2**). This launch area consists entirely of water depths greater than 900 m and was intended to simulate spills from offshore rigs and platforms. For the purposes of this analysis, it is assumed that a diesel fuel or condensate spill would act in similar fashion to a crude oil spill, recognizing that the chemical compositions and relative susceptibilities of each to weathering are different.

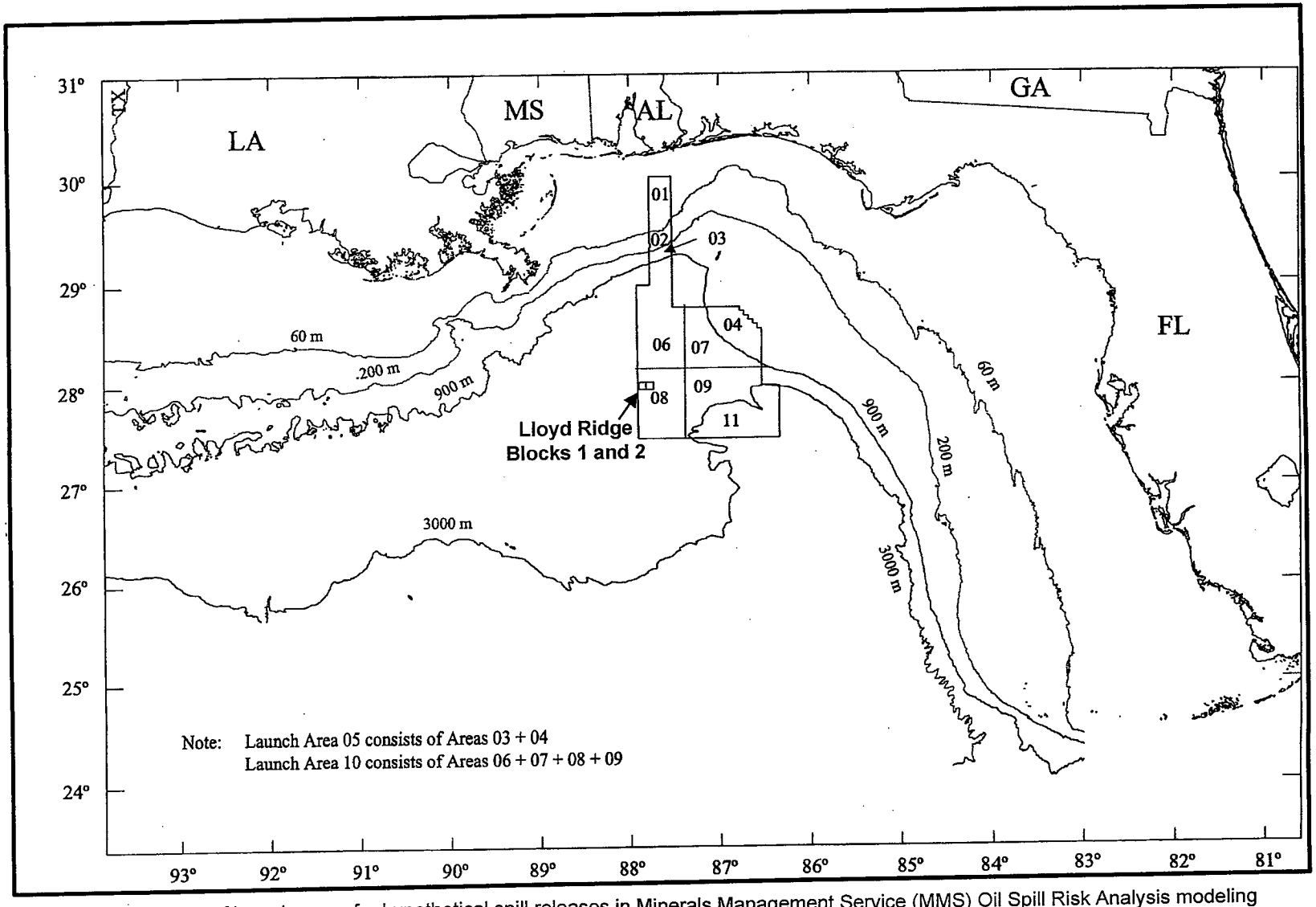

Figure 2. Locations of launch areas for hypothetical spill releases in Minerals Management Service (MMS) Oil Spill Risk Analysis modeling (MMS, 2001b). Lloyd Ridge Blocks 1 and 2 are in Launch Area 08.

The MMS calculated average, maximum, and minimum contact probabilities for spills from each launch area. This was done because each launch area consists of numerous launch points separated by 4 to 5 statute miles in the north-south or east-west direction. The average values are considered most representative for the project area. Maximum contact probabilities are not representative because they reflect launch points in shallower water. The MMS also calculated average, minimum, and maximum values for each season in addition to an overall annual value.

The OSRA modeling mapped trajectories in relation to specific environmental resources. These included land segments from western Louisiana through peninsular Florida, state waters of each state, and particular areas of concern such as the Chandeleur Islands, Florida Gulf Islands National Seashore, Florida Big Bend seagrass beds, Madison and Swanson Special Management Area, Steamboat Lumps Special Management Area, and Florida Middle Grounds. **Table 2** summarizes the results for hypothetical spills from Launch Area 08. The values are average conditional probabilities of a spill contacting specific resources within 3, 10, or 30 days. The highest average probability for any season is also indicated.

The most important finding of this analysis is that a spill would not reach the shoreline or coastal waters of any state, or any of the environmental resources modeled, within 3 days. Because of weathering and spill response measures as discussed in ***DOCD Appendix F***, a diesel spill (or a condensate spill from a well blowout) is unlikely to persist long enough to reach these resources.

Additional trajectory analyses were done for the Sale 189/197 EIS (Ji et al., 2002, 2004). The OSRA report by Ji et al. (2004) presents conditional probabilities of a spill contacting various shoreline segments. The results for Launch Area 137 (where LL 1 and 2 are located) and Launch Area 59 (where MC 920 is located) are presented in **Table 3.** There is no expected contact with any shorelines within 3 days, and the only potential shoreline contacts within 10 days are Plaquemines Parish, Louisiana (1 percent and 5 percent for a spill in LL 1/2 and MC 920, respectively) and LaFourche Parish, Louisiana (1 percent for a spill in MC 920). Because of weathering and spill response measures, a spill is unlikely to persist long enough to reach any shorelines. The impact analysis assumes that significant quantities of spilled hydrocarbons would not reach coastal areas.

Table 2. Conditional probabilities of a spill contacting various environmental resources, based on the Sale 181 Oil Spill Risk Analysis (OSRA) (From: Minerals Management Service [MMS], 2001b). Values are probabilities (percent) that a hypothetical spill at the project area (represented by average probabilities for MMS Launch Area 08) could contact particular environmental resources within 3, 10, or 30 days. The highest average probability for any season is given in parentheses; season(s) of highest average probability are indicated as superscripts (1=winter, 2=spring, 3=summer, and 4=fall).

Environmental Resource	Conditional Probability[a]			Comments
	3 days	10 days	30 days	
State Waters				
• Western Louisiana state waters	-- (--)	5 (7)	11 (14)	
• Eastern Louisiana state waters	-- (--)	4 (6)	10 (13)	
• Mississippi state waters	-- (--)	-- (1)	2 (3)	
• Alabama state waters	-- (--)	1 (1)	4 (6)	
• Florida Panhandle state waters	-- (--)	1 (1)	9 (13)	
• Florida peninsula state waters	-- (--)	-- (--)	4 (8)	
Shorelines[b]				
• Western Louisiana (segments 11-18)	-- (--)	1 (2)	2 (3)	
• Chandeleur Islands (Louisiana)	-- (--)	1 (3)	5 (7)	
• Eastern Louisiana, Mississippi, Alabama (segments 19-24)	-- (--)	2 (3)	4 (5)	
• Florida Panhandle (segments 25-29)	-- (--)	-- (--)	2 (4)	
• Florida Big Bend (segments 30-37)	-- (--)	-- (--)	1 (1)	Average probabilities predict no contacts from segment 34 (roughly Cedar Key) south
• Southwest Florida (segments 38-43)	-- (--)	-- (--)	-- (--)	
Specific Resources of Concern				
• Flower Garden Banks	-- (--)	-- (--)	-- (--)	Benthic resource, contact unlikely even if oil reached area
• Mobile Bay	-- (--)	-- (--)	1 (1)	
• Florida Gulf Islands National Seashore	-- (--)	-- (--)	3 (4)	
• Florida Big Bend seagrass beds	-- (--)	-- (--)	3 (6)	
• Madison and Swanson Special Management Area	-- (--)	-- (--)	1 (2)	Benthic resource, contact unlikely even if oil reached area
• Steamboat Lumps Special Management Area	-- (--)	-- (--)	1 (2)	Benthic resource, contact unlikely even if oil reached area
• Florida Middle Grounds Habitat Area of Particular Concern	-- (--)	-- (--)	1 (2)	Benthic resource, contact unlikely even if oil reached area

[a] Conditional probability refers to the probability of contact within the stated time period, assuming a spill occurred.
[b] "Segments" refer to shoreline segments as defined in the MMS OSRA modeling. Where multiple segments are listed, the one having the highest probability of contact was used.

Table 3. Conditional probabilities of a spill at the project area contacting shoreline segments, based on Oil Spill Risk Analysis (From: Ji et al., 2004). Values are probabilities (percent) that a hypothetical spill starting at Lloyd Ridge (LL) 1/2 (represented by Launch Area 137) or Mississippi Canyon (MC) 920 (represented by Launch Area 59) could contact shoreline segments within 3 or 10 days. Only segments with one or more non-zero values are listed.

Shoreline Segment	County or Parish and State	Conditional Probability of Contact[a]		
		3 days	10 days	30 days
Launch Area 137 (representing LL 1/2)				
C17	Terrebonne, LA	--	--	1
C18	LaFourche, LA	--	--	1
C20	Plaquemines, LA	--	1	6
C21	St. Bernard, LA	--	--	1
C30	Bay, FL	--	--	1
Launch Area 59 (representing MC 920)				
C13	Cameron, LA	--	--	1
C14	Vermilion, LA	--	--	1
C17	Terrebonne, LA	--	--	2
C18	LaFourche, LA	--	1	2
C19	Jefferson, LA	--	--	1
C20	Plaquemines, LA	--	5	11
C21	St. Bernard, LA	--	--	2
C29	Walton, FL	--	--	1
C30	Bay, FL	--	--	1

[a] Conditional probability refers to the probability of contact within the stated time period, assuming that a spill has occurred (-- indicates less than 0.5 percent).

B. ANALYSIS

B.1 SITE-SPECIFIC AT OFFSHORE LOCATION

B.1.1 Designated Topographic Features

(a) Routine Operations

There are no IPFs associated with routine operations that could cause impacts to designated topographic features. The lease area is not in or near an MMS-designated topographic feature or no-activity zone. The geohazards evaluation indicates no submarine banks in the leases.

(b) Accidents

The nearest designated topographic feature is Sackett Bank, which is over 100 km from the project area. The Flower Garden Banks are over 500 km away. Due to the spill weathering and response efforts, a spill would be unlikely to reach the vicinity of any topographic feature. Further, since the crests of designated topographic features in the northern Gulf are at least 10 m below the sea surface, concentrated oil would not be expected to reach their sessile biota. No impacts would be expected.

B.1.2 Pinnacle Trend Area Live Bottoms

(a) Routine Operations

There are no IPFs associated with routine operations that could cause impacts to pinnacle trend live bottoms. The leases are not covered by the Live Bottom (Pinnacle Trend) stipulation. The geohazards evaluation indicates no hard bottom features in the lease area.

(b) Accidents

The pinnacle trend is along the shelf edge, about 200 km inshore of the lease area. Due to spill weathering and response efforts, a spill would be unlikely to reach the vicinity of the pinnacle trend area. Further, since the crests of pinnacle features are more than 50 m below the sea surface, concentrated oil would not be expected to reach their sessile biota. No impacts would be expected.

B.1.3 Eastern Gulf Live Bottoms

(a) Routine Operations

There are no IPFs associated with routine operations that could cause impacts to low-relief Eastern Gulf live bottoms. The Live Bottom (Low-Relief) stipulation applies to Eastern Planning Area leases in water depths of 100 m or less. The leases are not covered by this stipulation. The geohazards evaluation indicates no hard bottom features in the lease area.

(b) Accidents

The nearest live bottom areas as defined by MMS stipulation are inshore of the 100-m isobath, over 100 km from the lease area. Because these are low-relief features on the seafloor, concentrated oil would not be expected to reach their sessile biota. No impacts would be expected.

B.1.4 Chemosynthetic Communities

(a) Routine Operations

There are no routine IPFs likely to cause impacts to chemosynthetic communities. There are no known chemosynthetic areas associated with LL 1 and 2. The shallow hazards report indicates that the area is clear of chemosynthetic communities. The seafloor appears to be void of geologic features that could support high-density chemosynthetic communities.

(b) Accidents

It is possible that undiscovered chemosynthetic communities exist in nearby deepwater lease blocks. However, a surface oil spill in the deepwater environment would not affect benthic communities, and a subsurface spill (e.g., a blowout) would be unlikely to affect benthic communities beyond a few hundred meters from the wellsite. Therefore, no impacts on chemosynthetic communities are likely.

B.1.5 Water Quality

(a) Routine Operations

Routine IPFs potentially affecting water quality include

- Effluent discharges; and
- Support operations.

Effluent Discharges. Effluent discharges affecting water quality include well completion fluids, sanitary and domestic wastes, deck drainage, uncontaminated freshwater or seawater, desalination brine, uncontaminated ballast and bilge water, and miscellaneous discharges. Minimal impacts on water quality are anticipated from these discharges in accordance with NPDES permit requirements. The discharges are either benign or would affect water quality slightly (e.g., suspended solids, nutrients, chlorine, and biochemical oxygen demand) within tens of meters of the discharge (MMS, 2003a).

Produced water (to be discharged at the Independence Hub location) can have high total suspended solids, salinities, levels of organic carbon, and metal content and can be very low in dissolved oxygen (Neff, 1987). Because these waters are closely intermingled with petroleum, they contain variable concentrations of hydrocarbons, which are required to be separated before discharge. Produced water discharges in accordance with NPDES permit requirements are expected to be diluted rapidly, resulting in minor, localized changes in water quality parameters.

Support Operations. Support vessels will discharge treated sanitary and domestic wastes. These will have a slight effect on water quality in the immediate vicinity of these discharges. Sanitary and domestic wastes may have elevated levels of nutrients, organic matter, and chlorine but should be diluted rapidly to undetectable levels within tens to

hundreds of meters of the source. Minimal impacts on water quality are anticipated from these discharges in accordance with USCG requirements.

(b) Accidents

A spill in offshore waters would produce a slick on the water and temporarily increase hydrocarbon concentrations. The OSRA modeling indicates no contacts with shorelines within 3 days after a spill and a small probability of contacting any shoreline within 10 days. During this time, it is assumed that most or all of the spill volume would be removed due to spill weathering and response measures. Therefore, no significant impacts on coastal water quality would be likely.

A small chemical spill could produce short-term, localized impacts on water quality. Depending upon the chemical spilled and its solubility in seawater, chemicals will either be diluted, dissolved, or remain insoluble and disperse once they reach the sea surface or come in contact with seawater. The consequence of a spill of any of the chemicals in the chemical inventory would be dependent on the type and volume of chemicals released. A short-term, localized reduction in water quality might be expected.

B.1.6 Fisheries

The main commercial fishing activity in deep waters of the northern Gulf of Mexico is pelagic longlining for tuna, swordfish, and other billfishes (Continental Shelf Associates, Inc., 2002). Pelagic longlining has occurred historically in the project area, primarily during spring and summer. However, in August 2000, the Federal government closed two areas in the Desoto Canyon area to longline fishing (65 Federal Register 47214, 1 August 2000). One of the closure areas is just north of and adjacent to the lease area (**Figure 3**). The closure areas were created because longline fishing has been identified as contributing to the bycatch mortality of billfishes and undersized swordfish.

Longline gear consists of monofilament line that is deployed from a moving vessel and generally allowed to drift for 4 to 5 hours (Continental Shelf Associates, Inc., 2002). As the mainline is put out, baited leaders and buoys are clipped in place at regular intervals. It takes 8 to 10 hours to deploy a 70-km longline and about the same time to retrieve it. Longlines are often set near oceanographic features such as fronts or downwellings, with the aid of sophisticated on-board temperature sensors, depth finders, and positioning equipment. Vessels are 10 to 30 m long, and their trips last from about 1 to 3 weeks. The main homeports for longlining vessels are Dulac and Venice, Louisiana; and Destin, Madeira Beach, and Panama City, Florida.

It is unlikely that any commercial fishing activity other than longlining is occurring at or near the project area. Benthic species targeted by commercial fishers occur on the upper continental slope, well inshore of the project area. Royal red shrimp are caught by trawlers in water depths of about 250 to 550 m. Tilefish are caught by bottom longlining in water depths from about 165 to 450 m (Continental Shelf Associates, Inc., 2002).

Most recreational fishing activity in the northeastern Gulf occurs in depths less than about 200 m (Continental Shelf Associates, Inc., 1997, 2002). In deeper water, the main attraction is petroleum platforms. Due to the distance from shore and the relatively small number of offshore structures, it is unlikely that any recreational fishing activity is occurring in the project area.

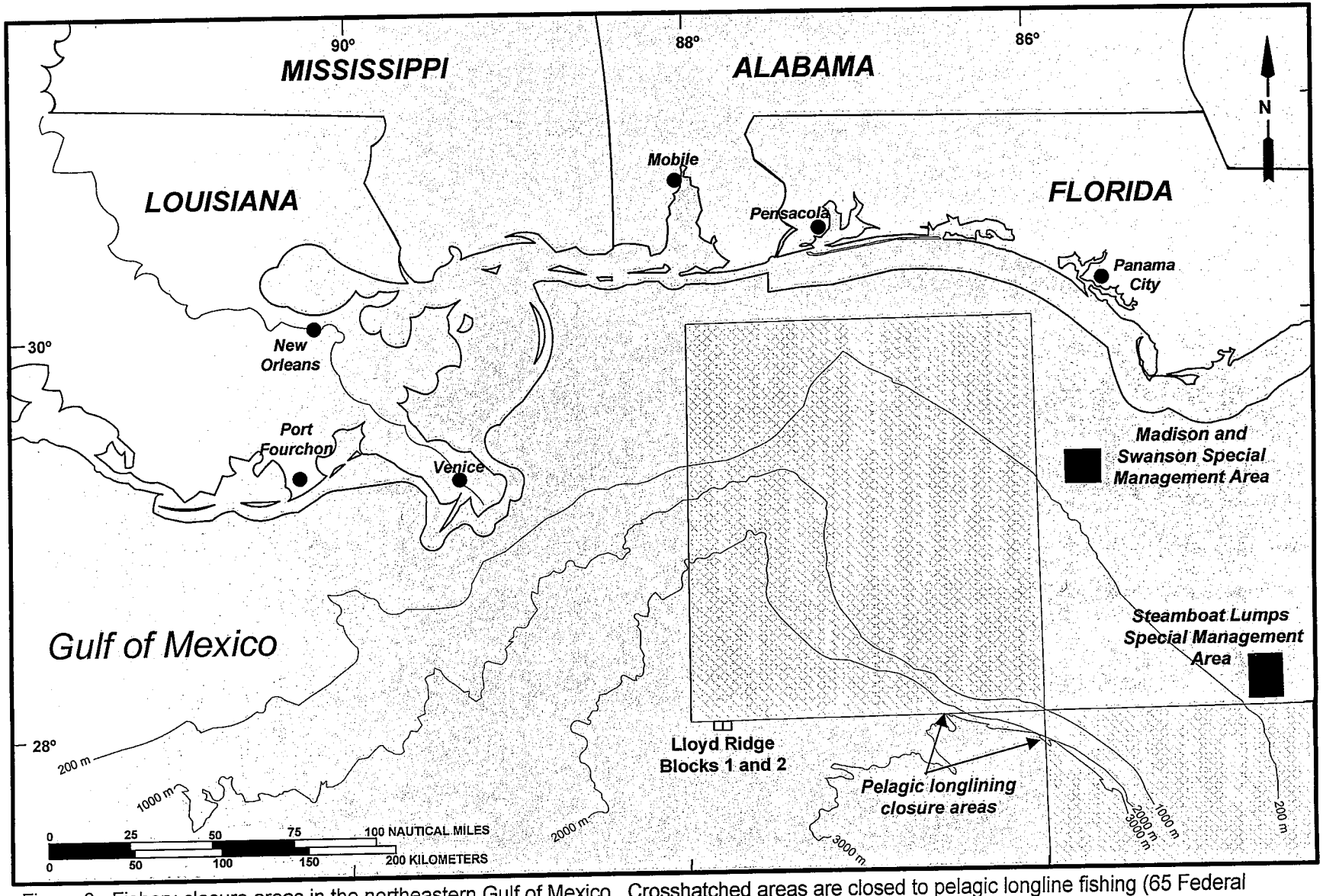

Figure 3. Fishery closure areas in the northeastern Gulf of Mexico. Crosshatched areas are closed to pelagic longline fishing (65 Federal Register 47214, 1 August 2000). Special management areas are closed to all fishing except for highly migratory species (tunas, billfishes, sharks), primarily to protect reef-associated groupers (65 Federal Register 31827, 19 May 2000).

(a) Routine Operations

Presence of structures is the only IPF that may have an impact on commercial fishing activity. There is a slight possibility of pelagic longlines becoming entangled with an offshore structure. For example, in January 1999, a portion of a pelagic longline snagged on the acoustic Doppler current profiler of a DP drillship working in the Gulf of Mexico (Continental Shelf Associates, Inc., 2002). The line was removed without incident. Generally, longline fishers use radar and are aware of offshore structures and ships when placing their sets. Therefore, little or no impact on pelagic longlining is expected.

As it is unlikely that any recreational fishing activity is occurring in the project area, no adverse impacts are anticipated. A minor beneficial impact is possible if recreational fishers are attracted to the Independence Hub.

Other factors such as effluent discharges are likely to have negligible impacts on commercial or recreational fisheries due to rapid dispersion, the small area of ocean affected, and the intermittent nature of the discharges.

(b) Accidents

Pelagic longlining activities could be temporarily disrupted in the event of a large spill in the project area. The area affected would be relatively small, and the duration presumably would be a few days, based on the anticipated weathering characteristics and spill response capabilities.

It is unlikely that any recreational fishing activity is occurring in the project area due to the distance from shore. Due to spill weathering and response measures, no disruption of commercial or recreational fishing activities in coastal waters would be expected.

B.1.7 Marine Mammals

(a) Routine Operations

Routine IPFs potentially affecting marine mammals include

- Presence of structures (noise and lights);
- Marine trash and debris; and
- Support operations.

Other factors such as effluent discharges are likely to have negligible impacts on marine mammals due to rapid dispersion, the small area of ocean affected, and the intermittent nature of the discharges.

The only endangered marine mammal potentially present at the project area is the sperm whale. The project area is near a region where sperm whales are frequently sighted, in the Mississippi Canyon area (Davis et al., 2000). The most common nonendangered cetaceans in the deepwater environment are odontocetes such as pantropical spotted dolphin, spinner dolphin, and clymene dolphin. Other odontocetes that may be present include dwarf and pygmy sperm whales, four species of beaked whales, and 14 species of dolphins and porpoises (MMS, 2003b).

The Florida manatee is a coastal species that does not occur in the project area. Manatees sometimes occur in Louisiana coastal waters (where the shore base is located) during

summer months, and vessel strikes are a major cause of manatee mortality in peninsular Florida, where most of the manatee population is located. Florida manatees are not likely to be adversely affected by oil and gas activities in the area (U.S. Fish and Wildlife Service [USFWS], 2001). Routine activities are not expected to have any impacts on manatees, and they are not discussed further.

Presence of Structures (noise and lights). Sperm whales may or may not avoid the project area. Noise associated with OCS activities is of relatively low frequency, typically between 4.5 to 30 Hz (Richardson et al., 1995). The sperm whale appears to have good low frequency hearing, but the available data do not indicate a consistent response to anthropogenic noise (National Marine Fisheries Service [NMFS], 2002). Sperm whales have been known to stop echolocating or vocalizing when disturbed by certain low frequency sounds. Noise associated with offshore oil and gas operations is relatively weak in intensity, and individual sperm whales' noise exposure would be transient. There is already considerable offshore oil and gas activity in nearby regions of the central Gulf, including drilling and production operations, support vessel and helicopter activity, and seismic surveys.

Other cetaceans may or may not avoid the project area due to noise. Most odontocetes have their best hearing in high frequencies and are less likely to be disturbed by low frequency noise. The marine mammals' exposure to these sounds would be transient.

Marine Trash and Debris. Ingestion of, or entanglement with, accidentally discarded debris can kill or injure marine mammals. The disposal of solid waste from drilling rigs and vessels is prohibited by the MMS and the USCG under MARPOL regulations. In addition, MMS has issued NTL 2003-G11, which instructs operators to exercise caution in the handling and disposal of small items and packaging materials, requires posting of placards at prominent locations on offshore vessels and structures, and requires a marine trash and debris awareness training and certification process. Compliance with this NTL and any related MMS requirements is assumed to be effective in minimizing the potential for debris-related impacts on marine mammals.

Support Operations. Vessel and helicopter traffic may startle or disturb marine mammals. Reactions may range from apparent indifference to evasive moves (e.g., turns, diving, etc.). Many of the reactions of marine mammals to vessel traffic appear to be primarily a result of noise, though there may be visual or other cues as well.

There is a small risk of a supply or crew boat striking a sperm whale. There have been reports of sperm whale deaths attributed to striking the propeller of a vessel (NMFS, 2002). Sperm whales are found within oceanic waters and are therefore more likely to encounter vessels traveling at high speeds, both during daylight and nighttime hours. Although sperm whales are capable of avoiding these vessels, it is possible that collisions may occur under certain circumstances. For example, sperm whales periodically spend extended periods of time (up to 30 minutes) to restore oxygen levels within their tissues after deep dives. The most likely impact on sperm whales would be vessel avoidance rather than collision.

To reduce the potential for vessel strikes, the MMS has issued NTL 2003-G10, which recommends protected species identification training, specifies ways for vessel operators and crews to avoid vessel strikes, and requires operators to report sightings of any injured

or dead protected species. Compliance with this NTL and any related MMS requirements is assumed to be effective in minimizing the likelihood of vessel strikes.

(b) Accidents

Sperm Whale (endangered species). The sperm whale is the only endangered marine mammal likely to be affected by an oil spill at the project area. Sperm whales are widely distributed in the Gulf of Mexico, but concentrations occur in the Mississippi Canyon area south of the Mississippi River Delta (Davis et al., 2000). Though the areas of sperm whale concentrations are relatively small, it is possible that a spill could reach areas frequented by sperm whales prior to weathering. The total area of a slick is expected to be small relative to the available deepwater habitat. Oil exposure would not persist in the open ocean, and the animals could avoid oiled areas. Although a spill could contact sperm whales, primarily sublethal effects are expected due to avoidance and natural dispersion/weathering of the spill in the offshore environment (MMS, 2003b).

Florida Manatee (endangered species). The Florida manatee occasionally occurs in coastal waters of Louisiana, Mississippi, Alabama, and the Florida Panhandle during summer months. OSRA modeling indicates no contacts with shorelines within 3 days and a small probability of contacting any shoreline within 10 days after a spill at the project area. During this time, natural weathering processes and spill response measures as described in the Sub-Regional Oil Spill Response Plan (OSRP) are assumed to remove most or all of the spilled oil, preventing significant impacts to manatees or their habitat. In addition, the number of manatees potentially present along this coast is a small fraction of the population in peninsular Florida, and the population is not likely to be adversely affected by offshore oil and gas activities, including an oil spill (USFWS, 2001).

Other Marine Mammals. The most common nonendangered cetaceans in the deepwater environment are pantropical spotted dolphin, spinner dolphin, and clymene dolphin. Other species that may be present include dwarf and pygmy sperm whales, four species of beaked whales, and 14 species of dolphins and porpoises. The total area affected by a spill is expected to be small relative to the available deepwater habitat. Although a spill could contact marine mammals, primarily sublethal effects are expected due to avoidance and natural dispersion/weathering of the spill in the offshore environment (MMS, 2003b).

B.1.8 Sea Turtles

Five species of endangered or threatened sea turtles may be found near the project area. Endangered species are the leatherback (*Dermochelys coriacea*), Kemp's ridley (*Lepidochelys kempii*), and hawksbill (*Eretmochelys imbricata*) sea turtles. The loggerhead sea turtle (*Caretta caretta*) is a threatened species. The green sea turtle (*Chelonia mydas*) is listed as threatened, except for the Florida breeding population, which is listed as endangered.

Leatherbacks and loggerheads are the turtles most likely to be present as adults near the project area. Leatherbacks are the most pelagic of the sea turtles and were frequently sighted on the continental slope during GulfCet II aerial surveys (Mullin and Hoggard, 2000). Leatherbacks were sighted on the continental slope in the northeastern Gulf during summer months, but not during winter. Although loggerheads were more abundant in shallower water, they were also sighted in deepwater areas during winter (Mullin and Hoggard, 2000). Green, hawksbill, and Kemp's ridley turtles are typically

inshore species that are unlikely to occur near the project area as adults. Hatchlings or juveniles of any of the sea turtles may be present in deepwater areas, where they may be associated with sargassum and other flotsam.

Sea turtle nesting in the northeastern Gulf of Mexico can be summarized as follows:

- Loggerhead turtles nest in significant numbers along the Florida Panhandle and to a lesser extent in Alabama, Mississippi, and Louisiana. Loggerheads account for over 99 percent of turtle nests on northwest Florida beaches, with their nesting season extending from 1 May through 31 October (MMS, 2003b).
- Green turtles infrequently nest on Florida Panhandle and Alabama beaches, generally between 1 May and 30 September (Meylan et al., 1995; Alabama Game and Fish Division, 1997).
- Leatherback turtles occasionally nest on Florida Panhandle beaches from 1 May through 31 October (MMS, 2003b).
- Hawksbill and Kemp's ridley turtles do not nest anywhere near the project area.

(a) Routine Operations

Routine IPFs potentially affecting sea turtles include

- Presence of structures (noise and lights);
- Marine trash and debris; and
- Support operations (service vessels and helicopters).

Other factors such as effluent discharges are likely to have negligible impacts on sea turtles due to rapid dispersion, the small area of ocean affected, and the intermittent nature of the discharges.

Presence of Structures (noise and lights). Offshore oil and gas activities produce a broad array of sounds at frequencies and intensities that may be detected by sea turtles (Geraci and St. Aubin, 1987). Potential impacts may include behavioral disruption and temporary or permanent displacement from the area near the sound source. Certain sea turtles, especially loggerheads, may be attracted to offshore structures and thus may be more susceptible to impacts from sounds produced during routine operations. Helicopters and service vessels may also affect sea turtles due to machinery noise and/or visual disturbances. The most likely impacts would be short-term behavioral changes such as diving and evasive swimming, disruption of activities, or departure from the area.

Turtle hatchlings may be attracted to brightly lit offshore platforms, where they may be subject to increased predation by birds and fishes that are also attracted to offshore structures. However, NMFS (2002) indicates that attraction to offshore platforms is unlikely to appreciably reduce the reproduction, numbers, or distribution of sea turtles in the wild.

Marine Trash and Debris. Ingestion of, or entanglement with, accidentally discarded solid debris can kill or injure sea turtles (Lutcavage et al., 1997). Some adult sea turtles such as loggerheads and leatherbacks may ingest plastic debris. The disposal of solid waste from drilling rigs and vessels is prohibited. Also, MMS has issued NTL 2003-G11, which instructs operators to exercise caution in the handling and disposal of small items and packaging materials, requires posting of placards at prominent locations on offshore vessels and structures, and requires a marine trash and debris awareness training and certification process. Compliance with this NTL and any

related MMS requirements is assumed to be effective in minimizing the potential for debris-related impacts on sea turtles.

Support Operations (service vessels and helicopters). There is a chance of collision between service vessels and sea turtles. While adult turtles are visible at the surface during the day and in clear weather, they can be difficult to spot from a moving vessel when resting below the water surface or during nighttime or periods of inclement weather. To reduce the potential for vessel strikes, the MMS has issued NTL 2003-G10, which recommends protected species identification training, specifies ways for vessel operators and crews to avoid vessel strikes, and requires operators to report sightings of any injured or dead protected species. Compliance with this NTL and any related MMS requirements is assumed to be effective in minimizing the likelihood of striking sea turtles.

(b) Accidents

Any of the five species of sea turtles could be affected by a spill in offshore waters. However, the turtles most likely to be affected would be leatherbacks and loggerheads, the most common adult turtles in offshore waters. Leatherbacks and loggerheads are regularly sighted within deepwater areas over the continental slope. In addition, juvenile turtles are regularly found within convergence zones in deepwater areas. The total area of a slick is expected to be small relative to the available deepwater habitat. Although turtle numbers within the deepwater Gulf are small when compared to the continental shelf, it is possible that individuals may come into contact with a spill. It is possible that some individuals may not recover from such exposure. However, primarily sublethal effects are expected (MMS, 2003b).

The OSRA modeling indicates no contacts with any shorelines within 3 days and a small probability of contacting any shoreline within 10 days. During this time, it is assumed that most or all of the spill volume would be removed due to weathering and response measures. Therefore, no significant impacts on turtle nesting beaches would be expected.

B.1.9 Air Quality

There are no site-specific air quality data for the project area. The attainment status of Federal OCS waters is unclassified because there is no provision for classification in the Clean Air Act for waters outside of state waters (MMS, 2003b). Due to the distance from shore-based pollution sources, offshore air quality is expected to be good.

All coastal counties and parishes in Louisiana, Mississippi, Alabama, and Florida are considered to be in attainment of the National Ambient Air Quality Standards (NAAQS) for carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), and suspended particulate matter (PM_{10}). Five Louisiana parishes (Ascension, Iberville, East Baton Rouge, West Baton Rouge, and Livingston) are nonattainment areas for ozone (O_3).

The Breton National Wilderness Area, which is part of the Breton National Wildlife Refuge (NWR) is designated under the Clean Air Act as a Prevention of Significant Deterioration Class I air quality area. This area is protected by stringent air quality standards administered by the USFWS. Mitigating measures, including low sulfur diesel fuels and stricter air emissions monitoring and reporting requirements, are required for sources that are within 100 km of the Breton Class I area and that exceed emissions levels

agreed upon by the administering agencies. The project area is beyond the 100-km radius from Breton Island, and therefore no special requirements apply.

(a) Routine Operations

Routine IPFs potentially affecting air quality include

- Air emissions; and
- Support operations (service vessels and helicopters).

Routine offshore air pollutant emissions will result from completion operations and from installation of subsea facilities in the lease area. Emissions occur mainly from combustion or burning of fuels and natural gas and from venting or evaporation of hydrocarbons. The combustion of fuels occurs primarily on diesel-powered generators, pumps, or motors and from lighter fuel motors. Primary air pollutants associated with OCS activities are nitrogen oxides, CO, sulfur oxides, volatile organic compounds (VOCs), and PM_{10}.

Due to the distance from shore, routine operations in the project area will have no impact on air quality conditions along the coast, including the Florida Panhandle. ***DOCD Appendix G*** provides the Projected Air Quality Emissions Report prepared in accordance with NTL 2003-G17. Included are drillship and support vessel emissions during completion operations, emissions from vessels (lay barge, tugs, support vessels) that will install lease-term pipelines in the lease area, and production-related emissions at the Independence Hub location. As shown in **Table 4**, the projected annual emissions are below the exemption levels, and therefore no further analysis is required. A separate calculation for installation of the Independence Hub has been submitted to the MMS and also shows projected emissions are below exemption levels.

(b) Accidents

A large spill would affect air quality in the vicinity of the oil slick by introducing VOCs through evaporation. The emissions would not last long due to rapid volatilization of hydrocarbons. Evaporation is greatest within the first few days (MMS, 2003b). The extent and persistence of impacts would depend on the meteorological and oceanographic conditions at the time.

The OSRA modeling indicates no contacts with shorelines within 3 days after a spill, when most of the evaporation occurs. Therefore, little or no impact on air quality in coastal or onshore areas would be expected.

A small chemical spill could also produce short-term, localized impacts on air quality (for example, if chemical dust or VOCs were released). The consequence of a spill of any of the chemicals in the chemical inventory would be dependent on the type and volume of chemicals released. A short-term, localized reduction in air quality might be expected following a spill of volatile materials.

Table 4. Summary of air emissions calculations.

Year	Emitted Substance (tons)					Includes
	Particulate Matter	Sulfur Oxides	Nitrogen Oxides	Volatile Organic Compounds	Carbon Monoxide	
2006	64.64	296.55	2,222.14	66.66	484.83	Completion
2007	6.37	28.48	744.32	10.75	388.01	Completion Flowline installation Production*
2008	1.85	9.31	1,120.67	10.13	692.07	Production*
2009	1.85	9.31	1,120.67	10.13	692.07	Production*
2010	1.85	9.31	1,120.67	10.13	692.07	Production*
2011	1.85	9.31	1,120.67	10.13	692.07	Production*
2012	1.85	9.31	1,120.67	10.13	692.07	Production*
2013	1.85	9.31	1,120.67	10.13	692.07	Production*
2014	1.85	9.31	1,120.67	10.13	692.07	Production*
2015	1.85	9.31	1,120.67	10.13	692.07	Production*
2016	1.85	9.31	1,120.67	10.13	692.07	Production*
2017	1.85	9.31	1,120.67	10.13	692.07	Production*
2018	1.85	9.31	1,120.67	10.13	692.07	Production*
2019	1.85	9.31	1,120.67	10.13	692.07	Production*
2020	1.85	9.31	1,120.67	10.13	692.07	Production*
2021	1.85	9.31	1,120.67	10.13	692.07	Production*
2022	1.85	9.31	1,120.67	10.13	692.07	Production*
2023	1.85	9.31	1,120.67	10.13	692.07	Production*
2024	1.85	9.31	1,120.67	10.13	692.07	Production*
2025	1.85	9.31	1,120.67	10.13	692.07	Production*
2026	1.85	9.31	1,120.67	10.13	692.07	Production*
2027	1.85	9.31	1,120.67	10.13	692.07	Production*
Allowable	3,529.80	3,529.80	3,529.80	3,529.80	76,152.27	

* "Production" refers to air emissions at the Independence Hub during production. These are provided for information only and are based on maximum emissions at the Hub, not just those resulting from production in LL 1 and 2.

B.1.10 Shipwreck Sites (known or potential)

(a) Routine Operations

There are no IPFs associated with routine operations that are likely to cause impacts to shipwreck sites. LL 1, LL 2, MC 920, and the lease blocks along the pipeline rights-of-way are not on the MMS list of blocks determined to have a high probability of archaeological resources. Therefore, no impacts are expected.

(b) Accidents

The OSRA modeling indicates no contacts with coastal waters or shorelines within 3 days and a small probability of contacting any shoreline within 10 days after a spill. Based on spill weathering characteristics and planned response measures, it is considered highly unlikely that a large oil spill in the project area would reach coastal areas or very shallow waters where shipwreck sites might become contaminated with oil.

B.1.11 Prehistoric Archaeological Sites

(a) Routine Operations

There are no IPFs that are likely to cause impacts to prehistoric archaeological sites. LL 1, LL 2, MC 920, and the lease blocks along the pipeline rights-of-way are not on the MMS list of blocks determined to have a high probability of archaeological resources. Therefore, no impacts are expected.

(b) Accidents

The OSRA modeling indicates no contacts with coastal waters or shorelines within 3 days and a small probability of contacting any shoreline within 10 days after a spill. Based on the anticipated spill weathering characteristics and planned response measures, it is considered highly unlikely that a spill in the project area would reach coastal areas or very shallow waters where prehistoric sites could become contaminated with oil.

B.2 VICINITY OF OFFSHORE LOCATION

B.2.1 Essential Fish Habitat

Most fishery species in the Gulf of Mexico are managed by the Gulf of Mexico Fishery Management Council (GMFMC). This council has prepared fishery management plans (FMPs) identifying EFH for corals and coral reefs, shrimp, stone crab, spiny lobster, reef fishes, coastal pelagic fishes, and red drum, none of which occur within the deeper waters overlying the lease area.

Another group of exploited species, the highly migratory pelagic fishes, are managed by NMFS. In its FMP for Atlantic tunas, swordfish, and sharks that inhabit the Gulf of Mexico, NMFS (1999) addressed EFH for managed highly migratory species. These include 10 sharks, 3 tunas, and 1 swordfish species of concern. These migratory species may occur as transients in the project area. EFH includes most of the substrate and water column of the Gulf of Mexico where the managed species commonly occur. Although billfishes (sailfish [*Istiophorus platypterus*], blue marlin [*Makaira nigricans*], white marlin [*Tetrapterus albidus*], and longbill spearfish [*T. pfluegeri*]) are now managed as highly migratory species, there were no EFH designations in NMFS (1999).

Spatially limited EFH called habitat areas of particular concern (HAPCs) have also been identified in the Gulf of Mexico by the GMFMC. These include Dry Tortugas (Fort Jefferson National Monument), Florida Keys National Marine Sanctuary, Florida Middle Grounds, and Flower Garden Banks National Marine Sanctuary. While no HAPCs are located near the lease area, migratory species that use these HAPCs may migrate through the area.

While the project area *per se* is not recognized as an important or critical area for breeding or migrations, the presence of the Loop Current (normally located to the south of the project area) and its role as a migratory pathway for highly migratory pelagic fish species suggest that migrants may be rare but present intermittently. Deepwater habitats, including those of the project area, may provide spawning areas for pelagic fishes such as king and Spanish mackerels and others.

(a) Routine Operations

Routine IPFs potentially affecting EFH include

- Presence of structures; and
- Effluent discharges.

Presence of Structures. The drillship and the Independence Hub will act as fish attracting devices (FADs). In oceanic waters, the FAD effect would be most pronounced for epipelagic fishes such as tunas, dolphin, billfishes, and jacks, which are commonly attracted to fixed and drifting surface structures (e.g., Holland et al., 1990; Higashi, 1994; Relini et al., 1994). This FAD effect would possibly enhance feeding of epipelagic predators by attracting and concentrating smaller fish species.

Effluent Discharges. Other effluent discharges affecting EFH via diminution in ambient water quality include well completion fluids, sanitary and domestic wastes, deck drainage, uncontaminated freshwater or seawater, desalination brine, uncontaminated ballast and bilge water, and miscellaneous discharges. Impacts on water quality have been discussed previously. No significant impacts on EFH are expected from these discharges.

(b) Accidents

A major spill in offshore waters would produce a slick on the water and temporarily increase hydrocarbon concentrations. Given that EFH includes most of the substrate and water column of the Gulf of Mexico where highly migratory managed species commonly occur, some impact on EFH would be unavoidable. However, the area affected would be a small percentage of the EFH in the Gulf of Mexico, and the duration would be brief (few hours to a few days).

A large spill could affect water column biota including phytoplankton, zooplankton, and nekton. While adult and juvenile fishes may actively avoid a large oil spill, the planktonic eggs and larvae would be unable to avoid contact. Eggs and larvae of fishes will die if exposed to certain toxic fractions of spilled oil. Most of the fishes inhabiting shelf or oceanic waters of the Gulf of Mexico have planktonic eggs and larvae. Impacts would be potentially greater if local scale currents retained planktonic larval assemblages (and the floating oil slick) within the same water mass. However, due to the wide dispersal of early life history stages of fishes in the surface waters of the Gulf of Mexico, a spill is not expected to have significant impacts at the population level.

A blowout resulting in a condensate spill could affect benthic communities within a few hundred meters of the wellsite. The impacts are discussed under Benthic Communities. The spill could affect a relatively small area of soft bottom seafloor, which would be recolonized by benthic organisms over a period of months to years. Neither chemosynthetic nor live bottom communities are found in the lease blocks. Therefore, a major spill is unlikely to have any impacts on EFH for demersal fishes.

The project area is not recognized as an important or critical area for breeding or migrations. However, the Loop Current, which is generally located south of the project area but sometimes overlaps it, serves as a migratory pathway for bluefin tuna and other migratory pelagic fishes as they move between the Gulf of Mexico and adjacent waters. Migratory species that migrate through the area following a spill could be exposed briefly to the spill. In open ocean waters, especially those near the Loop Current, it is expected

that a spill would be naturally dispersed and weathered rapidly. Due to the limited area affected by a deepwater spill and the rapid dissolution and evaporation of the slick, no significant impacts on breeding habitats or migration routes would be expected.

B.2.2 Marine and Pelagic Birds

A variety of seabirds may occur in the pelagic environment of the project areas (Peake, 1996; Hess and Ribic, 2000). Seabirds spend much of their lives offshore over the open ocean, except during breeding season when they nest along the coast. In addition, other birds such as waterfowl, marsh birds, and shorebirds may occasionally be present over open ocean areas. No endangered or threatened bird species are likely to occur at the project area due to the distance from shore. For a discussion of Shore Birds and Coastal Nesting Birds, see **EIA Section B.3.3**.

Seabirds of the northeastern Gulf of Mexico were surveyed from ships during the GulfCet II program. Hess and Ribic (2000) reported that terns, storm-petrels, shearwaters, and jaegers were the most frequently sighted seabirds in the deepwater area (>200 m). Relationships with hydrographic features were found for several species, possibly due to effects of hydrography on nutrient levels and productivity of surface waters where birds forage. GulfCet II did not estimate bird densities; however, Powers (1987) indicates that seabird densities over the open ocean typically are <10 birds/km^2.

(a) Routine Operations

Routine IPFs potentially affecting marine and pelagic birds include

- Presence of structures; and
- Marine trash and debris.

Other factors such as effluent discharges are likely to have negligible impacts on marine birds due to rapid dispersion, the small area of ocean affected, and the intermittent nature of the discharges.

Presence of Structures. Pelagic seabirds and trans-Gulf migrant birds may be present at the project area. Birds may use offshore drilling rigs and platforms for resting, feeding, or as temporary shelter from inclement weather (Russell, 2005). Some birds may be attracted to offshore structures because of the lights and the fish populations that aggregate around these structures. Birds that frequent platforms may be exposed to contaminants including air pollutants and routine discharges, but significant impacts are unlikely due to rapid dispersion. Birds migrating over water at night have been known to strike offshore structures, resulting in death or injury (Wiese et al., 2001; Russell, 2005).

Marine Trash and Debris. Debris lost overboard from offshore operations can injure or kill birds that ingest or become entangled in it. MMS regulations and Federal law prohibit disposal of trash and debris in the ocean. In addition, MMS has issued NTL 2003-G11, which instructs operators to exercise caution in the handling and disposal of small items and packaging materials, requires posting of placards at prominent locations on offshore vessels and structures, and requires a marine trash and debris awareness training and certification process. Compliance with this NTL and any related MMS requirements is assumed to be effective in minimizing the potential for debris-related impacts on birds.

(b) Accidents

Pelagic seabirds could be exposed to oil from a spill at the project area. Hess and Ribic (2000) reported that terns, storm-petrels, shearwaters, and jaegers were the most frequently sighted seabirds in the deepwater Gulf of Mexico (>200 m). Powers (1987) indicates that seabird densities over the open ocean typically are <10 birds/km^2, and therefore total numbers of birds potentially affected by a spill would be small.

Spilled oil may affect birds through various pathways. Direct contact with oil may result in the fouling or matting of feathers with subsequent limitation or loss of flight capability, or insulating or water repellent capabilities; irritation or inflammation of skin or sensitive tissues such as eyes and other mucous membranes; or toxic effects from ingested oil or the inhalation of oil or related volatile distillates. The Eastern Gulf multisale EIS discusses these impacts (MMS, 2003b).

B.2.3 Public Health and Safety

(a) Routine Operations

There are no IPFs associated with routine operations that are expected to affect public health and safety.

(b) Accidents

An H_2S release was not considered as an IPF because MMS determined LL 1 and 2 to be "H_2S absent." No impacts on public health and safety are expected from an H_2S release.

In the event of a major spill from a tank rupture or blowout, the main safety and health concerns are those of the offshore personnel responding to such a spill. The proposed activities will be covered by the Sub-Regional OSRP, and in addition, the drillship and the Independence Hub will maintain a Shipboard Oil Pollution Emergency Plan as required under MARPOL 73/78. Anadarko will use the best and safest technologies throughout the project, including spill response efforts. Based on the WCD discharge volumes, anticipated weathering characteristics, and response measures as detailed in the Sub-Regional OSRP, it is expected that most or all of the spill would be removed before reaching coastal waters or shorelines. Therefore, no impacts on the health and safety of the general public are expected.

B.3 COASTAL AND ONSHORE

Coastal habitats in the northeastern Gulf of Mexico that may be affected by oil and gas activities are described in the Eastern Gulf multisale EIS (MMS, 2003b) and in a literature review by Collard and Way (1997). Sensitive coastal habitats are also tabulated in Anadarko's Sub-Regional OSRP. Coastal habitats inshore of the project area include barrier beaches and dunes, wetlands, and submerged seagrass beds. Generally, most of the northeastern Gulf is fringed by barrier beaches, with wetlands and/or submerged seagrass beds occurring in sheltered areas behind the barrier islands and in estuaries.

B.3.1 Beaches

(a) Routine Operations

There are no IPFs associated with routine activities that could affect beaches due to the distance from shore (over 100 miles).

(b) Accidents

The OSRA modeling indicates no contacts with any shorelines within 3 days after a spill (see **Table 2**). In addition, there is a small probability of contacting any shoreline within 10 days. During this time, most or all of the spill volume is assumed to be removed due to spill weathering and response measures. Therefore, no significant impacts on beaches are expected.

B.3.2 Wetlands

(a) Routine Operations

Coastal wetlands are unlikely to be affected by a routine IPF due to the distance from shore (over 100 miles). Support operations including crew boats and supply boats may have a minor incremental impact on coastal wetlands. Over time with a large number of vessel trips, vessel wakes can erode shorelines along inlets, channels, and harbors. This is particularly of concern in coastal Louisiana because of the existing high rate of coastal wetland loss. Impacts are assumed to be minimized by following the speed and wake restrictions in harbors and channels.

(b) Accidents

The OSRA modeling indicates no contacts with shorelines within 3 days after a spill and a small probability of contacting any shoreline within 10 days. During this time, most or all of the spill volume is assumed to be removed due to spill weathering and response measures. Therefore, no significant impacts on wetlands are expected.

B.3.3 Shore Birds and Coastal Nesting Birds

The following bird species of concern are found in inshore waters or onshore areas:

- Brown pelican;
- Piping plover;
- Southeastern snowy plover; and
- Bald eagle.

Two other endangered species are mentioned in the Eastern Gulf multisale EIS (MMS, 2003b) but do not warrant further discussion: (1) the least tern, for which the endangered designation applies only to interior populations; and (2) the whooping crane, which is not likely to be present inshore of the project area (they winter at Aransas National Wildlife Refuge, Texas).

Brown Pelican. The eastern brown pelican (*Pelecanus occidentalis*) inhabits coastal habitats and forages within coastal waters and waters of the inner continental shelf. Aerial and shipboard surveys including GulfCet and GulfCet II indicate that brown pelicans do not occur in deep, offshore waters (Fritts and Reynolds, 1981; Peake, 1996; Hess and Ribic, 2000). Subsequent to the ban of DDT pesticide, this species has

successfully recolonized much of its former range. It has been de-listed from its endangered status in Alabama and Florida, though it is still listed as endangered in Louisiana and Mississippi (USFWS, 2002). Brown pelicans are listed by Florida as a species of special concern.

Piping Plover. The piping plover (*Charadrius melodus*) is a migratory shorebird that overwinters along the southeastern U.S. and Gulf of Mexico coasts. Piping plovers inhabit coastal sandy beaches and mudflats. This species is currently in decline and listed as threatened as a result of historic hunting pressure, and habitat loss and degradation (Ehrlich et al., 1992). Critical habitat has been proposed, including coastal areas in Florida, Alabama, Mississippi, and Louisiana.

Southeastern Snowy Plover. The southeastern snowy plover (*Charadrius alexandrinus tenuirostris*) is a shorebird that nests within Gulf of Mexico coastal habitats such as dry sandy beaches and flats. Though not federally listed as endangered or threatened (USFWS, 2002), it is listed as threatened by the State of Florida due to population declines resulting from habitat loss and degradation (Ehrlich et al., 1992). Nesting sites in the Florida Panhandle range from the Alabama border eastward beyond Little St. George.

Bald Eagle. The southern bald eagle (*Haliaeetus leucocephalus*) is a terrestrial raptor that is widely distributed across the southern U.S., including coastal habitats along the Gulf of Mexico. The Gulf coast is inhabited by both wintering migrant and resident bald eagles (Johnsgard, 1990; Ehrlich et al., 1992). Populations of southern bald eagles have increased in recent years as a result of the ban of DDT pesticide and the efforts of intense recovery programs. Populations in the lower 48 states are classified as threatened, but the USFWS has proposed to de-list the species in the lower 48 states (USFWS, 2002).

(a) Routine Operations

Due to the distance from shore, the only routine IPF that may affect shore birds and coastal nesting birds is support operations. Support vessels and helicopters will transit coastal areas in Louisiana where species such as the brown pelican, piping plover, snowy plover, and bald eagle may be found. Helicopter and vessel traffic could periodically disturb individuals or groups of birds within sensitive coastal habitats (e.g., wetlands that may support feeding, resting, or breeding birds). However, Federal Aviation Administration guidelines and corporate helicopter policies specify that pilots maintain a minimum altitude of 213 m (700 ft) while in transit offshore, 305 m (1,000 ft) over unpopulated areas or across coastlines, and 610 m (2,000 ft) over populated areas and sensitive habitats such as wildlife refuges and park properties. Vessel operators use designated navigation channels and comply with posted speed and wake restrictions while transiting sensitive inland waterways. With these guidelines in effect, it is likely that individual birds would experience at most only short-term, behavioral disruption.

(b) Accidents

Coastal bird species of concern that could be affected include the brown pelican, piping plover, southeastern snowy plover, and bald eagle. Brown pelicans typically do not venture offshore of the inner continental shelf. Piping plovers and southeastern snowy plovers could encounter the spill only if it reached coastal habitats. A spill would not be expected to contact or otherwise impact bald eagles unless contamination and subsequent cleanup activities occurred within the vicinity of eagle nesting or roosting sites. The

OSRA modeling indicates no contacts with any shorelines within 3 days after a spill and a small probability of contacting any shoreline within 10 days. During this time, it is assumed that most or all of the spill volume would be removed due to spill weathering and response measures. Therefore, no significant impacts on shore birds or coastal nesting birds, including species of concern, are expected.

B.3.4 Coastal Wildlife Refuges

National wildlife refuges along the coast from Cedar Key, Florida through Louisiana include four in Florida (Cedar Keys, Lower Suwannee, St. Marks, and St. Vincent), two in Alabama (Grand Bay and Bon Secour), one in Mississippi (Grand Bay), and three in Louisiana (Breton, Delta, and Shell Keys). In addition, there are various State wildlife refuges in coastal areas (tabulated in Anadarko's Sub-Regional OSRP).

(a) Routine Operations

Due to the distance from shore, there are no IPFs associated with routine activities that are likely to affect coastal wildlife refuges.

(b) Accidents

Coastal wildlife refuges could be affected only if a major spill occurred and the oil was transported to shore in significant quantities before being weathered by natural processes or dispersed by response measures. The OSRA modeling indicates that no coastal areas would be contacted by oil within 3 days, and there is a small probability of oil contacting any shoreline within 10 days. During this time, most or all of the spill would be removed due to natural weathering processes and spill response measures as described in the Sub-Regional OSRP. Therefore, no significant impacts on coastal wildlife refuges or other protected areas are expected.

B.3.5 Wilderness Areas

Wilderness areas and other protected coastal areas in Louisiana, Mississippi, Alabama, and the Florida Panhandle include a national seashore, numerous Wildlife Management Areas and State Parks, aquatic preserves, and other managed areas. There is also an Audubon Bird Sanctuary on the eastern end of Dauphin Island, Alabama. These areas include habitats such as barrier beach and dune systems, wetlands, and submerged seagrass beds that support wildlife including endangered or threatened species.

(a) Routine Operations

Due to the distance from shore, there are no IPFs associated with routine activities that are likely to affect wilderness areas.

(b) Accidents

Wilderness areas and other protected areas in Louisiana, Mississippi, Alabama, and the Florida Panhandle could be affected only if a major spill occurred and the oil was transported to shore in significant quantities before being weathered by natural processes or dispersed by response measures. The OSRA modeling indicates no shoreline contacts within 3 days and a small probability of contacting any shoreline within 10 days. During this time, most or all of the spill would be removed due to spill weathering and response measures as described in the OSRP. Therefore, no significant impacts on coastal wilderness areas are expected.

B.4 OTHER RESOURCES

B.4.1 Benthic Communities

The seafloor within the lease blocks is expected to consist of soft sediments. Water depths in the lease area range from about 2,542 to 2,551 m (8,343 to 8,369 ft). These depths would place the project area within the Mesoabyssal Zone for both megafauna and macroinfauna, as defined by Gallaway (1988). In terms of megafauna, the fish assemblage is characterized as depauperate, consisting of five species including *Dicrolene kanazawai* and *Basozetus normalis* (Pequegnat et al., 1990). Macroinfaunal densities reported by Gallaway (1988) for these depths are about 500 to 1,000 individuals/m^2. There are no individual dominant species in the deep-sea macroinfauna, but polychaetes are the most abundant and diverse group.

Meiofauna (animals passing through a 0.5-mm sieve but retained on a 0.062-mm sieve) and microbiota are also important components of the deep-sea benthos. Rowe (2000) indicates little information is available on either group for the deep Gulf. Meiofaunal densities and biomass in the depths of the project area are higher than those of the macroinfauna (Gallaway, 1988). Available data suggest that bacteria are the most important biotic component in terms of biomass, and much of the organic carbon supplying the benthos with energy cycles through the bacteria (Cruz-Kaegi, 1998).

A deep Gulf of Mexico benthos program has expanded on the depth and geographic coverage of the previous continental slope study (Rowe and Kennicutt, 2002). The study includes stations at depths from 300 m to over 3,000 m. Preliminary data from nearby Stations S37, S38, S39, and S40 (shown on **Figure 4)** indicate macrofaunal densities of about 4,000 to 10,000 individuals/m^2. Elevated macrofaunal densities were noted at some stations near Desoto Canyon, which may be attributable to organic matter accumulation. These densities are considerably higher than those reported previously by Gallaway (1988).

(a) Routine Operations

The most important IPFs on deepwater benthic communities are physical disturbances of the seafloor. In ***EIA Section A.1***, the total area disturbed was estimated to be about 6 ha for installation of subsea facilities in LL 1/2 and about 6 ha for installation of a right-of-way pipeline connecting to the Independence Hub. A few hectares are assumed to be disturbed in MC 920 by the 12 suction pilings used to moor the Independence Hub.

These physical disturbances may result in crushing of soft-bottom benthic fauna, burial or disruption of fauna, and increased turbidity from sediment resuspension. Disturbed bottom sediments will be recolonized through larval settlement and migration from adjacent areas. Because some deep-sea biota grow and reproduce slowly, recovery may require several years.

At the seafloor, bottom-dwelling fishes and invertebrates may be attracted to the structure provided by subsea facilities, including well trees, the production manifold, umbilical termination assemblies, in-field flowlines and umbilicals, and jumpers.

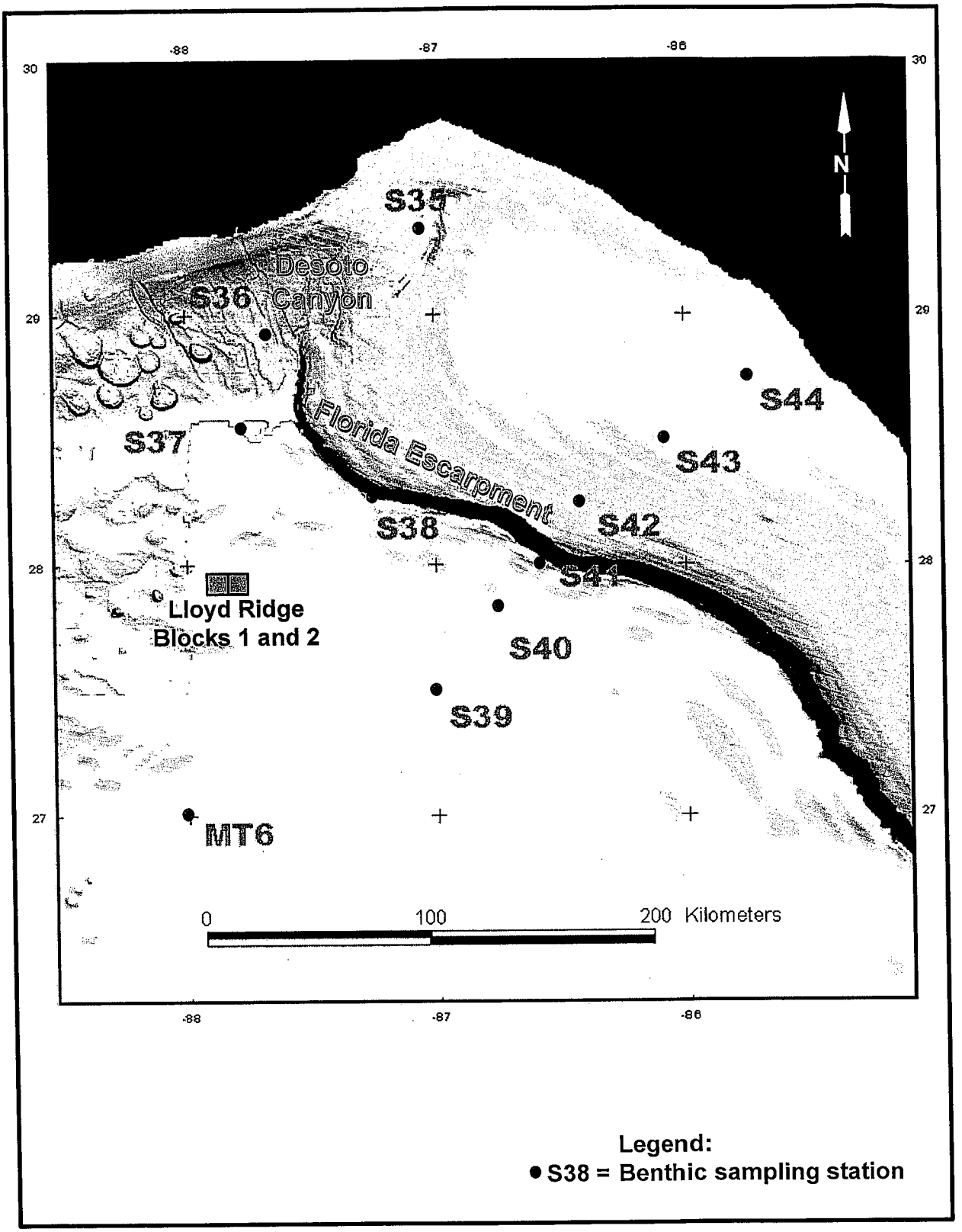

Figure 4. Location of Lloyd Ridge Blocks 1 and 2 in relation to stations of the Deep Gulf of Mexico Benthos Program (Rowe and Kennicutt, 2002).

Pursuant to NTL No. 2003-G03, operators may be required to conduct remotely operated vehicle (ROV) surveys for the purpose of biological and physical observations. If required by the MMS, Anadarko will conduct an ROV survey as specified under this NTL. ROV surveys provide information about the extent of impacts on deepwater benthic communities.

(b) Accidents

A blowout resulting in a condensate spill could affect benthic communities within a few hundred meters of the wellsite. While some oil could initially adhere to surface sediments surrounding the wellsite, resulting in smothering and/or toxicity to benthic organisms, most of the oil is assumed to rise rapidly through the water column. The physical impacts of a subsurface blowout are also a consideration. The MMS (2003b) estimates that a severe subsurface blowout could resuspend and disperse sediments within a 300-m radius. While coarse sediments (sands) would probably settle at a rapid rate within 400 m from the blowout site, fine sediments (silts and clays) could be resuspended for more than 30 days and dispersed over a much wider area. Surface sediments at the project area are assumed to be largely silt and clay, based on previous studies (Gallaway, 1988). The affected area would be recolonized by benthic organisms over a period of months to years.

Neither chemosynthetic nor live bottom communities are found in the lease blocks. It is possible that undiscovered chemosynthetic communities exist in other deepwater lease blocks, and live bottom areas are known to be present on the Mississippi-Alabama shelf and shelf edge. However, a spill at the sea surface is unlikely to reach the seafloor. Therefore, a major spill is unlikely to have any impacts on sensitive benthic habitats.

A chemical spill at the surface would be unlikely to affect benthic communities unless heavy or solid materials (e.g., pieces of copper or lead) were lost overboard and sank rapidly to the bottom. Material accumulating on the seabed could kill or injure a few benthic organisms or alter the sediment quality in a small area that would most likely already be disturbed by previous cuttings and drilling fluid releases. Impacts on benthic communities would be minor to negligible.

B.4.2 Pelagic Communities

(a) Routine Operations

Routine IPFs potentially affecting pelagic communities include

- Presence of structures; and
- Effluent discharges.

Presence of Structures. The drillship and the Independence Hub will act as FADs. In oceanic waters, the FAD effect would be most pronounced for epipelagic fishes such as tunas, dolphin, billfishes, and jacks, which are commonly attracted to fixed and drifting surface structures (e.g., Holland et al., 1990; Higashi, 1994; Relini et al., 1994). This FAD effect would possibly enhance feeding of epipelagic predators by attracting and concentrating smaller fish species.

Effluent Discharges. Effluent discharges affecting pelagic biota include well completion fluids, sanitary and domestic wastes, deck drainage, uncontaminated freshwater or seawater, desalination brine, uncontaminated ballast and bilge water, and miscellaneous discharges. Minimal impacts on water quality and biota are anticipated from these discharges in accordance with NPDES permit requirements. The discharges are either benign or would affect water quality slightly (e.g., suspended solids, nutrients, chlorine, and biochemical oxygen demand) within tens of meters of the discharge (MMS, 2003a).

Produced water discharges (at the Independence Hub location) have some characteristics that could adversely affect pelagic biota, including low dissolved oxygen and high levels of suspended solids, salinity, organic carbon, and certain metals and organic compounds (Neff, 1987). However, these discharges are expected to disperse and dilute to background levels within about 1,000 m of the discharge point, with no significant biological impacts (MMS, 2003b).

(b) Accidents

A large spill could affect water column biota including phytoplankton, zooplankton, and nekton. While adult and juvenile fishes may actively avoid a large oil spill, the planktonic eggs and larvae would be unable to avoid contact. Eggs and larvae of fishes will die if exposed to certain toxic fractions of spilled oil. Most of the fishes inhabiting shelf or oceanic waters of the Gulf of Mexico have planktonic eggs and larvae (Richards et al., 1989, 1993). Impacts would be potentially greater if local scale currents retained planktonic larval assemblages (and the floating oil slick) within the same water mass. However, due to the wide dispersal of early life history stages of fishes in the surface waters of the Gulf of Mexico, a spill is not expected to have significant impacts at the population level.

The inventory of chemicals on board for the project is predominantly formulations with low environmental hazards to the marine environment, and quantities transported are relatively small, hence a chemical spill will have lower environmental implications compared to a large oil spill. Any chemical spill reaching the sea surface has the potential to interact with marine organisms in the immediate vicinity of the spill. Phytoplankton, zooplankton, and nekton may potentially encounter spilled chemicals; however, rapid dilution, dissolution, or dispersal via wind and wave action will temper such impacts. Impacts on pelagic communities would be negligible.

B.4.3 Offshore Areas of Concern

In the offshore environment, areas of biological concern (excluding chemosynthetic and live bottom communities, which have been discussed in separate sections) include two pelagic longline fishing closure areas, two Special Management Areas, and one HAPC.

Pelagic Longline Fishing Closure Areas. In August 2000, the Federal government closed two adjacent areas in the Desoto Canyon area to longline fishing (65 Federal Register 47214, 1 August 2000). One of the closure areas is adjacent to the lease area (see **Figure 3**). The areas were closed because longline fishing may be contributing to the bycatch mortality of billfishes and undersized swordfish.

Special Management Areas. The Madison and Swanson Special Management Area and the Steamboat Lumps Special Management Area (**Figure 3**) are hard bottom areas on the continental shelf that are believed to be important for grouper spawning. Established by the GMFMC (65 Federal Register 31827, 19 May 2000), these are experimental research reserves that are closed to all fishing except highly migratory species (tuna, billfishes, sharks), primarily to protect groupers, which are associated with hard bottom areas.

Florida Middle Grounds Habitat Area of Particular Concern. The Florida Middle Grounds is a hard bottom feature located about 160 km northwest of Tampa Bay. It consists of two types of large reef structures: mountain-like pinnacles and flat-top plateaus. The tops of the structures are in depths of about 20 to 30 m, and they slope down to depths of 36 to 40 m. The hard bottom is covered with dense algae, large sponges, sea whips, and several stony coral species. Fish populations include 170 species (Jaap, 2000). The site has been designated as an HAPC since 1984. This is a Federal fishery management zone intended to protect fragile coral resources.

(a) Routine Operations

There are no routine IPFs that are expected to have any impacts on pelagic longline fishing closure areas, special management areas, or HAPCs.

(b) Accidents

Pelagic Longline Fishing Closure Areas. Presumably, portions of these areas could be contacted within a day by a spill in the project area. However, the relative area affected would be small. Although individual fishes including juveniles and floating larvae could be killed by exposure to spilled diesel fuel or condensate, no significant or persistent impacts at the population level are likely.

Special Management Areas. The OSRA modeling indicates no contacts with these areas within 10 days after a spill, during which time it is assumed that most or all of the spill volume would be removed due to weathering and response measures. Therefore, no impacts on these special management areas would be expected. In any case, no impact is likely because the protected resource is at the seafloor.

Florida Middle Grounds Habitat Area of Particular Concern. The OSRA modeling indicates no contact with this area within 10 days, during which time all of the spill volume would be removed due to weathering and response measures. Therefore, no impacts are expected. Also, no impact is likely because the protected resource is at the seafloor.

B.4.4 Gulf Sturgeon

The Gulf sturgeon (*Acipenser oxyrinchus desotoi*) is the only listed threatened fish species in the Gulf of Mexico. An anadromous fish that migrates from the sea upstream into coastal rivers to spawn in freshwater, it historically ranged from the Mississippi River to Charlotte Harbor, Florida (Wakeford, 2001). Today, this range has contracted to encompass major rivers and inner shelf waters from the Mississippi River to the Suwannee River, Florida. Populations have been depleted or even extirpated throughout this range by fishing, shoreline development, dam construction, water quality changes, and other factors (Barkuloo, 1988; Wakeford, 2001). These declines prompted the listing of the Gulf sturgeon as a threatened species in 1991. The best known populations occur

in the Apalachicola and Suwannee Rivers in Florida (Carr, 1996; Sulak and Clugston, 1998), the Choctawhatchee in Alabama (Fox et al., 2000), and the Pearl in Mississippi/Louisiana (Morrow et al., 1998).

Adult Gulf sturgeon spend March through October in the rivers and November through February in estuarine or shelf waters. The offshore distribution of Gulf sturgeon during winter months is not known, but there have been no reported catches in Federal OCS waters (MMS, 2003b).

In 2003, critical habitat for the Gulf sturgeon was designated in Louisiana, Mississippi, Alabama, and Florida. Critical habitat identifies specific areas that are essential to the conservation of Gulf sturgeon and that may require special management considerations or protections. Fourteen geographic areas among the Gulf of Mexico rivers and tributaries were designated critical habitat. The areas extend from Lake Borgne in Louisiana to Suwannee Sound in Florida (MMS, 2004).

(a) Routine Operations

There are no IPFs associated with routine project activities that are likely to affect Gulf sturgeon.

(b) Accidents

Presumably, Gulf sturgeon could be affected if oil reached very shallow waters or coastal rivers. However, the OSRA modeling indicates no contacts with coastal waters within 3 days after a spill and a small probability of any shoreline contact within 10 days. During this time, it is assumed that most or all of the spill volume would be removed due to spill weathering and response measures. Therefore, no significant impacts on Gulf sturgeon are expected.

B.4.5 Endangered Beach Mice and Florida Salt Marsh Vole

Four subspecies of endangered beach mouse occur on barrier islands of Alabama and the Florida Panhandle (MMS, 2003b). The Florida salt marsh vole occurs in a single marsh location near Cedar Key.

(a) Routine Operations

There are no IPFs associated with routine project activities that could affect endangered beach mice or the Florida salt marsh vole due to the distance from shore and the lack of any onshore support activities near any area inhabited by these species.

(b) Accidents

The OSRA modeling indicates no contacts with shorelines inhabited by beach mice within 10 days after a spill and no contacts within 30 days with shorelines adjacent to the Florida salt marsh vole habitat (land segment 34). By this time, it is assumed that all of the spill volume would be removed due to spill weathering and response measures. Therefore, no significant impacts on beach mice or Florida salt marsh voles are expected.

B.4.6 Economic and Demographic Conditions

(a) Routine Operations

The project involves offshore operations with support from existing shore base facilities in Louisiana. Due to the low level of activity and the small number of personnel involved, the project will have a negligible impact on economic and demographic conditions including local employment, and local population centers and industry. No new employees are expected to move permanently into the area.

(b) Accidents

Response to a spill would involve existing resources and personnel, and therefore it would not be expected to have any impact on employment, local population centers, or industry. The OSRA modeling indicates no contacts with shorelines within 3 days after a spill and a small probability of contacting any shorelines within 10 days after a spill. During this time, all of the spill volume would be removed due to spill weathering and response measures. Therefore, no direct or indirect impacts on economic conditions due to oiling of waters or shorelines, cleanup activities, etc. would be expected.

B.4.7 Land Use

(a) Routine Operations

The project will use existing onshore support facilities in coastal Louisiana. The existing land use is industrial. The project will not involve any new construction or changes to existing land use, and therefore will not have any impacts. Levels of boat and helicopter traffic, as well as demand for goods and services including scarce coastal resources, will represent a small fraction of the overall level of activity occurring at the shore base.

(b) Accidents

An offshore spill would not be expected to affect land use.

B.4.8 Recreation and Tourism

(a) Routine Operations

There are no known recreational uses of the lease blocks. Recreational resources and tourism in coastal areas would not be affected by any routine activities due to the distance from shore (over 100 miles). Anadarko will comply with all applicable regulations, NTLs, and lease stipulations regarding solid waste disposal. Waste management practices including waste minimization and recycling programs will minimize the chance of trash or debris being lost overboard and subsequently washing up on beaches.

(b) Accidents

The OSRA modeling indicates no contacts with shorelines within 3 days after a spill and a small probability of contacting any shorelines within 10 days after a spill. During this time, all of the spill volume would be removed due to spill weathering and response measures. Therefore, no impacts on coastal recreation and tourism would be expected.

B.4.9 Public Opinion

Most stakeholders in Florida are already intensely opposed to offshore drilling and production activities, whether near the coast or more than 100 miles offshore (Blanchard, 1999). Public opinion in coastal Alabama is more mixed, with many residents supporting oil and gas activities and others opposing them (Blanchard, 1999). It is unlikely that public opinion will be affected by the proposed activities, except in the event of a major oil spill reaching coastal waters, which is highly unlikely based on the spill modeling (**Tables 2** and **3**).

B.4.10 Coastal Littoral Processes

There are no IPFs associated with routine project activities that could affect littoral processes. In the unlikely event of a diesel or crude oil spill, impacts on coastal littoral processes are highly unlikely due to the measures detailed in the Sub-Regional OSRP and the distance from shore.

B.4.11 Navigation

There are no IPFs associated with either routine project activities or accidents that are likely to affect navigation. The blocks are not located within any USCG-designated fairway or shipping lane. No impacts on marine shipping or navigation are anticipated. The blocks are located within military warning area EWTA-1F; Anadarko will comply with MMS requirements and lease stipulations to avoid impacts on uses of the area by military vessels and aircraft.

B.4.12 Other Uses of the Area

There are no other known uses of the lease area, and therefore no impacts are anticipated.

C. IMPACTS ON PROPOSED ACTIVITIES

C.1 GEOLOGIC HAZARDS

Shallow hazards reports covering LL 1 and 2 were submitted with the Initial Exploration Plans for these leases in accordance with NTL 2003-G17 and NTL 98-20. The analyses concluded that the wellsites are free of any major geological hazards. A shallow hazard report covering MC 920 is being submitted separately to the MMS. Right-of-way pipelines will be permitted under separate pipeline applications that will contain individual hazard assessments. The pipeline route hazard assessments indicate there are no geologic hazards along the pipeline route that would hinder pipeline or umbilical construction activities or impede performance.

C.2 SEVERE WEATHER

Under most circumstances, weather is not expected to have any effect on the proposed activities. Extreme weather, including high winds, strong currents, and large waves, has been taken into account in the design criteria for the drillship and the Independence Hub. High winds and limited visibility during a severe storm could disrupt support activities

(vessel and helicopter traffic) and might make it necessary to suspend some activities for safety reasons until the storm or weather event passes. In the event of a hurricane, procedures as outlined in Anadarko's Hurricane Evacuation Plan as well as the rig's Emergency Response Manual for Hurricanes would be adhered to.

C.3 CURRENTS AND WAVES

Under most circumstances, physical oceanographic conditions are not expected to have any effect on the proposed activities. Strong currents and large waves have been taken into account in the design criteria for the drillship and the Independence Hub. High waves during a severe storm could disrupt support activities (vessel and helicopter traffic) and might make it necessary to suspend some activities for safety reasons until the storm or weather event passes.

D. ALTERNATIVES

In the development of the proposed action, Anadarko has considered various technical and operational options. However, no formal alternatives were analyzed.

E. MITIGATION MEASURES

The proposed action does not involve any mitigation measures other than those required by laws and regulations, including all applicable Federal, State, and local requirements concerning air emissions, discharges to water, and solid waste disposal, as well as any additional permit requirements. All project activities will be conducted under an MMS-approved Sub-Regional OSRP, which has been submitted to the MMS under separate cover.

F. CONSULTATION

No persons or agencies were consulted during the preparation of this EIA.

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APPENDIX I
CZM CONSISTENCY CERTIFICATION

Issues identified in the Louisiana Coastal Zone Management Program include the following: general coastal use guidelines, levees, linear facilities (pipelines); dredged soil deposition; shoreline modifications, surface alterations, hydrologic and sediment transport modifications, waste disposal; uses that result in the alteration of waters draining into coastal waters; oil, gas, or other mineral activities; and air and water quality.

Relevant enforceable policies were considered in certifying consistency for Louisiana.

Issues identified in the Alabama Coastal Zone Management Program include the following: review of all coastal resource uses and activities that have a direct and significant effect on the coastal area. Uses subject to the Alabama CZM Program are divided into regulated and non-regulated categories. Regulated uses are those that have a direct and significant impact on the coastal areas. These uses require a State permit or are required by Federal law to be consistent with the management program. Uses that require a State permit must receive a certificate of compliance. Non-regulated uses are those activities that have a direct and significant impact on the coastal areas but do not require a State permit or Federal consistency certification. Non-regulated uses must be consistent with the ACAMP and require local permits to be administered by ADEM.

Issues identified in the Florida Coastal Zone Management Program include the following: The Florida Coastal Zone Management Act authorized the development of the coastal management program. A network of agencies comprises the coastal management agencies to represent a balanced statewide perspective including interests in coastal development, professional/academic coastal science, commercial fishing, environmental/coastal conservation, local government, coast/marine commerce, energy development, recreational fishing/boating, regional planning councils, water management districts, and environmental education. The purpose of the program is to protect historic and archaeological resources, freshwater fish, birds, and both upland game and no-game animals, including endangered species; development, maintenance, and protection of the transportation systems, and the saltwater fisheries and marine mammals.

CZM Consistency Certifications for Louisiana, Alabama, and Florida are enclosed as **Attachment I-1**.

ALABAMA COASTAL ZONE MANAGEMENT
CONSISTENCY CERTIFICATION
Lloyd Ridge Blocks 1 and 2

OCS related oil and gas development activities having potential impact on the Alabama Coastal Zone are based on the location of the proposed facilities, access to those sites, best practical techniques for operations and production equipment, guidelines for the prevention of adverse environmental effects, effective environmental protection, emergency plans and contingency plans. Alabama policies have been addressed below or are cross referenced to the appropriate sections of the plan:

Topic	Cross Reference	Comments
Coastal Resource Use Policies		
Coastal Development		Dock and port facilities in LA will be used. There will be no new construction, dredging, or filling in Alabama state waters. There will be no new commercial development or capital improvements in Alabama's coastal zone, nor will there be any employment effects.
Mineral Resource Exploration and Extraction		Proposed operations will take place 110 miles from Alabama's coastline.
Commercial Fishing	Appendix H	
Hazard Management	Appendix C	A Shallow Hazards Report has been prepared and submitted to MMS in order to identify and assess the seafloor and shallow geologic conditions in this block(s).
Shoreline Erosion	Appendix H	Proposed operations will take place 106 miles from Alabama's coastline.
Recreation	Appendix H	
Transportation	Appendix B	
Natural Resource Protection Policies		
Biological Productivity	Appendix H	
Water Quality	Appendix H	
Water Resources	Appendix H	
Air Quality	Appendix G	
Wetlands and Submerged Grassbeds	Appendix H	
Beach and Dune Protection	Appendix H	
Wildlife Habitat Protection	Appendix H	
Endangered Species	Appendix H	
Cultural Resources Protection	Appendix D	This block does not lie within a high probability zone for historic shipwrecks, and thus does not require an archaeological report. As part of the Hazards Report, it was determined that no man-made facilities nor seafloor obstructions were located in this block(s)

The proposed activities described in detail in the Plan comply with Alabama's approved Coastal Management Program(s) and will be conducted in a manner consistent with such Program(s).

Anadarko Petroleum Corporation

Judy Davidson
Staff Regulatory Analyst

Date: May 4, 2005

COASTAL ZONE MANAGEMENT

CONSISTENCY CERTIFICATION

INITIAL DEVELOPMENT OPERATIONS COORDINATION DOCUMENT
LLOYD RIDGE BLOCKS 1 AND 2
OCS-G 10486 AND OCS-G 10487

The proposed activities described in detail in this OCS Plan comply with Louisiana's approved Coastal Zone Management Program(s) and will be conducted in a manner consistent with such Program(s).

Anadarko Petroleum Corporation

Judy Davidson, Certifying Official

May 4, 2005

CONSISTENCY CERTIFICATION

Anadarko Petroleum Corporation's Certification of Consistency with the State of Florida Coastal Management Program

INTRODUCTION

This Consistency Certification is an evaluation by Anadarko Petroleum Corporation (APC) of its proposed Initial Development Operations Coordination Document (DOCD) in Lloyd Ridge Blocks 1 and 2 for any reasonably foreseeable coastal effects on the land, water uses, or natural resources, of the coastal zone of Florida, pursuant to the enforceable policies of the Florida Coastal Management Program (FCMP). The Initial DOCD is supported by numerous studies performed by government agencies and the oil and gas industry concerning impacts of oil and gas activities in the Gulf of Mexico and other offshore areas around the world. For citations to these studies and agencies, please see the Environmental Impact Analysis (EIA).

The Initial DOCD provides for the subsea completion of three wells, the installation of a subsea system in the lease area, and the production of the three wells as detailed in ***DOCD Appendix A***. Production from Lloyd Ridge Blocks 1 and 2 will be transported by pipeline to Anadarko's proposed Independence Hub in Mississippi Canyon Block 920 in the Central Planning Area. Installation and operation of the Independence Hub, as well as installation of a right-of-way pipeline connecting the lease area to the Independence Hub, are being permitted separately and are not part of the proposed action in the DOCD. The activities in Lloyd Ridge Blocks 1 and 2 will occur in outer continental shelf (OCS) waters, offshore Alabama, approximately 189 miles from the nearest Florida shoreline. APC believes that the planned activities will have little, if any, effect beyond the area immediately adjacent to the proposed activity sites, and that the possibility of any impacts to Florida's coastal zone is remote. However, APC has undertaken this consistency evaluation and believes that the proposed activities comply with the enforceable policies of the FCMP and will be conducted in a manner consistent with this Program.

The activities will be conducted in accordance with Minerals Management Service (MMS) and U.S. Environmental Protection Agency (USEPA) regulations, applicable Notices to Lessees (NTLs), conditions in the approved permits, and lease stipulations. All required Federal permits will be obtained, and all activities will be conducted in compliance with such regulations, NTLs, conditions, and stipulations.

CONSISTENCY ANALYSIS

The FCMP is authorized by the Florida Coastal Management Act, Chapter 380, Land and Water Management, Part II, Coastal Planning and Management, of the Florida Statutes. For this consistency certification, APC has analyzed the proposed action in relation to 16 chapters of the Florida Statutes identified by the State as "core enforceable policies" having specific applicability to offshore oil and gas activity:

(1) Chapter 161 – Beach and Shore Preservation
(2) Chapter 252 – Emergency Management
(3) Chapter 253 – State Lands
(4) Chapter 258 – State Parks and Preserves
(5) Chapter 259 – Land Acquisitions for Conservation or Recreation
(6) Chapter 260 – Recreational Trails System
(7) Chapter 267 – Archives, History, and Records Management
(8) Chapter 288 – Commercial Development and Capital Improvements
(9) Chapter 370 – Saltwater Fisheries
(10) Chapter 372 – Wildlife
(11) Chapter 373 – Water Resources
(12) Chapter 375 – Outdoor Recreation and Conservation
(13) Chapter 376 – Pollution Discharge Prevention and Removal
(14) Chapter 377 – Energy Resources
(15) Chapter 403 – Environmental Control
(16) Chapter 582 – Soil and Water Conservation

1. Chapter 161 – Beach and Shore Preservation

The enforceable policies in this chapter recognize that coastal areas are among the State's most valuable natural, aesthetic, and economic resources and that they protect and provide habitat for a variety of plant and animal life. The State is required to protect beach and dune systems from imprudent activities that could weaken, damage, or destroy the integrity of the system, manage coastal sediments to reduce erosion, and restore and maintain critically eroding beaches. The State also designates coastal areas used, or likely to be used, by sea turtles for nesting and prohibits the removal of vegetative cover that binds sand. This chapter includes Part I, Regulation of Construction, Reconstruction, and Other Physical Activity; Part II, Beach and Shore Preservation Districts; and Part III, Coastal Zone Protection.

As APC will be using the existing dock and port facilities in the Port Fourchon, Louisiana area and helicopter facilities in Galliano, Louisiana during the proposed operations, there will be no new construction, dredging, or filling on Florida's lands or waters that could weaken, damage, or destroy the integrity of the system or cause erosion of beaches. In addition, oil spill impacts on Florida beaches and other coastal areas are highly unlikely due to the distance from shore and the measures detailed in APC's Sub-Regional Oil Spill Response Plan (OSRP), which addresses procedures for containment, recovery, and removal of an oil spill. The precautions included in APC's plan are consistent with the core policies of protecting beach and dune systems. Therefore, the proposed activities are consistent with Chapter 161.

2. Chapter 252 – Emergency Management

The enforceable policies of this chapter direct the State to reduce the vulnerability of its people and property to natural and manmade disasters; prepare for, respond to, and reduce the impacts of natural and manmade disasters; and decrease the time and resources needed to recover from disasters. Disaster mitigation is necessary to ensure the common defense of Floridians' lives and to protect the public peace, health, and safety. The policies provide the means to assist in the

prevention or mitigation of emergencies that may be caused or aggravated by the inadequate planning or regulation of facilities and land uses. State agencies are directed to keep land uses and facility construction under continuing study and identify areas that are particularly susceptible to natural or manmade catastrophic occurrences.

The proposed activities do not involve construction or operation of any facilities in the State of Florida. Therefore, a large oil spill is the only emergency that is considered relevant to this analysis. APC has developed a Sub-Regional OSRP that outlines response actions, inspection and maintenance of response equipment, required spill response drills, governmental notification procedures, inventories of response equipment, response team organization, spill movement monitoring, and contingency plans for oil spill containment, recovery, and removal. An oil spill is highly unlikely to reach Florida waters or shorelines due to the distance from shore and the measures detailed in APC's Sub-Regional OSRP, which addresses procedures for containment, recovery, and removal of an oil spill. The precautions included in APC's plan are consistent with the core policies of preparing for and responding to an oil spill and reducing the vulnerability of Florida's people and resources to impacts if such a spill occurred. Therefore, the proposed activities are consistent with Chapter 252.

3. Chapter 253 – State Lands

This chapter, in part, defines State-owned and State-managed lands and grants authority to acquire and lease lands and to grant rights-of-way and easements. The enforceable policies guide the management of State-owned and sovereign submerged lands and property by the Board of Trustees of the Internal Improvement Trust Fund (Trustees). Lands acquired for preservation, conservation, and recreation serve the public interest by contributing to the public health, welfare, and economy. In carrying out the requirements of this statute, the Trustees are directed to take necessary action to fully conserve and protect State lands, maintain natural conditions, protect and enhance natural areas and ecosystems, prevent damage and depredation, and preserve archaeological and historical resources. All submerged lands are considered single-use lands to be maintained in natural condition for the propagation of fish and wildlife and public recreation. Where multiple-uses are permitted, ecosystem integrity, recreational benefits, and wildlife values are conserved and protected.

During operations in the lease area, APC will not seek to lease or acquire rights-of-way across Florida State lands. The proposed operations will be conducted offshore Alabama, and at existing dock and port facilities located in the Port Fourchon, Louisiana area and helicopter facilities at Galliano, Louisiana. There will be no activities requiring acquisition of rights-of-way or easements on Florida State lands. In addition, oil spill impacts on State-owned and managed lands are highly unlikely due to the distance from shore and the measures detailed in APC's Sub-Regional OSRP, which addresses procedures for containment, recovery, and removal of an oil spill. The precautions in APC's plan are consistent with the core policies to fully conserve and protect State lands and other natural areas and ecosystems. Therefore, the proposed activities are consistent with Chapter 253.

4. Chapter 258 – State Parks and Preserves

State parks, aquatic preserves, and recreation areas are acquired to exemplify the State's natural values and to ensure that these values are conserved for all time. Parks and preserves are managed for the non-depleting use, enjoyment, and benefit of Floridians and visitors and to contribute to the State's tourist appeal. Aquatic preserves are recognized as having exceptional biological, aesthetic, and scientific value and are set aside for the benefit of future generations. Disruptive physical activities and polluting discharges are highly restricted in aquatic preserves. State managed wild and scenic rivers possess exceptionally remarkable and unique ecological, fish and wildlife, and recreational values and are designated for permanent preservation and enhancement for both the present and future.

Chapter 258 specifies limitations on dredge-and-fill activities, discharges, erection of structures, and drilling for oil or gas within aquatic preserves. APC's proposed activities in the lease area are not within or adjacent to any State parks or aquatic preserves. All discharges for the proposed activity will be governed by the National Pollutant Discharge Elimination System (NPDES) General Permit or an Individual Permit; impacts will be localized in deep, offshore waters, and will not have any effect on State parks, aquatic preserves, and recreation areas. Finally, oil spill impacts in these coastal areas are highly unlikely due to the distance from shore and the measures detailed in APC's Sub-Regional OSRP, which addresses procedures for containment, recovery, and removal of an oil spill. The precautions in APC's plan are consistent with the core policies of preserving and protecting the natural resources and aesthetic values of Florida's State parks, aquatic preserves, and recreation areas. Therefore, the proposed activities are consistent with Chapter 258.

5. Chapter 259 – Land Acquisitions for Conservation or Recreation

This chapter discusses the "Land Conservation Act" and the acquisition of lands or water areas for preservation, conservation, and recreational purposes. The chapter indicates an area is of special importance to the State if it involves an endangered or natural resource in imminent danger of development, is of unique value to the State, will result in irreparable loss to the State, or will impair the State's ability to manage or protect other State-owned lands. The enforceable policies guide the acquisition and management of lands to conserve and maintain the State's unique natural resources, protect environmental quality, and provide recreation opportunities for the benefit of future generations. Florida's legislature and citizens have made a tremendous financial commitment to long-term land acquisitions that will preserve and restore unique ecosystems, habitats, water resources, and recreational lands.

APC will be using existing dock and port facilities in Port Fourchon, Louisiana and helicopter facilities in Galliano, Louisiana during the proposed activities. Therefore, there will be no new development, construction, dredging, or filling on Florida's lands or waters. In addition, all discharges for the proposed activity will be governed by the NPDES General Permit or an Individual Permit; impacts will be localized in deep, offshore waters and will not have any effect on Florida lands being acquired or managed for preservation, conservation, or recreational purposes. Finally, oil spill impacts in these coastal areas are highly unlikely due to the distance from shore and the measures detailed in APC's Sub-Regional OSRP, which addresses procedures

for containment, recovery, and removal of an oil spill. The precautions in APC's plan are consistent with the core policies of managing lands to conserve and maintain the State's unique natural resources, protect environmental quality, and provide recreation opportunities. Therefore, the proposed activities are consistent with Chapter 259.

6. Chapter 260 – Recreational Trails System

This chapter discusses the "Florida Greenways and Trails Act" and the State policies to conserve, develop, and use its natural resources for healthful and recreational purposes by the establishment of a "Florida Greenways and Trails System." The System serves to provide recreational opportunities, including, among others, canoeing, jogging, and historical and archaeological interpretation, by acquiring designated lands and waterways for open space to benefit environmentally sensitive lands and wildlife.

As APC will be using existing dock and port facilities in the Port Fourchon, Louisiana area and helicopter facilities in Galliano, Louisiana, there will be no new construction, dredging, or filling on Florida's lands or waters, and no motorized watercraft will conduct any operations within or adjacent to any defined canoe trail necessary to ensure the safe use of a water body for canoes. Therefore, the proposed activities are consistent with the core policies of Chapter 260.

7. Chapter 267 – Archives, History, and Records Management

This chapter discusses the "Florida Historical Resources Act," the State policy to locate, inventory, and evaluate historic properties, and the preservation by the Division of Historical Resources of the Department of State, of all historical property, including sunken or abandoned ships with intrinsic historical or archaeological value. The enforceable policies recognize the State's rich and unique heritage of historic resources and direct the State to locate, acquire, protect, preserve, operate, and interpret historic and archaeological resources for the benefit of current and future generations of Floridians. Objects or artifacts with intrinsic historic or archaeological value located on, or abandoned on, State-owned lands or State-owned submerged lands belong to the citizens of the State. The Act operates in conjunction with the National Historic Preservation Act of 1966 to require State and Federal agencies to consider the effect of their direct or indirect actions on historic and archaeological resources. These resources cannot be destroyed or altered unless no prudent alternative exists. Unavoidable impacts must be mitigated.

Lloyd Ridge Blocks 1 and 2 are not on the MMS list of blocks determined to have a high probability of either prehistoric or historical archaeological resources. Shallow hazards reports covering these blocks were submitted with the Initial Exploration Plans for these leases and did not detect any shipwrecks. It is highly unlikely that objects or artifacts with intrinsic historic or archaeological value would be affected by APC's activities. Therefore, the proposed activities are consistent with the core policies of Chapter 267.

8. Chapter 288 – Commercial Development and Capital Improvements

Chapter 288 establishes enforceable policies that promote and develop the general business, trade, and tourism components of the State economy. The policies include requirements to protect and promote the natural, coastal, historical, and cultural tourism assets of the State, foster the development of nature-based tourism and recreation, and upgrade the image of Florida as a quality destination. Natural resource-based tourism and recreational activities are critical sectors of Florida's economy. The needs of the environment must be balanced with the need for growth and economic development.

As APC will be using existing dock and port facilities in the Port Fourchon, Louisiana area and helicopter facilities in Galliano, Louisiana during the proposed operations, there will be no activities conducted in Florida that would affect the general business, trade, or tourism components of the State economy. There will be no project-associated vessel or aircraft traffic in Florida waters, and there are no plans to purchase supplies or equipment in Florida. The project area is at least 163 miles from the nearest Florida shoreline, and activities will not be visible from the coast or Florida State waters. As discussed in the EIA, water quality impacts of routine discharges will be localized in the vicinity of the drillsites and will not affect Florida lands or waters. Disposal of trash and debris into the ocean is strictly prohibited, and waste management practices required by MMS under NTL 2003-G11 will minimize the chance of trash or debris being lost overboard and subsequently washing up on beaches. Oil spill impacts in Florida coastal areas are highly unlikely due to the distance from shore and the measures detailed in APC's Sub-Regional OSRP, which addresses procedures for containment, recovery, and removal of an oil spill. The precautions in APC's plan are consistent with the core policies of protecting the natural, coastal, historical, and cultural tourism assets of the State and maintaining the image of Florida as a quality destination. Therefore, the proposed activities are consistent with Chapter 288.

9. Chapter 370 – Saltwater Fisheries

The enforceable policies of this chapter direct the State to conserve and manage its renewable marine fishery resources through the protection and management of marine habitat and saltwater fisheries. The paramount conservation and management objective is the continuing health and abundance of the resource. Best available information must be used to manage and protect the State's marine, crustacean, shellfish, and finfish resources and to regulate the commercial and recreational use of the State's saltwater fisheries to ensure optimum sustained benefits to the people of the State.

As discussed in the EIA, effluents from project activities may temporarily affect water quality in the immediate vicinity of the wellsites in the lease area. Discharges including well completion fluids, sanitary and domestic waste, deck drainage, uncontaminated seawater for cooling machinery, and desalination brine may cause localized, short-term impacts on water quality near the site. All discharges will be in compliance with the standards imposed by the NPDES General Permit or an Individual Permit. Water quality is expected to quickly return to normal in the area after operations have been completed. Due to the low toxicity and rapid dispersion of discharges,

little or no impact on water column biota is likely, including fish larvae that recruit to nearshore nursery areas.

There is a very low probability that a spill may occur during operations. The potential impacts of these types of spills on Florida's coastal zone are discussed in the EIA. APC's Sub-Regional OSRP outlines response actions for specific hypothetical spill events. The Sub-Regional OSRP makes provisions for the use of a dispersant by boat or aerial application but notes that before a dispersant can be applied, Federal and State authorities must grant permission. Additional items that are addressed in the plan include provisions for inspection and maintenance of response equipment; required spill response drills; procedures for spill notification to government agencies; inventories of locally and nationally available response equipment; hierarchy of response team organization; provisions for disposal of wastes; and procedures for monitoring and predicting spill movement.

Finally, APC will be using the most modern dynamically positioned drillship in its proposed activities, with state-of-the-art equipment and technology for spill prevention, and will be operating in compliance with the NPDES General Permit or an Individual Permit regarding authorized discharges. If an oil spill should occur, APC's Sub-Regional OSRP addresses plans and procedures for containment, recovery, and removal. The precautions in APC's plan are consistent with the core policies of conserving and protecting marine habitat and saltwater fisheries and maintaining the continuing health and abundance of the resource. Therefore, APC's proposed activities are consistent with Chapter 370.

10. Chapter 372 – Wildlife

This chapter discusses the "Florida Endangered and Threatened Species Act" and its implementation by the Fish and Wildlife Conservation Commission to conserve and protect the fish and wildlife resources of the State, particularly those species defined as endangered or threatened. The Fish and Wildlife Conservation Commission has established a Wildlife Habitat Program, and a Conservation and Recreation Lands Program Trust Fund, for acquiring and managing lands for the conservation of fish and wildlife. The enforceable policies direct the State to conserve its diverse fish and wildlife resources. Florida has more endangered or threatened species than any other continental state; therefore, the protection of species defined as endangered or threatened is emphasized. State lands that provide habitat needed by these species shall be maintained and enhanced for their value as fish and wildlife habitat. Substances thrown, spilled, drained, or discharged into fresh waters that injure or kill fish are expressly prohibited.

As APC will be using the existing dock and port facilities in the Port Fourchon, Louisiana area and helicopter facilities in Galliano, Louisiana, there will be no new construction, dredging, or filling on Florida's lands or waters to affect wildlife habitats or recreation lands. As discussed in the EIA, routine discharges will be localized in the vicinity of the drillsites and will not have any effects on Florida lands, waters, or wildlife. Disposal of trash and debris into the ocean is strictly prohibited, and waste management practices required by MMS under NTL 2003-G11 will minimize the chance of trash or debris being lost overboard and subsequently endangering Florida wildlife. Oil spill impacts in Florida coastal areas are highly unlikely due to the distance from shore and the measures detailed in APC's Sub-Regional OSRP, which addresses procedures

for containment, recovery, and removal of an oil spill. The precautions in APC's plan are consistent with the core policies of conserving Florida's fish and wildlife resources, including endangered or threatened species. Therefore, the proposed activities are consistent with Chapter 372.

11. Chapter 373 – Water Resources

This chapter establishes enforceable policies that guide the management and protection of water resources, water quality, and environmental quality. The policies address the conservation of surface and ground waters for full beneficial use; sustainable water management; preservation of natural resources, fish, and wildlife; protecting public land; and promoting the health and general welfare of Floridians. The State manages and conserves water and related natural resources by determining whether activities will unreasonably consume water, degrade water quality, or adversely affect environmental values such as protected species habitat, recreational pursuits, and marine productivity.

As APC will be using the existing dock and port facilities in the Port Fourchon, Louisiana area and helicopter facilities in Galliano, Louisiana, there will be no usage of Florida water resources and no new construction, dredging, or filling on Florida's lands or waters to affect water quality, protected habitat, recreational pursuits, or marine productivity. All discharges for the proposed activity will be governed by the NPDES General Permit or an Individual Permit; impacts will be localized in deep, offshore waters and will not pollute Florida land or waters. In addition, oil spill impacts on Florida water resources are highly unlikely due to the distance from shore and the measures detailed in APC's Sub-Regional OSRP, which addresses procedures for containment, recovery, and removal of an oil spill. The precautions in APC's plan are consistent with the core policies of conserving surface and ground waters for full beneficial use and protecting natural resources, fish, wildlife, and public lands. Therefore, the proposed activities are consistent with Chapter 373.

12. Chapter 375 – Outdoor Recreation and Conservation

This chapter discusses the "Outdoor Recreation and Conservation Act of 1963" and the responsibility of the Florida Department of Environmental Protection (FDEP) to implement a comprehensive outdoor recreation plan in cooperation with the Fish and Wildlife Conservation Commission and the water management districts. The FDEP participates in the land and water conservation fund program to acquire lands and water areas for outdoor recreation, natural resource conservation, wildlife and forestry management, and water conservation and control. The Act also empowers the Fish and Wildlife Conservation Commission to regulate motor vehicle access and traffic control on public lands.

APC will be using the existing dock and port facilities in the Port Fourchon, Louisiana area and helicopter facilities in Galliano, Louisiana. Therefore, there will be no new construction, dredging, or filling on Florida's lands or waters, and no new vehicle traffic on public lands. In addition, oil spill impacts on Florida conservation, recreation, or resource areas are highly unlikely due to the distance from shore and the measures detailed in APC's Sub-Regional OSRP, which addresses procedures for containment, recovery, and removal of an oil spill. The

precautions in APC's plan are consistent with the core policies of preserving Florida's lands and water areas for outdoor recreation, conservation, and wildlife management. Therefore, the proposed activities are consistent with Chapter 375.

13. Chapter 376 – Pollution Discharge Prevention and Removal

Chapter 376 declares that the preservation of the seacoast as a source of public and private recreation and the preservation of water and certain lands are matters of the highest urgency and priority and shall be accomplished by maintaining surface and ground water, coastal waters, estuaries, tidal flats, beaches, and public lands adjoining the seacoast in as close to a pristine condition as possible. The discharge of pollutants into or upon any coastal waters, estuaries, tidal flats, beaches, and lands adjoining the seacoast of the State is declared to be inimical to the paramount interests of the State and is prohibited. The statute provides for hazards and threats of danger and damages resulting from any pollutant discharge to be evaluated, requires the prompt containment and removal of pollution, provides penalties for violations, and ensures the prompt payment of reasonable damages from a discharge. Portions of Chapter 376 serve as a complement to the national contingency plan portions of the Federal Water Pollution Control Act.

APC has prepared a Sub-Regional OSRP as required for the Eastern Planning Area, which must be consistent with the National Contingency Plan and with the Oil Pollution Act of 1990 (OPA) in order to obtain MMS approval. As APC will be using the existing dock and port facilities in the Port Fourchon, Louisiana area, there will be no transfers between vessels and Florida onshore facilities. As to transfers between offshore facilities and vessels, APC's Sub-Regional OSRP outlines response actions, inspection and maintenance of response equipment, required spill response drills, governmental notification procedures, inventories of response equipment, response team organization, spill movement monitoring, and contingency plans for oil spill containment, recovery, and removal. The precautions in APC's plan are consistent with the core policies of preventing unauthorized pollutant discharges and maintaining surface and ground water, coastal waters, estuaries, tidal flats, beaches, and public lands in as close to a pristine condition as possible. Therefore, the proposed activities are consistent with Chapter 376.

14. Chapter 377 – Energy Resources

The State's policy is to conserve and control the oil and gas resources in the State, including products made from these resources, and to safeguard the health, property, and welfare of Floridians. To accomplish this, Chapter 377 addresses the regulation, planning, and development of the energy resources of the State. The FDEP is authorized to regulate all phases of exploration, drilling, and production of oil, gas, and other petroleum products in the State. This chapter describes the permitting requirements and criteria necessary to drill for and develop oil and gas. FDEP rules ensure that all precautions are taken to prevent the spillage of oil or any other pollutant in all phases of extraction and transportation.

The State explicitly prohibits pollution resulting from drilling and production activities. No person drilling for or producing oil, gas, or other petroleum products may pollute land or water; damage aquatic or marine life, wildlife, birds, or public or private property; or allow any

extraneous matter to enter or damage any mineral or freshwater-bearing formation. Penalties for violations of any provisions of this chapter are detailed.

The proposed project does not involve any drilling or production activities in Florida that are regulated by the FDEP. All discharges will be in accordance with the NPDES General Permit or an Individual Permit; impacts will be localized in deep, offshore waters and will not pollute Florida land or waters, damage wildlife or public or private property, or contaminate any mineral or freshwater-bearing formation. Disposal of trash and debris into the ocean is strictly prohibited, and waste management practices required by MMS under NTL 2003-G11 and Lease Stipulation No. 4 will minimize the chance of trash or debris being lost overboard and subsequently washing up on Florida shorelines or waters. Oil spill impacts in Florida coastal areas are highly unlikely due to the distance from shore and the measures detailed in APC's Sub-Regional OSRP, which addresses procedures for containment, recovery, and removal of an oil spill. The precautions in APC's plan are consistent with the core policies of safeguarding the health, property, and welfare of Floridians and preventing pollution during offshore activities. Therefore, the proposed activities are consistent with Chapter 377.

15. Chapter 403 – Environmental Control

Chapter 403 establishes enforceable policies that guide environmental control efforts by conserving State waters, protecting and improving water quality for consumption and for the propagation of fish and wildlife, and maintaining air quality to protect human health and plant and animal life. Statutory provisions are enacted to protect the health, peace, safety, and general welfare of the people of the State. The statute provides wide-ranging authority to address various environmental control concerns, including air and water pollution, resource recovery and management, solid and hazardous waste management, drinking water protection, pollution prevention, ecosystem management, and natural gas transmission pipeline siting. Chapter 403 declares that pollution of the air and waters is a menace to public health and is harmful to wildlife, fish, and other aquatic life and that the policy of the State is to conserve, maintain, and improve its waters and air quality and develop a comprehensive program for its prevention, abatement, and control of pollution by establishing ambient air and water quality standards.

The Projected Air Quality Emissions Report (***DOCD Appendix G***) for the proposed activities falls well below allowable exemption levels and will not result in onshore ambient air concentrations above significant levels as prescribed in the regulations. Therefore, the proposed activities are consistent with the core policies of Chapter 403.

All discharges (inclusive of well completion fluids, sanitary and domestic wastes, deck drainage, and miscellaneous wastes) shall be in compliance with the standards imposed by the USEPA Region IV NPDES General Permit or an Individual Permit. As discussed in the EIA, discharges from project activities may temporarily affect water quality in the immediate vicinity of the drillsites but would not affect water quality or wildlife in Florida State waters. Pollution of coastal waters by an oil spill is highly unlikely due to the distance from shore and the measures detailed in APC's Sub-Regional OSRP, which addresses procedures for containment, recovery, and removal of an oil spill. The precautions in APC's plan are consistent with the core policies of

conserving State waters and protecting water and air quality. Therefore, the proposed activities are consistent with Chapter 403.

16. Chapter 582 – Soil and Water Conservation

The enforceable policies in this chapter require the conservation, development, and use of soil and water resources to preserve natural resources and to control and prevent soil erosion. Soil stabilization preserves State and private lands, protects wildlife habitat, maintains water quality, assists in the maintenance of navigable waterways, and prevents the impairment of dams and reservoirs.

The proposed operations will be conducted offshore Alabama and at APC's existing dock and port facilities located in the Port Fourchon, Louisiana area and helicopter facilities at Galliano, Louisiana. Routine operations will not involve any construction or other activities in Florida that could result in soil erosion. Oil spill impacts on Florida soils are highly unlikely due to the distance from shore and the measures detailed in APC's Sub-Regional OSRP, which addresses procedures for containment, recovery, and removal of an oil spill. Any cleanup or recovery activities in Florida would be conducted using applicable best management practices to minimize soil erosion. The precautions in APC's plan are consistent with the core policies of preserving Florida's natural resources and preventing soil erosion. Therefore, the proposed activities are consistent with Chapter 582.

CERTIFICATION

The proposed activity complies with the enforceable policies of Florida's approved Coastal Management Program and will be conducted in a manner consistent with such Program.

ANADARKO PETROLEUM CORPORATION

Judy Davidson
Staff Regulatory Analyst
May 4, 2005

SPECIFIC INFORMATION REQUIREMENTS

The State of Florida has specifically identified items (a) through (l) as required data and information, in accordance with NTL No. 2003-G17, Appendix I, Attachment 1. All of the information that is applicable to the proposed activity is provided in the EIA or elsewhere in the DOCD, as referenced below.

(a) A discussion of the measures used to prevent the discharge of oils and greases from drilling rigs or platforms during rainfall and routine operations.
- *This information is provided in **DOCD Appendix A**.*

(b) The following socioeconomic information:
(1) The estimated number of persons you expect to employ in support of your offshore, onshore, and transportation activities within the State of Florida, and where possible, the approximate number of new employees and families likely to move into the affected area;

- *Not applicable to the proposed activity.*

(2) An estimate of the major supplies, services, energy, water, or other resources you expect to purchase within the State of Florida and that are necessary for you to carry out the activities in your DOCD; and

- *Not applicable to the proposed activity.*

(3) The types of contractors or vendors within the State of Florida you will need to carry out the activities in your DOCD.

- *Not applicable to the proposed activity.*

(c) A complete description of any dredging and filling activities associated with the construction or expansion of any onshore facilities in Florida you will use to support your proposed activities.

- *Not applicable to the proposed activity.*

(d) The type and volume of chemical constituents of drilling muds anticipated to be used.

- *Not applicable to the proposed activity.*

(e) Detailed information on the presence of threatened and endangered species in the project area.

- *Information is provided in the following EIA sections: B.1.7 (Marine Mammals), B.1.8 (Sea Turtles), B.3.3 (Shore Birds and Coastal Nesting Birds), B.4.4 (Gulf Sturgeon), and B.4.5 (Endangered Beach Mice and Florida Salt Marsh Vole). Further information is provided in the Sale 181 EIS and Sale 189/197 EIS, which are referenced in the EIA.*

(f) A discussion of air and water quality in and adjacent to the area of proposed activity or potential impact.

- *Information is provided in the following EIA sections: B.1.9 (Air Quality) and B.1.5 (Water Quality). Further information is provided in the Sale 181 EIS and Sale 189/197 EIS, which are referenced in the EIA.*

(g) A thorough description of coastal habitats (including bays, bayous, sounds, estuaries, lagoons, rivers, streams, or other bodies of water) and their associated flora and fauna that could be affected by the proposed activities.

- *Information is provided in the following EIA sections: B.3.1 (Beaches), B.3.2 (Wetlands), B.3.3 (Shore Birds and Coastal Nesting Birds), B.3.4 (Coastal Wildlife Refuges), and B.3.5 (Wilderness Areas). Further information is provided in the Sale 181 EIS and Sale 189/197 EIS, which are referenced in the EIA, and in the Sub-Regional OSRP.*

(h) A description of any historical and archaeological resources that could be affected by your proposed activities. Describe the measures you will use to protect these resources. Describe thoroughly the surveys you used to locate and identify these resources.

- *Information is provided in the following EIA sections: B.1.10 (Shipwreck Sites, known or potential) and B.1.11 (Prehistoric Archaeological Sites). Further information is provided in the Sale 181 EIS and Sale 189/197 EIS, which are referenced in the EIA.*

(i) A discussion of sensitive or critical State and Federal resources, including specially designated and managed areas, that may be impacted by the project (planned activities or accidental discharges).

- *Information is provided in the following EIA sections: B.3.4 (Coastal Wildlife Refuges), B.3.5 (Wilderness Areas), and B.4.3 (Offshore Areas of Concern). Further information is provided in the Sale 181 EIS and Sale 189/197 EIS, which are referenced in the EIA.*

(j) A description of the potential for and types of direct, indirect or secondary, and cumulative impacts of the project (planned project activities and accidents) on: air quality; water quality and quantity; marine and coastal habitats; flora and fauna (including threatened and endangered species); coastal littoral processes; publicly owned and managed lands; cultural or historic resources; recreational and commercial fisheries; communities; the state and local economy; navigation; marine productivity; and other uses of the area.

- *Information is provided in the EIA sections listed below. Further information is provided in the Sale 181 EIS and Sale 189/197 EIS, which are referenced in the EIA.*
  - *Air Quality: Section B.1.9*
  - *Water Quality: Section B.1.5*
  - *Marine and Coastal Habitats: Sections B.1.1, B.1.2, B.1.3, B.1.4, B.2.1, B.3.1, B.3.2, B.3.4, B.3.5, B.4.1, B.4.2, and B.4.3*
  - *Flora and Fauna (including endangered/threatened species): Sections B.1.1, B.1.2, B.1.3, B.1.4, B.1.7, B.1.8, B.2.2, B.4.1, B.4.2, B.4.4, and B.4.5*
  - *Coastal Littoral Processes: Section B.4.10*
  - *Publicly Owned and Managed Lands: Sections B.3.4, B.3.5, and B.4.7*
  - *Cultural or Historic Resources: Sections B.1.10 and B.1.11*
  - *Recreational and Commercial Fisheries: Sections B.1.6 and B.2.1*
  - *Communities: Section B.4.6*
  - *State and Local Economy: Sections B.4.6 and B.4.8*
  - *Navigation: Section B.4.11*
  - *Marine Productivity: Sections B.2.1, B.4.1, and B.4.2*
  - *Other Uses of the Area: Section B.4.12*

(k) A description of measures you will take to avoid, minimize, and mitigate impacts to marine and coastal environments and habitats, biota, and threatened and endangered species.

- *As noted in EIA Section E, the proposed action includes all of the routine mitigation measures required by laws and regulations, including all applicable Federal, State, and local requirements concerning air emissions, discharges to water, and solid waste disposal, as well as any additional permit requirements. All project activities will be conducted under the Sub-Regional OSRP.*

(l) Existing and planned monitoring that will measure environmental conditions, including but not limited to that required by lease stipulation.

- *No monitoring of environmental conditions is included in the proposed action. APC is familiar with the remotely operated vehicle (ROV) survey and reporting provisions of NTL 2003-G03 and has prepared a survey plan in accordance with MMS requirements.*

U.S. Department of the Interior
Minerals Management Service

OMB Control Number: 1010-0049
OMB Approval Expires: August 31, 2006

OCS PLAN INFORMATION FORM

General Information

Type of OCS Plan:	Exploration Plan (EP)	x	Development Operations Coordination Document (DOCD)
Company Name:	Anadarko Petroleum Corporation	MMS Operator Number:	00981
Address:	1201 Lake Robbins Drive	Contact Person:	Judy Davidson
	The Woodlands, TX 77380	Phone Number:	(832) 636-8766
		E-Mail Address:	judy_davidson@anadarko.com

Lease(s): G10486 and G10487	Area: LL	Block(s): 1 and 2	Project Name (If Applicable): Mondo Northwest

Objective(s):		Oil	x	Gas		Sulphur		Salt	Onshore Base: Fourchon, Louisiana	Distance to Closest Land (Miles): 106

Description of Proposed Activities (Mark all that apply)

	Exploration drilling		Development drilling
x	Well completion		Installation of production platform
	Well test flaring (for more than 48 hours)		Installation of production facilities
	Installation of caisson or platform as well protection structure		Installation of satellite structure
x	Installation of subsea wellheads and/or manifolds	x	Commence production
x	Installation of lease term pipelines		Other (Specify and describe)

Have you submitted or do you plan to submit a Conservation Information Document to accompany this plan?	x	Yes		No
Do you propose to use new or unusual technology to conduct your activities	x	Yes		No
Do you propose any facility that will serve as a host facility for deepwater subsea development?	x	Yes		No
Do you propose any activities that may disturb an MMS-designated high-probability archaeological area?		Yes	x	No
Have all of the surface locations of your proposed activities been previously reviewed and approved by MMS?	x	Yes		No

Tentative Schedule of Proposed Activities

Proposed Activity	Start Date	End Date	No. of Days
Complete three wells and install subsea trees	04-01-06	07-30-06	120
Install three lease term pipelines and subsea manifold.	04-01-07	04-10-07	10
Commence production	07-01-07	06-30-15	2921

Description of Drilling Rig

	Jackup		Drillship
	Gorilla Jackup		Platform rig
	Semisubmersible		Submersible
x	DP Semisubmersible		Other (Attach Description)

Drilling Rig Name (If Known): Deepwater Millennium

Description of Production Platform

	Caisson		Tension leg platform
	Well protector		Compliant tower
	Fixed platform		Guyed tower
	Subsea manifold		Floating production system
	Spar		Other (Attach Description)

Description of Lease Term Pipelines

From (Facility/Area/Block)	To (Facility/Area/Block)	Diameter (Inches)	Length (Feet)
LL 1 No. 1 ST01	Subsea manifold	6"	80'
LL 1 No. 2	Subsea manifold	6"	80'
LL 2 No. 2	Subsea manifold	6"	80'

OCS PLAN INFORMATION FORM

Include one copy of this page for each proposed well/structure

Proposed Well/Structure Location			
ell or Structure Name/Number (If renaming well or structure, reference previous name): 1 No. 1 ST01		Subsea Completion	
Anchor Radius (if applicable) in feet: NA		x Yes	No

	Surface Location	Bottom-Hole Location (For Wells)
Lease No.	OCS G10487	OCS
Area Name	LL	
Block No.	2	
Blockline Departures (in feet)	N/S Departure: 5444 F N L	N/S Departure: F ____ L
	E/W Departure: 2102 F W L	E/W Departure: F ____ L
Lambert X-Y coordinates	X: 1,364,343	X:
	Y: 10,147,996	Y:
Latitude/ Longitude	Latitude 27.96199439	Latitude
	Longitude 87.85549945	Longitude
	TVD (Feet) :	MD (Feet): Water Depth (Feet): 8362'

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

nchor Name or No.	Area	Block	X Coordinate	Y Coordinate	Length of Anchor Chain on Seafloor
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

Paperwork Reduction Act of 1995 Statement: The Paperwork Reduction Act of 1995 (44 U.S.C. Chapter 35) requires us to inform you that MMS collects this information as part of an applicant's Exploration Plan or Development Operations Coordination Document submitted for MMS approval. We use the information to facilitate our review and data entry for OCS plans. We will protect proprietary data according to the Freedom of Information Act and 30 CFR 250.196. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid Office of Management and Budget Control Number. The use of this form is voluntary. The public reporting burden for this form is included in the burden for preparing Exploration Plans and Development Operations Coordination Documents. We estimate that burden to average 580 hours per response, including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding the burden estimate or any other aspect of this form to the Information Collection Clearance Officer, Mail Stop 4230, Minerals Management Service, 1849 C Street, N.W., Washington, DC 20240.

OCS PLAN INFORMATION FORM

Include one copy of this page for each proposed well/structure

Proposed Well/Structure Location

Well or Structure Name/Number (If renaming well or structure, reference previous name): LL 1 Well 2 (formerly B on IEP Control Number N-8098)	Subsea Completion		
Anchor Radius (if applicable) in feet: NA	x	Yes	No

	Surface Location	Bottom-Hole Location (For Wells)
Lease No.	OCS G10486	OCS
Area Name	LL	
Block No.	1	
Blockline Departures (in feet)	N/S Departure: 9200 F N L	N/S Departure: F ____ L
	E/W Departure: 12450 F W L	E/W Departure: F ____ L
Lambert X-Y coordinates	X: 1,358,850	X:
	Y: 10,144,250	Y:
Latitude/ Longitude	Latitude 27.95158106	Latitude
	Longitude 87.87243359	Longitude
	TVD (Feet) :	MD (Feet):
		Water Depth (Feet): 8343

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	Area	Block	X Coordinate	Y Coordinate	Length of Anchor Chain on Seafloor
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

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OCS PLAN INFORMATION FORM

Include one copy of this page for each proposed well/structure

Proposed Well/Structure Location

Well or Structure Name/Number (If renaming well or structure, reference previous name): LL 2 Well No. 2 (Formerly F location on SEP)	Subsea Completion			
Anchor Radius (if applicable) in feet: NA	x	Yes		No

	Surface Location	Bottom-Hole Location (For Wells)
Lease No.	OCS G10487	OCS
Area Name	LL	
Block No.	2	
Blockline Departures (in feet)	N/S Departure: 6300 F N L	N/S Departure: F ____ L
	E/W Departure: 2550 F W L	E/W Departure: F ____ L
Lambert X-Y coordinates	X: 1,364,790	X:
	Y: 10,147,140	Y:
Latitude/ Longitude	Latitude 27.95964786	Latitude
	Longitude 87.85409278	Longitude
	TVD (Feet) :	MD (Feet): Water Depth (Feet): 8369

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	Area	Block	X Coordinate	Y Coordinate	Length of Anchor Chain on Seafloor
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

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