DRAFT
ENVIRONMENTAL ASSESSMENT OF
THE EL PASO ENERGY BRIDGE GULF OF MEXICO, L.L.C.
DEEPWATER PORT LICENSE APPLICATION

Location: Gulf of Mexico, approximately 100 mi due south of the Louisiana coast line in West Cameron Area, South Addition Lease Block 603 (WC 603).

Docket Number: USCG-2003-14294

Prepared By: The lead agencies, U.S. Coast Guard (USCG) and the Maritime Administration (MARAD) and their contractor, engineering-environmental Management, Inc. (e^2M)

Prepared in Cooperation With: U.S. Environmental Protection Agency, Department of Interior – Minerals Management Service and U.S. Fish and Wildlife Service, and Federal Energy Regulatory Commission.

Contact Information: Commander Mark Prescott (G-MSO-2), 2100 Second Street, S.W., Washington, DC 20593-0001, (202) 267-0225, *mprescott@comdt.uscg.mil*.

Abstract: El Paso Energy Bridge Gulf of Mexico (GOM), Limited Liability Company (L.L.C.) proposes to construct and operate a deepwater port in WC 603. The purpose of the proposed deepwater port is to help meet the growing national energy demand by importing clean-burning natural gas into the U.S. Gulf Coast via the existing natural gas transmission infrastructure in southern Louisiana. El Paso Energy Bridge Vessels (EPEBVs) would be used to transport and regasify liquefied natural gas (LNG). When an EPEBV reaches the deepwater port, it would retrieve and connect to a Submerged Turret Loading (STL) buoy. A winch located on the EPEBVs would raise the submerged buoy from its subsurface location. The STL buoy would be drawn into an opening in the hull of the EPEBVs. After it is secured, the buoy would serve both as the mooring system for the EPEBV and as the offloading mechanism for transferring the natural gas. The EPEBV would vaporize the LNG with its onboard regasification equipment and deliver natural gas in a vapor state to the STL buoy and downstream infrastructure of the deepwater port for delivery to the existing third party pipelines. When it is not in use, the STL buoy would remain submerged below the sea surface in approximately 280 feet of water.

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DRAFT

ENVIRONMENTAL ASSESSMENT OF THE EL PASO ENERGY BRIDGE GULF OF MEXICO, L.L.C. DEEPWATER PORT LICENSE APPLICATION

Commandant
United States Coast Guard
Vessels and Facilities Operating Standards Division (G-MSO-2)
2100 Second Street, SW
Washington, DC 20593-0001

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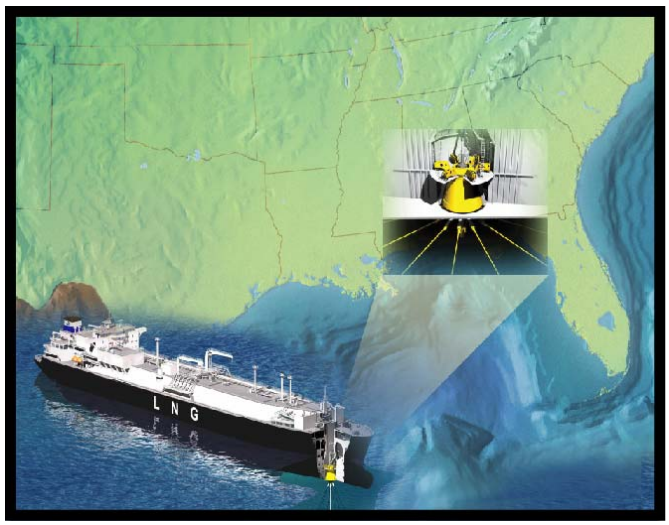

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ACRONYMS AND ABBREVIATIONS

°C	degrees Celsius
°F	degrees Fahrenheit
ACHP	Advisory Council on Historic Preservation
AISC	American Institute of Steel Construction
API	American Petroleum Institute
APL	Advanced Production and Loading
ASD	Automatic Shut Down
B.P.	Before present
BA	Biological Assessment
BACT	Best Available Control Technologies
bcf	billion cubic feet
BHP	brake horsepower
BOD	biological oxygen demand
BOG	boil-off gas
BOPD	barrels of oil per day
BV	Bureau Veritas
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CCC	Criteria Chronic Concentration
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CMC	Criteria Maximum Concentration
CO	carbon monoxide
COMDINST	Commandant's Instruction
CWA	Clean Water Act
CY	Calendar Year
CZMA	Coastal Zone Management Act
CZMP	Coastal Zone Management Program
dB	Decibel
dBA	A-weighted decibel
dBC	C-weighted decibel
DNL	day-night average sound level
DOE	U. S. Department of Energy
DOI	Department of the Interior
DOT	U.S. Department of Transportation
DSV	diving service vessel
dwt	Dead weight ton
EA	Environmental Assessment
EC	East Cameron
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EI	Eugene Island
EIS	Environmental Impact Statement
EO	Executive Order
EPEBV	El Paso Energy Bridge Vessel
EPFS	El Paso Field Services
ESA	Endangered Species Act
ESD	Emergency Shut Down
FAA	Federal Aviation Administration
FERC	Federal Energy Regulatory Commission
FFMZ	Federal Fishery Management Zones
FMP	Fishery Management Plans
FONSI	Finding of No Significant Impact
FSRU	floating, storage and regasification units
ft	feet
ft^2	square feet
g	grams
gal	gallons
GBS	gravity based systems
GMFMC	Gulf of Mexico Fishery Management Council
GOM	Gulf of Mexico
GPD	gallons per day
GPM	gallons per minute
GPS	Global Positioning System
GSMFC	Gulf of Mexico States Marine Fisheries Commission
HAP	hazardous air pollutant
HI	High Island
HP	high pressure
hp	horsepower
Hz	Hertz

IGC	International Code for Construction and Equipment of Ships Carrying Liquefied Gasses in Bulk
IMO	International Maritime Organization
in	inch
in/hr	inches per hour
IWC	International Whale Commission
kg	kilograms
kW	kilowatts
lbs	pounds
LDEQ	Louisiana Department of Environmental Quality
LDNR	Louisiana Department of Natural Resources
LFL	lower flammability limit
LLC	Limited Liability Company
LNG	liquefied natural gas
LNGC	liquefied natural gas carriers
LOOP	Louisiana Offshore Oil Port
m	meters
m/s	meters per second
m^2	square meters
m^3	cubic meters
m^3/hr	cubic meters per hour
m^3/s	cubic meters per second
MAOP	Maximum Allowable Operating Pressure
MARAD	Maritime Administration
MARPOL	International Convention for the Prevention of Pollution from Ships
MBTA	Migratory Bird Treaty Act
mg/m^3	milligrams per cubic meter
MGD	million gallons per day
mi	miles
mm	millimeters
MMA	Marine Managed Areas
MMcf/d	million cubic feet per day
MMPA	Marine Mammal Protection Act
MMS	Minerals Management Service
MPRSA	Marine Protection, Research, and Sanctuaries Act
MRFSS	Marine Recreational Fishery Statistics Study
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NERR	National Estuarine Research Reserves
NESHAPS	National Emission Standards for Hazardous Air Pollutants
NGA	Natural Gas Act
NHPA	National Historic Preservation Act
NM	nautical mile
NMFS	National Marine Fisheries Service
NMS	National Marine Sanctuaries
NO_2	nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NOx	nitrogen oxide
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRHP	National Register of Historic Places
NSPS	New Source Performance Standards
NSR	New Source Review
NWR	National Wildlife Refuges
O_3	ozone
OCS	Outer Continental Shelf
OPS	FERC, DOT Office of Pipeline Safety
ORT	Oceanic Release Transponder
ORV	Open Rack Vaporization
P.L.	Public Law
Pb	lead
PIC	Person-in-Charge
PIPL	Pelican Interconnector Pipeline
PLEM	Pipeline End Manifold
$PM_{2.5,10}$	particulate matter equal to or greater than 2.5/10 microns
POE	Plan of Exploration
ppb	parts per billion
ppm	parts per million

ppt	parts per trillion
PSD	Prevention of Significant Deterioration
RACT	Reasonably Available Control Technology
ROG	reactive organic gas
ROI	region of influence
ROV	remotely operated vehicle
ROW	right-of-way
RSPA	Research and Special Programs Administration
SCFD	standard cubic feet per day
SCV	Submerged Combustion Vaporizer
SEAMAP	South East Area Monitoring and Assessment Program
SIP	Louisiana State Implementation Plan
SO_2	sulfur dioxide
SSTI	subsea tie-ins
STL	Submerged Turret Loading
tpy	tons per year
TSP	total suspended particulate
U.S.	United States
U.S.C.	United States Code
USCG	U.S. Coast Guard
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VK	Viosca Knoll
VOC	volatile organic compound
WC	West Cameron
$\mu g/m^3$	micrograms per cubic meter
µPa	micro-Pascal
µg/L	Micrograms per liter (Parts per Billion)

Units of Measurement and Common Conversion Equations

TEMPERATURE

°C	degrees Celsius
°F	degrees Fahrenheit

°F =	°C x 1.8 + 32
°C =	(°F - 32) ÷ 1.8

TIME

hr	hour
min	minute
s	second

LENGTH/DISTANCE

cm	centimeter
ft	feet
in	inch
km	kilometer
m	meters
mi	statute miles
mm	millimeters
NM	nautical mile

1 in =	2.540 cm
1 in =	25.40 mm
1 ft =	0.3048 m
1 m =	3.2808 ft
1 m =	39.37 in
1 mi =	1.6093 km
1 km =	0.6214 mi
1 mi =	0.869 NM
1 NM =	1.15 mi

AREA

ft^2	square feet
km^2	square kilometers
m^2	square meters
mi^2	square miles

1 hectare =	2.471 acre
1 ft^2 =	0.0929 m^2
1 in^2 =	6.452 cm^2
1 mi^2 =	2.604 km^2
1 m^2 =	10.764 ft^2

VOLUME

bbl	barrel
ft^3	cubic feet
gal	gallons
in^3	cubic inches
L	liters
m^3	cubic meters
MG	million gallons
TCF	trillion cubic feet

1 ft^3 =	7.4805 gal
1 ft^3 =	0.02832 m^3
1 ft^3 =	28.32 L
1 gal =	0.134 ft^3
1 gal =	0.003785 m^3
1 m^3 =	264.172 gal
1 m^3 =	1000 L
1 gal =	0.0238 bbl
1 m^3 =	6.29 bbl
1 MG =	23,800 bbl

MASS

g	grams
kg	kilograms
lb	pounds
1 lb =	0.453592 kg
1 kg =	2.205 lb
1 kg =	1,000 g
1 ton =	2,000 lb
1 ton =	0.9072 metric tons

FLOW RATE (UNIT VOLUME PER UNIT TIME)

ft^3/hr	cubic feet per hour
GPD	gallons per day
GPM	gallons per minute
L/min	liters per minute
m^3/hr	cubic meters per hour
m^3/min	cubic meters per minute
MGD	million gallons per day
SCFD	standard cubic feet per day
1 ft^3/s =	0.028316 m^3/s
1 ft^3/s =	448.8 GPM
1 ft^3/min =	7.4805 GPM
1 MGD =	0.0438 m^3/s
1 L/min =	0.26417 GPM

VELOCITY (UNIT DISTANCE PER UNIT TIME)

cm/s	centimeters per second
ft/s	feet per second
in/hr	inches per hour
in/s	inches per second
m/s	meters per second
1 ft/s =	0.3048 m/s
1 ft/s =	30.48 cm/s
1 m/s =	1.467 ft/s
1 m/s =	17.604 in/s

CONCENTRATION (UNIT VOLUME PER UNIT VOLUME *OR* UNIT MASS PER UNIT VOLUME)

mg/L	milligrams per liter
ppb	parts per billion
ppm	parts per million
$\mu g/m^3$	micrograms per cubic meter
1 mg/L =	1 ppm (in water)
1 mg/L =	1×10^6 $\mu g/m^3$

ENERGY

MMBtu	million British thermal units
1 Btu =	2.9308×10^{-4} kW-hr

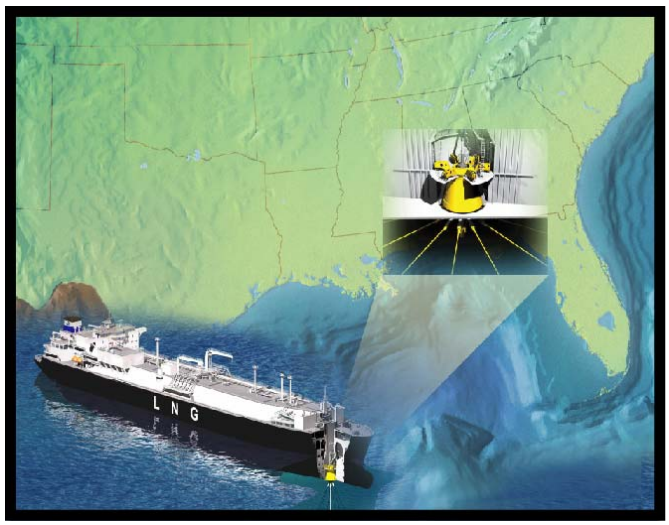
POWER

kW	Kilowatts
hp	horsepower
1 kW =	1.340 hp
1 hp =	0.746 kW

PRESSURE

psi	pounds per square inch (absolute)
psig	pounds per square inch gauge
μPa	micro-Pascal
1 psi =	psig + atmospheric pressure
1μPa =	145 psi

Section 1
Introduction



1. Introduction

1.1 Deepwater Port License Application

The Deepwater Port Act of 1974, as amended,[1] establishes a licensing system for ownership, construction, and operation of man-made structures located beyond the U.S. territorial sea. The Act promotes the construction and operation of deepwater ports as a safe and effective means of importing oil and natural gas into the U.S. and transporting oil and natural gas from the Outer Continental Shelf (OCS), while minimizing tanker traffic and associated risks.

The Deepwater Port Act requires a license applicant to submit detailed plans for its facility to the Secretary of Transportation. The Secretary has delegated the processing of deepwater port applications to the Commandant of the U.S. Coast Guard (USCG) and the Administrator of the Maritime Administration (MARAD). The USCG retains this responsibility with its transfer to the Department of Homeland Security.[2] On June 18, 2003, the Secretary also delegated to the Maritime Administrator his authority to issue, transfer, amend, or reinstate a license for the construction and operation of a deepwater port.[3] Hereafter, "the Secretary" represents the Maritime Administrator's actions and responsibilities as the delegated representative of the Secretary

On December 20, 2002, El Paso Energy Bridge Gulf of Mexico, L.L.C. ("El Paso Energy Bridge GOM" or "the Applicant") submitted to USCG and MARAD an application for a license and all Federal authorizations required to own, construct, and operate a deepwater port off the coast of Louisiana in West Cameron Area, South Addition Block 603 (WC 603). The principal components of the proposed deepwater port (the Port) would include:

- A Submerged Turret Loading (STL) buoy receiving system to receive natural gas from delivery vessels, with a mooring system of cables lines, chains and permanent anchors
- A flexible riser pipe to carry the natural gas from the STL buoy to a subsea manifold
- Approximately 1.93 miles (mi) of 20-inch natural gas pipeline connecting the subsea manifold to a metering platform.
- A metering platform to direct and regulate the natural gas flow into two 20-inch downstream pipelines.
    - One downstream pipeline (approximately 3.96 mi in length) would connect the metering platform to the existing Sea Robin offshore pipeline.
    - Another downstream pipeline (approximately 1.38 mi in length) would connect the metering platform to the existing Bluewater offshore pipeline.

[1] Public Law (P.L.) 93-627, Sec. 3, January 3, 1975, 88 Stat. 2127, as amended, codified to 33 United States Code (U.S.C.) 1501 – 1524.

[2] Title XV (Transition) of the Homeland Security Act provides that "pending matters," including license applications currently being processed, will continue without regard to the transfer of USCG from the Department of Transportation (DOT). Even though the function of processing applications has been transferred with USCG to the Department of Homeland Security, ultimate authority to issue, transfer, amend, or reinstate licenses under the Deepwater Port Act remains in the DOT.

[3] Vol. 68, *Federal Register*, No. 117, Wednesday, June 18, 2003, pp 36496-97.

The natural gas transported by Sea Robin and Bluewater pipelines would come ashore at the Louisiana coast.

On January 23, 2003, USCG and MARAD issued a Notice of Application in the *Federal Register* summarizing the application.[4] Under procedures set forth in the Deepwater Port Act, USCG and MARAD have 240 days from the date of the Notice of Application to hold one or more public hearings in the adjacent coastal state. The State of Louisiana was designated as the adjacent coastal state. Approval or denial of the license application must occur not more than 90 days after the last public hearing.

The Deepwater Port Act provides that for all applications, the Secretary, in cooperation with other involved Federal agencies and departments will comply with the National Environmental Policy Act (NEPA) of 1969. Consistent with the Deepwater Port Act, this Environmental Assessment (EA) evaluates the potential environmental effects associated with location, construction, operation, and decommissioning of the facilities proposed by El Paso Energy Bridge GOM.

1.2 Purpose and Need

The Deepwater Port Act requires the Secretary to approve or deny a deepwater port license application. In issuing this decision, it is the purpose and need of the Secretary to carry out the Congressional intent expressed in the Deepwater Port Act, which is to:

- Authorize and regulate the location, ownership, construction, and operation of deepwater ports in waters beyond the territorial limits of the United States.
- Provide for the protection of the marine and coastal environment to prevent or minimize any adverse impact which might occur as a consequence of the development of such ports.
- Protect the interests of the United States and those of adjacent coastal States in the location, construction, and operation of deepwater ports.
- Protect the rights and responsibilities of States and communities to regulate growth, determine land use, and otherwise protect the environment in accordance with law.
- Promote the construction and operation of deepwater ports as a safe and effective means of importing oil and natural gas into the United States and transporting oil and natural gas from the outer continental shelf while minimizing tanker traffic and the risks attendant thereto.
- Promote oil and natural gas production on the outer continental shelf by affording an economic and safe means of transportation of outer continental shelf oil and natural gas to the United States mainland." [5]

Within this broad framework of Congressional intent in the Deepwater Port Act, there are several factors that define an appropriate deepwater port. These factors further refine the Secretary's purpose and need to define reasonable alternatives for the Secretary to consider in determining whether or not to approve a deepwater port license application. A description of these factors as utilized in the Secretary's decision making process is presented below.

[4] Vol. 68, *Federal Register*, No. 15, Thursday, January 23, 2003, pp 3299-3301.
[5] 33 U.S.C. 1501(a)

Function. The Secretary is to promote both oil and natural gas deepwater ports equally, without comparison or preference to either. These deepwater ports may be used for importing oil and natural gas into the U.S. and transporting oil and natural gas from the outer continental shelf.

Location. The Deepwater Port Act specifies that platforms be located outside U.S. territorial waters. In concept, this would include any location along the maritime coastline of the U.S. in the Atlantic Ocean, Pacific Ocean, or Gulf of Mexico (GOM) in the U.S. Exclusive Economic Zone (EEZ), and that is at least 12 miles offshore. Moreover, platforms must not be sited in areas specially designated as vessel navigation routes, cargo operations areas (lightering zones), or environmental protection and conservation areas. Additionally, both safety and environmental considerations must be studied and evaluated.

Economic Viability. To avoid the potential for abandoned structures on the OCS, proposals for deepwater ports must be economically viable. Numerous factors contribute to economic viability. These include, for instance, the Applicant's financial strengths, due consideration of market demand, appropriate conceptualization of the project, adherence to construction and engineering standards to preclude loss of life and property, use of appropriate technologies, and an applicant's ability to support appropriate bonding. Certain considerations of location, such as proximity to existing offshore and onshore pipeline distribution systems and support infrastructure, would also influence the economic viability of a deepwater port.

Protection of the Environment. The Deepwater Port Act specifies that terminals be licensed and operated in a manner that protects the marine and coastal environment by preventing or minimizing any adverse impact that might occur as a consequence of the development of such ports. Multiple Federal and state programs, both regulatory and non-regulatory, exist to protect the environment. By adhering to these Federal and state programs, development of the OCS has proceeded in a manner that is sensitive to the protection of natural resources. Deepwater ports that pose a high probability of resulting in significant adverse environmental impacts would not be consistent with the requirements of the Deepwater Port Act and the precedents established by prior development, and they would contravene the national interests to protect the environment. Examples of unacceptable proposals include those that would result in significant adverse effects on cultural resources, losses of protected species, or high probability of water degradation through hydrocarbon spills.

Safety. Deepwater port alternatives that place human safety, property, or resources at unacceptable risk of injury or loss, and thereby possibly leading to significant adverse impacts on the environment, are not reasonable. Both the potential for safety risks and the potential to control those risks with a deepwater LNG port could result from a variety of factors associated with alternative locations, nature of a proposed design, and the various operational requirements, such as shipping the LNG, offloading the LNG carrier, storing the LNG, processing the LNG into natural gas, and delivery of the natural gas to shore. Potential safety risks and potential control measures would be unique to the location and concept of each deepwater port proposal. Safety risks are typically assessed through a process that involves identification of potential safety hazards and both the magnitude and probability for injury or loss associated with those safety hazards. The assessment of these risks at offshore locations must take into account the potential for severe weather and wave conditions. Risks may be reduced to acceptable levels by applying sound engineering and operational procedures. If alternatives are not amenable to reducing risk to acceptable levels, they are not reasonable.

State Interests. The Secretary also has a purpose to protect the interests of adjacent coastal States in the location, construction, and operation of deepwater ports. In the process of reviewing and

approving a deepwater port license, the Secretary must protect the rights and responsibilities of States and communities to regulate growth, determine land use, and otherwise protect the environment in accordance with law. Designation of at least one adjacent coastal state and coordination with that state throughout the application review process will be used by the Secretary to fulfill this purpose.

To ensure the intended purpose of natural gas deepwater ports is encouraged, the Deepwater Port Act allows the proposed Port to operate under a strategy of "exclusive use" dedicating the entire capacity of the facility for its own purposes, without being subject to the requirements of open access or common carriage.

The Department of Energy's Energy Information Administration (EIA) projects that demand for natural gas in the U.S. could reach 35 trillion cubic feet (tcf) annually by 2025 (EIA 2003a). This compares with an annual consumption of 22.2 tcf in 2001 (EIA 2003b) (Figure 1-1). Despite the forecasts of increased production within the lower 48 states, especially from unconventional sources, the EIA predicts that increased imports of natural gas will be required to meet domestic demand. Liquefied natural gas imports are expected to increase to 2.1 tcf per year in 2025, equal to 6 percent of total U.S. gas supply. This will require all the existing facilities to be fully operational with expansions completed, as well as the construction and operation of new U.S. LNG import terminals.

The applicant contends that the Port would contribute to the Nation's gas supply, by using the international LNG spot market to providing regular deliveries of regasified LNG into existing offshore pipelines with excess capacity. Using this strategy the Applicant would:

- Take advantage of an existing STL buoy deepwater port technology
- Limit the need for new pipeline and onshore infrastructure by exploiting excess capacity in the existing infrastructure
- Have the flexibility to easily adapt to shifting or volatile LNG supplies

Once delivered into the existing natural gas transmission infrastructure, the gas would then be redelivered by shippers into the national gas pipeline grid through connections with other major interstate and intrastate pipelines. The proposed deepwater port would provide significant volumes of natural gas to the Nation's gas distribution market, improving the flexibility of the existing pipeline infrastructure, and providing supply diversification.

It is important to note that at present, neither the USCG nor MARAD have developed implementing regulations for the Deepwater Port Act amendments of 2002 for the licensing of LNG deepwater ports. Existing regulations, at 33 CFR 148, do not specifically cover LNG deepwater ports. Pending final regulations to implement the Deepwater Port Act amendments of 2002, the Maritime Administrator will use the existing regulations as a guide. For example, 33 CFR 148 describes requirements for licensing deepwater ports and Appendix A of that section contains environmental review criteria for evaluating deepwater port license applications.

1.3 Purpose and Scope of this EA

This EA assesses the potential environmental impacts associated with construction and operation of the proposed deepwater port. This document has been prepared to comply with NEPA requirements, the Council on Environmental Quality (CEQ) regulations for implementing NEPA (40 Code of Federal Regulations [CFR] 1500-1508), Department of Transportation (DOT) Order 5610.1C

(*Procedures for Considering Environmental Impacts*), and USCG policy (Commandant's Instruction [COMDINST] M16475.1D).

The function of this EA is to provide the primary mechanism to determine whether a proposed deepwater port meets the elements of the Secretary's purpose and need (see Section 1.2) defined by *Location* and *Protection of the Environment*. Where applicable, this EA also considers *Safety* but does not function as the final safety screening. *Economic Viability* is being evaluated within MARAD as a separate task, and will be considered along with this EA as part of the final licensing decision.

USCG and MARAD prepared this EA in cooperation with the U.S. Environmental Protection Agency (USEPA); the Department of Interior (DOI) -Minerals Management Service (MMS) and U.S. Fish and Wildlife Service (USFWS), and the Federal Energy Regulatory Commission (FERC).

The primary purposes for preparation of this EA are:

- To provide an environmental analysis sufficient to support the Secretary's licensing decisions
- To facilitate a determination of whether the applicant has demonstrated that the deepwater port would be located, constructed, operated and decommissioned in a manner that meets the regulatory requirements necessary to protect the marine and coastal environments
- Provide evidence and analysis under NEPA to support a decision to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI)
- Aid in the agency's compliance with NEPA if an EIS is necessary; and
- Facilitate public involvement in the decision-making process.

The affected environmental components encompassed by this EA include: water quality; biological resources; cultural resources; geological resources, socioeconomics; recreation; transportation; and air quality. The EA describes the proposed action, screening of potential alternatives (Section 2.0), the affected environment as it currently exists (Section 3.0), and identifies probable environmental consequences and other impacts that might result from construction, operation and decommissioning of the proposed Port (Sections 4.0 and 5.0). Within Sections 4.0 and 5.0 of this EA, several aspects of the expected impacts are estimated in order to better describe them.

1.4 Public Review and Comment

Agency and public participation in the NEPA process promotes open communication between the public and the government and enhances decision-making. All persons and organizations having a potential interest in the Maritime Administrator's decision whether to grant the license are urged to participate in the decision-making process.

The USCG and MARAD have solicited public comment on this project by letter and public meetings. The mailing included an Interested Party Letter, the Public Notice announcing implementation of the EA process, inviting public participation at the informational meeting and requesting comments, and a fact sheet describing the proposed Port (see Appendix B). The Public Notice was published in southern Louisiana newspapers the weeks of May 28, 2003 and June 4, 2003. Public comments submitted as part of the scoping process are included in Appendix B and were considered during the preparation of this EA.

On June 10, 2003, USCG and MARAD hosted an informational meeting in Lafayette, Louisiana, to solicit public comments on the nature of environmental impacts associated with this project. Notice of the informational meeting was provided beforehand in the local media. Nine individuals attended the informational meeting. Attendees were invited to submit oral or written comments. No comments were submitted during the informal open house.

USCG and MARAD will announce the completion of the Draft EA in the *Federal Register* on or about September 09, 2003 and provide 30 days for public review and comment on the Proposed Action and the analyses presented in the Draft EA. At the end of the 30-day period, and subject to any comments received, a FONSI may be issued. If the USCG determines that issuance of a FONSI would be inappropriate, then the USCG may publish a notice of intent to prepare an EIS.

1.5 Permits, Approvals, and Regulatory Requirements

As the lead agencies for administration of the Deepwater Port Act, the USCG and MARAD are responsible for License application processing and issuance, NEPA compliance, and compliance with the provisions of several environmental laws that require consultation with other agencies concerning specific environmental resources. Examples of these include Section 7 of the Endangered Species Act (ESA), the Magnuson-Stevens Fishery Conservation and Management Act (MSA), Section 106 of the National Historic Preservation Act (NHPA), and Section 307 of the Coastal Zone Management Act (CZMA). A description of these regulations and subsequent consultation obligations are presented below and where applicable in Sections 3.0, 4.0 and 5.0. In addition, any enforceable conditions imposed, as part of an approved License must be consistent with the appropriate and applicable regulatory requirements.

For their part, the Applicant would be required to obtain and comply with all applicable and appropriate permits, guidelines and approvals including sections of the CZMA, the Clean Water Act (CWA) and Clean Air Act (CAA) for any wastewater discharges and/or regulated air emissions to the environment. It is the Applicant's responsibility to provide the licensing agency with the information necessary to evaluate potential compliance with the applicable regulations and guidelines. The USCG application review will assure that the applicant has or could comply with the appropriate permitting and regulatory notification requirements.

Table 1-1 lists major Federal and state permits, approvals and consultations that that would be required to construct and operate a natural gas deepwater port. Appendix A identifies the principal laws and Executive Orders (EOs) considered by the Secretary in formulating the License decision. Some of these authorities prescribe standards for compliance. Others require specific planning and management actions designed to protect environmental resources that might be affected by issuance of a deepwater port license. The authorities shown in Appendix A are addressed in various sections of the EA when relevant to particular environmental resources and conditions. Full text of the laws may be accessed at <*http://uscode.house.gov/uscode.htm*>. EOs may be accessed at <*http://www.archives.gov/ federal_register/executive_orders/disposition_tables.html*>.

Table 1-1. Major Permits, Approvals, and Consultations for Natural Gas Deepwater Ports

Agency	Permit/Approval/Consultation
U.S. Department of Homeland Security, USCG	License application processing
U.S. Department of Transportation, MARAD	License application processing and approval
U.S. Department of Transportation, Research and Special Programs Administration	– Establish and enforce deepwater port pipeline safety regulations – Consultation on LNG facility design
U.S. Department of Interior, MMS	– Pipeline right-of-way coordination – Hazard surveys coordination – Archeological coordination
U.S. Department of Interior, USFWS	– Section 7 (ESA) coordination – Migratory Bird Treaty Act (MBTA) coordination
USEPA	– National Pollutant Discharge Elimination System (NPDES) permit – Title V (CAA) permit – Marine Protection, Research, and Sanctuaries Act (MPRSA) consistency
U.S. Department of Commerce, NOAA Fisheries	– Section 7 (ESA) coordination – Essential Fish Habitat (MSA) coordination – Marine Mammal Protection Act (MMPA) compliance
U.S. Department of Energy, Office of Fossil Energy	Import certificate under Section 3, Natural Gas Act (NGA)
U.S. Army Corps of Engineers	Coordination letter, Section 10 permit, Rivers and Harbors Act
U.S. Department of Defense	Consultation (review of license application adequacy and views on effects on departmental programs)
U.S. Department of State, Bureau of Oceans and International Environment and Scientific Affairs	Consultation (review of license application adequacy and views on effects on departmental programs)
Advisory Council on Historic Preservation	Section 106 (NHPA) coordination
FERC	Certificates of public convenience and necessity for natural gas pipelines in interstate commerce
Governor of Louisiana	Consent to issue license
Louisiana Department of Natural Resources, Coastal Management Division	CZMA Consistency Certification
Louisiana Department of Wildlife and Fisheries	Louisiana Endangered Species Act coordination
Louisiana State Historic Preservation Office, Department of Culture, Recreation, and Tourism	NHPA coordination
Federally Recognized American Indian Tribes	Consultation regarding potential effects on cultural resources

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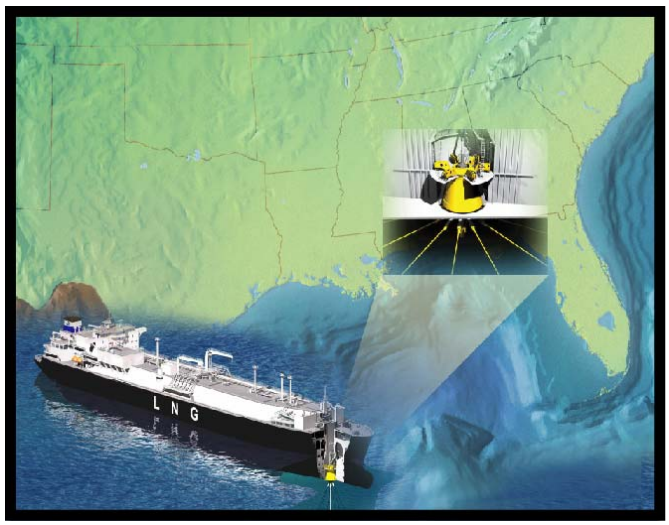
Section 2
Description of Proposed Action and Alternatives



2. Description of the Proposed Action and Alternatives

2.1 Description of the Proposed Action

El Paso Energy Bridge GOM proposes to construct and operate a deepwater port in West Cameron Area, South Addition, OCS Lease Block 603 (WC 603).[6] WC 603 is located in the Gulf of Mexico (GOM) approximately 116 mi due south of the Louisiana coastline near the town of Cameron. The deepwater port would provide additional deliveries of foreign natural gas to key domestic markets in the U.S.

Natural gas chilled to -163 degrees Celsius (°C) (-261.4 degrees Fahrenheit [°F]) (and thereby changed to LNG) would be transported on El Paso Energy Bridge Vessels (EPEBVs), LNG tankers designed with onboard regasification equipment and other features designed specifically to connect with and supply natural gas to the STL buoy. The Applicant indicates that there are currently two of these specialty-designed vessels under construction in South Korea with the intention that they would be dedicated to delivering natural gas to the Port.

When an EPEBV reaches the Port, it would retrieve and connect to the STL buoy and the integrated mooring system. When not in use, the STL buoy would remain submerged approximately 80 feet (ft) (24.4 meters [m]) below the sea surface in approximately 280 ft (85.3 m) of water. A winch located on the EPEBV would raise the submerged buoy from its subsurface location. The STL buoy would be drawn into an opening in the hull of the EPEBV. After it is secured, the STL buoy would serve both as the mooring system for the vessel and as the offloading mechanism for transferring the natural gas.

After the STL buoy has been attached to the vessel and all mooring and start-up prerequisites have been satisfied, the EPEBV onboard LNG regasification process would commence. The EPEBV would vaporize the LNG with its onboard regasification equipment. Natural gas would be transferred from the EPEBV through the STL buoy. The submerged STL buoy would be connected to a flexible riser leading to a seabed pipeline that would convey the natural gas to a metering platform. From the metering platform, the natural gas would be fed into two separate downstream seabed pipelines. One of these downstream seabed pipelines would travel through WC 600 and tie into the existing offshore Bluewater Pipeline in WC 601. The other downstream pipeline would travel from the metering platform through West Cameron Area, South Addition, OCS Lease Block 602 (WC 602) and WC 601, and tie into an existing Sea Robin pipeline in East Cameron Area, South Addition, OCS Lease Block 335 (EC 335). Figure 2-1 shows the general location of the proposed deepwater port. Figure 2-2 shows the location of the proposed deepwater port and alternative locations. A conceptual overview of the proposed Port is presented in Figure 2-3. Table 2-1 identifies the various components of the deepwater port and their location (by OCS lease block). Table 2-1 also indicates the relative dimensions of each component of the proposed Port through calculation of the maximum area of seafloor that would be disturbed by the Port's footprint. It is anticipated that each EPEBV would have a transport capacity of approximately 138,000 cubic meters (m^3) of LNG. The LNG would be carried at approximately -261.4 °F (-163 °C) at slightly higher than ambient pressure. Each EPEBV would be capable of delivering approximately 3 billion cubic feet (bcf) of natural gas. Under optimal operating conditions, each EPEBV would have the capability

[6] El Paso Production Company currently holds the oil and gas lease from MMS for the West Cameron Area, South Addition, OCS Lease Block 603.

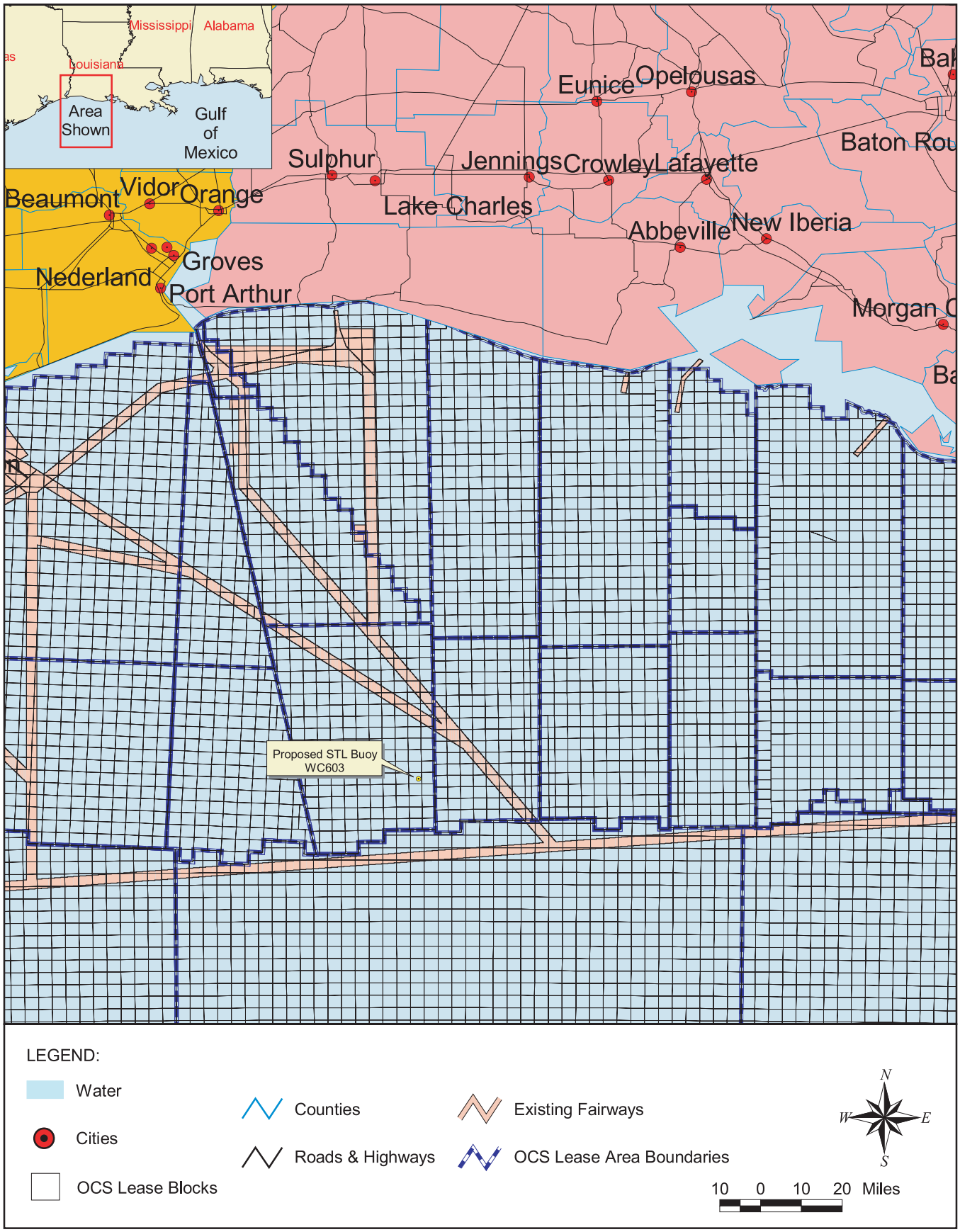


Figure 2-1. Regional Location Map El Paso Energy Bridge GOM

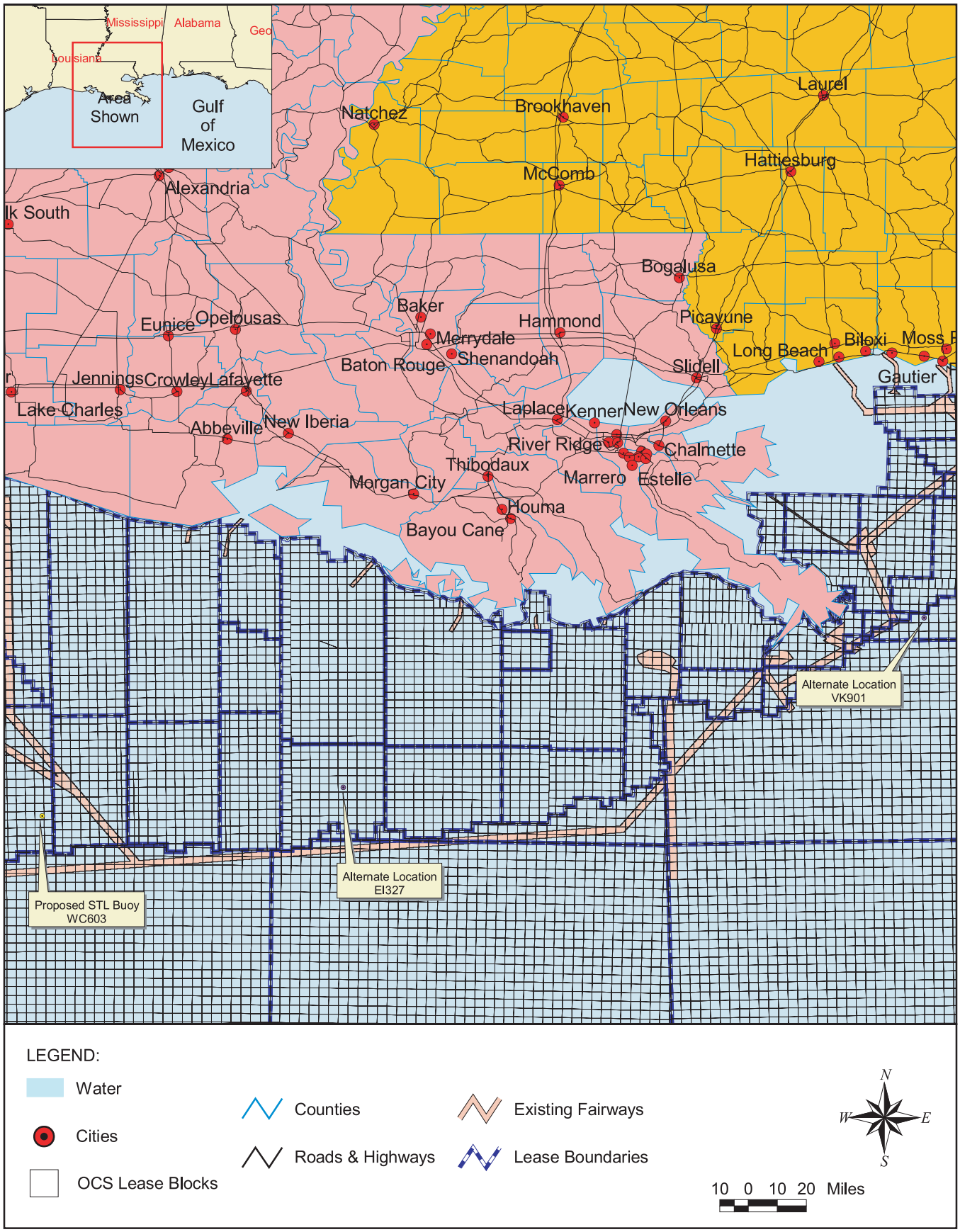


Figure 2-2. Proposed Port and Applicant's Alternative Sites

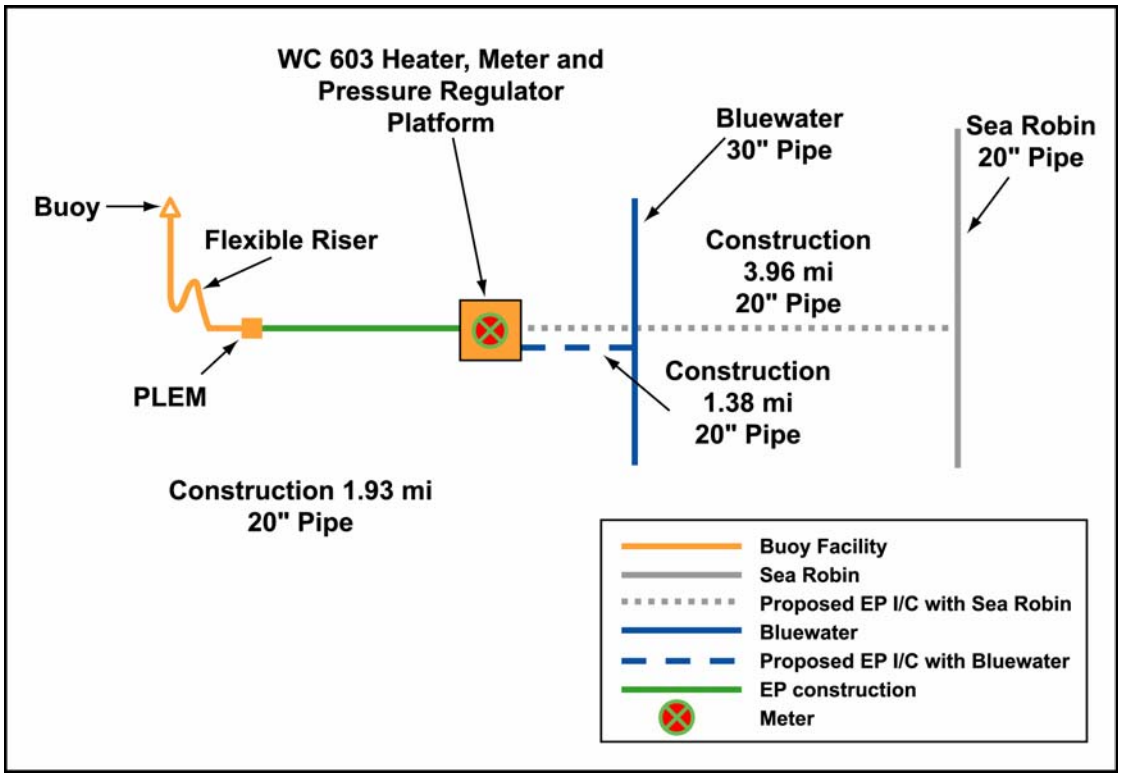


Figure 2-3. Conceptual Overview of the Proposed Port

to regasify and unload up to a maximum of 690 million cubic feet of natural gas per day (MMcf/d). Fabrication of the buoy would take approximately 12 months. Offshore construction and installation of the deepwater port's components would take approximately 6 months. During construction and installation, El Paso Energy Bridge GOM would conduct tests to ensure systems are in safe operational condition. Assuming issuance of the requisite license and approvals, the deepwater port could be operational and ready to receive its first delivery of natural gas by November 2004.

The owners of existing downstream pipeline systems that would receive natural gas from the proposed Port indicate that operational constraints within their respective systems would limit the maximum amount of natural gas they could receive at 550 MMcf/d. El Paso Energy Bridge GOM projects that the maximum amount of natural gas delivered would be closer to 500 MMcf/d.

Fabrication of the STL buoy, and other Port components would take approximately 12 months. Offshore construction and installation of the deepwater port's components would take approximately 6 months. During construction and installation, El Paso Energy Bridge GOM would conduct tests to ensure systems are in safe operational condition. Assuming issuance of the requisite license and approvals, the deepwater port could be operational and ready to receive its first delivery of natural gas by November 2004.

Section 2.3 provides a more detailed description of the Proposed Action.

Table 2-1. Maximum Seafloor Footprint of the Proposed Port

Lease Block	Facility Component	Maximum Seafloor Disturbance (acres)
West Cameron 603	Buoy	0
	Buoy mooring anchors	0.056
	Flexible riser	0
	PLEM	0.0004
	20" pipeline to metering station	0.39
	Metering station platform	0.33
	20" pipeline to Sea Robin	0.09
	20" pipeline to Bluewater	0.02
West Cameron 602	20" pipeline to Sea Robin	0.043
West Cameron 601	20" pipeline to Bluewater	0.22
	20" pipeline to Sea Robin	0.48
	Bluewater tap	0.002
West Cameron 600	20" pipeline to Bluewater	0.05
East Cameron 335	20" pipeline to Sea Robin	0.21
	Sea Robin tap	0.002
	Total	**1.88**

2.2 Alternatives Analysis

A bedrock principle of NEPA requires an agency to consider reasonable alternatives to a proposed action. The Secretary may approve or deny an application[7] for a license under the Deepwater Port Act. In approving a license application, the Secretary may impose enforceable conditions as part of the license. Consistent with NEPA, in determining the provisions of the license, the Secretary may also consider alternative means to construct and operate a deepwater port. Alternatives for a natural gas deepwater port may extend to matters such as its specific location, technologies for processing LNG, construction methods, and operational procedures. Considering alternatives helps to ensure that ultimate decisions concerning the license are well founded and as required by the Deepwater Port Act, are in the National interest and consistent with National security and other National policy goals and objectives.

2.2.1 Alternatives Considered

To warrant detailed evaluation by the USCG and MARAD, an alternative must be reasonable and meet the Secretary's purpose and need (see Section 1.2). To be considered reasonable, an alternative must be "ripe" for decision-making (any necessary preceding events have taken place), affordable, capable of implementation, and satisfactory with respect to meeting the purpose of and need for the action.

[7] For the application at hand, the No Action Alternative and denial of the license are considered to be the same.

Oil Deepwater Ports

The Secretary is to promote both oil and natural gas deepwater ports equally, without comparison or preference to either. While oil deepwater ports are possible, only one has been constructed. USCG has not received any other applications for oil deepwater port licenses since the first port was constructed 30 years ago. Also, the Deepwater Port Act places strict limits on the number of oil platforms the Secretary can license. (Refer to the concept of "application area" [33 U.S.C. 1504(d)] that allows for only one platform in a very large geographic area.) Finally, there are many more competing options for importing oil (as opposed to natural gas). For example, existing onshore oil terminals are numerous and nearly ubiquitous at the coast. By comparison, there are only four operating shore-side LNG facilities. As a consequence of this and other provisions, the Secretary believes that there will be very few applications for oil deepwater ports. Therefore, analysis of oil deepwater ports was eliminated from further consideration.

Alternative Natural Gas Deepwater Port Locations

In concept, a license for a deepwater port could be granted for any location along the maritime coastline of the U.S. in the Atlantic Ocean, Pacific Ocean, or GOM under the authority contained in the Deepwater Port Act. These areas in the U.S. EEZ, at least 12 miles offshore, would be highly exposed to the effects of meteorological and oceanographic forces such as high winds, waves, and currents. Locations that are in areas with less extreme conditions, such as in more sheltered areas or areas that are in historically calmer waters, would be favored for both design and operational reasons, ultimately influencing the economic viability of the construction and operation of a deepwater port.

Furthermore, the Secretary recognizes that deepwater LNG ports must be located in waters of at least 40 feet (approximately 13 meters) in depth. LNG vessels typically have a draft of 38 feet and require an additional 2 feet of depth to provide sufficient clearance from the sea bottom for safe maneuvering. This means that the minimum depth of water for siting a deepwater port will be determined by the minimum depth of water required for the safe maneuvering of the LNG vessels – 40 feet or 13 meters. All deepwater ports will need to be located in water of at least this depth. At present, there is no maximum depth of water that would limit the location of a deepwater port. Instead, the limits of the U.S. EEZ would serve to provide a maximum limit for siting an LNG deepwater port.

For safety reasons, the USCG will establish safety zones surrounding the deepwater port to exclude ship traffic not related to the port operations. The need for these safety zones would necessitate that the deepwater port be located away from shipping fairways, existing oil or gas platforms, other deepwater ports, and other areas of activity on the OCS to avoid interference with those activities. Other considerations of location, such as proximity to existing offshore and onshore pipeline distribution systems and support infrastructure, will also influence the cost effectiveness of a deepwater port. With appropriate design and operational constraints, the Secretary recognizes that many locations may provide economically viable sites for a deepwater port.

In general, the Secretary believes that the GOM provides many favorable conditions for the development of a deepwater port. Extensive existing onshore support infrastructure and the general economy of the Gulf area strongly support further development. In addition to onshore resources, the GOM offers access to an extensive existing offshore pipeline infrastructure with direct access to major onshore distribution points. For example, four major interstate natural gas pipeline systems pass near the proposed Project and Henry Hub in southern Louisiana is an index point for natural gas

markets. While some other locations outside the GOM might support a deepwater port, they would serve other markets in the U.S.

However, the Secretary does not purport to fully understand the financial and other risks associated with the business of operating an LNG deepwater port. Furthermore, the Secretary is limited in authority to generally promoting deepwater ports. Therefore, the Secretary must rely on the expertise of prospective applicants to identify those LNG deepwater port locations that represent viable business opportunities and must rely on applicants to present reasonable and objective consideration of alternative locations to support their license applications.

The Secretary has fully reviewed the Applicants site selection process and concludes that there is no compelling environmental condition that requires the Secretary to reject the Applicants preferred location. Therefore, the WC 603 port configuration is carried forward for detailed analysis. A summary of the Applicants site selection process is presented below.

In determining the proposed port location, the Secretary acknowledges that, the Applicant evaluated three locations within the GOM. These sites included: WC 603; Eugene Island OCS Lease Block 327 (EI 327); and Viosca Knoll OCS Lease Block 901 (VK 901). The Applicant's proposed Port location and the alternate sites evaluated are shown in Figure 2-2.

The applicant further refined the Secretary's purpose and need to establish criteria to identify possible deepwater port sites in the GOM. The applicant then performed a detailed evaluation of the resulting three potential locations for the proposed deepwater port. One site, WC 603, has been carried forward for detailed analysis. Following is a summary of the applicant's criteria and the detailed evaluation of the other two sites, EI 327 and VK 901.

The siting criteria used by the Applicant to identify their preferred location within WC 603 are presented below.

- *Unimpeded Access*. El Paso Energy Bridge GOM articulated the need for an area free of structures and other obstructions. Because an LNG tanker might need to approach the buoy from varying directions (based upon prevailing wind and current velocity), the docking process requires an area of approximately 3 km (1.62 nautical miles [NM]) around the STL buoy unimpeded by structures. Having to maneuver around obstructions would represent a complicated operational hindrance and limit the weather spectrum when the vessel could move to the buoy, adding cost and time to the process while compromising the safety of personnel on both the maneuvering ship or on the obstruction (a platform or another ship).
- *Buoy Location.* El Paso Energy Bridge GOM determined that preferred water depths for operation of the proposed deepwater port are between 50 m (164 ft) and 150 m (492 ft). Depths outside this range would present additional design, construction, and/or operational considerations for the system. Also, the location of the STL buoy in proximity to shipping fairways would present an important navigational consideration. Although having a nearby shipping fairway is important for the transportation of the LNG, the STL buoy should be located far enough away from shipping fairways to reduce the possibility of interference with passing ships. Locating the buoy a sufficient distance from shipping fairways would allow operators to identify and monitor traffic effectively to and from the Port. Sufficient distance from a shipping fairway would allow more time to identify passing ships or potential threats to the STL buoy or an engaged EPEBV. Based on these considerations, the preferred distance from the nearest shipping fairway is between 9.3 and 18.5 km (5 and 10 NM). The proposed

location (WC 603) is approximately 20 km (10.79 NM) from the Sabine Pass Fairway that runs north/south to the east of the proposed STL buoy location.

- *Other Considerations.* El Paso Energy Bridge GOM determined that the proposed Port should not be located within a designated USCG Traditional Lightering Area or Lightering Zone. Moreover, the proposed deepwater port would not occur within designated natural, recreational, or scenic areas or landmarks. Other factors in the location of the deepwater port would involve its proximity to a desirable pipeline system to transport natural gas to key markets. Pipeline systems located in areas of substantial future drilling plans would not be desirable. El Paso Energy Bridge GOM intends to utilize currently available interruptible capacity on the downstream third party pipelines. Existing and predicted economic conditions on a candidate receiving pipeline system must be favorable for gas supply from the deepwater port. These conditions include a high available basis or netback and maximum trading liquidity. An assessment of netback is used to determine if a market price is economical and attractive for a producer/seller, the cost associated with delivering the gas from the origination point to the market point, must be subtracted from the market price, resulting in the "netback" to the producer. If the netback is not sufficient, the producer/seller will either not produce, or seek other markets. An assessment of trading liquidity is used to identify certain market and production areas where that there are a significant number of both buyers and sellers.

Alternate Location: Eugene Island Block 327. The Applicant found that the EI 327 alternative compares very closely with WC 603 in several important considerations. Market considerations (e.g., basis/netback, liquidity, and future drilling plans) are equivalent between the two locations.

The Sea Robin (East) pipeline, considered as a recipient pipeline for EI 327 gas, does not have favorable overcapacity compared to the proposed location (WC 603). Favorable overcapacity is defined as excess or spare capacity on existing pipelines which have "room" in the pipelines to handle the volumes being delivered from the Port, without the need to construct new pipelines and without the need for investment needed to increase the capacity of existing pipelines.

The longer distance to Sea Robin (East) pipeline and the Bluewater (East) line from the STL buoy would require at least double the amount of new pipeline construction as compared to WC 603. Because the pipeline would be considerably longer than that proposed for the WC 603, the construction would have a greater impact to the benthic and demersal fauna. The pipelines are not proposed for burial and therefore any exposed pipeline surface would be potential substrate for invertebrate settlement. The benthic environment under the pipeline would be lost.

Bathymetry of the EI 327 alternative site shows that the location would be on a flat, stable portion of the GOM OCS between the 70- and 80-meter isobaths. The sediment texture throughout EI 327 is silty clay. This sediment is much different than the sandy silt of the proposed WC 603 site. Sandy silt has a higher settling velocity than silty clay and therefore dispersal of sediments during construction would be higher if the EI 327 alternative were chosen. Silty clay can form clumps when disturbed depending on the percentage of clay within the silt; these clumps would also have higher settling velocities than silt alone. However, a detailed analysis of sediment texture would be necessary in order to determine the exact nature of settling velocities and the dispersal of disturbed sediments.

Active oil and gas platforms are located within and around EI 327. EI 327, however, contains one existing structure near the alternative STL buoy location; and preferred operating conditions provide for no structures in the lease block. Active oil and gas platforms within EI 327 increase the potential

for accidental disturbance to those existing structures and decrease the safety of the proposed deepwater port. The proposed location (WC 603) does not have any active oil and/or gas platforms located within the lease blocks that would be affected by the proposed deepwater port.

In addition, the active oil and gas platforms located in the area of the EI 327 alternative site suggest that the sediment may be more likely to have hydrocarbon, volatile hydrocarbon, tar balls and synthetic contamination from oil and gas production activities and recovery. An analysis of the sediment would be necessary to determine if contamination was present in this area. While not critical to the site selection, the decision did consider that disturbance to the sediment at WC 603 could have less potential of releasing contaminated sediments.

Six proposed artificial reef locations are located at least 20 miles from the EI 327 alternative site. Construction and operation of the deepwater port should not impact these sites.

Finally, the EI 327 alternative site is located approximately 130 miles south of St. Mary's Parish, Louisiana and is west of the Mississippi Delta. An advantage of the proposed location (WC 603) is its distance from the Louisiana mainland, approximately 100 mi (186.7 km). Locating the proposed deepwater port closer to shore brings potential air and water emissions closer to Louisiana population centers and areas of commercial and recreational fishing.

From a security standpoint, the Applicant feels that the proposed location (WC 603) holds an advantage over the locations nearer to population centers, such as EI 327.

Alternate Location: Viosca Knoll Block 901. El Paso Energy Bridge GOM found that the VK 901 alternative site would require the same amount of new pipeline construction as the proposed WC 603 location. In addition, the availability of interruptible capacity on the downstream Viosca Knoll system (proposed recipient pipeline) would be favorable. However, potential range for transport cost would be high, so the netback would be not advantageous.

The VK 901 alternate site is located approximately 30 miles east of the Mississippi Delta. The sediment texture throughout this block is mostly clayey sand with some silty clay. This sediment would have settling velocities similar to those found at the proposed WC 603 location. Therefore, impact of sediment disturbance at VK 901 would be equal to that at WC 603 because the sediment is similar at both locations. A detailed analysis of sediment texture would be necessary in order to determine the exact nature of sediment settling velocities found at the VK 901 alternate site.

The VK 901 alternate site would require the same length of pipelines to transport the natural gas from the proposed STL buoy to existing supply line as those proposed for WC 603. Because the pipeline length would be similar to the proposed WC 603 site, the impacts to the benthic infauna and epifauna would be the same. The pipelines are not proposed for burial and therefore any exposed pipeline surface would be potential substrate for invertebrate settlement. The benthic environment under the pipeline would be lost.

No active oil and gas platforms or proposed artificial reef locations exist within VK 901, similar to the proposed WC 603 site. Because there are no active oil and gas platforms within VK 901, safety issues of the proposed deepwater port would be similar to those at WC 603.

The Mississippi River Delta is located within 30 miles of VK 901 site. The impacts of freshwater, nutrients, and suspended sediments would be much greater at VK 901 than at WC 603. This sediment input is reflected in the bathymetry at Viosca Knoll. Bathymetry at VK 901 has close

isobaths suggesting the area has steep slopes, and the proposed deepwater port would be constructed over areas less stable than the proposed WC 603 site, ranging in depths from 100 to 200 m. Construction over sloping silty environments is less preferable to construction on stable plateaus for safety reasons.

In addition, the Mississippi/Atchafalaya River system contributes about 73 percent of the freshwater entering the area of the Texas-Louisiana Continental Shelf. Trace metals enter northern Gulf waters from river outflow, the atmosphere, and local human activities (Philips and James 1988). Because Viosca Knoll is located close to the Mississippi Delta and closer to shore than WC 603, it is likely to have the greatest anthropogenic impacts. The most important sources for sediment contaminants are Mississippi River outflow, local oil and gas production activities, and ship traffic (Philips and James 1988). Concentrations of contaminants around the Mississippi River Delta are particularly high (Philips and James 1988), and disturbance of the sediment at VK 901 could release and resuspend contaminants that may be trapped within the sediments. It is anticipated that sediment contamination at WC 603 would be lower because it is not located as close to the Mississippi River Delta and its consequential anthropogenic sources of contaminants. An analysis of the sediment would be necessary to determine if contamination was present in either area. While not critical to the site selection, the decision did consider that disturbance to the sediment at WC 603 could have less potential of releasing contaminated sediments.

Because nutrient and freshwater impacts are expected to be higher at VK 901 than at the proposed WC 603 site, it is likely that the diversity of planktonic flora and fauna at VK 901 would be higher than at the proposed WC 603 location.

Impacts to EFH potentially would be greater at VK 901 than impacts created by siting the deepwater port within the proposed WC 603 location. Increased impacts are attributed to several reef fish and migratory pelagic species that have nursery areas near VK 901 that do not have nursery areas near the proposed WC 603 location.

As previously stated, VK 901 is located closer to the Louisiana mainland than the proposed WC 603 location. Locating the proposed deepwater port closer to shore brings potential air and water emissions closer to Louisiana population centers and areas of commercial and recreational fishing. Also, potential exists for an EPEBV to become a target of terrorist activity, as with any storage of petroleum products. In this regard, the proposed WC 603 location holds an advantage over the locations nearer to population centers. Of the three sites investigated (WC 603, EI 327, and VK 901), construction of the proposed deepwater port at VK 901 presents the likelihood for the greatest potential impacts to the existing environment.

Drilling Plans. A review of the potential for drilling activity at the three alternate locations supports the favorability of the proposed WC 603 site. The level of lease bonus payments paid for leases in the WC 603 area suggests either high risk or low potential prospects. The lack of previous drilling within lease blocks in the area of WC 603 and the lack of a Plan of Exploration (POE) filing for any nearby lease block supports the poor prospectivity. There are production platforms in the area; however, the nearest production platform is in excess of three miles from the center of WC 603. At the EI 327 alternate site, El Paso's platform is still active with recent production volumes of 236 barrels of oil per day (BOPD) and 455 MMcf/d in January 2003. Although there are no POE's filed for nearby lease blocks, production operations are ongoing to the south and southeast. At VK 901, a production affiliate of El Paso filed a POE in May 2000 with the intent to drill four wells. However, El Paso's lease is set to expire in March 2004. Chevron has a platform directly west in VK 900, almost 4 miles from the center of VK 901, producing about 1,400 BOPD and 3.5 MMcf/d. The lack

of other leasing and very little earlier drilling in the area tend to support VK 901 as an attractive alternate project site. So, purely from the perspective of future drilling activity in the area, WC 603 and VK 901 are both attractive while EI 327 is much less so.

Applicants Conclusions. Among the three locations investigated, the Applicant found the WC 603 location exhibits advantages for siting the proposed deepwater port over EI 327 and VK 901, while exhibiting no disadvantages. Table 2-2 summarizes the criteria and the results of Applicants comparisons of alternative deepwater port sites.

Table 2-2. Applicants Comparison of Site Alternatives

Criterion	WC 603	EI 327	VK 901
Potential environmental impact	Favorable	Less favorable	Less favorable
Distance from third party pipelines	Favorable	Less favorable	Favorable
Existing structures	Favorable	Less favorable	Favorable
Proximity to shipping fairway	Favorable	Less favorable	Favorable
Capacity	Favorable	Less favorable	Favorable
Basis/netback	Favorable	Favorable	Less favorable
Future drilling potential	Favorable	Favorable	Favorable

Pipeline Right of Way Location

El Paso Energy Bridge GOM conducted a Hazard Survey for the proposed Port area for any significant obstructions in accordance with MMS guidance. As a result, El Paso Energy Bridge GOM modified its proposed pipeline route to avoid one potential hazard. No other significant hazards were found to exist in the proposed project area (Thales Geosolutions, Inc. 2002).

Alternative LNG Deepwater Port Concepts

The Secretary considered a variety of deepwater port concepts. They can be generally divided into two groups that fit the operational models of either continuous base load operations or intermittent operations. Those that include storage capacity for LNG would generally be used for continuous base load operations and those concepts that do not include storage for LNG would generally be used for intermittent operations. All concepts would include systems for docking and unloading of LNG vessels and systems for vaporization of the LNG for delivery to onshore markets via undersea pipelines.

Those concepts that include storage capacity for LNG may be either stationary structures or floating, storage, and regasification units (FSRU). Stationary structures with storage capacity for LNG may be either gravity based systems (GBS) or platforms supported by pilings or other methods used in the offshore oil and gas production industry. Due to the requirements for an appropriate depth of water for safe navigation of the LNG vessel and considerations of the cost of construction of larger structures, GBS terminals would generally be limited to water depths between 40 and 85 feet. GBS structures must also be located in areas where the seafloor is relatively level or gently sloping,

lacking in geologic hazards, and with satisfactory sediments to support the foundation and weight of the structure. The installation of the GBS structure would generally result in a greater disturbance of the bottom than other types of stationary structures. Other types of stationary structures may be located in deeper water, but would have similar constraints with regard to avoiding areas with geologic hazards. Floating structures with storage capacity generally require an anchoring system and sufficient water depth (generally greater than 160 feet) to accommodate the technology required for a flexible pipeline connection between the unit and the seafloor pipeline.

Those floating concepts that do not include storage capacity for LNG may include a variety of stationary structures to support regasification processes or they may require that the delivery LNG vessel support the regasification process. In either case, the LNG is not stored at the deepwater port but is immediately converted into natural gas for delivery to a seafloor pipeline. This operational concept can include either stationary or floating methods of mooring the LNG vessel and delivering the natural gas to the pipeline. Stationary mooring and delivery methods would be much like those required for the continuous base load operational concept. Floating moorings typically involve a buoy with associated anchoring systems to connect a pipeline to the LNG vessel. Due to the specialized materials and engineering requirements to handle the extremely cold LNG, floating moorings will generally be associated with vessels that are designed to support the LNG regasification process onboard the vessel. Floating mooring and delivery methods will generally require water depths of 160 feet or greater to accommodate the flexible pipeline connection between the unit and the seafloor pipeline.

Since the implementation of the amended Deepwater Port Act in late 2002, two Deepwater Port License Applications, including the El Paso Energy Bridge L.L.C. application have been submitted to the USCG and MARAD for review. ChevronTexaco submitted the other application under consideration, for the Port Pelican Deepwater Port. The Port Pelican application includes a GBS based continuous base load system for offloading, storage, and regasification of LNG. The USCG and MARAD are in the process of developing an EIS of the proposed Port Pelican proposal (USCG 2003).

While the Secretary recognizes that the GBS would likely be used to serve a different operating and delivery model than the El Paso Energy Bridge GOM proposal, it nevertheless represents a reasonable option within the broad context of the Secretary's purpose and need. Because the Secretary's decision on the Port Pelican proposal would continue independently of the El Paso Energy Bridge proposal if a No Action (denial of a license) decision was moade on El Paso the Port Pelican proposal is included as a potential eventuality under the No Action alternative presented in this EA.

The Secretary does not give preference to either the GBS or the STL buoy operational model. Instead, the Secretary will rely upon the LNG industry to determine the appropriate operational model to serve its intended market. Likewise, the determination as to whether the deepwater port is stationary or floating is an individual business decision for the applicants. The Secretary believes that any of these operational models or deepwater port concepts can be acceptable in terms of safety, operability, availability, and environmental protection. Therefore, the Secretary will evaluate the merits of each application on a case-by-case basis and require each applicant to provide a rational and objective analysis of alternative concepts.

At this time, no other intermittent delivery Deepwater Port concept is known to the Secretary beyond the onboard regasification/STL buoy system proposed by El Paso Energy Bridge GOM. The Port Pelican continuous base load GBS system is the only other Deepwater LNG Port concept ever

submitted for formal review under the Deepwater Port Act prior to The El Paso Energy Bridge GOM Application. Compared to the GBS concept, the onboard regasification system STL buoy system was found acceptable in terms of safety, operability, availability, and environmental perspectives. The Secretary found no compelling reason to reject El Paso Energy Bridge GOM's proposed concept. Therefore, the use of the STL buoy concept is carried forward for detailed analysis.

Alternative Natural Gas Pipelines

Several major interstate natural gas pipeline systems pass near the proposed Project. The Secretary determined that these pipelines would not be available to an applicant at volumes established in screening criteria, due to currently contracted volumes. Therefore, the use of alternative natural gas pipelines was eliminated from further consideration.

Alternative Regasification Technologies

The Secretary considered use of a shell and tube vaporizer using either once through heating water (open loop) or a steam heated (closed loop) system and five other technologies for LNG regasification; 1) open rack vaporizer (ORV) technology; 2) submerged combustion vaporizer (SCV); 3) intermediate fluid vaporizer (glycol/water intermediate fluid), 4) intermediate fluid vaporizer (Rankine Cycle), and 5) intermediate and fluid vaporizer with boiling and condensing intermediate. All six processes were evaluated for safety during operations, commercial viability, operability and maintainability, space requirements and suitability for offshore shipboard use, and environmental impacts. The intermediate fluid vaporizer (glycol/water intermediate fluid), intermediate fluid vaporizer (Rankine Cycle), and intermediate and fluid vaporizer with boiling and condensing intermediate were eliminated from further consideration due to safety, cost, reliability, and environmental concerns.

The ORV technology requires a stable platform environment to prevent sloshing of heating water and LNG and would not be acceptable for use on a moored ship. In addition submerged combustion vaporizes technology require a considerable amount of space. An open flame, and high fuel usage adds even greater restrictions to SCV as a shipboard technology. The open loop and closed loop shell-and-tube alternatives are evaluated further.

As discussed in Section 2.1, the proposed shipboard shell-and-tube regasification technology incorporated into the EPEBVs can be operated in an open loop, closed loop, or combined mode.

With the shell and tube technology operating in the open loop mode, the EPEBV at the deepwater port would pump seawater from fixed intakes on the ships hull bellow the waterline. The relatively warm seawater would be passed through the shell and tube vaporizer to provide the heat necessary change the methane (natural gas) from a liquid to its natural gas phase. The open loop configuration is more efficient than the closed loop configuration and has lower air emissions. The open loop configuration would have negative effects associated with heating water intake and discharge that would not be associated with the closed loop system. In the open loop configuration the onboard regasification system can produce a maximum of approximately 690 MMcf/d of natural gas.

In the closed loop configuration, steam from the EPEBV's propulsion boilers would be used to heat water circulated in a closed loop through the shell and tube vaporizer and a steam heater. Operating the regasification system in the closed loop configuration would have no negative affects associated with heating water intake or discharge. There would be no entrainment of ichyoplankton.

The closed loop configuration would require significantly more fuel to convert the LNG to a gas than the open loop configuration. The closed loop configuration is less efficient than the open loop. In the closed loop configuration the onboard regasification system can produce a maximum of 450 MMcf/d. The capacity of the existing downstream pipelines that would receive gas from the proposed Port is approximately 550 MMcf/d. This reduced efficiency would have a negative affect on the Applicant's business model and result in increased air emissions. These effects would results from burning additional fuel and the increased time necessary to convert all of the LNG to natural gas. These affects would not be associated with the open loop system.

The closed loop capabilities were designed into the onboard regasification system to allow LNG regasification when surrounding seawater temperatures, such as those encountered in the North Sea, are too cold for the more efficient open loop configuration. Standard operating procedures engage the closed loop system only if surrounding seawater temperatures fell below 5.5 °C (42.0 °F). Even under extreme conditions, the average near surface seawater temperatures in this region of the GOM would not be expected to fall below 60 °F at any time of the year (NDBC 2003).

Operating the shell and tube warming water system in a partially closed or "combined" configuration would require the ships boilers to be brought online, resulting in fuel consumption and air emissions equal to the fully closed loop configuration. The design specifications of the shell and tube vaporizers requires the warming water to move through the system at a specific flow rate calculated to prevent freezing within the system and to provide natural gas within a specific design temperature and pressure. Because of the flow rate requirements within the system and limitations of the closed loop configuration, partial decreases in the intake volume would not necessarily have a directly proportional decrease in intake velocity.

For the purposes of this EA, the Secretary does not give preference to any of the alternate regasification technologies. Instead, the Secretary will rely upon the LNG industry to determine the appropriate technology to safely and reliably serve its intended business purpose. The Secretary believes that any of these technologies can be acceptable in terms of safety, operability, availability, and environmental protection. Therefore, the Secretary will evaluate the merits of each application on a case-by-case basis and require each applicant to provide a rational and objective analysis of alternative regasification technologies. A detailed evaluation of the engineering and reliability of shell and tube technology is being evaluated by the USCG.

The shell and tube system operated in the open loop configuration was found acceptable in terms of safety, operability, availability, and environmental perspectives. The Secretary's screening has found no compelling reason to reject El Paso Energy Bridge GOM's proposed regasification technology. Therefore, the use of the shipboard, shell-and-tube regasification technology operated in the open loop configuration is carried forward for detailed analysis.

2.2.2 No Action Alternative

Inclusion of the No Action Alternative is prescribed by CEQ regulations and serves as a benchmark against which Federal actions can be evaluated. Under the No Action Alternative, the Secretary would deny the license application preventing construction and operation of this deepwater port proposal at the WC 603 site. The additional infrastructure for acquisition of energy, as proposed by El Paso Energy Bridge GOM, would not be built at this location, and there would be no contribution to the Nation's natural gas supply from this source. The applicant could choose to submit a new application for another location.

Because of the existing and predicted demand for natural gas (see Section 1.2), it will be necessary to find other means to facilitate the importation of natural gas from foreign sources if the application is denied. At this time, only one other LNG Deepwater Port license application is under consideration by the USCG and MARAD, ChevronTexaco's Port Pelican. If licensed, that Port would not by itself compensate for the additional supply proposed by the El Paso Energy Bridge GOM. In addition to the Port Pelican proposal, other license applications concerning proposals to satisfy demand for natural gas might be submitted, or other means might be used to satisfy the Nation's energy demands such as expansion or establishment of onshore LNG ports. A detailed description and analysis of the Port Pelican proposal is presented in the Final EIS (USCG 2003). This EA includes a summary of potential impacts that may be associated with the Port Pelican proposal in the No Action Alternative sections under the appropriate resource discussions of Section 4.0, *Environmental Consequences*.

Because the demand for energy in the U.S. is predicted to increase, customers may have fewer and potentially more expensive options for obtaining natural gas supplies in the near future. It is possible that existing natural gas infrastructure supplying the proposed market area could be developed in other ways unforeseen at this point, including the further development of natural gas sources in North America and construction of associated pipeline projects. In some cases, energy demand would require potential customers of natural gas to select other energy alternatives such as oil, coal, or nuclear power to compensate for increased energy demands and the natural gas not provided by the proposed Port. However, it is not within the scope or capabilities of this EA to speculate on future solutions to the Nation's energy needs.

2.2.3 Alternatives Selected for Detailed Evaluation

The Deepwater Port Act provides for the Secretary's action to authorize and regulate the "… *location*, ownership, construction, and operation of deepwater ports"[8] (emphasis added). The Secretary has applied the purpose and need for the Proposed Action and carefully considered various alternatives. The Secretary reviewed El Paso Energy Bridge GOM's evaluation of alternate sites and concludes that the Proposed Action could be developed with equal or less negative economic and environmental effects than the reasonable alternatives. Accordingly, and for the reasons presented in this section, the Proposed Action as submitted by Applicant and the No Action Alternative are carried over for detailed evaluation in this EA. Since the Secretary will either grant (with or without conditions) or deny the license, the alternatives selected for further evaluation within the EA are the Proposed Action and the No Action Alternative.

2.3 Detailed Description of the Proposed Action

The following presents a detailed description of the Proposed Action.

2.3.1 Location

As shown in Figure 2-1, the proposed Port's STL buoy would be located approximately 116 mi south (offshore) from the Louisiana coast in OCS Lease Block 603 at approximately 28°05'16" Latitude, 93°03'07" Longitude.

[8] 33 U.S.C. 1501(a)(1).

Water at this location in Vermilion Block 140 in the GOM is approximately 83 ft deep. This location affords the Project suitable water depth, proximity to existing gas pipelines, and reduced potential conflicts with existing facilities or hazards. Other considerations for selection of this location included proximity to established or recognized shipping lanes for LNGC access, sediment conditions favorable to GBS installation, and environmental factors. In selecting the site, Port Pelican LLC conducted detailed offshore marine corridor and pipeline route surveys that took into account data on water depth, general marine access, leasing status of blocks, access to third-party gas transmission lines, and distance to the existing Tiger Shoal "A" Lateral of the existing Henry Hub. Figure 2-1 shows the proposed Port Pelican Terminal and Vicinity.

2.3.2 Construction

Location The Terminal would be approximately 36 mi south southwest of Freshwater City, Louisiana, as shown in Figure 2-2 (note that Figure 2-2 also depicts the Alternate Siting Location). Water at this location in Vermilion Block 140 in the GOM is approximately 83 ft deep. This location affords the Project suitable water depth, proximity to existing gas pipelines, and reduced potential conflicts with existing facilities or hazards. Other considerations for selection of this location included proximity to established or recognized shipping lanes for LNGC access, sediment conditions favorable to GBS installation, and environmental factors. In selecting the site, Port Pelican LLC conducted detailed offshore marine corridor and pipeline route surveys that took into account data on water depth, general marine access, leasing status of blocks, access to third-party gas transmission lines, and distance to the existing Tiger Shoal "A" Lateral of the existing Henry Hub. Figure 2-1 shows the proposed Port Pelican Terminal and Vicinity.

2.3.2.1 Mooring Anchors and Mooring Legs

The proposed design for the mooring system integrated with the STL buoy would utilize a circular array of eight suction-piled mooring anchors located approximately 3,281 ft from the STL buoy to hold the buoy and a connected EPEBV in place. Each mooring anchor would disturb a maximum seafloor area of approximately 28.3 squared meters (m2) (304.6 squared feet[ft2]). The location and design of these anchors would be engineered uniquely for the currents encountered in the proposed location. Figures 2-4 and 2-5 illustrate the mooring system layout and typical suction-mooring anchor chains.

Installation of the mooring anchors and cables would include a remotely operated vehicle (ROV) to identify the proper location for installation of each mooring anchor. Two dynamically positioned (DP) installation vessels would establish position, stern to stern, approximately 10 m (32.8 ft) apart above the installation location. A towing winch from the other vessel would pull the anchor and mooring assembly over the stern of the offloading vessel and lower it toward the seabed Prior to touchdown, final positioning would be conducted followed by the anchor's self-penetrating the seabed. Prior to penetration, positioning and orientation of the mooring anchor would be adjusted to final tolerances. A ROV-mounted pump skid would then be engaged and would commence anchor penetration. An observation ROV would monitor this procedure. Finally, the offloading vessel would lay the mooring cables.

Each mooring line would lie within a predefined corridor. A winch would provide tension to eliminate slack in the chain during the laying process. The length of cable would be adjusted as necessary. This process would be repeated for each of the eight anchors and associated mooring legs.

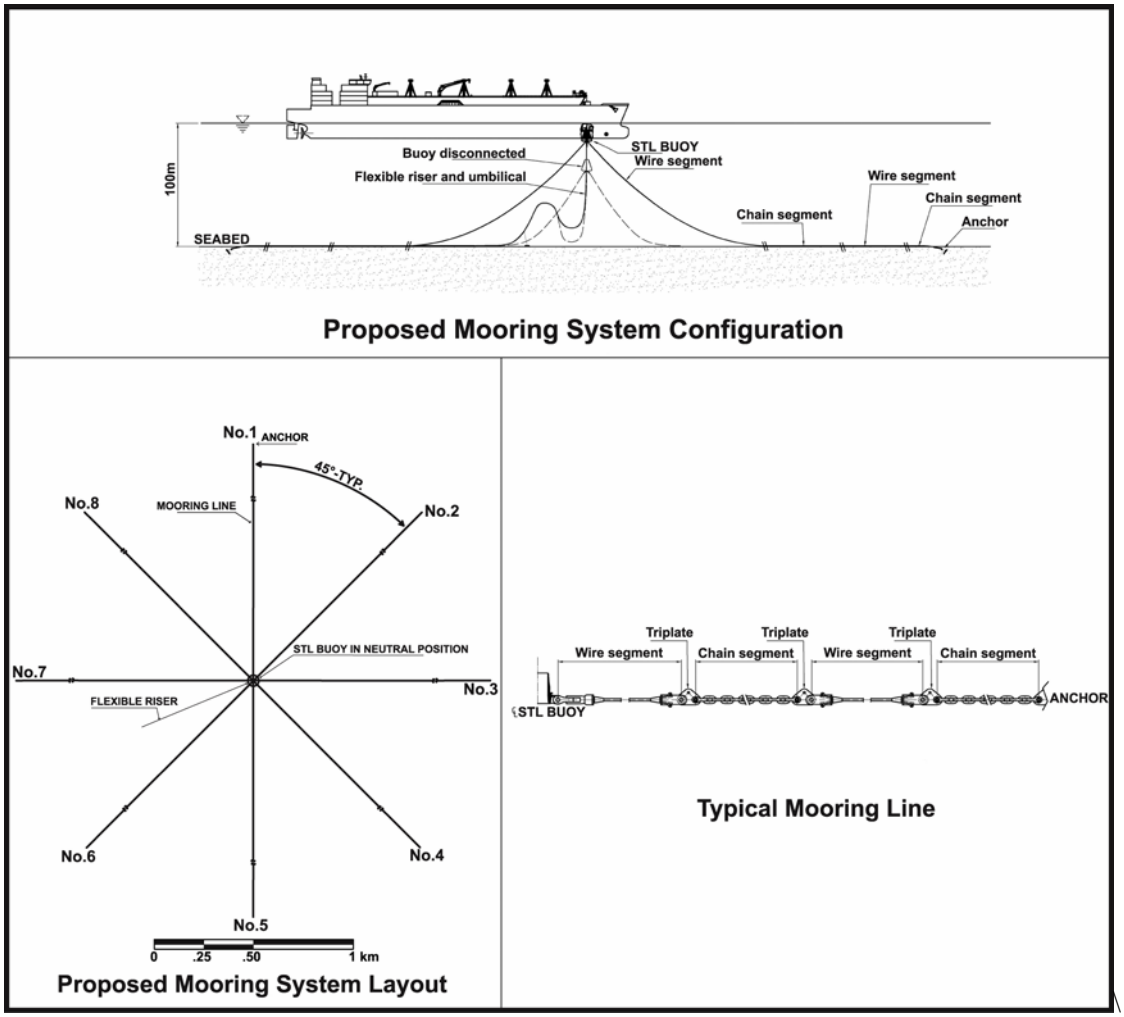


Figure 2-4. Proposed Mooring Components

2.3.2.2 Pipeline End Manifold (PLEM)

The PLEM would connect the flexible riser and the subsea pipeline. The PLEM will be mounted to the top of a suction pile and the pile will be seated into the seafloor to a depth of approximately 15 m (49.2 ft) depending on local soil conditions. Seafloor disturbance by this unit would not exceed 1.8 m2 (19.4 ft2). Procedures to install the PLEM would be the same as those to install the mooring anchors. The process would utilize the same installation equipment, including the suction pump skid.

2.3.2.3 Flexible Riser

The flexible riser would be transported on an under-roller reel on a lay barge. It would be unreeled over a lay arch into position in the water. An STL guide pipe and messenger line would be used to facilitate the installation process. The line would be routed through the STL guide pipe and connected to the riser pull head. A surface winch attached to the messenger line would pull the flexible riser (filled with water on the lay barge) through the STL guide pipe. The pull head end of the flexible riser would be secured within the water by lay barge cable. The remainder of the flexible riser then would be pulled through the STL into position in the water carefully to ensure the proper

catenary shape. Buoyancy rigging would be attached along the flexible riser. The PLEM end of the riser would be lowered to the seafloor where divers would attach it to the PLEM. A hydraulic tension or torque tool would secure the bolts.

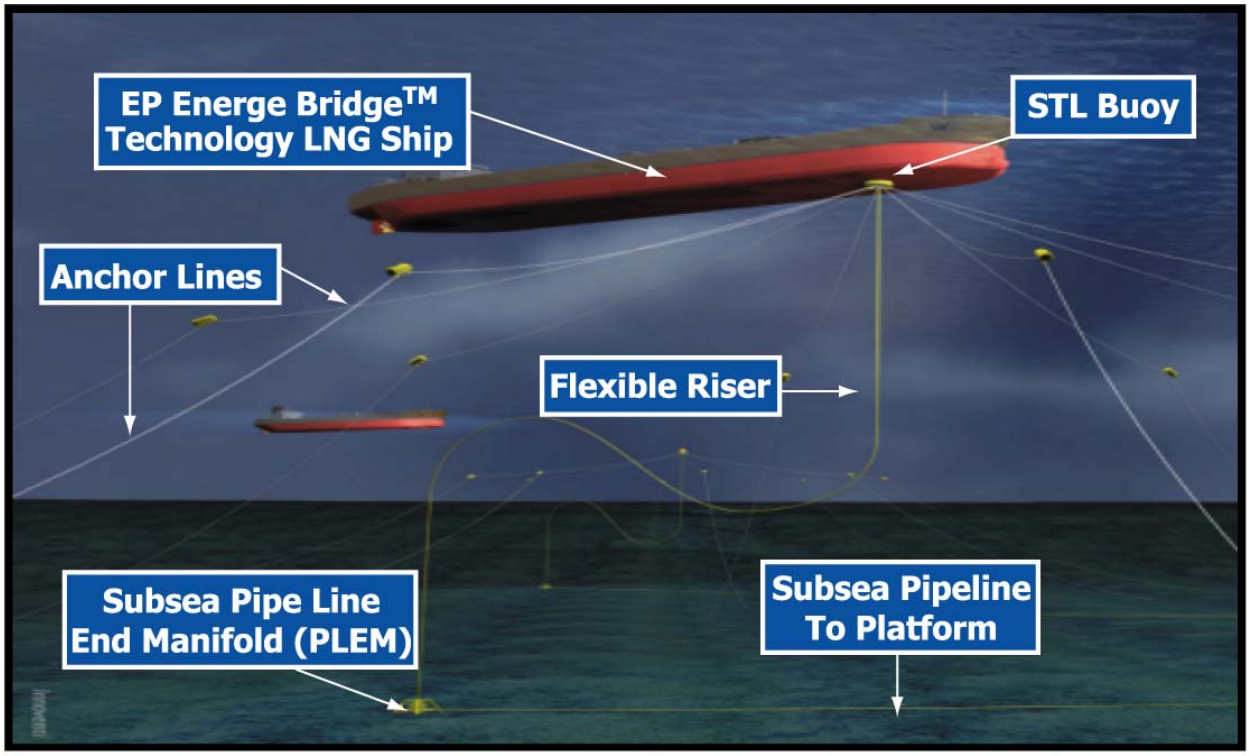


Figure 2-5. Proposed Port Infrastructure at the STL Buoy

2.3.2.4 Metering Station

Platform Construction and Installation Methodology. The metering platform would be a conventional steel jacket structure designed in accordance with recommendations published by the American Petroleum Institute (API). Figure 2-6 illustrates a typical metering platform and riser. The design of the platform would meet various requirements, including environmental conditions (initial transportation and in-place 100-year storm conditions), soil characteristics, and American Institute of Steel Construction (AISC) codes and recommendations. The Applicant has indicated that, if a license is granted, they may consider refurbishing an existing platform that is currently out-of-service in dry-dock. Design, installation, and operation of the platform would meet all applicable and appropriate guidelines subject to approval by the USCG.

The metering platform would be a typical offshore jacket structure supported by piles, and it would have a deck structure containing a main deck, a cellar deck, and a helideck. Deck legs connected to the top of the piles would support the deck structure. The piles would extend from above the Mean Low Water through the mud line and into the substrate. Underwater, the piles would be contained inside the legs of a "jacket" structure, which would serves as bracing for the piles against lateral loads. The jacket would also serve as a template for the initial driving of the piles. The piles would be driven through the inside of the legs of the jacket structure. The top of the jacket would be placed near the water level where a boat landing would be located for accessing the platform by boat.

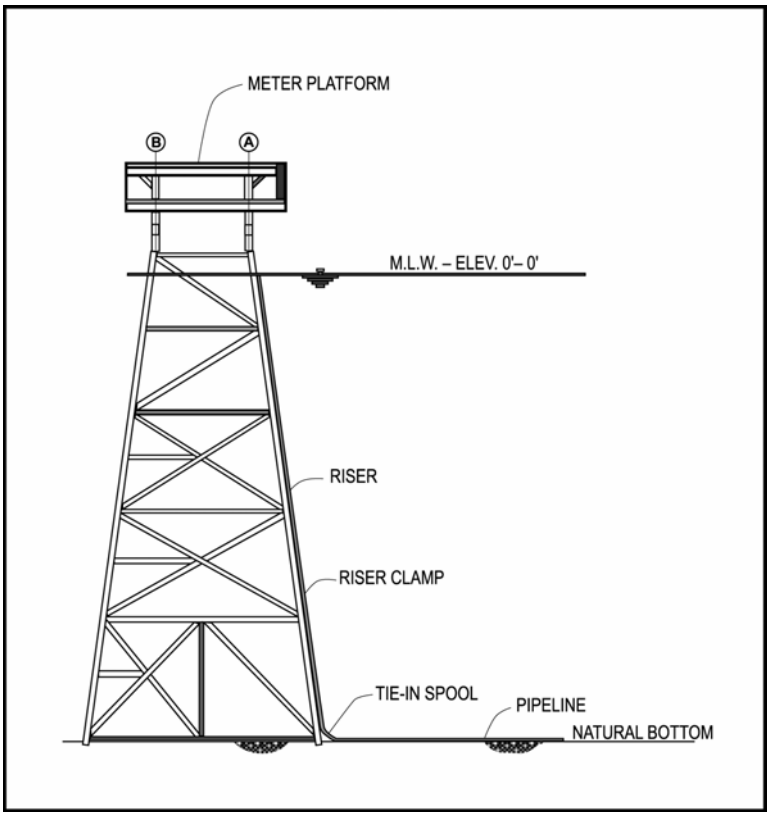


Figure 2-6. Conceptual Meter Platform

Platform design would incorporate the following major equipment: incoming gas pipeline riser, pipeline flow control manifold, custody transfer gas measurement, two export gas pipeline risers, electrical power generation, platform utility systems, natural gas-fired heater, heliport, and control building.

The platform would receive natural gas from the offloading EPEBV via the subsea pipeline and split that flow of gas into two gas-metering stations. One of the meters would provide custody transfer measurement of gas to be delivered to the Sea Robin pipeline and the other meter would measure gas to be delivered to the Bluewater pipeline. The gas would be pressure and flow regulated on the metering platform. Gas would exit the platform in separate pipelines for tie-in to the Sea Robin and Bluewater pipelines.

Construction, Transportation, and Installation. A new or refurbished platform and equipment components would be built or refurbished onshore at existing fabrication yards located on the Gulf Coast. The fabrication yard(s) will be selected from facilities that are currently capable of providing the construction or refurbishing without modifications to the facilities current operations or permits.

Upon completion, the platform would be transported offshore to the platform installation location in WC 603. The Applicant's offshore design and analysis of the platform would also include a load out and transportation subject to approval by USCG and MARAD. All the structural sections of an offshore platform would be designed to withstand the lifting and installation stresses.

The jacket would be designed to be self-supporting during installation. Consequently, the jacket would have "mud mats" at the bottom horizontal brace level to support the jacket while resting on the mud line. Mud mats are sections of the bottom of the jacket structure covered by stiffened plates to allow the weight of the jacket to be supported by the top layer of the soil at the ocean floor (the mud line). Mud mats are generally located adjacent to the jacket leg connections for structural reasons.

The piles would be installed in sections. The first section would be long enough to go from a few meters above the top of the jacket leg to the mud line. The second section would be field welded to the first section at an elevation slightly higher than the top of the jacket legs. When all the piles have been driven to the required design penetration they would be trimmed at the design "top of pile" elevation. The jacket would then be welded to the piles about 1.0 m or less below the top of the piles. The deck structure, whose legs would have "stabbing guides" at the bottom, would be lowered to fit on top of the piles and would be welded to the piles. The three pipelines could then be connected to the platform piping.

2.3.2.5 Pipelines

Pipeline Design and Installation Methodology. El Paso Energy Bridge GOM proposes to design, construct, maintain, and operate three pipelines associated with the proposed deepwater port. The pipeline from the subsea PLEM would be a 20-inch diameter pipeline extending 10,189 ft (1.93 mi) to the metering platform. Two 20-inch diameter pipelines would be installed downstream of the metering platform to deliver gas to two separate pipeline systems. One of these downstream pipelines would extend 7,256 ft (1.38 mi) and connect through an existing subsea valve assembly to an existing 30-inch Bluewater pipeline in West Cameron (WC) 601. The other pipeline would extend 20,912 ft (3.96 mi) from the metering platform and connect via hot tap into the existing Sea Robin 20-inch pipeline in East Cameron (EC) 335. Pipeline risers would be installed for each pipeline at the metering platform. Subject to guidance received from MMS and approval by RSPA, the proposed pipeline right-of-way (ROW) would be a 200-foot wide corridor along the pipeline routes (100 feet on each side of the pipeline). The ROW would extend 200 feet beyond the project terminals at the PLEM and the connection taps to the Sea Robin and Bluewater pipelines. The proposed pipeline routes are shown in Figure 2-9.

Design. All of the proposed pipelines would be designed, installed, tested, operated, and maintained in accordance with DOT regulations at 49 CFR Part 192 (*Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards*). In addition to regulatory requirements, the pipelines would be designed to meet applicable guidelines of the American National Standards Institute and API. A Maximum Allowable Operating Pressure (MAOP) for all pipelines would be established in accordance with DOT requirements and all safety devices would be installed accordingly. For the pipelines downstream of the metering platform, the MAOP would be less than the MAOP of the receiving pipeline.

Corrosion coating and cathodic protection requirements would provide for a minimum 30-year design life. Corrosion coating would consist of an externally applied fusion bonded epoxy coating. Cathodic protection would consist of sacrificial aluminum anodes, electrically bonded to the pipelines. The pipelines would be weight coated (external application of concrete) to achieve on-bottom stability in 100-year storm conditions. The thickness and unit weight of the concrete would be determined utilizing standard practices and computer software developed by the American Gas Association. A detailed stress analysis of the pipeline, riser, and subsea tie-in facilities would be conducted to ensure that the stress limits of the pipeline and risers meet or exceed relevant standards.

Design, installation, and operation of all three pipelines would be subject to guidance from MMS and approval by RSPA.

Installation. MMS regulations (30 CFR 250.1003(a)(1)) require all pipelines with diameters ≥ 8.625 inches that are installed in water depths less than 200 ft are to be buried to a depth of at least 3 ft below the mudline. All of the pipelines that would be constructed as part of the proposed Port would be in water depths greater than 200 feet and would be installed on the seafloor using methods typical for pipeline construction in this region of the GOM. All construction work would be in accordance with the specifications of 49 CFR Part 192, relating to minimum safety standards for pipeline transportation of natural gas.

- *Normal Lay Operations.* The contractor engaged by El Paso Energy Bridge GOM would be required to comply with the requirements of the Deepwater License and all other applicable requirements regarding anchor placement around pipelines, magnetic anomalies and environmentally sensitive areas. A conventional pipe lay barge would be used to install the pipeline. The lay barge would anchor at the point of origination, where a supply barge would provide the pipe in 40-foot sections. The 40-foot pipe sections would have been previously coated with corrosion and concrete coating with sacrificial anodes installed. Individual lengths would be welded together; welds would be 100 percent inspected utilizing either radiography or ultrasonic inspection techniques. The welded field joints would then be coated with a corrosion coating. During this process, the lay barge would advance 40 feet while lowering the newly formed pipeline off the stern of the barge. Repetition of the process would continue until the entire pipeline segment is in place. The procedure would then be repeated for the other pipelines. Figure 2-7 shows a typical lay barge. To install 20-in piping in water depths as proposed, the pipelaying barges may use an array of eight 9.9-ton anchors to position the barge and to move it forward along the pipeline route. These anchors are continually being moved as the pipelaying operation proceeds. The spreads would be reset at approximately 2,000-ft intervals. The areal extent of the seafloor disturbance from anchoring depends on water depth, wind, currents, chain length, as well as the size of the anchor and chain (MMS 2002a). The disturbed area would be larger if the anchors are dragged due to barge movement.
- *Riser Installation.* All pipeline risers would be fabricated, hydrostatically tested, and clamped to the metering platform during onshore fabrication of the platform itself. Field installation of the risers would not be required.
- *Subsea Tie-in.* Connection of the installed pipelines to the PLEM at the offloading buoy location, to the risers at the metering platform, and to the subsea valve assembly and hot tap assembly at the existing pipeline tie-in locations would be performed by utilizing a diving service vessel (DSV). Piping spool assemblies would be fabricated and hydrostatically tested onshore prior to mobilization of the DSV. These assemblies would then be loaded onto the DSV and transported, with the DSV, offshore to the site. At each tie-in location, divers would be used to install the piping spools to connect the pipeline to the respective component.

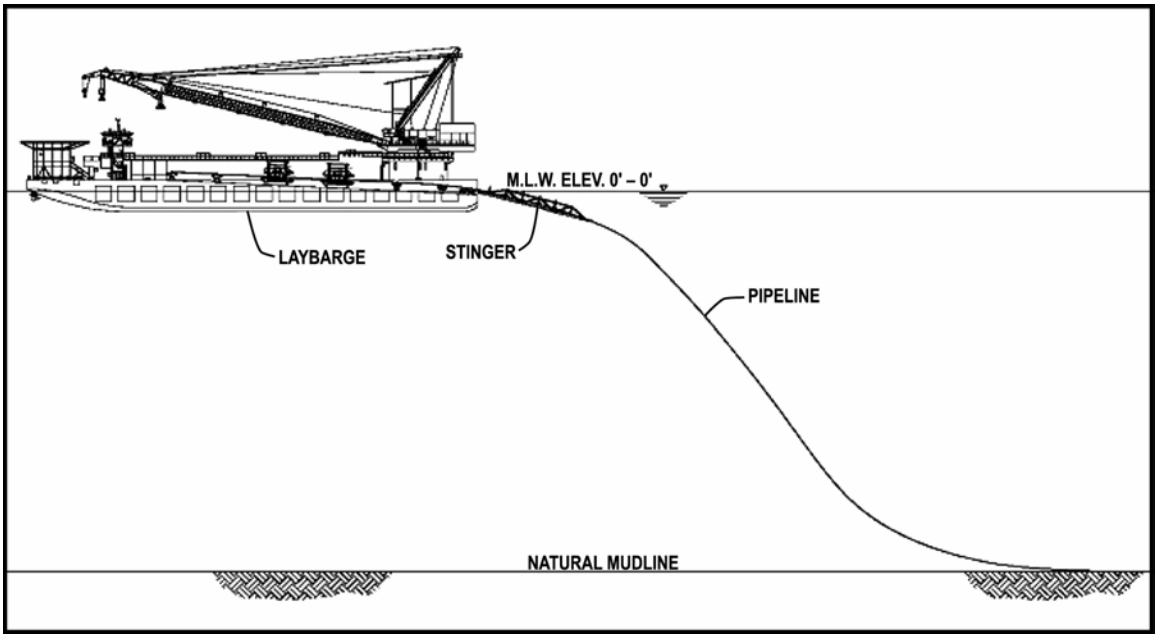


Figure 2-7. Typical Lay Barge

- *Hydrostatic Testing.* In accordance with DOT regulations, the pipelines would be hydrostatically tested with seawater to verify the integrity of the pipeline segments in accordance with the requirements of 49 CFR 192.503, 192.505 and 192.619(a)(2)(ii) and all other applicable regulatory requirements. Seawater would be withdrawn from the upper 10 m of the water column using a 1-in mesh filter at the foot of the withdrawal hose to minimize the entrainment of organisms. The risers and tie-in piping spools would be tested onshore to 1.5 times the MAOP prior to installation. Once all of the pipeline tie-in work is complete, the pipelines would be hydrostatically tested with seawater to 1.25 times the MAOP. Pressures would be maintained for a minimum of eight hours. The hydrostatic test for the pipeline segment from the PLEM to the platform would require approximately 198,742 gallons of seawater. The section from the platform to the Bluewater tie-in would require approximately 141,531 gallons of seawater, and the pipeline segment from the platform to the Sea Robin tie-in would require approximately 407,898 gallons of seawater. The total volume of seawater used for hydrostatic testing of the pipelines would be approximately 748,171 gallons. Upon completion of hydrostatic testing, the pipelines would be de-watered into the Gulf and commissioned for operation. No treatment of the discharge would be necessary. The hydrostatic testing process would not utilize chemical additives and all tested pipe would be new.

- Before any of the pipeline segments (i.e., platform to PLEM, platform to Bluewater tie-in, and platform to Sea Robin tie-in) are put into service they would be subjected to pigging operations to remove debris and to gauge the pipeline inside diameter to confirm that the pipeline is not dented, buckled, or otherwise obstructed. These pigging operations will involve the use and discharge of equivalent volumes of seawater as required for the hydrostatic testing operations. Detailed procedures for pipeline installation, hydrostatic testing, commissioning, and dewatering would be included in the approved Operations Manual.

- *As-Built Documentation and Operation.* All material, welding, non-destructive testing, installation, hydrostatic testing, and other as-built documentation would be collected and maintained in accordance with DOT requirements. In addition to meeting DOT requirements

for construction records, operating and maintenance procedures would be developed and followed during the operation of the pipelines.

2.3.3 Operations

2.3.3.1 Capacity and Unloading Frequency

Each EPEBV would have integrated shipboard systems for offshore regasification capabilities. The EPEBVs currently under construction would have capacity to store 138,000 m^3 of LNG, the equivalent of approximately 3 bcf of natural gas. The EPEBVs would also have the capability to deliver their cargo in ports having regasification and storage terminals. Figure 2-8 shows a conceptual design of an EPEBV.

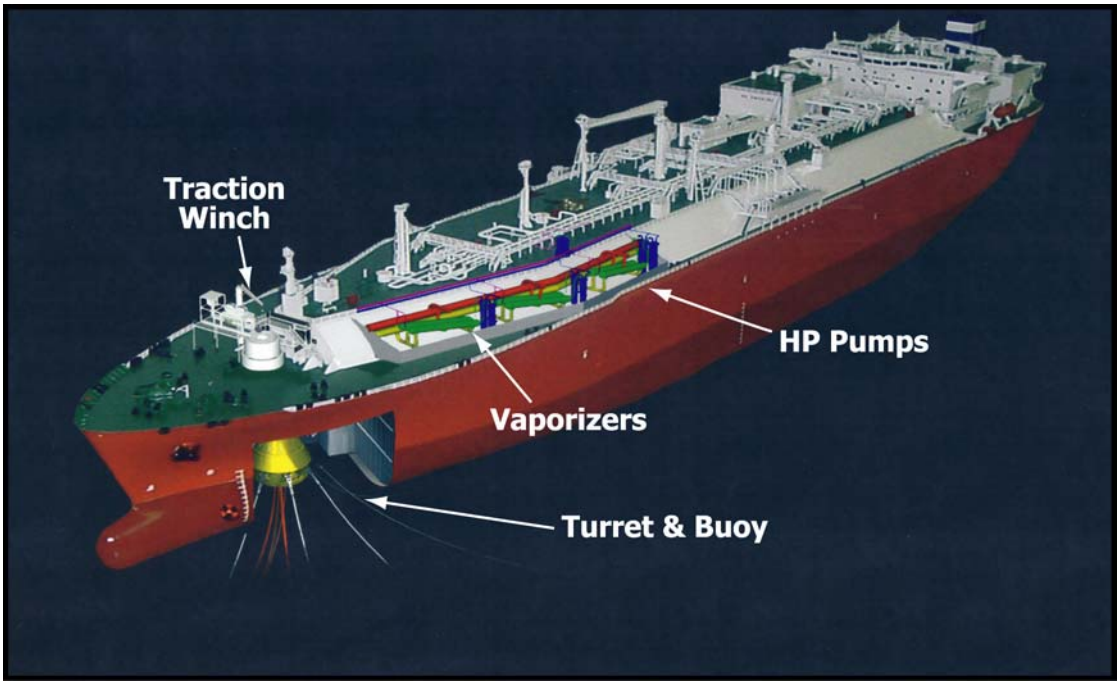


Figure 2-8. EPEBV Conceptual Design

El Paso Energy Bridge GOM's proposed operating strategy would have two EPEBVs dedicated to delivering gas to the Port. According to the Applicant, these ships are currently under construction in Korea. The onboard regasification would be accomplished using a shell and tube vaporizer system. The applicant has stated that their preferred and intended method of regasification would be to operate the regasification system in an open loop (once through, non-contact warming water) mode. In the open loop mode, the EPEBV at the proposed deepwater port would pump seawater from fixed intakes on the ships hull bellow the waterline. The relatively warm seawater would be passed through the shell and tube vaporizer to provide the heat necessary to change methane (natural gas) from a liquid to its natural gas phase. A discussion of the projected intake velocities and intake depth is presented in Section 2.3.3.2.

In addition to the Open loop mode, the onboard regasification system would have the capability to operate in a closed loop (recirculating warming water) mode or in a combined mode. In the closed

loop mode, steam from the EPEBV's propulsion boilers would be used to heat water circulated in a closed loop through the shell and tube vaporizer and a steam heater. Information provided in the application indicates that the closed loop mode produces natural gas at a slower rate and requires significantly more fuel than the open loop mode. Use of the closed loop system would increase the amount of time each EPEBV would spend at the proposed Port and increase the load on the ships propulsion boilers. These conditions would significantly increase air emissions when compared to the open loop system (see Section 4.8).

The closed loop capabilities were designed into the onboard regasification system to allow LNG regasification when surrounding seawater temperatures, such as those encountered in the North Sea, are too cold for the more efficient open loop mode. The applicants proposed operating plans would engage the closed loop system only if surrounding seawater temperatures fell below 5.5 °C (42.0 °F). Even under extreme conditions, the average near surface seawater temperatures in this region of the GOM would not be expected to fall below 60 °F at any time (NDBC 2003).

All of the proposed specifications and analysis presented in the EA assumes the exclusive use of the open loop configuration. In the open loop, the system would be capable of regasifying up to 690 MMcf/d. However, due to operating constraints related to downstream pipelines, the proposed deepwater port would regasify a maximum of 550 MMcf/d in the open loop mode. Closed loop steam operations could regasify up to 450 MMcf/d. Utilizing the various operating models, regasified natural gas volumes could range from 10 MMcf/d to 690 MMcf/d. Maximum volume for the port would be limited to 550 MMcf/d with an average of 500 MMcf/d.

El Paso Energy Bridge GOM believes that, for the foreseeable future, there would be two EPEBVs dedicated to delivery of regasified LNG at the deepwater port. The amount of time that these EPEBVs would unload their cargo would be a function of the distance between the LNG export terminal and the proposed deepwater port, as well as the natural gas unloading rate at the proposed deepwater port. With two EPEBVs, the maximum number of LNG cargo deliveries at the proposed port from the closest LNG supply point, Trinidad, would be approximately 42 deliveries annually (at an average unloading rate of 500 MMcf/d). Currently, Algeria is the next closest LNG supply source after Trinidad. If the LNG supply company elected to deliver natural gas originating from Algeria, the maximum number of LNG deliveries at the proposed deepwater port using two EPEBVs would be approximately 24.4 deliveries annually (at an average unloading rate of 500 MMcf/d). For the purposes of this EA it is assumed that the Port will operate at 42 deliveries per year.

The two EPEBVs would have the capacity to unload approximately 2,950 MMcf of natural gas per delivery; therefore, in the open loop mode and at an average unloading rate of 500 MMcf/d, the EPEBVs would be unloading cargo at the deepwater port approximately 68 percent of the time each year (2,950 MMcf per carrier x 42 carriers per year (from Trinidada) / 500 MMcf per day / 365 days per year).

The selection of LNG supply and unloading terminals is a decision that would be made by the EPEBV's chartering party. The Applicant anticipates that for the foreseeable future the chartering party for the EPEBVs would dedicate the EPEBVs to unload their cargo primarily at the proposed Port. If the chartering party chooses to use one EPEBV to move LNG from Trinidad to the proposed deepwater port and the second EPEBV to move LNG from Algeria to the proposed deepwater port, EPEBVs would be unloading at the proposed deepwater port approximately 50 percent of the time each year (average of 67 percent if LNG is imported from Trinidad or 39 percent = 53 percent if gas is imported from Algeria). A fully loaded vessel would be able to discharge its cargo in approximately six days.

The EPEBV is designed for safe and efficient operation, with maximum operational performance and minimal downtime risks. El Paso Energy Bridge GOM's first EPEBV would be the 17th LNG vessel to be delivered by the manufacturer, Daewoo, and it would be the first regasification vessel. The EPEBV would be fully approved and certified by Bureau Veritas (BV) Classification Society. In addition, upon successful completion of a foreign flag tank vessel examination the EPEBV would be issued an USCG Certificate of Compliance for a foreign flag vessel entering U.S. waters. The vessel owner and operator has accepted full operational responsibility for EPEBV operations and is developing dedicated EPEBV operational procedures, maintenance plans, and crew training programs.

The STL buoy system designed by Advanced Production and Loading AS (APL), fully integrated into the EPEBV design, has proven safe and efficient in the harsh North Sea environment. Eighteen similar APL installations have occurred worldwide, with over 1,000 oil tanker shuttle loadings in the North Sea. The discharge of high pressure (HP) gas (100 bar) through the APL STL buoy is a new application for the STL buoy, but this application is similar to HP gas (300 bar) re-injection at the North Sea through an STL buoy permanently attached to a floating production, storage, and offloading platform.

The STL buoy and mooring system can operate effectively in water depths of approximately 40 m to greater than 150 m. At North Sea locations, connections have taken place at a buoy during 5.5 m (18.0 ft) sea states, and loading can be accomplished with sea states at 13 m (42.7 ft). For the EPEBVs, El Paso Energy Bridge GOM has established a 5.0 m (16.4 ft) sea state maximum connection and 12.0 m (39.4 ft) sea state maximum discharge (unloading) design criteria. Based on GOM weather data, an EPEBV would be able to connect to the buoy more than 98 percent of the year.

The LNG containment system in the EPEBV would be able to withstand any potential degree of "sloshing" during transportation and unloading as a result of partially loaded tanks. The tanks have been designed to withstand 100-year storms in the GOM and North Atlantic voyage "sloshing" conditions. The integrity of the reinforced insulation boxes, structural reinforcement of the cargo inner hull, and strengthened cargo pump towers have been verified by laboratory testing, and they have been approved by BV and Gas Transport and Technigaz for unrestricted liquid levels when offshore. For maximum ship maneuvering capability, each EPEBV is equipped with two bow thrusters, at 1500 kilowatts (kW) each, and one 2000 kW stern thruster. In addition, each EPEBV is equipped with a maneuvering assistance and positioning system that provides automatic heading and direction of the thrusters and main propulsion; this system controls the EPEBV's position within 10 m (32.8 ft) during buoy retrieval operations.

2.3.3.2 Docking, Regasification, and Unloading

El Paso Energy Bridge GOM used successful North Sea procedures as a baseline for the proposed navigational approach and connection to the STL buoy. Operations of the deepwater port would follow procedures detailed in an Operations Manual prepared by El Paso Energy Bridge GOM and approved by the USCG and other applicable regulatory agencies prior to operation of the deepwater port. The Operations Manual would serve two important purposes. First, the document would serve as a tool to facilitate regulatory review and permitting. Second, the document would serve as a guide and reference tool for Port operations and maintenance personnel.

El Paso Energy Bridge GOM has proposed demarcation of five zones around the proposed STL buoy to support safe and efficient port operations. As described in Section 4.7, three of the proposed

zones may correspond to recognized navigation zones as designated on NOAA nautical charts. These three zones include:

- *Safety Zone.* This zone would extend 500 m (1,640 ft) outward from the mooring buoy and could be designated under USCG regulations for deepwater port Safety Zones. No traffic unrelated to Port operations would be authorized within this area.
- *Precautionary Area.* The Applicant has described this zone as extending 500 m (1,640 ft) beyond the Safety Zone (extending 1.0 km [3,281 ft] outward from the mooring buoy). An area demarcating the STL buoy-mooring array could be designated on nautical charts as a "Precautionary Area."
- *Recommended Route.* The Applicant has described one potential route that could be used by EPEBVs approaching and departing the Port via the Sabine Pass Fairway.

After review and approval, the USCG would initiate the International Maritime Organization's (IMO) process for formal demarcation on nautical charts as described in Section 4.7. The Safety Zone and proposed Precautionary Area are shown on Figure 2-9. The Applicant's proposed recommended route is presented in Figure 4-1.

El Paso Energy Bridge GOM has also proposed a 3.0 km Navigation Area and a 10.0 km Watch Area. These areas would provide recommended navigation and watch procedures for use by the EPEBV's. These proposed areas could be adopted in the Operations Manual for purposes important to the internal operations of the Port. However, because there is no foreseeable mechanism to demarcate, define, or enforce these areas for unrelated vessels, they are not included in the scope of this EA.

As discussed earlier, El Paso Energy Bridge GOM is proposing to operate the EPEBVs onboard regasification process as an open loop system exclusively. The open loop system would draw seawater from the surrounding area at approximately 7 m (23.0 ft) below the water surface. Intake structures on the EPEBVs are sized to provide seawater for both standard ship operations and the warming water for the LNG vaporizers. To supply natural gas at a rate of 500 MMcf/d, the EPEBV would require a total intake flow of 12,000 cubic meters per hour (m^3/hr). Using a single sea chest inlet, the combined cooling water and warming water intake velocities would be approximately 1.2 meters per second (m/s) (3.9 ft/s). The Applicant has proposed to connect two of the EPEBV's four sea chests internally to increase the intake area and reduce average intake velocity (see Section 4.0). Using this scenario, the intake velocity at the two sea chests would be approximately 0.3 m/s (1.0 ft/s) The sea chest intakes incorporate metal slotted grating on 21 millimeters (mm) spacings to reduce the potential to entrain flora, fauna, or foreign objects. This mesh size would not prevent the entrainment of eggs and larvae of marine fish species.

All of the seawater entering the sea chest intakes either for ship operations or for the regasification process will pass through a copper cathode antifouling system. Supplementary information provided by the Applicant to the USCG indicates that the EPEBV's antifouling system will not include aluminum anodes as described in the Environmental Report (El Paso 2003b). The copper anodes release a small amount of copper into the ships seawater system at the intake to prevent biota in the seawater from establishing within the seawater flow path. This is necessary not only for the safe operation of the ship but also to prevent the potential transport and discharge of non-native species. This antifouling system and the copper concentrations associated with it are typical of most ships operating around the world.

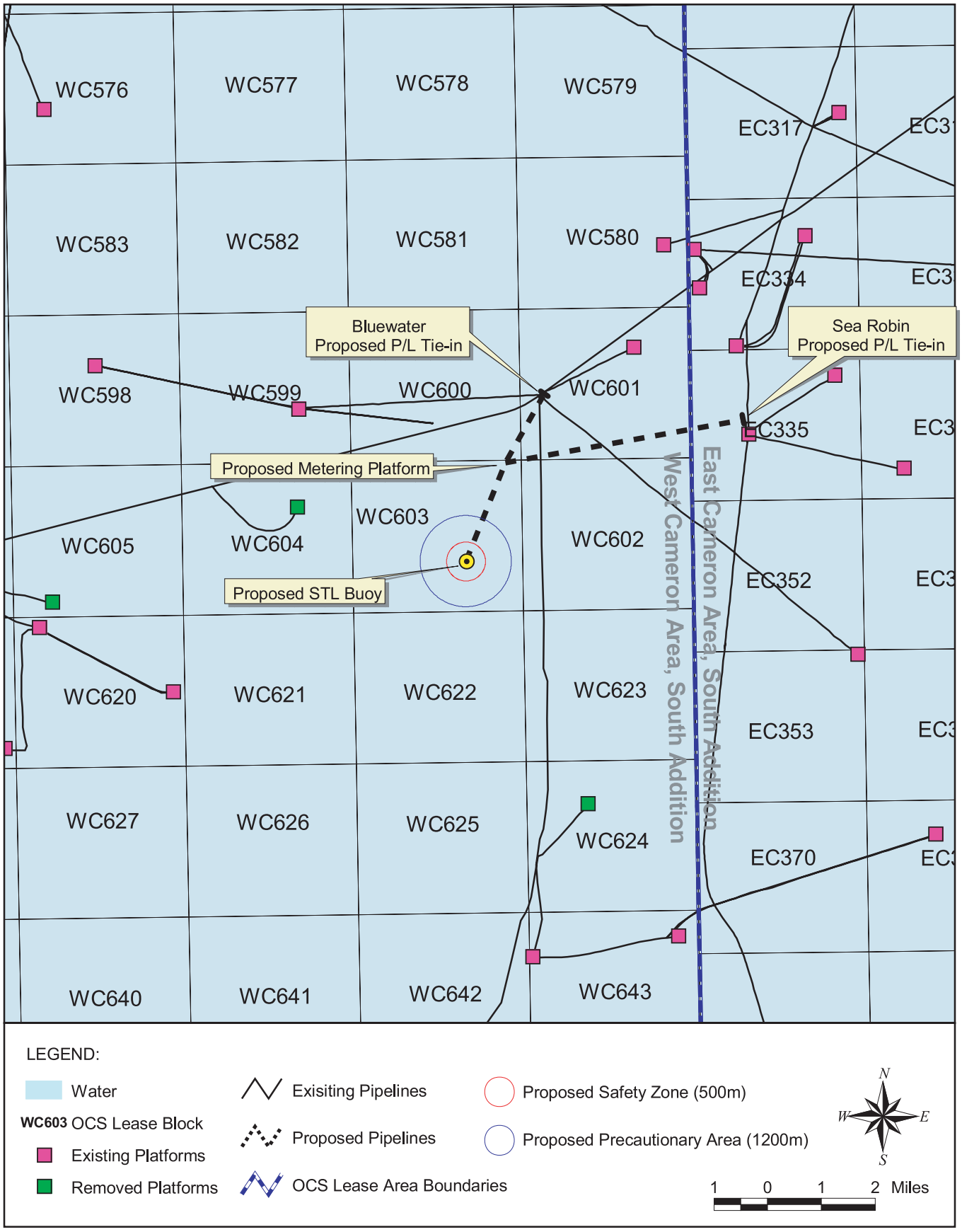


Figure 2-9. Proposed Energy Bridge GOM Port and Vicinity

The intake velocities and mesh sizes employed by EPEBVs are the standard design practice for all LNG vessels. The Applicant has indicated that the seawater intake velocity for ship operations of the EPEBVs is typical of similar sized ships at sea (ENSR 2002).

Any reduction in the intake velocity and/or mesh size of the sea chest intakes would require a proportional increase in the area of the intakes to the sea chests. There are practical limits to the size of these openings due to structural integrity (size of opening cut in side shell), interference with tanks and equipment adjacent to the sea chests, and increased ship resistance due to the increased area of hull openings. The sea chests on the EPEBVs are already enlarged over a standard LNG vessel to maintain the normal shipboard intake velocity with the added regasification flows.

The EPEBV would discharge the water through the EPEBV keel at a maximum rate of approximately 55,000 gallons per minute (gpm) through two discharge pipes (maximum 27,500 gpm each) at approximately 11.5 m (37.7 ft) below the water surface. Temperature of the discharge water would be approximately 7.5 °C (13.5 °F) less than the temperature of the intake water.

Approximately 30 personnel would operate aboard the EPEBV as it transports LNG and moors to the proposed deepwater port. All shipboard officers would be licensed by the flag state of the EPEBV and all officers and crew would be trained specifically in EPEBV operations. Once moored, approximately three Facility Operator personnel would board the vessel to assist with cargo transfer. The transfer operation would involve shore-based assistance from personnel employed by the Facility Operator. The Facility Operator also would control operations of the natural gas from the PLEM to the interconnections with Bluewater and Sea Robin, including valves and taps at the metering stations and interconnections. As part of their existing daily schedule shore-based maintenance and supply vessels currently supporting El Paso's OCS facilities would be redirected as necessary to transport personnel to attend to specific needs of the deepwater port facilities.

The Operations Manual would incorporate safety features to prevent fires, spills of LNG, releases of natural gas, and other potential accidents. A comprehensive manually and/or automatically activated Emergency Shut Down (ESD) system and automatically activated Automatic Shut Down system (ASD) would deactivate LNG regasification and natural gas transfer in the event of any malfunction. If an ASD or ESD occurs, the Vessel Operator would inform the Facility Operator's onboard Person-In-Charge (PIC), who would confirm the shut down to other Facility Operators and the Shore Operator. Following the initiation of the ASD or ESD systems, the Vessel Operator would be required to demonstrate to the PIC that the cause of the shut down had been rectified and would be required to receive permission from the PIC to resume gas delivery operations.

The ESD system would also be initiated manually by operating personnel from several ESD stations around the EPEBV, when necessary. The design includes three ESD valves, one each located on the EPEBV, in the STL buoy, and in the PLEM. The Vessel Operator would control the valves connecting the EPEBV and natural gas pipeline system. Detection equipment aboard the EPEBV would include state-of-the-art gas, fire, and smoke detection systems for continuous monitoring of the atmosphere of the EPEBV for the presence of gas, fire, and/or smoke. Prior to mooring, the Vessel Operator would ensure these systems are working properly and are not detecting potentially harmful environments. The Vessel Operator would ensure a "gas-free condition" exists in the STL compartment and onboard gas transfer piping beyond the last ESD valve in the EPEBV system.

The Vessel Operator would commence regasification and discharge into the gas riser and subsea pipeline in accordance with detailed operational procedures, including the gradual buildup of pressure and gas discharge rates. The Vessel Operator and Facility Operator would continually

monitor weather conditions and forecasts to ensure unloading and transfer operations occur within the safe operating parameters of the system. Should existing conditions or forecasts exceed normal operating parameters, the Vessel Operator would follow its "Heavy Weather" plan, which includes the following basic provisions:

- Monitor any weather disturbances within a 500-mile radius of the STL buoy.
- Any named tropical storm, or a weather disturbance of greater intensity than a named tropical storm, within a 500-mile radius of the STL buoy site would place the EPEBV in a "six hour to departure" mode.
- Any named tropical storm, or a weather disturbance of greater intensity than a named tropical storm, that approaches within a 300-mile radius of the STL buoy site, or as the speed of advance of the storm center approaches to within 12 hours of the STL buoy site, shall initiate a "Secure Gas Transfer Operations."
- Any named tropical storm, or a weather disturbance of greater intensity than a named tropical storm, that approaches with a 200-mile radius of the STL buoy site, or as the speed of advance of the storm center approaches to within eight hours of the STL buoy site, shall initiate a "Departure from Buoy."

To compensate for changing weather and varying sea conditions after connection to the STL buoy, the STL would rotate on an internal swivel. This would allow the EPEBV to "weathervane," or adjust position with changing wind and/or current directions. The STL buoy would serve as the EPEBV mooring system; no propulsion or maneuvering power would be used after connection to the buoy.

The Vessel Operator would complete gas transfer operations in accordance with detailed operational procedures noted above.

When not in use, the buoy would drop to a depth of approximately 80 ft (24.4 m) below the surface of the water and maintain that position until retrieved by an EPEBV calling at the Port. The area above the buoy would be marked with a sea surface buoy with flashing lights to prevent fishing vessels or other vessels from entering the Port's Safety Zone

2.3.3.3 Monitoring/Leak Detection

The EPEBV cargo tanks are designed with "double containment" cryogenic liquid barriers, that include a complete inner tank within a complete outer tank designed to withstand the LNG temperatures. Their design adheres to standards established in the IMO's International Code for Construction and Equipment of Ships Carrying Liquified Gasses in Bulk (IGC). The cargo containment system used on EPEBVs is the Gas Transport and Technigaz No. 96 system, which has been proven in LNG vessel operation for over thirty years. The inter-barrier space is continually purged with nitrogen and the outlet flow monitored by gas detectors. In the unlikely event of a primary containment system leak, the leak would be detected immediately and appropriate corrective measures would be initiated. Any pressure increases would be vented through one of the vent stacks on the upper trunk deck of the EPEBV. The secondary barrier of the double containment system would prevent any LNG leakage. Once the onloading operation is complete, nitrogen would be injected into the interior barrier space until it is purged of natural gas. The cargo tank would be purged with inert gas slowly warmed to ambient temperature. The inert gas then would be purged using fresh air, making it safe for entry by personnel who would address the correction of the leak.

In addition to the double containment cargo tanks, the ship would have two carbon steel inner and outer hulls. This design provides four liquid-tight barriers between the LNG and a failure scenarios involving mechanical penetration of the tank initiated externally. In such cases, all four barriers would have to be breeched before LNG could be released from the tank. If one were to assume a failure scenario initiated by a catastrophic failure of the inner barriers, this could allow LNG to come in contact with the hull material which is not designed for cryogenic temperatures and would be expected to fail. However, the most common failure scenario for the inner barriers tends to be the development of porosity or cracks which tends to cause a gradual increase over time in the amount of gas leaking into the space between the two inner barriers. This space is purged with inert gas and monitored for gas leakage.

EPEBV tankage for fuel oil and diesel oil complies with all international regulations to prevent accidental spillage of any fuel oil or diesel oil. All oil tankage on the EPEBV is protected by the vessel's double hull and the vents from all oil tanks are fitted with spill containments to prevent the discharge of oil during venting or sloshing of fluid in the tank.

2.3.3.4 Pigging

Because the dew point of natural gas is extremely low, it is unlikely that hydrocarbon liquids would condense in any of the proposed deepwater port pipelines.

Following some types of maintenance, it would be necessary to run cleaning, de-watering, or possibly caliper or other types of inspection pigs. The pipeline installation contractor would be able to install a temporary pig launcher for this purpose. Pigging would be performed subsea from a pig launcher to be mounted onto the PLEM. During any pipeline repairs, water would be displaced from the line by blow-down with nitrogen.

The Applicant does not anticipate a need for pigging during normal Port operations and does not intend to install a pig launcher at the PLEM. The PLEM would be constructed with a full opening valve on its end to enable installation of a pig launcher at a later date, if necessary.

2.3.3.5 Waste Disposal and Discharge

Operation of the EPEBV while at the proposed deepwater port would result in galley waste and hotel services waste. In compliance with the 1978 Protocol of the 1973 International Convention for the Prevention of Pollution from Ships (MARPOL), none of these wastes would be discharged into the GOM. Galley waste would be ground to particles and flushed overboard when the vessel leaves the GOM into the open ocean. Hotel services waste and machinery space sludge and residues would be incinerated aboard the EPEBV. Sewage would be retained aboard the EPEBV in a specialized sewage tank and treated in accordance with MARPOL regulations. Other refuse generated from the construction or operation of the proposed deepwater port would be stored, transported, and disposed of in accordance with applicable Federal, state, and local regulations.

2.3.4 Decommissioning

The El Paso Energy Bridge has been designed for a 20-year lifetime under design conditions and barring unforeseen circumstances, the Applicant's intention is to operate the port for at least that period of time. If circumstances warrant continued Port operation beyond 20 years, certain components may require additional maintenance and repair. At the time of removal of the deepwater port, decommissioning procedures would be subject to the approval of the Maritime Administrator in

consultation with MMS. All decommissioning activities will be conducted in compliance with all applicable and appropriate regulations, guidelines, and technologies in place at that time.

It is speculated that decommissioning would include removal of the deck, jacket, and piles associated with the metering platform and transport of these items by derrick and/or material barges to an onshore site for disposal or salvage. The piles would be cut off and removed to a point at least 15 feet below the mud line or as otherwise specified by regulations in effect at the time of removal. There would be no need for the use of explosives during decommissioning. The means selected for cutting of piles would be in accordance with applicable regulations and appropriate technology available at the time of abandonment.

The STL buoy, chains, cables, control umbilical, flexible riser, and the PLEM would be removed. The anchors for the cables would be left in place.

The pipelines would be abandoned in place in accordance with all applicable and appropriate regulations and guidelines. The pipelines would be disconnected from all gas sources and purged of gas and flushed. The pipelines would subsequently be filled with inhibited seawater, the ends cut and caped. The ends of the pipelines will then be buried to prevent snagging. The downstream pipelines' tie-in piping would be disconnected from the pipeline/gas source, and the open pipe ends would be sealed.

It is anticipated that decommissioning would occur over a period of approximately two weeks. During such period, there would be increased vessel traffic to support cutting of the metering platform legs, and capping, separations, and removal of equipment. The Project does not require decommissioning of any other facilities prior to construction and operation.

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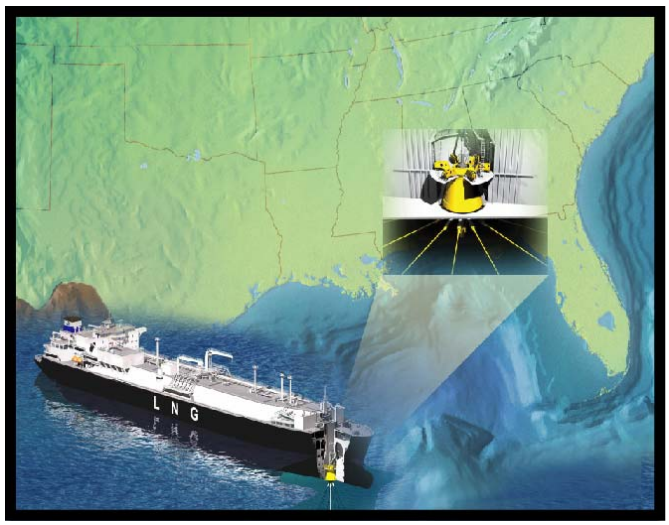
Section 3
Affected Environment



3. Affected Environment

3.1 Water Quality

3.1.1 Definition of the Resource

Water quality is defined as the ability of a waterbody to maintain the ecosystems it supports or influences. In the case of coastal and marine environments, water quality is influenced by river drainage (including sediments), and wet (e.g., precipitation) and dry (e.g., dust) atmospheric deposition. The natural aquatic processes of mixing and circulation can either improve the water quality through flushing or contribute to the decline in water quality. Besides these natural inputs, human activities affect water quality through discharges, run off, burning, dumping, air emissions, and oil or chemical spills.

The GOM, a semi-enclosed oceanic system with ocean-derived currents, connects to the Caribbean Sea and the Atlantic Ocean via the Yucatan Channel and the Florida Straits, respectively. The dominant circulation feature in the GOM is the Loop Current (MMS 2001a).

The chemical (salinity, temperature, oxygen, nutrients, primary production) and physical nature of the GOM is influenced primarily by its configuration and water circulation, and the large volume of freshwater runoff received from the Mississippi River and other large rivers. Fresh water from roughly two-thirds of the U.S. and more than one-half of Mexico enters the GOM via the Mississippi River and other major rivers (MMS 2001b). This large amount of nonoceanic runoff mixes into the nearshore surface waters of the GOM, providing water chemistry quite different from the offshore areas of the GOM (MMS 2001b). The Loop Current is one of the primary causes for the variable chemical characteristics of the GOM.

The region under consideration is divided into coastal and marine waters that may be affected by construction and operation of the proposed El Paso Energy Bridge GOM deepwater Port. Coastal waters include the bays and estuaries along the south-central Louisiana shore. Marine waters as defined in this document include both nearshore waters (shoreline seaward to 3 NM) and offshore waters (from 3 NM seaward to the limits of the EEZ located approximately 200 NM from the coastline).

3.1.2 Marine Waters

The proposed El Paso Energy Bridge GOM facility would be on the continental shelf approximately 100 mi due south of the south-central Louisiana shoreline entirely within the offshore marine waters of the GOM. While the various parameters used to evaluate water quality vary in marine waters, one parameter—pH—does not. The buffering capacity of the marine environment is controlled by carbonate and bicarbonate, which maintain a pH of 8.2 (MMS 2002a). Factors such as currents and severe weather events also affect water quality, but in a manner often more difficult to measure. The following description details the physical environment of the marine waters in the vicinity of the El Paso GOM facility.

3.1.2.1 Water Depths

Water depths in the vicinity of the proposed Port vary from 262 ft (79.9 m) in Block WC 600 to 307 ft (93.6 m) at the southern edge of Block WC 603. The water depths at the STL and the metering platform, both located in Block WC 603, are 298 ft (90.8 m) and 282.3 ft (86.0 m), respectively. Water depth at the Bluewater subsea tie-in in Block WC 601, is 271.5 ft (82.8 m). Water depth at the Sea Robin subsea tie-in in Block EC 335 is 275.2 ft (83.9 m) (Thales Geosolutions, Inc. 2002).

The continental shelf is the seaward extension of the continent. A gentle incline or gradient (<1:1,000), low relief (65 ft or <20 m), widths of about 62 mi (100 km), and water depths of 427 ft (130 m) on average, worldwide, distinguish a continental shelf (Kennett 1982; Eisma 1988). The width of the continental shelf in the GOM is highly variable, ranging from less than 12 mi (20 km) to more than 124 mi (200 km). The depth at which the shelf break (the change in gradient that marks the transition between the continental shelf and continental slope provinces) occurs in the GOM from 33 to 656 ft (10 to 200 m) of water depth (Roberts et al. 1999). In the area of interest, the shelf break occurs at approximately 394 ft (120 m).

3.1.2.2 Water Temperature

The average near surface(above 15 m) seawater temperature in the project vicinity is approximately 29 ºC (84 °F) and would not be expected to fall below 16 ºC (60 °F) at any time of the year (NDBC 2003).

Thermal stratification with depth varies seasonally. The water column typically is stratified in three layers, a top layer of relatively uniform temperature (referred to as “the mixed layer”), a thin “thermocline” layer in which temperature drops dramatically over a small change in depth, and a bottom layer in which temperature is generally uniform, dropping only slightly with depth.

During the winter months, there is little difference between surface temperatures and waters at depth. Based on mixed layer depth contour maps for the Texas-Louisiana shelf area (provided in Phillips and James, 1998), the depth of mixed layer in the project area can be expected to range between 35 to 45 meters, often extending beyond the mid-depth of the 87 meter deep water column. The strength of the thermocline during the winter months is low, typically approximately 2ºC. The strength indicates that the difference between mixed-layer temperature and the temperature in the bottom half of the water column is minimal during the winter months and the water column can essentially be considered fully mixed and non-stratified.

During the summer months, the temperature of the surface layer increases significantly and, as a result, the depth of the mixed-layer reduces. In the project area, the depth of the mixed layer during the summer months typically ranges from 15 to 25 meters. Beneath this mixed layer is a shallow thermocline layer (1 to 2 meters thick) over which water temperature/density changes dramatically, by as much as 6ºC. Below the thermocline a cool water layer extends to the seafloor, with only a minor decrease in temperature with depth. During the spring and fall seasons, the water column transitions between the highly stratified summer condition and the near fully mixed winter condition.

3.1.2.3 Waves and Circulation

The Loop Current dominates circulation within the GOM. It enters the Gulf through the Yucatan Channel, turning clockwise, and then exits into the Straits of Florida (see Figure 3-1) (MMS 2001b). The location of the highly variable Loop Current fluctuates. It might be confined to the southeastern

GOM or extend well into the northeastern or north-central GOM, with intrusions of Loop Current water even to the shelf edge along Louisiana and the Florida panhandle (MMS 2001b). The volumetric flux of the Loop Current has been estimated at 98.4 million ft^3/sec (30 million m^3/sec). This volume of water flow is enough to replace the entire the GOM in about 10 days (MMS 1996a).

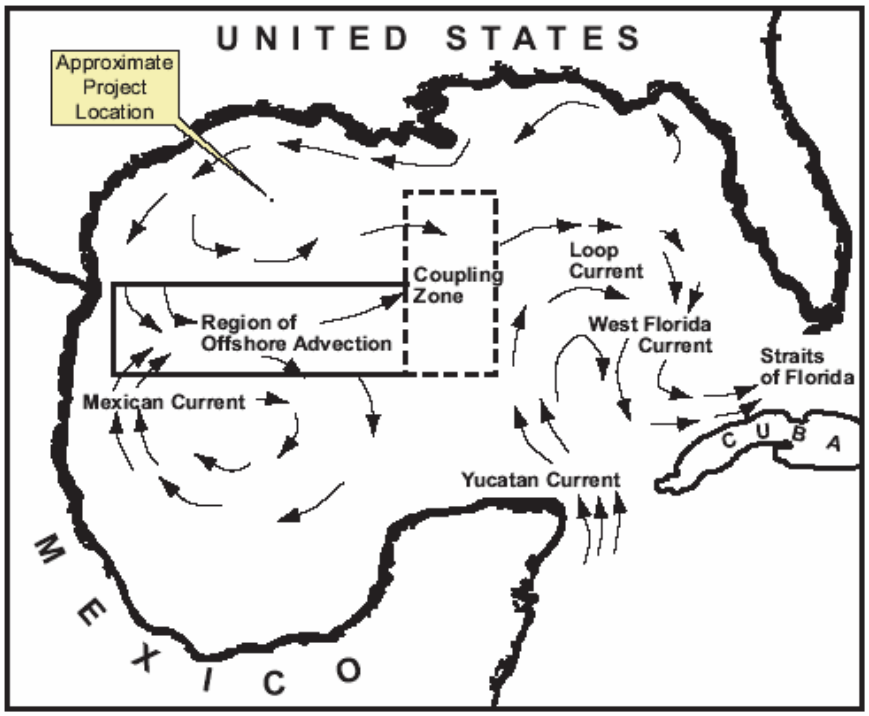


Figure 3-1. Loop Current

Loop Current Eddies are responsible for the variability of the Loop Current. Anticyclonic Loop Current Eddies are closed rings of clockwise rotating water that separate from the Loop Current. Major Loop Current Eddies have diameters greater then 250 km (134.9 NM) (MMS 2001b). Currents associated with the Loop Current and Loop Current Eddies reach depths of 1 km (3,281 ft), and perhaps approach depths of 2 km (6,561.7 ft) within the sill depth of the Yucatan Channel (MMS 2001b). Currents associated with the Loop Current and Eddies might have surface speeds of 150 to 200 cm/s (2.9 to 3.9 knots), and current speeds of 10 cm/s (0.2 knots) are not uncommon at depths of 1,640 ft (500 m) (MMS 2001b). The principal mechanisms coupling the circulation patterns of the eastern and western parts of the Gulf Basin are the Loop Current Eddies created from the Loop Current (MMS 1996a).

Two additional circulation features exist within the GOM in addition to the Loop Current and its associated eddies. One feature is an anticyclonic circulation feature oriented about ENE-WSW with its western extent near 24° N latitude off Mexico. The other feature is a cyclonic gyre centered in the Bay of Campeche near 20.8° N latitude, 94.5° W longitude. Both features are thought to be wind driven (MMS 2001b). Currents on the outer shelf and slope are a result of a balance between the influence of open Gulf circulation features, such as the Loop Current and Loop Current Eddies, and the shelf circulation, which is dominated by long-term wind forcing (MMS 1996a).

Severe wind conditions occur in the continental shelf region of the proposed deepwater Port, including gales, squalls, and hurricanes. The most severe wind conditions occur during winter storms and hurricanes. Such wind events can result in extreme waves and currents with a velocity of

3.2 to 4.9 ft/s (100 to 150 cm/s) over the continental shelf. Cold fronts and the subsequent wave conditions affect nearsurface water temperatures, although water at depths greater than about 328 ft (100 m) remains unaffected by surface boundary heat flux. Table 3-1 identifies mean and maximum current velocities in the vicinity of the proposed deepwater Port.

Table 3-1. Mean and Maximum Current Velocities in the Vicinity of the Proposed El Paso Energy Bridge GOM Facility from 1992 Through 1995

Location/Depth Below Surface	Summer (July and August)		Non summer (September through June)	
	Mean Velocity (ft/s)	Maximum Velocity (ft/s)	Mean Velocity (ft/s)	Maximum Velocity (ft/s)
LATEX Site 21, 28.837° N, 94.08° W (Approx. 80 mi NW of Proposed Project Location)				
46 ft	0.17	1.10	0.23	1.33
72 ft	0.14	0.95	0.12	0.97
LATEX Site 18, 28.963° N, 91.983° W (Approx. 90 mi NW of Proposed Project Location)				
26 ft	0.35	1.57	0.19	1.67
62 ft	0.07	0.75	0.06	1.13
LATEX Site 16, 28.867° N, 90.491° W (Approx. 165 mi NW of Proposed Project Location)				
33 ft	0.09	0.94	5	0.16
46 ft	0.05	0.40	2.3	0.95

Source: Nowlin et al. 1998

3.1.3 Coastal Waters

As discussed earlier in this section, the proposed El Paso Energy Bridge GOM facility would be approximately 100 mi offshore (south) of the Louisiana Coast and would not be in or near coastal waters. Support operations for the proposed deepwater Port would deploy from existing shore-based facilities at Sabine Pass, Texas, and from other manned platforms offshore, such as El Paso Field Services' High Island (HI) Block 264 platform facility. All of the required support activities would be conducted as an additional mission to existing offshore activities. No new infrastructure, support vessels, or helicopters are proposed for the Port.

The proposed fabrication and construction staging areas have not been determined. Construction contracts would be awarded to existing fabrication sites with the capabilities to manage the required activities without modification to the existing business, permit conditions or infrastructure.

Proposed onshore fabrication and support operations would include activities that would be adjacent to or traverse coastal and intracoastal waters. Estuaries represent a transition zone between the fresh water of rivers and the higher salinity waters offshore. These bodies of water are influenced by freshwater and sediment influx from rivers and the tidal actions of the oceans. The primary variables that influence coastal water quality are water temperature, total dissolved solids (salinity), suspended solids (turbidity), and nutrients. An estuary's salinity and temperature structure are determined by hydrodynamic mechanisms including tides, nearshore circulation, freshwater discharge from rivers, and local precipitation.

Estuarine ecosystems are affected by humans, primarily via upstream withdrawals of water for agricultural, industrial, and domestic purposes; contamination by industrial and sewage discharges and agricultural runoff carrying pesticides and herbicides; and habitat alterations (e.g., construction and dredge-and-fill operations). Drainage from more than 40 percent of the contiguous U.S. enters the GOM, primarily from the Mississippi River. Texas, Louisiana, and Alabama ranked first, second, and fourth in the Nation in 1995 in terms of discharging the greatest amount of toxic chemicals (USEPA 1999). The GOM region ranks highest of all coastal regions in the U.S. in the number of wastewater treatment plants (1,300), number of industrial point sources (2,000), percent of land use devoted to agriculture (31 percent), and application of fertilizer to agricultural lands (62,000 tons of phosphorus and 758,000 tons of nitrogen) (NOAA 1990).

3.2 Biological Resources

3.2.1 Definition of the Resource

Biological resources include those species and habitats within the coastal and offshore environments of the GOM. General descriptions of these resources include species, habitat distributions, and occurrences throughout the GOM. More detailed descriptions of these resources are provided for the region of influence (ROI). The ROI is described in Section 2.1.1 and includes the preferred location of the proposed Port: (EC 335, WC 600, WC 601, WC 602, and WC 603). The ROI is presented in Figure 2-1. The proposed Port would be located approximately 116 mi (187 km) offshore, with no population centers nearby. Water depth in the ROI ranges from approximately 262 to 307 ft (79.9 to 93.6 m). Additionally, support activities for the proposed Port would deploy from existing shore-based facilities at Sabine Pass, Texas, and from other manned platforms offshore. All of the required support activities would be conducted as an additional mission to existing offshore activities. No new infrastructure, support vessels or helicopters would be dedicated to the proposed Port for support activities.

Determining which habitats and species occur in an area affected by a proposed action may be accomplished through literature reviews and coordination with appropriate Federal and state regulatory agency representatives, resource managers, and other knowledgeable experts.

Protected and sensitive biological resources include protected and sensitive coastal habitats and environments, offshore resources, marine mammals, sea turtles, migratory birds, and other species listed as threatened or endangered by the USFWS and National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries). Fisheries resources include federally managed commercial and recreational fisheries resources, ichthyoplankton (i.e., fish eggs and larvae), as well as EFH. Biological resources are protected under several federal laws described below.

Under the Marine Mammal Protection Act (MMPA) of 1972 (16 U.S.C. 1361 et seq.), the Secretary of Commerce is responsible for the protection of all cetaceans (whales, porpoises, and dolphins) and pinnipeds (seals and sea lions) except walruses, and has delegated authority for implementing the MMPA to NOAA Fisheries. The Secretary of the Interior is responsible for walruses, polar bears, sea otters, manatees, and dugongs and has delegated the responsibility of conservation and protection of these marine mammals to USFWS. These responsibilities include providing overview and advice to regulatory agencies on all Federal actions that may affect these species.

The MMPA prohibits the "take" of marine mammals, with certain exceptions, in waters under U.S. jurisdiction and by U.S. citizens on the high seas. Under Section 3 of the MMPA, "take" of marine mammals is defined as "harass, hunt, capture, or kill or attempt to harass, hunt, capture, or kill any marine mammal" and "harassment" is defined as any act of pursuit, torment, or annoyance that has the potential to injure marine mammal stock in the wild; or has the potential to disturb a marine mammal or marine mammal stock in the wild by disrupting behavioral patterns, including migration, breathing, nursing, breeding, feeding, or sheltering. In cases where U.S. citizens are engaged in activities, other than fishing, that result in "unavoidable," incidental take of marine mammals, the Secretary of Commerce can issue a "small take authorization." The authorization can be issued after notice and opportunity for public comment if the Secretary of commerce finds negligible impacts. The MMPA requires consultations with NOAA Fisheries if impacts to marine mammals are unavoidable. Informal consultation with the both NOAA Fisheries was initiated by the USCG and MARAD on June 26, 2003. However, the Applicant, El Paso Energy Bridge GOM, L.L.C., would have the responsibility under the MMPA to acquire a small take authorization, if deemed necessary. Sections 2.0, 3.2.4, and 4.2.3 of this EA serve as the Biological Assessment (BA) for the Proposed Action, and present information relevant to the resources afforded protection under the MMPA.

The Endangered Species Act (ESA) of 1973 (16 U.S.C. 1531-1534) establishes protection and conservation of threatened and endangered species and the ecosystems upon which they depend. The ESA is administered by USFWS and NOAA Fisheries. Under the ESA, an "endangered species" is defined as any species in danger of extinction throughout all or a significant portion of its range. A "threatened species" is defined as any species likely to become an endangered species in the foreseeable future. Section 7 of ESA requires that all Federal agencies consult with USFWS or NOAA Fisheries, as applicable, before initiating any action that could affect a listed species. Section 7 of the ESA states that any project authorized, funded, or conducted by any Federal agency should not "… jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined … to be critical." Informal consultation with the both NOAA Fisheries and USFWS was initiated by the USCG and MARAD on June 26, 2003. USCG and MARAD have the responsibility under the ESA to determine whether or not the Proposed Action would adversely affect federally listed threatened and endangered species and their critical habitat. USCG and MARAD, or an applicant if designated as a non-Federal representative, are required to consult with the USFWS and the National Marine Fisheries Service (NMFS) (currently recognized as National Oceanic and Atmospheric Administration [NOAA] Fisheries) to determine whether any federally listed or proposed endangered or threatened species or their designated critical habitats occur near the proposed project.

If, upon review of existing data or data provided by the applicant, USCG and MARAD determine that these species or habitats may be affected by the proposed deepwater port, USCG and MARAD must prepare a BA to identify the nature and extent of adverse impacts, and recommend measures that would avoid the habitat or species or reduce potential impact to acceptable levels The BA would be used in the interagency consultation as a basis for determining whether the adverse affects are likely to result in jeopardy to any listed species or adversely affect their habitats. After consultation, USFWS and/or NOAA Fisheries would issue a Biological Opinion expressing their opinion about the potential for jeopardy. If their opinion is that the project is not likely to jeopardize any listed species or habitats, they may also issue an incidental take statement as an exception to the prohibitions in Section 9 of the ESA. If, however, USCG and MARAD determine that no federally listed or proposed endangered species or their designated critical habitat would be affected by the deepwater port, no further action is necessary under the ESA. Sections 2.0, 3.2.4, and 4.2.3 of this EA serve as the BA for the Proposed Action. Correspondence with USFWS and NOAA Fisheries with respect to the ESA is presented in Appendix C.

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 U.S.C. 1802) calls for direct action to stop or reverse the continued loss of fish habitats. Toward this end, Congress mandated the identification of habitats essential to managed species and measures to conserve and enhance this habitat. Under the MSA, Congress directs the NOAA Fisheries and the eight regional Fishery Management Councils, under the authority of the Secretary of Commerce, to describe and identify EFH in each fishery management plan, minimize to the extent practicable the adverse effects of fishing on EFH, and identify other actions to encourage the conservation and enhancement of EFH. The MSA requires cooperation among NOAA Fisheries, the Councils, fishing participants, and Federal and state agencies to protect, conserve, and enhance EFH. The statute includes a mandate that Federal agencies must consult with the Secretary of Commerce on all activities, or proposed activities, authorized, funded, or undertaken by the agency, that may adversely affect EFH. NOAA Fisheries recommends consolidated EFH consultations with interagency coordination procedures required by other statutes such as NEPA or the ESA (50 CFR 600.920(e)(1)) to reduce duplication and improve efficiency. The mandatory contents of an EFH Assessment are detailed in 50 CFR 600.920(e)(3). As part of the consultation process, Sections 2.0, 3.2.5, 4.2.4, and 5.1.2 of this EA serve as an EFH Assessment for the Proposed Action (also see Appendix D). Correspondence with NOAA Fisheries regarding to the EFH is presented in Appendix D.

The Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. 703-712) affirms, or implements, the U.S. commitment to four international conventions (with Canada, Japan, Mexico, and Russia) for the protection of a shared migratory bird resource. The MBTA protects species or families of birds that live, reproduce, or migrate within or across international borders at some point in their life cycle.

3.2.2 Protected and Sensitive Coastal Habitats and Environments

As proposed the Port would be placed approximately 116 mi (187 km) offshore. Support activities for the proposed Port would deploy from existing shore-based facilities at Sabine Pass, Texas, and from other manned platforms offshore. All of the required support activities would be conducted as an additional mission to existing offshore support activities and would not increase the number of vessels or the number of vessel trips from onshore to the OCS area. Two EPEBVs would be dedicated to the proposed Port. These two EPEBVs would visit the proposed facility a total maximum of 42 times per year. Each time a EPEBV unloads at the facility, regularly scheduled crew or supply boats would transport personnel from existing onshore or OCS facilities to assist in the unloading (i.e., 42 times per year). This support function would be accomplished exclusively through the redirection of the daily vessel trips that currently support El Paso's existing offshore facilities.

The potential for accidents resulting from proposed operations related to vessel traffic, while minimal, may have ramifications for nearshore coastal waters throughout the GOM. Thus, there is a need to characterize the coastal environments of the GOM. The following description of protected and sensitive coastal habitats of the central GOM has been developed with these considerations in mind.

3.2.2.1 Protected Habitats

Marine Managed Areas (MMA) is a term used by NOAA to refer to a number of biologically and sensitive marine habitats that are managed by Federal, state, or local agencies. MMAs in the GOM include National Marine Sanctuaries (NMS), Federal Fishery Management Zones (FFMZ), National Wildlife Refuges (NWR), and National Estuarine Research Reserves (NERR). All MMAs are offered varying degrees of protection from agencies such as NOAA Ocean Services, NOAA Fisheries, the DOI, USFWS, the National Park Service (NPS), and the USCG, as well as state

agencies. There are no MMAs in the ROI. As such, USCG and MARAD have eliminated MMAs from further consideration.

Coral reefs are offered additional protection under Executive Order (EO) 13089, *Coral Reef Protection*. EO 13089 directs Federal agencies to determine whether their proposed actions could affect coral reefs; to use their programs and authorities to protect and enhance the conditions of such ecosystems; and, to the extent permitted by law, to ensure that any actions they authorize, fund, or carry out will not degrade the conditions of such ecosystems. There are no coral reefs in the ROI. As such, USCG and MARAD have eliminated coral reefs from further consideration.

Critical habitat is designated under the ESA as "a specific geographic area that is essential for the conservation of a threatened or endangered species and that may require special management or protection." Critical habitat can include an area that is not currently occupied by a species, but is needed for the recovery of that species. There are no critical habitats in the ROI. However, critical habitat has been designated for wintering piping plovers at various locations along the Louisiana Gulf Coast (66 FR 132 pp. 36037-36086). As previously stated, support activities for the proposed Port would deploy from existing shore-based facilities at Sabine Pass, Texas, and from other manned platforms offshore. All of the required support activities would be conducted as an additional mission to existing offshore activities. No new infrastructure, support vessels or helicopters would be dedicated to the proposed Port for support activities. While the onshore facilities may be located near an area designated critical habitat for wintering piping plovers (unit LA-1), support activities would be indistinguishable from current activities and are not expected to affect piping plover critical habitat or interfere with piping plover wintering activities. As a result, USCG and MARAD have eliminated the evaluation of protected or critical habitats from further evaluation.

The National Marine Sanctuary (NMS) Program was created by Title III of the Marine Protection, Research and Sanctuaries Act of 1972, which was renamed the National Marine Sanctuaries Act in 1992 (16 U.S.C. 1431 et seq.). Most NMSs prohibit drilling, dredging, discharging pollutants, and other activities considered to have an adverse effect on wildlife. There are no NMSs within the ROI. The NMS closest to the ROI is Flower Garden Banks which is 56 mi (90 km) southwest of WC 603. As a result, USCG and MARAD have eliminated NMSs from further evaluation.

3.2.2.2 Coastal Habitats

The CZMA calls for the "effective management, beneficial use, protection, and development" of the Nation's coastal zone and promotes active state involvement in achieving those goals. To reach those goals, the CZMA requires participating states to develop management programs that demonstrate how these states will meet their obligations and responsibilities in managing their coastal areas. In the Notice of Application, pursuant to the Deepwater Port Act, the USCG designated the State of Louisiana as an adjacent coastal state. In the State of Louisiana, the Department of Natural Resources (LDNR) is the agency responsible for administering its Coastal Zone Management Program (CZMP). Energy Bridge GOM must prepare a consistency certification finding that its proposed activities are fully consistent with the enforceable policies of Louisiana's coastal management program (Marks 2003).

Coastal habitats in the GOM include coastal barrier beaches, dunes, wetlands, and seagrass beds.

The length of the GOM shoreline is approximately 919 mi (1,500 km) long from the Mexican border to Florida (MMS 2002a). The coastline is characterized by coastal barrier landforms (i.e., barrier islands, major sand bars, sand spits), which are composed of sand and other unconsolidated course

sediments (MMS 2001b). The sediments have been transported to their present location by rivers, waves, currents, storm surges, and winds. Coastal landforms are transient in nature and are constantly being sculpted and modified by the same forces that led to their original deposition.

The GOM has the largest area of wetlands of any region in the U.S. (NOAA 1990). In the GOM wetland habitats include mangroves; fresh, brackish, and salt marshes; mudflats; forested wetlands of hardwoods; and cypress-tupelogum swamps (MMS 2001b). They may cover vast expanses of the coastline or may occupy only narrow bands along the shore. Wetlands provide unique habitats that are critical to both the adjacent terrestrial and continental shelf ecosystems. A vast number of invertebrate, fish, reptile, bird, and mammal species inhabit wetland areas. Over three-quarters GOM commercial fishery harvest are species that are dependent on estuarine waters or coastal wetlands, including shrimp and menhaden (NOAA 1990). Additionally, many ecologically important species (e.g., forage fish) are estuarine dependent.

Seagrass beds occur in shallow water on sand bottoms with relatively low wave energy. Seagrass beds support a tremendously complex ecosystem and are extremely productive. They provide nursery grounds for vast numbers of commercially and recreationally important fisheries species, including shrimp, black drum, snapper, grouper, spotted sea trout, southern flounder, and many others.

The preferred location of the proposed El Paso Energy Bridge GOM Port is approximately 116 mi (187 km) offshore, in water depths ranging from 262 to 307 ft (79.9 to 93.6 m) in an area devoid of vegetation (ENSR 2002). As previously stated, support activities for the proposed Port would deploy from existing shore-based facilities at Sabine Pass, Texas, and from other manned platforms offshore. All of the required support activities would be conducted as an additional mission to existing offshore activities. No new infrastructure, support vessels or helicopters would be dedicated to the proposed Port for support activities. Thus, the proposed activities would be indistinguishable from current activities and are not expected to impact coastal habitats. As a result, USCG and MARAD have eliminated coastal beaches, wetlands, and seagrass beds from further evaluation.

3.2.3 Offshore Benthic Resources

The continental shelf extends from the coastline to the shelf break, to water depths ranging from approximately 387 to 492 ft (118 to 150 m). The preferred location of the proposed Port is on the Texas-Louisiana continental shelf within EC 335, WC 600, WC 601, WC 602, and WC 603 in water depths ranging from 262 to 307 ft (79.9 to 93.6 m). Habitat types that may occur on the continental shelf include live/hard bottoms and pinnacle trends. Chemosynthetic communities may occur on the continental slope. As discussion of important topographic features on the OCS identified by MMS is presented in Section 3.4.

Live/Hard Bottoms. Live bottoms (hard-bottom areas) are high-productivity communities generally characterized by a high diversity of epibiota on rock or firm substrate (MMS 2002a). Live bottoms are characterized by macroalgae (seaweed), seagrasses, sponges, hydroids (colonial class of cnidarians), octocorals (subclass of cnidarians that includes sea whips, sea pens, gorgonians), anitpatharians (black corals), hard corals, bryozoans (minute colonial animals), and ascidians (class of sessile tunicates). Only three percent of the seafloor between 59 and 299 ft (18 and 91 m) consist of reef or hard bottom habitat from Pensacola, Florida, west to Pass Cavallo, Texas (MMS 2002b). There are no hard-bottom areas reported in the ROI; the nearest hard-bottom area to the ROI is approximately 37.3 mi (60 km) from the ROI (ENSR 2002). Results from a geophysical survey of the proposed pipeline routes and construction site indicated that area contains no major topographic

features (Thales Geosolutions, Inc. 2002). As such, USCG and MARAD have eliminated live/hard bottoms from further evaluation.

Pinnacle Trends. Pinnacle trends are carbonate mounds ranging in size from less than a few meters to nearly a kilometer in diameter, which appear to be biogenic features formed during periods of lower sea levels during the last deglaciation (MMS 2002b). The nearest mapped pinnacle trend area is located more than 100 mi from the proposed Port along the shelf edge between the Mississippi River Delta and De Soto Canyon more than 100 mi from the pooposed (MMS 2002a). Exclusion zones are required around topographic highs such as pinnacle trends on the outer continental shelf, because rises of 6 to 8 ft stimulate increased biological productivity. Results from a geophysical survey of the proposed pipeline routes and construction site indicated that area contains no major topographic features (Thales Geosolutions, Inc. 2002). As such, USCG and MARAD have eliminated pinnacle trends from further evaluation.

Chemosynthetic Communities. Chemosynthetic (seep) communities are located in deep (951 ft to greater 9,842 ft [290 m to greater than 3,000 m]) continental slope waters of the GOM, where the chemical conditions are most favorable and constant (MMS 2002a). These communities include vestimentiferan tubeworms, seep mussels, vesicomyid and lucinid clams, and specialized polychaete worms, which use a chemosynthetic process to oxidize hydrogen sulfide or methane to produce basic organic compounds (MMS 2002a). There are no seep communities near the ROI. As such, USCG and MARAD have eliminated chemosynthetic communities from further evaluation.

3.2.4 Protected Marine Species

This section is an overview of protected marine species within the ROI. Protected and sensitive marine species include marine mammals, federally listed endangered or threatened marine species, and sea turtles. A general overview is provided, followed by detailed discussion of protected and sensitive species.

The location and temporary distribution and abundance of protected species are often determined by a combination of environmental, biotic, and human generated factors. Environmental factors include those that are chemical, climatological, or physical (i.e., related to characteristics of a location). Biotic factors include the distribution and abundance of prey, inter- and intra-specific competition, reproduction, natural mortality, catastrophic events (e.g., die-offs), and predation. Human-generated factors include noise, hunting pressure, pollution, oil spills, habitat loss, and habitat degradation. Human activities that may affect distribution of protected species include shipping traffic, recreational and commercial fishing, oil and gas development and production, and seismic exploration. The interplay of these various factors and activities and the effects of various oceanographic characteristics (e.g., bottom depth and topographic relief) ultimately affect the location and temporary distribution of prey species. This, in turn, is the major influence on diversity, abundance, and distribution of marine mammals, and sea turtles.

3.2.4.1 Marine Mammals

A total of 29 species of marine mammals occur within the GOM (MMS 2001b) (see Table 3-2). There are 28 species of the order Cetacea, including seven species from the suborder Mysticeti (i.e., baleen whales) and 21 species from the suborder Odontoceti (i.e., toothed whales including dolphins) (MMS 2001b). There are two subspecies of the West Indian manatee (Order Sirenia, Family Trichechidae), the Florida manatee (*Trichecus manatus latirostris*), and the Antillean manatee (*Trichechus manatus manatus*) (MMS 2001b).

Table 3-2. Marine Mammals Present in the GOM

Species	A	B	Typical Habitat			
			C	D	E	Additional Data
SUBORDER MYSTICETI (baleen whales)						
Family Balaenidae						
Northern right whale *(Eubalaena glacialis)*	E	1	--	X	X	♦ two right whales observed off New Pass, Sarasota, FL, in 1963
Family Balaenopteridae						
Blue whale *(Balaenoptera musculus)*	E	1	--	X	X	♦ two strandings between Freeport and San Luis, TX, in 1940
Bryde's whale *(Balaenoptera edeni)*	--	3	--	X	X	♦ northeastern Gulf, DeSoto Canyon to western FL ♦ near 328-ft (100-m) isobath
Fin whale *(Balaenoptera physalus)*	E	2	--	X	X	♦ three strandings, seven sightings, likely accidental occurrences
Humpback whale *(Megaptera novaeangliae)*	E	2	--	X	X	♦ various sightings, strandings, and soundings, but likely strays from Caribbean ♦ no resident population in GOM
Minke whale *(Balaenoptera acutorostrata)*	--	2	X	X	X	♦ ten confirmed strandings (most on eastern GOM beaches), no live sightings ♦ may be strays or winter migrants
Sei whale *(Balaenoptera borealis)*	E	2	--	X	X	♦ only five reliable records, four of which are strandings (three in eastern LA and one on FL panhandle)
SUBORDER ODONTOCETI (toothed whales and dolphins)						
Family Physeteridae						
Dwarf sperm whale *(Kogia simus)*	--	3	--	--	X	♦ northern GOM region ♦ shelf edge break/upper slope ♦ 328-6,562 ft (100-2,000 m)
Pygmy sperm whale *(Kogia breviceps)*	--	3	--	--	X	♦ northern GOM region ♦ nearshore and shelf edge break/upper slope 328-6,562 ft (100-2,000 m)
Sperm whale *(Physeter macrocephalus)*	E	4	--	--	X	♦ Mississippi Delta region ♦ between 328-6,562 ft (100-2,000 m) ♦ most concentrated at 3,280 ft (1,000 m)
Family Ziphiidae						
Blainville's beaked whale *(Mesoplodon densirostris)*	--	2[1]	--	--	X	♦ distributed in water 3,280 ft (>1,000 m) (unidentified ziphiids sighted in GulfCet survey)
Cuvier's beaked whale *(Ziphius cavirostris)*	--	2[1]	--	--	X	♦ distributed in water 3,280 ft (>1,000 m) (unidentified ziphiids sighted in GulfCet survey)
Gervais' beaked whale *(Mesoplodon europaeus)*	--	3[1]	--	--	X	♦ distributed in water 3,280 ft (>1,000 m) (unidentified ziphiids sighted in GulfCet survey)
Sowerby's beaked whale *(Mesoplodon bidens)*	--	1[1]	--	--	X	♦ one animal stranded alive in Gulf County, FL ♦ distributed in water 3,280 ft (>1,000 m) (unidentified ziphiids sighted in GulfCet survey)
Family Delphinidae						
Atlantic spotted dolphin *(Stenella frontalis)*	--	4	--	X	X	♦ 66-656 ft (20-200 m) ♦ some records out to 3,280 ft (1,000 m) ♦ concentrated around 328 ft (100 m)

Species	A	B	Typical Habitat			
			C	D	E	Additional Data
Bottlenose dolphin *(Tursiops truncates*)	--	4	X	X	X	♦ coastal and oceanic populations ♦ depths less than 3,2980 ft (1,000 m) ♦ most common species of coastal GOM
Clymene dolphin *(Stenella clymene*)	--	4	--	--	X	♦ central GOM ♦ >328 ft (100 m)
False killer whale *(Pseudorca crassidens*)	--	3	--	--	X	♦ widely distributed throughout northern GOM ♦ 656-6,562 ft (200-2,000 m)
Fraser's dolphin *(Lagenodelphis hosei*)	--	4	--	--	X	♦ northwestern GOM ♦ water around 1,000 m (3,280 ft)
Killer whale *(Orcinus orca*)	--	3	--	--	X	♦ Mississippi Delta Region 328-6,560 ft (100-2,000 m)
Melon-headed whale *(Peponocephala electra)*	--	4	--	--	X	♦ northwestern Gulf ♦ 656-6,562 ft (200-2,000 m)
Pantropical spotted dolphin (*Stenella attenuate)*	--	4	--	--	X	♦ northern GOM ♦ 328-6,562 ft (100-2,000 m) ♦ most common cetacean in deep GOM waters
Pygmy killer whale (*Feresa attenuate)*	--	3	--	--	X	♦ strandings from FL to south TX ♦ northern GOM ♦ 1,640-3,280 ft (500-1,000 m)
Short-finned pilot whale (*Globicephala macrorhynchus)*	--	4	--	--	X	♦ central and western (northern) GOM ♦ 200-2000 m (656-6,560 ft)
Risso's dolphin (*Grampus griseus)*	--	4	--	--	X	♦ Northern GOM ♦ 150-2,000 m (492-6,560 ft)
Rough-toothed dolphin (*Steno bredanensis)*	--	4	--	--	X	♦ northern GOM ♦ south of Mississippi Delta ♦ 656-5,020 ft (200-1,530 ft)
Spinner dolphin (*Stenella longirostris)*	--	4	--	--	X	♦ southeast of Mississippi River ♦ >328 ft (100 m)
Striped dolphin (*Stenella coeruleoalba)*	--	4	--	--	X	♦ northern GOM ♦>200 m (656 ft) ♦ rare in extreme northwest
ORDER SIRENIA (dugongs and manatees)						
Family Trichechidae						
West Indian manatee (*Trichechus manatus)*	E	2	X	--	--	♦ rare except in Florida

Source: adapted from Würsig et al. 2000

Notes:
A – Status: E = endangered under the Endangered Species Act of 1973
B – Occurrence: 1 = extralimital; 2 = rare; 3 = uncommon; 4 = common
C – Coastal
D – Shelf
E – Slope/Deep
[1] Beaked whales in the Gulf of Mexico may be uncommon or common rather than rare or extralimital. Their population status is uncertain because they are difficult to see and identify to species. Most surveys have been conducted in sea states that are not optimal for sighting beaked whales.

NOAA Fisheries has performed stock assessments on 27 stocks of whales and dolphins in the GOM at least once since 1995. The species assessed include the Atlantic spotted dolphin, Blainville's beaked whale, bottlenose dolphin, Bryde's whale, Clymene dolphin, Cuvier's beaked whale, dwarf sperm whale, Fraser's dolphin, Gervais' beaked whale, killer whale, melon-headed whale, pantropical spotted dolphin, pygmy sperm whale, Risso's dolphin, rough-toothed dolphin, short-finned pilot whale, sperm whale, spinner dolphin, and striped dolphin (NOAA Fisheries 2003a).

Potentical impacts that could result from the proposed port to cetaceans are the impacts of increased vessel traffic and marine debris. Those impacts will be discussed in Section 4.2.2.4. The following descriptions were developed with these considerations in mind. Noise may cause long or short term disruption to cetaceans (MMS 2002a). Short-term disruptions are not expected to impact growth or survival. Some whale species may reduce their use of certain areas heavily used by ships, including avoiding or abandoning important feeding areas, breeding areas, resting areas, or migratory routes. However, various cetacean species are continually present in areas with heavy boat traffic, indicating a considerable degree of tolerance to vessel disturbance (MMS 2002a).

A review of data on collisions between ships and great whales (baleen whales and sperm whales) indicate that whale/ship strikes began late in 1800's when ships reached speeds of 15 knots and increased significantly again between 1950 and 1970 (Laist et al. 2001). Most severe or lethal injuries occurred with ships traveling at speeds of 14 knots or greater. In areas where special caution is needed to avoid such collisions, maintaining ship speeds of 14 knots or less may be beneficial (Laist et al. 2001).

The potential for ship collision is most severe with large, slow moving species. Collisions are most significant to the highly endangered population (<300) of North Atlantic right whales, for which ship strikes are believed to be the leading cause of mortality. Fast moving species such as bottlenose dolphins occasionally are struck by boats (Bloom and Jager 1994) although with much less frequency, especially considering their greater abundance. Injuries to four individuals of a well-studied population of 100 bottlenose dolphins off the coast of Sarasota, Florida were due to collisions with boats (Wells and Scott 1997).

Fin whales are most frequently struck, sperm whales are commonly hit, and records of collisions with Bryde's whales are rare (MMS 2002a). Fin whales, sperm whales, and Bryde's whales are rare, common, uncommon in the GOM, respectively. Regardless of size and type, vessels can collide with whales; most collisions occur over or near the continental shelf. Most lethal or severe injuries are caused by ships that are 80 m or longer, and are unable to avoid whales before the collision (MMS 2002a).

Major and/or fatal wounds on cetaceans have been reported for northern right whales, bottlenose dolphins, and sperm whales (MMS 2002a). Debilitating injuries may have negative effects on a population through impairment of reproductive output. Most vulnerable cetaceans include slow moving cetaceans (e.g., northern right whale) or those that spend extended periods of time at the surface in order to restore depleted tissue oxygen levels after deep dives (e.g., sperm whale). Dolphins often change their behavior in response to vessels. They approach vessels to ride the wake, extend inter-breath intervals, decrease inter-animal distance, change heading, or increase swimming speed. Dolphins may be struck by vessels due to inattentiveness, age/health, or voluminous vessel traffic (MMS 2002a).

Death or serious injury of marine mammals is caused by entanglement in and ingestion of debris (MMS 2002a). Net fragments and monofilament line from commercial and recreational fishing

boats, and strapping bands and ropes from all types of vessels are most often found entangling marine mammals. Plastic bags and small plastic fragments are commonly reported in the digestive tracts of cetaceans and manatees (MMS 2002a).

Nonendangered and Nonthreatened Marine Mammal Species

A total of 20 and 19 species of cetaceans were sighted during the GulfCet I and II surveys, respectively (MMS 1996b; MMS and USGS 2000). The most abundant species in both surveys was the pantropical spotted dolphin. Other species that were abundant in both surveys include the spinner dolphin, Clymene dolphin, bottlenose dolphin, striped dolphin, melon-headed whale, Atlantic spotted dolphin, and Risso's dolphin (MMS and USGS 2000). The distribution of cetaceans throughout the GOM appears to be affected by water depth or geographic region (MMS and USGS 2000; MMS 2001b). Table 3-2 presents the general distribution of marine mammals in the GOM. Based on typical habitat, depth, and occurrence, the nonthreatened or nonendangered cetaceans expected to occur in the ROI are the bottlenose dolphin, Atlantic spotted dolphin, and possibly Bryde's whale.

Endangered and Threatened Marine Mammals Species

Six of the whale species that occur in the GOM, along with the West Indian manatee, including both subspecies, are listed as endangered. The endangered whale species are the sperm whale (*Physeter macrocephalus*), sei whale (*Balaenoptera borealis*), blue whale (*Balaenoptera musculus*), fin whale (*Balaenoptera physalus*), northern right whale (*Eubalaena glacialis*), and humpback whale (*Megaptera novaeangliae*). Of these marine mammal species, only the sperm whale has the potential for interaction with any of the proposed activities. As such, the USCG and MARAD have eliminated the sei whale, blue whale, northern right whale, humpback whale, and West Indian manatee from further evaluation.

Sperm Whale. The sperm whale is the only large cetacean common to the GOM (NMFS 2002a; MMS 2001b). Sperm whales are found in the waters of the GOM throughout the year, but are most common during the summer months. Sperm whales are the largest member of the suborder Odontoceti or toothed whales. The International Whale Commission (IWC) recognizes four populations of sperm whales world-wide, North Pacific, North Atlantic, Northern Indian Ocean, and southern hemisphere (NMFS 2002a). GOM sperm whales are assessed as a unit stock by NOAA Fisheries. In the northwestern Atlantic, sperm whales are distributed in the U.S. EEZ over the continental shelf edge, the continental slope, and into the midocean regions. Their distribution is associated with the Gulf Stream and social structure (Waring et al. 2003). Generally, sperm whales group by gender and age, with the females and juveniles based in tropical and subtropical waters and males in the higher latitudes, feeding in polar regions and returning to tropical waters to breed (Waring et al. 2003). In eastern U.S. waters, sperm whales are distributed off Cape Hatteras in the winter, shifting to the waters off Delaware and Virginia north to the southern portion of Georges Bank in the spring. The distribution expands in the summer to include the areas east and north of Georges Bank and into the Northeast Channel region, as well as the continental shelf (inshore of the 328-ft [100-m] isobath) south of New England. In the fall, sperm whales shift to the continental shelf edge from the mid-Atlantic Bight to south of New England (Waring et al. 2003).

Consistent sightings, strandings, and catches indicate that there may be a distinct stock of sperm whales in the GOM (NOAA Fisheries 2003a). The last assessment of the GOM stock of sperm whales occurred in 1995. This population was estimated to be 411 individuals based on a 1991 – 1994 average abundance estimate of 530 sperm whales (NOAA Fisheries 2003a). GulfCet II was a

program conducted in 1996 and 1997 that used aerial surveys and shipboard visual and acoustic surveys to document cetacean, sea turtle, and seabird populations. This program was an extension of GulfCet I, which was a 3-year, extensive survey of cetaceans in the offshore waters (328 ft to 6,560 ft deep [100 to 2,000 m]) of north central and western GOM. An annual abundance of 530 sperm whales was estimated from GulfCet II survey data.

Sperm whales generally occur in waters greater than 590 ft (180 m) deep. While they may be encountered almost anywhere on the high seas, their distribution shows a preference for continental margins, sea mounts, and areas of upwelling where food is abundant (NMFS 2002a). The GulfCet II survey indicated that sperm whales were sighted throughout the GOM; however, sightings were most commonly aggregated along the 3,280-ft (1,000 m) isobath (MMS and USGS 2000). The presence of female and juvenile sperm whales south of the Mississippi River Delta was associated with cyclonic eddies. This association suggests that the whales are trying to stay near variable areas of low salinity, and nutrient rich water with enhanced primary and secondary productivity. As such, distribution is related to the distribution of prey (MMS and USGS 2000). Currently no critical habitat is designated for sperm whales in the GOM, but the area south of the Mississippi Delta may be important habitat for sperm whales. Based on depth, sperm whales are not expected to be common within the ROI.

Predatory behavior of sperm whales may include ambushing prey, attracting squid with bioluminescent mouths, and stunning prey with ultrasonic sounds. This predatory behavior makes sperm whales vulnerable to drowning from deep sea cables (NMFS 2002a).

3.2.4.2 Sea Turtles

The USFWS and NOAA Fisheries share the responsibility for sea turtle recovery under the authority of the ESA. All five species of sea turtles that inhabit the GOM are threatened or endangered (MMS 2001b). These species are the loggerhead sea turtle (*Caretta caretta*), Kemp's ridley sea turtle (*Lepidochelys kempi*), leatherback sea turtle (*Dermochelys coriacea*), hawksbill sea turtle (*Eretmochelys imbricata*), and the green sea turtle (*Chelonia mydas*). The loggerhead sea turtle is the most common sea turtle in the GOM, while the hawksbill sea turtle is the least common sea turtle in the GOM. Table 3-3 lists the sea turtles that occur in the GOM.

Sea turtle life history stages include eggs, hatchling, juvenile, and adult (MMS 2002b). In general, sea turtles nest long the entire northern GOM coastline; however, specific nesting distributions by species are described below. Hatchling sea turtles move offshore in a swimming frenzy immediately after hatching. Post-frenzy, hatchling sea turtles move to areas of convergence or to *Sargassum* mats and undergo passive oceanic migrations (Wyneken 2001). Juvenile sea turtles actively recruit to nearshore nursery habitat and move into adult foraging habitat when approaching sexual maturity (MMS 2002b). At the onset of nesting, adults move between foraging habitats and nesting beaches. Mating habitat depends on species and may occur off nesting beaches or remotely. Females reside near nesting beaches during nesting season (MMS 2002b).

There are no designated critical habitats or migratory routes for sea turtles in the northern GOM. However, NOAA Fisheries recognizes many coastal areas as preferred habitat (i.e., important habitats for the species within a specific geographic area) for sea turtles. For example, nearshore or inshore areas are preferred habitat for green sea turtles, while bays, especially in Louisiana and Texas, are preferred habitat for Kemp's ridley sea turtles (MMS 2002b). *Sargassum* mats are also recognized as preferred habitat for hatchlings (MMS 2001b). Highest sea turtle abundance in the

western GOM occurs in depths from 0 to 60 ft (0 to 18 m). However, sea turtles are more abundant the eastern GOM relative to the western GOM (McDaniel et al. 2000).

Table 3-3. Sea Turtles That Occur in the GOM

Species	Status[1]	Typical Adult Habitat	Juvenile/ Hatchlings Potentially Present?	Nesting
FAMILY CHELONIIDAE				
Caretta caretta (Loggerhead sea turtle)	T	estuarine, coastal, and shelf waters	Yes	Some nesting along northern Gulf Coast; main U.S. nesting beaches are in southeastern Florida
Chelonia mydas (Green sea turtle)	T, E[2]	shallow coastal waters, seagrass beds	Yes	Isolated and infrequent nesting in northern Gulf
Eretmochelys imbricata (Hawksbill sea turtle)	E	coral reefs, hard bottom areas in coastal waters; adults not often sighted in northern Gulf	Yes	Nesting in continental U.S. is limited to southeastern Florida and Florida Keys
Lepidochelys kempi (Kemp's ridley sea turtle)	E	shallow coastal waters, seagrass beds	Yes	Nests mainly at Rancho Nuevo, Mexico; minor nesting on Padre and Mustang Islands, Texas
FAMILY DERMOCHELYIDAE				
Dermochelys coriacea (Leatherback sea turtle)	E	slope, shelf, and coastal waters; considered the most "pelagic" of the sea	Yes	Some nesting in northern Gulf, especially Florida Panhandle; nearest major nesting turtles concentrations are in Caribbean and southeastern Florida

Source: MMS 2002a; Wyneken 2003

[1] Status: E = endangered species and T = threatened species under the Endangered Species Act of 1973.

[2] Green sea turtles are listed as threatened except for Florida, where breeding populations are listed as endangered.

Potentical impacts that could result from the proposed port to sea turtles are the impacts of increased vessel traffic and marine debris. Those impacts will be discussed in Section 4.2.2.4. The following descriptions were developed with these considerations in mind. Vessel traffic has caused sea turtle mortality in the GOM (MMS 2002a). About 9 percent of living and dead stranded sea turtles had boat strike injuries in the GOM, Atlantic, Puerto Rico, and the U.S. Virgin Islands from 1986 through 1993. However, in the GOM and Atlantic Coast, vessel-related injuries were noted in 13 percent of stranded turtles examined in 1993. Some of these turtles may have been struck by boats postmortem. In Florida, 18 percent of the sea turtle strandings documented between 1991 and 1993 were attributed to vessel collisions. Annually, large numbers of loggerheads and Kemp's ridley turtles are estimated to be killed by vessel traffic (MMS 2002a).

Sea turtles may also become entangled and ingest fragments of marine debris, causing death or serious injury (MMS 2002a). Turtles may drown, incur impairment to forage or predator avoidance, sustain wounds and infections, or exhibit altered behavior from entanglement of marine debris. Tar is the most common item ingested by sea turtles. Plastics are also ingested causing impaction of the

alimentary canal. Leatherback sea turtles are believed to misidentify translucent films as jellyfish. Ingested debris may block the digestive tract or remain in the stomach for extended periods, thereby lessening the feeding drive, causing ulcerations and injury to the stomach lining, or providing a source of toxic chemicals. Ingested debris may weaken sea turtles causing a greater susceptibility to predators and disease, and reducing fitness for migration, breeding, or nesting success (MMS 2002a).

One study indicated that the GOM had the second highest number of sea turtle strandings resulting from marine debris (35.9 percent) (MMS 2002a). Kemp's ridley was the second most commonly stranded turtle, but seemed less susceptible to the adverse impacts of debris than the other sea turtle species. A study of post-hatchling loggerheads in drift lines 9 to 40 mi (15 to 65 km) east of Cape Canaveral and Sebastian Inlet, Florida indicated that 17 percent contained plastic or other synthetic fibers in their stomachs or mouths (MMS 2002a).

Loggerhead Sea Turtle. The loggerhead is the most abundant sea turtle in the GOM (MMS 2002b). It has been federally listed as a threatened species since 1978 (NMFS and USFWS 1991a; NMFS 2002a). It is a cosmopolitan species that inhabits temperate and tropical waters, including estuaries and continental shelves of both hemispheres (NMFS and USFWS 1991a; NMFS 2002a). Five populations of loggerhead sea turtles exist worldwide: the Atlantic Ocean, Pacific Ocean, Indian Ocean, Caribbean Sea, and Mediterranean Sea populations (NMFS 2002b). In the western Atlantic Ocean, five major nesting aggregations include (1) a northern nesting aggregation that occurs from North Carolina to northeast Florida about 20º N latitude; (2) a south Florida nesting aggregation from 29º N latitude on the east coast to Sarasota on the west coast; (3) a Florida panhandle nesting aggregation, occurring at Eglin Air Force Base and the beaches near Panama City, Florida; (4) a Yucatán nesting aggregation occurring on the eastern Yucatán Peninsula, Mexico; and (5) a Dry Tortugas nesting aggregation occurring on the islands of the Dry Tortugas, near Key West, Florida (NMFS 2002a, b).

Index data on nesting females is one of the best methods to assess the population size of loggerhead sea turtles. These data indicate that between 1989 and 1998, the number of nests laid along the U.S. Atlantic and GOM coasts ranged from 53,000 to 92,000, annually. The average was nearly 73,000. On average, 90.7 percent of the nests were from the south Florida nesting aggregation, 8.5 percent from the northern nesting aggregation, and 0.8 percent from the Florida panhandle nesting aggregation (NMFS 2002a). The loggerhead sea turtle nesting aggregation in the southeastern U.S. is the second largest nesting subpopulation in the world.

In the southeastern U.S., female loggerhead sea turtles mate from late April through early September (NMFS and USFWS 1991a). Individual females may nest several times within one season, but usually at intervals of every 2 to 3 years. For their first 7 to 12 years, loggerhead turtles inhabit the pelagic waters near the North Atlantic Gyre and are called pelagic immatures. When loggerhead sea turtles reach 16 – 24 in (40 – 60 cm) straight-line carapace length, they begin to recruit to coastal inshore and nearshore waters of the continental shelf throughout the U.S. Atlantic and GOM, and are referred to as benthic immatures. Benthic immatures have been found in waters from Cape Cod, Massachusetts, to southern Texas. They forage off the northeastern U.S. and migrate south in the fall as temperatures drop. Most recent estimates indicate that the benthic immature stage ranges from ages 14 - 32 and the turtles mature around ages 20 – 38 (NMFS 2002a).

Prey species for omnivorous juveniles include crab, mollusks, jellyfish, and vegetation at or near the surface (NMFS 2002a). Coastal subadults and adults feed on benthic invertebrates, including mollusks and decapod crustaceans.

Loggerhead sea turtles were sighted during both the GulfCet I and GulfCet II surveys (MMS 1996b; MMS and USGS 2000). Results from the GulfCet II survey indicate that the number of loggerhead sea turtle sightings in the northeastern GOM was 20 times higher on the continental shelf versus the continental slope (MMS and USGS 2000). The majority of the loggerhead sea turtle sightings occurred in winter, around depths of 328 ft (100 m). However, there were sightings over waters as deep as 3,280 ft (1,000 m). Oceanic waters may be used by loggerhead turtles to travel between foraging sites (MMS and USGS 2000). Loggerhead sea turtles may occur in the ROI.

Kemp's Ridley Sea Turtle. The Kemp's ridley sea turtle primarily inhabits coastal waters in the GOM and northwestern Atlantic Ocean (NMFS and USFWS 1992a; NMFS 2002a). This species has been federally listed as an endangered species since 1978, and is considered the most endangered sea turtle in the world (NMFS and USFWS 1992a; NMFS 2002a). Nesting is limited to beaches at Rancho Nuevo, a stretch of beach in southern Tamaulipas, Mexico. Nesting occurs from April into July. On average, individual females nest every other year (ranging from every year to every 4 years), with an average of 2.5 nests per female per season. Average clutch size is 100 eggs per nest (NMFS 2002a).

Nesting data indicate a severe decline of Kemp's ridley sea turtles from more than 40,000 females when the nesting aggregation in Rancho Nuevo was first discovered. In the 1970s, the number of females ranged from 2,000 to 5,000. The number of nests increased from a low of 702 nests in 1985 to 1,930 nests in 1995 and 6,277 nests in 2000 (NMFS 2002a).

Prey species for the Kemp's ridley sea turtle include nearshore crab, mollusks, fish, shrimp, and shrimp fishery discards (NMFS 2002a). After hatching, pelagic Kemp's ridley sea turtles feed on *Sargassum* or other epipelagic GOM species.

Kemp's ridley sea turtles have been sighted within 9.3 mi (15 km) of shore and in depths less than 59 ft (18 m) (MMS 2002a). Kemp's ridley sea turtles were sighted during both GulfCet I and GulfCet II surveys (MMS 1996b; MMS and USGS 2000). Three Kemp's ridley sea turtles were sighted in shelf waters of the eastern GOM during GulfCet II survey (MMS and USGS 2000). The abundance estimate resulting from these three sightings was 12 individuals. Nearshore waters of the GOM are believed to provide important developmental habitat for juvenile Kemp's ridley sea turtles (NMFS 2002a). The primary subadult habitat is along the northern GOM coast from Cedar Key, Florida, to Port Aransas, Texas (NMFS 2002a).

Leatherback Sea Turtle. The leatherback sea turtle has been federally listed as an endangered species since June 2, 1970 (USFWS 2002a). It is primarily a pelagic species and is distributed in temperate and tropical waters worldwide (NMFS and USFWS 1992b; USFWS 2002a). Of all sea turtles, the leatherback is the largest, deepest diving, most migratory, widest ranging, and most pelagic sea turtle (USFWS 2002a). Nesting grounds are found circumglobally. Leatherbacks undergo extensive migrations from feeding grounds to nesting beaches. Once they nest, they move offshore and use both coastal and pelagic waters (NMFS 2002a).

Historically, the most important nesting ground for the leatherback was the Pacific coast of Mexico (USFWS 2002a). Nesting in the U.S. Caribbean is reported in the Virgin Islands (NMFS 2002a). However, French Guiana in the western Atlantic now has the largest nesting population. Other important nesting sites for the leatherback sea turtle include Colombia, in the western Atlantic; and West Papua and Indonesia, in the western Pacific. U.S. nesting sites include the Florida east coast; Sandy Point, U.S. Virgin Islands; and Puerto Rico. Nesting occurs from March through July. On average, individual females nest every 2 to 3 years, laying an average of five to seven nests per

season. Average clutch size is 70 to 80 yolked eggs. Critical habitat has been designated for the leatherback sea turtle in the Virgin Islands and at Sandy Point Beach, St. Croix, and the waters adjacent to Sandy Point Beach (50 CFR17.95, 50 CFR 226.207) (USFWS 2002a).

Global nesting data indicate a severe decline from more than 115,000 females estimated in 1980 to recent estimates of 26,000 to 43,000 nesting females (USFWS 2002a). Numbers of leatherback sea turtles in the western Atlantic may be declining. Recent increases in mortalities are reportedly due to interactions with fishing gear (NMFS 2002a).

Adult leatherbacks forage in temperate and subpolar regions in all oceans (NMFS 2002a). Jellyfish are the major component of the leatherback diet. Leatherbacks are also known to feed on sea urchins, squid, crustaceans, tunicates, fish, blue-green algae, and floating seaweed (USFWS 2002a).

Leatherback sea turtles were sighted during the GulfCet I and GulfCet II surveys (MMS 1996b; MMS and USGS 2000). In the GulfCet I survey, the majority of the sightings occurred from the Mississippi Canyon to the DeSoto Canyon. The GulfCet I survey indicated leatherbacks were primarily an oceanic species (656 ft [>200 m]) (MMS 1996b). These results were reiterated during the GulfCet II survey, when leatherback sea turtles were more commonly sighted on the continental slope than the shelf. The leatherback sea turtles that were sighted on the continental slope were 12 times more abundant during the summer than the winter (MMS and USGS 2000). Temporal variability in leatherback distribution and abundance suggests that specific areas may be important to this species, either seasonally or for short periods of time.

Hawksbill Sea Turtle. The hawksbill sea turtle has been recorded in waters of all of the states located along the GOM (NMFS and USFWS 1993). However, the hawksbill is the least common sea turtle in the GOM (MMS 2002b). The hawksbill sea turtle has been federally listed as endangered throughout its range since 1970. The species is primarily coastal, seldom seen in waters deeper than 65 ft (19.8 m). Hawksbill sea turtles inhabit rocky areas, coral reefs, shallow coastal areas, lagoons or oceanic islands, and narrow creeks and passes. The species is found in tropical and subtropical waters in the Atlantic, Pacific, and Indian Oceans. The global population of hawksbill sea turtles has declined 80 percent over the last 100 years, with only approximately 15,000 females nesting worldwide. Only five regional populations remain with more than 1,000 females nesting annually (Syechelles, Mexico, Indonesia, and two in Australia) (USFWS 2002b).

The highest densities of nests for the hawksbill sea turtle occur on the GOM and Caribbean coasts of the Yucatán Peninsula, Mexico. Nesting also occurs in lower densities on scattered beaches. The Caribbean populations account for 20 to 30 percent of the hawksbill population worldwide (USFWS 2002b). Historically, the Panama breeding population used to be the most important breeding population in the Caribbean; now the Mexico population is the most important. In most locations, nesting occurs between April and November, but varies depending on the area. No more than four nests were recorded annually from 1979 to 2000 in Florida. Nesting on GOM beaches is extremely rare, with only one nest on Padre Island, Texas documented in 1998 (NMFS 2002a).

On average, individual females nest every 2 to 3 years laying an average of 4.5 nests per season at approximately 2-week intervals. Average clutch size is approximately 140 eggs (USFWS 2002b). Critical habitat is designated for hawksbill sea turtles in Puerto Rico and waters off Puerto Rico (50 CFR 17.95, 50 CFR 226.209).

Adults usually forage around coral reefs and other hard bottom habitats at depths of 100 m or more (NMFS 2002a). Sponges are the major component of the hawksbill sea turtle diet (USFWS 2002b).

Hawksbill sea turtles have been sighted near coral reefs south of Florida and very few have been documented near Texas (NMFS 2002a). The GulfCet I and II surveys did not identify any hawksbill sea turtles, although there were some sightings of unidentified sea turtles (MMS 1996b; MMS and USGS 2000).

Green Sea Turtle. The green sea turtle breeding colony populations in Florida and on the Pacific coast of Mexico have been federally listed as endangered; all other populations have been listed as threatened (USFWS 2002c). The species was listed in 1978. The green sea turtle nests in tropical and subtropical waters worldwide. The green sea turtle inhabits shallow waters (except when migrating) inside reefs, bays, and inlets and is associated with marine grass and algae (USFWS 2002c). It is found in western Atlantic waters of the U.S. from Massachusetts to Texas, as well as Puerto Rico and the U.S. Virgin Islands (MMS 1999).

In the U.S., green sea turtles nest in North Carolina, South Carolina, Georgia, Florida, U.S. Virgin Islands, and Puerto Rico. The east coast of Florida is considered a principal nesting area for green sea turtles. Conservative estimates from 1990 through 1999 range from 470 to 1,509 nesting females per year in Florida (NMFS 2002a). Since historical data on green sea turtles are sparse, it is unclear how reduced the nesting population is. Estimates do indicate that the species may be recovering. Green sea turtles rarely nest in the GOM, but nesting has been reported at Eglin Air Force Base, on the Florida Panhandle (MMS 1999). On average, individual females nest every 2 to 4 years, laying an average of 3.3 nests per season, at approximately 13-day intervals. Average clutch size is approximately 140 eggs (USFWS 2002c).

Green sea turtles are known to make extensive migrations between nesting and feeding habitats (NMFS 2002a). Hatchling green sea turtles eat a variety of plants and animals (USFWS 2002c) and forage in areas such as coral reefs, emergent rocky bottom, *Sargassum* mats, and lagoons and bays (MMS 2001b). Adults feed on seagrasses and marine algae including species of *Cymodcea*, *Thalassia*, and *Zostera*, (USFWS 2002c; NMFS 2002b). Feeding grounds in the GOM include inshore south Texas waters, the upper west coast of Florida, and the northwestern coast of the Yucatán Peninsula, Mexico.

Green sea turtles occur in small numbers over seagrass beds along the south Texas coast and the Florida GOM coast. Reports of nesting along the Central GOM coast are infrequent, and the closest important nesting aggregations are along the east coast of Florida and the Yucatán Peninsula (NMFS and USFWS 1991b). The GulfCet I and GulfCet II surveys did not identify any green sea turtles, although there were some sightings of unidentified sea turtles (MMS 1996b; MMS and USGS 2000). Critical habitat is designated for the green sea turtle in the waters off Culebra Island, Puerto Rico (50 CFR 226.208).

3.2.4.3 Endangered or Threatened Fish Species

Gulf Sturgeon. The Gulf sturgeon (*Acipenser oxyrinchus desotoi*) is one of two fish in the GOM that is listed as threatened. The USFWS and Gulf States Marine Fisheries Commission have developed a recovery plan to ensure the preservation and protection of Gulf sturgeon spawning habitat (MMS 2002a). Both overfishing and habitat degradation have led to the decline of the Gulf sturgeon. Habitat degradation includes damming of coastal rivers and the degradation of water quality. The Gulf sturgeon occurs in the eastern portion of the GOM, distant from the ROI.

Smalltooth Sawfish. NOAA Fisheries listed the smalltooth sawfish (Prestis pictinata) as an endangered species on April 1, 2003 (68 FR 62 pp. 15674-15680). Sawfish, like sharks, skates, and

rays, belong to a class of fish called elasmobranchs, whose skeletons are made of cartilage. Smalltooth sawfish has been reported in both the Pacific and Atlantic Oceans, but the U.S. population is found only in the Atlantic. Historically, the U.S. population was common throughout the GOM from Texas to Florida, and along the east coast from Florida to Cape Hatteras. The current range of this species has contracted to peninsular Florida, and smalltooth sawfish are relatively common only in the Everglades region at the southern tip of the state. No accurate estimates of abundance trends over time are available for this species. However, available records, including museum records and anecdotal fisher observations, indicate that this species was once common throughout its historic range and that smalltooth sawfish have declined dramatically in U.S. waters over the last century. Since smalltooth sawfish do not currently range in the ROI, the USCG and MARAD have eliminated this species from further evaluation (NOAA Fisheries 2003b).

3.2.5 Fisheries and Essential Fish Habitat (EFH)

3.2.5.1 Marine Fisheries Resources

This description of Marine Fisheries Resources is included as part of the EFH consultation, pursuant to MSA. The northern GOM has traditionally been one of the most productive fishery areas in North America (Gunter 1967). GOM in marine habitats, ranging from coastal marshes to the deep-sea abyssal plain, support a varied and abundant fish fauna. Demersal and coastal pelagic fish fauna of the GOM are characterized by substrate composition and water depth (Gallaway 1981). The fish assemblage associated with the ROI is considered the soft sediment, outer-shelf assemblage. Little has been published regarding the outer shelf soft-bottom assemblage, which is similar to the brown shrimp assemblage, but in deeper waters and farther offshore. The brown shrimp assemblage which was characterized by dominant shrimp trawl catches described below (Gallaway 1981). These fish may have commercial, recreational, and/or ecological importance.

Demersal Fishes. The bottom-oriented or demersal fish associated with the outer shelf and brown shrimp assemblage are generally not estuarine dependent (Gallaway 1981). Trawl catches within the brown shrimp assemblage are dominated by longspine porgy (*Stenotomus caprinus*), Mexican searobin (*Prionotus paralatus*), horned searobin (*Bellator militaris*), and dwarf goatfish (*Deneus paryus*) (Gallaway 1981). Juvenile red snapper (*Lutjanus campechanus*) are also abundant in trawl catches on brown shrimp grounds.

Coastal Pelagic Fishes. Coastal pelagic fishes inhabit the continental shelf waters of the GOM throughout the year. The major coastal pelagic fishes in the GOM include requiem sharks, ladyfish, anchovies, herrings, mackerels and tunas, jacks, mullets, bluefish (*Pomatomus saltatrix*), and cobia (*Rachycentron canadum*). Pelagic species that dominate brown shrimp communities include scads, sardines, king mackerel (*Scombermorous cavalla*), little tunny (*Euthynnus alletteratus*), and cobia (Gallaway 1981). Tunas and billfishes are also present further offshore. Some species form large schools (e.g., Spanish mackerel), while others travel independently or in smaller groups (e.g., cobia).

Coastal pelagic fishes can be divided into two ecological groups: predators and planktivores. The predators include species such as king and Spanish mackerels, bluefish, cobia, dolphin, jacks, and little tunny. These species typically undergo migrations, grow rapidly, mature early, and exhibit high fecundity. Some large predator species (particularly bluefish, Spanish mackerel, and blue runner) may be attracted to large concentrations of anchovies, herrings, and silversides that congregate in nearshore areas. The planktivores have similar life history characteristics, but the species are smaller in body size. This group includes Gulf menhaden, Atlantic thread herring, Spanish sardine, round scad, and anchovies (Gallaway 1981).

Fisheries Management. Commercial and recreational fisheries resources in the GOM are managed by the states within the Gulf of Mexico States Marine Fisheries Commission (GSMFC), and federally by the Gulf of Mexico Fishery Management Council (GMFMC), and NOAA Fisheries.

The states within GSMFC (i.e., Texas, Louisiana, Mississippi, Alabama, and Florida) manage nearshore commercial and recreational fisheries. The GSMFC was formed to coordinate regional management of stocks of fish that migrate throughout state jurisdictions. Through GSMFC, the GOM coastal states implement consistent regulations wherever possible. State managed species include black drum, blue crab, flounder, Gulf menhaden, oysters, striped bass, striped mullet, and spotted seatrout (GSMFC 2001).

The GMFMC is one of eight regional Fishery Management Councils established by the MSA to manage fisheries within the US EEZ (i.e., 3 to 200 miles offshore). Fishery management plans (FMPs) developed by the GMFMC include

- *Shrimp Fishery of the Gulf of Mexico, U.S. Waters*
- *Red Drum Fishery of the Gulf of Mexico*
- *Reef Fish of the Gulf of Mexico*
- *Coastal Migratory Pelagic Resources (Mackerels) in the Gulf of Mexico*
- *Stone Crab Fishery of the Gulf of Mexico and South Atlantic*
- *Spiny Lobster in the Gulf of Mexico and South Atlantic*
- *Coral and Coral Reefs of the Gulf of Mexico*

Secretarial FMPs have been developed by NOAA Fisheries for highly migratory species (which also occur in the GOM) and include the *FMP for Atlantic Billfish* and the *FMP for Atlantic Tuna, Swordfish, and Sharks*. EFH for federally managed species is addressed in Section 3.2.5.5 (See also Appendix D).

Commercial and Recreational Fisheries. Gulf menhaden, managed by the states, comprised the bulk of the commercial landings in the GOM over the last 5 years (1997 – 2001). Average annual landings of Gulf menhaden for this time period were 1.29 billion lbs (74 percent of the landings). Federally managed species which also dominated commercial landings for this period, were brown shrimp and white shrimp. State managed species which also dominated commercial catches were blue crabs and eastern oysters. Louisiana landings were comprised predominantly of Gulf menhaden, brown shrimp, white shrimp, and blue crabs. Texas landings were comprised predominantly of brown shrimp, white shrimp, blue crabs, eastern oyster, and black drum (a state managed species).

Spotted seatrout, Spanish mackerel, and Atlantic croaker were the most commonly caught nonbait species (numbers of fish). By weight, the largest harvests were of red drum, spotted seatrout, sheepshead, red snapper, Spanish mackerel, king mackerel, and dolphin (O'Bannon 2002). Spotted sea trout, red drum, Atlantic croaker, sand sea trout, and black drum dominated the Louisiana recreational harvest in 2001, in terms of numbers. By weight, the largest harvests were red drum, spotted sea trout, black drum, unclassified tunas and mackerels, and sheepshead. Section 3.5.2 presents a description of the value of the GOM commercial and recreational fisheries.

3.2.5.2 Ichthyoplankton

Most fishes inhabiting the GOM have pelagic egg and larval stages. Duration of the larval stage can range from 10 to 100 days, depending on the species. Year-class strength in adult populations of fishes and invertebrates largely depends on variability in survival and transport of pelagic larval (MMS 2002a).

The distribution of fish eggs and larvae depends on spawning behavior of adults, hydrographic structure and transport at a variety of scales, duration of the pelagic period, behavior of larvae, and larval mortality and growth (MMS 2002a). Two of the most important hydrographic features in the GOM are the Mississippi River discharge plume and the Loop Current. Researchers hypothesize that the aggregate of ichthyoplankton at the frontal zone of the Mississippi River discharge plume may indicate that frontal waters provide feeding and growth opportunities for larvae. Bothids (lefteye flounders), carangids (jacks), engraulids (anchovies), exocoetids (flying fishes), gobiids (gobies), sciaenids (drums), scombrids (mackerels), synodontids (lizardfishes), and tetraodontids (puffers) are the most frequently caught taxa in plume/shelf samples off the Mississippi River Delta (MMS 2002a).

Ichthyoplankton is abundant in the north-central GOM (Lyczkowski-Shultz 2003). For most of the year, density of ichthyoplankton is greater at the surface and decreases with depth (Shaw 2002). There may be some movement of larvae within a 24-hr period throughout the water column (Lyczkowski-Shultz 2003).

Water temperature is a major influence on the structure of larval fish assemblages (MMS 2002b). Larval densities are lowest during winter, increase during the spring, peak during the summer, and decline during the fall. Table 3-4 presents the seasonality and peak seasonal occurrence of larval fishes in the north-central GOM. Most fish species would be in the ROI in the spring, late spring, and early fall. From May through October, king and Spanish mackerel and all the snappers are present (Lyczkowski-Shultz 2003). Red drum spawn at the end of the summer. Croaker and spot spawn from the fall to early winter. Striped mullet spawn in deep GOM in spring to late summer and the young migrate into coastal waters. Young menhaden and sand sea trout (white sea trout) occur in the ROI in the winter months (Lyczkowski-Shultz 2003).

Many ichthyoplankton taxa are collected within specific depth ranges. Inshore demersal species such as Atlantic bumper (*Caranx ruber*) (an important forage species), spotted seatrout (*Cynoscion nebulosus*), pigfish (*Orthopristis chrysoptera*), and black drum (*Pogonias cromis*) are found in water depths shallower than 82 ft (25 m). Several clupeids (herrings) (*Brevoortia patronus*, *Opisthonema oglinum*, and *Sardinella aurita*) and serranids (sea basses) (*Centropristis striata*, *Diplectrum formosum*, and *Serraniculus pumilio*) are found at depths less than 164 ft (50 m). Species collected exclusively at depths of 164 to 656 ft (50 to 200 m) were tuna (*Auxis* sp. and *Euthynnus alletteratus*), blue runner (*Caranx crysos*), round herring (*Etrumeus teres*), red barbier (*Hemanthias vivanus*), red snapper (*Lutjanus campechanus*), king mackerel (*Scomberomorus cavalla*), and rough scad (*Trachurus lathami)*. Wide-ranging epipelagic species were collected in water depths exceeding 492 ft (150 m), including skipjack tuna (*Euthynnus pelamis*), sailfish (*Istiophorus platypterus*), and Atlantic swordfish (*Xiphias gladius*). Table 3-5 presents the primary depth distribution of larvae of some abundant fish species in the northern GOM. Species likely to occur in the ROI are the species distributed less than 328 ft (100 m) and from 164 to 656 ft (50 to 200 m).

Table 3-4. Seasonality and Peak Seasonal Occurrence of Larval Fishes (< 10 mm standard length) in the North-Central GOM

Family (common name)	Taxa (common name)	Scientific Name	J	F	M	A	M	J	J	A	S	O	N	D
Herring and Menhaden	Gulf menhaden	*Brevoortia patronus*	*	*	X	X					X	X	X	*
	Round herring	*Etrumeus teres*	*	*	*	X	X	X					X	X
	Atlantic thread herring	*Opisthonema oglinum*			X	X	*	*	*	*	X	X	X	
Anchovy	Striped	*Anchoa hepsetus*	X	X	*	*	*	*	*	*	*	X	X	X
	Bay	*Anchoa mitchilli*	X	X	*	*	*	*	*	*	*	X	X	X
	Longnose	*Anchoa nasuta*	X	X	*	*	*	*	*	*	*	X	X	X
Sea Bass and Grouper	Sand perch	*Diplectrum formosum*	X	X	X	X	*	*	*	*	X	X	X	X
	Pygmy sea bass	*Serraniculus pumilio*					X	*	*	*	*	X	X	
Jacks, Scads, Pompanos, and relatives	Blue runner	*Caranx crysos*			X	X	X	*	*	*	X	X	X	
	Atlantic bumper	*Chloroscombrus chrysurus*				X	X	*	*	*	*	X		
	Round scad	*Decapterus punctatus*			X	*	*	*	*	*	*	X	X	
	Rough scad	*Trachurus lathami*	*	*	X	X	X						X	X
	Dolphin	*Coryphaena hippurus Linnaeus*					X	X	X	X	X	X	X	
Snapper	Red	*Lutjanus campechanus*				X	X	*	*	*	X	X	X	
	Gray	*Lutjanus griseus*				X	X	*	*	*	X	X	X	
	Lane	*Lutjanus synagris*				X	X	*	*	*	X	X	X	
Mojarras	Pigfish	*Orthopristis chrysoptera*	X	X	*	X	X							
Porgies	Sheepshead	*Archosargus probatocephalus*	X	*	*	*	X							
	Pinfish	*Lagodon rhomboides*	*	*	X	X						X	X	*
Drums, Croakers, Seatrout	Spotted seatrout	*Cynoscion nebulosus*		X	X	*	*	*	*	*	X	X		
	Spot	*Leiostomus xanthurus*	*	X	X	X						X	X	*
	Atlantic croaker	*Micropogon undulatus*	*	X	X	X					X	*	*	*
	Red drum	*Sciaenops ocellata*								X	*	*	X	
Spadefish	Atlantic spadefish	*Chaetodipterus*				X	X	*	*	*	X			

Family (common name)	Taxa (common name)	Scientific Name	J	F	M	A	M	J	J	A	S	O	N	D
		faber												
Mackerals, Tunas, Wahoo	Bullet mackerel	*Auxis rochei*	X	X	X	X	*	*	*	*	*	X	X	
	Little tunny	*Euthynnus alletteratus*				X	*	*	*	*	*	X	X	
	Skipjack tuna	*Euthynnus pelamis*				X	X	X	X	X	X	X		
	King mackerel	*Scomberomorus cavalla*					X	X	X	*	*	X	X	
	Spanish mackerel	*Scomberomorus maculatus*				X	X	X	X	*	*	X		
	Bluefin tuna	*Thunnus thynnus*				X	X	X						
Butterfish	Gulf butterfish	*Peprilus burti*	*	*	*	X	X	X	X	X	X	X	*	*

Source: MMS 2002b

Notes: X = Seasonality

* = Peak Seasonal Occurrence

Table 3-5. Primary Depth Distribution of Larval Fishes (<10 mm standard length) in the GOM, North of 26º N Latitude

Common Name	Genus/Species	82 ft (<25 m)[1]	< 164 ft (<50 m)[1]	<328 ft (<100 m)[1]	164-656 ft (50-200 m)[1]	>492 ft (>150 m)[1]
Sheepshead	*Archosargus probatocephalus*[2]	X				
Atlantic spadefish	*Chaetodipterus faber*	X				
Atlantic bumper	*Chloroscombrus chrysurus*	X				
Sand seatrout	*Cynoscion arenarius*	X				
Spotted seatrout	*C. nebulosus*[2]	X				
Pigfish	*Orthopristis chrysoptera*	X				
Northern harvestfish	*Peprilus paru*	X				
Black drum	*Pogonias cromis*[2]	X				
Anchovies	*Anchoa spp.*		X			
Gulf menhaden	*Brevoortia patronus*[2]		X			
Black sea bass	*Centropristis striata*		X			
Sand perch	*Diplectrum formosum*		X			
Scaled herring	*Harengula jaguana*		X			
Pinfish	*Lagodon rhomboids*[2]		X			
Spot	*Leiostomus*		X			

Common Name	Genus/Species	82 ft (<25 m)[1]	< 164 ft (<50 m)[1]	<328 ft (<100 m)[1]	164-656 ft (50-200 m)[1]	>492 ft (>150 m)[1]
	xanthurus[2]					
Atlantic croaker	*Micropogonias undulates*[2]		X			
Atlantic thread herring	*Opisthonema oglinum*		X			
Round sardinell	*Sardinella aurita*		X			
Spanish mackerel	*Scomberomorus maculates*		X			
Pygmy sea bass	*Serraniculus pumilio*		X			
Round scad	*Decapterus punctatus*			X		
Gulf butterfish	*Peprilus burti*			X		
Mackerel	*Auxis sp.*				X	
Blue runner	*Caranx crysos*				X	
Round herring	*Etrumeus teres*				X	
Little tunny	*Euthynnus alletteratus*				X	
Red barbier	*Hemanthias vivanus*				X	
Red snapper	*Lutjanus campechanus*				X	
King mackerel	*Scomberomorus cavalla*				X	
Rough scad	*Trachurus lathami*				X	
Skipjack tuna	*Euthynnus pelamis*					X
Sailfishes	*Istiophorus spp.*					X
Swordfish	*Xiphias gladius*					X

Source: MMS 2002a

Notes:

[1] Depth ranges are those at which >75 percent of larvae were collected

[2] Indicates larvae are estuarine dependent

Spring and fall plankton surveys have been conducted in the GOM as part of the South East Area Monitoring and Assessment Program (SEAMAP) since 1982. While plankton are collected using both a neuston net and a bongo net, only bongo net data are presented. The bongo net has a 23.6 in (60 cm) mouth opening and carries 0.333 mm mesh netting. The bongo net is fitted with a flowmeter that allows the volume of water filtered during the tow to be measured. This net is fished from approximately 3.28 to 16.4 ft (1 to 5 m) off the bottom to the water's surface and yields a sample from the water column that is integrated over depth. Fish larvae data cover the period 1993-2000 and consist of eleven "Spring" (April-July) and five "Fall" (September-November) samples. These samples were collected at NOAA's SEAMAP Sampling Station B23 (SSB23), which is located generally at 28 degrees N latitude and 93 degrees W longitude. All samples were collected within

one degree (North/South, East/West), of these coordinates. This location also puts them within one degree (North/South, East/West), of the proposed project location (i.e., 28 degrees 5 minutes N latitude and 93 degrees 03 minutes W longitude). Fish egg data, were collected from 1982-2001 within a 5-mile radius near SSB23, the same station used for the fish larva database. All samples were collected using a Bongo net, which was fished at a maximum depth of 193 ft (58.8 m). As this type of net is fished vertically, as opposed to horizontally, for the purpose of this evaluation it is assumed that it was fished to the surface.

An analysis of these bongo net data performed by the Applicant indicate that an average of 5,027 eggs (i.e., an average of 4,179 and 5,871 eggs in the spring and fall, respectively) and 10,523 larvae (i.e., an average of 11,508 and 6,019 larvae in the spring and fall, respectively) occur in a million gallons (3,785.4 m^3) of filtered seawater in the area of the proposed location (El Paso 2003a). The larvae in these samples represent a total of 127 taxa (i.e., larvae identified to order, family, genus, or species level), including a group of unidentified fish. The twenty most abundant taxa, in order of abundance, are presented in Table 3-6 (El Paso 2003b). The abundance (i.e., average numbers per gallons of filtered seawater) by taxa varies with season. For example, Istiophoridae (billfish), are present only in fall samples and are sparse (12 larvae/million gallons of filtered seawater [0.0032/m^3]), and Engraulidae larvae (anchovies) were sampled in both seasons (310 larvae/million gallons of filtered seawater [0.0819/m^3] in the fall samples and 802 larvae/million gallons of filtered seawater [0.2119/m^3] in the spring samples) (El Paso 2003a). These two taxa represent the lowest density and one of the highest, respectively, in the database.

In general, only a few percent of newly hatched eggs and larvae would be expected to survive to adulthood (Comyns 2003). Natural mortality is highest during the early life history stages of aquatic organisms and varies among species (USEPA 2002). Natural mortality for larvae can be as high as 96 percent for larvae and as high as 99 percent for eggs (Houde 1987; Lasker 1987).

3.2.5.3 Essential Fish Habitat

EFH has been designated for shrimp, red drum, reef fish, and coastal migratory pelagic resource in the GOM by the GMFMC in the *Generic Amendment for Addressing Essential Fish Habitat Requirements* (GMFMC 1998). For some species, EFH for only a particular life history stage occurs in the ROI. In general, for each species managed by GMFMC, inshore EFH is the estuaries where the species are "common," "abundant," and "highly abundant" and offshore EFH is adult areas, spawning areas, and nursery areas for each species. However, the ROI would not include inshore EFH. Species that have EFH in the ROI include brown shrimp (*Panaeus aztecus*), white shrimp (*Panaeus setiferus*), red drum (*Sciaenops ocellatus*), red snapper (*Lutjanus campechanus*), gray snapper (*Lutjanus griseus*), lane snapper (*Lutjanus synagris*), greater amberjack (*Seriola dumerlli*), lesser amberjack (*Serioloa fasciata*), gray triggerfish (*Balistes capriscus*), king mackerel (*Scomberomorus maculates*), bluefish (*Pomatomus saltatrix*), little tunny (*Euthynnus alleteratus*), cobia (*Rachycentron canadum*), and dolphin (*Coryphaena hippurus*) (Sutter 2003).

EFH for HMS is described in separate FMPs, including the *FMP for Atlantic Tunas, Swordfish, and Sharks* (NMFS 1999) and the *Atlantic Billfish FMP Amendment 1* (NOAA Fisheries 1999). The only HMS that has EFH in the ROI is bluefin tuna (*Thunnus thynnus*) (Sutter 2003).

Table 3-6. Twenty Most Abundant Taxa, of the NOAA SEAMAP Surveys for Site B23 by Season and On Average

Order	Family	Genus/Species	Common Name
SPRING			
Gadiformes	Bregmacerotidae	*Bregmaceros spp.*	codlets
Clupeiformes	Engraulidae		anchovies
Stomiiformes	Sternoptychidae	*Maurolicus muelleri*	hatchetfish
n/a	n/a	*n/a*	unidentified fish
Myctophiformes	Myctophidae	*Diaphus spp.*	lanternfishes
Aulopiformes	Synodontidae	*n/a*	lizardfishes
Clupeiformes	Clupeidae	*Etrumeus teres*	threadfin shad
Perciformes	Gobiidae	*n/a*	gobies
Perciformes	Serranidae	*Anthias nicholsi*	yellowfin
Perciformes	Pomacentridae	*n/a*	damselfishes
Pleuronectiformes	Soleidae	*Symphurus spp.*	tonguefish
Myctophiformes	Myctophidae	*n/a*	lanternfishes
Pleuronectiformes	Bothidae	*Syacium spp.*	lefteye flounders
Perciformes	Scombridae	*Euthynnus alleteratus*	Little tunny
Perciformes	Serranidae	*n/a*	sea basses
Perciformes	Trichuridae	*Trichurus lepturus*	Atlantic cutlassfish
Perciformes	Serranidae	*Epinephelus spp.*	sea basses
Perciformes	Grammatidae	*n/a*	basslets
Perciformes	Lutjanidae	*Lutjanus*	snappers
Perciformes	Carangidae	*Selene vomer*	lookdown
FALL			
Gadiformes	Bregmacerotidae	*Bregmaceros spp.*	codlets
Perciformes	Gobiidae	*n/a*	gobies
Myctophiformes	Myctophidae	*Diaphus spp.*	lanternfishes
Clupeiformes	Engraulidae	*n/a*	anchovies
Stomiiformes	Sternoptychidae	*Maurolicus muelleri*	hatchetfish
Perciformes	Serranidae	*n/a*	sea basses
Perciformes	Lutjanidae	*n/a*	snappers
Clupeiformes	n/a	*n/a*	herrings and anchovies
Aulopiformes	Synodontidae	*n/a*	lizardfishes
Gadiformes	Ophiidae	*Brotula spp.*	cusk-eels
Pleuronectiformes	Bothidae	*Bothus spp.*	lefteye flounders
Myctophiformes	Myctophidae	*n/a*	lanternfishes
Perciformes	Scombridae	*Auxis spp.*	mackerels
Scorpaeniformes	n/a	*n/a*	scorpionfishes and flatheads
Stomiiformes	Gonostomatidae	*n/a*	lightfishes
Perciformes	Sphyraenidae	*Sphyraena spp.*	barracudas
Stomiiformes	Gonostomatidae	*Cyclothone spp.*	lightfishes
Perciformes	Acropomatidae	*n/a*	lanternbellies

Order	Family	Genus/Species	Common Name
Pleuronectiformes	Bothidae	*n/a*	lefteye flounders
TOTAL (SPRING AND FALL)			
Gadiformes	Bregmacerotidae	*Bregmaceros spp.*	codlets
Clupeiformes	Engraulidae	*n/a*	anchovies
Myctophiformes	Myctophidae	*Diaphus spp.*	lanternfishes
n/a	n/a	*n/a*	unidentified fish
Stomiiformes	Sternoptychidae	*Maurolicus muelleri*	hatchetfish
Perciformes	Gobiidae	*n/a*	gobies
Clupeiformes	Clupeidae	*Etrumeus teres*	threadfin shad
Aulopiformes	Synodontidae	*n/a*	lizardfishes
Perciformes	Serranidae	*Anthias nicholsi*	yellowfin bass
Perciformes	Serranidae	*n/a*	sea basses
Myctophiformes	Myctophidae	*n/a*	lanternfishes
Perciformes	Trichuridae	*Trichurus lepturus*	Atlantic cutlassfish
Perciformes	Serranidae	*Epinephelus spp.*	sea basses
Clupeiformes	n/a	*n/a*	herrings and anchovies
Gadiformes	Ophiidae	*Brotula spp.*	cusk-eels
Pleuronectiformes	Bothidae	*Syacium spp.*	lefteye flounders
Pleuronectiformes	Soleidae	*Symphurus spp.*	tonguefish
Perciformes	Carangidae	*Selene vomer*	lookdown
Perciformes	Pomacentridae	*n/a*	damselfishes
Perciformes	Scombridae	*Euthynnus alleteratus*	Little tunny

Source: El Paso 2003b
n/a=not available

One type of vegetation present in the GOM and considered EFH is the floating seaweed *Sargassum*. *Sargassum* is considered a neuston species/community (i.e., organisms that live in the air-seawater interface). The *Sargassum* community comprises a unique and diverse association of organisms (MMS 2002a). Animals associated with *Sargassum* include hydroids, copepods, fish (54 species), crab, gastropods, polychaetes, bryozoans, anemones, and sea-spiders. Shrimp and crab comprise the bulk of the invertebrates and are a major source of food for associated fish. *Sargassum* acts as a vehicle for dispersal of some of its inhabitants and may be important in the life histories of many species of fish. It provides these species with a substrate, protection against predation, and concentration of food in the open GOM (GMFMC 1998). Large predators associated with the *Sargassum* complex include amberjacks (*Seriola dumerili)*, dolphin (*Coryphaena hippurus*), and almaco jacks (*Seriola rivoliana*). Sargassum may occur within the ROI and is designated as EFH for juvenile greater amberjack, gray triggerfish, and dolphin.

EHF types that would occur within the ROI include the water column, sediments, and *sargassum*. More detailed descriptions of EFH for species within the ROI by life history stage is presented in Tables D-1 and D-2 of Appendix D.

3.2.5.4 Artificial Reef Communities

Two types of artificial reefs exist in the GOM: 1) those structures placed in the water to serve as artificial reefs; and 2) those structures placed in the water to serve another purpose (e.g., oil and gas

production) (GMFMC 1998). There are currently no artificial reefs within the ROI. However, components of the proposed Port, i.e., the pipelines and the metering platform, would constitute artificial reefs. The following description is included for that reason. The impact of the Proposed Action as an artificial reef is described in Section 4.2.2.4.

The attraction of biota to artificial reefs and their longevity at particular structures varies depending upon the ecological role of the species in question, as well as environmental conditions. Fishes can generally be classified as either resident or transient.

Within the resident community, two groupings can be made. The first group includes species directly dependent upon the biofouling community for food or cover. The second group includes those species that appear attracted to the structures for cover, exhibiting little trophic dependence on the biofouling community. Fishes that are trophically independent of platforms are often responsible for most of the fish biomass around production platforms (GMFMC 1998). Atlantic spadefish (*Chaetodipterus faber*), lookdown (*Selene vomer*), Atlantic moonfish (*Selene setapinnis*), and the creole-fish (*Paranthias furcifer*) all occupy a similar trophically independent niche and comprise high biomass around production platforms (GMFMC 1998).

Resident benthic species around production platforms that appear trophically independent of the biofouling community include the red snapper (*Lutjanus campechanus*). Red snapper exhibit site fidelity, and population levels have been observed as high as 7,000 individuals around major platforms (GMFMC 1998). This species is trophically linked to the surrounding soft bottom motile epifauna, preying mainly upon shrimp, swimming crabs, and fish. Red snapper feed at night over soft bottoms away from the platforms, and return to the platforms during the day for cover. Other species having a similar trophic mode include large tomtate (*Haemulon aurolineatum*), and several large groupers (GMFMC 1998).

Resident species that appear trophically dependent upon the biofouling community for food or cover include small cryptic forms such as combtooth blennies (Blenniidae), as well as large grazers (e.g., sheepshead [*Archosargus probatocephalu*s]), and small grazers (e.g., butterflyfishes [Chaetodontidae]). Sheepshead exhibit site fidelity with population levels proportional to the submerged area of structure. Normal density of sheepshead was estimated to be about 0.3 fish/m of submerged platform substrate (GMFMC 1998).

With the exception of barracuda (*Sphyraena barracuda*), almaco jack (*Seriola rivoliana*), hammerhead sharks (*Sphryna* spp.), and cobia, most of the large predators around petroleum platforms do not appear to be residents, but rather are believed to be highly transient. The above-listed species, along with the bluefish, are either known or expected to feed upon other resident species and probably have a longer resident time at platforms than do the other large predators such as various mackerels (Scombridae), jacks (*Caranx* spp.), and the little tunny. The latter species come and go to platforms for periods of a few hours to a few days as they follow large schools of prey species. Both the pelagic prey and predator species are attracted to structures, but with different schools constantly moving into and away from the structures. Large variations in the daily number of pelagic species are normal. The results of one study showed that as many as 10,000 fish were attracted to small, floating structures one day after they were positioned (GMFMC 1998).

Zonation of fishes other than cryptic blennies at shallower coastal platforms was not evident (GMFMC 1998). Dominant species were sheepshead and schools of Atlantic spadefish. Also in schools were bluefish and blue runner (*Caranx crysos*). Individual specimens of lookdown and Atlantic moonfish were also observed. Other reef-associated species observed were whitespotted

soapfish (*Rypticus maculatus*), gray triggerfish, lane snapper, and two species of grouper (*Epinephelus nigritus* and *Mycteroperca rubra*) (GMFMC 1998).

Dominant fishes at an offshore platform were bluefish, spadefish, and mixed schools of moonfish and lookdowns (GMFMC 1998). Blue runner and other jacks (crevalle jack [*Caranx hippos*], greater amberjack, and almaco jack) were common. Sheepshead and gray triggerfish were present but not abundant, and large predators were represented by barracuda, cobia, and a nurse shark (*Ginglymostoma cirratum)*. Reef fish encountered included cocoa damselfish, cubbyu, whitespotted soapfish, bigeye, and bermuda chub. The snapper/grouper assemblage was a major component of the ichthyofauna, being represented by large schools of gray snapper and medium-to-large schools of red and lane snapper. Scamp (*Mycteroperca phenax)* were also abundant (GMFMC 1998).

3.2.6 Protected Seabirds and Migratory Birds

Nonendangered and Nonthreatened Seabirds and Migratory Birds

The following description of seabirds and migratory birds is written because the proposed deepwater Port could potentially impact trans-Gulf migrant birds, which are protected under the MBTA. The GOM is an important pathway for migratory birds, including many coastal and marine species, and large numbers of terrestrial species. Most of the migrant birds (especially passerines or perching birds) overwinter in the neotropics (tropical Central America and South America), and breed in eastern North America, either directly cross the GOM (trans-Gulf migration) or move north or south by traversing the GOM coast or the Florida Peninsula (MMS 2002b). Recent studies indicate that the flight pathways of the majority of the trans-Gulf migrant birds during spring are directed toward the coastlines of Louisiana and eastern Texas. During overwater flights, migrant birds (other than seabirds) commonly use offshore oil and gas production platforms for rest stops or as temporary shelter from inclement weather. Thus it is believed that these platforms may serve as artificial islands for these species during their migrations (MMS 2002a, b).

Seabirds are defined as those species that spend extended periods away from land and obtain all or most of their food from the sea while flying, swimming, or diving. Within the GOM, there are five taxonomic orders of seabirds and migratory birds: Gaviiformes (loons), Podicipediformes (grebes), Procellariiformes (albatrosses, fulmars, petrels, shearwaters, and storm-petrels), Pelicaniformes (pelicans, tropicbirds, boobies and gannets, cormorants, and frigatebirds), and Charadriiformes (phalaropes, gulls, terns, noddies, and skimmers). Many species migrate and are found within the GOM region only seasonally (MMS 1994).

Some species of seabirds inhabit only pelagic habitats in the GOM (OCS and beyond) (e.g., boobies, petrels, and shearwaters). Most GOM seabird species, however, inhabit waters of the continental shelf and adjacent coastal and inshore habitats (Clapp et al. 1982; MMS 2002b).

GOM seabirds can be categorized as summer migrant pelagics, summer residents, wintering marine species, or permanent residents (Fritts and Reynolds 1981). Summer migrant pelagic species are those that are present in the GOM during the summer but breed primarily elsewhere (e.g., black tern, boobies, shearwaters, storm-petrels, and tropicbirds). Summer residents are those that are present during summer months, but also breed in the GOM (e.g., least tern, sandwich tern, and sooty tern). Wintering marine bird species are those that may be found in the GOM only during winter months (e.g., Herring gull, jaegers, and northern gannet). Permanent resident species are found in the GOM throughout the year (e.g., laughing gull and royal tern are permanent residents within the ROI) (MMS 2002a).

Seabird distributions and abundances in the offshore waters of the GOM were studied in the GulfCet I and II surveys (MMS 1996b; MMS and USGS 2000). The GulfCet I survey identified 14 species represented over 99 percent of the total sightings. The most abundant species sighted were terns, storm-petrels, jaegers, and laughing gulls (*Larus atricilla*). Water depth influenced the distribution of species groups and individual species of seabirds, which varied both spatially and seasonally (MMS 1996b). Other environmental parameters, such as sea surface productivity, that affected seabird distribution were identified in GulfCet II (MMS and USGS 2000). Other evidence indicates that seabird groups tend to concentrate at fronts defined by steep temperature gradients (Ribic et al. 1997). Highest species diversity of seabirds was associated within cyclonic eddies, while lowest species diversity occurred on the continental shelf (MMS and USGS 2000). Species diversity was greatest in spring and lowest in winter and fall, and sighting rate, or numbers of bird sightings per day, was highest in summer and lowest in fall (MMS 1996b; MMS and USGS 2000).

Endangered and Threatened Bird Species

While no species of threatened or endangered birds that occur in ROI. The following descriptions of the Southern bald eagle (*Haliaeetus leucocephalus*) (threatened), brown pelican (*Pelicanus occidentalis carolinensis*) (endangered), and piping plover (*Charadrius melodus*) (endangered) are included because of the support activities that would be associated with proposed Port. Support activities for the proposed Port would deploy from existing shore-based facilities at Sabine Pass, Texas, and from other manned platforms offshore. All of the required support activities would be conducted as an additional mission to existing offshore activities. No new infrastructure, support vessels or helicopters would be dedicated to the proposed Port for support activities. As such, neither these species nor there critical habitat are likely to be adversely affected by the proposed support activities. The following descriptions of endangered bird species of the central GOM have been developed with these considerations in mind.

Southern Bald Eagle. The Southern bald eagle (*Haliaeetus leucocephalus leucocephalus*) is listed as threatened. It is a terrestrial raptor that is widely distributed across the southern U.S., including coastal habitats along the GOM. Bald eagles nest in Louisiana from October through mid-May. Eagles typically nest in bald cypress trees near fresh to intermediate marshes or open water in the southeastern parishes (Firmin 2003). Eagles infrequently nest near large lakes in central and northern Louisiana (Firmin 2003). Areas with high numbers of nests include the Lake Verret Basin, south to Houma, the southern marsh ridge from Houma to Bayou Vista, the north shore of Lake Pontchartrain, and the Lake Salvador area. One hundred twenty bald eagles nests have been found in Louisiana; only three nests occurred within 5 mi of the coast (MMS 2002a). The GOM coast is inhabited by both wintering migrant northern bald eagles (*Haliaeetus leucocephalus alascanus*) and resident Southern bald eagles (MMS 2002b).

Major threats to this species include habitat alteration, human disturbance, and environmental contaminants (i.e., organochlorine pesticides and lead) (Firmin 2003). Although 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, it is currently listed as threatened (MMS 2002a).

Eastern Brown Pelican. The Eastern brown pelican (*Pelicanus occidentalis carolinensis*) is listed as endangered is listed as endangered in Mississippi, Louisiana, and Texas. It is one of two pelican species occurring in North America. Brown pelicans are currently known to nest east of the ROI on Raccoon Point on Isles Dernieres, Queen Bess Island, Plover Island (Baptiste Collette), Wine Island, and islands in the Chandeleur chain in coastal Louisiana. Pelicans change nesting sites as habitat changes occur. Thus, pelicans may also be found nesting on mud lumps at the mouth of South Pass

(Mississippi River Delta) and on small islands in St. Bernard Parish, Louisiana. In winter, spring, and summer, nests are built in mangrove trees or other shrubby vegetation, although occasional ground nesting may occur (Firmin 2003).

Brown pelicans feed in shallow estuarine waters, using sand spits and offshore sand bars as rest and roost areas along coastal Louisiana. Brown pelicans are known to forage as far as 20 mi offshore of the Louisiana Gulf Coast, and it is possible that they could range slightly farther than 20 mi offshore if they become lost or disoriented (Firmin 2003).

Major threats to this species include chemical pollutants, colony site erosion, disease, and human disturbance (Firmin 2003). Following the ban of DDT, this species has successfully recolonized much of its former range and has been delisted from its endangered status from much of its range; however, it is still listed as endangered in Louisiana (USFWS 1995).

Piping Plover. The piping plover (*Charadrius melodus*) is listed as endangered. The piping plover and its designated critical habitat, occur along the Gulf of Mexico shoreline (Firmin 2003). Piping plovers winter in Louisiana, and may be present for 8 to 10 months; they arrive from the breeding grounds as early as late July and remain until late March or April. Piping plovers feed extensively on intertidal beaches, mudflats, sand flats, algal flats, and wash-over passes with no or very sparse emergent vegetation; they also require unvegetated or sparsely vegetated areas for roosting. Roosting areas may have debris, detritus, or micro-topographic relief offering refuge to plovers from high winds and cold weather. In most areas, wintering piping plovers are dependant on a mosaic of sites distributed throughout the landscape, as the suitability of a particular site for foraging or roosting is dependent on local weather and tidal conditions. Plovers move among nesting sites as environmental conditions change (Firmin 2003).

Designated piping plover critical habitat includes those specific areas that are essential to the conservation of that species (Firmin 2003). The primary constituent elements for piping plover wintering habitat are those that support foraging, roosting, and sheltering, and the physical features necessary for maintaining the natural processes that support those habitat components. Constituent elements are found in geologically dynamic coastal areas that contain intertidal beaches and flats (between annual low tide and annual high tide), and associated dune systems and flats above annual high tide. Important components (or primary constituent elements) of intertidal flats include sand and/or mud flats with no or very sparse emergent vegetation. Adjacent unvegetated or sparsely vegetated sand, mud, or algal flats above high tide are also important, especially for roosting plovers. Major threats to this species include the loss and degradation of habitat due to development, disturbance by humans and pets, and predation (Firmin 2003).

3.3 Cultural Resources

3.3.1 Definition of the Resource

Cultural resources or historic properties consist of prehistoric and/or historic sites, structures, buildings, objects, or features that are made or modified in the course of human activities. Since it is national policy to foster conditions in which our modern society and our prehistoric and historic resources can exist in productive harmony, Federal laws and regulations direct action associated with the discovery, assessment, and management of these resources.

The most important of the Federal mandates is the National Historic Preservation Act (NHPA) as amended. Section 106 of the act requires agencies to take into account the effect of their undertakings on properties in or eligible for listing in the National Register of Historic Places (NRHP) and to afford the Advisory Council on Historic Preservation (ACHP) an opportunity to comment on the undertaking.

The USCG and MARAD are using MMS guidance for cultural resources surveys on the OCS, found in 30 CFR 250.194, to determine whether cultural resources are present in the area of potential effect. Other guidance includes the MMS Notice to Lessees 98-06, *Archaeological Requirements;* Notice to Lessees 98-20, *Shallow Hazards Requirement (NTL 2002-GO1); and* .the Archaeological and Historic Preservation Act of 1974.

MMS requirements in 30 CFR 250.194 require that an archaeological report, based on geophysical and other data, be prepared if there are indications that a significant archaeological resource may exist within a lease area. For offshore historic resources, this decision is based on whether a historic shipwreck is reported to exist within or adjacent to a lease area. For offshore prehistoric resources, all leases shoreward of the 146-foot (45-meter) bathymetric contour are required to have an archaeological survey prior to initiating exploration and development activities.

If evidence of a possible archaeological resource within the area of interest is found, the proposed action must either be moved to avoid the possible resource or the proponent must conduct further investigations to determine if an archaeological resource actually exists at the location. If an archaeological resource is present at the location of a proposed activity and cannot be avoided, the Maritime Administrator will consult with the MMS Regional Director to determine the procedures required to protect the resource.

3.3.2 Existing Conditions

Analysis of archaeological evidence has determined that early humans first came to the GOM area around 12,000 years before present (B.P.) (MMS 2002a). Not only has research shown that humans were present, geological evidence has been recovered that helps identify the most probable locations of the early settlements.

Approximately 19,000 years ago, so much water was locked in glacial ice that global (eustatic) sea levels were approximately 120 m lower than today. Large expanses of what is now the OCS were exposed as dry land. As late Pleistocene/early Holocene climatic conditions ameliorated, sea level began rising, drowning the continental shelf. The position of the shoreline at 12,000 B.P. roughly corresponds with the 45-meter bathymetric contour; thus, inundated prehistoric sites may exist shoreward of the 45-meter contour. The 12,000 B.P. shoreline roughly coincides with the 45-meter bathymetric contour; thus, inundated prehistoric sites may exist on or shoreward of the 45-meter contour. Since known prehistoric sites on land usually occur in association with certain types of geographic features, prehistoric sites should be found in association with those same types of features now submerged and buried on the continental shelf.

Regional geologic mapping studies by MMS provide a framework that helps the interpretation of marine geophysical data and suggests specific areas that have potential for containing evidence of past human activity. These data allow interpretations to go beyond identification of relict geomorphic features to an assessment of their archaeological potential in terms of their general age, the type of system to which they belong, and the geologic processes that formed and modified them. Therefore, it is possible not only to identify areas with potential for site occurrence but also the

potential for site preservation. In general, sites covered by sediments in a low-energy environment (e.g., floodplains, bays, lagoons, river terraces, and subsiding deltas) prior to the sea's inundation of the area will have a high degree of preservation. Other protected areas (e.g., depressions, ponds, lakes, and sinkholes) and areas subjected only to low wave energy also would favor site preservation (MMS 2002a).

Historically, settlement and development of Louisiana has been closely tied to maritime activities in the Gulf of Mexico. Shipping routes from all historic periods crossed the GOM, typically hugging the coast. Later, oil production, shipbuilding, and associated industries were added to the traditional trade and fishing fleets on the Gulf Coast (CEI 1977).

A study of historic shipwrecks conducted by the MMS found that about 75 percent of shipwrecks occur in waters near shore, with the remainder occurring in the open sea. The study concluded that wrecks are associated with approaches to seaports, straits, shoals, reefs, and along maritime routes. From searching shipwreck databases and historic accounts, it is estimated that there have been about 4,000 shipwrecks from 1500 to the present (Garrison et al. 1989).

3.4 Geological Resources

3.4.1 Definition of the Resource

Geological resources within a given physiographic province consist of the surface and near surface materials (i.e., rock and soil) of the earth and regional or local forces by which they are formed. These resources are typically described in terms of regional and local geology, soil resources, topography, mineral (paleontological, if applicable) resources, and geologic hazards. Regional and local geologic resources are comprised of earth materials within a specified region and the forces that have shaped them. This includes bedrock or sediment type and structure, unique geologic features, depositional or erosional environment, and age or history. Soils resources are the unconsolidated, terrestrial materials overlying the bedrock or parent material. Topography is the discussion of the geomorphic characteristics of the land or seafloor surface, including elevations, relationship with adjacent land features, and geographic location. Mineral and paleontological resources include usable geologic materials that have some economic or academic value. Geologic hazards comprise the regional or local forces or conditions that could have the potential to impact a proposed development or land use and include, for example, seismicity, slope stability, expansive soils or bedrock, and subsidence or settlement.

3.4.2 Existing Conditions

3.4.2.1 Regional Geology

The four distinct physiographic regions of the GOM include the continental shelf, continental slope, continental rise, and abyssal plain. The proposed location of the Energy Bridge is located within the Northern Continental Shelf and, specifically, the Texas-Louisiana Shelf. The continental shelf slopes gradually away from shore, usually at one degree or less, and extends out to a water depth of approximately 656 ft (200 m). The continental slope extends from the seaward edge of the continental shelf to an approximate depth of about 6,560 ft (2,000 m) and is the region of the GOM where the most significant geological hazards are found because of interactions between salt tectonics and the rapid rate of sedimentation (ENSR 2002). The continental rise is an apron of sediment that has accumulated at the base of the continental slope, which inclines gently seaward to

the abyssal plain. The abyssal plain is the deepest portion of the GOM and has a depth typically greater than 6,560 ft (2,000 m).

The Northern Gulf Continental Shelf ranges in width from approximately 130 NM (240 km) off the west coast of Florida to approximately 8.6 NM (16 km) in the area of the Mississippi River Delta. The continental shelf contains many areas of deltaic sedimentation, primarily from the Mississippi Delta and to a lesser degree the Brazos-Colorado and Rio Grande Deltas (ENSR 2002). The seafloor of the shelf is generally smooth, with some local areas of subdued topography remaining from times of exposure during lower sea levels.

The Northern Gulf Continental Shelf, including the Texas-Louisiana Shelf, of the GOM is underlain by Quaternary Period sedimentary deposits that originated from rivers and deltas in a coastal plain setting. The presence of these and other deposits within the GOM indicate that a major river system corresponding to the Mississippi River has persisted in the Louisiana region at least since the beginning of the formation of the GOM as a result of the separation of the North and South American Plates approximately 160 million years ago (late Jurassic period) (ENSR 2002). The entire suite of sedimentary deposits associated with this region has advanced progressively south into the GOM through time, and this advancement continues to date.

During episodes of glaciation in the Pleistocene Epoch (1.8 million to 11,000 years ago), the earth's sea level dropped and the GOM shoreline moved farther seaward resulting in the deposition of river sediments farther out into the GOM. This deposition occurred during the sea regression in the Pleistocene Epoch and has not occurred again to date. The regression of the sea resulted in the development of additional drainage networks and channelization of the previously existing submarine deltaic deposits. Interglacial warming episodes, resulting in sea-level elevation rises (transgression) and corresponding resumption of deltaic shelf-outbuilding conditions, restored the deltaic depositional environment, causing infilling of the channels (Stanley 1986; USGS 2001). This rise in sea level changed the depositional environment of the region, causing the emergence of estuarine and ultimately shallow marine conditions and the infilling of stream channels with dominantly fine-grain clastic sediments such as clays (Thales Geosolutions, Inc. 2002). This transgressive/regressive depositional environment resulted in the formation of channelized deltaic deposits with a mosaic of interwoven clastic (sand, silt, and clay) deposits characteristic of the Mississippi Delta region.

3.4.2.2 Local Geology

The proposed location of the El Paso Energy Bridge GOM is in Blocks EC 335, WC 603, WC 602, WC 601, and WC 600 of the GOM (ENSR 2002). The Texas-Louisiana Shelf underlying these lease blocks is comprised of unconsolidated Quaternary clastic deltaic, estuarine, and shallow marine sediments characteristic of the Mississippi Delta region. The sediments within this region range from sands and shelly sands on the beaches of barrier islands to muddy sands and silty clays from a few miles offshore to the shelf break. Surficial sediment deposits in the vicinity of the proposed El Paso Energy Bridge GOM originated from sediments of streams and minor rivers emptying into the GOM at or near the southwestern Louisiana coast, and from current-, wave-, and storm-reworked deltaic sediments (Stanley 1986). The vicinity of the proposed location of the El Paso Energy Bridge GOM is underlain by silty clays and clayey sands. Figure 3-2 depicts a detailed sediment distribution map for the proposed location.

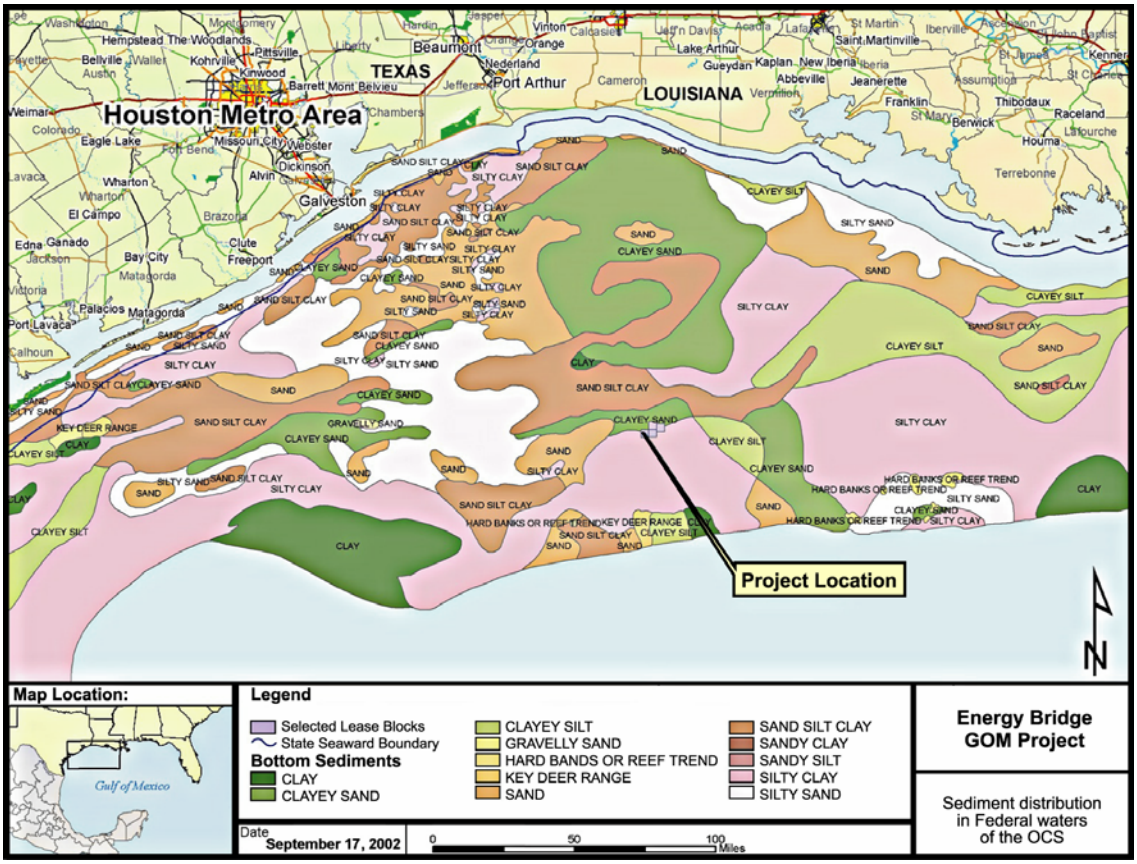


Figure 3-2. Sediment Distribution for the Proposed El Paso Energy Bridge GOM Location

Thales Geosolutions, Inc. performed a geophysical survey of the proposed pipeline routes and construction sites in August 2002 (Thales Geosolutions, Inc. 2002). A review of this report provides detailed information within the proposed Energy Bridge location pertaining to topographic features, man-made features, and surficial geologic features. A limited geologic interpretation discussion was included in the report based on acoustic records and published research papers. Silty clay sediment dominates the seafloor in the immediate vicinity of the project area, with two underlying erosional unconformities created by the Pleistocene Epoch regressive/transgressive sea level cycles. Specifically, sediment deposits along the pipeline route vary from 19 to 31 ft. (5.8 m to 9.4 m) in thickness of soft silty clay, with two underlying erosional (wave-cut terrace and truncated, steeply dipping reflectors) unconformities comprised of sandier fluvial and estuarine sediments.

Soil Resources

Soils are formed and located on land. Soil resource issues are not discussed in this EA, as the structures and activities under the proposed El Paso Energy Bridge GOM are located entirely within the GOM.

Topography

The proposed El Paso Energy Bridge GOM project is approximately 116 NM (187 km) south of the southwestern Louisiana coast within the Texas-Louisiana Shelf of the GOM. The entire proposed location, including subsea pipelines, is within Blocks EC 335, WC 600, WC 601, WC 602, and WC 603. The seafloor underlying this area slopes gently to the south-southwest with an average gradient

of about 0.16 percent (0.93) (Thales Geosolutions, Inc. 2002) and is relatively featureless and level (ENSR 2002). Water depths in the vicinity of the proposed Energy Bridge GOM project vary from 262 ft (79.9 m) in Block WC 600 to 307 ft (93.6 m) at the southern edge of Block WC 603.

As shown on Figure 3-3, there are no significant topographic features mapped by MMS within 15 mi of the proposed Port location. The closest eight topographic features to the proposed Port include: Fathom Bank (26.6 mi west northwest), McNeil Bank (27.5 mi west), Rankin Bank (25.8 mi west southwest), Bright Bank (18.7 mi southwest), Geyer Bank (15.2 mi south), Elvers Bank (20.1 mi southeast), McGrail (27.3 mi east southeast) and East Flower Garden Bank (33.7 mi east southeast of the STL buoy).

Mineral Resources

Economic offshore mineral resources of the GOM include phosphate, sulfur, salt, lime, limestone, sand and gravel, magnesium, oil, and gas. Oil and gas operations have become the largest industrial enterprise within the GOM. The Texas-Louisiana Shelf is a very active oil and gas producing area. The large amounts of sediment carried by the Mississippi River over the past 20 million years have created a major sedimentary basin with optimum characteristics for the successful formation and accumulation of oil and gas deposits (ENSR 2002). The proposed El Paso Energy Bridge GOM occurs within regions of active oil and gas production; however, only five lease blocks (WC 600, WC 601, and EC 335) have underlying oil or gas fields. The WC 600 field underlies Block WC 600, and the EC 334 field underlies blocks WC 601 and EC 335. Even though the general project area is located in a highly productive area for oil and natural gas, there are currently no active oil or natural gas platforms within 2 mi (3 km) of the proposed STL buoy. (ENSR 2002).

Sand and gravel deposits include Pleistocene river and coast-parallel terrace deposits and Holocene river alluvium. These deposits are primarily mined on or near shore to provide economically feasible extraction and transportation. Due to the distance offshore, the proposed El Paso Energy Bridge GOM does not contain economically feasible sand or gravel deposits (ENSR 2002).

Within the GOM, salt and sulfur deposits often occur as salt domes and are frequently associated with hydrocarbon deposits. Thick salt deposits were formed in the shallow seas of the ancient GOM and are now deeply buried (ENSR 2002). Salt domes form as less dense salt intrudes upward into the overlying sediments. Where economically feasible, solution mining of these salt domes occurs to extract salt and sulfur; however, these activities do not occur in the proposed Energy Bridge location.

3.4.2.3 Geologic Hazards

Geologic hazards pose constructability and operational constraints that can usually be effectively mitigated through existing or new design engineering and technology. In the GOM area, major geologic and topographic features are located seaward from the proposed El Paso Energy Bridge GOM project site and thus will likely not affect the proposed project. For purposes of this study, geologic hazards are discussed under faulting and seismicity, slope stability, sediment degassing, diapiric structures, seafloor depressions, and seafloor features.

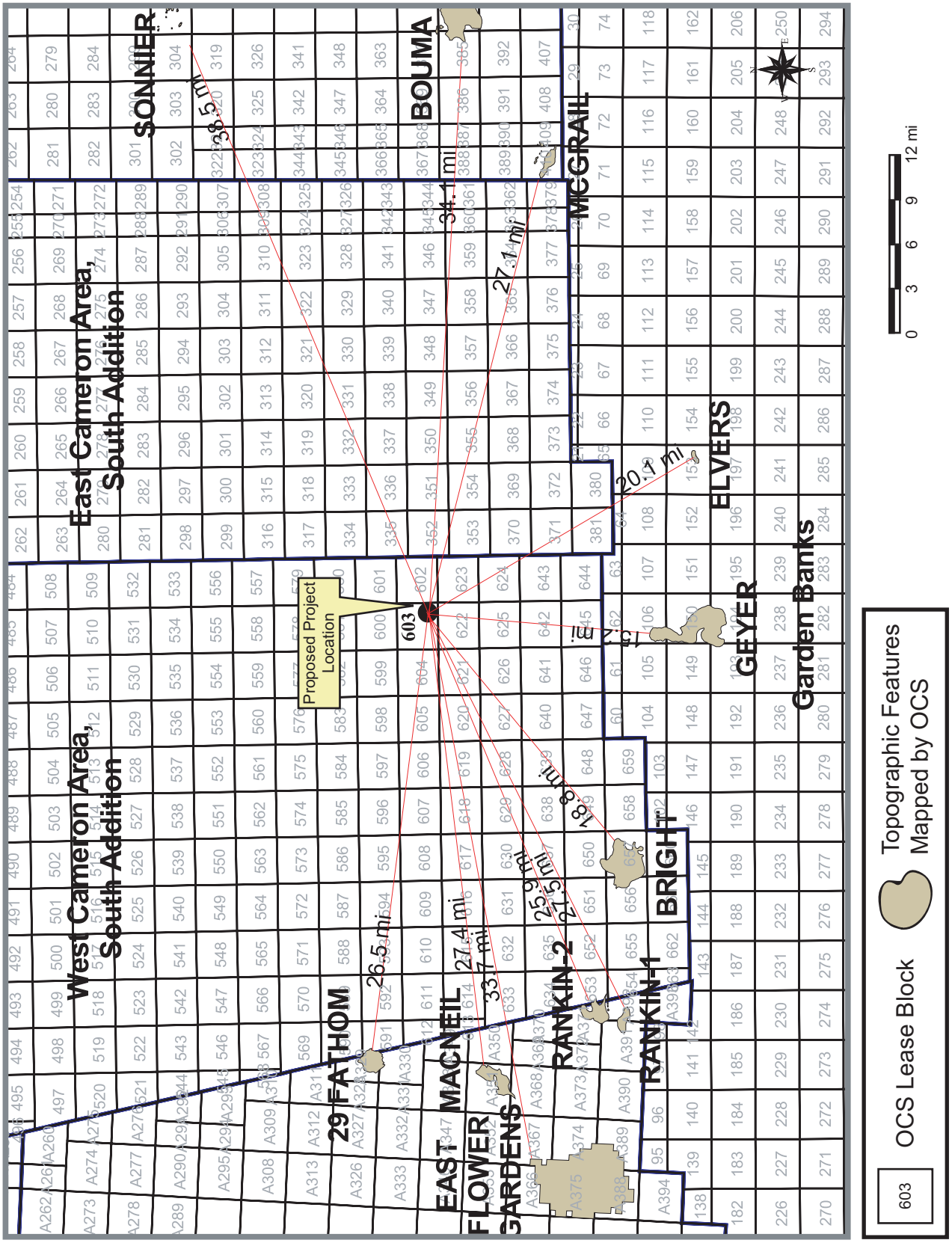


Figure 3-3. Topographic Features in the Western & Central OCS.

Faulting and Seismicity

The Texas-Louisiana Shelf is located in the south central area of the North American tectonic plate in a region of low seismic activity and faulting hazard. Historic records of seismic events in the region indicate that seismic shaking does occur; however, the magnitude and frequency are low. Based upon recent seismic conditions of the region, the greatest likelihood of any scale of groundshaking would be a result of activities in the New Madrid Seismic Zone around Northeastern Arkansas (Stevenson and McCulloh 2001). Consequently, there is a low probability of seismic shaking, fault rupture, or seismically induced geologic hazards, like liquefaction and/or tsunamis that would affect the proposed El Paso Energy Bridge GOM project site.

Local active faults occur within the Texas-Louisiana Shelf region, and are primarily attributed to massive accumulation and settlement (or growth faults) of the deltaic sediments and the vertical migration of salt or shale deposits. Growth faults continually form along with sediment deposition and are found mostly on the upper continental slope and on the continental shelf where sediment accumulation is the thickest.

A sub-bottom profile survey was conducted in the vicinity of the proposed STL buoy system, PLEM, metering platform, and along the pipeline route of the proposed Energy Bridge in July and August of 2002 (Thales Geosolutions, Inc. 2002). According to the survey, shallow faulting is present in the proposed El Paso Energy Bridge GOM location in the form of two narrow graben trends. One fault trend runs in an east-west direction and crosses the survey area north of the tie-in found in Block WC 601, while another runs in a northwest-southeast direction in Block EC 335. Reportedly, these faults are related to salt movement at depth and extend to the sea floor. Although faulting is detected in the vicinity of the proposed Energy Bridge, Thales Geosolution, Inc. concluded that the planned pipeline route would not cross any active faults, and no impacts should be realized (Thales Geosolutions, Inc., 2002; ENSR 2002).

Slope Stability

Geologic hazards associated with slope instability in marine environments include slumps, creep, mud or debris flows, and turbidity currents. Seafloor instability is considered the principal engineering constraint to construct bottom-founded structures, including pipelines. Mass movement of sediments sometimes results from pipeline construction. Slumping or sliding of sediments can also result in displacement, rupture, or total destruction of the pipeline. However, mass movements of sediments are usually limited to areas of the continental slope, as well as canyons and canyon heads. Impacts associated with mass sediment movement are not expected to occur within the proposed El Paso Energy Bridge GOM project area because the proposed pipeline route does not cross areas of the continental slope or areas of canyons. Shallow hazard surveys conducted along the proposed pipeline route revealed little or no potential for geologic effects related to slope stability. Generally, the seafloor at the proposed Energy Bridge site is smooth and featureless, without localized topographic irregularities. All slope gradients identified in the site vicinity are well below the 47.0 ft/mi or greater gradient typically associated with slope failures in the GOM.

Shallow Gas in Sediments

Shallow gas in near-seafloor sediments can contribute to sediment strength reduction, liquefaction, and slope failure by lowering the shear strength of the sediments. Decomposition of trapped organic matter is the primary source of biogenic interstitial gas. In addition, thermogenic gas, originating in deeply buried source rocks, can migrate upward and also become trapped in shallow marine

sediments (ENSR 2002). Shallow hazard surveys conducted for the proposed Energy Bridge, including the pipeline route, revealed little or no potential for gas-saturated sediments (Thales Geosolutions, Inc. 2002). The presence of shallow gassy sediments in the proposed Energy Bridge location is not expected to pose a technical or safety problem.

Diapiric Structures

Salt movement can cause potential hazards such as seafloor fault scarps slumping from steep unstable slopes, shallow gas pockets, seeps, and vents and rocky or hard bottom areas. There is no shallow evidence of diapiric structures at the proposed Energy Bridge location (Thales Geosolutions, Inc. 2002).

Seafloor Depressions

Pockmarks are formed when gas bubbles, found along the seafloor, are released by natural events or human activities. Earthquakes, seafloor dragging, and even anchors dropped from boats may cause bubbles to be released in areas where gas has accumulated in adequate concentrations. Pockmarks appear to be unique to muddy, formerly glaciated areas. It is believed that thick glacial sediments may play an important role by trapping gas that would escape more readily in other depositional environments (ENSR 2002). Results from the survey indicate that the proposed Energy Bridge location contains no major topographic features; however, several pockmarks were identified within the survey area ranging from 10 to 200 ft (3 to 70 m) in diameter and depths of 1 to 2 ft (0.3 m to 0.6 m). The pockmarks were more common in Blocks WC 600 and WC 601, with fewer occurrences in Blocks WC 602, WC 603 and EC 335 (Thales Geosolutions, Inc. 2002).

Seafloor Features

Sediment waves, brine-flow channels, and seabed furrows are all evidence of strong bottom currents of water with varying amounts of sediments. Brine-flow channels are caused by the dissolution of near seafloor salt deposits generating high-density brines that move at sufficient velocity to erode and channelize the seafloor. These features are generally found on the continental slope and basin in deep water. Additionally, significant topographical features such as fault scarps, rock outcrops, and sand waves can cause spanning and result in pipeline stress. Sonograms were reviewed for the presence of surficial mass-movement features, mudmounds, rock outcrops, relict reef, and any other anomalous features. One small mudmound was identified in the southeastern corner of Block WC 600. This mudmound is minor, 1.5 ft (0.5 m) above the surrounding seabed. With the exception of the identified pockmarks and mudmound, no other geologic features were identified within the surveyed area (Thales Geosolutions, Inc. 2002).

The sub-bottom profile survey conducted for the proposed Energy Bridge did not detect any significant geologic hazards within the proposed project area (Thales Geosolutions, Inc. 2002). Additionally, prior to installation of the project components, El Paso Energy Bridge GOM would take geologic core samples in the proposed locations of the mooring anchors, PLEM, and metering platform. These cores will be analyzed and the results will be used to ensure that the seafloor and underlying strata are suitable to provide a foundation stable enough to support these facilities. Support facilities would be designed according to site-specific seabed and geology conditions. To minimize the potential effect from unexpected geologic events such as sediment slumping or tectonic activity, the proposed Energy Bridge would comply with relevant construction engineering standards.

3.5 Socioeconomics

3.5.1 Definition of the Resource

Socioeconomics are defined as the basic attributes and resources associated with the human environment, particularly population and economic activity. Regional birth and death rates and immigration and emigration affect population levels. Economic activity typically encompasses employment, personal income, and industrial or commercial growth. Changes in the fundamental socioeconomic indicators of population and economic activity may be accompanied by changes in other components such as housing availability and the provision of public services. Socioeconomic data at county, state, and national levels permits characterization of baseline conditions in the context of regional, state, and national trends.

3.5.2 Existing Conditions

The Project would be within an area of the GOM that supports multiple socioeconomic resources. Extraction, processing, and transport of oil and natural gas economically dominate the offshore area and coastal region that encompasses the proposed Project infrastructure. Historically, Louisiana has been heavily influenced by offshore drilling and oil support activities (Kelley 2002).

Commercial Fisheries

The GOM has one of the most productive fisheries, providing almost 21 percent of the commercial fish landings in the continental U.S. (MMS 2002a). Table 3-7 presents the total commercial landings in the GOM from 1990 through 2001.

Table 3-7. Total Commercial Landings in the GOM, 1990 – 2001

Year	Pounds	Value ($)
1990	1,659,732,834	667,346,642
1991	1,672,274,707	681,223,248
1992	1,426,004,731	655,640,926
1993	1,717,301,349	623,835,142
1994	2,160,872,631	789,876,241
1995	1,489,482,088	764,633,274
1996	1,519,396,286	713,931,363
1997	1,807,889,578	767,373,932
1998	1,575,639,613	786,367,339
1999	2,002,808,415	820,312,134
2000	1,794,218,466	995,000,814
2001	1,608,888,221	803,389,598

Source: O'Bannon 2002

In 2001, Louisiana had the second highest commercial fisheries landings in the U.S., following Alaska, at 1.3 billion lbs and valued at $400 million (O'Bannon 2002). Louisiana consistently had the highest landings in the GOM from 1997 to 2001 (NOAA Fisheries 2003c). However, the

Louisiana landings have the lowest value per pound (1997 – 2001 average) and were comprised predominantly of Gulf menhaden (NOAA Fisheries 2003c). Average annual landings of Gulf menhaden for this period were 1.29 billion pounds. Gulf menhaden was the fishery with the third highest ex-vessel value in the GOM (1997 – 2001 average). Average annual (1997 – 2001) ex-vessel value was $72 million; however, this is less than one cent per pound. Brown shrimp had the highest ex-vessel value (1997 – 2001 average) of $264 million. Menhaden is the most important fishing commodity in terms of pounds, but shrimp is the most important fishing commodity in terms of dollars. Other important species are crab, oysters, and mullet (ENSR 2002).

The GOM shrimp fishery is the most valuable fishery in the U.S., accounting for 69 percent of the total domestic production (MMS 2002a; O'Bannon 2002). Three species of shrimp—brown, white, and pink—dominate the shrimp landings by weight. The status of the stocks is as follows: (1) brown shrimp yields are at or near the maximum sustainable levels, (2) white shrimp yields are beyond maximum sustainable levels with signs of overfishing occurring, and (3) pink shrimp yields are at or beyond maximum sustainable levels (MMS 2002a).

Many commercial species besides shrimp harvested from the northern GOM are considered to be at or near an overfished condition. Continued fishing at the present levels may result in rapid declines in commercial landings and eventual failure of certain fisheries. Commercial landings of traditional fisheries such as red snapper, vermilion snapper, spiny lobster, jewfish, and mackerel have declined over the past decade despite substantial increases in fishing effort. Commercial landings of fisheries such as shark, black drum, and tuna have increased exponentially in the recent years, and those fisheries are thought to be in need of conservation (MMS 2002a; Grimes et al. 1992; NMFS 1997). The number of species designated by NOAA Fisheries as "over fished" would likely continue to rise under new, more stringent definitions in the MSA.

Recreational Fisheries

Marine fishing is a prominent recreational activity in the GOM. According to the NOAA Fisheries Marine Recreational Fishery Statistics Survey (MRFSS), over 3 million marine recreational anglers participated in 22.8 million trips and caught a total of 163 million fish in the Gulf (excluding offshore Texas) in 2001 (NOAA Fisheries 2003d). Sixteen percent of these trips were made in Louisiana. In the GOM, 7 percent of recreational fishing is conducted from charter boats and about 50 percent is done from private or rented boats. The remaining 43 percent of recreational fishing occur onshore (Entrix 2002). The total recreational catch from 1995-2002 is presented in Table 3-8. More than 20 percent of the recreational anglers in Louisiana were non-coastal residents or from out of state, from 1995 through 2002 (NOAA Fisheries 2003d).

A majority of the offshore recreational fishing in the central portion of the GOM is directly associated with oil and gas structures. Recreational anglers catch at least 46 different fish species near oil and gas platforms in the central GOM (MMS 2002b). Interest remains high throughout the GOM region to acquire, relocate, and retain selected oil and gas structures in the marine environment for use as dedicated artificial reefs to enhance marine fisheries when the structures are no longer useful for oil and gas production (MMS 2001b).

Table 3-8. Recreational Fish Catches in the Exclusive Economic Zone off the Coast of Louisiana

Year	Total Catch	
	Numbers	Pounds
1995	1,455,325	3,237,616
1996	937,457	2,129,313
1997	1,117,157	2,332,581
1998	556,474	1,536,498
1999	855,617	2,276,602
2000	982,392	1,715,452
2001	722,716	2,277,270
2002	931,563	2,274,949

Source: NOAA Fisheries 2003d

Tourism

Coastal and offshore activitities attract tourists and residents along the GOM Coast.

Beaches hold opportunities for fishing, beachcombing, camping, picnicking, and bird watching (MMS 2002a). Beach use is a major economic component of many of the GOM coastal communities, especially during the peak-use spring and summer seasons. Beach activities and the aesthetic value of the shoreline are important economic factors in the coastal zone. The scenic and aesthetic value of Gulf Coast beaches plays an important role in attracting both residents and tourists to the coastal zone.

Offshore activities such as sport diving and boating are also tourist activities that generate revenue along the GOM coast. Prominent natural features (e.g., flower garden banks) serve as primary diving destinations for sport divers.

Leasing Activities

There are a number of OCS oil and gas leasing activities in the general project area. The proposed buoy, mooring area, PLEM, delivery pipelines, and metering platform would all be located in Block WC 603. The proposed seabed pipelines would run through blocks WC 602, WC 601, WC 600, and EC 335. Table 3-9 shows which lease blocks and owners would be affected by the Proposed Action.

Onshore Socioeconomic Conditions

The closest onshore communities to the Proposed Action are Vermilion and Cameron parishes. As shown in Tables 3-10 and 3-11, Cameron Parish has a poverty level almost equal the national average and well below the state average. Vermilion Parish has a significantly higher poverty level than both the national and state averages. Both parishes are predominantly white.

Table 3-9. Identification of Lease Blocks Traversed by the Proposed Port and Pipelines

Lease Block	Proposed EBGOM Use	Current Oil and Gas Leaseholder/ Lease Number
WC 603	Deepwater Port Facilities (buoy, mooring area, PLEM, delivery pipelines, metering platform), Safety Zone, Precautionary Area	El Paso Production Company. (OCS-G 23780)
WC 602	Delivery pipeline crossing;	Kerr-McGee Oil and Gas Corporation. (OCS-G 24777)
WC 601	Delivery pipeline crossing; Bluewater Tap	Jointly owned by Pogo Producing Company and Exxon Mobil Corporation. (OCS-G12807) Denbury Offshore, Inc. (OCS-G3386)
EC 335	Delivery pipeline; Sea Robin Tap	Devon Energy Production Company, LP (OCS-G2439)
WC 600	Pipeline crossing	Samedan Oil Corporation (OCS-G12807)

Source: ENSR 2002

Table 3-10. Race and Poverty Characteristics in Cameron Parish, Vermilion Parish, the State of Louisiana, and the U.S.

	Cameron Parish	Vermilion Parish	State of Louisiana	U.S.
Total Population, 2001 estimate	9,805	53,661	4,465,430	281,421,906
Percent White, 2000	93.7	82.7	63.9	75.1
Percent Black, 2000	3.9	14.2	32.5	12.3
Percent American Indian, Eskimo, or Aleut, 2000	0.4	0.3	0.6	0.9
Percent Asian or Pacific Islander, 2000	0.4	1.8	1.2	3.7
Percent Other, 2000	0.9	0.3	0.7	5.5
Percent Reporting two or more races, 2000	0.7	0.8	1.1	2.4
Percent Living in Poverty, 1999	12.3	22.1	19.6	12.4

Source: U.S. Bureau of Census 2000

Onshore Support Facility. Personnel, vessels, and helicopters that could support the proposed Port would likely deploy from existing shore-based facilities in Sabine Pass, Texas, or from other manned platforms offshore, such as El Paso Field Service's (an affiliate of El Paso Energy Bridge Gulf of Mexico) platform on HI Block 264. Operation and maintenance of the custody transfer equipment on the metering platform would be the responsibility of the downstream pipeline company. No additional personnel or equipment would be specifically dedicated to the proposed Port.

Table 3-11. Economic and Business Characteristics in Cameron Parish, Vermilion Parish, the State of Louisiana, and the U.S.

	Cameron Parish	Vermilion Parish	State of Louisiana	U.S.
Private nonfarm establishments, 1999	178	956	101,020	7,008,444
Private nonfarm employment, 1999	1,882	9,468	1,579,949	110,705,661
Nonemployer establishments, 1999	730	3,046	228,628	16,152,604
Manufacturers shipments, 1997 ($1000)	n/a[1]	203,887	80,423,978	3,842,061,405
Retail Sales, 1997 ($1000)	29,098	277,531	35,807,894	2,460,886,012
Retail sales per capita, 1997	3,256	5,374	8,229	9,190
Percent of minority-owned firms, 1997	<100[2]	9.3	14.1	14.6
Percent of women-owned firms, 1997	22.6	20.7	23.9	26
Housing units authorized by building permits, 2000	42	125	14,720	1,592,267
Federal funds and grants, 2001 ($1000)	48,260	284,177	27,816,445	1,763,896,019
Local government employment – full-time equivalent, 1997	430	2,505	169,976	10,227,429

Source: U.S. Bureau of Census 2000
[1] Not available
[2] Fewer than 100 firms

Fabrication Facility. The proposed fabrication and staging areas have not been determined. Construction contracts would be awarded to existing fabrication sites with the capabilities to managing the required activities without modification to the existing businsess or infrastructure. It is anticipated that facilities would be selected from one, or a combination of, the following places: Houma, New Iberia, Louisa, Lafayette, or Morgan City, Louisiana; or Houston, Texas. Staging areas with the the required resources exist in Intracoastal City, Cameron, Houma, Port Fourchon, and Morgan City, Louisiana; and Port Arthur and Sabine Pass, Texas. The Applicant predicts that any one or a combination of these sites would be able to handle the proposed project without expansion since the technology would be typical of other OCS development and not unique to the Energy Bridge project.

3.6 Recreation

3.6.1 Definition of the Resource

Recreational resources are natural and man-made conditions that offer coastal visitors and residents diverse opportunities for beach and waterways use. Onshore support would be located in existing developed areas. The proposed STL buoy and fixed facilities (mooring anchors, PLEM, platform seafloor pipelines, and subsea tie-ins) would be offshore (seaward of the Sea Robin and Tennessee

Gas Pipeline Company metering platform). Therefore, shore-based recreation is only generally referenced.

3.6.2 Existing Conditions

The northern GOM coastal zone is one of the major recreational regions of the U.S., particularly in connection with marine fishing and recreational beach-related activities. The shorefronts along the coasts of Louisiana and Texas offer a diversity of natural and developed landscapes and seascapes. Residents and tourists use the coastal beaches, barrier islands, estuarine bays and sounds, river deltas, and tidal marshes for recreational activities. Commercial and private recreational facilities and establishments serve as primary interest areas and support services for people who seek the enjoyment of the recreational resources offered in the GOM (MMS 2002a).

The coastal zone of Texas and Louisiana is considered a major U.S. recreational region. Coastal recreational sources include recreational areas (e.g., national seashores, parks, beaches, wildlife lands), wilderness areas, wildlife sanctuaries, and scenic rivers, as well as resorts, marinas, and amusement parks, and ornamental gardens. Publicly owned coastal recreational resources include national seashores, parks, beaches, and wildlife lands. They also extend to designated preservation areas such as historic and natural sites, landmarks, wilderness areas, wildlife sanctuaries, and scenic rivers. Private and commercial recreational facilities along the Gulf Coast include resorts, marinas, amusement parks, and ornamental gardens (MMS 2001b).

Offshore activities such as sport diving and boating are also activities that attract tourists and residents. The abundance of marine mammals in the GOM offers a potential recreational and aesthetic resource in terms of tourism and activities such as whale watching.

3.7 Transportation

3.7.1 Definition of the Resource

Transportation refers to the movement of vessels and OCS activity support helicopters in the vicinity of the proposed project. Two primary vehicles are used for transportation in the GOM: supply vessels engaged in commercial, recreational, Federal, and state functions; and helicopters supporting various offshore activities. Transportation also includes the existing infrastructure of roads, rails, and inland waterways that may be impacted by a proposed action.

3.7.2 Existing Conditions

A wide-ranging domestic and foreign maritime industry exists in the northern GOM. Major trade shipping routes between ports in and outside the northern GOM occur via the Bay of Campeche, the Yucatan Channel, and the Straits of Florida. Fourteen of the 50 leading U.S. ports (based on millions of short tons in 1999) are located on the GOM. The five Gulf States, when ranked by state tons in 1999, are in the top 20, with Louisiana being ranked first (MMS 2002a). Louisiana's are ports critical for the movement of raw materials and finished products in support of the agricultural, mining, and industrial base of the state and other areas, particularly the Midwest (LTOTD 2003).

A large proportion of the GOM shipping traffic pertains to crude oil and petroleum products and is due to the region's extensive refinery capacity, easy port access, and a well-developed transportation system. Most crude oil produced within the GOM region is transported by pipelines from Gulf

terminals to refineries and onshore transportation routes. Petroleum products are barged, tankered, piped, or trucked from the large refinery complexes. Between 60 and 65 percent of the crude oil imported into the U.S. comes through GOM waters (MMS 2002a). The area also includes the Nation's Strategic Petroleum Reserve and Louisiana Offshore Oil Port (LOOP), the only deepwater crude-oil terminal in the country.

More than 4,000 offshore platforms play a pivotal role in the development of offshore oil and gas resources in the GOM. Supply vessels are primarily used to haul heavy cargo such as freshwater, fuel, equipment, and food to service bases, platforms, rigs, or barges. There are currently 376 supply vessels (platform supply vessels and anchor handling tugs/supply vessels) in the western and central portions of the GOM (increased from a 1993 low of 247 units) (MMS 2002a). Nearly three-quarters of the supply fleet is less than 200 ft long and works primarily in shallow waters; 28 percent of the fleet is 200 ft or larger and works primarily in deep waters.

There are two designated fairways for ship traffic in the area of the proposed deepwater Port: the Gulf Fairway and the Sabine Pass Fairway. The Gulf Fairway is an east-west corridor approximately 19 mi south of Block WC 603. The Sabine Pass Fairway is a northwest-southeast corridor approximately 13 mi northwest of the proposed site. There are presently no established safety zones in Block WC 603.

Helicopters transport personnel between service bases and offshore facilities. In some instances, helicopters are also used to carry equipment and supplies. Helicopter facilities, "heliports," are used primarily as flight support bases to service the offshore oil and gas industry. There are 29 such facilities in coastal southeastern Louisiana. The Federal Aviation Administration (FAA) regulates helicopter flight patterns (MMS 2002a).

3.8 Air Quality

3.8.1 Definition of the Resource

In accordance with Federal Clean Air Act (CAA) requirements, the air quality in a given region or area is measured by the concentration of various regulated pollutants in the atmosphere. The measurements of these "criteria pollutants" in ambient air are expressed in units of ppm or in units of micrograms per cubic meter ($\mu g/m^3$). This ambient air quality is a result not only of the types and quantities of atmospheric pollutants and pollutant sources in an area, but also surface topography, the size of the topological "air basin," and the prevailing meteorological conditions.

The CAA directed USEPA to develop, implement, and enforce regulations that would ensure clean and healthy ambient air quality. In order to protect public health and welfare, USEPA developed numerical concentration-based standards known as National Ambient Air Quality Standards (NAAQS) for pollutants that have been determined to affect human health and the environment. The NAAQS are currently established for six criteria air pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), respirable particulate matter (including particulates equal to or less than 10 microns in diameter [PM_{10}] and particulate matter equal to or less than 2.5 microns in diameter [$PM_{2.5}$]), and lead (Pb).

USEPA established both primary and secondary NAAQS under the provisions of the CAA. The primary NAAQS represent maximum levels of background air pollution that are considered safe, with an adequate margin of safety to protect public health. Secondary NAAQS represent the

maximum pollutant concentration necessary to protect vegetation, crops, and other public resources along with maintaining visibility standards. Table 3-12 presents the Federal primary and secondary NAAQS.

Table 3-12. National Ambient Air Quality Standards (NAAQS)

Pollutant	Standard Value		Standard Type
CARBON MONOXIDE (CO)			
8-hour Average	9 ppm	(10 mg/m^3) [2]	Primary and Secondary
1-hour Average	35 ppm	(40 mg/m^3) [2]	Primary
NITROGEN DIOXIDE (NO_2)			
Annual Arithmetic Mean	0.053 ppm	(100 µg/m^3) [2]	Primary and Secondary
OZONE (O_3)			
1-hour Average[1]	0.12 ppm	(235 µg/m^3) [2]	Primary and Secondary
8-hour Average[1]	0.08 ppm	(157 µg/m^3) [2]	Primary and Secondary
LEAD (PB)			
Quarterly Average		1.5 µg/m^3	Primary and Secondary
PARTICULATE < 10 MICROMETERS (PM_{10})			
Annual Arithmetic Mean		50 µg/m^3	Primary and Secondary
24-hour Average		150 µg/m^3	Primary and Secondary
PARTICULATE < 2.5 MICROMETERS ($PM_{2.5}$)			
Annual Arithmetic Mean		15 µg/m^3	Primary and Secondary
24-hour Average		65 µg/m^3	Primary and Secondary
SULFUR DIOXIDE (SO_2)			
Annual Arithmetic Mean	0.03 ppm	(80 µg/m^3) [2]	Primary
24-hour Average	0.14 ppm	(365 µg/m^3) [2]	Primary
3-hour Average	0.5 ppm	(1,300 µg/m^3) [2]	Secondary

Notes:

[1] In July of 1997, the 8-hour ozone standard was promulgated and the 1-hour ozone standard was remanded for all areas, except areas that were designated nonattainment with the 1-hour standard when the ozone 8-hour standard was adopted. USEPA estimates that the revised 8-hour ozone standard rules will be promulgated in 2003 – 2004. In the interim, no areas can be deemed definitively nonattainment with the new 8-hour standard.

[2] Parenthetical value is an approximately equivalent concentration

mg/m^3 – milligrams per cubic meter
µg/m^3 – micrograms per cubic meter

When the measured concentrations of regulated air pollutants exceed the pollutant-specific NAAQS, an area may be designated as a nonattainment area for that pollutant. The number of exceedances and the measured concentrations determine the nonattainment classification of an area. There are five classifications of nonattainment status: marginal, moderate, serious, severe, and extreme. A final designation regarding NAAQS conformance is unclassifiable. An unclassifiable air quality designation means that there is not enough information to appropriately classify an air basin or region, so the area is considered to be in attainment with the NAAQS. Based on these classifications, the responsible state or local agency with CAA implementation responsibilities will develop USEPA-approved rules, regulations, and pollutant-specific emission control programs that will reduce regional emissions and return the area to NAAQS attainment.

Regulation of Air Quality on the OCS

The attainment status of regional air quality in OCS waters is unclassified. The OCS areas are not classified because there is no provision for any classification in the CAA for waters outside of the boundaries of state waters (the seaward boundary for Louisiana extends 3 miles from the shore). In accordance with the CAA, only areas within state boundaries are to be classified as either attainment, nonattainment, or unclassifiable. The El Paso Energy Bridge GOM would be approximately 100 miles offshore, which is well beyond the 3-mile state boundary. Therefore, the Louisiana Department of Environmental Quality (LDEQ) air quality regulations, permitting, and review requirements would not apply to the proposed project.

Pursuant to CAA regulations promulgated in 40 CFR Part 328, USEPA does not normally administer the CAA in the GOM west of longitude 87º 30'. Typically, MMS is responsible for regulating such "OCS sources" in the area. However, a deepwater port constructed solely for the purpose of transporting imported resources does not meet the definition of an OCS source according to Section (a)(1) of the OCS Lands Act. USEPA Region 6 has made a preliminary determination that the proposed activities fall within its jurisdiction.

The MMS has officially determined that it does not have air jurisdiction over the proposed LNG facility and the jurisdiction for administrative Clean Air Act Amendments (CAAA) belongs to EPA.

USEPA's national air program is currently attempting to develop a nationally consistent policy regarding the regulation of deepwater port air emissions.

Regulated criteria pollutants and their effect on health and environmental welfare are discussed in more detail below.

O_3. Although O_3 is considered a criteria air pollutant and measurable in the atmosphere, it is not often considered a regulated air pollutant when calculating emissions because O_3 is typically not emitted directly from most emissions sources. O_3 is formed in the atmosphere by photochemical reactions involving sunlight and previously emitted pollutants or "O_3 precursors." These O_3 precursors consist primarily of nitrogen oxides (NO_x) and volatile organic compounds (VOCs) that are directly emitted from a wide range of emission sources. For this reason, regulatory agencies attempt to limit atmospheric O_3 concentrations by controlling VOC pollutants (also identified as reactive organic gases or ROG), and NO_x.

NO_2. NO_x emissions are primarily generated from the combustion of fuels. NO_x includes nitric oxide and NO_2. Because nitric oxide converts to NO_2 in the atmosphere over time and NO_2 is the more toxic of the two, NO_2 is the listed criteria pollutant. It can penetrate deep into the lungs where

tissue damage occurs. The control of NO_x is also important because of its role in the formation of O_3.

CO. CO is a product of fuel combustion, principally from automobiles and other mobile sources of pollution. The major immediate health effect of CO is that it competes with oxygen in the blood stream and can cause death by asphyxiation. However, concentrations of CO in urban environments are usually only a fraction of those levels that cause asphyxiation. Peak CO levels typically occur during winter months due to a combination of higher emission rates and stagnant weather conditions.

SO_2. SO_2 is produced when any sulfur-containing fuel is burned. It is also emitted by chemical plants that treat or refine sulfur or sulfur-containing chemicals. Health and welfare effects attributed to SO_2 are due to highly irritant effects of sulfate aerosols, such as sulfuric acid, which are produced from SO_2.

Particulate Matter (PM). Particulates in the air are caused by a combination of wind-blown fugitive dust; particles emitted from combustion sources (usually carbon particles); and organic, sulfate, and nitrate aerosols formed in the air from emitted hydrocarbons, sulfur oxides, and NO_x. Particulate matter may contribute to the development of chronic bronchitis and may be a predisposing factor to acute bacterial and viral bronchitis. In 1987, the USEPA adopted standards for PM_{10} and phased out the total suspended particulate (TSP) standards that had been in effect up to that time. In 1997, the USEPA adopted emission standards for $PM_{2.5}$ pollutants which, due to their size, have been determined by USEPA to lodge deep in lung tissue and cause chronic health impacts.

Lead. Lead exposure can occur through multiple pathways, including inhaling air and ingesting lead in food from water, soil, or dust contamination. Excessive exposure to lead can affect the central nervous system. Lead gasoline additives were a significant contributor to atmospheric lead emissions. Legislation in the early 1970s required gradual reduction of the lead content of gasoline over a period of time, which has dramatically reduced lead emissions from mobile and other combustion sources. In addition, unleaded gasoline was introduced in 1975, and together these controls have essentially eliminated violations of the lead standard for ambient air in urban areas. Hence, many states do not provide a background level for lead.

Applicable Regulatory Requirements

As specified under USEPA guidance and Federal CAA regulations (40 CFR 55.15), the specific provisions of the CAA that should be considered for relevance to the stationary operational emission sources from OCS sources include the following:

- New Source Performance Standards (NSPS)
- National Emission Standards for Hazardous Air Pollutants (NESHAP)
- Prevention of Significant Deterioration (PSD)
- Title V Operating Permits (Title V)
- New Source Review (NSR)

Each of these components is discussed below, along with its relevance to the Proposed Action.

New Source Performance Standards (NSPS)

NSPS include emission controls and operational requirements on specific stationary emission source types or categories, as specified under the CAA. The only proposed stationary emission source includes an emergency generator (30 kW) and a natural gas-fired heater located on the metering platform approximately 2 mi from the STL buoy, NSPS do not apply to these stationary devices, nor to the emissions associated with the international vessels that would dock and use the Energy Bridge.

National Emission Standards for Hazardous Air Pollutants (NESHAP)

NESHAP Parts 61 and 63 regulate the emission of hazardous air pollutants (HAP) from existing and new sources. The Clean Air Act Amendments (CAAA) of 1990, under revisions to Section 112, requires USEPA to list and promulgate NESHAP to reduce the emissions of HAPs (such as formaldehyde, benzene, xylene, and toluene) from categories of major and area sources. As these standards are promulgated, they are published in 40 CFR 63. The major source threshold for NESHAP is 10 tons per year (tpy) of any single HAP or 25 tpy for all combined HAP emissions.

Additionally, USEPA recently promulgated NESHAP for natural gas transmission and storage facilities (40 CFR 63 Subpart HHH). However, facilities that transport natural gas, including the El Paso Energy Bridge GOM project, are not subject to this regulation if the facility does not contain a glycol dehydration unit.

The Proposed Action design and equipment specifications indicate that HAPs emissions from the proposed generator and heater would be well below the major source thresholds. Therefore, NESHAP standards would not apply to the proposed Project.

Prevention of Significant Deterioration (PSD)

The regulations under the Federal PSD program, administered by USEPA, are intended to preserve the existing air quality in attainment areas where pollutant levels are below (or better than) the NAAQS. In addition to requiring an extensive review of environmental impacts, viable emission control technologies, and related impacts, PSD regulations impose specific limits on the amount of pollutants that major new or modified stationary sources may contribute to existing air quality levels. Major sources are defined as facilities with a potential to emit listed pollutants in amounts equal to or greater than 250 tpy or 100 tpy for 28 specific source categories. In addition, a facility is subject to PSD permit requirements if net emission increases associated with source modifications within a contemporaneous 5-year period equal or exceed the following thresholds for criteria pollutants (see 40 CFR 52.21):

- CO: 100 tpy
- NO_x, VOC, and SO_x: 40 tpy
- $PM_{2.5}$: 25 tpy
- PM_{10}: 15 tpy
- Pb: 0.6 tpy

Under the PSD Program, Class I areas are assigned to protect Federal wilderness areas such as national parks, where the least amount of air quality deterioration is allowed. Class I areas are designated as pristine natural areas or areas of natural significance. The Class II designation is used for all others areas, except for Class III designations, which are intended for heavily industrialized

zones (40 CFR 51.166). The classifications differ in terms of the amount of growth allowed before significant deterioration of air quality occurs. The closest Class I area to the proposed El Paso Energy Bridge GOM project is the Breton Wilderness Area, off the shore of Louisiana in Breton Sound, approximately 218.5 mi northeast of the proposed site (see Figure 3-4).

Figure 3-4. Project Proximity to Sensitive Air Quality Areas

Based upon low pollutant emissions generated by the proposed emergency generator and heater, PSD requirements are not expected to apply to this project.

Title V

Title V of the CAAA of 1990 requires USEPA, states, or local agencies to permit major stationary sources. A major stationary source is a facility (i.e., plant, installation, or activity) that has the potential to emit more than 100 tons annually of any one criteria air pollutant, 10 tpy of one HAP, or

25 tpy of any combination of HAPs. In addition to these thresholds, lower pollutant-specific "major source" permitting thresholds apply in nonattainment areas. The purpose of the permitting requirement is to establish regulatory control over larger activities and to monitor their effect on air quality. Based on USEPA guidance and MMS concurrence, major source OCS facilities are not subject to state permitting, but are issued Title V permits by USEPA under 40 CFR 71.

Similarly to the PSD applicability determination above, the small emergency generator and heater associated with the project would not have pollutant emissions that exceed the applicable Title V thresholds. Additionally, emissions associated with temporary construction activities and the mobile sources (i.e., vessels) associated with the Proposed Action do not fall under the Title V Operating Permit program.

New Source Review (NSR)

New or modified air pollutant emissions sources proposed in nonattainment areas must undergo the NSR permitting process prior to operation or construction. Through the NSR permitting process, local or state regulatory agencies review and approve proposed construction plans, regulated pollutant increases or changes, emission controls, and various other details. The agencies then issue construction permits that include specific requirements for construction and startup. Once construction is complete, the sources are issued operating permits that specify detailed operating conditions, emission limits, fees, reporting and record-keeping requirements, and various other operating parameters that must be met throughout the life of the permit. The applicability of the NSR permitting processes under USEPA jurisdiction depends upon whether the proposed source(s) exceed specific emission thresholds or source type thresholds established in the Federal regulations. The projected stationary emissions would not occur within the boundaries of a nonattainment area, the proposed Energy Bridge would not be subject to NSR permitting.

3.8.2 Existing Conditions

Regional Climatology

This section briefly describes the regional climate and meteorological conditions that influence the transportation and dispersion of air pollutants, as well as the existing levels of criteria air pollutants in the region. The data presented here represent the offshore project location where the proposed turbine generators and other air-emitting equipment could impact regional air quality.

Louisiana has a humid, subtropical climate. Summers are long and hot and winters are short and mild. The annual average temperature in southern Louisiana is about 68° F (20º C). Rainfall is distributed fairly evenly throughout the year, with an annual rainfall of about 60 in. The 10-year rainfall is 3.5 in per hour (in/hr), the 25-year rainfall is 3.9 in/hr, and the 50-year rainfall is 4.3 in/hr (NCDC 2001).

Existing Ambient Air Quality

Background air quality in the area surrounding a proposed project is normally obtained from air quality monitoring stations located in the vicinity of the project. However, because of the location of the proposed project, the closest air quality monitoring stations are on shore (more than 100 NM from the proposed project's location). Data from the following air quality monitoring stations were used to characterize the background air quality in the region: Carlyss, Vinton, and Westlake stations, as well as two stations in Baton Rouge.

Within the Calcasieu Parish, Carlyss, Vinton and Westlake stations were used because they are the closest to the proposed project site. As published by LDEQ in annual reports, the data are reported for the years 1996 to 1999 (see Table 3-13). For some criteria pollutants, ambient air monitoring data in the vicinity of the proposed project were not available; therefore, the best available data for these stations were used.

Table 3-13. Background Air Quality Summary – by Monitoring Station

Monitoring Station	Data Year	NO_2 (ppm)	SO_2 (ppm)		O_3 (ppm)
		Annual Mean	2nd Max 1-hr	Annual Mean	2nd Max. 1-hr
Carlyss	1997				0.114
	1998				0.123
	1999				0.085
Vinton	1997	0.005			0.122
	1998	0.005			0.122
	1999	0.005			0.127
Westlake	1997		0.054	0.003	0.120
	1998		0.061	0.0032	0.111
	1999		0.060	0.004	0.096
Baton Rouge (Plaquemine)	1997	0.007			0.120
	1998	0.0068			0.111
	1999	0.006			0.122
Baton Rouge (Capitol)	1997	0.02	0.083	0.006	0.126
	1998	0.0187	0.107	0.0046	0.119
	1999	0.019	0.101	0.005	0.117

Source: LDEQ 1999

Note: Not all stations collected data for all the criteria pollutants. Blank cells indicate no monitoring data was collected. Calcasieu Parish did not exceed 1 day per year of 0.12 ppm O_3 and is considered in attainment of the NAAQS for ozone.

ppm – parts per million

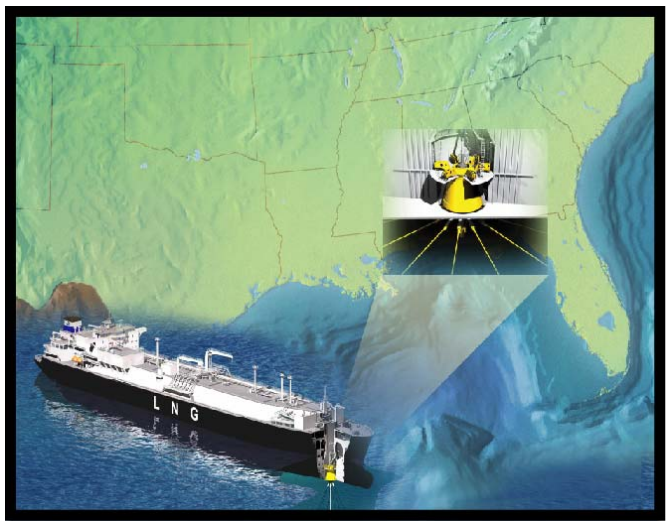
All of the coastal Louisiana parishes are in attainment for the NO_x, SO_2, CO, and PM_{10} NAAQS. The five-parish area (Ascension, East Baton Rouge, Iberville, Livingston, and West Baton Rouge parishes) surrounding Baton Rouge is classified as a serious ozone nonattainment area for the 1-hour ozone standard. This five-parish area is in southeastern Louisiana and is approximately 140 to 150 miles northeast of the proposed deepwater Port. The 2005 Baton Rouge Ozone Attainment Plan and Transport Demonstration was published in December 2001 and addresses the five-parish area's nonattainment status. The Plan describes control measures to be implemented by the five-parish area

in order to bring the area into attainment and maintain the region's ambient air quality to protect public health and the environment.

Calcasieu Parish is the parish closest to the proposed Energy Bridge (within 225 km or 121.4 NM) with ambient air quality monitoring stations. Previously designated as a nonattainment area for ozone, in 1997, Calcasieu Parish was redesignated by USEPA as an ozone attainment area with an activated contingency plan. The contingency plan is part of the Louisiana State Implementation Plan (SIP) and outlines contingency and VOC and NO_x emission control measures that must be taken if a violation of the ozone NAAQS occurs. Calcasieu Parish exceeded the ozone NAAQS by having six exceedences of the 1-hour ozone NAAQS during the 3-year period between 1998 and 2000. Based on these exceedances, Louisiana activated the contingency plan and determined a strategy for preventing the redesignation of Calcasieu Parish as an ozone nonattainment area. Currently, additional urban airshed modeling is proposed to demonstrate ozone transport into Calcasieu Parish from other areas. Also, a NO_x Reasonably Available Control Technology (RACT) rule might be promulgated, requiring additional controls for sources of NO_x within Calcasieu and other parishes (ENSR 2002).

Further, an air quality study on the GOM determined that based on comprehensive modeling results, the OCS petroleum development contribution to O_3 concentrations in onshore nonattainment areas in Louisiana parishes and Texas counties was very small (MMS 1995).

Section 4
Environmental Consequences



4. Environmental Consequences

4.1 Water Quality

4.1.1 Evaluation Criteria

Significant effects on water quality are those that measurably threaten human health, result in persistent degradation of the environment, or cause an existing Federal, state, or local water quality criterion or a federally recognized international criterion to be exceeded.

4.1.2 Proposed Action

A combination of long-term periodic and short-term minor adverse effects on water quality would be expected. These would occur predominantly in the marine waters in the immediate vicinity of the proposed Energy Bridge. Impacts on coastal waters would be limited to increased vessel traffic during construction of the proposed facility. The following list identifies discrete activities associated with the proposed project that could affect marine and coastal water quality:

- Installation of the STL buoy and mooring system
- Installation of pipelines
- Integrity testing of pipelines
- Routine port discharges and ships antifouling system.
- Decommissioning
- Hydrocarbon spills
- Activities affecting coastal waters

The principal impacts on water quality caused by the Proposed Action would be (1) a decreased water temperature from the regasification warming water discharge, (2) increased water turbidity during facility installation and decommissioning, (3) domestic water and sanitary water discharges from the EPEBVs, and (4) cooling water discharge to support normal ship functions.

4.1.2.1 El Paso Energy Bridge GOM Construction

During construction of the proposed Energy Bridge (pipeline installation, metering platform installation, and mooring installation), wastewater discharged from construction vessels would cause short-term minor adverse localized degradation of the water quality. Any frequent or intermittent discharges would require compliance with all applicable and appropriate regulations. It is anticipated that any construction vessel discharges would dilute rapidly in the water column.

Short-term minor, adverse, localized effects related to emplacement activities associated with the installation of the buoy anchor and lines and the metering platform would be expected to result in temporary increases in sedimentation and turbidity. The proposed construction activities and anticipated construction effects would be similar in type and scope to other oil and gas construction activities common in this area of the GOM. It is anticipated that dynamically positioned (DP) vessels

would be employed forr installation of the STL buoy, anchors and mooring system. These vessels remain on station without the use of anchors.

Installation of the metering platform will likely require an anchored construction barge. It is anticipated that a barge between 350 to 500 ft (91 to 152 m) long would be be required with as many as eight anchor spreads. The maximum anchor spread would be expected to be approximately 7 times the water depth at the construction site. The construction and anchoring activities would have short-term minor localized effects typical of construction activities associated with similar OCS. structures.

4.1.2.2 Pipeline Installation

Direct short-term minor, localized, adverse effects would occur to water quality during installation of the three proposed pipelines segments. The three pipeline segments would have an approximate total length of 7.27 mi and include

- Approximately 1.93 mi of 20-inch pipeline from the STL buoy to the metering platform.
- Approximately 3.96 mi of 20-inch pipeline from the metering platform to the existing Sea Robin Pipeline.
- Approximately 1.38 mi of 20-inch pipeline from the metering platform to the existing Tennessee Gas Pipeline.

Since the proposed pipelines would be installed in water depths greater than 200 ft (61 m), the pipeline would be laid and secured directly to the seafloor as allowed by applicable regulations for pipeline installation in this region of the GOM. It is anticipated that pipeline installation will require barges that are 350 to 500 ft (91 to 152 m) long using eight anchor spreads. The maximum anchor spread is expected to be approximately 7 times the water depth at the construction site. It is anticipated that the spreads would be reset at approximately 2,000-ft (610 m) intervals.

Vessels associated with the installation of the proposed pipeline would be equipped with spill containment and clean-up equipment to respond to small accidental releases of bunkers, lubricants, or other chemicals. In the event of a large spill, an emergency response would be mobilized from shore.

4.1.2.3 Integrity Testing of Pipelines

No effects on water quality would be expected in connection with hydrostatic integrity testing of the proposed pipelines.

The proposed pipelines would be hydrostatically tested to ensure their integrity before being placed in service. The pipelines would be tested using approximately 2,505,272 gal (9,480,691 L) of seawater drawn from and returned to the GOM. During construction, the hydrostatic fills and discharges would occur at the platform, PLEM, and subsea tie-ins (SSTI) to the interconnecting pipelines where hydrostatic test water fill and discharges would most likely occur. The metering platform in Block WC 603 would be the fill location for all three pipelines.

The discharges would be made in accordance with the terms of the general discharge permit governing hydrostatic testing operations of this type in the GOM. Intake and discharge rates would be limited to approximately 2,000 gpm (7,570 L per minute [l/min]). Water quality impacts associated with the hydrostatic testing of the proposed pipelines would be minimal short-term and localized.

4.1.2.4 Routine Port Discharges

Four principal routine discharges from separate outfalls would be expected in association with operations at the proposed Energy Bridge. All of these discharges listed below would be associated with the EPEBVs while at the Energy Bridge. It is estimated that an EPEBV would be at the port periodically for a total of approximately 245 days out of any given year. These sources would have periodic long-term direct minor adverse impacts or no impacts on water quality. When EPEBVs are not at the port, no discharges of any kind would occur from the Energy Bridge facilities.

The anticipated EPEBV discharges include

- Open-Loop regasification warming water discharge.
- Cooling water discharge from normal operations of the EPEBVs systems.
- Combined domestic water (gray water discharge from shower, laundry, lavatory, scullery, and galley) and sanitary water (black wastewater from urinals and toilets) discharge (two combined treated discharges) would average approximately 5,010 gallons per day (GPD) (19 m^3/day) at each treated discharge.
- Intermittent storm water from deck drainage.

Regasification Warming Water Discharge

Based on a review of the data presented by the Applicant, the cold-water discharge from the onboard regasification process in the open loop configuration would have an unavoidable, periodic, minor adverse impact on water quality within the plume.

The Applicant conducted thermal plume modeling using the CORMIX1 mixing model (Doneker and Jirka 1990) to quantify thermal impacts associated with the EPEBVs onboard regasification warming water discharge. Both the nonstratified and stratified receiving water conditions were evaluated based on the assumptions presented in Table 4-1.

The CORMIX1 model is typically used to evaluate discharges of warmer-than-ambient effluent from a submerged diffuser in the vicinity of the sea floor and pointed vertically upward. The model has not been configured for the direct modeling of colder-than-ambient discharge from a discharge located within the top third of the water column and directed vertically downward as would be the case with the vessel discharge. However, representative thermal plume results were obtained by switching the ambient and discharge density values and modeling the plume as a vertically upward, positively buoyant plume.

CORMIX1 modeling was performed based on a submerged diffuser located 11.5 m above the sea floor (simulating 11.5 m below the water surface), pointing vertically upward (simulating a vertically downward discharge), with a discharge density of 1022.85 kg/m^3 and an ambient seawater density of 1025.10 kg/m^3. These conditions resulted in a positively buoyant plume that moves upward through the water column due to a combination of the momentum of the discharge and density difference of 2.25 kg/m^3 (simulating a negatively buoyant plume moving downward through the water column due to a combination of the momentum of the discharge and density difference of 2.25 kg/m^3).

For the nonstratified condition, the model predicted that over the typical range of current velocities (10 to 50 cm/s), the predicted maximum vertical penetration of the thermal plume (assuming that a

Table 4-1. Assumptions for Thermal Plume Modeling of the El Paso Energy Bridge GOM Cold Water Discharge

Parameter	Assumptions for Nonstratified Condition	Assumptions for Stratified Condition
Water depth (meters)	87	
Seawater Temperature (ºCelsius)	29º from water surface to bottom	29º for top 15 meters; and 23º below 15 meters
Seawater Density (kilograms per cubic meter) (assumed salinity 36 ppt)	1022.85 from water surface to bottom	1022.85 for top 15 m and 1024.69 below 15 m
Ambient Current Velocity (centimeters per second)	1, 10, 25, 50, and 100	10
Discharge Configuration	Two-0.6 meter diameter pipes discharging vertically downward at a depth of 11.5 meter below the water surface	
Discharge Rate – Per Nozzle (cubic centimeters per second)	1.74 cubic meters per second (m^3/s) (27,500 gallons per minute [gpm]) per nozzle\55,000 gpm total	
Discharge Temperature (ºCelsius)	7.5° below ambient temperature (21.5°)	
Discharge Density (kilograms per cubic meter) (assumed salinity 36 ppt)	1025.10	

Source: ENSR 2002

ppt – parts per trillion

1 °C change in temperature is the approximate edge of plume) would be in the range of approximately 24 to 34 m below the water surface. The typical downcurrent extent of the plume for current velocities of 10 to 50 cm/s was predicted to be 2 to 5 m from the discharge point. This indicates that the discharge plumes from opposite sides of the ship are not expected to merge. In the horizontal plane, the predicted plume width was predicted to be narrow, in the range of approximately 4 to 6 m.

Because current direction and velocity are expected to fluctuate over the course of a given 6- to 8-day unloading period, the relative location and magnitude of the plume would also be expected to fluctuate. Based on the model plume predictions for different current velocities, the horizontal area potentially affected by thermal plume can be described as a circular area, at the centerline of the vessel, with a maximum radius of approximately 15 m. The vertical cross-section within this area that would potentially be affected by the thermal plume would extend to a maximum depth of approximately 35 m below the water surface.

For the stratified condition, mixing-based "dilution" of the plume was similar to the dilution under non-stratified conditions. The discharge velocity of 6.15 m/s vertically downward dominated discharge dilution and the density differences associated with stratification were found to be less important. With regard to the actual dilution of the thermal plume, the temperature of the discharge plume just above the thermocline was predicted to be 5.5 to 6.5° C (41.9 to 43.7º F) lower than the

surface layer temperature. However, when this water passes through the 6° C (42.8º F) (approximate) summer thermocline, the result would be a traveling plume with a temperature approximately equal to the surrounding waters. Although the discharge may disturb the thermocline from a mixing perspective, its thermal impacts within and below the thermocline are expected to be negligible. It would, therefore, be conservative to assume that the 15-m radius and 35-m deep thermally affected area estimated for nonstratified conditions applies throughout the year.

All of the seawater entering the sea chest intakes either for ship operations or for the regasification process will pass through a copper cathode antifouling system. Supplementary information provided by the Applicant to the USCG indicates that the EPEBV's antifouling system will not include aluminum anodes as described in the Environmental Report (El Paso 2003b). The copper anodes release a small amount of copper into the ships seawater system at the intake to prevent biota in the seawater from establishing within the seawater flow path. The copper concentration in all of the ships seawater discharge will be approximately 2 ppb. This system is necessary not only for the safe operation of the ship but also to prevent the potential transport and discharge of non-native species. This antifouling system and the copper concentrations associated with it are typical of most ships operating around the world.

In an evaluation of metals grouped according their toxicity by the U.S. Geological Survey (USGS), copper was grouped in the low-toxicity category (MEADE 1995). USEPA has set maximum contaminant levels for heavy metal concentrations in water supporting aquatic life and criteria for open-water disposal of polluted sediments. The limit for copper in water supporting aquatic life has been set at 20 ppb (USEPA 1982). Average concentrations of copper in deepwater GOM surface waters have been reported at 0.082 ppb (MMS 2001b). The discharge concentration of 2 ppb associated with the ships antifouling system should not have an adverse effect on the marine environment greater than that associated with ships currently operating in the GOM and around the world.

USEPA's *National Recommended Water Quality Criteria: 2002* (USEPA 2002) provides recommended water quality criteria for "priority toxic pollutants" and for "non-priority pollutants." Standards are provided for both freshwater and saltwater and include both human health and aquatic life criteria. The human health criteria for each parameter consist of criteria for consumption of water and organisms (does not apply to saltwaters) and for organisms only. The aquatic life criteria for each parameter consist of a "criteria maximum concentration" (CMC) and a "criteria chronic concentration" (CCC). The CMC is an estimate of the highest concentration of a material in a surface water to which an aquatic community can be exposed briefly without resulting in an unacceptable effect (i.e., an acute standard). The CCC is an estimate of the highest concentration of a material in a surface water to which an aquatic community can be exposed indefinitely without resulting in an unacceptable effect (i.e., a chronic standard).

Copper is classified as a priority toxic pollutant. The standards applicable for copper in a saltwater environment are an acute (CMC) criterion of 4.8 ppb and a chronic (CCC) criterion of 3.1 ppb. These criteria are ambient water quality criteria that would apply at the edge of a zone of initial dilution (e.g., at the edge of a mixing zone).

As demonstrated in the thermal modeling performed in support of the thermal plume impact assessment, dilution of the discharge plume in the ambient seawater would occur rapidly at a short distance from the discharge point.

The minimal concentration of copper present in the seawater discharge plume associated with the ships operating and regasification systems would have a periodic minor localized impact on water quality in the area adjacent to the EPEBVs while at the deepwater Port.

EPEBV Systems Cooling Water Discharge

Discharges of seawater required to support typical ship functions during transportation and idling would occur during regasification from the EPEBV's cooling water system. These discharges would not contain additives, have small change in temperature from ambient water, or have a much smaller mixing plume compared to the discharge of heating water in the Open Loop mode.

The largest auxiliary seawater discharge, the main condenser overboard discharge, would discharge approximately 32,500 gpm of seawater at approximately 3.1° C (37.6º F) warmer than ambient water through a 1.4-m diameter pipe located approximately 7.7 m below the water surface at an angle of 45° toward the sea floor.

The thermal plumes associated with auxiliary seawater discharges would be typical for similar vessels already operating in the northern GOM region and would constitute a periodic minor unavoidable long-term impact on the water quality in the immediate vicinity of the discharges.

Domestic Water and Sanitary Water

Operational discharges from OCS service and construction vessels include bilge and ballast waters and sanitary and domestic wastes (MMS 2002a).

Plumes of released wastes mix rapidly with ambient seawater and are thus diluted. The bilge water within these vessels might contain some quantity of machinery waste oil. The type and quantity of fluid waste discharge permitted from vessels offshore is a function of the distance of the vessel from shore, according to international protocols provided by MARPOL 73/78 (33 CFR 157) (MMS 2001b; MMS 2002a). The Energy Bridge would be constructed at a distance from shore that would permit the discharge of waste fluids from these vessels. All sanitary and domestic wastes would be either treated or monitored for relative levels of contaminants prior to discharge.

Water from Energy Bridge operations would be generated by the EPEBV's "hotel" functions associated with sanitary systems. "Black" water is collected in a biological-type treatment system which includes a 10 m^3 holding tank, sized for a 15-day holding period for a 40-person crew. "Grey" water collects drainage from wash basins, sinks, and scuppers for routing into the final stage of the sanitary system where it is chlorinated before being routed overboard. There is no holding tank for grey water.

Sanitary disposal systems on the platform are similar in that black water would be routed to a biological-type treatment system. Grey water would be routed to the final stage of this system for sanitizing before being discharged.

Domestic and sanitary waste discharges would probably contain some biological oxygen demand (BOD). The 5-day BOD in untreated wastewater from sanitary and domestic sources can range from 0.13 to 0.24 lb (59 to 109 grams [g]) per day per person (Tchobanoglous et al. 2002). Assuming a maximum capacity of 40 crew/operators on board the EPEBV while at the deepwater Port, the total BOD from sanitary and domestic sources could range from approximately 5.2 lbs (2.3 kilograms [kg]) to approximately 9.6 pounds (lbs) (4.3 kg) per day.

Sanitary and domestic water discharge may introduce additional nutrients into the water column. Discharges of sanitary wastes and domestic wastes in the offshore GOM waters would be rapidly diluted and dispersed (i.e., to ambient levels within several thousand meters of the discharge). Therefore, they are not expected to have any significant impact on water quality in the offshore GOM (MMS 2001b).

Discharges of domestic and sanitary wastes from the EPEBVs would be similar to those produced by existing manned platforms in this region of the GOM. These waste discharges would have long-term periodic, minimal, localized adverse effects on the water quality in the vicinity of the EPEBVs.

Intermittent Storm Water from Deck Drainage

Storm water discharge would come from intermittent, uncontrolled deck drainage and may cause increased turbidity. The USEPA Storm Water Multisector General Permit[9] lists statistics for selected storm water pollutants reported by oil and gas extraction facilities. The mean grab sample total suspended solids concentration reported was 332 mg/L and the mean grab sample 5-day BOD reported was 13.9 mg/l. Such values may be expected in the storm water discharge of a ship moored at the deepwater Port. This runoff would be similar to and not greater than the runoff associated with other oil and gas facilities common in this area of the GOM. This source would have episodic minimal impacts on the surface waters immediately adjacent to EPEBVs moored at the proposed Energy Bridge.

4.1.2.5 Decommissioning

Short-term direct minor adverse effects to water quality would be expected in connection with decommissioning of the El Paso Energy Bridge GOM facilities.

Section 2.3 describes activities that would be associated with decommissioning of the deepwater Port. Decommissioning would cause temporary impacts on water quality due to increased turbidity seafloor (surface sediment) disturbance. These impacts would be very short in duration as decommissioning would be expected to take no more than two weeks to complete. Increased vessel traffic from these activities would be minor relative to average Gulf-wide traffic.

4.1.2.6 Spills of Hydrocarbons and Other Hazardous Substances

Spills of hydrocarbons (petroleum, oil, and lubricants) may result in direct adverse affects on water quality, which are expected to be minor and short in duration. Accidental releases of hazardous substances while the EPEBVs were moored at the proposed Port would be minimized by application of protective measures and the nature and quantities of potential contaminants at the site.

Protective Measures

Effects associated with the Proposed Action would be avoided or minimized by protective measures to be detailed in the Facility Operations Manual including

- All equipment and process designs would be previously proven and consistent with industry norms.

[9] *Federal Register*, 1995, Vol. 60, 189

- Spill containment and recovery equipment will be included on the EPEBVs in accordance with the applicable and appropriate requirements of the Flag Administration of the vessel.
- The design, construction, and operation of the deepwater Port would minimize the use of materials determined to be toxic or hazardous to the environment.

LNG Spills

Only minimal short-term effects on water quality would be anticipated from an accidental spill or release of LNG since the LNG would spread on the surface of the water and rapidly dissipate. When exposed to ambient seawater, LNG would boil rapidly and vaporize due to its low boiling temperature (approximately – 126.7º C [–260 °F]). The formation of ice is also possible, although this has not been observed in field experiments (Entrix 2002).

Currents and Flow

The effect of a moored ship upon local currents is dependent upon current velocity. Currents associated with the Loop Current and Eddies in the GOM may have surface speeds of 150 to 200 cm/s (2.9 to 3.9 knots). Current speeds of 10 cm/s (0.2 knots) are not uncommon at depths of 1,640 ft (500 m) (MMS 2001b). Normal current speed in the proposed Energy Bridge region is slow compared to the typical underway velocity of a large ship.

Two types of wakes are generated by the passage of a ship's hull through the water (in this case, the passage of the water around the ship's hull). The turbulent wake created by the passage of water around an obstruction is visible as the smooth region downstream of the object. Because the turbulent wake damps out very quickly, it may cover an area only about two to three times the diameter of the object. The Kelvin wave, or ship wake, is the V-shaped wave seen diverging downstream from the hull. In the conditions likely to be present at the proposed Energy Bridge mooring location, the water speed around the ship's hull would be low. Therefore, the Kelvin wave would be small in amplitude and decay quickly. This wake would become masked by ambient waves and most likely disappear in well under a distance of one km downstream (Terray 2002).

The ambient wave regime causes scattered waves on a moored ship. The scattering effect is the change in the direction of the waves as they impinge upon and go around the hull. For example, a straight line of waves may scatter (disperse) upon encountering the obstruction and move away downstream from the ship as an arc. This effect might differ according to the size of the ship and the orientation of the ship's hull with respect to the oncoming waves. A minimal effect would be visible in the case where the ship is heading into both the wind generating the waves and the local current regime, thus, presenting the smallest barrier. In the worst case, the ship would be broadside to the waves in calm conditions (no wind) but with a large swell approaching the ship perpendicular to the ambient current. This situation would produce the most wave scattering and the scattering effect might be able to be seen for a few km downstream. In general, such wave scattering becomes masked by wind-generated waves, and although potentially measurable, is not easily detected more than a few km downstream. (Terray 2002).

To compensate for changing weather and varying sea conditions after an EPEBV connects to the buoy, the STL buoy would rotate on an internal swivel allowing the EPEBV to "weathervane," or adjust position with changing wind or current directions.

Any perturbations on the local currents and waves caused by the presence of a moored ship would be minimized, and would have little if any perceptible effect on water quality.

The effect of other components of the Energy Bridge GOM project, such as the STL buoy, the flexible riser, the PLEM, the pipeline, and the metering platform on the currents, winds, and waves would be even more negligible than those of the EPEBV due to the smaller size of these components in contact with the natural forces. Thus, currents, winds, and waves would have no perceptible effect on these facilities or water quality.

As stated by the Applicant, Lloyd's Register Safety Evaluation and the BV and Gas Transport and Technical approval of the EPEBV membrane system verify that the Energy Bridge Gas Delivery System could withstand conditions in the GOM up to 100-year storm conditions.

4.1.2.7 Activities Affecting Coastal Waters

The operation and maintenance of the custody transfer equipment on the metering platform would be the responsibility of the downstream pipeline companies, witnessed by representatives of the port owner, typically on a monthly or quarterly basis. El Paso Energy Bridge GOM would contract the operation and maintenance of the remainder of the facilities to others currently operating in the area, such as El Paso Field Services (EPFS), an affiliate of El Paso Energy Bridge GOM, L.L.C. Personnel vessels and helicopters, that could provide support to the deepwater Port. These would deploy from existing shore-based facilities at Sabine Pass, Texas, and from other manned platforms offshore, such as EPFS' Block HI 264 platform facility. No support vessels or helicopters would be dedicated to the proposed Port.

Operational support personnel from each of the downstream pipeline companies would monitor all safety systems and coordinate the operation of pressure and flow-control valves between the ship and the downstream pipelines' control centers, primarily while connecting and disconnecting the shipboard regasification process to the pipeline system. In addition to the personnel on site, the downstream pipeline companies would use personnel at their respective onshore gas-control centers that would have real-time data and remote control over the flow-control valves into each of their systems.

The maintenance requirements for all equipment, control devices, and safety systems associated with Energy Bridge GOM facilities would be entered into a Maintenance Management System (e.g., Maximo) for planning, scheduling, record keeping, and diagnostic purposes. The type of equipment installed on the platform would typically require on-site maintenance no more frequently than once per month, and much of it annually.

By using and rescheduling existing resources to support the proposed Port operations, there would be no increase or decrease to the existing number of vessels, number of trips, or the number of personnel already in place to support existing facilities in the GOM. Accordingly, there would be no additional impacts on coastal waters associated with proposed El Paso Energy Bridge GOM operations.

Construction activities would have a temporary short-term minor effect on water quality in coastal waters by slightly increasing the vessel trips through the coastal waters to reach the proposed Energy Bridge construction site. This traffic would include vessels that exist at the time of the construction and the operations would be similar to existing vessel activities in the coastal reason. Negative construction effects would end upon completion of the proposed Energy Bridge.

4.1.2.8 Mitigation

No mitigation measures would be required other than those identified in the above discussion.

4.1.3 No Action Alternative

Under this alternative, the license application would not be approved and El Paso Energy Bridge GOM would not proceed with construction and operation of a deepwater port. If the Maritime Administrator denies the license application, the short- and long-term environmental impacts on water quality identified in Section 4.1.2 would not occur. Existing conditions would prevail. Means to satisfy the Nation's energy demands might result in increased use of existing land-based LNG receiving terminals, greater reliance on domestic and foreign oil and gas resources, development of other sources of energy, including energy conservation. The Secretary's purpose and need would continue as a mechanism for the review of deepwater ports applications and implementation of the appropriate alternative, approval, conditional approval or denial. It is reasonable to assume that a decision on the Port Pelican application would be made independent of the deccesion reached on this application.

If approved, Port Pelican would have a combination of long-term and short-term minor adverse impacts on water quality. These would occur with respect to both marine and coastal waters. Short-term minor adverse impacts would occur during the installation of the proposed Terminal and PIPL as a result of the resuspension of sediments. No effects on water quality would be anticipated in connection with the integrity testing of the proposed PIPL and Terminal piping. The Open-Rack Vaporizer (ORV) water discharge would have several impacts on water quality within 328 ft (100 m) of the proposed Terminal, including decreased water temperature, increased turbidity, and increased dissolved oxygen content. Anchoring of LNGCs in the Applicant's proposed Anchorage Area in proximity to the Terminal may have short-term, minor adverse effects on water quality. Spills of hazardous substances such as hydrocarbons (petroleum, oils, and lubricants) may result in direct adverse effects on water quality, which are expected to be minor and short in duration. No adverse impacts on water quality would be expected from an accidental spill or release of LNG since the LNG would spread on the surface of the water, gasify, and rapidly dissipate. Long-term minor adverse effects would be expected in connection with Port Pelican activities in coastal waters. Discharge from vessels and onshore facilities associated with Port Pelican would be the primary sources of impacts on water quality in coastal waters.

4.2 Biological Resources

4.2.1 Evaluation Criteria

This section evaluates the potential effects on the biological resources under the Proposed Action and the No Action Alternative. The biological resources potentially affected by the Proposed Action are described in Section 3.2. Under NEPA, significance of impact requires considerations of both context and intensity, and is based on (1) the importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource, (2) the proportion of the resource that would be affected relative to its occurrence in the region, (3) the sensitivity of the resource to the proposed activities, and (4) the duration of the ecological ramifications. The impacts on biological resources are significant if species or habitats of high concern are adversely affected over relatively large areas. Impacts are also considered significant if disturbances cause reductions in population size or changes in distribution of a species of high concern. As required by ESA, MMPA, MBTA, and MSA, effects on threatened or endangered species, marine mammals, migratory birds, and EFH, respectively, if present, will be discussed under each impact type.

4.2.2 Proposed Action

The Proposed Action is described in Section 2.1. Minor adverse effects on biological resources may result from the construction, operation, and decommissioning of the proposed Port. The following discussions address potential effects on benthos, threatened and endangered species, migratory birds, marine mammals, commercial and recreational fisheries, and EFH. None of the foreseen effects on biological resources are expected to be significant, based on the evaluation criteria presented in Section 4.2.1.

4.2.2.1 General Construction and Installation Impacts

Construction of the proposed Port could directly and indirectly affect fish resources and EFH by increasing turbidity; displacing sediments; and crushing, displacing, burial of, and direct removal of demersal and benthic biota. Installation of all of the proposed components of the Port would impact approximately 1.88 acres (0.75 hectares) of seafloor plus additional temporary impacts from anchoring of metering platform and pipeline construction barges. Construction methods and associated impacts would be consistent with those of similar OCS structures.

Turbidity

Turbidity refers to the insoluble, suspended particulates that impede the passage of light through water by scattering and absorbing light energy. This reduction in light penetration reduces the depth of the photic zone, in turn reducing the depth at which primary productivity can occur. Four ways that turbidity adversely affects fish and fish food populations (USEPA 1976) are (1) kills or reduces the rate or growth, (2) prevents the successful development of fish eggs and larvae, (3) modifies the migration patterns of the fish; and (4) reduces the abundance of available food (in part due to the reduction in primary production). Resuspended sediments could also clog and obstruct filter-feeding mechanisms and gills of sedentary benthic organisms and demersal fish.

The National Academy of Sciences recommended that the depth of light penetration not be reduced by more than 10 percent (USEPA 1976). Because the proposed pipeline installation routes are in water depths of greater than 200 ft (61 m) the pipelines would be laid on the sediment; therefore jetting or trenching is not required. As such, the resuspension sediment during the pipeline installation process is expected to be minimal.

As discussed in Section 3.4.2.2, the site proposed for construction consists predominantly of soft sediments (clayey sand and silty clay), devoid of vegetation, and not crossing any geologic features or sensitive benthic resources such as hard/live bottom. As indicated in the EFH table in Table D-1 of Appendix D, soft sediments are designated as EFH for various life stages of brown shrimp, white shrimp, red drum, lane snapper, red snapper, gray snapper, and tilefish. Increased turbidity would negatively affect these species and other soft bottom species such as sand seatrout and spotted seatrout, species sought by recreational fishermen. It is anticipated that an increase in turbidity associated with the resuspension of sediments would cause most demersal species to avoid construction areas. The sediment types (clayey sand and silty clay) are expected to form clumps and have high settling velocities (Boswell 1961). As a result, expected impacts on fish and EFH should be temporary and minor, resulting in displacement followed by rapid postconstruction return by these organisms (FERC and MMS 2001).

Redeposition of suspended sediments can also smother demersal eggs and larvae (FERC and MMS 2001). As indicated in the EFH table in Table D-1 of Appendix D, the only demersal eggs that have

EFH in the ROI are brown shrimp eggs. Although impacts from the proposed construction may result in effects on brown shrimp eggs, the effects on populations would be minor since spawning occurs over broad areas and brown shrimp eggs hatch in approximately 24 hrs (GMFMC 1998). Impacts can also be minimized by scheduling construction activities to avoid the spawning seasons of fish and shrimp species, especially brown shrimp. The brown shrimp spawning season lasts from the September through May; peaks are documented in September through November and April through May (USFWS 1983-1988). The disturbance area would comprise only a small portion of the total soft sediments available in the area. The area of disturbance, 1.89 acres is equal to 0.003 mi^2 (0.007 km^2). The area of the GOM continental shelf is estimated to be approximately 132,510 mi^2 (343,200 km^2) (Ubelacker and Johnson 1984). Additionally, the impacts on benthic habitat would be short in duration and not permanent.

Sediment Displacement

Deepwater and shelf fish that feed on benthos may be displaced by seafloor structures such as the metering platform and the pipelines. Additional indirect effects could result by reducing the available prey base and feeding behavior of demersal (benthic) species. Some minor loss of benthic (epifaunal and infaunal) prey may occur. However, the total seafloor area impacted under the Proposed Action would be approximately 1.88 acres (0.75 hectares) plus additional temporary impacts from anchoring of metering platform and pipeline construction barges. Construction methods and associated impacts would be consistent with those of similar OCS structures.

Additional impacts would also be expected from anchoring of metering platform and pipeline installation vessels. The aerial extent of the seafloor potentially disturbed by anchoring is estimated to be approximately 80 ft^2. However, impact would area depends on water depth, wind, currents, chain length, as well as the size of the anchor and chain during installation (MMS 2002a). The disturbed area would be larger if the anchors are dragged due to barge movement. Anchor depressions can be as deep as 7 to 8 ft (2.1 to 2.4 m) (FERC and MMS 2001). Anchors from installation vessels have the greatest potential to impact live bottoms. However, live bottoms do not occur in the ROI.

The total area of seafloor disturbed by installation of the proposed facilities represents only a fraction of the total seafloor available on the continental shelf in the GOM. The area of disturbance, 1.88 acres is equal to 0.003 mi^2 (0.007 km^2). The area of the GOM continental shelf is estimated to be approximately 132,510 mi^2 (343,200 km^2) (Ubelacker and Johnson 1984). As indicated in Section 3.4, the proposed site is devoid of vegetation, geologic or topographic features, and sensitive benthic resources. As such, impacts to soft sediments and marine biota are expected to be minimal and temporary in nature. Faunal benthic communities would recover from localized damage without mitigation. Additionally, it would be expected that the proposed Port would also result in some positive impacts to the benthic community, fish resources, and EFH. The subsurface structures would provide a surface area for the new colonization of marine species by functioning as an artificial reef. The impacts of the subsurface structures as an artificial reef are described in Section 4.2.2.2.

Noise and Vessel Traffic Impacts

Increased noise levels and vessel traffic would result from the construction of the proposed facilities, but would be consistent with construction activities that currently exist in the GOM.

Construction activities related to the Proposed Action would be typical of other OCS structure and pipeline projects in terms of schedule, equipment used, and types of activities. It is expected that construction of the proposed facilities would temporarily increase noise levels in the vicinity of the proposed Port, but no onshore noise sensitive areas would be affected since the project area would be located far offshore. Pile-driving activities are proposed for installation of the metering platform.

The STL buoy, metering platform, and associated facility infrastructure would be fabricated, staged, and transported from existing onshore facilities. These activities would not be expected to increase noise levels above those already occurring at the respective facilities. Installation of the proposed El Paso Energy Bridge GOM infrastructure would extend to the STL buoy system; chains, lines, and anchors; a flexible riser and subsea pipeline end manifold; a metering platform and risers; and approximately 7.27 mi of 20-inch diameter pipeline (in three segments).

Construction equipment for installation of the deepwater Port would be operated on an as-needed basis maintained to the manufacturer's specifications in order to minimize noise impacts. The construction methods and materials used for this project would be similar to other oil and gas construction activities typical for this region of the GOM. The construction noise would have a short-term direct minor adverse impact on sound levels in the vicinity of construction activities. These noise levels would be consistent with typical oil and gas constructions activities in the GOM. Except for limited barge activity near shore, noise associated with installation of the proposed Port would be confined to lease blocks approximately 100 mi from shore and, hence, would not affect human receptors onshore.

Increased noise levels and vessel traffic may adversely affect fish, sea turtles, marine mammals, and, to a lesser extent, seabirds. The Applicant would coordinate with USFWS and NOAA Fisheries, follow available guidance, and obtain necessary permits or authorizations in order to reduce impacts to marine organisms and seabirds. As such, any such effects are expected to be minimal and temporary. No direct physical contact with fish, marine mammals, sea turtles, and seabirds would be expected (MMS 2002a). As such, impacts from an increase in noise and vessel traffic associated with the proposed construction are not expected to be significant. Noise and vessel traffic impacts are further discussed in Section 4.2.2.2.

Impacts from Installation Vessel Discharges

Discharges that could occur during the installation of the proposed facilities are the normal discharges from installation vessels, including domestic wastes (e.g., sanitary wastes and grey water), bilge water, and food scraps, and other miscellaneous discharges (MMS 2002a). Any frequent or intermittent discharges (i.e., sanitary and domestic wastes and other minor discharges) would comply USCG regulations and MARPOL protocols, as applicable, and would be diluted rapidly in the water column. Adhering to these regulations and protocols would minimize impacts to water quality; therefore, effects on marine biota are expected to be minimal.

Impacts of Hydrostatic and Integrity Testing

The proposed pipelines would be hydrostatically tested with seawater in accordance with DOT regulations. Seawater would be withdrawn from the upper 32.8 ft (10 m) of the water column using a 1-in mesh (25.4 mm) filter at the foot of the withdrawal hose to prevent the entrainment of organisms. The risers and tie-in piping spools would be tested on shore prior to installation. The total volume of seawater used for hydrostatic testing of the proposed Port should be approximately 748,171 gallons (2,832 m^3). Upon completion of hydrostatic testing, the pipelines would be

dewatered into the GOM. No treatment of the discharge would be necessary. The hydrostatic testing process would not use chemical additives and all tested pipe would be new. The discharge of hydrostatic test water should not affect water quality along the proposed pipeline route. Only new pipe would be used and no cleaning agents would be utilized in the process. Ichthyoplankton could be entrained during hydrostatic testing. Based on the number of eggs and larvae in a million gallons of seawater approximately 3,761 eggs and 7,873 larvae could be entrained during proposed hydrostatic testing. This would be an insignificant impact that would not re-occur. No additional or significant impacts on biological resources are anticipated from hydrostatic integrity testing of the proposed pipelines. Testing would comply with applicable permits requirements. Because NPDES permit requirements would limit discharges to comply with USEPA water quality standards, effects on marine biota are expected to be minimal.

4.2.2.2 Operational Impacts

LNG Vaporization Impingement/Entrainment Impacts

Minor adverse impacts might occur from the impingement and entrainment of ichthyoplankton. The impacts are not expected to be ecologically significant based on: 1) the proposed location that mitigates impingement and entrainment impacts due to the distance from the shoreline (where population densities are lower) (presented under "STL Buoy Concept); 2) the number of eggs and larvae by family or taxa potentially entrained is not expected to be ecologically significant as related to the number of eggs and larvae laid by a single fish in a year; 3) volumetric analyses that indicate that less than one tenth of one percent of eggs and larvae available in the proposed project area would be entrained (presented under "Entrainement Estimates"); 4) not all the eggs and larvae within the project area would be entrained in the EPEBV (presented under "Egg and Larvae Distribution"); and 5) entrainment mortality of eggs and larvae is expected to be less than 100 percent (presented under "Entrainment Mortality").

Another concern noted by NOAA Fisheries is the potential for the impingement of sea turtle hatchlings. The proposed intake velocity for the open loop system is 1.0 ft/s (0.3 m/s). Average swimming speeds for hatchling sea turtles range from 1.43 ft/s (0.436 m/s) for green sea turtles and 1.17 ft/s (0.36 m/s) for loggerhead sea turtles to 0.83 ft/s (0.25 m/s) for leatherback sea turtles (Wyneken 2001). However, the proposed site would be over 200 mi from the Chandeleur Islands, the closest known sea turtle nesting site (Witherington 2002). Additionally, hatchling sea turtles are known to drift at or near the surface passively with ocean currents during their pelagic stage (Wyneken 2003). If a sea turtle hatchling were to encounter the area of proposed Port, it would be expected to be floating on the surface. The seawater intakes would be located at depths of approximately 23 ft (7 m) and 38 ft (11.5 m) below the water surface. Thus, impingement of sea turtle hatchlings is not expected to occur.

STL Buoy Concept. The proposed EPEBV would intake seawater from the surrounding area using the same intakes that are used for the vessel's main condenser cooling system and other cooling systems. These intakes are located on the starboard and port sides of the vessel at approximately 23.0 ft (7 m) and 38 ft (11.5 m) below the water surface. Total seawater demand for the vessel is approximately 133 MGD (21,000 m^3/hr), with approximately 57 percent or 76.1 MGD (12,000 m^3/hr) of the total demand dedicated to the regasification system. The remainder of the seawater demand is dedicated to the vessel's main condenser cooling system (approximately 46.9 MGD [7,400 m^3/hr]) and the vessel's other cooling systems (approximately 10 MGD [1,600 m^3/hr]). This seawater demand for vessel cooling systems is typical of most LNG vessels and most very large crude carriers

(oil tanker over 200,000 tonne dead weight ton [dwt]). Approximately 20,000 of these types of ships are currently at sea (El Paso 2003b).

The Applicant originally proposed that one of the seawater intake structures would be dedicated to the regasification system with and intake velocity of 3.93 ft/s (1.2 m/s). However, to reduce this large intake velocity, the Applicant proposes that two of the vessel's seawater intakes would be dedicated to the regasification system and the vessel's other cooling systems (not including the main condenser). The vessel's other two seawater intakes would be dedicated to the vessel's main condenser. This would achieve a seawater intake velocity of 1.0 ft/s (0.3 m/s) for the seawater intakes that are dedicated to the regasification and the vessel's other cooling systems (not including the main condenser). The specifications for the seawater intakes are constrained by vessel design and integrity. As such, metal slotted grating on 0.83 in (21 mm) spacings would be incorporated to reduce entrainment of flora, fauna, or other foreign objects and the use of smaller screens are not possible. However, a grating of this size would not reduce the entrainment of ichthyoplankton.

Impingement would occur at the EPEBV when marine organisms are trapped against water intake grating. Entrainment would occur when small marine organisms, including eggs and larvae of fish and shellfish, are drawn into the water intakes and carried through the regasification system. To prevent biological accumulation in the EPEBV equipment, the regasification system would incorporate an antifouling system. This system would add small amounts of copper (2 ppb) and aluminum (0.5 ppb) to the water, which would prevent the establishment of barnacles, mussels, or other small forms of marine life. Survivability for impinged and entrained organisms would vary among species, but is not expected to be 100 percent, as described below.

In the open loop mode and at an average unloading rate, the EPEBVs would be at the proposed Port unloading natural gas approximately 245 days per year (approximately 67 percent of the year). During periods when EPEBVs were not at the proposed Port, the Port would be unmanned and offline

Properly designed and employed protection technology can significantly reduce impingement and entrainment of marine organisms and increase survivability of impinged and entrained organisms. Design issues include depth of the intake screens, which would affect both impingement and entrainment; intake velocity, which would affect impingement; screen type and mesh, which would affect both impingement and entrainment; screen rotation frequency or backwashing, which would effect impingement, fish return system, and re-impingement. These factors have been taken into consideration in the design of the proposed EPEBV seawater intake systems within the constraints allowed by vessel design and integrity.

The intake velocities and mesh sizes employed by EPEBV seawater intake systems are the standard design practice for all LNG and other large cargo vessels. Reducing the intake velocity and/or mesh size requires a proportional increase in the area of seawater intakes. There are practical limits to the size of these openings due to structural integrity (i.e., size of opening cut in side shell), interference with tanks and equipment adjacent to the seawater intakes, and increased ship resistance due to the increased area of hull openings. The seawater intakes on the EPEBVs are sized to maintain the normal shipboard intake velocity and taking into account the addition seawater demand related to regasification operations. The Applicant determined that it is possible to reduce maximum intake velocity by combining the seawater intake for the regasification system with the seawater intake with the vessel's other cooling systems (not including the main condenser). Further reduction of the intake velocity and mesh sizes would restrict water flow, reducing the efficiency of the regasification procedure by requiring the vessel to operate for longer periods of time to offload a constant quantity

of cargo. The STL Buoy concept mitigates impingement and entrainment impacts due to the distance from the shoreline (where population densities are lower).

USEPA published final regulations addressing cooling water intake structures for new facilities (Final Rule) on June 13, 2003 (68 FR 118, pp. 36749-36755). While the Final Rule may provide guidance for the design of LNG regasification systems, the Final Rule is not applicable to the proposed seawater intake at the proposed Port. These regulations require that: intake flow is reduced to a level commensurate with that which can be attained by a closed-cycle recirculation cooling system; the intake is designed with a maximum through-screen intake velocity of 0.5 ft/s; and technologies are implement to minimize impingement mortality and entrainment of protected species, migratory and/or sport or commercial species, or if deemed necessary by the Director or any fishery management agency. The Final Rule also has monitoring and record-keeping requirements. In its industry profile for the oil and gas extraction industry, USEPA states that little is known about potential impacts of impingement and entrainment and further study is required.

Entrainment Estimates. An analysis of these bongo net data performed by the Applicant indicate that an average of 5,027 eggs (i.e., an average of 4,179 and 5,871 eggs in the spring and fall, respectively) and 10,523 larvae (i.e., an average of 11,508 and 6,019 larvae in the spring and fall, respectively) occur in a million gallons (3,785.4 m^3) of filtered seawater in the area of the proposed location (El Paso 2003a). Based on these numbers, the number of eggs and larvae that could potentially be entrained in regasification system was estimated for the Open Loop and Closed Loop configurations, to compare the potential impact of the two modes on ichthyoplankton. Operating in the Closed Loop configuration, seawater intake demand necessary for the ship's main condenser and would be 56.8 MGD. In the Open Loop configuration, the combined seawater intake for the ships systems and the vaporizers would total 132.9 MGD. A comparison of estimated ichthyoplankton impacts associated with the Open and Closed Loop on during a single trip is presented in Table 4-2. It is assumed that the potential ichthyoplankton impacts associated with a combined configuration would be less than the Open Loop but more the Closed Loop.

Table 4-2. Comparison of the Impact of the Open and Closed Loop Modes on Ichtyoplankton During a Single Trip

Warming Water System Configuration	Volume of LNG (MMcf)	Regasification Rate (MMcfD)	Number of Days Required to Complete Regasification	Intake Rate (MGD)	Total Volume Intake for One Trip (10^6 gallons)	Estimated No. of Eggs Impacted/Trip	Estimated No. of Larvae Impacted/Trip
Open Loop	2,950	500	5.9	132.9	784.11	3,941,721	8,251,190
Closed Loop	2,950	450	6.6	56.8	372.35	1,871,831	3,918,298

To represent anticipated operating conditions, a more detailed estimate of potential eggs and larvae entrained within the vaporizers Open Loop warming water system is presented in Table 4-3. This table does not include seawater that would be used by the ships standard operating systems.

To evaluate the impact on individual populations the number of larvae for each species that could be entrained must be considered. However, these data are currently not available. Eggs are not identified in the SEAMAP data, but larvae are identified to the lowest taxon possible. The larvae collected in these samples represent 127 taxa (i.e., fish larvae identified to the order, family, genus, or species level), the twenty most abundant taxa, by season, are presented in Table 3-6. Many larvae

were only identified to the order or family level. Additionally, many of the taxa collected in the samples do not include species that have EFH in the ROI. The abundance (i.e., average numbers per gallons of filtered seawater) by taxa varies with season. For example, Istiophoridae (billfish), are present only in fall samples and are sparse (12 larvae/million gallons of filtered seawater [0.0032/m^3]), and Engraulidae larvae (anchovies) were sampled in both seasons (310 larvae/million gallons of filtered seawater [0.0819/m3] in the fall samples and 802 larvae/million gallons of filtered seawater [0.2119/m^3] in the spring samples) (El Paso 2003a). These two taxa represent the lowest density and one of the highest, respectively, in the database. Based on these two families, Table 4-3 presents an estimated range of impacts on any one family during normal and maximum regasification operations.

Table 4-3. Estimate of Total Eggs and Larvae Potentially Impacted by Regasification Operations

Rate	Number Spring	Number Fall	Average Number
Total Eggs			
Per Day	318,028	446,795	382,556
Per Year Normal Operation[a]	76,962,803	108,124,372	92,578,444
Per Year Maximum Operation[b]	116,080,260	163,080,148	139,632,777
Total Larvae			
Per Day	875730	458030	800,832
Per Year Normal Operation[a]	211,926,558	110,843,167	193,801,260
Per Year Maximum Operation[b]	319,641,296	167,180,809	292,303,553
Istiophoridae Larvae– Represents Minimal Impact to a Taxon			
Per Day	0	922	n/a
Per Year Normal Operation[a]	0	223,081	n/a
Per Year Maximum Operation[b]	0	336,465	n/a
Engraulidae Larvae – Represents Maximum Impact to a Taxon			
Per Day	61,042	23,593	n/a
Per Year Normal Operation[a]	14,772,118	5,709,469	n/a
Per Year Maximum Operation[b]	22,280,260	8,611,389	n/a

[a] Based on an estimated 245 days of operation per year.
[b] Based on 365 days of operation per year.

There are nine fish families with species that have EFH in the ROI. These families and the available egg data are presented in Table 4-4. Three of the EFH families are not represented in the SEAMAP data for the proposed location. These are: Panaeidae (shrimp); Rachycentridae (cobia); and Pomatomidae (bluefish). Within the family Sciaenidae, red drum is not represented in the database, although two other sciaenids are listed. Due to their absence from the database, it is assumed that the larvae of the red drum are not likely to be found in the vicinity of the proposed Port location and that there would be no adverse impact to the larvae of this species. The family Pomatomidae includes bluefish. Because their larvae were not represented in the SEAMAP samples for the proposed location, it is also assumed that the proposed Port would pose very little impact to bluefish larvae.

Table 4-4. Families and Available Egg Data for Species that have EFH in the ROI

FAMILY	COMMON NAME	NUMBER OF EGGS
Balistidae	gray triggerfish	49,000-66,000 eggs per fish per year
Carangidae	greater amberjack	n/a
	lesser amberjack	n/a
Coryphaenidae	dolphin fish	n/a
Lutjanidae	red snapper	200,000-9,300,000 eggs per fish per year [1, a]
	gray snapper	590,000-5,900,010 eggs per fish per year [2, a]
	Lane snapper	347,416-994,787 eggs per fish per year [2, a]
Panaeidae	brown shrimp	n/a
	white shrimp	n/a
Pomatomidae	bluefish	900,000- 4,500,000 eggs per fish per year [b]
Rachycentridae	cobia	n/a
Sciaenidae	red drum	millions of eggs per fish per year [c]
Scombridae	little tunny	n/a
	king mackerel	69,000-12,000,000 eggs per fish per year [1, a]
	bluefin tuna	n/a

Source: [a] USFWS 1983-1988, [b] NOAA COB undated, [c] Porch 2000
Notes: [1]increases with age, [2]increases with size
n/a = not available

Both bluefish and red drum are species that have larval EFH in the nearshore, estuarine habitat (GMFMC 1998). Rachycentridae includes the cobias, which are considered coastal migratory pelagics. Because cobia larvae were not sampled, it is assumed that the impact to larvae of species within the Rachycentridae would be negligible.

Panaeidae is the family for brown and white shrimp. NOAA Fisheries maintains invertebrate larvae in a separate database, and this data set was not available for analysis because it has not been completely analyzed by the agency. It is possible that all life stages of brown shrimp and larvae of the white shrimp could be found in the proposed project area. However, data presented in Table D-1 indicate that brown and white shrimp eggs are demersal, and that white shrimp eggs are predominantly sampled nearshore. As such, the proposed project is not likely to have an impact on brown and white shrimp eggs or white shrimp larvae. Any impact on brown shrimp larvae is expected to be minimal, since the larval stage is relatively short-lived and the post-larvae begin to move inshore to the estuaries (see Table D-2).

Based on the potential minimal impact and maximum impact to an individual taxa presented in Table 4-3 and the egg data for individual fish, the impacts of the regasification system for the proposed port would be insignificant. Minimal impact to for a family is no eggs and larvae entrained (note: because egg data are not available for individual taxa minimum and maximum impact for the larvae taxa will be assumed for the eggs as well) and maximum impact for a family is 8.6 million eggs and

larvae entrained a year if the proposed Port were to operate 365 days a year. However, most families in the SEAMAP data represent more than one species. Because the Port is likely only to operate 245 days a year and most families in the SEAMAP data represent more than one species, more than likely less than 8.6 million eggs and larvae would be entrained in a year. As indicated in Table 4-4, most individual fish would lay more than one million eggs per year. It can also be assumed that fewer eggs and larvae would be entrained for species that lay fewer eggs (e.g., gray triggerfish) because fewer eggs would be available to be entrained.

The Applicant also provided volumetric and flow analyses that indicate that number of eggs and larvae would not be ecologically significant relative to the number of eggs and larvae that occur within the proposed project area (El Paso 2003a). For the volumetric analysis, the number of eggs and larvae potentially entrained in the seawater regasification system were compared to the number of eggs and larvae available within specific boundaries that surround the proposed project location. The north and south boundaries are the 28° and 30° N latitudes, respectively and the east and west boundaries are the 92° and 94° W longitudes, respectively. The boundaries encompass an area of 13,997 mi^2 (36,251 km^2). The northern boundary was selected near the 328-ft (100-m) isobath because the habitat beyond that isobath becomes less reprasentative of the proposed project area as habitat quickly changes with increase water depth. A maximum depth of 60 meters for the offshore vertical boundary was selected based on the maximum depth at which samples in the database were collected. The habitat within this boundary has a total seawater volume of approximately 287.3 x 10^{12} gallons (1,087.5 km^3). The number of eggs and larvae available were estimated by applying the abundance of fish larvae and eggs that occur in a gallon of seawater at the project area to the total volume of seawater within defined boundaries. The flow analysis analyzed the percent of total flow passing through the area that would be diverted through the EPEBV. Both analyses are based on conservative estimates of the number of larvae that would be available to be impinged and entrained within the proposed project area, which are based on SEAMAP ichthyoplankton data. Both analyses indicate that the number of eggs and larvae that would be entrained in the EPEBV under a "worse case" scenario are less than a tenth of one percent of the eggs and larvae within proposed project area (El Paso 2003a).

While the proposed Port represents another source of mortality ichthyoplankton, most eggs and larvae would not be expected to survive to adulthood. Natural mortality is estimated to be as high as 99 percent and 96 percent for eggs and larvae, respectively (Houde 1987; Lasker 1987).

Egg and Larvae Distribution. Not all eggs that would be present in the area would be entrained. The number of eggs and larvae entrained would depend on the distribution of eggs and larvae. Distribution and abundance of eggs and larvae is highly variable and is related to distribution of spawning adults (Gledhill and Lyckowski-Shultz 2000). Postlarval and juvenile fish are more abundant in proximity to the platform structures compared to adjacent down-current open waters (Shaw et al. 2002). As such, the density of eggs is expected to be higher in proximity to the metering platform compared to the location of the STL buoy. The metering platform would be located approximately 2 mi (3 km) from the proposed STL buoy.

Most of the year in the north-central GOM, the densities of ichthyoplankton are greater at the surface and decrease with depth (Shaw 2002). While siting the seawater intake lower in the water column might result in further reduction of impinged or entrained organisms. The constraints of the EPEBVs make it impossible to site the seawater intake lower in the water column.

Entrainment Mortality. Mortality of entrained eggs and larvae is expected to be less than 100 percent. Mortality for entrained eggs and larvae would result from direct contact from impeller

blades, a decrease in ambient pressure, a decrease in water temperature, and the marine growth prevention system. However, as described in the following paragraphs, mortality of entrained eggs and larvae is expected to be some percentage less than 100 percent.

Entrainment mortality of early life history stages of fish, as relates to turbine passage in hydropower plants, can be as low as less than five percent mortality of entrained organisms (Cada 1990). Mortality due to contact with turbine blades is dependent on the turbine design, but is expected to be low (Cada 1990).

A sudden decrease in ambient pressure of 40 percent or less of the acclimation pressure may lead to burst swim bladders and thus mortality to larvae that have developed swim bladders (Cada 1990). Because the seawater intakes are sited at approximately 23 ft (7 m) and 38 ft (11.5 m), the ichthyoplankton would experience approximately a 30 percent decrease in air pressure when pumped to the surface. As such, depth is not expected to be an important factor in larval mortality.

The temperature inside the regasification system would also have an impact on the survivability of organisms. The Applicant proposes that the temperature inside the regasification system will be 13 ºF lower than ambient temperature. The minimum temperature inside the regasification system would be 45 ºF. To assure the minimum temperature is maintained the regasification system reduces natural gas flow and then shuts down when the water out of the vaporizer is less than 45 ºF. The design of the regasification systems is such that an increase in temperature inside the system would require the use of higher volumes of seawater (e.g., a 10 ºF decrease would require the use of twice as much seawater, thus twice as many organisms impinged). Data on lethal temperatures for fish eggs and larvae are sparse (Appendix D, Table D-2). Review of the data indicates that a 13 ºF temperature differential is unlikely to cause mortality of all eggs and larvae. The minimum temperature of 45 ºF is near the lower lethal temperature for the shrimp species.

The length of Open Loop piping from sea chest through vaporizer and overboard is approximately 325 m with an average pipe velocity of approximately 4.5 m/sec, and a total onboard time of approximately 75 sec.

All of the seawater entering the sea chest intakes either for ship operations or for the regasification process will pass through a copper cathode antifouling system. Supplementary information provided by the Applicant to the USCG indicates that the EPEBV's antifouling system will not include aluminum anodes as described in the Environmental Report (El Paso 2003b). The copper anodes release a small amount of copper into the ships seawater system at the intake to prevent biota in the seawater from establishing within the seawater flow path. The copper concentration in all of the ships seawater discharge will be approximately 2 ppb. This system is necessary not only for the safe operation of the ship but also to prevent the potential transport and discharge of non-native species. This antifouling system and the copper concentrations associated with it are typical of most ships operating around the world.

As discussed in Section 4.1 the U.S. Geological Survey (USGS), grouped copper in the low-toxicity category (MEADE 1995). USEPA's limit for copper in water supporting aquatic life has been set at 20 ppb (USEPA 1982). Average concentrations of copper in deepwater GOM surface waters have been reported at 0.082 ppb (MMS 2001b). The discharge concentration of 2 ppb associated with the ships antifouling system should not have an adverse effect on the marine environment greater than that associated with ships currently operating in the GOM and around the world. USEPA's *National Recommended Water Quality Criteria: 2002* (USEPA 2002) classifies copper as a priority toxic pollutant. The standards applicable for copper in a saltwater environment are an acute (CMC)

criterion of 4.8 ppb and a chronic (CCC) criterion of 3.1 ppb. These criteria are ambient water quality criteria that would apply at the edge of a zone of initial dilution (e.g., at the edge of a mixing zone).

As demonstrated in the thermal modeling performed in support of the thermal plume impact assessment, dilution of the discharge plume in the ambient seawater would occur rapidly at a short distance from the discharge point.

The minimal concentration of copper present in the seawater discharge plume associated with the ships operating and regasification systems would have a periodic minor localized impact on water quality in the area adjacent to the EPEBVs while at the deepwater Port.

Thermal Discharge Impacts

EPEBVs would discharge the water used in the regasification process from two discharge pipes at the bottom of each vessel. Each discharge pipe could produce from 12.67 MGD to 39.6 MGD of cooled sea water, for a total of 25.34 MGD to 79.2 MGD of cooled sea water. The proposed discharges would be from open pipes with no baffles or mesh. The discharge location would be 36.1 ft (11 m) below the water surface.

The discharge of cooled sea water from open loop operations would result in a plume of water approximately 7.5 ºC (13.5 °F) cooler than the ambient water. Where the discharge plume extends below the thermocline, the difference in temperature between the discharge plume and the ambient water would be reduced because ambient temperatures below the thermocline tend to range from 6 ºC (10.8° F) to 2 ºC (3.6 °F) cooler than ambient temperatures above the thermocline. Below the thermocline, the discharge plume would likely range from 1.5 ºC (2.7 °F) to 5.5 ºC (9.9 °F) cooler than the ambient water. This temperature difference does not take into account the effect of the discharge plume's diffusion with ambient water toward the thermocline, which likely would further reduce the difference in temperature between the discharge plume and the ambient water temperature. The discharge plume is more likely to reach waters below the thermocline in summer, when the thermocline can be as shallow as 32.8 ft (10 m). The discharge plume would not be likely to reach the thermocline in winter when thermocline depths in the GOM can be as deep as 246.1 ft (75 m).

The Applicant modeled the discharge plume under different conditions (i.e., nonstratified and stratified, and different current velocities). Because current direction and velocity is expected to fluctuate over the course of a given 6- to 8-day unloading period, the relative location and magnitude of the plume would also be expected to fluctuate. Under nonstratified conditions, the thermal plume can be described as a circular area, at the centerline of the vessel, with a maximum radius of approximately 49 ft (15 m). The vertical cross-section within this area would extend to a maximum depth of approximately 114 ft (35 m) below the water surface. The Applicant indicates that it would be conservative to assume that under stratified conditions the thermal plume would be a similar size.

Marine organisms have thermal tolerance ranges that determine how the organisms respond to the temperature. Distribution and migration patterns of many marine organisms are associated with temperature. Tables D-2 of Appendix D and 4-2, respectively, describe the temperature ranges and associations of fish and shrimp species with EFH in the ROI as well as several species of sea turtles. Any adverse biological effects from the thermal discharge should be localized. It is anticipated that most mobile species would move out of the cold-water plume, and thus, minimal adverse effects on protected, managed, or other marine species are expected.

Most fish are ectothermic/poikilothermic (variable body temperatures) animals that are affected by the temperature of their environment. With rapid ambient water temperature changes, the body temperature of a fish may vary for a short time period, but generally body temperatures are about equal to ambient water temperatures (Hazel 1993). Additionally, fish may exhibit a physiological response to temperature decreases such as decreasing gill ventilation and heart rate (Hazel 1993). However, adult fish are mobile and capable of moving away from an external source, such as the cold-water discharge plume that may affect their physiology or health. Some fish, including tuna, bonito, and billfish are endothermic (warm-bodied), which means they have specialized mechanisms to regulate temperature. For example the muscle temperature of bluefin tuna has been recorded at 20 ºC (68 ºF) in waters of 7.2 ºC (45 ºF) (Hazel 1993). As such, a thermal plume discharge would not be expected to impact adult fish.

In general, most fish larvae are concentrated in the upper half of the water column, with the larvae of few species such as Atlantic croaker and spotted seatrout concentrated in the lower half of the water column (Lyczkowski-Shultz and Steen 1991). Research indicates that some larval fish and other zooplankton are concentrated higher in the water column during daylight and in deeper waters at night. Species of fish larvae that undergo these vertical diurnal migrations are exposed to a wide range in water temperatures, resulting in an increased level of thermal tolerance (Myers et al. 1986). Even larvae with a high thermal tolerance may be immobilized or killed by a sudden exposure to cold temperature (Table D-2; Myers et al. 1986). Overall, the impact on fish larvae from the thermal discharge plume is expected to be minimal.

Data are available on the optimal hatching temperatures for eggs. However, available data on lethal temperatures for fish eggs are sparse (Table D-2 of Appendix D). Review of the data indicates that temperature differential in the discharge plume may be sufficient to cause lethal effects on at least some species of fish eggs. However, because the eggs that are likely to be affected would represent only a small portion of the total eggs available, this effect is not expected to be ecologically or economically significant.

It is also unlikely that sea turtles would suffer a lethal impact or adverse effect from the 7.5 ºC (13.5 °F) lower water discharge temperature. Although sea turtles are also poikilothermic animals that can be affected by temperature change, they are mobile and can readily move out of the cold-water plume by swimming away from it. Sea turtles suffer from potentially lethal cold shock when they are exposed to low water or air temperatures from which they cannot escape (Table 4-5). The proposed EPEBV regasification discharge in the open ocean represents an entirely different situation and thus, the thermal water discharge would not be expected to physiologically affect or disrupt sea turtles.

Table 4-5. Temperature Associations of Sea Turtles in the ROI

Kemp's Ridley Sea Turtle	
Not listed in literature source	<50 ºF = floating immobile; death at 41-42.8 ºF
Green Sea Turtle	
Not listed in literature source	Water must be above 68 ºF; immobile at 48.2-50 ºF; death at 42.8 ºF
Leatherback Sea Turtle	
Not listed in literature source	Can survive at much colder temps than 64.4 ºF
Loggerhead Sea Turtle	
Not listed in literature source	Immobile at 48.2-50 ºF; death at 39.2-41ºF
Spawning Adults	66-69.8 ºF

Source: Entrix 2002

The thermal discharge could possibly be considered harassment for marine mammals under the MMPA, as interaction with the plume may cause these animals to change their location or behavior. However, marine mammals are mobile and can readily move or swim out of the cooler water, causing no physiological impact. Furthermore, as homeothermic (warm-blooded) animals, marine mammals can regulate their internal body temperature and would experience no effect from the difference in water temperature.

Turbidity. Turbidity impacts on marine biota are described in Section 4.2.2.1. Impacts on primary productivity are expected to be minimal and impacts on fish resources or EFH are not expected. Modeling results indicate that it is unlikely that water discharged from the EPEBV units would come in contact with the sediment on the seafloor in the proposed Port area. As such, the proposed regasification process is not expected to result in an increase in turbidity. Section 4.1.2.4 provides more detail on the discharge plume.

Treated Water Discharge

Treated water from the proposed metering platform and the EPEBVs could possibly affect marine life in the area of the proposed Port. To prevent long-term impacts on water quality, all treated waters discharged from the proposed Port would comply with the provisions of all applicable laws, regulations, and permit requirements. Therefore, impacts on biological resources resulting from the discharge of treated waters are expected to be minimal.

As previously stated, all of the seawater entering the sea chest intakes either for ship operations or for the regasification process will pass through a copper cathode antifouling system. Supplementary information provided by the Applicant to the USCG indicates that the EPEBV's antifouling system will not include aluminum anodes as described in the Environmental Report (El Paso 2003b). The copper anodes release a small amount of copper into the ships seawater system at the intake to prevent biota in the seawater from establishing within the seawater flow path. The copper concentration in all of the ships seawater discharge will be approximately 2 ppb. This system is necessary not only for the safe operation of the ship but also to prevent the potential transport and discharge of non-native species. This antifouling system and the copper concentrations associated with it are typical of most ships operating around the world.

As discussed in Section 4.1 the U.S. Geological Survey (USGS), grouped copper in the low-toxicity category (MEADE 1995). USEPA's limit for copper in water supporting aquatic life has been set at 20 ppb (USEPA 1982). Average concentrations of copper in deepwater GOM surface waters have been reported at 0.082 ppb (MMS 2001b). The discharge concentration of 2 ppb associated with the ships antifouling system should not have an adverse effect on the marine environment greater than that associated with ships currently operating in the GOM and around the world. USEPA's *National Recommended Water Quality Criteria: 2002* (USEPA 2002) classifies copper as a priority toxic pollutant. The standards applicable for copper in a saltwater environment are an acute (CMC) criterion of 4.8 ppb and a chronic (CCC) criterion of 3.1 ppb. These criteria are ambient water quality criteria that would apply at the edge of a zone of initial dilution (e.g., at the edge of a mixing zone).

As demonstrated in the thermal modeling performed in support of the thermal plume impact assessment, dilution of the discharge plume in the ambient seawater would occur rapidly at a short distance from the discharge point.

The minimal concentration of copper present in the seawater discharge plume associated with the ships operating and regasification systems would have a periodic minor localized impact on water quality in the area adjacent to the EPEBVs while at the deepwater Port.

Water associated with the proposed Port's operations would be generated by the ships' "hotel" functions associated with sanitary systems. Black water would be collected in a biological-type treatment system which includes a 10 m^3 holding tank, sized for a 15-day holding period for a 40-person crew. Grey water would be collected in drainages from wash basins, sinks, and scuppers for routing into the final stage of the sanitary system. Sanitary disposal systems on the platform are similar in that black water would be routed to a biological-type treatment system. Grey water would be routed to the final stage of this system for sanitizing before being discharged.

Any frequent or intermittent discharges (i.e., sanitary and domestic waste and other minor discharges) would comply with USEPA NPDES permit-based effluent limits, USCG regulations, and MARPOL protocol, as applicable, and would be diluted rapidly in the water column. As such, impacts on marine biota are expected to be insignificant.

Noise

Properties of Noise. In order to understand the impact of noise on biological resources it is necessary to understand the properties of noise in air and water and the existing ambient noise levels in the Gulf of Mexico. The ambient sound level of a region is defined by the total noise generated, including sounds from both natural and artificial sources. The magnitude and frequency of environmental noise may vary considerably over the course of the day and throughout the week, due in part to changing weather conditions. Two measurements used by some Federal agencies to relate the time-varying quality of environmental noise to its known effect on people are the 24-hr equivalent sound level (Leq(24)) and the day-night sound level (DNL). The Leq(24) is the level of steady sound with the same total (equivalent) energy as the time-varying sound of interest, averaged over a 24-hr period. The DNL is the Leq(24) with a penalty added to the A-weighted nighttime sound levels (i.e., hours between 10 p.m. and 7 a.m.) to account for people's greater sensitivity to sound during nighttime hours. When measuring sound to determine its effects on the human population, A-weighted sound levels (dBA) are typically used to account for the response of the human ear. A-weighted sound levels represent adjusted sound levels. The adjustments are made according to the frequency content of the sound. Another sound scale is the C-weighted scale (dBC). In contrast to the A-weighted scale, the C-weighted scale provides no adjustment to the noise signal over most of the audible frequency range. The C-weighted scale is generally used to measure impulsive noise such as airblasts from explosions, sonic booms, and gunfire.

Underwater sound measurements are different than airborne sounds. The reference pressure used for underwater noise measurements is 1 micro-Pascal (μPA) at 1 m (re 1μPA-m), which is much lower than that used for airborne sound measurements. The reference level used in air is 20 re 1μPA-m (MMS 2000a). Because of these differences in reference standards, noise levels cited in air do not equal underwater levels. A different reference level is used for underwater sound, 1 re 1μPA-m (Entrix 2002). In addition, underwater noise measurements typically do not have any frequency weighting applied (i.e., A-weighted or C-weighted), while airborne noise is often measured using one of several frequency weighting scales. In many cases, underwater noise levels are reported only for limited frequency bands, while airborne noise is usually reported as an integrated value over a very wide range of frequencies. To compare noise levels in water to noise levels in air, one must subtract 26 decibels (dB) from the noise level referenced in water in order to account for the difference in reference pressure (a dB is defined as the ratio between a measured pressure and a reference

pressure) (NOAA 2002). For example, a supertanker that emits 164 dB in air (20 re 1μPA-m) would sound more like 190 dB in water (1 re 1μPA-m) (NOAA 2002).

Furthermore, because the mechanical properties of water differ from those of air, sound moves at a faster speed in water (1,500 meters per second [m/s]) than in air (about 340 m/s) (Entrix 2002). Temperature also affects the speed of sound, traveling faster in warm water than in cold water, which is very significant in some parts of the ocean. A lower frequency sound has a longer wavelength, and the wavelength of a sound equals the speed of sound in either air or water divided by the frequency of the wave. Therefore, a 20 Hertz (Hz) sound wave is 75 m long in the water, whereas a 20 Hz sound wave in air is only 17 m long (Entrix 2002).

Existing Ambient Noise Levels. Existing ambient noise levels in the GOM are primarily associated with OCS oil and gas development and result from seismic surveys, the operation of fixed structures such as offshore platforms and drilling rigs, helicopters, and commercial shipping traffic including OCS related traffic (MMS 2002a). Noise generated from these activities can be transmitted through both air and water, and may be stationary or transient. Offshore drilling and production involves various activities that produce a stationary composite underwater noise field. The intensity level and frequency of the noise emissions are highly variable, both between and among the various industry sources. Anticipated noise impacts resulting from the Proposed Action on biological resources will be compared to existing noise levels associated with the OCS oil and gas development and other noise-generating activities in the GOM.

Seismic Surveys. A sound source more specific to operations in the OCS originates from seismic operations. Airguns produce an intense, but highly localized sound energy and represent a source of possible concern. Marine seismic surveys direct a low-frequency energy wave (generated by an airgun array) into the ocean floor and record the reflected energy wave's strength and return arrival time. The pattern of reflected waves, recorded by a series of hydrophones embedded in cables towed by the seismic vessel (streamers), can be used to "map" subsurface layers and features. Seismic surveys can be used to check for foundation stability, detect groundwater, locate mineral deposits (coal), and search for oil and gas.

At distances of about 500 m and more (farfield), the array of individual airguns would effectively appear to be a single point source. In the past, sound-energy levels were expected to be less than 200 dB re 1μPa-m at distances beyond 90 m from the source. A typical source would output approximately 220 dB 1 μPa-m, although the peak-to-peak source level directly below a seismic array can be as high as 262 dB re 1μPa-m (MMS 2002a).

More recently, it has been estimated that a typical 240-dB seismic array would have a 180 dB re 1μPA-m level at approximately 225 m from the array. The 180 dB re 1μPA-m level is an estimate of the threshold of sound energy that may cause hearing damage in cetaceans. It is unclear which measurements of a seismic pulse provide the most helpful indications of its potential impact on marine mammals. However, it is speculated that peak broadband pressure and pulse time and duration would be most relevant at short ranges (hearing damage range) while sound intensity in 1/3 octave bands is a more useful measurement at distance (behavioral effects) (MMS 2002a).

Fixed Structures. Information on drilling noise in the GOM is unavailable to date. From studies mostly in Alaskan waters, drilling operations often produce noise that includes strong tonal components at low frequencies, including infrasonic frequencies in at least some cases. Drillships are apparently noisier than semisubmersibles (MMS 2002a). Sound and vibration paths to the water are through either the air or the risers, in contrast to the direct paths through the hull of a drillship.

Machinery noise generated during the operation of fixed structures can be continuous or transient, and variable in intensity. Underwater noise from fixed structures ranges from about 20–40 dB above background levels within a frequency spectrum of 30–300 Hz at a distance of 30 m from the source (MMS 2002a). These levels vary with type of platform and water depth. Underwater noise from platforms standing on metal legs would be expected to be relatively weak because of the small surface area in contact with the water and the placement of machinery on decks well above the water.

Helicopter and Service-Vessel Traffic. Service vessels and helicopters are the primary modes for transporting personnel and supplies between service bases and offshore platforms, drilling rigs, derrick barges, and pipeline construction barges. Service vessels and helicopters might add noise to broad areas. Sound generated from helicopter and service-vessel traffic is transient in nature. The intensity and frequency of the noise emissions are highly variable, both between and among these sources. The level of underwater sound detected depends on receiver depth and aspect, and the strength/frequencies of the noise source. The duration that a passing airborne or surface sound source can be received underwater might be increased in shallow water by multiple reflections (echoes) (MMS 2002a).

Service vessels transmit noise through both air and water. The primary sources of vessel noise are propeller cavitation, propeller singing, and propulsion; other sources include auxiliaries, flow noise from water dragging along the hull, and bubbles breaking in the wake (MMS 2002a). Propeller cavitation is usually the dominant noise source. The intensity of noise from service vessels is roughly related to ship size, laden or not, and speed. Large ships tend to be noisier than small ones, and ships under way with a full load (or towing or pushing a load) produce more noise than unladen vessels. For a given vessel, relative noise also tends to increase with increased speed. Commercial vessel noise is a dominant component of man-made ambient noise in the ocean (MMS 2002a).

Normal offshore work schedules involve 2-week (or longer) periods with some weekly crew changes; therefore, helicopters would travel to some facilities in the GOM at least once a week. According to the Helicopter Safety Advisory Conference, the number of helicopter flights supporting Gulfwide OCS operations has been increasing steadily since 1994 to over 1.7 million trips annually, carrying 3.7 million passengers during 417,000 flight hours (MMS 2002a).

The FAA regulates helicopter flight patterns. Because of noise concerns, FAA Circular 91-36C encourages pilots to maintain higher-than-minimum altitudes near noise-sensitive areas (MMS 2002a). Corporate policy (for all helicopter companies) states that helicopters should maintain a minimum altitude of 700 ft while in transit off shore and 500 ft while working between platforms and drilling rigs. When flying over land, the specified minimum altitude is 1,000 ft over unpopulated areas and coastlines, and 2,000 ft over populated areas and sensitive areas including national parks, recreational seashores, and wildlife refuges. In addition, the guidelines and regulations promulgated by NOAA Fisheries require helicopter pilots to maintain 1,000 ft of airspace over marine mammals (MMS 2002a).

Helicopter sounds contain dominant tones (resulting from rotors) generally below 500 Hz (MMS 2002a). Hz is equal to one cycle of vibration per second and is the standard unit of measure for frequency. Helicopters often radiate more sound forward than backward; thus, underwater noise is generally brief in duration, compared with the duration of audibility in the air. In addition to the altitude of the helicopter, water depth and bottom conditions strongly influence propagation and levels of underwater noise from passing aircraft. Lateral propagation of sound is greater in shallow than in deepwater. Helicopters, while flying off shore, generally maintain altitudes above 700 ft

during transit to and from the working area, and an altitude of about 500 ft while between platforms (MMS 2002a).

Proposed Port Facilities. The metering platform would be manned intermittently (i.e., approximately 42 times per year) during offloading operations at the STL buoy; the metering platform would normally be unmanned while the Port is vacant. In the latter instances, the deepwater Port would contribute no noise above background levels.

Noise produced by EPEBV operation, regasification activities, support operations, and metering platform activities could affect resources at or near the proposed Port. The Applicant estimates that these activities would occur approximately 42 times per year. Noise generated by the regasification process would not affect noise sensitive areas on shore due to the distance from shore. Support vessel and helicopter trips would originate from existing facilities onshore and would follow established routes in nearshore waters and airspace, thus reducing the likelihood for creating noise annoyance.

It is generally recognized that commercial shipping is a dominant component of the ambient low-frequency background noise in modern world oceans and that OCS-related vessel traffic would contribute to this background noise. For the GOM, contribution to existing shipping noise from the EPEBVs would be insignificant. Transiting EPEBVs would operate at decibel levels estimated to range from about 85 to 120 dBA. LNG carriers moored at the proposed Port would emit similar noise levels during offloading operations. Table 4-6 shows typical sound levels, measured in dBA, from equipment that may operate on the EPEBVs while at the proposed deepwater Port. Sound traveling through air is heard at these levels; the same sound traveling through water has a greater impact at close range.

The only sound that would originate from the proposed deepwater Port itself would be produced by an intermittent transponder system (i.e., the system would only be activated when an EPEBV is 50 m from approaching the proposed Port) that would be placed on the STL buoy. The acoustic transponder system would be used for monitoring the STL buoy's draft and its position relative to the ship before and during connection. The transponder would be a Type 7409 Sonardyne Oceanographic Release Transponder (ORT) that requires no antenna at the surface. The transponder would have a floating tag line (used to retrieve the buoy) with two flashing warning lights on the end. Table 4-7 provides some of the specifications of the Sonardyne ORT as they relate to its acoustic parameters. However, these specifications can be adapted to any criteria that would be required by the USFWS or NOAA Fisheries in order to reduce impacts to marine organisms.

The top of the STL buoy would be fitted with three sonar transponders equally spaced around the circumference of the upper part of the buoy. The EPEBV buoy location system would automatically search for the strongest return signal from the buoy. Because of their spacing on the top of the buoy, two of the three transponders would always receive a signal from the ship's transducer. If the HPR system should lose the return signal from the transponder, the search procedure to retrieve the buoy and accomplish connection would start anew.

Proposed Pipelines. The pipelines delivering gas from the STL buoy and the metering platform would be installed directly on top of the bottom sediments. Similar pipelines are common in this area of the GOM. Use of the pipelines would not be a significant source of noise to either the human environment or to marine mammals.

Table 4-6. Equipment Sound Levels That May Be Associated with Regasification Ships

Equipment	BHP	dBA in Air [1]	dBA in Water [2]	Comments
Fire Water Pump	300 – 700	96.9	122.9	Determined for a 175 hp pump
Air Compressor	125	98	124	Actual noise level for 125 hp compressor
Gas Compressor	1200	107.5	133.5	Determined for 400 hp compressor
Boil-off gas (BOG) Compressor	720	107.5	133.5	Determined for 400 hp compressor
LNG Tank Pump	310	96.9	122.9	Determined for 175 hp pump
LNG Sendout Pump	2060	96.9	122.9	Determined for 175 hp pump
Turbine Generator	23,470	85	111	
Emergency Generator	800	85	111	
Utility Seawater Lift Pump	20	87.6	113.6	Determined for 20 hp pump
Seawater Pump	650	96.9	122.9	Determined for 175 hp pump
Mobile Crane		109	135	Worst case scenario based on 429 hp mobile crane
Crane	274	108	134	Actual noise level for 190 hp crane
Jib Crane	550	105	131	Actual noise level for 250 crane

Source: Entrix 2002

Notes:

1 20 re 1µPA-m

2 1 re 1µPA-m

BHP - Brake horsepower

dBA - decibels A-weighted

hp – horsepower

Table 4-7. Specifications for the Sonardyne Oceanographic Release Transponder (ORT), Type 7409

System Property	Specification
Frequency	16.5 – 17.5 kHz
Depth Rating	2,000 meters
Transducer Beamshape	Hemispherical
Acoustic Output Power	186 dB re 1µPa @ 1 m
Receive Threshold	<90 dB re 1µPa

Source: Sonardyne 2003

Support Vessels and Helicopters. The El Paso Energy Bridge GOM proposal would not require the use of any new support vessels or helicopters. Personnel, vessels, and helicopters that could provide support to the proposed deepwater Port would deploy from existing shore-based facilities at Sabine Pass, Texas, and from other manned El Paso platforms offshore. No support vessels or helicopters would be dedicated to the proposed Port. Use of existing resources to support deepwater port operations would result in no increase or decrease of the existing number of vessels or helicopters or, generally, in the number of trips that already occur to support existing facilities in the GOM. Accordingly, there would be no additional impacts on the noise environment associated with support vessel and helicopter operations. However, impacts of vessel traffic on marine organisms are described below.

The majority of support vessel and helicopter activities would occur offshore, up to 100 mi from the Louisiana coast. Onshore communities and their more sensitive receptors such as schools, churches, and hospitals would not be affected.

Fish. The machinery noise generated by helicopters, support vessels, EPEBVs, and the acoustic transponder associated with the operation of the proposed Port may have an impact on fish. It is assumed that these noises would occur only when an EPEBV calls to the proposed Port, approximately 42 times per year. It is presumed that all fish species in the northern GOM can hear, with varying degrees of sensitivity, within the frequency range of sounds produced by oil and gas exploration, production, and decommissioning activities. Noise from these activities can mask sounds important to fishes. In particular, loud noise may cause fish to change their behavior and movements and may temporarily affect the usual distribution of fish, disrupting commercial fishing activities. Continuous, long-term exposure to high sound pressure levels above 180 dB has been shown to cause damage to the hair cells in the ears of some fishes. These effects may not be permanent since damaged hair cells are repaired or regenerated in fishes. As the distance between the fish and the source increases, the probability of hearing impairment would decrease as sounds attenuate with distance from a source (MMS 2002a). As indicated above, increase in noise levels, as relates to vessel activity would be negligible. The acoustic specifications of the transponder system can be adapted below the threshold that would cause avoidance behavior by or hearing loss in fish that would be in the area. The Applicant would consult with USFWS and NOAA Fisheries in order adapt the acoustic specifications of the transponder system to reduce impacts to marine organisms. As such, the noise associated with the Proposed Action would not result in significant impacts on fish.

Sea Turtles. The machinery noise generated by helicopters, support vessels, EPEBVs, and the acoustic transponder associated with the proposed Port may affect sea turtles. It is assumed that these noises would occur only when an EPEBV calls to the proposed Port, approximately 42 times per year.

Sounds from helicopters and vessels would originate from coastal ports and travel through broad areas of the continental shelf and slope. The most likely effects would be short-term behavioral changes such as diving and evasive swimming, disruption of activities, or departure from the area of disturbance. Areas with heavy vessel traffic may be avoided by sea turtles, although generally most species appear to exhibit tolerance to noise. Noise related to helicopter and vessel traffic in the GOM is transient and generally not at levels that would prevent rapid recovery of sea turtles once the noise ceased. The acoustic specifications of the transponder system can be adapted below the threshold that would cause avoidance behavior by or hearing loss in sea turtles that would be in the area. The Applicant would consult with USFWS and NOAA Fisheries in order adapt the acoustic specifications of the transponder system to reduce impacts to marine organisms. Therefore, noise

impacts on sea turtles associated with Proposed Action would be insignificant and minor (MMS 2002a).

Marine Mammals. Airborne sounds from helicopters may impact marine mammals while at the surface. Levels of underwater sounds from passing or hovering helicopters vary widely depending on the specific engine type and size, number of rotors, altitude and relative angle of the aircraft, and water depth (Richardson et al. 1995). Reactions of cetaceans may range from apparent indifference to evasive behavior (e.g., turns, diving). Documented observations of sperm whales to low-flying helicopters showed no obvious reactions (Richardson et al. 1995).

Disturbance of marine mammals by ships and boats may be considered a more prominent source of potential impact because of substantially greater underwater noise levels, relatively large numbers, and Gulf-wide distribution of vessels. 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. Cetacean reaction to boat traffic varies by species and, within species, according to their current behavior patterns and previous experience. Toothed whales and dolphins show tolerance of vessel traffic.

Many dolphin species are attracted to vessels, and spend periods of time following them or swimming within these vessels' bow pressure waves, apparently to reduce energetic costs of swimming (Williams et al 1992). Wurzig (in Richardson et al 1995) reported that resting dolphins tended to avoid boats, foraging dolphins ignore boats, and socializing dolphins may approach the vessels. It is known that bottlenose dolphins inhabit channels in many areas that are used by vessels including large tankers as well as small pleasure craft (Barham et al 1980; Shane 1980; Acevedo 1991; Fertl 1994). Acevedo (1991) reported that in Mexico, bottlenose dolphins exposed to frequent boat traffic exhibited little discernable reaction unless the boat approached within 5 m of the animal. Wurzig et al (1996) reported that during the GulfCet survey GOM, 100 percent of the stenellid species of dolphins (i.e., Clymene, Atlantic spotted, Pantropical spotted, spinner, and striped dolphins), with the exception of the striped dolphin, habitually bow rode. None of the observed bottlenose dolphins or Atlantic spotted dolphins showed any negative reaction to the survey vessel. No information was found on the reaction of these species to helicopters; however, most species of toothed whales have been observed to have a fairly strong avoidance reaction to helicopters (Richardson et al 1995). Watkins (1981) reported, however, that Brydes whales exhibited little response to vessels approaching at a steady speed. Sperm whales may have a high tolerance for vessel traffic noise (MMS 2002a).

Noise associated with the operation of the proposed Port that may have a minor adverse impact on marine mammals includes sounds from helicopters, support vessels, EPEBVs, and the acoustic transponder. It is assumed that these noises would occur only when an EPEBV calls to the proposed Port, approximately 42 times per year. These noises could elicit a startle response with subsequent avoidance or evasive behavior (MMS 2002a). The behavioral responses to noise may affect group structure and local populations by interfering with communication between group members. Navigation and feeding may also depend upon sound reception and be affected by high levels of artificial ambient noise. Animals may avoid or abandon important feeding areas in response to vessel and aircraft noise. Such noise may cause stress, making the animals more vulnerable to parasites and disease. However, noise related to helicopter and vessel traffic is transient and generally not at levels that would prevent rapid recovery of marine mammals once the noise dissipates. The acoustic specifications of the transponder system can be adapted below the threshold that would cause avoidance behavior by or hearing loss in marine mammals that would be in the area (i.e., the only cetaceans expected to occur in the ROI are the bottlenose dolphin, Atlantic spotted dolphin, and possibly Bryde's whale). The Applicant would consult with USFWS and NOAA Fisheries in order

adapt the acoustic specifications of the transponder system to reduce impacts to marine organisms. It is expected that noise impacts on marine mammals would be manifested primarily as avoidance behavior. It is assumed that behavior would return to normal once a vessel or aircraft has passed. Therefore, noise impacts on marine mammals related to the proposed Port are expected to be insignificant and minor (MMS 2002a).

Seabirds. Noise resulting from helicopter and service vessel traffic could periodically disturb individuals or groups of coastal or marine birds. The effects of disturbance may be manifested as temporary or permanent displacement of birds from areas such as preferred or critical habitats, including nesting areas. Displacement from active nests may result in nesting failure or allow the predation of eggs or unfledged young. The level of disturbance to birds may be highly variable depending on the bird species, type of vehicle (helicopter or vessel), relative noise level, speed of vessel, altitude, distance, frequency, and season (MMS 2002b). FAA guidelines and corporate helicopter operatives request that pilots maintain a minimum altitude of 700 ft (213 m) while in transit offshore, 1,000 ft (304 m) over unpopulated areas or across coastlines, and 2,000 ft (610 m) over populated and sensitive areas. Vessel operators are required to maintain slow, wake-free speeds while transiting across most sensitive inland waterways. Compliance with Federal and corporate regulations regarding helicopter altitudes and vessel speeds when entering or departing coastal waterways is expected to minimize noise impacts on nesting or roosting birds within coastal areas. However, it is assumed that relatively small, if any, proportions of the populations of these species would be exposed, considering that only approximately 42 vessel or helicopter trips per year would support Port activities, originating from shore. Additionally, all of the required support activities would be conducted as an additional mission to existing offshore activities and would be indistinguishable from current activities. No new infrastructure, support vessels or helicopters would be dedicated to the proposed Port for support activities. It is likely that any effects would be short-term, nonlethal (primarily temporary displacement behavior) from noise generated by helicopters and service vessels. As such, impacts are expected to be insignificant and minor (MMS 2002a).

The top of the STL buoy would be fitted with three sonar transponders equally spaced around the circumference of the upper part of the buoy. The EPEBV buoy location system would automatically search for the strongest return signal from the buoy. Because of their spacing on the top of the buoy, two of the three transponders would always receive a signal from the ship's transducer. If the HPR system should lose the return signal from the transponder, the search procedure to retrieve the buoy and accomplish connection would start anew.

Proposed Pipelines. The pipelines delivering gas from the STL buoy and the metering platform would be installed directly on top of the bottom sediments. Similar pipelines are common in this area of the GOM. Use of the pipelines would not be a significant source of noise to either the human environment or to marine mammals.

Support Vessels and Helicopters. The El Paso Energy Bridge GOM proposal would not require the use of any new support vessels or helicopters. Personnel, vessels, and helicopters that could provide support to the proposed deepwater Port would deploy from existing shore-based facilities at Sabine Pass, Texas, and from other manned El Paso platforms offshore. No support vessels or helicopters would be dedicated to the proposed Port. Use of existing resources to support deepwater port operations would result in no increase or decrease of the existing number of vessels or helicopters or, generally, in the number of trips that already occur to support existing facilities in the GOM. Accordingly, there would be no additional impacts on the noise environment associated with support vessel and helicopter operations.

The majority of support vessel and helicopter activities would occur offshore, up to 100 mi from the Louisiana coast. Onshore communities and their more sensitive receptors such as schools, churches, and hospitals would not be affected.

Fish. The machinery noise generated by helicopters, support vessels, EPEBVs, and the acoustic transponder associated with the operation of the proposed Port may have an impact on fish. It is assumed that these noises would occur only when an EPEBV calls to the proposed Port, approximately 42 times per year. It is presumed that all fish species in the northern GOM can hear, with varying degrees of sensitivity, within the frequency range of sounds produced by oil and gas exploration, production, and decommissioning activities. Noise from these activities can mask sounds important to fishes. In particular, loud noise may cause fish to change their behavior and movements and may temporarily affect the usual distribution of fish, disrupting commercial fishing activities. Continuous, long-term exposure to high sound pressure levels above 180 dB has been shown to cause damage to the hair cells in the ears of some fishes. These effects may not be permanent since damaged hair cells are repaired or regenerated in fishes. As the distance between the fish and the source increases, the probability of hearing impairment would decrease as sounds attenuate with distance from a source (MMS 2002a). As indicated above, increase in noise levels, as relates to vessel activity would be negligible. The acoustic specifications of the transponder system can be adapted below the threshold that would cause avoidance behavior by or hearing loss in fish that would be in the area. The Applicant would consult with USFWS and NOAA Fisheries in order adapt the acoustic specifications of the transponder system to reduce impacts to marine organisms. As such, the noise associated with the Proposed Action would not result in significant impacts on fish.

Sea Turtles. The machinery noise generated by helicopters, support vessels, EPEBVs, and the acoustic transponder associated with the proposed Port may affect sea turtles. It is assumed that these noises would occur only when an EPEBV calls to the proposed Port, approximately 42 times per year.

Sounds from helicopters and vessels would originate from coastal ports and travel through broad areas of the continental shelf and slope. The most likely effects would be short-term behavioral changes such as diving and evasive swimming, disruption of activities, or departure from the area of disturbance. Areas with heavy vessel traffic may be avoided by sea turtles, although generally most species appear to exhibit tolerance to noise. Noise related to helicopter and vessel traffic in the GOM is transient and generally not at levels that would prevent rapid recovery of sea turtles once the noise ceased. The acoustic specifications of the transponder system can be adapted below the threshold that would cause avoidance behavior by or hearing loss in sea turtles that would be in the area. The Applicant would consult with USFWS and NOAA Fisheries in order adapt the acoustic specifications of the transponder system to reduce impacts to marine organisms. Therefore, noise impacts on sea turtles associated with Proposed Action would be insignificant and minor (MMS 2002a).

Marine Mammals. Airborne sounds from helicopters may impact marine mammals while at the surface. Levels of underwater sounds from passing or hovering helicopters vary widely depending on the specific engine type and size, number of rotors, altitude and relative angle of the aircraft, and water depth (Richardson et al. 1995). Reactions of cetaceans may range from apparent indifference to evasive behavior (e.g., turns, diving). Documented observations of sperm whales to low-flying helicopters showed no obvious reactions (Richardson et al. 1995).

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Noise associated with the operation of the proposed Port that may have a minor adverse impact on marine mammals includes sounds from helicopters, support vessels, EPEBVs, and the acoustic transponder. It is assumed that these noises would occur only when an EPEBV calls to the proposed Port, approximately 42 times per year. These noises could elicit a startle response with subsequent avoidance or evasive behavior (MMS 2002a). The behavioral responses to noise may affect group structure and local populations by interfering with communication between group members. Navigation and feeding may also depend upon sound reception and be affected by high levels of artificial ambient noise. Animals may avoid or abandon important feeding areas in response to vessel and aircraft noise. Such noise may cause stress, making the animals more vulnerable to parasites and disease. However, noise related to helicopter and vessel traffic is transient and generally not at levels that would prevent rapid recovery of marine mammals once the noise dissipates. The acoustic specifications of the transponder system can be adapted below the threshold that would cause avoidance behavior by or hearing loss in marine mammals that would be in the area (i.e., the only cetaceans expected to occur in the ROI are the bottlenose dolphin, Atlantic spotted dolphin, and possibly Bryde's whale). The Applicant would consult with USFWS and NOAA Fisheries in order adapt the acoustic specifications of the transponder system to reduce impacts to marine organisms. It is expected that noise impacts on marine mammals would be manifested primarily as avoidance behavior. It is assumed that behavior would return to normal once a vessel or aircraft has passed. Therefore, noise impacts on marine mammals related to the proposed Port are expected to be insignificant and minor (MMS 2002a).

Seabirds. Noise resulting from helicopter and service vessel traffic could periodically disturb individuals or groups of coastal or marine birds. The effects of disturbance may be manifested as temporary or permanent displacement of birds from areas such as preferred or critical habitats, including nesting areas. Displacement from active nests may result in nesting failure or allow the

predation of eggs or unfledged young. The level of disturbance to birds may be highly variable depending on the bird species, type of vehicle (helicopter or vessel), relative noise level, speed of vessel, altitude, distance, frequency, and season (MMS 2002b). FAA guidelines and corporate helicopter operatives request that pilots maintain a minimum altitude of 700 ft (213 m) while in transit offshore, 1,000 ft (304 m) over unpopulated areas or across coastlines, and 2,000 ft (610 m) over populated and sensitive areas. Vessel operators are required to maintain slow, wake-free speeds while transiting across most sensitive inland waterways. Compliance with Federal and corporate regulations regarding helicopter altitudes and vessel speeds when entering or departing coastal waterways is expected to minimize noise impacts on nesting or roosting birds within coastal areas. However, it is assumed that relatively small, if any, proportions of the populations of these species would be exposed, considering that only approximately 42 vessel or helicopter trips per year would support Port activities, originating from shore. Additionally, all of the required support activities would be conducted as an additional mission to existing offshore activities and would be indistinguishable from current activities. No new infrastructure, support vessels or helicopters would be dedicated to the proposed Port for support activities. It is likely that any effects would be short-term, nonlethal (primarily temporary displacement behavior) from noise generated by helicopters and service vessels. As such, impacts are expected to be insignificant and minor (MMS 2002a).

Anchoring

Impacts EFH. Anchoring impacts from typical Port operations are not anticipated. EPEBVs would moor directly to the proposed Port when offloading LNG. Additionally, only two EPEBVs would initially be dedicated to the Port. If an EPEBV approaches the vicinity of the proposed Port while another EPEBV is regasifying LNG, the approaching EPEBV would be directed to slow its speed to afford enough time for the second EPEBV to finalize the regasification process. There would be no anchoring of EPEBVs waiting to regasify LNG in proximity to the proposed Port. As such, there will be no effects as a result of anchoring during operation of the proposed Port.

Lighting Impacts

Ichthyoplankton and Fisheries Resources. Ichthyoplankton, juvenile fish, and small fish species may be attracted to lighting associated with the proposed Port (Lysckowski-Schultz 2003a). However, impacts on ichthyoplankton or fisheries resources are expected to be minor.

Sea Turtles. Light pollution on nesting beaches is detrimental to sea turtles because it alters critical nocturnal behaviors such as nest site selection, return-to-sea post nesting, and hatchlings entry to the sea (Witherington and Martin 1996). Because the proposed Port would be located over 200 mi from the Chandeleur Islands, the closet known sea turtle nesting site (Witherington 2002), it is not expected to attract hatchling sea turtles. The light on the proposed STL buoy messenger line could attract sea turtles. However, sea turtles would not be expected to encounter the Port. Additionally, the movement of the proposed STL buoy from its submerged depth of 98.4 ft (30 m) should avert any sea turtles from the area. Additionally, design of the all flashing warning lights would meet the criteria for these types of equipment set forth by the USFWS guidance (Watson 2003). As such lighting from the proposed messenger line or metering platform lighting would have no adverse or significant effect on sea turtles.

Migratory Birds. Lighting is also a concern for trans-Gulf migratory birds. Many neotropical birds migrate from Mexico to North America by crossing the GOM nonstop over 575 mi (500 NM) of open water in the spring (and the reverse in autumn). The proposed Port would be in the heart of this migratory pathway; thus many of these trans-Gulf migrants may encounter the light on the end of the

proposed STL buoy messenger line or lighting from the proposed metering platform. These birds are known to be attracted to artificial lighting on offshore facilities (Gathreaux 2002; Witherington 2002) which can seriously disrupt bird's migration patterns. For example, migrating birds have been observed circling artificial lights until they become exhausted and drop into the water (Barrow 2002).

The Applicant proposes to take all measures possible to minimize the amount of total lighting used on the proposed Port to only those required for safety. Additionally, the amount of light should be minimized during the height of the trans-migratory period. To reduce the disruptive effects of lighting, all lighting on the metering platform superstructures (except for on the helipad and STL buoy) should be down-shielded to keep the dispersion of light to a minimum. The shields would prevent the lights from shining skyward, instead directing the light to shine only on work areas. Such shielded lighting has resulted in significant reductions in bird mortality. The Applicant would install lighting on the proposed helipad and the proposed STL buoy messenger line in accordance with USFWS guidelines for aviation safety lights (Watson 2003). These guidelines specify that only white or red strobe lights should be used at night and these strobes should be minimal in number, intensity, and number of flashes (Watson 2003). As such, no significant impacts on migratory birds would be expected.

Use of Metering Platform by Migratory Birds as Rest Stop or Shelter

The proposed metering platform may have a slight positive impact on migratory birds. Birds migrating over the GOM may encounter adverse weather, particularly rain or headwinds and especially tropical storms and hurricanes. Birds that seek shelter from such adverse conditions, or are simply exhausted, may land on offshore facilities such as the proposed metering platform.

Artificial Reef and Safety Zone

Although the placement of the proposed metering platform and pipelines on the floor of the GOM would initially displace demersal and benthic organisms in an approximate 1.89 acre (0.75 hectare) footprint, it would be expected that the proposed Port facilities would also result in some positive impacts on the benthic community, fish resources, and EFH. The subsurface structures would provide a surface area for the new colonization of marine species by functioning as an artificial reef. The proposed Safety Zone would prohibit fishing (and its associated negative impacts on EFH) within a 194.1 acre (78.6 hectare) area, providing additional refuge to fisheries resources. The positive impacts of the proposed facilities as an artificial reef are expected to last the life of the proposed Port, an estimated 20 years.

The proposed metering platform and pipeline substructures would serve as an aggregation point for fish, representing many species. When oil and gas platforms are installed in marine waters, they are colonized by a diverse array of microorganisms, algae, and sessile invertebrates including barnacles, oysters, mussels, soft corals (bryozoans, hydroids, and octocorals), sponges, and hard corals. Organisms that attach and grow on the structures provide habitat and food for many mobile invertebrates and fish. Similar to oil and gas structures, it is expected that these proposed structures would attract numerous species. A description of the fish and other biota attracted to artificial reefs is located in Section 3.2.5.7 of this EA. The attraction of biota to artificial reefs and their longevity at particular structures vary depending upon the ecological role of the species in question, as well as the environmental conditions at the structure.

A Coastal Marine Institute Study funded by the MMS found that one eight-leg platform provides habitat for 12,000 to 14,000 fish. An eight-leg platform at a depth of 164 ft (50 m) provides

approximately 0.61 acres (2,500 m^2) of hard substrate for various coral species and other invertebrate species habitat.

Platforms may also provide nursery/recruitment habitat for species of reef fish. Abundance of postlarval and juvenile fish was higher within platform structures compared to adjacent down-current open waters (Shaw et al. 2002). Distribution and abundance of eggs and larvae is highly variable and is related to distribution of spawning adults (Gledhill and Lyczkowski-Shultz 2000).

Although the proposed STL buoy is expected to attract some pelagic species, resident colonization to the extent of an artificial reef is not expected. During the regasification process the buoy would be inside the unloading vessel. Additionally, the Applicant indicates that the marine growth would be cleaned from the buoy every time it is in use. As such, increased entrainment due to increased densities of marine fishery species and ichthyoplankton at the proposed STL buoy would not be expected. However, the colonization on the proposed metering platform and pipelines would be expected to proceed as other artificial reefs that are in this area of the Texas-Louisiana continental shelf. These structures would not be affected negatively by the impingement and entrainment or discharge because of their respective distances from the STL buoy and the regasification process. The metering platform would be located approximately 2 mi (3 km) from the submerged turret buoy. The pipelines would be on the seafloor at depths of over 200 ft (61 m) while the seawater intake would be located at 27 ft (7 m) from the surface.

Vessel Traffic

An increase in vessel traffic related to the proposed Port would be associated with vessels used for construction and installation of the proposed Port and two new EPEBVs (the size of typical LNG carriers) that would be dedicated to the proposed Port. All of the required support activities would be conducted as an additional mission to existing offshore activities and would not constitute an increase in vessel traffic.

Vessel traffic associated with installation and construction of the proposed Port would be consistent with current OCS construction activities throughout the GOM and would be temporary. The probability of a cetacean or sea turtle/vessel collisions occurring during construction or operation of the proposed Port would be very low and should be considered negligible.

Under the current proposal, only two new EPEBVs would be dedicated to the Port. EPEBVs would visit the proposed facility a maximum of 42 times per year. EPEBVs would access the proposed Port from international waters and typically would travel between the fairways and the proposed Port at a speed of no greater than 10 knots.

Each time a carrier delivers natural gas to the Port, existing crew and supply vessels would be redirected from their current daily support functions at other El Paso OCS facilities to the proposed Port. Support vessels servicing the Port would be drawn from El Paso's existing fleet and originate from existing facilities and would be indistinguishable from current activity.

It is estimated that currently more than 1,000 vessel trips occur per day in support of OCS oil and gas operations in the western and central GOM (Norris 2001). This figure does not include recreational vessels or commercial fishing or shipping vessels. The 84 one way service vessel trips to and from the proposed Port annually would represent less than a 0.02 percent change in the estimated 365,000 annual support vessel trips currently servicing the OCS oil and gas industry.

The impact of the vessel traffic associated with the proposed Port and collisions with marine animals and sea turtles is expected to be insignificant, because of the frequency of vessels calling to the Port (i.e., approximately 42 LNG carrier trips per year and 42 service vessel trips per year) and the expected speed of LNG carriers calling to the Port (i.e., 10 knots or less).

Entanglement in and Ingestion of Debris

In recent years, there has been an increasing concern involving man-made debris discarded from offshore and coastal sources and its impact on the marine environment (MMS 2002a). Trash and debris, some accidentally lost during oil and gas drilling and production operations, is common in the GOM (MMS 2002a). A total of 40,580 debris items were collected in a 16-mi transect made along the Padre Island National Seashore, Texas, from March 1, 1994, to February 28, 1995. A total of 13 percent of the trash and debris found in the transect was attributed to the offshore oil and gas industry. Complete descriptions of the impacts of debris on marine mammals and sea turtles are presented under Sections 3.2.4.1 and 3.2.4.2, respectively. MMS prohibits the disposal of equipment, containers, and other materials into coastal and offshore waters by lessees (30 CFR 250.40) (MMS 2002a). The Applicant would also be required to follow these requirements.

On January 1, 1989, Annex V of MARPOL (P.L. 100-220) was adopted. Enforced by the USCG, it prohibits the discharge and disposal of vessel- and offshore structure-generated garbage and solid waste items into both offshore and coastal waters. Waste handling practices at the proposed Port and on the unloading EPEBVs would follow all applicable rules and regulations, and as such, would minimize the chances of the overboard loss of such materials. Additionally, MMS enacted NTL 2003-G11, Marine Trash and Debris Awareness and Elimination to help control OCS related trash and debris in the marine environment. Solid wastes would be collected and transported to shore for proper disposal. As such, impacts on sea turtles and marine mammals are expected to be insignificant and minimal.

4.2.2.3 Effects of LNG Spill

Short-term adverse effects would be expected as a result of an LNG spill. Potential effects on marine life include exposure to low-temperature LNG at the water surface and asphyxiation by natural gas vapors above the surface of the water. The low temperature is sufficient to rapidly cause the equivalent of frostbite, or if enough of the body surface is exposed, death from freezing of the tissue. Asphyxiation could result as natural gas vapors displace oxygen immediately above the surface of the water, or as flames consume available oxygen. These potential impacts could occur on individuals that are at the spill location within approximately 1 hour of the spill. The timeframe for these potential impacts is limited. LNG does not dissolve in the water, so no residual effects are expected after the LNG has boiled off and the vapors have dispersed. Information on the area of impact resulting from an LNG spill is presented in Section 4.10. However, the probability of an LNG spill is extremely low. As such, no significant impacts are expected.

4.2.2.4 Decommissioning

Decommissioning impacts are expected to be temporary and would not result in long-term adverse effects on fish resources or EFH. Decommissioning options for the proposed Port are described in Section 2.1.4 of this EA.

The proposed decommissioning procedures, subject to the approval of the Maritime Administrator, would involve removing the deck, jacket, and piles associated with the measurement platform and

transporting these items by derrick or material barges to an onshore site for disposal or salvage. The piles would be cut off and removed to a point at least 15 feet below the mud line or as otherwise specified by the regulations in effect at the time of removal. Cutting of piles would be done in accordance with applicable regulations at the time of abandonment. The STL buoy, chains, cables, control umbilical, flexible riser, the PLEM, anchors, and cables would be removed and decommissioned in accordance to all applicable and appropriate regulations at the time of decommissioning . The pipelines would be disconnected from all gas sources and purged of gas. The pipelines would subsequently be filled with water or an inert material and sealed at the ends and abandoned in place. The downstream pipelines' tie-in piping would be disconnected from the pipeline/gas source and the open pipe ends sealed.

The environmental impacts of decommissioning operations would be temporary with no long-term impacts on biological resources in the vicinity of the proposed Port.

Temporary effects on water quality would occur as increased turbidity is expected from seafloor (surface sediment) disturbance during decommissioning. High turbidity would result in short-term displacement of mobile species that likely would repopulate the area as the turbidity improves. Remaining structures would serve as an artificial reef attracting invertebrate colonization, which, in turn, would attract vertebrate populations. As decommissioning activities and disturbances would occur no greater than 15 ft below the seafloor, there would be no effect on geological resources. Temporary, minor air impacts would occur as the result from emissions of increased vessel traffic during the decommissioning process. These impacts would be very short in duration as decommissioning is expected to take no more than 2 weeks to complete. Increased vessel traffic from these activities would be minor relative to average Gulf-wide traffic. Decommissioning activities such as small detonations (to cut the platform legs), equipment capping, equipment separations, equipment removal, and vessel traffic would result in discrete occurrences of unusually high noise levels. These occurrences would cease upon completion of the decommissioning and should not have an adverse long-term effect on ambient conditions in the ROI.

Historically in the GOM, about two-thirds of the platforms have been removed using explosives. This may be practical for the metering platforms as well as the moorings at the proposed Port. Impacts of an underwater explosion could include physical damage from pressure and noise. Should explosives be used, qualified observers would monitor the detonation area for protected species before and after each detonation. The detection of any marine mammal within a predetermined radius from the structure before detonation would, without exception, delay its removal. As a result, it is expected that, other than short-term behavioral disturbances, adverse impacts would be avoided.

Additionally, given that decommissioning would occur more than 20 years from now, it seems reasonable to expect that the technologies for decommissioning and removal, as well as our understanding of the potential for impact to the marine ecosystem may be different than under current conditions. This issue will be addressed at the time of decommissioning (i.e., 20+ years hence), at which time it is expected that the owner would adhere to all applicable and appropriate requirements. The owner will consult with NOAA Fisheries and USFWS at that time.

4.2.3 Endangered Species Act Consultation Summary

Several federally listed endangered or threatened marine mammal, sea turtle, fish, and migratory bird species occur in or near the ROI. There are no listed threatened or endangered plants in, or in proximity, to the ROI.

Sperm whales (endangered) generally occur in waters greater than 590 ft (180 m) in depth. Currently there is no critical habitat designated for sperm whales in the GOM, but the area south of the Mississippi Delta may be important habitat for them. The Mississippi Delta is outside the ROI. Based on the information presented in Section 4.2, the proposed activities are not likely to adversely affect the sperm whale.

The West Indian manatee is an endangered marine mammal that has been documented to occur within the Lake Pontchartrain Watershed. The proposed support activities would originate from Sabine Pass, Texas, more than 100 mi (161 km) west of Lake Pontchartrain. The occurrence of the West Indian manatee in the northern GOM is considered rare (Würsig et al. 2000). The West Indian manatee is not expected to interact with support vessels associated with the proposed Port. As such, the proposed Port is not likely to adversely affect the West Indian manatee.

Threatened or endangered sea turtles which might occur in the ROI, include the loggerhead sea turtle (threatened), Kemp's ridley sea turtle (endangered), leatherback sea turtle (endangered), hawksbill sea turtle (endangered), and green sea turtle (threatened). Generally, sea turtle abundance is higher in the eastern GOM than in the western GOM (McDaniel et al. 2000). There are no designated critical habitats or migratory routes for sea turtles in the northern GOM. However, NOAA Fisheries recognizes many coastal areas as preferred habitat (i.e., important or sensitive habitats for the species within a specific geographic area) for sea turtles. Based on the information presented in Section 4.2, the proposed activities are not likely to adversely affect sea turtles or their critical habitat.

The Gulf sturgeon (threatened) and smalltooth sawfish are the only federally listed fish found in the GOM (MMS 2002a). Gulf sturgeon and smalltooth sawfish currently occur in the eastern portion of the GOM, distant from the proposed Port and proposed support activities associated with the proposed Port.

There are no species of threatened or endangered birds that have the potential to occur in the ROI. However, the brown pelican (endangered), southern bald eagle (threatened), and piping plover (endangered) are discussed in the EA/BA because of the support activities that originate from onshore. Due to the distance of the proposed activities from shore (approximately 116 mi offshore) and the fact that support activities would be indistinguishable from current activities, the proposed activities are not likely to adversely affect these species or their critical habitat.

Based on the analysis presented throughout Section 4.2, impacts associated with the proposed Port are not expected to be significant. Furthermore, there are no critical habitats in proximity to the ROI. Therefore, the proposed activities are not likely to adversely affect threatened and endangered species that occur in, or in proximity to, the ROI.

4.2.4 EFH Assessment

Included in this EA are the components required for an EFH Assessment. The USCG's and MARAD's request for an EFH consultation and NOAA Fisheries' response appear in Appendix D (to be included upon receipt). The required components of this EFH consultation and the sections of this EA where the EFH discussions and other related material can be located are as follows:

1. A description of the Proposed Action is in Section 2.0.
2. A description of EFH within the ROI is in Section 3.2.5 and Tables D-1 and D-2 of Appendix D.

3. Analyses of the effects, including cumulative effects, of the Proposed Action on EFH are throughout Sections 4.2 and 5.1.2.
4. The USCG's and MARAD's assessment and conclusion of the effects of the action on EFH are included at the end of each impact discussion outlined in Section 4.2 and are summarized in Table 4-8.

Species that are managed by the GMFMC and have EFH in the proposed ROI include brown shrimp, white shrimp, red drum, red snapper, gray snapper, lane snapper, greater amberjack, lesser amberjack, gray triggerfish, king mackerel, bluefish, little tunny, cobia, and dolphin. The only species that is managed by NOAA Fisheries – Highly Migratory Species Division and has EFH in the proposed ROI is the Atlantic bluefin tuna (Sutter 2003). The habitat associations and life stages of these species that have EFH within the ROI are presented in Tables D-1 and D-2 of Appendix D. While some of these species have habitat associations (i.e., EFH) with habitat types other than the water column (e.g., tidal creeks, oyster reefs, artificial reefs), the only types of habitat that currently exist in the proposed ROI include the water column, unvegetated sediments, and *Sargassum*. These habitat types are essential for the species for which they are designated; however, these designations are based on distribution (presence/absence) and abundance of these species (GMFMC 1998; NMFS 1999).

The Maritime Administrator is aware of NOAA Fisheries' concerns regarding the impacts of impingement/entrainment and the thermal discharge that would result from the regasification process. These impacts, plus methods to avoid, minimize, and mitigate these impacts, were analyzed in Section 4.2.2.2. While construction and operation of the proposed Port may have the potential to affect the water column and sediments, all impacts were evaluated by the Maritime Administrator as insignificant, based on the significance criteria outlined in Section 4.2.1. EFH for these species include broad areas of the GOM. Additionally, the water column and unvegetated sediments (not ecologically sensitive habitat types) within the ROI would represent only a small fraction of these habitat types available within these species' distributions throughout the GOM. All impacts to the water column and unvegetated sediments are expected to be localized. Thus, none of the potential impacts to EFH are expected to result in population-level effects or a reduction in biomass for any stock. Additionally, the proposed metering platform and pipelines would provide artificial reef habitat for colonization for many commercially and/or recreationally important species and the proposed Safety Zone (with an area of approximately 194.1 acres [78.6 hectares]) would provide additional refuge to these species by excluding commercial fishing. No potential impacts to *Sargassum* were identified.

4.2.4.1 Impacts to Commercial and Recreational Fisheries Resources

Potential impacts to fisheries resources were examined throughout Section 4.2. Any potential impacts to commercial and recreational fisheries resources would result from the EFH impacts that are identified in Table 4-8 and are not expected to be significant or result in a significant reduction in stock biomass for any commercially and/or recreationally important species that would occur in the ROI. Additionally, the proposed metering platforms and pipelines would provide valuable artificial reef habitat for colonization and the proposed Safety Zone (with an area of approximately 194.1 acres [78.6 hectares]) would provide additional refuge to federally managed species by excluding commercial fishing.

Table 4-8. Summary of the Proposed Action Impacts on EFH

Proposed Action Component/Impact	EFH Type		
	Water Column	**Sediments**	***Sargassum***
Placement of STL System	▪ temporary increase in turbidity - not significant	▪ displacement of sediments – not significant ▪ secondary impact to prey species – not significant	▪ no expected impact
Pipeline Installation	▪ temporary increase in turbidity - not significant	▪ displacement of sediments – not significant ▪ secondary impact to prey species – not significant	▪ no expected impact
Installation of Metering Platform	▪ temporary increase in turbidity - not significant	▪ displacement of sediments – not significant ▪ secondary impact to prey species – not significant	▪ no expected impact
LNG Vaporization- Intake	▪ impingement/entrainment – localized minimal impact	▪ no expected impact	▪ no expected impact
LNG Vaporization- Discharge	▪ 13.5 ºF decrease in water temperature - not significant ▪ potential increase in turbidity – not significant	▪ displacement of sediments – not significant	▪ no expected impact
Treated Water Discharge	▪ impact to water quality – not significant, release of aluminum and copper below USEPA CCC and CMC values	▪ impact to sediment quality – not significant, release of aluminum and copper below USEPA CCC and CMC values	▪ no expected impact
Vessel and Aircraft Noise	▪ temporary negligible impacts	▪ no expected impacts	▪ no expected impact
Anchoring (construction only)	▪ temporary increase in turbidity – not significant	▪ temporary displacement of sediments – not significant	▪ no expected impact
Port Lighting (metering platform and STL buoy)	▪ may attract ichthyoplankton - not significant	▪ no expected impact	▪ no expected impact
Presence of Platform	▪ would provide artificial reef for colonization – positive impact	▪ displacement of sediments – not significant ▪ would provide artificial reef for colonization - positive impact	▪ no expected impact
Presence of Safety Zone	▪ provide refuge from fishing – positive impact	▪ provide refuge from fishing – positive impact	▪ no expected impact
Increased Vessel Traffic	▪ no expected impacts	▪ no expected impacts	▪ no expected impact
Marine Debris	▪ impacts will be controlled through compliance with applicable regulations	▪ no expected impact	▪ no expected impact
Accidental Release	▪ Minor release no expected impacts ▪ Unlikely, catastrophic release freezing of tissue – localized, short-term impacts (at surface only)	▪ Minor release – ▪ no expected impacts ▪ Unlikely, catastrophic release no expected impacts	▪ Minor release no expected impacts Unlikely, catastrophic release freezing of tissue – localized, short-term impacts (at surface only)
Decommissioning	▪ consultation would occur at time of decommissioning (20+ years hence)	▪ consultation would occur at time of decommissioning (20+ years hence)	▪ consultation would occur at time of decommissioning (20+ years hence)

4.2.4.2 Mitigation

No mitigation measures would be required other than those specified in Section 4.2.2.2.

4.2.5 No Action Alternative

Under this alternative, the license application would not be approved and El Paso Energy Bridge GOM would not proceed with construction and operation of a deepwater port. If the Secretary denies the license application, the short- and long-term environmental impacts on biological resources identified in Section 4.2.2 would not occur. Existing conditions would prevail. Means to satisfy the Nation's energy demands might result in increased use of existing land-based LNG receiving terminals, greater reliance on domestic and foreign oil and gas resources, development of other sources of energy, including energy conservation. The Secretary's purpose and need would continue as a mechanism for the review of deepwater ports applications and implementation of the appropriate alternative, approval, conditional approval or denial. It is reasonable to assume that a decision on the Port Pelican application would be made independent of the decision reached on this application.

If approved, Port Pelican would have Short-term and long-term minor adverse effects on biological resources. These impacts would occur in connection with construction and operation of Port Pelican, potential LNG spills, and several miscellaneous circumstances associated with the Project (e.g., use of the GBSs as an artificial reef, increased vessel traffic, hazards posed by debris in the marine environment). Effects would also occur with respect to commercial and recreational fisheries. The establishment of the 500-m Safety Zone around the proposed Terminal would result in an extremely localized long-term loss of commercial fisheries. Port Pelican, however, would not displace recreational fishing in the vicinity of the deepwater Port for its expected 40-year operational period because there is currently no such recreational activity at the proposed site. The placement of the Port Pelican GBSs in the GOM would potentially create an artificial reef, resulting in minor but temporary beneficial impacts on commercial and recreational fisheries stocks. Port Pelican is not likely to adversely affect federally listed threatened and endangered species that occur in proximity to or migrate through the Port Pelican area. Minor adverse impacts may occur from the impingement and entrainment of ichthyoplankton (fish eggs and larvae); however, none of the potential impacts on essential fish habitat (EFH) would be expected to result in population-level effects or a reduction in biomass for any stock. None of the expected impacts on biological resources associated with Port Pelican would be significant.

4.3 Cultural Resources

4.3.1 Evaluation Criteria

Archaeological properties in the GOM that could be affected by the proposed Project include inundated prehistoric sites and offshore historic shipwrecks. Section 106 of the NHPA requires that any properties encountered in the area of an action must be assessed to determine if they meet one or more of the criteria developed by the National Park Service to determine eligibility for nomination to the NRHP. Briefly, these criteria are that the resource be associated with an important historical event, be associated with a person or people who were important in history, has distinctive design or construction features, or is likely to contain data important for interpreting archaeology or history.

4.3.2 Proposed Action

Activities associated with the implementation of the proposed Energy Bridge could cause adverse effects on archaeological resources if they are present. Direct physical contact with a site could destroy fragile artifacts and cause the loss of the context which is absolutely critical in assessing importance and interpretation. Construction activities that disturb the GOM bottom may disturb sediments for an unknown distance, in turn disrupting stratigraphic and contextual factors. Pipeline placement and anchoring associated with its placement have the potential to cause physical impacts on prehistoric or historic archaeological resources.

4.3.2.1 Survey

In 1989, the MMS reevaluated all lease blocks in the GOM region for the probability for the presence of historical resources (Garrison et al.1989). All lease blocks in the survey area, blocks WC 600, WC 601, WC 602, WC 603, and EC 335, are considered to have low potential for cultural resources; therefore, no cultural resource survey is required. No survey requirements are specified for low probability lease blocks, and no archaeological studies are required. However, as part of its due diligence for its project and to address any potential cultural resource concerns, El Paso Energy Bridge requested that Christopher Goodwin and Associates, Inc., review the remote sensing data collected by Thales GeoSolutions, Inc., and submit an assessment of any possible impacts on submerged cultural resources in the construction area. These data and the methods used in collecting them are discussed below.

In August 2002, Thales GeoSolutions, Inc., performed a geophysical survey of the proposed Energy Bridge location consisting of two construction sites and three pipeline routes in the GOM off the coast of Louisiana (Thales Geosolutions, Inc. 2002; ENSR 2002). The survey collected data using a Magnetometer, side-scan sonar, and a Global Position Satellite (GPS) system for location information. The survey was divided into three routes. Route One in Block WC 603 includes the construction sites of the STL buoys, the PLEM, the loading pipeline, and the metering platform at the loading pipeline's northern end. Route Two consists of the proposed 0.51-m (20-inch) pipeline running from the metering platform in Blocks WC 603 through WC 600 to a subsea tie-in to the 0.76-m (30-in) Bluewater pipeline in Block WC 601. Route Three consists of a proposed 0.51-m (20-in) pipeline running from the metering platform in blocks WC 603 through WC 602 and WC 601 to the 0.51-m (20-in) Sea Robin pipeline in Block EC 335.

Route One. Route One has a total of three acoustic anomalies and no magnetic anomalies in the 61.0-m (200-ft) wide construction corridor (Thales Geosolutions, Inc. 2002; ENSR 2002). Two of the acoustic anomalies are pockmarks most likely created by microbubbles escaping from sedimentary gas pockets below the seabed. The third anomaly is likely man-made scarring of the seabed, possibly a lay barge anchor strike associated with the construction of the 0.6-m (24-in) Columbia-Gulf pipeline in this area. None of these anomalies constitute submerged historic cultural resources and require no further archaeological study or consideration. Route One appears to be clear of any archaeological resources.

Route Two. Route Two has seven acoustic anomalies and two magnetic anomalies in the construction corridor (Thales Geosolutions, Inc. 2002; ENSR 2002). Two of these acoustic anomalies are naturally occurring pockmarks and three are man-made gouges or scarring that are most likely associated with pipeline construction activity. One acoustic anomaly is an abandoned well with jack-up drilling rig can holes. The seventh acoustic anomaly is the pipeline junction for the proposed sub-sea tie-in to the 0.76-m (30-in) Bluewater pipeline in WC 601.

One of the two magnetic anomalies is a dipolar high amplitude deflection that corresponds to an abandoned well. The second magnetic anomaly is a multi-component, high gamma perturbation that corresponds to the 0.76-m (30-in) Bluewater pipeline and proposed tie-in point for Route Two.

None of the anomalies in Route Two, either acoustic or magnetic, represent submerged historic cultural resources. No further archaeological study is recommended for any of the anomalies in Route Two of the proposed El Paso Energy Bridge GOM Project.

Route Three. Route Three has 23 acoustic anomalies and seven magnetic anomalies (Thales Geosolutions, Inc. 2002; ENSR 2002) in the construction corridor (Thales Geosolutions, Inc. 2002; ENSR 2002). Thirteen of the acoustic anomalies are pockmarks. Another six of the acoustic anomalies represent construction-related sea floor scars, one of which might be a drag mark.

Three of the acoustic anomalies represent pipelines: the 0.6-m (24-in) Columbia-Gulf pipeline, the 0.3-m (10-in) Tenneco Pipeline, and the 0.5-m (20-in) Sea Robin Pipeline. The last acoustic anomaly appears to be an eight-foot long object with a high degree of reflectivity. This reading most likely represents minor debris associated with pipeline construction or the general offshore oil industry in this area.

There is a high degree of correlation between magnetic anomalies and the pipelines crossing the Energy Bridge GOM Project area. Two magnetic anomalies correspond to the 0.6-m (24-in) Columbia-Gulf pipeline. Two of the magnetic anomalies represent the 0.3-m (10-in) Tenneco Pipeline. Two other magnetic anomalies correspond to the 0.5-m (20-in) Sea Robin pipeline, where Energy Bridge GOM proposes to tie in Route Three.

All but one of the seven magnetic anomalies in Route Three has been correlated with visible features on the seafloor. The area where this anomaly is located is characterized by some change in surficial reflectivity. However, the acoustic image of this general area shows no anomalous disconformities that could be associated with a shipwreck or other cultural material. The lack of any substantial acoustic contact, coupled with the absence of spatial adjacency and the low amplitude value and relatively short duration of this anomaly suggests it most likely represents an isolated point source of ferrous debris associated with pipeline construction or the general oilfield industry in this area.

None of the acoustic or magnetic anomalies on Route Three constitute submerged historic cultural resources. Therefore, no further archaeological study is warranted.

None of the acoustic or magnetic anomalies detected within the 61.0 m (200 ft) pipeline construction corridor for Routes One, Two, or Three appear to represent submerged historic cultural resources

4.3.2.2 Findings

No cultural resources were identified in the survey and data review of the proposed Energy Bridge location, so no additional work is recommended. These findings are based on the August 2002 Thales GeoSolutions Inc., hazard survey of the area. Christopher Goodwin and Associates assessed the results of the Thales Geosolutions, Inc., remote sensing survey for evidence of archaeological sites. Appropriate databases were also reviewed for previously recorded material on cultural resources. In addition to the review of the geophysical data obtained in the survey of the proposed Energy Bridge, the Automated Wreck Obstruction Information System at NOAA was consulted for information on recorded obstructions.

4.3.2.3 Unanticipated Discoveries

It is possible that small geomorphic features representing high probability areas for prehistoric archaeological sites and historic shipwreck materials were not detected by the geophysical instruments or during interpretation of the data. It is also possible that the scatter of recent ferrous materials (such as those accounting for the seventh magnetic anomaly in Route Three of Section 4.3.2.1) could mask buried shipwreck debris. If evidence of prehistoric or historic cultural remains is encountered during subsequent work at the proposed Port location, all activity in that vicinity would be halted and an avoidance zone for further work would be established. Representatives from the USCG Commandant and MARAD's notified immediately. The Regional Director of MMS in New Orleans would be consulted ascertain the possible cultural significance of the resource and recommend appropriate protection measures (30 CFR 250.194).

4.3.3 No Action Alternative

Under the No Action Alternative, the license application would not be approved and the proposed Energy Bridge would not proceed with construction and operation of a deepwater LNG port. If the Maritime Administrator denies the license application, potential effects on cultural resources identified in Section 4.3.2 would not occur. Existing conditions would prevail. There would be no effect to cultural resources or potential historic properties in the proposed Port location as a result of the No Action Alternative.

Means to satisfy the Nation's energy demands might result in increased use of existing land-based LNG receiving terminals, greater reliance on domestic and foreign oil and gas resources, development of other sources of energy, including energy conservation. The Secretary's purpose and need would continue as a mechanism for the review of deepwater ports applications and implementation of the appropriate alternative, approval, conditional approval or denial. It is reasonable to assume that a decision on the Port Pelican application would be made independent of the decision reached on this application.

If approved, Port Pelican would have no effects on cultural resources. Geotechnical surveys of the proposed Terminal area and PIPL route recorded several unidentified anomalies. These anomalies have not been evaluated to determine their cultural significance; however, all of the anomalies will be avoided during Terminal and PIPL installation activities. Avoidance of the unidentified anomalies, and adherence to unanticipated discovery procedures and mitigation measures would ensure no adverse effects to significant cultural resources.

4.4 Geological Resources

4.4.1 Evaluation Criteria

Protection of unique geological features, minimization of soil erosion, and the siting of facilities in relation to mineral resources and potential geologic hazards are considered when evaluating potential impacts of a proposed action on geological resources. Generally, impacts as a result of geological resources can be avoided or minimized through proper siting, foundation and structural engineering design, erosion-control measures, and construction/operation techniques. The main geologic hazards that may occur on the OCS include:

- Faults – sediment tectonics, halokinesis (salt dome movement)

- Slope Stability – slope steepening, slumps, creep, debris flow
- Shallow Gas in Sediments – strength reduction, hydrates (frozen gas and water)
- Liquefaction
- Diapiric Structures – salt, mud, hydrates
- Seafloor Depressions – blowouts, pockmarks
- Seafloor Feature – sediment waves, differential channel fill, brine-flow channels, seabed furrows

Analysis of potential impacts associated with geological resources typically includes the following steps:

- Identify and describe the geological resources that could potentially be impacted or affect the proposed development.
- Examine the proposed action and the potential impacts or effects related to the resource.
- Assess the significance of potential impacts or effects.
- Provide mitigation measures to minimize the potential impacts or effects, as necessary.

A review of the Geophysical Survey Report (Thales Geosolutions, Inc. 2002) indicates that there are no geological hazards or features of concern within area of the proposed Port, including the metering platform and the proposed pipeline ROWs.

4.4.2 Proposed Action

Long-term and short-term local minor and negligible adverse effects to geological resources would be expected under the Proposed Action. The effects would be associated with disturbance of seafloor sediments during installation, operation, and decommissioning of the proposed Energy Bridge. No specific mitigation measures appear warranted.

Proposed El Paso Energy Bridge GOM Project Installation and Operation

Activities that could affect geological resources or the installation and operational activities of the proposed Energy Bridge are related to founding the project components and anchoring into marine sediments. Sea vessels would be used during installation and maintenance; however, the project STL buoy system would be used to secure LNG vessels during operation and additional anchoring would not be necessary.

Under the Proposed Action, suction piles would be used to anchor the STL buoy system and PLEM, and the metering platform would be anchored using a minimal pile foundation structure (ENSR 2002). Because the entire proposed Energy Bridge is in water deeper than 200 ft, and in accordance with MMS requirements, the pipeline segments would be laid directly onto the seafloor, impacts on marine sediments would be minimized. Exclusive of the area of disturbance related to anchoring of sea vessels during installation and maintenance, the total area disturbed by the proposed Energy Bridge would be approximately 1.85 acres. Construction and operation activities would use best industry practices to limit effects on surficial sediments and topography of the seafloor.

Sediment displacement is expected to occur during pipelaying activities. Pipelaying barges use an array of eight 9.9-ton anchors to position the barge and to move it forward along the pipeline route. These anchors would continually be moved as the pipelaying operation proceeds. The area actually

affected by these anchors depends on water depth, wind, currents, chain length, and the size of the anchor and chain.

The effects on geological resources in the proposed Energy Bridge vicinity due to construction and operation would result in the disturbance of seafloor sediments to a minimal depth, a one-time occurrence for construction and continued occurrences during maintenance. Therefore, the Proposed Action would result in local, short-term minor and long-term negligible adverse effects.

Decommissioning

The decommissioning activities performed at the proposed Energy Bridge would be similar to the activities described under their construction; therefore, effects would be similar. Discussion of the specific activities and impacts is included in the preceding section.

The effects on geological resources in the proposed El Paso Energy Bridge GOM location as a consequence of decommissioning would result in the disturbance of seafloor sediments to a minimal depth. Therefore, decommissioning would result in local, short-term minor and long-term negligible adverse effects on geological resources.

Mitigation

The Proposed Action would result in local, short-term minor and long-term negligible adverse effects on geological resources from disturbance of seafloor sediments during installation, operation, and decommissioning of the proposed Energy Bridge. Mitigation measures would not be required. However, following decommissioning of the proposed Energy Bridge, the affected areas would be restored to more natural conditions.

4.4.3 No Action Alternative

Under this alternative, the license application would not be approved and El Paso Energy Bridge GOM would not proceed with construction and operation of a deepwater port. If the Maritime Administrator denies the license application, the short- and long-term environmental effects on geological resources identified in Section 4.4.2 would not occur. Existing conditions would prevail. Means to satisfy the Nation's energy demands might result in increased use of existing land-based LNG receiving terminals, greater reliance on domestic and foreign oil and gas resources, development of other sources of energy, including energy conservation. The Secretary's purpose and need would continue as a mechanism for the review of deepwater ports applications and implementation of the appropriate alternative, approval, conditional approval or denial. It is reasonable to assume that a decision on the Port Pelican application would be made independent of the decision reached on this application.

If approved, Port Pelican would have local short-term minor and long-term negligible adverse effects to geological resource. Through a geophysical study of the proposed Terminal area, preferential siting of the GBSs would be employed, thereby minimizing the amount of disturbance to undesirable seafloor sediments and reducing the effect of local geologic hazards. The effects would be associated with installation and operation of the proposed Terminal (LNGC anchoring and sediment displacement), installation of the PIPL (sediment displacement), and decommissioning.

4.5 Socioeconomics

4.5.1 Evaluation Criteria

Criteria for impacts on socioeconomics are those that directly affect the proposed project area. Examples are changes to population that might affect housing, infrastructure (schools, police, and fire services), or changes to the economy of the region (i.e., new or loss of business that affects employment). This section addresses socioeconomic impacts that could be considered direct effects on the environment.

4.5.2 Proposed Action

Minor short-term beneficial effects would be expected due to construction and fabrication of the components of the proposed deepwater Port. Long-term minor adverse effects would be expected to commercial fisheries.

Project Fabrication and Construction

The Proposed Action would include some construction and fabrication of components at a fabrication yard. The metering platform, facility control devices, and pipeline would all be constructed at currently unidentified onshore fabrication yards. In addition to labor at fabrication facilities, workers would also be needed for pipeline coating, and for offshore installation of the pipelines and metering platform. Table 4-9 estimates the number of workers that would be needed at the peak phase of construction.

Table 4-9. Proposed Estimate of Workers Needed During Peak Construction

Construction Task	Number of Workers
Platform	
Jacket/Piles	20 to 30
Deck	20 to 30
Facility/Controls Skids and Hook-Up	
Skids	15 to 20
MCC Building	8 to 10
Electrical and Piping Hook-Up	15 to 20
Pipeline Coating	10 to 20
Offshore Installation	
Platform	60 to 80
Pipelines	100 to 120
Total Estimated Workers	**248 to 330**

These construction activities are anticipated to have minor short-term beneficial effects to the local work force. The platform, metering components, and pipelines would all be constructed "off the

shelf," meaning no new technology would be used. Therefore, no specialized mode of construction would be needed to build components of the proposed Port. Local workers would most likely be used for the Proposed Action, sustaining the local economy of the fabrication facility (or facilities) for a short period of time during construction.

Although directly related and necessary for the successful implementation of the project, the selection of the fabrication facility is independent of other aspects of the project. To date, fabrication facilities have not been identified.

Two EPEBVs are currently under construction in Korea (El Paso 2002). Since construction is abroad, no effects from construction of the EPEBV would occur to a portion of the U.S. economy. It is also assumed that the STL buoy system would also be constructed overseas and, therefore, would have no effect on the local economy.

Existing Offshore Infrastructure and Lease Blocks

The Safety Zone would effectively restrict the installation of above-water structures supporting exploration around the port until decommissioning.

Onshore Support Facility

The Proposed Action would include using existing onshore support facilities. The Applicant would contract the operation and maintenance of the port to facilities currently operating in the area. Personnel, vessels, and helicopters that could provide support to the Port would deploy from existing shore-based facilities in Sabine Pass, Texas, and from other manned platforms offshore, such as El Paso Field Service's (an affiliate of El Paso Energy Bridge GOM) platform on Block HI 264. In addition to personnel on site, the downstream pipeline companies would use personnel at their respective onshore gas-control centers to control and monitor flow into their systems. All of the support vessel and helicopters trips to the port will be carried out by redirecting one of the existing daily trips currently used to support El Paso's other OCS facilities. No new trips to or from onshore will be required to support the proposed port.

It is estimated that the Port will be manned for approximately 250 days per year.

Since no new full-time positions would be required for onshore support, the Proposed Action would contribute negligible effects.

Operations

The Applicant estimates that 30 personnel would be aboard an EPEBV; however, those workers would likely be employed by the flag state of the EPEBV and, therefore, would not have an effect on local socioeconomics.

An estimated three domestic Facility Operator personnel would be present at the proposed Energy Bridge. However, operation and maintenance on the platform would be the responsibility of the downstream pipeline companies. It is expected that port operations would be witnessed only monthly or quarterly by El Paso Energy Bridge GOM. A slight increase of employment from service and support of the proposed Energy Bridge would be expected, but that increase would have minor effects on local socioeconomics. Effects on population, employment, housing, and public services, if

any, would be very minor as a result of the Proposed Action because of the negligible increase in population.

Infrastructure. The western and central GOM are two of the most active offshore oil and gas areas in the world (MMS 1994, 2001b; Entrix 2002). Most of the equipment and facilities supporting GOM oil and gas operations are located onshore of the western and central GOM. Equipment utilization varies over time, depending upon a variety of factors, including commodity prices.

Shipping and Vessel Traffic. The proposed Project would be constructed outside shipping fairways and navigation channels, and would not affect shipping or navigation activities. There would be minimal impacts on any, to shipping lanes or channels, such as increased traffic and potential vessel collisions with pipeline barge and support vessels during construction.

Commercial Fisheries

Project Construction. Construction of the proposed Port would affect less than 1.8 acres of benthic substrata. The benthic substrata affected by the proposed Energy Bridge are typical for this region of the GOM and are not protected, nor unique. The 194.1 acre area occupied by the Safety Zone would be unavailable to commercial fishermen. However, because the maximum excluded area represents only a small fraction of the total fishing area in the GOM, there should be no measurable effects.

There would be temporary, indirect noise and activity disturbance in the work area during proposed Project construction activities. Most species of demersal and pelagic fish would avoid construction and assembly areas. Potential effects on commercial fishing would be temporary and minor, resulting in fish displacement followed by rapid recolonization. Fish and crustaceans may relocate to avoid construction and assembly disturbances, but this would only be a temporary effect. The increase in sediment loads during construction would be short-term as the suspended sediments redeposit upon completion. Temporary loss of food supply for fish and crustaceans could occur during construction; however, new structures may attract fish to recently disturbed areas.

Effects on shellfish, including oyster beds, would be minimal, because the proposed facilities do not traverse any known commercial shellfish beds. Construction would remove a small area in the vicinity of the construction barge from fishing opportunities but the effects would be temporary and minimal.

Project Operations. The only direct socioeconomic impacts from pipeline operation would be the occasional contract for special services associated with inspection and maintenance. Pipelines as a bottom feature could damage fishing gear (trawls, pots, traps). Given the depth of water (greater than 200 ft), trawl fishing is not likely to be affected. Potential economic losses due to snagging fishing gear on obstructions would be further avoided by the Safety Zone, which would prohibit all unauthorized traffic in the proposed Terminal vicinity. These types of losses are typically less than 0.1 percent of the value of commercial fisheries landings, and are covered under the Fisherman's Contingency Fund if the source of the hang is unknown (FERC and MMS 2001).

Terminal Operations. There may be some localized impacts on fisheries resources associated with proposed Energy Bridge operations including noise avoidance, avoidance or attraction to colder oxygenated saturated discharge from EPEBV, and direct losses from water intakes. Because the Safety Zone would prohibit fishing within 500 m of the proposed Terminal, it is not anticipated that these potential localized impacts would have a measurable economic effect on the regional fisheries industry.

Enforcing the Safety Zone would prohibit fishing within 500 m of the proposed Energy Bridge. There may be some impacts to the routes used by vessels through the area, including commercial fishing vessels. The size of the Safety Zone relative to the open offshore waters of the area would require only minor alterations to a route through the area. The water depths and bottom conditions in adjacent areas are similar to those within the Safety Zone and would not have an effect on the operations, characteristics, or activities of vessels that might currently operate within the area where the proposed Safety Zone would be located, including commercial fishing vessels.

Recreational Fisheries

Similar effects on recreational fisheries would be similar to commercial fisheries as described above. Though fishermen would not be allowed to enter the proposed 194.1 acre Safety Zone, they could fish under the proposed metering platform, located outside the 3 km Navigation Zone radius. Platforms generally attract varying pelagic species of recreational interest, including the red snapper (GMFMC 1998). Therefore, the minor adverse effect of lost fishable acreage would be offset by the minor positive effect of the metering platform.

Mitigation

Effects associated with the proposed Energy Bridge relating to population, employment, housing, public services, vessel traffic, and shipping would be almost insignificant and easily absorbed within the existing GOM regional resources and socioeconomic infrastructure.

The onshore fabrication location will be evaluated for mitigation upon identification.

Commercial and Recreational Fisheries – Construction. The Proposed Action would affect less than 1.8 acres of benthic substrate associated and approximately 1 acre outside of Block WC 603 associated with pipeline activity. Pipeline-laying effects would be temporary and minimal since the pipeline would rest on the seafloor as opposed to being buried. Additional effects would be associated with avoidance of noise and activity.

Temporary short-term benthic disturbances and displacement due to construction noise and activity would be minimized by applying regulated operating procedures and industry standards. Mobile fauna would readily relocate to adjacent areas and would move back into the disturbed area without further mitigation. Benthic organisms would begin to colonize the disturbed substrate soon after completion of construction activities, without the need for further mitigation. Construction would not take place during periods of seasonal resource sensitivity, such as spawning runs.

Commercial and Recreational Fisheries – Terminal Operations. Potential impacts on fisheries resources may be associated with impingement/entrainment losses, noise, temperature, and turbidity. Potential ballast water impacts associated with incoming EPEBV would be mitigated by strict adherence to all applicable ballast management regulations. The USCG has established mandatory reporting and record-keeping requirements for all vessels equipped with ballast water tanks that enter into the waters of the U.S. after operating beyond the EEZ. A detailed ballast water management plan would also be included as part of the Port Operations Plan. Therefore, effects on commercial and recreational fisheries from invasive species resulting from ballast water exchange are expected to be minimal.

It is assumed that proposed Energy Bridge operations would have only localized effects on fisheries resources, and that the there would be no measurable effects to commercial fisheries outside the Safety Zone.

Environmental Justice

On February 11, 1994, President Clinton issued EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. This EO requires that Federal agencies' actions substantially affecting human health or the environment do not exclude persons, deny persons benefits, or subject persons to discrimination because of their race, color, or national origin. The essential purpose of the EO is to ensure the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no groups of people, including racial, ethnic, or socioeconomic groups, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of Federal, state, tribal, and local programs and policies. Consideration of environmental justice concerns includes race, ethnicity, and the poverty status of populations in the vicinity where a proposed action would occur. Such information aids in evaluating whether a proposed action would render vulnerable any of the groups targeted for protection in the EO.

Following the decision for the fabrication yard location, possible effects on protected groups under EO 12898 will be assessed.

The remaining proposed Project components would occur predominantly in GOM waters. Effects on residential areas, regardless of ethnic and minority composition, would be avoided. Even with the temporary increase of construction workers, the Proposed Action would not cause adverse environmental or disproportionate human health effects on minority or low-income communities

4.5.3 No Action Alternative

Under this alternative, the license application would not be approved and El Paso Energy Bridge GOM would not proceed with construction and operation of a deepwater port. If the Maritime Administrator denies the license application, the short- and long-term environmental effects on socioeconomics identified in Section 4.5.2 would not occur. Existing conditions would prevail. Means to satisfy the Nation's energy demands might result in increased use of existing land-based LNG receiving terminals, greater reliance on domestic and foreign oil and gas resources, development of other sources of energy, including energy conservation. The Secretary's purpose and need would continue as a mechanism for the review of deepwater ports applications and implementation of the appropriate alternative, approval, conditional approval or denial. It is reasonable to assume that a decision on the Port Pelican application would be made independent of the decision reached on this application.

If approved, Port Pelican would have long-term and short-term minor adverse and short-term minor beneficial effects on socioeconomic conditions. These effects would be associated with fabrication and installation of the PIPL and commercial fisheries. The establishment of the 500-m Safety Zone around the proposed Terminal would result in an extremely localized long-term loss of commercial fisheries. A majority of the proposed Project would occur in GOM waters. Impacts on residential areas, regardless of ethnic and minority composition, would be avoided. The Proposed Action would

not cause adverse environmental impacts or disproportionate human health effects on minority and/or low-income communities.

4.6 Recreation

4.6.1 Evaluation Criteria

Significant effects on recreational resources would occur if a proposed action would cause long-term, substantial interference with coastal access for recreational use or waterways or cause long-term degradation of a significant recreational resource. Effects on recreation would be indicated by impairment to fishing activities, reduced fish catches, or disturbance to fish habitats. Recreational fisheries and offshore biological resources associated with recreation are discussed in Section 4.2.

4.6.2 Proposed Action

Some minor short-term adverse effects on small boat traffic may be associated with the moving the proposed metering platform and other Port components from the shore based faculties through the coastal zone.

Fabrication of the fixed facilities and support operations at onshore locations would occur at existing GOM fabrication yards and would not affect recreation opportunities.

Neither the STL buoy nor its other components would be located in designated recreation and public interest areas such as marine reserves, wildlife refuges or sanctuaries, or state parks. The Proposed Action would not interfere with recreational enjoyment of these resources.

Mitigation

No mitigation measure would be required as a result of the Proposed Action.

4.6.3 No Action

Under this alternative, the license application would not be approved and El Paso Energy Bridge GOM would not proceed with construction and operation of a deepwater port. If the Maritime Administrator denies the license application, the environmental effects on recreation identified in Section 4.6.2 would not occur. Existing conditions would prevail. Means to satisfy the Nation's energy demands might result in increased use of existing land-based LNG receiving terminals, greater reliance on domestic and foreign oil and gas resources, development of other sources of energy, including energy conservation. The Secretary's purpose and need would continue as a mechanism for the review of deepwater ports applications and implementation of the appropriate alternative, approval, conditional approval or denial. It is reasonable to assume that a decision on the Port Pelican application would be made independent of the decision reached on this application.

If approved, Port Pelican would have long-term minor adverse and minor beneficial impacts on recreation would be expected. No impacts on shore-related recreational activities would be anticipated. This Project, however, would not displace recreational fishing in the vicinity of the deepwater Port for its expected 40-year operational period because there is currently no such recreational activity at the proposed site. The placement of the GBSs in the GOM would potentially

create an artificial reef, resulting in minor beneficial impacts on commercial and recreational fisheries stocks.

4.7 Transportation

4.7.1 Evaluation Criteria

Significant effects on transportation would occur when a proposed action would cause long-term interference with access to transportation routes, or crowding of routes resulting in substantially increased risks of collisions or other mishaps (e.g., grounding). Effects on transportation would also be considered when they would affect large populations or represent a substantial degree of change over current conditions. Transportation also includes the existing infrastructure of roads, rails, and waterways.

4.7.2 Proposed Action

4.7.2.1 Marine Traffic

EPEBVs. The proposed STL buoy would accommodate only one EPEBV at a time. For the foreseeable future, El Paso Energy Bridge GOM anticipates that there would be only two LNG carriers having onboard regasification capabilities for the proposed deepwater Port. These two ships are currently under construction in Korea. While these LNG carriers could unload their cargo at conventional onshore terminals, it is anticipated that, if licensed, use of these vessels would be dedicated to the proposed Port.

The amount of time that these LNG carriers would be unloading their cargo at the proposed Energy Bridge would be a function of the distance between the LNG export terminal location, the proposed Port, and the natural gas unloading rate at the proposed Port.

For example, with two LNG carriers, the maximum number of LNG cargo deliveries at the proposed Port from the closest LNG supply point, Trinidad, is estimated at approximately 41.2 per year. With an average unloading rate of 500 MMcf/d (open loop mode), and an average capacity of 2,950 MMcf of natural gas per carrier, the two carriers would be at the proposed Energy Bridge approximately 67 percent of the year when the LNG comes from Trinidad.[10]

However, the maximum number of LNG carrier deliveries and the maximum percentage of the year that an LNG carrier is unloading at the Port decreases significantly as the distance to the LNG supply source increases. Algeria is the next closest LNG supply source after Trinidad. The maximum number of LNG carrier deliveries at the proposed Energy Bridge using two EPEBVs from Algeria is approximately 24.4 at an average unloading rate of 500 MMcf/d (equates to both EPEBVs unloading 39 percent of the year) and approximately 23.3 at an average unloading rate of 400 MMcf/d (equates to both EPEBVs unloading 47 percent of the year).

The selection of LNG supply and unloading terminals is a decision born by the EPEBV's chartering party. The Applicant anticipates that for the foreseeable future the chartering parties would dedicate the EPEBVs to unload their cargo primarily at the proposed Energy Bridge. In addition, the Applicant anticipates that the preferred unloading mode would be Open Loop with an average

[10] 2,950 MMcf per carrier x 41.5 carriers per year / 500 MMcf per day / 365 days per year = 0.67

unloading rate of 500 MMcf d. Assuming the chartering party uses one vessel to move LNG from Trinidad and the second carrier to move LNG from Algeria, then an EPEBV would be unloading cargo at the proposed Energy Bridge approximately 50 percent of the year (average of 67 percent and 39 percent).

Demarcated Safety/Security Areas. The Applicant has identified a Recommended Route for inbound and outbound EPEBVs. This route would indicate a corridor from the Sabine Pass Fairway and extending northwest approximately 20 mi to the proposed deepwater Port. If approved, this route would be identified on navigation charts and would enhance transportation safety by informing other marine vessel operators that large ships might traverse this route.

Recommended Routes are advisory in nature. They do not regulate vessel movement or preclude construction of artificial or fixed structures in the demarcated path. Mariner vessel operators would be expected to use appropriate caution while operating in the vicinity of the Recommended Route. Proposals for construction or placement of a structure within, or in the vicinity of, the Recommended Route would require notification to the USCG and, if appropriate, amendments would be made to the Recommended Route. As discussed in Section 2.0, the Applicant provided a review of information indicative of potential for drilling activity in the OCS lease blocks in the WC 603 site vicinity. The Secretary's evaluation of this information indicates that the level of lease bonus payments paid for leases in the WC 603 area suggests that the regional lease blocks have either high risks or low potential prospects for future exploration. The lack of previous drilling within lease blocks in the area of WC 603 and the lack of a Plan of Exploration (POE) filing for any nearby lease block supports the poor prospectivity. There are production platforms in the area; however, the nearest production platform is in excess of three miles from the center of WC 603. An evaluation of potential exploration within a potential Recommended Route would be considered as part of the approval process.

If the license were approved, a 500 m Safety Zone would be established around the STL buoy. This Safety Zone would exclude all unauthorized vessels and activities and could be enforced by the USCG.

In addition to the Safety Zone, a wider Precautionary Area could also be proposed for the STL buoy. As proposed, this area would demarcate an area on nautical charts where mariners would be advised to be cautious. A Precautionary Area is advisory in nature and would not regulate vessel movement or preclude construction of artificial or fixed structures within the area. This precaution would alert mariners of the potential for EPEBVs and port support vessels operating in the area. It would also provide a surveillance zone for the port operators while the EPEBV would be offloading cargo at the deepwater Port. If approved, these areas would serve to minimize potential impacts related to EPEBVs and support vessel traffic operating in the vicinity of the STL buoy. No safety demarcations are proposed for the metering platform.

Governments intending to amend or establish a new navigation demarcation in international waters must submit proposed routing measures to IMO. Since the U.S. is a signatory to the IMO, requests for the proposed Precautionary Area and Recommended Route would be forwarded to the appropriate IMO subcommittee and, if reported favorably, would be submitted to the entire IMO for final approval (IMO 1998).

One minor localized long-term effect on maritime transportation could result from restricting vessel traffic within the proposed 500 m Safety Zone. A vessel on a course heading that would cross the vicinity of the deepwater Port would have to change course to avoid the Safety Zone. The water

depths and surface conditions adjacent to the proposed Safety Zone are similar to the conditions within the proposed Safety Zone; there would be no obstacles to any vessel traffic pathways necessary to avoid the Safety Zone. Commercial fishing vessels may also be affected within the proposed Precautionary Area. Commercial fishing vessels that operate underwater gear would have to avoid fishing in the proposed Precautionary Area to avoid damaging their equipment or the proposed Port's STL buoy or mooring system.

EPEBVs would make calls on the deepwater Port to unload their cargo approximately 42 times per year. This number of port visits would not be a significant change in the number or types of vessels currently operating in the region. The relatively uniform physical and ecological conditions in this region of the GOM would allow fishing vessels to easily operate in areas outside of the proposed Precautionary Area.

Ports. The EPEBVs would not be expected to make port calls along the Gulf coast and, therefore, would not add to nearshore shipping traffic unless required for repairs or other unusual circumstances. As proposed, the operation of the port could necessitate infrequent use of service vessels in support of operating and maintaining the metering platform. These service vessels would be part of El Paso's existing GOM support fleet berthed at existing facilities. The number of support vessel trips to and from the proposed Port area would not significantly increase existing vessel traffic in the Louisiana coastal region or in offshore areas.

Aviation. Helicopter flights to support the proposed Port would abide by FAA regulations. Support helicopters servicing the deepwater Port would be drawn from El Paso's existing fleet and would originate from an existing facility. The possible addition of a small number of flights would result in only a minor increase in total helicopter traffic. The incremental increase in helicopter traffic would be negligible, given the current levels being experienced in the Gulf (MMS 2001b).

4.7.2.2 Ground Transportation

No new onshore facilities, equipment, or personnel would be required to support the operation and maintenance of the proposed Port. El Paso Energy Bridge GOM has proposed to use only existing onshore facilities, personnel, and equipment presently involved in support of El Paso's offshore activities and infrastructure in the GOM. To support the deepwater Port's operations and maintenance, these resources would be redirected as needed from other ongoing tasks. The efforts required to support the proposed Port would be similar in scope to existing tasks assigned to these resources. They would not affect ground transportation resources such as highways and railroads.

Mitigation

No mitigation measure would be required as a result of the Proposed Action.

4.7.3 No Action Alternative

Under this alternative, the license application would not be approved and El Paso Energy Bridge would not proceed with construction and operation of a deepwater port. If the Maritime Administrator denies the license application, the potential environmental impacts on transportation identified in Section 4.7.2 would not occur. Existing conditions would prevail. Means to satisfy the Nation's energy demands might result in increased use of existing land-based LNG receiving terminals, greater reliance on domestic and foreign oil and gas resources, development of other sources of energy, including energy conservation. The Secretary's purpose and need would continue

as a mechanism for the review of deepwater ports applications and implementation of the appropriate alternative, approval, conditional approval or denial. It is reasonable to assume that a decision on the Port Pelican application would be made independent of the decision reached on this application

If approved, Port Pelican would have long-term minor adverse impacts on transportation. These effects would occur in connection with increased LNGC use of established fairways and supply vessels and helicopters transiting the GOM between Intracoastal City, Louisiana, and the proposed Terminal location.

4.8 Air Quality

4.8.1 Evaluation Criteria

The potential effects on local and regional air quality conditions near a proposed action are determined by the increases in regulated pollutant emissions relative to existing conditions and ambient air quality. Specifically, the effect on NAAQS "attainment" or unclassifiable areas would be considered significant if the net increases in pollutant emissions from the Proposed Action resulted in one of the following three scenarios:

- Cause or contribute to a violation of any NAAQS
- Exceed the MMS air quality emission thresholds specified in 30 CFR 250.303(b)
- Expose sensitive receptors to substantially increased pollutant concentrations

Federal PSD regulations define air pollutant emissions to be "significant" if (1) a proposed major stationary source is within 10 km of any Class I area, and (2) regulated pollutant emissions would cause an increase in the 24-hr average concentration of 1 $\mu g/m^3$ or more of any regulated pollutant in the Class I area (40 CFR 52.21(b)(23)(iii)). PSD regulations also define ambient air increments, limiting the allowable increases to any area's baseline air contaminant concentrations, based on the area's designation as Class I, II, or III (40 CFR 52.21(c)). The pollutant-specific impacts resulting from direct and indirect emissions from stationary emission sources under this Proposed Action would be addressed through USEPA's Federal permitting requirements under PSD regulations (40 CFR Part 52).

USEPA does not normally administer the CAA in the GOM west of longitude 87 degrees 30 minutes. Typically, MMS is responsible for regulating "OCS sources" in that area pursuant to CAA Part 328. However, deepwater ports do not appear to be "OCS sources." Therefore, USEPA might be the regulatory authority. USEPA's national air program is currently seeking to develop a nationally consistent policy regarding the regulation of deepwater port air emissions. In light of the absence of such standards, MMS analysis requirements as applied to other emission sources in the GOM are the most appropriate frame of reference for quantifying the significance of potential environmental impacts.

The MMS is responsible for implementing the CAA for OCS in the GOM west of longitude 87 degrees 30 minutes (CAA, Section 328). The MMS accomplishes this through regulations that ensure that new or modified offshore pollutant sources will not substantially affect onshore ambient air quality. The air quality emission thresholds published by MMS are determined by comparing the highest annual total amount of air quality emissions from the proposed facility for each criteria pollutant to the emission exemption amount (E) expressed in tons per year as specified in 30 CFR

250.303. The exemption thresholds are calculated using the following formulas, where D is the distance of the proposed facility from the closest onshore area of a state expressed in statute miles:

- CO $E = 3{,}400D^{2/3}$
- TSP, SO_2, NO_x, and VOC $E = 33.3D$

Cameron Parish and Vermillion Parish, Louisiana, are the closest onshore areas to the Proposed Action each approximately 105 statute miles. Therefore the emission exemption amounts for the Proposed Action are

- CO E = 91,234 tons/yr
- TSP, SO_2, NO_x, and VOC E = 4,629 tons/yr

If the resulting MMS emission thresholds are exceeded by a proposed facility, an approved air quality model must be used to determine whether the projected emissions of those pollutants from the facility would result in an onshore ambient air concentration above the significance levels. The MMS promulgated the significance levels in 30 CFR 250.303 to determine the compliance of any proposed OCS facility with NAAQS and PSD requirements. The MMS modeling significance levels are the same as the concentrations as of the current USEPA significance levels for new or modified major PSD sources in attainment areas. Table 4-10 presents these significance levels.

Table 4-10. MMS Significance Levels: Air Pollutant Concentrations

Air Pollutant	Averaging Time (hours)				
	Annual Mean	24-hour Maximum	8-hour Maximum	3-hour Maximum	1-hour Maximum
SO_2	1 µg/m^3	5 µg/m^3	--	25 µg/m^3	--
TSP	1 µg/m^3	5 µg/m^3	--	--	--
NO_2	1 µg/m^3	--	--	--	--
CO	--	--	500 µg/m^3	--	2,000 µg/m^3

Source: 30 CFR 250.303

Note: µg/m^3 – micrograms per cubic meter

The projected emissions of any air pollutant (other than VOC from the proposed facility) that would significantly affect the quality of a nonattainment area would have to be fully reduced. This reduction would be accomplished through the application of Best Available Control Technologies (BACT) and, if additional reductions are necessary, through the application of additional emission controls or through the acquisition of offshore or onshore offsets. Similarly, the projected emissions of any air pollutant (other than VOC) that would significantly affect the quality of an attainment or unclassifiable area would be required to be reduced through the application of BACT.

4.8.2 Proposed Action

Long-term significant adverse impacts on air quality would not be expected from this Proposed Action.

Construction Impacts

Construction of the offshore gas delivery system consists primarily of installation of mooring anchors and mooring legs, the PLEM, STL buoy, flexible riser, pipelines, and a metering platform. Construction of the metering platform would be accomplished onshore in fabrication yards along the Gulf Coast and the pipeline and PLEM would be purchased for installation at the proposed site.

Regulated criteria pollutants and HAPs would be emitted during construction/assembly of the STL buoy system, PLEM, pipeline, and metering platform. Construction would cause temporary reduction of local ambient air quality due to emissions generated by the pipeline-laying barge and other auxiliary mobile equipment working offshore. The emissions during construction activities would occur during 2004 from fuel combustion in the barge and support boat engines, and would consist of NO_x, and CO, and small amounts of VOC, PM_{10}, and SO_2 emissions. Emissions from construction activities had not been fully evaluated at the time of this report. However, emissions from a similar, yet much larger, construction of another LNG regasification port were used as surrogate emission estimates (Entrix 2002). Table 4-11 summarizes the regulated pollutant emission estimates from the proposed construction activities and equipment from this Proposed Action, all of which would occur during 2004.

Table 4-11. Construction and Operation Source Emissions in 2004

Source Category	Emitted Pollutant (tons per year)				
	PM	SO_x	NO_x	VOC	CO
Construction Sources[1]	20.86	95.69	717.06	21.51	156.45
Operation: EPEBV Sources[2]	27.8	388	49.5	1.3	12.3
Operation: Port Sources[2]	.12	.01	1.58	.09	1.3
Totals:	**49**	**484**	**768**	**23**	**170**
MMS Emission Threshold[3]	4,629	4,629	4,629	4,629	91,234

Source: ENSR 2002

[1] Calendar year (CY) 2004 construction emissions estimates reflect 180 days of pipeline installation as well as metering platform towing and installation.

[2] CY2004 operation/production emissions estimates reflect operations from November 1 through December 31 and are estimated at 2/12 of annual operating capacity.

[3] Distance from Proposed Action to the closest onshore area (Calcasieu Parish, Louisiana) is 139 statute miles.

Operational Impacts

Each EPEBV would integrate complete offshore regasification capabilities into its shipboard system. At full capacity, the EPEBV can store 138,000 m^3 of LNG, which is the equivalent of approximately 3 bcf of natural gas. The regasification system can operate in open loop mode, closed loop mode, or together in a combination mode. In the open loop mode, the EPEBV would intake seawater from the surrounding area to heat the LNG. The warm seawater would pass through a shell and tube vaporizer indirectly heating the LNG. Then the EPEBV would discharge this water through the EPEBV keel. In the closed loop mode, steam from the EPEBV propulsion boilers would heat water circulated in a closed loop through the shell and tube vaporizer and a steam heater. After the cycle, the water would be recirculated through the system. The closed loop mode allows for LNG regasification when

surrounding seawater temperatures are too cold for the more efficient open loop mode. The system would operate in 100 percent closed loop mode only when surrounding seawater temperatures are less than 5.5 °C (42.0 °F). The maximum volume for the Proposed Action would be limited to 550 MMcf/d. Therefore, a fully loaded vessel would be able to discharge its cargo in about 6 to 8 days, depending on operating conditions.

Additionally, the EPEBV would have vaporizers and pumps used in the regasification process, but this equipment would be electrically powered (i.e., from the ship's power plant) and would not contribute to air emissions.

In order to accommodate the transfer of the vaporized natural gas into the existing pipeline facilities, a natural gas-fired gas power generator and a 30 kW emergency generator would be installed on a metering platform approximately 2 miles from the proposed buoy site. The platform would be designed to receive gas from the EPEBV and then split the flow of gas into two gas-metering stations. One of the meters would provide custody transfer measurement of gas delivered to the Sea Robin pipeline and the other meter would measure gas delivered to the Bluewater pipeline. The gas would be pressure- and flow-regulated on the metering platform. Gas would exit the platform in separate pipelines for tie-in to the Sea Robin and Bluewater pipelines.

Operation of the proposed offshore gas delivery system would not adversely affect onshore nonattainment areas. The air emission sources associated with the proposed offshore gas delivery system would include the following sources associated with the modified LNG carriers (EPEVBs) and metering platform:

- Two dual fuel propulsion boilers, 71 tons steam/hour each (EPEBV)
- One diesel powered generator, 3450 kW (EPEBV)
- One refuse incinerator, 700,000 Kcal/hour (EPEBV)
- Six residual fuel oil storage tanks, 7,872 m^3 total capacity (EPEBV)
- Three diesel storage tanks, 458 m^3 total capacity (EPEBV)
- One used oil storage tank, 3 m^3 total capacity (EPEBV)
- One natural gas heater, 22 MMBtu/hr (metering platform)
- One natural gas emergency generator, 30 kW (metering platform)

In calculating air emissions from the Proposed Action in a previous study (ENSR 2002), a conservative approach was taken to estimate emissions from the operations for comparison with the MMS emission exemption amounts. These conservative assumptions were

- There would be an EPEBV vessel offloading LNG continuously 8,760 hrs per year.
- The mode of operation for the entire year would be closed loop, with both propulsion boilers operational to provide heat and electrical power to operate onboard vaporizers and pumps.
- The EPEBV waste incinerator would operate continuously at design capacity of 617 lb refuse per hr and.
- The residual fuel oil sulfur content was assumed to be 1.15 percent by weight.

Actual regasification activities are anticipated to be:

- Only two EPEBV vessels would be equipped to offload LNG at the port and, depending on which supply terminal is selected, actual time spent offloading LNG can vary between 50 – 77 percent of the year.
- Operation in closed loop mode a maximum of 4 months of the year, with the remainder in open loop mode with one propulsion boiler operational to provide electrical power for the vessel.
- EPEBV waste incinerator used in batch mode to dispose of nonhazardous waste generated from 30 personnel on board the EPEBV.
- Actual sulfur content of residual fuel oil of 1.15 percent by weight.

In lieu of a more rigorous approach to calculating emissions, the conservative emission estimates were used to determine whether there would be significant impacts as determined versus the MMS emission exemption amounts.

Table 4-11 summarizes the estimated maximum emissions of regulated pollutants from the stationary port equipment and mobile sources associated with the LNG vessel and vessels associated with port construction activities during 2004. Table 4-12 presents the estimated maximum operational emissions for 2005 and beyond. Based on the emissions in Tables 4-11 and 4-12, the PM, SO_x, NO_x, VOC, and CO emissions would not exceed the annual MMS emission thresholds limits from 30 CFR 250.303. Therefore, further emission modeling would not be triggered under MMS permitting guidelines, and no significant adverse impacts on onshore or offshore air quality would be expected from the Proposed Action.

Preliminary screening-level air dispersion modeling analysis was conducted and reported (ENSR 2002) to determine onshore effects from operations at the port. Results indicate that effects from the Proposed Action were below the NAAQS set at the Louisiana coastline. No further refinement of this modeling has been conducted.

Table 4-12. Operational Source Emissions in 2005 and Beyond

Source Category	Emitted Pollutant (tons per year)[3]				
	PM	**SO_x**	**NO_x**	**VOC**	**CO**
Operation: EPEBV Sources[1]	167	2,330	297	8	74
Operation: Port Sources[1]	0.73	0.07	9.48	0.52	7.96
Totals:	**168**	**2,330**	**306**	**8.5**	**82**
MMS Emission Threshold[2]	4,629	4,629	4,629	4,629	91,234

Source: ENSR 2002

[1] CY2005 operation/production emissions estimates reflect operations from January 1 through December 31. The facility is projected to operate under this scenario until decommissioning.

[2] Distance from Proposed Action to the closest onshore area (Calcasieu Parish, Louisiana) is 139 statute miles.

[3] Values in table represent the maximum emission rates from open loop operations.

LNG Release and Impact on Air Quality

Vaporized natural gas is initially dense and lower in temperature than the surrounding air. In the absence of wind, the dense natural gas vapor cloud would remain near the water surface initially after release. It would rise and disperse as it warmed and become less dense than air (Conrado and Vesovic 2000). It is possible that the vapor cloud could burn. Experience and testing indicate that unconfined natural gas vapor clouds do not explode. However, the vapors could be ignited if within their explosive range (5 to 15 percent concentration of natural gas vapors in air) and an ignition source is present. LNG does not burn, but natural gas vapors above the LNG could burn until the LNG or natural gas vapors are fully dissipated. The duration of time in which potential effects could occur is based on modeling results of a catastrophic LNG release from a tanker, indicating that for a 16.4-ft (5-m) hole in a ship, the time to burnout of the spill vapor was 37 min. For a slower leak, through a 3.28-ft (1-m) hole, the time to burnout was 64 min. In both cases 82,021 ft^3 (2,322 m^3) of LNG were released (Juckett 2002).

Pipeline Operations

Operation of the pipeline would not result in substantial air emissions under normal operating conditions since the pipeline would be installed underwater and is a closed loop system. Typically, only minor emissions of natural gas, called fugitive emissions, occur from pipeline connections at aboveground locations. Because such emissions are typically very small, they are not regulated by permit or source-specific requirements. A Leak Detection and Repair program that is intended to minimize the release of pollutants would control these fugitives. Pump and compressor seals, valve stems, and pipeline fittings would be monitored regularly using an organic vapor analyzer to confirm that VOC emissions were below permissible levels. Any leaks found would be repaired and would be subject to more rigorous monitoring until fugitive emissions were reduced. A minor release of natural gas to the water is unlikely to present any significant air impact. The extent of the effects would depend not only on the size of a release but also on wind and water conditions at the time of a release.

Applicable Regulations/Controls

Typically, MMS is responsible for regulating "OCS sources" in the area pursuant to CAA Part 328. However, deepwater ports do not appear to meet the definition of OCS sources. The MMS has officially determined that it does not have air jurisdiction over the proposed LNG facility and the jurisdiction for administrative Clean Air Act Amendments (CAAA) belongs to USEPA.

USEPA Region 6 has made a preliminary determination that the proposed activities fall within its jurisdiction. USEPA's National Air Program is currently attempting to develop a nationally consistent policy regarding the regulation of deepwater port air emissions.

NSPS. The proposed gas heater with a heat input of approximately 22 MMBtu/hr would trigger the NSPS emission standards promulgated in 40 CFR 60.40, Subpart Dc Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units.

The control requirements associated with these NSPS standards would be incorporated into the design and specifications of this equipment and would be enforced by applicable permits issued by USEPA for the facility.

PSD and Title V. Based on the stationary source emission estimates presented above, the proposed deepwater Port would not be a major source of regulated pollutants. As a result, the proposed Energy Bridge is not required to obtain a preconstruction PSD permit nor a major source Title V operating permit. El Paso Energy Bridge GOM and USEPA, Region 6 have entered into discussions pertaining to the characterization of emissions from the vessels calling on the deepwater Port and whether or not those emissions constitute a "fuel conversion plant" when moored at the Port.

Mitigation

Air quality effects resulting from the operation of the deepwater Port would be minimal and not require mitigation either through the PSD or Title V air permitting process. Current estimates of uncontrolled emissions are presented in Tables 4-10 and 4-11. Based on these emissions calculations, potential and projected emissions of all criteria pollutants are below PSD and Title V major source thresholds and significance criteria.

4.8.3 No Action Alternative

Under this alternative, the license application would not be approved and El Paso Energy Bridge GOM would not proceed with construction and operation of a deepwater port. If the Maritime Administrator denies the license application, the short- and long-term environmental impacts on air quality identified in Section 4.8.2 would not occur. Existing conditions would prevail. In some cases, potential customers of natural gas could select available energy alternatives such as oil or coal to compensate for the reduced availability of natural gas. Increased use of alternative fossil fuels such as oil or coal would generally result in higher emission rates of NO_x and SO_2 than would be the case with natural gas. To comply with current regulations, emission control technologies could be required that could limit the economic viability of projects using these alternative fuels.

Means to satisfy the Nation's energy demands might result in increased use of existing land-based LNG receiving terminals, greater reliance on domestic and foreign oil and gas resources, development of other sources of energy, including energy conservation. The Secretary's purpose and need would continue as a mechanism for the review of deepwater ports applications and implementation of the appropriate alternative, approval, conditional approval or denial. It is reasonable to assume that a decision on the Port Pelican application would be made independent of the decision reached on this application

If approved, Port Pelican would have long-term minor adverse impacts on air quality would be expected. These impacts would be associated primarily with operation of equipment on the Terminal. Criteria pollutant emissions would not exceed annual USEPA-permitted emissions levels. In addition, based on the emissions rate and the distance to the nearest nonattainment areas, the Proposed Action would not adversely affect the air quality of onshore nonattainment areas.

4.9 Risk Management

The transportation, storage, and processing of LNG and transportation of associated natural gas requires strict controls to minimize potential risks and interruptions of scheduled deliveries. This section provides an overview of issues that would affect the safe and reliable operation of proposed Energy Bridge. Section 4.9 is limited to design, engineering, and operational components of the proposed Port infrastructure and EPEBVs while operating near or moored at the proposed Energy Bridge. Reliability of overseas LNG supplies and shipping schedules is outside the scope of this EA.

The Applicant has proposed the Port as an interrupted source of natural gas with a periodic delivery schedule controlled by customer demand and the suppliers' ability to schedule deliveries. If the license is approved, the USCG would review and approve all design, engineering, and operations specifications prior to construction and/or operation of the proposed Port. The USCG's review would include a thorough evulation of the Applicant's measures to manage risks to safety.

4.9.1 LNG Hazards

The principal hazards associated with LNG include

- Cryogenic: LNG is shipped and stored at a temperature of approximately -260 °F. Physical contact or spillage constitutes a personnel and equipment hazard.
- Flammability: LNG vapors in a 5 to 15 percent mixture with air are highly flammable.
- Asphyxiation: Because of its vapor dispersion characteristics, natural gas presents an asphyxiation hazard.

Methane is the primary component of natural gas. LNG occurs when natural gas is cooled to approximately –260 °F at ambient pressure. LNG will neither burn nor explode. LNG vaporizes rapidly in contact with ambient heat sources and produces approximately 625 ft^3 of natural gas for every cubic foot of LNG.

LNG is less dense than water. If spilled into water, it would boil rapidly when exposed to the warmer ambient temperature. Because of density differences and turbulence created by the rapid boiling, an LNG spill would spread and vaporize rapidly. Due to the low boiling temperature of LNG, the formation of ice is possible; however, ice formation has not been observed in field experiments**.**

As a cryogenic liquid, LNG quickly cools materials it contacts and causes extreme thermal stress in materials not specifically designed for ultracold conditions. Such thermal stresses can cause brittleness, fracture, or other loss of tensile strength (FERC 2003).

Vaporized natural gas is initially characterized by a low temperature and is denser than the surrounding air. In the absence of wind, a natural gas vapor cloud would stay low, near the water surface or at low points within the GBS. It would rise and disperse as it warms and become less dense than air (Entrix 2002).

LNG can undergo "rapid phase transition," a physical vapor explosion (not combustion). Experience and testing indicate that unconfined natural gas vapor clouds do not explode. However, if there is an ignition source and the vapors are in their explosive range, they could be ignited with subsequent burn back to the source (Juckett 2002). If no ignition source is found, a potentially combustible plume would migrate until either the LNG source is exhausted or the air dilutes the concentration of natural gas to below the lower flammability limit (LFL).

Regarding worker safety, potential hazards include exposure to low temperature LNG and asphyxiation by concentrated vapors. The low temperature is sufficient to rapidly cause the equivalent of frostbite, or if enough of the body surface is exposed, death via freezing of the tissue. Asphyxiation could result as the dense LNG vapors displace oxygen in the area, or as flames consume available oxygen. These potential impacts could occur to individuals who are at the spill location until approximately 1 hour after the spill. The timeframe for potential impacts is limited.

There are environmental hazards associated with a spill of LNG. The low temperature of the material could kill marine life if it is exposed. However, LNG will sit on the water surface and boil until the temperature of the water converts it to natural gas. Because LNG does not dissolve in water, no residual hazards are expected after the LNG has boiled off and the vapors have dispersed.

It has been suggested that LNG carrier ships are no more hazardous than other cargo shipments. According to the Department of Energy (DOE), there have been no reported instances of LNG cargo explosions even though LNG tankers have "been run aground, experienced loss of containment, suffered weather damage, been subjected to low temperature embrittlement from cargo spillage, suffered engine room fires, and been involved in serious collisions with other vessels" (Juckett 2002). LNG carriers might actually be less hazardous than typical crude oil and chemical tankers because the carriers are inherently more robust. British Petroleum reports that there have been more than 32,000 shipments of LNG since marine transport of LNG began in the 1950s (BP 2002).

Catastrophic Release of LNG

The DOE has determined that a catastrophic release of LNG from the vessel could occur from a vessel collision. EcoEléctrica L.P. (1995) determined that the minimum beam-on striking speed to penetrate LNG cargo tanks is 3.0 knots. Lower angles of impact proportionately increase the value. The EPEBVs would have four liquid-tight barriers between the ocean and the vessel's cargo, including the reinforced LNG membrane tank.

For the proposed Energy Bridge, the primary concern for potential accidents is the potential for fire resulting from accidental releases of LNG or natural gas. The evaporation rate of LNG from the water surface has been estimated to be 1 inch per minute (Burgess 1970). Although the methane gas evaporated from a LNG spill has a molecular weight (16) less than that of air (29), it will disperse initially as a heavier-than-air gas due to its low temperature (-163 °C/-261.4 ºF). During this stage, most of the plume growth will be in the lateral direction due to gravitational slumping. Eventually sufficient air will be entrained into the cloud so that its dispersion is governed solely by ambient turbulence (USEPA 1988). Throughout the LNG cloud the level of mixing will not be uniform, and pockets of flammable gas might exist in regions of the cloud, which are generally outside the flammability limits of methane (Parry and Koliopulos 2002). If this flammable plume finds an ignition source, a fire will flash back to the source of the emission, causing potentially serious burns to those individuals outdoors in the flammable concentration zone. Thermal radiation (the heat that is felt when standing in front of a fireplace) is the primary mechanism of heat transfer from the burning methane to an individual or structure (ENSR 2002). The only potential fixed ignition sources applicable to the proposed Port would be onboard the EPEBV, at the Port's metering platform or associated with a support vessel. The STL buoy and the metering platform would be located more than 3 mi (4.8 km) from the nearest fixed above water structure. A vessel transiting within the proposed Precautionary Zone could also provide a potential ignition source.

The pool of LNG ignited by a flash fire also presents a thermal hazard, but at a shorter distance than that of the flammable vapor cloud. This fire would, however, be of longer duration than the vapor cloud fire as a portion of the radiant heat of combustion is used to evaporate more LNG to feed the fire. The burn rate for a LNG pool on the water would be greater (1.37 inches per minute vs. 0.37 inches per minute) than for a pool on land due to the heat supplied by the water (ENSR 2002).

As discussed below if a release were to occur without an ignition source, a flammable vapor cloud could potentially travel up to 2.5 miles from the vessel, depending upon prevailing winds. For a vessel located near shore, the vapor cloud could encompass population centers. A remote

(downwind) ignition of a plume in the flammable portion of the vapor cloud would result in a relatively slow (subsonic) burn back to site of the spill. For this release the threshold distance for second-degree burns from a 25,000 m^3 (6,604,000 gallons [gal]) pool fire would be 1.3 mi. For the proposed Energy Bridge, however, the EPEBV would always be beyond this distance from the shoreline. In addition there are no active structures within 3 miles of the proposed STL buoy location.

However, the DOE also pointed out that it would be highly unlikely that a collision with the LNG vessel capable of breeching all four protective barriers would occur without creating an ignition source. This ignition source would be close to the vessel and a burn down of the released material would be localized to the proximity of the vessel. (DOE 2002)

Accident Modeling

Following the September 11th terrorist incidents, LNG tanker dockings were suspended in Boston Harbor. Subsequently, DOE, along with FERC, DOT Office of Pipeline Safety (OPS), and local and state officials commissioned the modeling of a catastrophic LNG release. The scenario involved the catastrophic breaching of a single tank of an LNGC typical of the servicing terminals in the U.S. Two types of spills were modeled—a 5-m and a 1-m hole in the tank. Both spills were characterized by a loss of the entire contents of the tank, 25,000 m^3 (6,604,000 gal) of product. Two different types of atmospheric conditions were modeled—very stable with wind conditions of 1.5 m/s (Pasquill-Gifford stability "F"), and less stable with winds gusting to 5 m/s (stability "D"). As shown in Table 4-13, distance to the LFL varied considerably depending on atmospheric stability.

The model found that the 5-m hole took 37 minutes to burnout of the spill. For a slower leak through a 1-m hole, the time to burnout was 64 minutes. Other conclusions from the report are as follows:

- Modeling results showed the natural gas cloud dispersing to a distance of 3 to 6 km
- Exposure at 1,000 ft (300 m) from a pool fire would cause pain within 60 seconds
- As the gas warms, the cloud would become lighter than air and rise
- No direct environmental damage or cleanup from the primary spill would occur

Table 4-13. LNG Dispersion Modeling

Hole size	Wind Speed	Atmospheric Stability	Liquid Impoundment	Distance to LFL
5 meters	1.5 m/s	F	No	2.5 miles
5 meters	5 m/s	D	No	0.6 miles
1 meter	1.5 m/s	F	No	2.3 miles
1 meter	5 m/s	D	No	0.5 miles

Onboard release of LNG

The most-likely worst-case accident for the operation of the proposed Energy Bridge would be the onboard rupture of an LNG line running to one of the EPEBV vaporizers. With an LNG flow rate of

40 lbs/s, and an estimated 30 seconds for detection and an additional 30 seconds for shutdown, approximately 2,400 lbs of LNG could be released. Such a release would pool in the stainless steel sumps below the cryogenic LNG line running to the vaporizers. The sumps will be constructed of stainless steel to handle the cryogenic affects of LNG. The capacity of the containment sump area is approximately 1,800 gallons, over three times the projected release quantity. The LNG pooled in the sumps will almost immediately begin to vaporize and disperse.

LNG Vessels

In 1980, the USCG published *Liquefied Natural Gas and Liquefied Petroleum Gas - Views and Practices - Policy and Safety*, in which it determined that the level of risk associated with LNG maritime transportation is acceptable. LNG vessels are well constructed with spill and accident prevention measures incorporated into equipment design, operations, and safety training (FERC 2001). The transportation of LNG by ship has proven to be an extremely safe method of LNG transportation since the first LNG maritime shipment in 1959. Commercial maritime shipments of LNG began shortly thereafter in 1964. Since then, over 30,000 shiploads have traveled over 100 million kms while loaded, with no recorded fatalities to vessel crew or the general public and no recorded fires on deck or within cargo areas. Out of the greater than 30,000 shipments of LNG since 1964, only 30 incidents have been reported. Twelve of these incidents involved the LNG leakage. The most significant damage resulting from LNG leakage involved a deck or plating fracture from low temperature embrittlement (CH-IV International 2002). Eleven of the incidents involved a vessel collision, a vessel running aground, or vessel fracture due to high seas deflection stresses. None of these 11 incidents resulted in the spill of LNG (CH-IV International 2002).

As of 2000, 124 active LNG vessels with another 23 LNG vessels on order comprised the world's LNG fleet. LNG capacity of these ships range from 19,100 m^3 to 137,600 m^3. All of these LNG vessels operate (or intend to operate) under a foreign flag with foreign crews and must have a Letter of Compliance inspection from the USCG to verify compliance with international safety standards. These ships are required to have an operations plan written in English and at least one officer fluent in English that is knowledgeable of the cargo systems aboard at all times (ENSR 2002).

4.9.2 El Paso Energy Bridge Vessels

As discussed in Section 2.0, two ships are currently under construction in Korea to provide gas deliveries to the proposed Energy Bridge. According to the Applicant, all aspects of the EPEBVs have been designed to reduce the potential for accidental events during the transport of the LNG, regasification process, or any other maritime operation. The design for each EPEBV was subjected to the following:

- Lloyd's Register Safety Evaluation and a formal HAZOP assessment that showed no fatal flaws in design.
- BV design concept review.
- BV and Gas Transport and Technigaz approval of EPEBV membrane system for unrestricted liquid levels when offshore.

The LNG containment system in the EPEBV would be able to withstand any potential degree of “sloshing” during transportation and unloading as a result of partially loaded tanks. The tanks have been designed to withstand 100-year storms in the GOM and North Atlantic voyage “sloshing” conditions. The integrity of the reinforced insulation boxes, structural reinforcement of the cargo

inner hull, and strengthened cargo pump towers have been verified by laboratory testing, and they have been approved by BV and Gas Transport and Technigaz for unrestricted liquid levels when offshore. For maximum ship maneuvering capability, each EPEBV is equipped with two bow thrusters, at 1500 kilowatts (kW) each, and one 2000 kW stern thruster. In addition, each EPEBV is equipped with a maneuvering assistance and positioning system that provides automatic heading and direction of the thrusters and main propulsion; this system controls the EPEBV's position within 10 m (32.8 ft) during buoy retrieval operations.

The EPEBV cargo tanks are designed with "double containment" cryogenic liquid barriers, that include a complete inner tank within a complete outer tank designed to withstand the LNG temperatures. Their design adheres to standards established in the International Maritime Organization's (IMO's) International Code for Construction and Equipment of Ships Carrying Liquified Gasses in Bulk (IGC). The cargo containment system used on EPEBVs is the Gas Transport and Technigaz No. 96 system, which has been proven in LNG vessel operation for over thirty years. The inter-barrier space is continually purged with nitrogen and the outlet flow monitored by gas detectors. In the unlikely event of a primary containment system leak, the leak would be detected immediately and appropriate corrective measures would be initiated. Any pressure increases would be vented through one of the vent stacks on the upper trunk deck of the EPEBV. The secondary barrier of the double containment system would prevent any LNG leakage. Once the onloading operation is complete, nitrogen would be injected into the interior barrier space until it is purged of natural gas. The cargo tank would be purged with inert gas slowly warmed to ambient temperature. The inert gas then would be purged using fresh air, making it safe for entry by personnel who would address the correction of the leak.

In addition to the double containment cargo tanks, the ship would have two carbon steel inner and outer hulls. This design provides four liquid-tight barriers between the LNG and a failure scenarios involving mechanical penetration of the tank initiated externally. In such cases, all four barriers would have to be breeched before LNG could be released from the tank. If one were to assume a failure scenario initiated by a catastrophic failure of the inner barriers, this could allow LNG to come in contact with the hull material which is not designed for cryogenic temperatures and would be expected to fail. However, the most common failure scenario for the inner barriers tends to be the development of porosity or cracks which tends to cause a gradual increase over time in the amount of gas leaking into the space between the two inner barriers. This space is purged with inert gas and monitored for gas leakage.

During regasification, any leakage from pipelines on the trunk deck of the ship in the area of the regasification system and in the submerged turret compartment would be detected by gas detectors at various locations on the deck of the LNG carrier and in all spaces through which LNG or natural gas pipes pass.

4.9.3 Operations

In accordance with 33 CFR 150, the licensee of a deepwater port may not operate the port without an approved Operations Manual. This document would address the requirements of the Deepwater Port Act and provide detailed specifications and procedures for all aspects of port operations and infrastructure including navigation, vessel movement, materials handling, safety, and protection of the environment. The manual would encompass port requirements for calling vessels, approaches, Safety Zones, port infrastructure, and pipelines to existing receiving/distribution points.

If the proposed Project is approved and commences operations, USCG would conduct regular inspections of the port facility to ensure that the operations manual is being properly implemented. In addition, the USCG may review the operations manual at anytime and propose or require amendments as necessary to meet the intentions of the appropriate regulations.

4.9.4 Marine Safety

This section addresses marine safety for the proposed EPEBVs between the charted shipping lanes and the Terminal only. While in the shipping channels and on the open sea, the EPEBVs are subject to all domestic and international maritime laws, standards, and regulations. The proposed support vessel traffic would be required to operate at all times under USCG rules and regulations, including any special operating regulations established for the Safety Zone (described later in this Section).

The STL buoy system proposed by the Applicant would allow only one vessel to be moored at a time. The Applicant indicates that under normal circumstances there would be no other EPEBV in the Port vicinity while the Port was in use, and no staging or anchoring of inbound vessels to the proposed Port would be necessary.

The Applicant estimates that under normal circumstances the EPEBVs would call at the proposed Port a total of 42 times per year. The vessels would be at the Port for approximately 8 days per trip (1 day to moor the ship, 6 days to deliver the natural gas, and 1 day to disengage from the port).

Recommended Route

As shown on Figure 4-1, the Applicant proposes a route for the EPEBVs to approach the STL buoy from the Sabine Pass Fairway. A full assessment of any Recommended Route would be conducted by the USCG prior to approval. If approved the USCG would submit the Recommended Route to the IMO for consideration as a Recommended Route. A Recommended Route is defined by the IMO as "a route of undefined width, for the convenience of ships in transit…" If accepted by the IMO, the route would appear on nautical charts as parallel inbounds and outbound arrows. There would be no additional regulatory control of this area. This would be an advisory note only for EPEBVs calling at the port and other vessels operating in the area.

Safety fairways, traffic separation schemes, and anchorages are the most effective means of preventing vessel collisions with OCS structures. USCG requirements for indicating the location of fixed structures on nautical charts and for lights, sound-producing devices, and radar reflectors to mark fixed structures and moored objects also help minimize the risk of collisions. In addition, the USCG 8th District's Local Notice to Mariners (monthly editions and weekly supplements) informs GOM users about the addition or removal of drilling rigs and platforms, locations of aids to navigation, and defense operations involving temporary moorings.

MMS maintains a site on its web page – Offshore Minerals Management, OCS-Related Incidents, Collisions – that provide information on collisions that occur between vessels and OCS structures *(http://www.mms.gov/incidents/collisions.htm)*. Reports are included on most events that describe the circumstances surrounding the incidents (reports are not included if the incident is still under investigation). The MMS data show that from 1995 to 2001 there were 56 OCS-related collisions. Most collision mishaps are the result of service vessels colliding with platforms or vessel collisions with pipeline risers. Approximately 10 percent of vessel collisions with platforms in the OCS caused diesel spills.

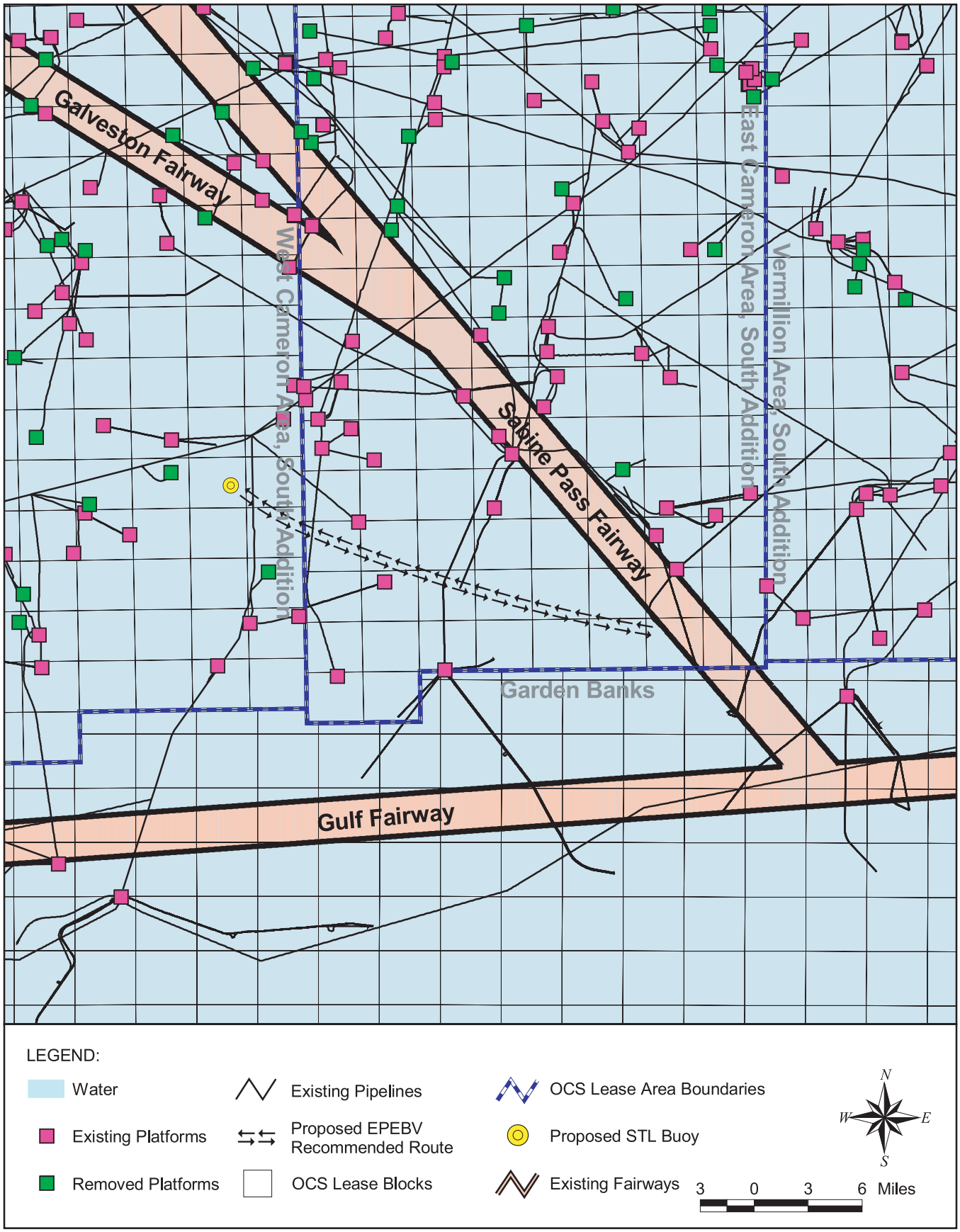

Figure 4-1. Applicant Recommended EPEBV Access Route

MMS also prepared a report on incidents that occurred on the OCS during the year 2000 *(http://www.mms.gov/incidents/PDFs/AccidentReport2000_March25.pdf)*. This report provides a brief description and explanation of each vessel/structure collision that occurred during the year 2000.

The National Offshore Safety Advisory Committee (NOSAC 1999) subcommittee on collision avoidance prepared a report that examined collision avoidance measures between a generic deepwater structure and marine vessels in the GOM. Though the focus of this document was toward deepwater structures and drilling rigs, information within the report provides insight into enhancing collision avoidance with structures. The NOSAC report offered three sets of recommendations: (1) voluntary initiatives for offshore operators; (2) joint government/industry cooperation or study; and (3) new or continued USCG action.

Prohibited Areas

There are a number of prohibited areas designated in the GOM. The regulations governing these areas allow vessels to transit, but under no circumstance may a vessel anchor, drill for oil, or lay a pipeline in these areas. These areas are clearly marked on the navigation charts and are not in the vicinity of the Applicant's proposed infrastructure or operational area.

Mooring and Berthing

The STL buoy would be designed to act as the mooring mechanism for the EPEBVs. As shown in Figure 2-3, eight anchor lines would radiate out from the buoy to fixed moorings on the seafloor at a distance of approximately 3000 ft (914.4 m) from the buoy. The proposed design includes floats attached to the mooring cables to reduce the strain on the STL buoy when not in use.

Transponders on the STL buoy would be activated by an approaching EPEBV and used to guide the ship into place for retrieval of and connection to the buoy. The EPEBVs currently under construction have been specially designed for operation at the proposed STL buoy.

LNGC Support

The Applicant indicates that the EPEBVs would not refuel or take on any supplies while moored on the STL buoy.

If the license is approved, the USCG would review and approve all design, engineering, and operations specifications associated with marine safety at the facility.

Safety Zone and Precautionary Area

Safety Zone. Pursuant to the regulations of Deepwater Port Act, USCG is authorized to establish a Safety Zone around deepwater ports. The proposed Safety Zone would have a radius of 500 m from the center of the proposed STL buoy. The entire Safety Zone would encompass an area of approximately 194.1 acres.

All unauthorized vessels would be prohibited from anchoring or transiting the Safety Zone at any time. USCG would have the primary responsibility for monitoring, patrolling, and enforcing the law within a Safety Zone.

Precautionary Area. If the license is approved, the Applicant would propose establishing a Precautionary Area with a radius of 3,281 ft (1 km) from the center of the proposed STL buoy. This demarcation would alert prudent vessel operators to the presence of the underwater mooring cables and possible presence of maneuvering EPEBVs. The area would also provide a boundary for the EPEBVs and port operators to monitor vessel traffic.

This area would be approved and shown on nautical charts in accordance with IMO guidelines as applied by the USCG. IMO defines a Precautionary Area as "an area within a defined limits where ships must navigate with particular caution…" This area would not regulate vessel movement or activities in any way.

4.9.5 Proposed Pipelines and Metering Platform

El Paso Energy Bridge GOM proposes to design, construct, maintain, and operate three pipelines associated with the proposed deepwater Port. The pipeline from the STL buoy would be 20-inches in diameter and extend approximately 10,189 ft (1.93 mi) to the metering platform. Two 20-inch diameter pipelines would direct natural gas from the metering platform to two separate pipeline systems. One of these downstream pipelines would extend approximately 7256 ft (1.38 mi) and connect through an existing subsea valve assembly to the existing 30-inch Bluewater pipeline in Block WC 601. The other pipeline would extend approximately 20,912 ft (3.96 mi) from the metering platform and connect via hot tap into the existing Sea Robin 20-inch pipeline in Block EC 335. For the purposes of this assessment the metering platform was evaluated as an integrated component of the pipeline system.

Pipeline Route and Installation

The pipeline route was selected during preliminary engineering following a preliminary route survey that included survey and analysis of subsea hazards, existing pipeline and cable crossings, and other obstructions. All identified hazards would be avoided.

During installation operations, emergency procedures would be developed to protect construction crews and the pipeline during adverse weather conditions.

Pipeline Safety and Incident Data

The pipeline would be designed, constructed, and operated to meet or exceed the conditions of all applicable and appropriate regulations and guidelines. Pipe wall thickness, shutoff valve spacing, and depth of cover would comply with the applicable requirements for the particular Class Location along the pipeline. The pipeline would be installed directly onto the seabed as allowed in depths greater than 200 ft.

Hydrostatic testing of the pipelines and pipeline risers would be performed in accordance with all applicable and appropriate regulations and guidelines. A cathodic protection system using sacrificial anodes would be installed to protect the pipeline from external corrosion. Due to the low liquids content of natural gas regasified from LNG, the rate of corrosion for proposed Energy Bridge components should be lower than many other pipelines in the GOM.

The pipeline proposed by the Applicant would be designed to accept pipeline pigs, allowing the future use of "smart pigs" for integrity inspections. The frequency of pipeline inspection by pigging

and other surveillance measures to confirm integrity would meet or exceed the conditions of all applicable and appropriate regulations and guidelines.

The proposed Project would comply with all applicable regulations regarding operating and maintaining pipeline facilities. Applicable regulations may require an approved operation and maintenance plan that includes the following provisions:

- Employees would be trained/qualified to operate and maintain the pipeline system in accordance with all applicable and appropriate regulations and guidance. Operating procedures would address routine and emergency tasks.
- Periodic in-house refresher training classes would be required for operation and maintenance personnel to maintain skill levels and review safety and emergency procedures.
- Annual testing and inspection of pressure-limiting devices and emergency shutdown systems would be performed.

Inspection and flyovers of pipeline routes would be conducted at specified time intervals in accordance with the applicable and appropriate regulations and guidance.

Tables 4-14 and 4-15 provide information on gas transmission pipeline incidents as reported by OPS and MMS. The data presented in Table 4-14 is specific to the GOM.

Table 4-14. Transmission Pipeline Incident Summary by Cause[1]

Cause	1997	1998	1999	2000	2001
Construction/Material Defect	12	19	8	7	12
Corrosion, External	5	8	3	14	7
Corrosion, Internal	16	14	10	16	9
Corrosion, Not Specified			1	1	
Damage by Outside Force	28	37	18	20	36
Other	12	21	14	22	22
Total	**73**	**99**	**54**	**80**	**86**

Source: OPS 2003

Note: [1] Historic totals may change as OPS receives supplemental information on incidents

It should be noted that external corrosion is generally not considered to be a problem for pipelines in the GOM. The sacrificial anode system has been shown to provide successful lifetime protection against external corrosion (MMS 2000b).

Damage from outside forces clearly poses the largest threat to pipeline safety. However, the proposed pipeline would be in a region of the GOM designated for managing fossil fuels. There is no reason to anticipate that these pipelines would pose a significant hazard to public safety or natural gas supply reliability. The Applicant proposes no extraordinary measures beyond regular inspections and maintenance of the pipeline.

Table 4-15. Gas Pipeline Incident Summary by Cause

Cause	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003[1]
Construction/Material Defect	2	1	2	4	4	2	2	0	3	1	0
Corrosion, External	4	12	15	15	10	8	16	17	13	8	0
Corrosion, Internal	4	19	5	4	11	6	4	8	3	7	4
Corrosion, Other	0	0	0	0	0	0	1	0	0	1	0
Third Party Damage	5	6	6	3	6	2	3	5	4	1	0
Other	13	7	16	15	6	19	11	13	13	34	5
Total	**28**	**45**	**44**	**41**	**37**	**37**	**37**	**43**	**36**	**52**	**9**

Source: MMS GOM database
Note: [1]Data through 5/14/03

Regarding public safety, except for the moored EPEBVs and the metering platform, there are no habitable structures within 1,000 ft of the proposed pipelines. Potential public risks associated with the construction and operation of the proposed pipelines would be minimized by use of safe work practices and the applicable requirements of the Operations Manual. It is anticipated that the pipeline would pose a *de minimis* risk to public safety.

Third Party Hazards

During offshore operations, there is a remote possibility that a passing ship could collide with the platform. The worst-case scenario for a platform collision would be the loss of natural gas in the three pipelines that connect at the proposed Energy Bridge location. The proposed Energy Bridge connection is designed with check valves at the interconnects and would shut down in the event of an emergency. Approximately 4,823,000 standard cubic feet of gas could be released if a collision occurred and all three pipelines (approximately 10 mi) were breached. It is unlikely that a resultant fire would occur or cause significant damage, due to the need for an ignition source and because of the limited amount of fuel available to feed the fire. In the event of a collision and fire at the platform, the EPEBV would commence emergency shutdown and evacuation procedures. Any fire that did occur would be confined to the general vicinity of the release (the platform) and would be of limited duration (i.e., self-limited). The fire would have limited impact on the environment and, due to the lack of surrounding man-made features, would have a minimal impact on other facilities.

Anchor hooking of a pipeline could possibly puncture the pipeline, leading to a natural gas leak. The worst-case scenario for a pipeline rupture would be along the 6.4-km (3.45 NM) long, 20-inch diameter line from the proposed platform to the Sea Robin system. A rupture near the interconnect would result in a loss of approximately 2,606,000 standard cubic feet of natural gas from the pipeline section. However, any significant damage would be unlikely from this type of event, because natural gas would bubble to the surface and dissipate. A fire could develop in the unlikely event that a ship located in the area provides an ignition source. As in the case of the scenario described in the platform collision, the resultant fire would be of short duration and have limited impact on the environment.

4.9.6 Overall Project Impacts on Public Safety

Risk management concerns associated with the proposed Energy Bridge would be confined to authorized personnel employed to manage, operate, or support the Terminal and pipeline. While the September 11 attacks have fueled concerns about the handling and storage of LNG and other hazardous substances, the proposed Port would be sufficiently far from centers of population that a terrorist act would not likely affect the public.

No hazards to the general public, non-Project structures, or vessels are anticipated with the proposed Project that could not be mitigated. Conditions that contribute to minimizing potential risks include

- Port components would be fabricated within an existing facility closed to the public.
- The proposed Port would be located approximately 116 mi offshore.
- The proposed Safety Zone would preclude any unauthorized transit or activities within 500 m of the STL buoy project anchorage. The proposed Precautionary Area would encompass an area within 1.2 NM of the proposed Terminal. If adopted, this area would be shown on nautical charts with an associated caution note.
- The nearest existing structure to the Terminal is more than 3 mi away.
- As discussed in Section 4.7 the OCS lease blocks surounding the proposed Port have a low potential for future exploration.
- Pipeline construction would be conducted with strict adherence to potential license conditions, as well as all applicable construction and maritime safety regulations and guidelines.
- Installation, materials, and testing of the proposed Project infrastructure would meet or exceed the applicable engineering and regulatory standards and potential license conditions.
- Detailed security measures would be developed and implemented as an integral part of the Energy Bridge Deepwater Facility Operations Manual. USCG would be responsible for patrol and enforcement within the Safety Zone as described in Section 4.9.3.

4.9.7 No Action Alternative

Under this alternative, the license application would not be approved and El Paso Energy Bridge would not proceed with construction and operation of a deepwater port. If the Maritime Administrator denies the license application, the short- ad long-term environmental impacts on safety identified in Section 4.9.2 would not occur. Existing conditions would prevail. Means to satisfy the Nation's energy demands might result in increased use of existing land-based LNG receiving terminals, greater reliance on domestic and foreign oil and gas resources, development of other sources of energy, including energy conservation. The Secretary's purpose and need would continue as a mechanism for the review of deepwater ports applications and implementation of the appropriate alternative, approval, conditional approval or denial. It is reasonable to assume that a decision on the Port Pelican application would be made independent of the decision reached on this application

If approved, Port Pelican would have no effects in connection with reliability and safety issues having potential to affect Project personnel, the public, or the environment.

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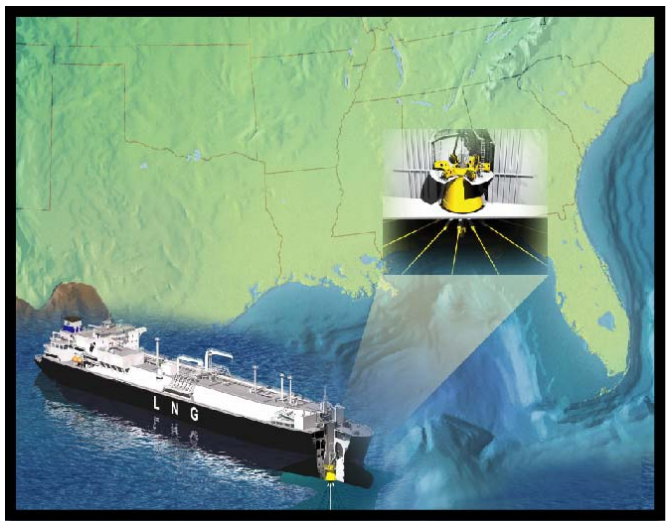
Section 5
Cumulative and Other Impacts



5. Cumulative and Other Impacts

5.1 Cumulative Impacts

CEQ defines cumulative impacts as the "impacts on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 CFR 1508.7). Although individual impacts of various actions may be minor, taken together their effects could be significant.

Impacts subject to cumulative impacts analysis are identified by reference to the temporal span and spatial area in which the Proposed Action would cause impacts. For the purposes of this analysis, the expected service life of the proposed Port is 20 years, the design life of the equipment that would comprise the proposed Port. The purpose of the Proposed Action is to help satisfy the Nation's energy's needs. In that regard, it is similar in function and range of activities generally associated with OCS leasing and energy production programs. Accordingly, this EA considers the OCS and directly affected shore areas to be the region in which cumulative effects could occur.

In November 2002, the MMS prepared an EIS entitled *Gulf of Mexico OCS Oil and Gas Lease Sales: 2003 – 2007*.[11] The EIS evaluates five lease sales in the Central Planning Area and four lease sales in the Western Planning Area that are planned to occur through 2007. Its discussions take into account a wide variety of activities that flow from OCS leases: exploration; pipeline and platform construction, emplacement, and removal; oil and gas production operations, to include use of support vessels and helicopters; and ship transit and anchoring. The multiple action EIS also considers the relationships of these actions on other activities not driven by the OCS Program that occur on the OCS and nearby shores, such as recreational pursuits and commercial fishing. In light of the similarity between the Proposed Action evaluated in this EA and the MMS's OCS Proposed Action, the Secretary has adopted the MMS's summaries and conclusions concerning cumulative impacts of its OCS Program.

The MMS EIS for oil and gas lease sales includes offshore scenario information related to OCS Program activities in the Gulf of Mexico for the years 2003 to 2042. Estimations for those future activities pertain to various water depths. Table 5-1, extracted from information in the MMS EIS, shows selected estimates for activities occurring in water less than 60 m deep (the area most like the Proposed Action). It also provides estimates for activities Gulf-wide at all water depths.

The MMS estimates there are presently 4,000 offshore structures. Over the next 40 years, an estimated 2,987 to 3,999 production structures will be installed and an estimated 6,303 to 7,296 production structures, mostly in water depths up to 60 m, might be removed. The net result of these actions would be a substantial decrease in the number of structures in the Gulf. The MMS made its estimates, however, before Congress amended the law to allow the construction and operation of deepwater ports for natural gas. To date, the USCG and MARAD have received 2 formal Deepwater Port License applications including the El Paso Energy Bridge GOM discussed in this EA and the ChevronTexaco Port Pelican proposal. The USCG & MARAD have also received several informal

[11] The EIS may be accessed at *<http://www.gomr.mms.gov/homepg/regulate/environ/nepa/CW2003-2007.html>*.

inquiries concerning application procedures for other deepwater ports for natural gas.[12] While deepwater ports pose potential to increase the number of structures and pipelines Gulf-wide, it is unlikely that their inclusion would significantly affect the MMS estimates shown in Table 5-1.

Table 5-1. Estimated OCS Activity Levels, 2003–2042

Activity	Water Depth 0–60 Meters	Water Depth 60–200 Meters	Water Depth All Depths
Exploration/delineation wells drilled	3,409–3,977	1,217–1,420	8,996–11,333
Development wells (oil and gas)	7,390–8,181	3,599–3,990	17,148–21,079
Production structures installed	2,239–2,969	426–566	2,897–3,999
Production structures removed	5,2866,069	827–988	6,303–7,296
Length of installed pipelines (km)[1]	9,800–24,374	NA	27,590–52,364
Service vessel trips (1,000 trips)	9,689–9,835	1,433–1,531	11,889–12,479
Helicopter trips (1,000 trips)	11,374–18,920	4,792–8,360	27,997–50,692

Source: MMS 2002a
Note: [1] Excludes pipelines in state waters.

The USCG and MARAD would not expect the construction and operation of the proposed Port to result in cumulative impacts on near shore coastal or onshore resources.

The No Action Alternative is represented by denial of the license sought by El Paso Energy Bridge LLC.. In such case, the Proposed Action would not proceed and the circumstances characterizing the baseline environment would not be affected by potential impacts associated with the Proposed Action (grant of the license). Accordingly, the subsequent subsections address potential cumulative effects only in the context of implementation of the Proposed Action.

5.1.1 Water Quality

Activities that can impact water quality include installation/removal of platforms, laying pipelines, service vessel operations, supporting infrastructure discharges, and oil spills. Non-OCS sources include industrial, recreational, agricultural, and natural activities as well as oil and gas activities in state waters. Coastal water quality would be impacted by service vessels. In light of the substantial number of tug and supply vessel trips serving the OCS and the small number of service vessel trips associated with the proposed Project, cumulative effects to coastal waters would be negligible. Cumulative impacts on the water quality of the marine environment result from the addition of discharges from exploratory and production activities to a relatively pristine environment. As long as discharge criteria are met, impacts on the marine environment are not expected to be adversely significant.

If approved Port Pelican would also contribute to the cumulative water quality impacts within the OCS. The distance between the proposed El Paso Port and the proposed Port Pelican terminal

[12] The USCG declines to speculate on where additional deepwater ports for natural gas might be located, what technologies they might employ, or whether the inquiries that have been made to date will, in fact, result in license applications.

combined with the aerial extent of the GOM OCS would minimize the cumulative effects to GOM water quality resulting form operation of these two ports. . Details of the potential environmental impacts that would be associated with the proposed Port Pelican terminal are presented in the *Final EIS for the Port Pelican LLC Deepwater Port License Application* (USCG August 2003).

5.1.2 Biological Resources

Marine Mammals. Effluents produced by general OCS activities and routinely discharged into offshore waters are regulated by NPDES permits. Cetaceans may periodically be exposed to these discharges; direct effects to cetaceans would not be expected to be lethal. Indirect effects via food sources would not be expected due to dilution and dispersion of offshore operational discharges. However, any pollution in effluent could potentially poison, kill, debilitate, or stress marine mammals, and adversely affect prey species and other key elements of the GOM ecosystem, and operational discharges could periodically contact or affect marine mammals. The Proposed Action's contribution to these scenarios would be negligible.

The FAA's Advisory Circular 91-36C requires helicopters to maintain a minimum altitude of 700 ft while in transit offshore and 500 ft while working between offshore structures. It is unlikely that cetaceans would be affected by routine OCS helicopter traffic at these altitudes, provided pilots do not alter their flight patterns to more closely observe or photograph marine mammals that they encounter. It is also expected that, due to inclement weather, 10 percent of helicopter trips would occur at altitudes below the specified minimums. Occasional overflights probably have no long-term consequences on cetaceans; however, frequent overflights could have long-term consequences if they occur repeatedly and disrupt vital activities such as feeding and breeding. The OCS-related helicopters are not the only aircraft that fly over the coastal and offshore areas. Military, private, and commercial aircraft also traverse these areas and might affect marine mammals. Relative to the large number of helicopter flights forecast by the MMS, the Proposed Action's contribution to potential effects on marine mammals would be negligible.

Numerous service vessel trips occur annually in support of general OCS activities. Noise from service vessel traffic may elicit a startle or avoidance reaction by cetaceans and mask their sound reception. Service vessel traffic could affect cetaceans either by active avoidance or displacement of individuals or groups to less suitable habitat areas. In addition to OCS-related vessel trips, there are other vessels traversing coastal and offshore waters that could affect marine mammals, including numerous commercial and recreational fishing vessels. Contributions by the Proposed Action to this type of impact would be negligible.

General OCS activities could affect protected cetaceans and sirenians by the degradation of water quality resulting from operational discharges, vessel traffic, noise generated by platforms, drill ships, helicopters and vessels, seismic surveys, explosive structure removals, oil spills, oil-spill response activities, loss of debris from service vessels and OCS structures, commercial fishing, capture and removal, and pathogens. The cumulative effect on marine mammals caused by general OCS-related activities would be expected to result in a number of chronic and sporadic sublethal effects (behavioral effects and nonfatal exposure to or intake of OCS-related contaminants or discarded debris) that may stress or weaken individuals of a local group or population and predispose them to infection from natural or anthropogenic sources. Few deaths are expected from oil spills, chance collisions with OCS service vessels, ingestion of plastic material, commercial fishing, and pathogens. Collisions between cetaceans and ships, although expected to be rare, could cause serious injury or mortality. Effects of the incremental contribution of the Proposed Action combined with non-OCS activities might be deleterious to cetaceans occurring in the GOM. Biological significance of any

mortality would depend, in part, on the size and reproductive rates of the affected stocks, as well as the number, age, and size of animals affected.

Sea Turtles. OCS activities may harm sea turtles and their habitats. These activities include structure installation, dredging, water quality and habitat degradation, OCS-related trash and flotsam, vessel traffic, seismic surveys, explosive structure removals, oil spills, oil-spill response activities, natural catastrophes, pollution, dredge operations, vessel collisions, commercial and recreational fishing, human consumption, beach lighting, and power plant entrainment. Sea turtles could be killed or injured by chance collision with service vessels or by eating marine debris, particularly plastic items lost from OCS structures and service vessels. It is expected that deaths due to structure removals would rarely occur due to mitigation measures (e.g., NOAA Fisheries Observer Program). The presence of, and noise produced by, service vessels and the construction, operation, and removal of drill rigs may cause physiological stress and make animals more susceptible to disease or predation, as well as disrupt normal activities. Contaminants in waste discharges and drilling muds might indirectly affect sea turtles through food-chain biomagnification; the possible effect is uncertain. Oil spills and oil-spill response activities are potential threats that may cause turtle deaths. Contact with, and consumption of, oil and oil-contaminated prey may seriously affect turtles. Sea turtles have been seriously harmed by oil spills in the past. The majority of OCS activities are estimated to be sublethal (behavioral effects and nonfatal exposure to intake of OCS-related contaminants or debris). Chronic sublethal effects (e.g., stress) resulting in persistent physiological or behavioral changes and/or avoidance of impacted areas could cause declines in survival or productivity, resulting in either acute or gradual reduction in population. The incremental contribution of the Proposed Action to cumulative impacts on sea turtles, as one of several thousand energy-related activities occurring in the GOM, is slight.

Coastal and Marine Birds. OCS activities would detrimentally affect coastal and marine birds. It is expected that the majority of effects from the major impact-producing factors on coastal and marine birds would be sublethal (behavioral effects and nonfatal exposure to or intake of contaminants related to OCS activities or discarded debris) and would usually cause temporary disturbances and displacement of localized groups inshore. The net effect of habitat loss from oil spills, new construction, and maintenance and use of pipeline corridors and navigation waterways would alter species composition and reduce the overall carrying capacity of disturbed area(s) in general. The cumulative effect on coastal and marine birds would be expected to result in a discernible decline in the numbers of birds that form localized groups or populations, with associated change in species composition and distribution. Some of these changes would be expected to be permanent (as exemplified in historic census data) and to stem from a net decrease in preferred or critical habitat. Because proposed activities at the Port would create noise and activity similar to or less than existing or foreseeable OCS platforms and activities the incremental contribution of the Proposed Action would be negligible.

Fish Resources and EFH. Human activities have the potential to cause detrimental effects on fish resources and EFH in the northern GOM include, but are not limited to, the degradation of water quality resulting from effluent discharges, vessel traffic, machinery-generated noise, explosive structure removals, oil spills, loss of debris from service vessels and OCS structures, and fishing. Natural gas deepwater ports would represent a new source of human activity in the GOM.

To date, USCG and MARAD have received two applications for natural gas deepwater ports in the GOM, the Proposed Action and the Proposed Port Pelican Terminal. Although the regasification technologies are different, both of the proposed ports would utilize seawater to warm LNG as part of the regasification process. In addition, USCG and MARAD estimate that a total of five natural gas

deepwater ports may be built in the GOM over the next ten years. At the current time, it is impossible to estimate the impact of any additional natural gas deepwater ports in the GOM. The impact of individual natural gas deepwater ports depends on the site of the deepwater port, the technology utilized for regasification, the technology utilized to construct the deepwater port, among other factors.

The effects of most anthropogenic impacts, with the exception of fishing, would not be easily distinguished from effects due to natural mortality. Predation is likely to be major cause of natural mortality of fish eggs and larvae; starvation is an additional source for larval natural mortality (Bailey and Houde 1989).

If approved Port Pelican would also contribute to the cumulative fisheries and EFH impacts within the OCS. The distance between the proposed El Paso Port and the proposed Port Pelican terminal combined with the aerial extent of the GOM OCS would minimize the cumulative effects to GOM to these resources resulting form operation of these two ports. It is anticipated that the potential cumulative impacts associated with the two ports would be indistinguishable from most other anthropogenic impacts to fisheries resources and EFH and would be inconsequential compared to natural mortality. Details of the potential environmental impacts that would be associated with the proposed Port Pelican terminal are presented in USCG August 2003.

5.1.3 Cultural Resources

Several impact-producing factors might threaten historic and prehistoric archaeological resources of the GOM. An impact could result from contact between an OCS activity (pipeline and platform installations, drilling rig emplacement and operation, dredging, and anchoring activities) and a historic shipwreck and/or a prehistoric archaeological site on the continental shelf. The archaeological surveys and resulting archaeological analysis and clearance that are required before an operator begins oil and gas activities are expected to be highly effective at identifying possible historic and prehistoric resources. The OCS development prior to requiring archaeological surveys has possibly affected wrecks and other sites containing significant or unique historic and prehistoric information.

The loss or discard of ferromagnetic debris associated with oil and gas exploration and development and trawling activities could result in the masking of historic shipwrecks or other sites. Loss of significant or unique archaeological information from commercial fisheries (trawling) is not expected. It is expected that dredging, sport diving, commercial treasure hunting, and tropical storms have impacted and would continue to impact archaeological resources. In the case of factors related to OCS Program activities, it is reasonable to assume that most impacts would have occurred before 1973, the date of initial archaeological survey and clearance requirements.

The incremental contribution of the Proposed Action is expected to be very small due to the relatively small project footprint (approximately 1.88 acres), non-intrusive pipeline construction, distance offshore (approximately 116 mi), efficacy of the required remote-sensing survey and concomitant archaeological report and clearance. However, an interaction between bottom-disturbing activity (rig emplacement, pipeline trenching, and anchoring) and a historic or prehistoric cultural resource is possible.

If approved the proposed Port Pelican project would contribute no measurable impacts to the cultural resources within the GOM (USCG August 2003).

5.1.4 Geological Resources

General OCS activities that can affect geological resources principally include installation/removal of the mooring anchors, PLEM, metering platform, and seafloor pipelines. The Proposed Action would disturb surficial sediments in the immediate vicinity of the proposed Port; however, maximum seafloor impact is estimated to be less than 2 acres. The proposed pipeline segments would be laid on the seafloor and not buried, thereby minimizing impacts to surficial sediments. Cumulative effects to sediments would be expected to be minor.

If approved Port Pelican would also contribute to the cumulative seafloor impacts. The distance between the proposed El Paso Port and the proposed Port Pelican terminal combined with the aerial extent of the GOM OCS would minimize the cumulative effects to GOM to these resources resulting form construction and operation of these two ports. It is anticipated that the potential cumulative impacts associated with the two ports would be indistinguishable from the impacts associated with the thousands of pipelines, platforms and other OCS structures existing and anticipated for the northern GOM. Details of the potential environmental impacts that would be associated with the proposed Port Pelican terminal are presented in USCG August 2003.

5.1.5 Socioeconomics

Economic Factors. Activities related to the OCS would produce only minor economic changes in the Texas, Mississippi, and Alabama coastal areas, typically generating an increase of less than 1 percent in employment in any of the coastal subareas in these states. There would be very little economic stimulus in Florida coastal subareas (assuming that the state of Florida remains opposed to mineral extraction anywhere along its coastline). Substantial impacts to Louisiana coastal subareas would be expected form activities associated with the OCS. According to MMS, OCS-related employment for Louisiana's western coastal parishes would be expected to peak as high as 6.3 percent during the period 2004 – 2012. The proposed Port would contribute to the expected economic increase during its operating life but would not be significant when measured against all OCS activities.

If approved it is anticipated that fabrication of the Port Pelican GBS could have a significant socioeconomic impact on the communities in the vicinity of the chosen fabrication yard. For a number of reason described in the Final EIS for the Port Pelican EIS these impacts will not be quantified until after a decision is made on the License Application. The onshore and offshore socioeconomic impacts associated with the El Paso Energy Bridge are anticipated to be minimal. As a result the cumulative effects to there resources associated with the current Deepwater Port proposals would be minimal.

5.1.6 Recreation

There would be no applicable cumulative effect to coastal recreational resources or activities (e.g., beaches, birdwatching) due to the proposed project. If approved the Port Pelican GBS fabrication could have potentially significant temporary impacts to onshore recreational activities in communities surrounding the selected fabrication facility. Any existing or new onshore OCS activities in the vicinity of the Port Pelican fabrication activities could have significant cumulative effects. For a number of reason described in the Final EIS for the Port Pelican EIS these impacts will not be quantified until after a decision is made on the License Application

5.1.7 Transportation

Activities that can affect transportation include operation of ocean-going ships and other vessels in the GOM. Implementation of the Project would not affect access to transportation routes or result in crowding of routes that might lead to substantially increased risks of collisions or other mishaps. However, the forecasts for increased demands for natural gas, coupled with the extension of the Deepwater Port Act to include natural gas activities, suggests that additional license applications would be forthcoming (to date, the USCG and MARAD have received two total such applications). To the extent that additional deepwater ports for natural gas might be licensed, there would be increased number of LNG carriers operating in the GOM and increased numbers of support vessels attending port operations. In light of the extensive domestic and foreign maritime industry that exists in the northern GOM, the incremental increase in use of major trade shipping routes that might be brought about by additional deepwater ports would be minor. Moreover, appropriate dispersion of the ports would avoid cumulative effects on transportation.

In December, 2002, the USCG and MARAD published a Notice of Application for licensing of a deepwater port submitted by ChevronTexaco for the Port Pelican. Port Pelican would be located in Vermilion Lease Block 140 on the Outer Continental Shelf in the Gulf of Mexico. The deepwater port would consist of a terminal for receipt, storage, and regasification of liquefied natural gas, a 37 nautical mile pipeline to carry natural gas from the terminal to existing Tiger Shoal "A" facilities, an associated anchorage area, and a recommended vessel route. Port Pelican would deliver natural gas to the U.S. Gulf Coast using existing gas supply and gathering systems in the Gulf of Mexico and southern Louisiana. The natural gas would then be delivered to shippers using the national pipeline grid through existing interconnections with major interstate and intrastate pipelines. When fully operational the Port Pelican facility would expect 244 LNG vessel calls per year. The combined EPEBVs and LNG carriers from Port Pelican would be a small fraction of the many cargo vessels transiting the GOM; for instance, in 2001, more than 6,600 ships called on the Port of Houston (Port 2001).

5.1.8 Air Quality

Emissions of pollutants into the atmosphere from OCS activities are generally not projected to have significant effects on onshore air quality because of prevailing atmospheric conditions, emission rates and heights, the resulting pollutant concentrations and advances in control technology. The incremental contributions of the Proposed Action to cumulative impacts are not significant and not expected to alter onshore air quality classifications. This conclusion only considers the impact on air quality from OCS sources. If onshore sources are considered, there might be considerable adverse effects on O_3 concentration and on visibility. The OCS contribution to the air quality problem in the coastal areas is small, but total impact from onshore and offshore emissions might be significant because of the O_3 nonattainment problem in southeast Texas, and Baton Rouge, Louisiana. As a result, implementation of the 8-hr O_3 standard would lead to more areas being classified as nonattainment areas. The incremental contributions of the Proposed Action to cumulative impacts are not significant and not expected to alter onshore air quality classifications located approximately 100 mi to the north of the proposed Port.

If approved Port Pelican would also contribute to the cumulative air quality impacts within the Northern GOM OCS region. The distance between the proposed El Paso Port and the proposed Port Pelican terminal combined with the aerial extent of the GOM OCS would minimize the cumulative effects to regional air quality resulting form construction and operation of these two ports. It is anticipated that the potential cumulative impacts associated with the two ports would be

indistinguishable from the impacts associated with the thousands of other OCS facilities an coastal industrial facilites existing and anticipated for the northern GOM region Details of the potential environmental impacts that would be associated with the proposed Port Pelican terminal are presented in USCG August 2003.

5.2 Unavoidable Impacts

Unavoidable adverse impacts are anticipated to be primarily short term, insignificant, and localized. All of the following identified impacts would be negligible to minor in magnitude.

Water Quality. Routine offshore operations would have unavoidable effects to varying degrees on the quality of the surrounding water if the Proposed Action were to be implemented. Installation of the STL's mooring anchors and pipe-laying activities would cause an increase in the turbidity of the affected waters for the duration of the activity periods. Vessel traffic could contribute to the degradation of Gulf waters through inputs of chronic oil leakage, treated sanitary and domestic waste, bilge water, and contaminants known to exist in ship paints. Colder than ambient seawater will be discharged from the shipboard regasification LNG regasification system.

Biological Resources. Unavoidable but insignificant impacts to endangered and threatened marine mammals, sea turtles, fish, and migratory birds would result from the installation and operation of the proposed deepwater Port, vessel and helicopter traffic, as well as trash and debris. Marine birds would be affected by noise and disturbances associated with the offshore activities. Localized populations of fish species would be expected to experience sublethal effects, resulting in a temporary decrease in a local population. Other unavoidable adverse effects include loss of fishing space caused by the installation of the STL buoy, mooring system and the metering platform.\

Cultural Resources. Installation of the proposed Port could result in the loss of unique or significant archaeological information. Required archaeological surveys significantly lower the potential for this loss by identifying potential archaeological sites prior to an impact, thereby making avoidance or mitigation of impacts possible. In areas of high sedimentation rates, however, survey techniques may not be effective in identifying a potential resource.

Geological Resources. Unavoidable disturbance of surficial sediment would occur during installation of the proposed deepwater Port mooring anchors and laying of pipeline segments, and during decommission (removal) of the facilities.

Socioeconomics. It is considered unlikely that the proposed project would have a measurable effect on local or regional socioeconomic conditions. The applicant proposes to refurbish a dry-docked platform for use as the metering platform at an existing fabrication yard with existing capabilities to implement the project. The STL buoy is being constructed at an existing facility dedicated to construction of this buoy type. No new onshore employees are anticipated. When compared to the entire OCS based economy the proposed port is not significant.

Recreation. Creation of a Safety Zone in the vicinity of the project would result in limited displacement of commercial and recreational fishing during the period the deepwater Port would be licensed for operations. The impacts on fishing would be unavoidable because of the need to ensure the safety of the facilities.

Air Quality. Mitigation of long-term effects would be accomplished through existing regulations and ongoing development of new emission control technology. Short-term effects from nonroutine catastrophic events (accidents) are uncontrollable.

5.3 Coastal Zone Management Act Consistency

Congress enacted the Coastal Zone Management Act (CZMA) in 1972 to encourage states to preserve, protect, develop, and, where possible, restore or enhance valuable natural coastal resources such as wetlands, floodplains, estuaries, beaches, dunes, barrier islands, and coral reefs, as well as the fish and wildlife using those habitats.

The license sought by Energy Bridge GOM to own and operate a deepwater port requires concurrence in a consistency certification (15 CFR 930.57) by the state of Louisiana. The request for the state's concurrence must be accompanied by all necessary data and information (15 CFR 930.58). El Paso Energy Bridge GOM has informed USCG and MARAD that it has initiated consultation with the state of Louisiana. El Paso Energy Bridge GOM will submit appropriate documentation to the Louisiana Department of Natural Resources Coastal Zone management authority to establish compliance with CZMA requirements. Copies of that documentation, when available, will be included in the EA.

5.4 Irreversible and Irretrievable Commitment of Resources

An irreversible or irretrievable commitment of resources refers to impacts on or losses to resources that cannot be reversed or recovered. Examples are when a species becomes extinct or when wetlands are permanently converted to open water. In either case, the loss is permanent.

Chronic low-level pollution can injure and kill organisms at virtually all trophic levels. Mortality of individual organisms can be expected to occur, and possibly a reduction or even elimination of a few small or isolated populations.

Structure removal by explosives, such as would occur for removal of the metering platform during decommissioning, would cause mortality to fish resources, including commercial and recreational species. Small numbers of fish kills, including such valuable species as red snapper, are known to occur when explosives are used to remove structures in the GOM. Structure removal by explosives adversely impacts the commercial fishing industry close to the removal site.

Although the impact to archaeological resources as a result of implementing the Proposed Action would be expected to be low, any interaction between an impact-producing factor (e.g., emplacement of the mooring anchors and laying of the pipeline segments) and a significant historic shipwreck or prehistoric site could destroy information contained in site components and their spatial distribution. This could cause a permanent loss of potentially unique archaeological data.

The OCS oil and gas exploration, development, production, and transportation are carried out under comprehensive, state-of-the-art, enforced regulatory procedures designed to ensure public safety and environmental protection. Nonetheless, some loss of human and animal life is inevitable from unpredictable and unexpected acts of man and nature (accidents, human error and noncompliance, and adverse weather conditions). Some normal and required operations, such as structure removal, can result in the destruction of viable marine life. Although the possibility exists that individual

marine mammals, marine turtles, birds, and fish can be injured or killed, there is unlikely to be a lasting effect on baseline populations.

5.5 Relationship between Short-Term Uses and Long-Term Productivity

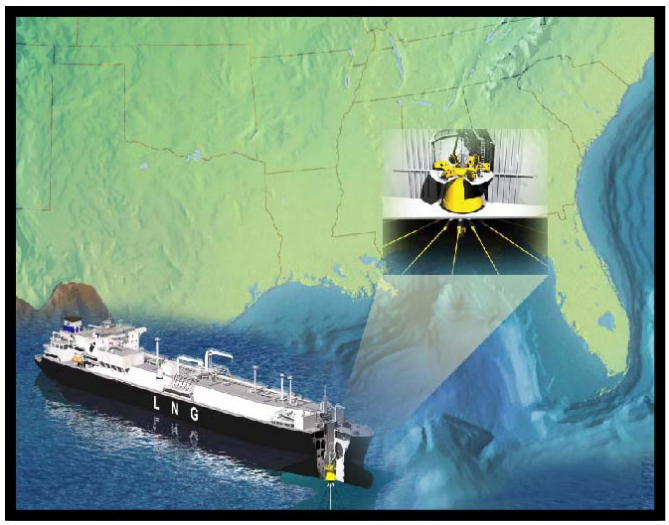
Effects on resources are often characterized with respect to their being of short-term or long-term duration. This section, highlighting some of the broader relationships between short-term and long-term effects, is not intended to repeat analyses already provided. Rather, this section presents some of the tradeoffs in the relationship between short-term uses of humankind's environment and the maintenance and enhancement of long-term productivity of resources. That is, an important consideration when analyzing the effects of a proposed project is whether it will result in short-term environmental effects (adverse or beneficial) to the detriment of achieving long-term or maximizing productivity of these resources. In this discussion, short-term refers to the duration of installation and operation of the El Paso Energy Bridge GOM Project, and long-term refers to an indefinite period following decommissioning of the deepwater Port.

The principal short-term use of the OCS is generally to acquire energy resources for the Nation. In this instance, however, the OCS is the location for facilitating importation of LNG to help satisfy the Nation's energy demand. Short-term El Paso Energy Bridge GOM operational activities might result in chronic impacts for the duration of the project period. Mooring anchor, metering platform, and pipeline segment emplacement would cause minor, localized effects in the short term. The effects of site clearance might be longer lasting because of minor elements that would be left in place. The short-term use may have long-term impacts on biologically sensitive offshore areas or archaeological resources. Important to long-term productivity, however, is the very low potential for consumption of resources during operation of the Proposed Action. As a result, upon completion of licensed activities, the marine environment would generally be expected to remain at or return to its normal long-term productivity levels.

The OCS development off Louisiana and Texas has enhanced recreational and commercial fishing activities, which in turn have stimulated the manufacture and sale of larger private fishing vessels and special fish recreational equipment. Commercial enterprises such as charter boats have become heavily dependent on offshore structures for satisfying recreational customers. The Proposed Action could increase these incidental benefits of offshore development to a limited extent. Offshore fishing and diving has gradually increased in the past 3 decades; platforms have been the focus of much of that activity. As mineral resources throughout the Gulf become depleted, platform removals would occur and may result in a decline in these activities. To maintain the long-term productivity of site-specific uses, artificial reefs attractive to fishermen and divers could eventually prove to be a beneficial replacement for removed platforms.

No long-term productivity or environmental gains are expected as a result of the Proposed Action. The benefits of the Proposed Actions are expected to be principally those associated with an increase in supplies of natural gas for domestic consumption. Implementing the Proposed Action would not be expected to achieve short-term goals at the expense of long-term environmental productivity or goal achievement. Nor would implementation narrow the range of beneficial uses of the environment or pose long-term risks.

Section 6
List of Preparers



6. List of Preparers

This EA has been prepared under the direction of HQ USCG and MARAD in cooperation with USEPA, MMS, USFWS, and FERC. The individuals who contributed to the preparation of this document are listed below.

Robert Corbin (HQ USCG)
Vessel and Facilities Operating Standards Division

Frank Esposito (HQ USCG)
Attorney, Office of Environmental Law

CDR Mark Prescott (HQ USCG)
Vessel and Facilities Operating Standards Division

David Reese (HQ USCG)
Environmental Protection Specialist

Daniel Yuska (MARAD)
Office of Ports and Domestic Shipping

Ken Mittelholtz (HQ USEPA)
Office of Federal Activities

Joe Montgomery (HQ USEPA)
Office of Federal Activities

Robert D. Lawrence (USEPA Region 6)
Chief, Office of Planning and Coordination

David Moore (HQ MMS)
Engineering and Operations Division

Alex Alvarado (MMS Gulf of Mexico Region)
Pipeline Section

Elizabeth Komiskey (MMS Gulf of Mexico Region)
Pipeline Section

David Frugé (USFWS)
Lafayette Field Office Supervisor

Brigette Firmin (USFWS)
Lafayette Field Office

Robert Arvedlund (FERC)
Chief, Environmental Gas Branch 1

Christopher Zerby (FERC)
Environmental Gas Branch 1

In addition to the agencies mentioned above, several other Federal agencies were included as part of an Interagency Working Group that was formed to assist USCG and MARAD in the development of the EIS. These additional agencies are listed below.

White House Task Force on Energy Project Streamlining

U.S. Department of Energy, Office of Fossil Fuels

U.S. Department of Transportation, Research and Special Programs Administration Office of Pipeline Safety

National Oceanic and Atmospheric Administration

National Oceanic and Atmospheric Administration, National Marine Fisheries Service

U.S. Army Corps of Engineers

The contractor responsible for the preparation of this document was engineering-environmental Management, inc. (e^2M). The individuals who contributed to the preparation of this document are listed below.

Michael Cassio (e^2M)
B.S. Geology
Professional Geologist
Registered Environmental Manager
Years of Experience: 16

Suanne Collinsworth (e^2M)
M.S. Environmental Sciences and Engineering
B.S. Geology
Certificate of Water Quality Management
Years of Experience: 6

Melissa Ellinghaus (e^2M)
M.E.S. Environmental Policy
B.S. Biology
Years of Experience: 3

Alan Finio (e^2M)
B.S. Environmental Science (Biology)
Years of Experience: 17

Russell Goff (e^2M)
B.S. Chemistry
Years of Experience: 12

Gustin Hare (e^2M)
B.S. Environmental Science
Registered Environmental Professional
Years of Experience: 9

Russell Henning (e^2M)
B.S. Mechanical Engineering
Registered Professional Engineer
Years of Experience: 16

Brian Hoppy (e^2M)
B.S. Biology
Certificate of Environmental Management
Years of Experience: 13

Joan Lang (e^2M)
B.A. History and Political Science
Years of Experience: 20

Sean McCain (e^2M)
M.B.A. Business Administration
B.S. Forestry and Natural Resources Management
Years of Experience: 8

Deborah Pansius (e^2M)
B.S. Economics
Certificate of Hazardous Materials Management
Years of Experience: 11

Allan Priest (e^2M)
B.S. Natural Resources Management
Years of Experience: 13

Craig Vrabel (e^2M)
B.S. Geology
California Registered Geologist
Wyoming Professional Geologist
Years of Experience: 14

Valerie Whalon (e^2M)
M.S. Fisheries Science
B.S. Marine Science
Years of Experience: 10

Paul Wilbur
Principal, Wilbur and Associates
B.A. English; J.D.
Years of experience: 25

Newell Wright (e^2M)
Ph.D. Archaeology
Years of Experience: 32

Mary Young (e^2M)
B.S. Environmental Science
Years of Experience: 1

Section 7
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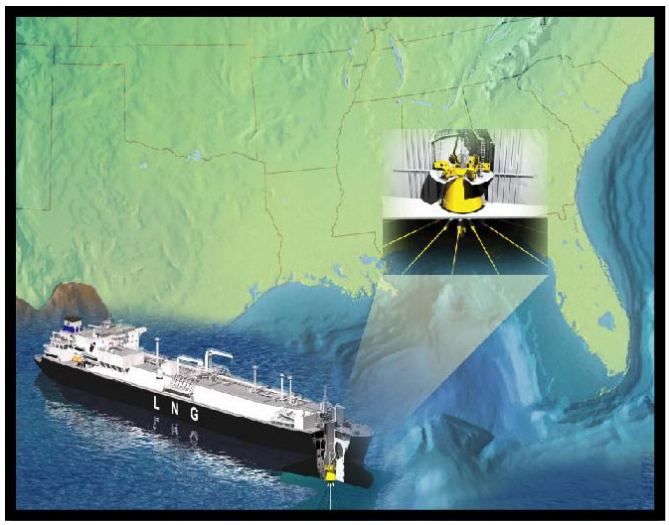

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Appendix A
Applicable Laws and Executive Orders

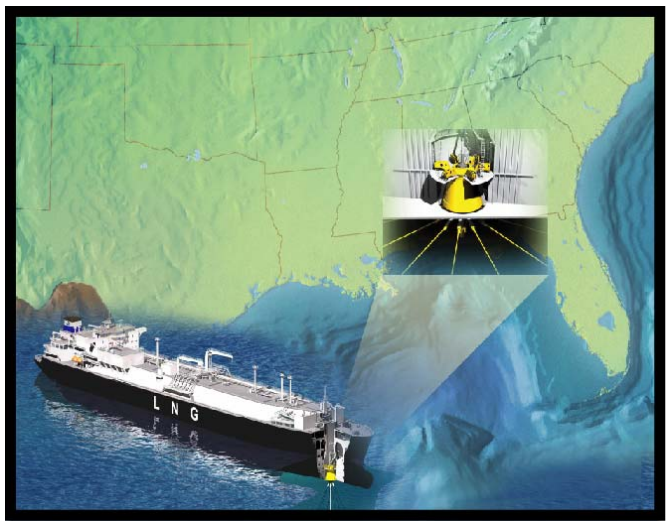


Table of Applicable Laws and Executive Orders [1]

Title, Citation	Summary
Archaeological and Historical Preservation Act, 16 U.S.C. 469	Protects and preserves historical and archaeological data. Requires Federal agencies to identify and recover data from archaeological sites threatened by a proposed action(s).
Clean Air Act, 42 U.S.C. 7401-7671q, as amended	Establishes Federal standards for air pollutants. Prevents significant deterioration in areas of the country where air quality fails to meet Federal standards.
Clean Water Act, 33 U.S.C. 1251-1387 (also known as the Federal Water Pollution Control Act)	Comprehensively restores and maintains the chemical, physical, and biological integrity of the Nation's waters. Implemented and enforced by the U.S. Environmental Protection Agency (USEPA).
Coastal Barrier Resources Act, 16 U.S.C. 3501-3510	Discourages coastal barrier island degradation by prohibiting direct or indirect Federal financial funds (including flood insurance) for development, except for emergency life-saving activities.
Coastal Zone Management Act of 1972, 16 U.S.C. 1451-1464	Establishes a policy to preserve, protect, develop, and where possible, restore and enhance the resources of the Nation's coastal zone. Encourages and assists states in developing and implementing coastal zone management programs.
Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. 9601-9675 (also known as "Superfund")	Provides for liability, compensation, cleanup, and emergency response for hazardous substances released into the environment and cleanup of inactive hazardous substances disposal sites. Establishes a fund financed by hazardous waste generators to support cleanup and response actions.
Deepwater Port Act of 1974, 33 U.S.C. 1501-1524	Assigns responsibility to the Secretary of Transportation to license the construction and operation of all oil and natural gas deepwater ports located beyond the U.S. territorial sea and off the U.S. coast.
Endangered Species Act of 1973, 16 U.S.C. 1531-1543, as amended	Protects threatened, endangered, and candidate species of fish, wildlife, and plants and their designated critical habitats. Prohibits Federal action that jeopardizes the continued existence of endangered or threatened species. Requires consultation with U.S. Fish and Wildlife Service (USFWS) and National Oceanic and Atmospheric Administration (NOAA) Fisheries and a biological assessment when such species are present in an area affected by government activities.

Title, Citation	Summary
Fish and Wildlife Coordination Act, 16 U.S.C. 661-667e, as amended	Authorizes the Secretaries of Interior and Commerce to provide assistance to and cooperate with Federal and State agencies to protect, rear, stock, and increase the supply of game and fur-bearing animals, as well as to study the effects of domestic sewage, trade wastes, and other polluting substances on wildlife. The 1946 amendments require consultation with the USFWS and the state fish and wildlife agencies involving any waterbodies that are proposed or authorized, permitted or licensed to be impounded, diverted or otherwise controlled or modified by any agency under a Federal permit or license.
Magnuson-Stevens Fishery Conservation and Management Act, 16 U.S.C. 1801-1883, as amended	Establishes regional fisheries councils that set fishing quotas and restrictions in U.S. waters. Requires Federal agencies to consult with NOAA Fisheries on all actions (authorized, funded, or undertaken) that might adversely affect essential fish habitat.
Marine Mammal Protection Act of 1972, 16 U.S.C. 1361-1389, 1401-1407, 1538, 4107	Establishes a moratorium on the taking and importation of marine mammals. Prohibits harassing, hunting, capturing, collecting, or killing of marine mammals or attempting such actions. Requires permits for taking marine mammals. Requires consultations with USFWS and NOAA Fisheries if impacts on marine mammals are possible.
Marine Protection, Research, and Sanctuaries Act of 1972, 33 U.S.C. 1401-1445	Regulates dumping of materials into ocean waters. Provides a permitting process to control ocean dumping of dredged materials. Establishes the marine sanctuaries program.
Maritime Transportation Security Act of 2002, Pub. L. 107-295	Extends the Deepwater Port Act application to include facilities and operations related to natural gas.
Migratory Bird Treaty Act, 16 U.S.C. 703-712	Implements various treaties for protecting migratory birds; the taking, killing, or possession of migratory birds is unlawful.
National Environmental Policy Act of 1969, 42 U.S.C. 4321-4370e, as amended	Requires Federal agencies to use a systematic approach when assessing environmental impacts of government activities. Proposes an interdisciplinary approach in a decision-making process designed to identify unacceptable or unnecessary impacts to the environment.
National Historic Preservation Act, 16 U.S.C. 470-470x-6	Requires Federal agencies to consider the effect of any federally assisted undertaking or licensing on any district, site, building, structure, or object eligible for inclusion, or listed in the National Register of Historic Places (NRHP). Provides for the nomination, identification (through NRHP listing), and protection of significant historical and cultural properties.

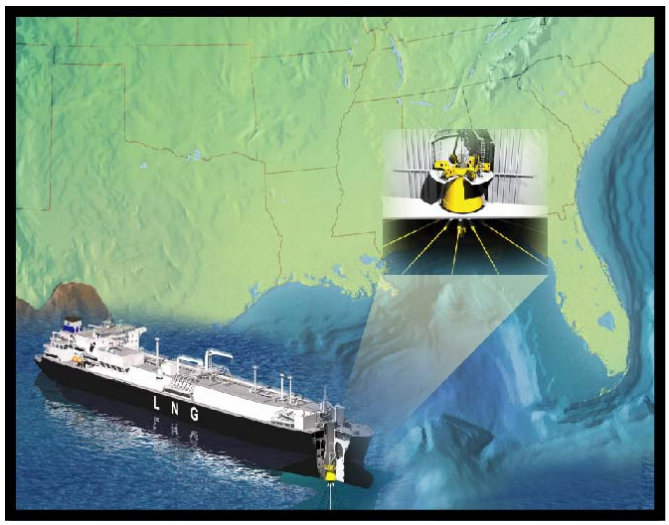
Title, Citation	Summary
National Marine Sanctuaries Act, 16 U.S.C. 1431 *et seq.*	Authorizes the Secretary of Commerce to designate national marine sanctuaries based on statutory criteria and stipulated factors to be considered by the Secretary as a basis for designation. Stipulates consultation requirements with various Federal agencies, Congressional committees, state agencies and regional fishery councils.
Natural Gas Act of 1938, 15 U.S.C. 717	Designates the Federal Energy Regulatory Commission—an independent agency within the Department of Energy—to regulate the transmission and sale of natural gas for resale in interstate commerce.
Natural Gas Pipelines and Safety Act of 1968 and Hazardous Liquid Pipeline Safety Act of 1979, as amended, 49 U.S.C. 601	The Natural Gas Pipelines and Safety Act of 1968 authorizes the Department of Transportation to regulate pipeline transportation of natural (flammable, toxic, or corrosive) gas and other gases as well as the transportation and storage of liquefied natural gas (LNG). The Hazardous Liquid Pipeline Safety Act of 1979 authorizes the Department of Transportation to regulate pipeline transportation of hazardous liquids (crude oil, petroleum products, anhydrous ammonia, and carbon dioxide). Both of these Acts have been recodified as 49 U.S.C. Chapter 601.
Noise Control Act of 1972, 42 U.S.C. 4901-4918	Establishes a national policy to promote an environment free from noise that jeopardizes health and welfare. Authorizes the establishment of Federal noise emissions standards and provides relevant information to the public.
Nonindigenous Aquatic Nuisance Prevention Control Act of 1990, 16 U.S.C. 4701-4751	Establishes aquatic nuisance species.
Northwest Atlantic Fisheries Convention Act of 1995, 16 U.S.C. 5601-5610	Implements provisions of international conventions and establishes regulatory framework.
Occupational Safety and Health Act of 1970, 29 U.S.C. 651-678	Establishes standards to protect workers, including standards on industrial safety, noise, and health standards.
Outer Continental Shelf Lands Act of 1953, 43 U.S.C. 1331-1356, as amended	Defines the Outer Continental Shelf as all submerged lands lying seaward of State coastal waters that are three miles offshore. Delegates leasing authority to the Secretary of the Interior to promulgate regulations in an effort to reduce waste and conserve natural resources.
Port and Waterways Safety Act, 33 U.S.C. 1221-1232	Sets boat operating and towing safety requirements and established enforcement provisions. Authorizes the U.S. Coast Guard (USCG) to establish vessel traffic service/separation schemes for ports, harbors, and other waters subject to congested vessel traffic.

Title, Citation	Summary
Resource Conservation and Recovery Act, 42 U.S.C. 6901-6992k	Establishes requirements for safely managing and disposing of solid and hazardous waste and underground storage tanks.
Executive Order (EO) 12372, *Intergovernmental Review of Federal Programs*, July 14, 1982, 47 FR 30959 (6/16/82), as supplemented	Requires Federal agencies to consult with state and local governments when proposed Federal financial assistance or direct Federal development impacts interstate metropolitan urban centers or other interstate areas.
EO 12898, *Environmental Justice*, February 11, 1994, 59 FR 7629 (2/16/94), as amended	Requires certain Federal agencies, to the greatest extent practicable permitted by law, to make environmental justice part of their missions by identifying and addressing disproportionately high and adverse health or environmental effects on minority and low-income populations.
EO 13089, *Coral Reef Protection*, June 11 1998, 64 FR 232 (12/3/99)	Mandates that all Federal agencies whose actions may affect U.S. coral reef ecosystems (1) identify their actions that may affect U.S. coral reef ecosystems; (2) use their programs and authorities to protect and enhance the conditions of such ecosystems; and (3) to the extent permitted by law, ensure that any actions they authorize, fund, or carry out will not degrade the conditions of such ecosystems. Federal agencies shall, subject to the availability of appropriations, provide for the implementation of measures needed to research, monitor, manage, and restore affected ecosystems, including measures reducing impacts from pollution, sedimentation, and fishing.
EO 13148, *Greening the Government Through Leadership in Environmental Management*, April 21, 2000, 65 FR 24595 (4/26/00)	Designates the head of each Federal agency to ensure that all necessary actions are taken to integrate environmental accountability into agency day-to-day decision making and long-term planning processes, across all agency missions, activities, and functions. Establishes goals for environmental management, environmental compliance, right-to-know (informing the public and their workers of possible sources of pollution resulting from facility operations) and pollution prevention, and similar matters.
EO 13175, *Consultation and Coordination with Indian Tribal Governments*, November 6, 2000, 65 FR 67249 (11/09/00)	Requires Federal agencies to establish an accountable process that ensures meaningful and timely input from tribal officials in developing policies that have tribal implications.

Title, Citation	Summary
EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, January 10, 2001, 66 FR 3853 (1/17/01)	Requires each agency to ensure that environmental analyses of Federal actions (required by the National Environmental Policy Act or other established environmental review processes) evaluate the effects of actions and agency plans on migratory birds, emphasizing species of concern. Agencies must support the conservation intent of migratory bird conventions by integrating bird conservation principles, measures, and practices into agency activities, and by avoiding or minimizing, to the extent practicable, adverse impacts on migratory bird resources when conducting agency actions.
EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, January 10, 2001, 66 FR 11 (1/17/01)	Requires each Federal Agency taking actions that have, or are likely to have, a measurable negative effect on migratory bird populations to develop and implement, within 2 years, a Memorandum of Understanding (MOU) with the USFWS that promotes the conservation of migratory bird populations.
EO 11593, *Protection and Enhancement of the Cultural Environment*, May 13, 1971, 36 FR 8921 (5/15/71)	Requires all Federal agencies to locate, identify, and record all cultural resources, including significant archaeological, historical, or architectural sites.

[1] This table only reflects those laws and EOs that may reasonably be expected to apply to the Proposed Action and alternatives.

Appendix B
Dear Interested Party Letter, Mailing List, and Responses



U.S. Department of Homeland Security
United States Coast Guard

Commandant
United States Coast Guard

2100 Second Street, S.W.
Washington, DC 20593-0001
Staff Symbol: G-MSO-2
Phone: (202) 267-0225
Fax: (202) 267-4570

MAY 29 2003

Dear Interested Party:

The U.S. Coast Guard and the Maritime Administration have initiated an Environmental Assessment (EA) in response to a Deepwater Port License Application form El Paso Energy Bridge Gulf of Mexico L.L.C. (Energy Bridge GOM). The Public Notice initiating the comment process was published in several Southern Louisiana newspapers during the week of May 28, 2003 (Enclosure 1).

The application for a deepwater port license was received from Energy Bridge GOM on December 20, 2002. A Fact Sheet containing details about the proposed Energy Bridge GOM is included (Enclosure 2). We are considering the three alternatives of 1) to approve, 2) approve with conditions, or 3) not approve (the No Action Alternative) the license application to construct and operate Energy Bridge GOM. The EA will identify the potential impacts of these alternatives on the natural and human environment and assess the significance of the identified impacts.

We would like to hear from the public and encourage you to submit comments and related materials. We will consider all comments received by June20, 2003. During this time we will determine the scope of the issues that will be addressed in the EA. In particular, we invite public comment on the scope of the EA, any specific environmental concerns raised by the proposed project, sources of relevant data, and any suggested analysis methods. Please refer to the Public Notice (enclosure 1) for instructions on how to submit comments. In addition, an informational Open House will be held on June10, 2003 from 3 to 7 PM at the Lafayette Hilton, West Pinhook Rd, Lafayette, LA 70503, (337) 235-6111.

If you have questions about the proposed Energy Bridge GOM Deepwater Port or about the EA, you may contact Commander Mark Prescott, U.S. Coast Guard, at (202) 267-0225 or <mprescott@comdt.uscg.mil>.

Sincerely,

Mark Prescott
Commander, U.S. Coast Guard
Acting Chief, Office of Operating and Environmental Standards
By direction of the Commandant

Enclosures:
1. Public Notice
2. Proposed Energy Bridge GOM Deepwater Port Fact Sheet

PUBLIC NOTICE

Informational Open House
for the El Paso Energy Bridge Gulf of Mexico, LLC
Deepwater Port License Application
Environmental Assessment

LAFAYETTE, LA – The U.S. Coast Guard (USCG) and the Maritime Administration (MARAD) announce their intent to prepare an environmental assessment (EA) to assist in the evaluation of a license for the proposed El Paso Energy Bridge Gulf of Mexico, L.L.C. natural gas deepwater port in the Gulf of Mexico. The two agencies are now in the scoping period that precedes preparation of the EA, and invite public comment relating either to concerns raised by the proposal or to the scope of the EA. As part of the scoping process, the USCG and MARAD will hold an informational open house in Lafayette, Louisiana on Tuesday June 10, 2003 from 3 p.m. to 7 p.m. at the Lafayette Hilton Hotel, West Pinhook Rd, Lafayette, LA 70503, (337) 235-6111. The event is open to the public and all interested parties are encouraged to attend.

Comments may be submitted to the Department of Transportation's Docket Management Facility. Comments and related material must reach the Docket Management Facility on or before June 20, 2003. To make sure your comments and related material are not entered more than once in the docket, please submit them by only one of the following means:

(1) By mail to the Docket Management Facility (USCG-2003-14294), U.S. Department of Transportation, Room PL-401, 400 Seventh Street SW, Washington, DC 20590-0001.
(2) By delivery to Room PL-401 on the Plaza Level of the Nassif Building, 400 Seventh Street, SW, Washington DC between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The telephone number is (202) 366-9329.
(3) By fax to the Docket Management Facility at (202) 493-2251.
(4) Electronically through the Web Site for the Docket Management System at *http://dms.dot.gov*.

Written and verbal comments will also be accepted at the Open House. In choosing from these means, please give due regard to the continuing difficulties and delays associated with delivery of mail through the U.S. Postal Service to federal facilities.

Comments and material received from the public, as well as the Environmental Assessment, will become part of this docket and will be available for inspection or copying at Room PL-401 on the Plaza Level of the Nassif Building, 400 Seventh Street SW., Washington, DC between 9 a.m. and 5 p.m., Monday through Friday, except for Federal holidays. You may also view this docket, including this notice and comments, on the Internet at *http://dms.dot.gov*.

If you have questions about the project or the meeting, contact Commander Mark Prescott, USCG at (202) 267–0225 or *mprescott@comdt.uscg.mil*.

ENVIRONMENTAL ASSESSMENT FACT SHEET

Introduction

In accordance with the Deepwater Port Act of 1974, as amended (the Act, 33 U.S. Code [U.S.C] 1501 *et seq.*), the National Environmental Policy Act (NEPA) (Section 102(2)(c)), as implemented by Council on Environmental Quality regulations (40 Code of Federal Regulations [CFR] Parts 1500-1508), and other applicable regulations, the U.S. Coast Guard and the Maritime Administration intend to prepare an Environmental Assessment (EA) to assist in evaluating the license application for the proposed El Paso Energy Bridge Gulf of Mexico Deepwater Port (Energy Bridge GOM).

NEPA requires Federal agencies to consider environmental impacts that may result from a proposed action, to inform the public of potential impacts and alternatives, and to facilitate public involvement in the assessment process. The EA will identify the nature and extent of the environmental impacts of the Proposed Action and alternatives and discuss appropriate mitigation measures for any adverse impacts. The EA will include discussions of the purpose and need for the Proposed Action, a description of alternatives, a description of the affected environment, and an assessment of the potential environmental impacts of the Proposed Action.

Proposed Action

The application addresses the Energy Bridge GOM Port, a proposed natural gas receiving and delivery facility. The Port would be located approximately 146 miles south of Lake Charles, Louisiana in West Cameron Block 603.

The main components of the proposed Port would include: ship mooring facilities (chains, lines and anchors); a submerged gas receiving buoy called a Submerged Turret Loading ("STL") system; a flexible riser pipe; and a sub-sea manifold. The main components of the natural gas delivery system would include approximately 1.93 miles of 20-inch pipeline that would extend from the sub-sea manifold to a metering platform and risers and two 20-inch diameter transportation pipelines that would connect directly to existing offshore natural gas pipelines.

Specially designed vessels would transport liquefied natural gas (LNG) to the Port. These LNG carriers would then connect to the moorings, retrieve the STL, and deliver natural gas to the Port and distribution system. The LNG carrier would have fully integrated regasification facilities on-board that would offload natural gas to the STL. The Port would have no facilities for storage of LNG or natural gas. The LNG carriers would also be capable of offloading to conventional land based LNG facilities.

Environmental Assessment of
El Paso Energy Bridge Gulf of Mexico L.L.C.
Deepwater Port License Application

Dear Interested Party Mailing List

National Elected Officials

The Honorable Rodney Alexander
Representative
316 Cannon House Office Building
Washington, DC 20515-1805

The Honorable Richard Baker
Representative
341 Cannon House Office Building
Washington, DC 20515-1806

The Honorable John Breaux
U.S. Senator
503 Hart Senate Office Building
Washington, DC 20510

The Honorable Pete Domenici
Chair
Committee on Energy and Natural Resources
US Senate
364 Dirkson Senate Office Building
Washington, DC 20510

The Honorable William Jefferson
Representative
240 Cannon House Office Builiding
Washington, DC 20515-1802

The Honorable Chris John
Representative
403 Cannon House Office Building
Washington, DC 20515-1807

The Honorable Mary Landrieu
U.S. Senator
724 Hart Senate Office Building
Washington, DC 20510

The Honorable Jim McCrery
Representative
2104 Rayburn House Office Building
Washington, DC 20515-1804

The Honorable Richard Pombo
Chair
House Resources Subcommittee
1324 Longworth House Office Building
Washington, DC 20515

The Honorable W.J. Tauzin
Representative
2183 Rayburn House Office Building
Washington, DC 20515-1803

The Honorable David Vitter
Representative
414 Cannon House Office Building
Washington, DC 20515-1801

State Elected Officials

The Honorable Bob Riley
Governor of Alabama
State of Alabama
State Captiol
600 Dexter Avenue
Montgomery, AL 36130

The Honorable Jeb Bush
Governor of Florida
State of Florida
PL 05 The Capitol
400 S. Monroe Street
Tallahassee, FL 32399-0001

The Honorable Mike Foster, Jr.
Governor of Louisiana
State of Louisiana
P.O. Box 94004
Baton Rouge, LA 70804-9004

The Honorable Ronnie Musgrove
Governor of Mississippi
State of Mississippi
P.O. Box 139
Jackson, MS 39205

The Honorable Rick Perry
Governor of Texas
State of Texas
P.O. Box 12428
Austin, TX 78711-2428

Local Elected Officials

Freddie Arceneau, President
Greater Abbeville-Vermilion
Chamber of Commerce
1907 Veterans Memorial Drive
Abbeville, LA 70510

Chamber of Commerce
15301 Highway 182 West
Franklin, LA 70538

Paul Price, Jr, President
Chamber of Commerce
3830 Front St
Winnsboro, LA 71295

Mr. Greg Davis, President
Chamber of Commerce
804 East Saint Mary Boulevard
Lafayette, LA 70503

Chamber of Commerce
7332 Highway 182 East
Morgan City, LA 70380

Ms. Mary Ellen Wilke
Chamber of Commerce
111 West Main Street
New Iberia, LA 70560

Mr. Sid Hebert
Sheriff
Iberia Parish Sheriff's Office
300 Iberia Street
Suite 120
New Iberia, LA 70560

Mr. Jerry Larpenter
Sheriff
Terrebonne Parish Sheriff's Office
P.O. Drawer 1670
Houma, LA 70361

Mr. Raywood Lemaire
Sheriff
Vermillion Parish Sheriff's Office
101 S. State Street
Abbeville, LA 70510

Mr. Mike Neustrom
Sheriff
Lafayette Parish Sheriff's Office
316 W. Main Street
Lafayette, LA 70501

Mr. James R. Savoie
Sheriff
Cameron Parish Sheriff's Office
P.O. Drawer A
Cameron, LA 70631

Mr. David A. Naquin
Sheriff
Saint Mary Parish Sheriff's Office
500 Main Street
Franklin, LA 70538

Federal Agency Contacts

Mr. Don Klima
Director, Office of Planning and Review
Advisory Council on Historic Preservation
1100 Pennsylvania Avenue
The Old Post Office Building
Washington, DC 20004

Mr. Horst Greczmiel
Council on Environmental Quality
360 Old Executive Office Building, NW
Washington, DC 20501

Mr. Rusty Swafford
Fishery Biologist / Team Leader
NMFS-Galveston
Habitat Conservation Division
4700 Avenue U, Bldg 302
Galveston, TX 77551-5997

Ms. Karen Abrams
Marine Resource Specialist, Office of Habitat Conservation
US Department of Commerce
National Marine Fisheries Service
1315 East West Highway
Building 3, 14th Floor
Silver Spring, MD 20910

Ms. Joanne Lyczkowski-Shultz
NMFS-Pascagoula
Mississippi Laboratories
Pascagola Laboratory P.O. Drawer 1207
Pascagoula, MS 39568-1207

Ms. Donna Wieting
Deputy Director, Office of Protected Resources
US Department of Commerce
National Oceanic and Atmospheric Administration
F/PR
1315 East West Highway, SSMC3
Silver Spring, MD 20910

Mr. David Kaiser
Federal Consistency and Regulatory Coordinator
US Department of Commerce
NOAA, Coastal Programs Division, N/ORM3
1315 East West Highway, SSMC4
Silver Spring, MD 20910

Ms. Georgia Cranmore
Assitant Regional Administrator for Protected Resources
US Department of Commerce
National Oceanic and Atmospheric Administration
F/SER
9721 Executive Center Drive North
St. Petersburg, FL 33072

Mr. Kyle Baker
US Department of Commerce
National Oceanic and Atmospheric Administration
F/SER
9721 Execuitve Center Drive North
St. Petersburg, FL 33072

Mr. Richard Hartman
EFH Regional Coordinator
NOAA
Room 266, Military Science Bldg.
LSU
Baton Rouge, LA 70803

Mr. A. Forester Einarsen
NEPA Coordinator
US Army Corps of Engineers
Office of Environmental Policy (CECW-AR-E)
20 Massachusetts Avenue
Washington, DC 20314-1000

Ms. Carolyn Wilber
ODUSD (I & E)
3400 Defense, Pentagon
Rm 3D784
Washington, DC 20301

Dr. Donald A. Juckett
Director, Office of Natural Gas and Petroleum Import and Export
US Department of Energy
Office of Fossil Energy
FE-34, Room 3E-052
1000 Independence Avenue, SW
Washington, DC 20585

Mr. Jim Lecky
US Department of Energy
White House Task Force on Energy Project Streamlining
ME-41/Forresal Buildling
1000 Independence Avenue, SW
Washington, DC 20585

Robert Middleton, PhD
Director
US Department of Energy
White House Task Force on Energy Project Streamlining
WH-1, Room 8E044
1000 Independence Avenue, SW
Washington, DC 20585

Mr. David Frugé
USFWS -Lafayette LA
Endangered Species
646 Cajundome Blvd. #400
Lafayette, LA 70506

Mr. Charles R. Demas
District Chief
US Department of the Interior
Geological Survey
3535 S. Sherwood Forest Blvd, Suite 120
Baton Rouge, LA 70816

Celso Puente
Acting Chief, Office of Environmental Affairs Program
US Department of the Interior
Geological Survey
12201 Sunrise Valley Drive
Mail Stop 440
Reston, VA 22092-0002

Mr. Alex Alvarado
Minerals Management Service
Pipeline Section
1201 Elmwood Park Blvd.
New Orleans, LA 70123-2394

Ms. Elizabeth Koniskey
Pipeline Section
1201 Elmwood Park Blvd ,
New Orleans, LA 70123-2394

Mr. Christopher Oynes
Regional Director, Gulf of Mexico
US Department of the Interior
Minerals Management Service
1201 Elmwood Park Blvd.
New Orleans, LA 70123-2394

Mr. David Moore
Physical Scientist, Engineering and Operations Division
US Department of the Interior
Minerals Management Service
Performance and Safety Branch
381 Elden Street
Herndon, VA 20170-4817

Dr. Willie Taylor
Director, US Department of the Interior
Office of Environmental Policy and Compliance
Main Interior Building, MS 2340
1849 C Street, NW
Washington, DC 20240

Ms. Ann Navaro
General Litigation Section
US Department of Justice
Environmental and Natural Resources Division
P.O. Box 663
Washington, DC 20044-0663

Assistant Attorney General Thomas L. Sansonetti
US Department of Justice
Environment and Natural Resources Division
Rm 2133, Justice Bldg
Washington, DC 20530

US Department of Labor
Office of Regulatory Economics
Rm S-2312, Frances Perkins Bldg
Washington, DC 20210

US Department of State
Office of Environment and Health
Rm 4325 State Dept Bldg
Washington, DC 20520

The Honorable Mary Beth West
Deputy Assistant Secretary for Oceans and Fisheries
U.S. Department of State
2201 C Street, NW
Washington, DC 20520

Mr. Dan Yuska
US Department of Transportation
Maritime Administration
400 7th Street, Room 7201
Washington, DC 20590

Mr. Richard Huriaux
Manager, Regulations
US Department of Transportation
RSPA/Office of Pipeline Safety
400 7th St SW
Suite 7128; DPS-12
Washington, DC 20590

Ms. Marilyn Kuray
Staff Attorney
USEPA Office of General Counsel
Ariel Rios Building-North (2322A)
1200 Pennsylvania Ave., NW
Washington, DC 20460

Mr. Ken Mittelholtz
Office of Federal Activities
US Environmental Protection Agency
Ariel Rios Building (2252A)
1200 Pennsylvania Ave., NW
Washington, DC 20460

Mr. Robert D. Lawrence
Chief, Office of Planning and Coordination
USEPA Region 6
Office of Planning and Coordination
1445 Ross Avenue (6EN-XP)
Dallas, TX 75202

Federal Maritime Commission
Bureau of Tariffs, Certification, and Licensing
800 North Capitol Street, NW
Room 940
Washington, DC 20573-0001

Mr. Theodore Zook
Assistant Secretary
Federal Maritime Commission
800 North Capitol Street, NW
Room 1046
Washington, DC 20573-5725

Mr. John Daly
Assistant General Counsel
Federal Trade Commission
Litigation
600 Pennsylvania Avenue, NW
Room 580
Washington, DC 20850

Mr. Larry Simpson,
Executive Director,
Gulf States Marine Fisheries Commission
P.O. Box 726
Ocean Springs, MS 39566-0726

Ms. Sylvia Waggoner
Division Engineer
International Boundary and Water Commission
Environmental Management Division, United States Section
4171 North Mesa Street
Suite C-310
El Paso, TX 79902-1492

Chief of Energy and Environment
Interstate Commerce Commission
Rm 4143, 12th and Constitution
Washington, DC 20423

John E. Reynolds III, Ph.D.
Chairman
Marine Mammal Commission
4340 East West Highway
Suite 905
Bethesda, MD 20814-4447

Mr. Aston A. Hinds, Chairman
National Ocean Industries Association
1120 G Street, N.W., Suite 900
Washington, DC 20005

Assistant Administrator
Mr. Jamison S. Hawkins,
Assistant Administrator for Ocean Services and Coastal Zone Management
National Ocean Service
1305 East West Highway
Room 13609
Silver Spring, MD 20910

Ms. Andree DuVarney
National Environmental Coordinator
US Department of Agriculture
Natural Resources Conservation Service
14th and Independence Avenue, SW
P.O. Box 2890

State Agency Contacts

Mr. Phillip Hinesly
Section Chief
ADCNR State Lands, Coastal Section
Stonebrook Executive Complex, Suite B-1
23210 Hwy, 98
Fairhope, AL 36532

Mr. Scott Demick
SPOC
Alabama Department of Environmental Management
1400 Coliseum Blvd.
Montgomery, AL 36100-2059

Florida Coastal Management Program
Department of Environmental Protection
Mail Station #47
3900 Commonwealth Blvd.
Tallahassee, FL 32399-3000

Ms. Cindy Cranick
Coordinator
Florida Department of Environmental Protection
Department of Community Affairs
3900 Commonwealth Blvd.
Tallahassee, FL 32399-3000

Mr. Greg DuCote
Program Manager
Lousiana Department of Natural Resources
Coastal Management Division
625 North Fourth Street
P.O. Box 44487
Baton Rouge, LA 70804-4487

Mr. Hall Bohlinger
Secretary
Louisiana Department of Environmental Quality
P.O. Box 82263
Baton Rouge, LA 70884-2263

Mr. Jack Caldwell
Secretary
Louisiana Department of Natural Resources
Secretary
P.O. Box 94396
Baton Rouge, LA 70804-9396

Terry Gee
Director
Louisiana Department of Transportation and Development
Louisiana Offshore Terminal Authority
P.O. Box 94245 (1201 Capitol Access Rd)
Baton Rouge, LA 70804-9245

Mr. Gary Lester
Coordinator, Natural Heritage Program
Louisiana Department of Wildlife and Fisheries
P.O. Box 98000
Baton Rouge, LA 70898

Blue Watson
Environmental Program Manager
Louisiana Department of Wildlife and Fisheries
Marine Fisheries Division, Habitat Program
2000 Quail Dr.
Baton Rouge, LA 70808

Terry Ryder
Deputy Chief of Staff
Louisiana Governor's Office
900 N. 3rd Street / P.O. Box 94004 , 70804-9004
Baton Rouge, LA 70802

Chacko J. John
Director
Louisiana Geological Survey
P.O. Box G, University Station
Baton Rouge, LA 70893

Mr. J. Dale Givens
Secretary
Louisiana Department of Environmental Quality
P.O. Box 82263
Baton Rouge, LA 70884-2263

Ms. Laurel Wyckoff
Louisiana State Historic Preservation Officer
1051 N 3rd St
Baton Rouge, LA 70804

Mr. Rickey Hemba, Chairman
Mississippi Department of Marine Resources
1141 Bayview Avenue, Suite 101
Biloxi, MS 39530

Mr. Charles Chisolm
Executive Director
Mississippi Department of Environmental Quality
P.O. Box 20305
Jackson, MS 39289-1305

Mr. Jerry Patterson,
Commissioner,
Texas General Land Office
Coastal Division
1700 North Congress Street
Austin Building
Austin, TX 78701

Ms. Wendy Wyman
Environmental Policy Director
Budget Planning and Policy Office
1100 San Jacinto
Austin, TX 78701

Tribal Contacts

Mr. Earl Barbry, Jr.
THPO
Tunica-Biloxi Indians of Louisiana
P.O. Box 331
Marksville, LA 71351

Alton LeBlanc
Chairman
Chitimacha Indian Tribe
P.O. Box 661
Charenton, LA 70523-0661

Lovelin Poncho
Chairman
Coushatta Indian Tribe
P.O. Box 818
Elton, LA 70532-0818

Chief
Jena Band of Choctaw Indians
P.O. Box 14
Jena, LA 71342-0014

Stakeholder Groups

Mr. Martin D. Floyd
President
Wildlife Society, Louisiana Chapter
5492 Grand Chenier Hwy
Grand Chenier, LA 70643

Tee John Mialjevich
Concerned Shrimpers Of America
2621 Wyoming Dr.
Marrero, LA 70072-6331

Mr. Terry Tiersch
President
American Fisheries Association, Louisiana Chapter
Louisiana Dept of Wildlife and Fisheries
P.O. Box 98000
Baton Rouge, LA 70898

Ms. Barbara Vincent
Sierra Club, Delta Chapter
P.O. Box 19469
New Orleans, LA 70179

The Ocean Conservancy
Southeast United States & Gulf of Mexico Regional Office
449 Central Avenue, Suite 200
St. Petersburg, FL 33701

United Commercial Fishermen's Association
1519 East Judge Perez Drive
Chalmette, LA 70043

Executive Director
Louisiana Wildlife Federation, Inc.
PO 65239
337 S. Acadian Thruway
Baton Rouge, LA 70806

Mr. Dan Juneau, President
Louisiana Association of Business and Industry (LABI)
3113 Valley Creek Drive
Baton Rouge, LA 70825

Louisiana Environmental Action Network (LEAN)
P.O. Box 66323
Baton Rouge, LA 70896

Tulane Environmental Law Clinic (TELC)
6329 Freret Street
New Orleans, LA 70118

Ms. Doris Falkenheiner
President
Louisiana Audubon Council
355 Napolean St
Baton Rouge, LA 70802

Mr. Roy Francis
Louisiana One Coalition, Inc.
Post Office Box 2048-Nsu
Thibodaux, LA 70310

Mr. Jerry Holmes
President
Louisiana Association of Conservation Districts
663 Holmes Rd
Keatchie, LA 71046

Mr. Keith Saucier
President and Alternative Representative
Louisiana Wildlife Federation, Inc.
P.O. Box 65239
Baton Rouge, LA 70896

Dr. Jack R. Vanlopik
Louisiana Sea Grant College Program
Louisiana State University
Baton Rouge, LA 70803

Mr. Don G. Briggs, President
Louisiana Independent Oil and Gas Association
PO 4069
Baton Rouge, LA 70801

Mr. B. Jim Porter, President
Louisiana Mid-Continent Oil and Gas Association
801 North Boulevard
Baton Rouge, LA 70802

Mr. Richard D. Hayes
Save Our Coast
Esturary Issues
504 East Main Street
New Iberia, LA 70560

Gulf Coast Fisherman's Coalition
6329 Freret Street
New Orleans, LA 70118

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

252147

MAR 28 2003

Commander Mark Prescott
U.S. Coast Guard
2100 Second Street, S.W.
Washington DC 20593

USCG-2003-14294-8

Subject: EPA Authority Over Construction and Operation
El Paso Energy Bridge Deepwater Port Project

Dear Commander Prescott:

EPA Region 6 received a copy of the deepwater port license application for El Paso Energy Bridge on February 12, 2003. The proposed port will consist of a mooring buoy and natural gas transfer system in the Gulf of Mexico. After docking at the mooring buoy, liquid natural gas carriers will re-gasify and transfer the natural gas, which will be conveyed *via* a short pipeline to an existing natural gas pipeline for transport ashore. EPA Region 6 appreciates this opportunity to provide the following information to the Coast Guard as part of the coordinated licensing effort for this facility.

CLEAN WATER ACT. Section 301(a) of the Clean Water Act (CWA) generally forbids discharges of pollutants to the waters of the ocean and contiguous zone from a point source (other than a vessel operating in a transportation capacity) in the absence of a national discharge elimination system (NPDES) permit issued pursuant to CWA § 402. Based on review of the deepwater port license application, it appears NPDES permit authorization will be required for the proposed facility's operational discharges, including discharges of non-contact warming water associated with the "open loop" re-gasification process on the LNG carriers and hydrostatic test water from the short connecting pipeline. Because the Deepwater Port Act (DPA) designates the proposed facility a "new source" for CWA purposes, EPA will consider the information in the Coast Guard's NEPA review documents in its NPDES permit action in accordance with CWA § 511(c)(1) and DPA § 106(f).

To initiate the NPDES permit process, the applicants should submit NPDES permit application forms 1 and 2D to EPA Region 6. Those forms may be obtained from EPA's website at http:\\cfpub.epa.gov/npdes/pareas.cfm.

CLEAN AIR ACT. EPA does not normally administer the Clean Air Act (CAA) in the Gulf of Mexico west of longitude 80 degrees 30 minutes; the Minerals Management Service is responsible for regulating "OCS sources" in that area pursuant to CAA § 328. Deepwater ports do not appear to be "OCS sources," however, and EPA's national air program is currently attempting to develop a nationally consistent policy regarding their regulation. Hence, the information Region 6 now provides should be considered a preliminary view subject to change.

Based on review of the deepwater port application, it appears the El Paso Energy Bridge project will be a major source because it is a category listed in CAA § 169, i.e., a fuel conversion plant, and the shipboard fuel oil fired boilers used in the re-gasification process will emit a total of 297 tons/year of NO_x, 2330 tons/year of SO_2, and 166 tons/year of PM_{10}. In addition, the application indicates their gas powered boilers will emit 168 tons/year of NO_x. The facility will probably require a preconstruction prevention of significant deterioration (PSD) permit and an operating (Title V) permit, both of which may be issued in a single regulatory action. All criteria emissions in excess of significant levels listed at 40 CFR § 52.21(b)(23) will be evaluated for best available control technology (BACT). NESHAPS criteria at 40 CFR Parts 61 & 63 will also apply to this source. Although 40 CFR Part 55 does not appear to apply directly to this facility, the applicant should submit the information identified in 40 CFR § 55.6(a)(1) in applying for its PSD permit. Information required in an application for a Title V permit is identified at 40 CFR § 71.5. Appropriate Title V permit application forms may be obtained at EPA's website at http://www.epa.gov/air/oaqps/ permits/p71forms.html.

MARINE PROTECTION, RESEARCH, AND SANCTUARIES ACT. Under Section 101 of the Marine Protection, Research, and Sanctuaries Act of 1972 (MPRSA), 33 U.S.C. § 1401, no person may transport material from the United States or on an American flagged vessel for the purpose of dumping it in ocean waters in the absence of a permit issued by EPA pursuant to MPRSA § 102. A MPRSA §102 permit is also required for any person transporting material from anywhere for the purpose of dumping it in the territorial seas or to the contiguous zone where it might affect the territorial seas. Based on our current understanding, it does not appear that anyone proposes to transport materials for the purpose of dumping it in connection with the construction or operation of the El Paso Energy Bridge. Moreover, "dumping" does not include "construction of any fixed structure or artificial island nor the intentional placement of any device in ocean waters, or on or in the submerged land beneath such waters, for a purpose other than disposal, when such construction or such placement is otherwise regulated by Federal or state law . . . ." MPRSA § 3(f). The construction of this deepwater port falls squarely within the ambit of this statutory exclusion. Although the Deepwater Port Act specifically references MPRSA, it does not appear a MPRSA § 102 permit will be required for construction or operation of the El Paso Energy Bridge.

NATIONAL ENVIRONMENTAL POLICY ACT. Pursuant to Section 309(a) of the Clean Air Act, EPA is required to review environmental impact statements (EISs) prepared by other federal agencies and refer projects it finds "environmentally unacceptable" to the President's Council on Environmental Quality (CEQ). EPA is authorized, but not required, to take similar actions on environmental assessments (EAs) and findings of no significant impact (FNSIs) prepared by other federal agencies.

In its deepwater port license application, the applicant suggests environmental review of its project may best be accomplished with an EA and FNSI. If the Coast Guard nevertheless decides to prepare an EIS on the project, it should file it in accordance with 40 CFR § 1506.9.

The filing address for an EIS is now:

EPA
Office of Federal Activities
EIS Filing Section
South Ariel Rios Building (Room 7220)
1200 Pennsylvania Avenue, N.W.
Washington, DC 20004

As noted above, EPA Region 6 will rely on the Coast Guard's NEPA documents in issuing a "new source" NPDES permit to the El Paso Energy Bridge. EPA Region 6 thus requests that you provide it a copy with those documents regardless of whether the Coast Guard decides to use the EA/FNSI or EIS process.

POINT OF CONTACT. The primary EPA point of contact for communications on the El Paso Energy Bridge project is:

Robert D. Lawrence, Chief
Office of Planning & Coordination
EPA Region 6
1445 Ross Avenue (6EN-XP)
Dallas TX 75202
(214) 665-8150

EPA Region 6 looks forward to working with the Coast Guard on this project.

Sincerely yours,

Myron O. Knudson

for Lawrence E. Starfield
Acting Regional Administrator

cc: Col. Peter J. Rowan
Corps of Engineers, New Orleans, LA

Ms. Deborah Cranswick,
Minerals Management Service, New Orleans, LA

Ms. Doris Bautch
Maritime Administration, Washington, DC

Mr. Mark Schroeder, Vice President
El Paso Merchant Energy, Houston, TX

United States Department of the Interior

FISH AND WILDLIFE SERVICE
646 Cajundome Blvd.
Suite 400
Lafayette, Louisiana 70506

252139

June 13, 2003

USCG-2003-14294-5

Mark A. Prescott, Commander
U.S. Coast Guard, Commandant (G-MSO-2)
Vessels and Facilities Operating Standards Division
2100 Second Street, SW
Washington, DC 20593-0001

Dear Commander Prescott:

The U.S. Fish and Wildlife Service (Service) has received the joint U.S. Coast Guard (USCG)/Maritime Administration (MARAD) May 29, 2003, Notice of Intent to prepare an Environmental Assessment (EA) in response to a Deepwater Port License Application from El Paso Energy Bridge Gulf of Mexico, L.L.C. (Energy Bridge). Energy Bridge proposes to construct a natural gas receiving and delivery facility, which would include ship mooring facilities, a submerged turret loading system, a flexible riser pipe, and a sub-sea manifold, as well as three offshore natural gas pipelines. The proposed project would be located approximately 146 miles south of Lake Charles, Louisiana, in West Cameron Block 603. The Service has reviewed the information you provided, and offers the following comments in accordance with provisions of the National Environmental Policy Act (NEPA) of 1969 (83 Stat. 852; 42 U.S.C. 4321 et seq.), the Coastal Barrier Resources Act (CBRA) of 1982 (as amended), the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.), and the Migratory Bird Treaty Act (40 Stat. 755, as amended; 16 U.S.C. 703 et seq.).

Because the proposed project would be located approximately 116 miles off the Louisiana Gulf coast, there would likely be no impacts to either the Coastal Barrier Units located on the coasts of Vermilion and Cameron Parishes, or wetlands. Similarly, there are no threatened or endangered species within the Service's purview that are located within the proposed project area. Therefore, no further ESA consultation would be required with the Service unless there are changes in the scope or location of the action, or the action has not been initiated within one year. If the action has not been initiated within one year, follow-up consultation should be accomplished with the Service prior to making expenditures because our threatened and endangered species information is updated annually. Should the scope or location of the proposed action change, consultation should occur as soon as such changes are made.

Endangered and threatened sea turtles forage in the near-shore waters, bays and sounds of Louisiana. Threatened and endangered whales also occur throughout the Gulf of Mexico. The National Marine Fisheries Service is responsible for the above-listed aquatic marine threatened or endangered species. Please contact Eric Hawk (727/570-5312) in St. Petersburg, Florida, for information concerning those species.

Lighting, communication, and/or flare towers associated with the operation of the deepwater port could potentially impact trans-Gulf migratory birds. Impacts from lighting and towers on trans-Gulf migratory birds should, therefore, be addressed and analyzed in the forthcoming EA. For your convenience, the Service has enclosed guidelines to assist you with siting, constructing, operating and decommissioning communication towers.

We appreciate the opportunity to provide these scoping-level comments during the preliminary stages of developing the EA. If you have any questions regarding our comments, please contact Brigette Firmin (337/291-3108) of this office.

Sincerely,

Russell C. Watson
Acting Supervisor
Louisiana Field Office

Enclosure

cc: FWS, Atlanta, GA (ES/HC)
EPA, Dallas, TX
Corps of Engineers, New Orleans, LA
NMFS, Baton Rouge, LA
NMFS, St. Petersburg, FL
LDNR, CMD, Baton Rouge, LA
LDWF, Natural Heritage Program, Baton Rouge, LA

United States Department of Interior
Fish and Wildlife Service
Washington, DC 20240

September 14, 2000

To: Regional Directors
From: Director /s/ Jamie Rappaport Clark
Subject: Service Guidance on the Siting, Construction, Operation and Decommissioning of Communications Towers*

Construction of communications towers (including radio, television, cellular, and microwave) in the United States has been growing at an exponential rate, increasing at an estimated 6 percent to 8 percent annually. According to the Federal Communication Commission's *2000 Antenna Structure Registry*, the number of lighted towers greater than 199 feet above ground level (AGL) currently number over 45,000 and the total number of towers over 74,000. Non-compliance with the registry program is estimated at 24 percent to 38 percent, bringing the total to 92,000 to 102,000. By 2003, all television stations must be digital, adding potentially 1,000 new towers exceeding 1,000 feet AGL.

The construction of new towers creates a potentially significant impact on migratory birds, especially some 350 species of night-migrating birds. Communications towers are estimated to kill 4-5 million birds per year, which violates the spirit and the intent of the Migratory Bird Treaty Act and the Code of Federal Regulations at Part 50 designed to implement the MBTA. Some of the species affected are also protected under the Endangered Species Act and Bald and Golden Eagle Act.

Service personnel may become involved in the review of proposed tower sitings and/or in the evaluation of tower impacts on migratory birds through National Environmental Policy Act review; specifically, Sections 1501.6, opportunity to be a cooperating agency, and 1503.4, duty to comment on federally-licensed activities for agencies with jurisdiction by law, in this case the MBTA, or because of special expertise. Also, the National Wildlife Refuge System Improvement Act requires that any activity on Refuge lands be determined as compatible with the Refuge system mission and the Refuge purpose(s). In addition, the Service is required by the ESA to assist other Federal agencies in ensuring that any action they authorize, implement, or fund will not jeopardize the continued existence of any Federally endangered or threatened species.

A Communication Tower Working Group composed of government agencies, industry, academic researchers and NGO's has been formed to develop and implement a research protocol to determine the best ways to construct and operate towers to prevent bird strikes. Until the research study is completed, or until research efforts uncover significant new mitigation measures, all Service personnel involved in the review of proposed tower sitings and/or the evaluation of the impacts of towers on migratory birds should use the attached interim guidelines when making recommendations to all companies, license applicants, or licensees proposing new tower sitings. These guidelines were developed by Service personnel from research conducted in several eastern, midwestern, and southern states, and have been refined through Regional review. They are based on the best information available at this time, and are the most prudent and effective measures for avoiding bird strikes at towers. We believe that they will provide significant protection for migratory birds pending completion of the Working Group's recommendations. As new information becomes available, the guidelines will be updated accordingly.

Implementation of these guidelines by the communications industry is voluntary, and our recommendations must be balanced with Federal Aviation Administration requirements and local community concerns where necessary. Field offices have discretion in the use of these guidelines on a case by case basis, and may also have additional recommendations to add which are specific to their geographic area.

Also attached is a Tower Site Evaluation Form, which may prove useful in evaluating proposed towers and in streamlining the evaluation process. Copies may be provided to consultants or tower companies who regularly submit requests for consultation, as well as to those who submit individual requests that do not contain sufficient information to allow adequate evaluation. This form is for discretionary use, and may be modified as necessary.

The Migratory Bird Treaty Act (16 U.S.C. 703-712) prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Department of the Interior. While the Act has no provision for allowing unauthorized take, it must be recognized that some birds may be killed at structures such as communications towers even if all reasonable measures to avoid it are implemented. The Service's Division of Law Enforcement carries out its mission to protect migratory birds not only through investigations and enforcement, but also through fostering relationships with individuals and industries that proactively seek to eliminate their impacts on migratory birds. While it is not possible under the Act to absolve individuals or companies from liability if they follow these recommended guidelines, the Division of Law Enforcement and Department of Justice have used enforcement and prosecutorial discretion in the past regarding individuals or companies who have made good faith efforts to avoid the take of migratory birds.

Please ensure that all field personnel involved in review of FCC licensed communications tower proposals receive copies of this memorandum. Questions regarding this issue should be directed to Dr. Benjamin Tuggle, Chief, Division of Habitat Conservation, at (703)358-2161, or Jon Andrew, Chief, Division of Migratory Bird Management, at (703)358-1714. These guidelines will be incorporated in a Director's Order and placed in the Fish and Wildlife Service Manual at a future date.

Service Interim Guidelines For Recommendations On

Communications Tower Siting, Construction, Operation, and Decommissioning

1. Any company/applicant/licensee proposing to construct a new communications tower should be strongly encouraged to collocate the communications equipment on an existing communication tower or other structure (*e.g.,* billboard, water tower, or building mount). Depending on tower load factors, from 6 to 10 providers may collocate on an existing tower.

2. If collocation is not feasible and a new tower or towers are to be constructed, communications service providers should be strongly encouraged to construct towers no more than 199 feet above ground level (AGL), using construction techniques which do not require guy wires (*e.g.,* use a lattice structure, monopole, etc.). Such towers should be unlighted if Federal Aviation Administration regulations permit.

3. If constructing multiple towers, providers should consider the cumulative impacts of all of those towers to migratory birds and threatened and endangered species as well as the impacts of each individual tower.

4. If at all possible, new towers should be sited within existing "antenna farms" (clusters of towers). Towers should not be sited in or near wetlands, other known bird concentration areas (*e.g.,* state or Federal refuges, staging areas, rookeries), in known migratory or daily movement flyways, or in habitat of threatened or endangered species. Towers should not be sited in areas with a high incidence of fog, mist, and low ceilings.

5. If taller (>199 feet AGL) towers requiring lights for aviation safety must be constructed, the minimum amount of pilot warning and obstruction avoidance lighting required by the FAA should be used. Unless otherwise required by the FAA, only white (preferable) or red strobe lights should be used at night, and these should be the minimum number, minimum intensity, and minimum number of flashes per minute (longest duration between flashes) allowable by the FAA. The use of solid red or pulsating red warning lights at night should be avoided. Current research indicates that solid or pulsating (beacon) red lights attract night-migrating birds at a much higher rate than white strobe lights. Red strobe lights have not yet been studied.

6. Tower designs using guy wires for support which are proposed to be located in known raptor or waterbird concentration areas or daily movement routes, or in major diurnal migratory bird movement routes or stopover sites, should have daytime visual markers on the wires to prevent collisions by these diurnally moving species. (For guidance on markers, see *Avian Power Line Interaction Committee (APLIC). 1994. Mitigating Bird Collisions with Power Lines: The State of the Art in 1994. Edison Electric Institute, Washington, D.C., 78 pp*, and *Avian Power Line Interaction Committee (APLIC). 1996. Suggested Practices for Raptor Protection on Power Lines. Edison Electric Institute/Raptor Research Foundation, Washington, D.C., 128 pp.* Copies can be obtained via the Internet at http://www.eei.org/resources/pubcat/enviro/, or by calling 1-800/334-5453).

7. Towers and appendant facilities should be sited, designed and constructed so as to avoid or minimize habitat loss within and adjacent to the tower "footprint". However, a larger tower footprint is preferable to the use of guy wires in construction. Road access and fencing should be minimized to reduce or prevent habitat fragmentation and disturbance, and to reduce above ground obstacles to birds in flight.

8. If significant numbers of breeding, feeding, or roosting birds are known to habitually use the proposed tower construction area, relocation to an alternate site should be recommended. If this is not an option, seasonal restrictions on construction may be advisable in order to avoid disturbance during periods of high bird activity.

9. In order to reduce the number of towers needed in the future, providers should be encouraged to design new towers structurally and electrically to accommodate the applicant/licensee's antennas and comparable antennas for at least two additional users (minimum of three users for each tower structure), unless this design would require the addition of lights or guy wires to an otherwise unlighted and/or unguyed tower.

10. Security lighting for on-ground facilities and equipment should be down-shielded to keep light within the boundaries of the site.

11. If a tower is constructed or proposed for construction, Service personnel or researchers from the Communication Tower Working Group should be allowed access to the site to evaluate bird use, conduct dead-bird searches, to place net catchments below the towers but above the ground, and to place radar, Global Positioning System, infrared, thermal imagery, and acoustical monitoring equipment as necessary to assess and verify bird movements and to gain information on the impacts of various tower sizes, configurations, and lighting systems.

12. Towers no longer in use or determined to be obsolete should be removed within 12 months of cessation of use.

In order to obtain information on the extent to which these guidelines are being implemented, and to identify any recurring problems with their implementation which may necessitate modifications, letters provided in response to requests for evaluation of proposed towers should contain the following request:

> "In order to obtain information on the usefulness of these guidelines in preventing bird strikes, and to identify any recurring problems with their implementation which may necessitate modifications, please advise us of the final location and specifications of the proposed tower, and which of the measures recommended for the protection of migratory birds were implemented. If any of the recommended measures can not be implemented, please explain why they were not feasible."

** Please note that the above information can be found at the following website: http://migratorybirds.fws.gov/issues/towers/comtow.html*

TOWER SITE EVALUATION FORM

1. Location (Provide maps if possible):
State:_____County:_____ Latitude/Longitude/GPS Grid:_____City and Highway Direction (2 miles W on Hwy 20, etc.)

2. Elevation above mean sea level: _____

3. Will the equipment be co-located on an existing **FCC licensed** tower or other existing structure (building, billboard, etc.)? (y/n)_____ If yes, type of structure:
If yes, no further information is required.

4. If no, provide proposed specifications for new tower:
Height: _____ Construction type (lattice, monopole, etc.):
_____
Guy-wired? (y/n)_____ No. bands:_____ Total No. Wires:
Lighting (Security & Aviation):
_____

If tower will be lighted or guy-wired, complete items 5-19. If not, complete only items 19 and 20.

5. Area of tower footprint in acres or square feet:_____

6. Length and width of access road in feet:_____

7. General description of terrain - mountainous, rolling hills, flat to undulating, etc. Photographs of the site and surrounding area are beneficial:

8. Meteorological conditions (incidence of fog, low ceilings, etc.):

9. Soil type(s):

10. Habitat types and land use on and adjacent to the site, by acreage and percentage of total:

11. Dominant vegetative species in each habitat type:

12. Average diameter breast height of dominant tree species in forested areas:

13. Will construction at this site cause fragmentation of a larger block of habitat into two or more smaller blocks? (y/n)_____ If yes, describe:

14. Is evidence of bird roosts or rookeries present? (y/n)_____ If yes, describe:
15. Distance to nearest wetland area (forested swamp, marsh, riparian, marine, etc.), and coastline if applicable:

16. Distance to nearest telecommunications tower:

17. Potential for co-location of antennas on existing towers or other structures:

18. Have measures been incorporated for minimizing impacts to migratory birds? (y/n)
If yes, describe:

19. Has an evaluation been made to determine if the proposed facility may affect listed or proposed endangered or threatened species or their habitats as required by FCC regulation at 47 CFR 1.1307(a)(3)? (y/n) _____ If yes, present findings:

20. Additional information required:

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office
9721 Executive Center Drive North
St. Petersburg, FL 33702
(727) 570-5312, FAX 570-5517
http://caldera.sero.nmfs.gov

JUN 16 2003

Dear Colleague:

The National Marine Fisheries Service (NOAA Fisheries) Protected Resources Division has reviewed your letter pursuant to section 7(a)(2) of the Endangered Species Act (ESA) concerning EA for Deepwater Port License Application for El Paso Energy Bridge, Gulf of Mexico LLC, dated May 29, 2003.

✓ We cannot determine impacts to threatened or endangered species, or designated critical habitat, under NOAA Fisheries' purview because the letter lacks sufficient information to evaluate the project. **Enclosed are guidelines to conduct a proper biological evaluation.**

✓ **As requested, enclosed is a list of federally-protected species under the jurisdiction of NOAA Fisheries for the state of** Louisiana. Biological information on federally-protected sea turtles, sturgeon, sawfish, and other listed species and candidate species can be found at the following website addresses: NOAA Fisheries Southeast Regional Office (http://caldera.sero.nmfs.gov/protect/protect.htm); NOAA Fisheries Office of Protected Resources (http://www.nmfs.noaa.gov/prot_res/prot_res.html); U.S. Fish and Wildlife Service (http://noflorida.fws.gov/SeaTurtles/seaturtle-info.htm), http://endangered.fws.gov/wildlife.html#Species; the Ocean Conservancy (http://www.cmc-ocean.org/main.php3); the Caribbean Conservation Corporation (http://www.cccturtle.org/); Florida Fish and Wildlife Conservation Commission (http://floridaconservation.org/psm/turtles/turtle.htm); http://www.turtles.org; http://www/seaturtle.org; http://alabama.fws.gov/gs/; http://obis.env.duke.edu/data/sp_profiles.php; www.mote.org/~colins/Sawfish/SawfishHomePage.html; www.floridasawfish.com; www.flmnh.ufl.edu/fish/sharks/InNews/sawprop.htm.

It is NOAA Fisheries' opinion that the project will have no effect on listed species or critical habitat protected by the ESA under NOAA Fisheries' purview. No further consultation with NOAA Fisheries pursuant to section 7(a)(2) of the ESA is required. Consultation with NOAA Fisheries, Habitat Conservation Division, pursuant to the Magnuson-Stevens Fishery Conservation and Management Act's requirements for **essential fish habitat** consultation (16 U.S.C. 1855 (b)(2) and 50 CFR 600.905-.930, subpart K), may be required. Please contact our Habitat Conservation Division at (727) 570-5317.

If you have any questions, please contact the ESA section 7 coordinator, Eric Hawk, at (727) 570-5312, or by e-mail at eric.hawk@noaa.gov.

Sincerely,

Georgia Cranmore
Assistant Regional Administrator
for Protected Resources

✓ Enclosure BA guidelines; LA species list
File:1514-22 ~~b. General correspondence~~ H. USCG
O:\forms\no-effect letter.wpd
I/SER/2003

Endangered and Threatened Species and Critical Habitats under the Jurisdiction of the National Marine Fisheries Service

Louisiana

Listed Species	Scientific Name	Status	Date Listed
Marine Mammals			
blue whale	*Balaenoptera musculus*	Endangered	12/02/70
finback whale	*Balaenoptera physalus*	Endangered	12/02/70
humpback whale	*Megaptera novaeangliae*	Endangered	12/02/70
sei whale	*Balaenoptera borealis*	Endangered	12/02/70
sperm whale	*Physeter macrocephalus*	Endangered	12/02/70
Turtles			
green sea turtle	*Chelonia mydas*	Threatened[1]	07/28/78
hawksbill sea turtle	*Eretmochelys imbricata*	Endangered	06/02/70
Kemp's ridley sea turtle	*Lepidochelys kempii*	Endangered	12/02/70
leatherback sea turtle	*Dermochelys coriacea*	Endangered	06/02/70
loggerhead sea turtle	*Caretta caretta*	Threatened	07/28/78
Fish			
gulf sturgeon	*Acipenser oxyrinchus desotoi*	Threatened	09/30/91

Species Proposed for Listing

None

Designated Critical Habitat

None

Proposed Critical Habitat

Gulf Sturgeon: A proposed rule designating Gulf sturgeon critical habitat was published on June 6, 2002 (67 FR 39106) and 14 geographic areas (units) among the Gulf of Mexico rivers and tributaries were identified. Maps and details regarding the proposed rule can be found at alabama.fws.gov/gs

Candidate Species[1]	Scientific Name
Fish	
dusky shark	*Carcharhinus obscurus*
sand tiger shark	*Odontaspis taurus*
night shark	*Carcharinus signatus*
speckled hind	*Epinephelus drummondhayi*
saltmarsh topminnow	*Fundulus jenkensi*
Goliath grouper	*Epinephelus itajara*
Warsaw grouper	*Epinephelus nigritus*
largetooth sawfish	*Pristis perroteti*

1. Candidate species are not protected under the Endangered Species Act, but concerns about their status indicate that they may warrant listing in the future. Federal agencies and the public are encouraged to consider these species during project planning so that future listings may be avoided.

---

[1] Green turtles are listed as threatened, except for breeding populations of green turtles in Florida and on the Pacific Coast of Mexico, which are listed as endangered.

National Marine Fisheries Service
Recommendations for the Contents of
Biological Assessments and Biological Evaluations

When preparing a Biological Assessment (BA) or Biological Evaluation (BE), keep in mind that the people who read or review this document may not be familiar with the project area or what is proposed by the project. Therefore your BA or BE should present a clear line of reasoning that explains the proposed project and how you determined the effects of the project on each threatened or endangered species in the project area. Try to avoid technical jargon not readily understandable to people outside your agency or area of expertise. Remember, this is a **public document**. Some things to consider and, if appropriate, to include in your BA or BE follow.

1. What is the difference between a Biological Evaluation and a Biological Assessment?

By regulation, a Biological Assessment is prepared for "major construction activities" considered to be Federal actions significantly affecting the quality of the human environment as referred to in the National Environmental Policy Act of 1969 (NEPA) [(42 U.S.C. 4332(2)(C)]. A BA is required if listed species or critical habitat may be present in the action area. A BA also may be recommended for other activities to ensure the agency's early involvement and increase the chances for resolution during informal consultation. Recommended contents for a BA are described in 50 CFR §402.12(f).

Biological Evaluation is a generic term for all other types of analyses. Although agencies are not required to prepare a Biological Assessment for non-construction activities, **if a listed species or critical habitat is likely to be affected, the agency must provide the Service with an evaluation on the likely effects of the action.** Often this information is referred to as a BE. The Service uses this documentation along with any other available information to decide if concurrence with the agency's determination is warranted. Recommended contents are the same as for a BA, as referenced above.

The BAs and BEs should not be confused with Environmental Assessments (EA) or Environmental Impact Statements (EIS) which may be required for NEPA projects. These EAs and EISs are designed to provide an analysis of multiple possible alternative actions on a variety of environmental, cultural, and social resources, and often use different definitions or standards.

2. What are you proposing to do?

- Describe the project. A project description will vary, depending on the complexity of the project. For example, describing the placement and construction of a new microwave tower may be relatively simple, but describing an alternative for improving range management likely would be more detailed and complex. Include sketches if they will help others understand your proposed action and its relationship with the species' habitat.

- How are you (or the project proponent) planning on carrying out the project? What tools or methods may be used? How will the site be accessed?

- Describe the project area. Always include a map (topographic maps are particularly helpful). Provide photographs including aerials, if available. Describe the project area (i.e., topography, vegetation, condition/trend).

- Describe current management or activities relevant to the project area. How will your project change the area?

- Supporting documents are very helpful. If you have a mining plan, research proposal, NEPA or other planning document or any other documents regarding the project, attach them to the BA or BE.

3. What threatened or endangered species may occur in the project area?

A request for a species list may be submitted to the Service, or the Federal action agency or its designated representative may develop the list. If you have information to develop your own lists, the Service should be contacted periodically to ensure that changes in species' status or additions/deletions to the list are included. Sources of information include, but are not limited to, the Forest Service or Bureau of Land Management, this office for marine species, members of the public or academic community, and books and various informational booklets. Due to budget constraints and staff shortages, we are only able to provide general, state-wide, or country-wide (territory-wide) species lists.

Use your familiarity with the project area when you develop your species lists. Sometimes a species may occur in the larger regional area near your project, but the habitat necessary to support the species is not in the project area (including areas that may be beyond the immediate project boundaries, but within the area of influence of the project). If, for example, you know that the specific habitat type used by a species does not occur in the project area, it does not need to appear on the species list for the project. However, documentation of your reasoning is helpful for Service biologists or anyone else that may review the document.

4. Have you surveyed for species that are known to occur or have potential habitat in the proposed project area?

The "not known to occur here" approach is a common flaw in many BA/BEs. The operative word here is "known." Unless adequate surveys have been conducted or adequate information sources have been referenced, this statement is difficult to interpret. It begs the questions "Have you looked?" and "How have you looked?" Always reference your information sources.

Include a clear description of your survey methods so the reader can have confidence in your results. Answer such questions as:

- How intensive was the survey? Did you look for suitable habitat or did you look for individuals? Did the survey cover the entire project area or only part of it? Include maps of areas surveyed if appropriate.

- Who did the surveys and when? Was the survey done during the time of year/day when the plant is growing or when the animal can be found (its active period)? Did the survey follow accepted protocols?

- If you are not sure how to do a good survey for the species, the Service recommends contacting species experts. Specialized training is required before you can obtain a permit to survey for some species.

- *Remember that your evaluation of potential impacts from a project does not end if the species is/are not found in the project area. You must still evaluate what effects would be expected to the habitat, even if it is not known to be occupied.*

5. Provide background information on the threatened or endangered species in the project area.

Describe the species in terms of overall range and population status. How many populations are known? How many occur in the project area? What part of the population will be affected by this project? Will the population's viability be affected? What is the current habitat condition and population size and status? Describe related items of past management for the species, such as stocking programs, habitat improvements, or loss of habitat or individuals caused by previous projects.

6. How will the project affect the threatened or endangered species or critical habitat that occurs in the project area?

- If you believe the project will not affect the species, explain why.

- If you think the project may affect the species, explain what the effects might be. The Endangered Species Act requires you consider <u>all</u> effects when determining if an action funded, permitted, or carried out by a Federal agency may affect listed species. Effects you must consider include direct, indirect, and cumulative effects. Effects include those caused by interrelated and interdependent actions, not just the proposed action. Direct effects are those caused by the action and occur at the same time and place as the action. Indirect effects are caused by the action and are later in time but are reasonably certain to occur. Interrelated actions are those that are part of a larger action and depend on the

larger action for their justification. Interdependent actions are those that have no significant independent utility apart from the action under consideration. Cumulative effects are those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal actions subject to consultation.

- Describe measures taken to avoid, reduce, or eliminate adverse effects or enhance beneficial effects to the species. Refer to conversations you had with species experts to achieve these results.

- Consider recovery potential if the project area contains historic range for a species.

- Evaluate designated critical habitat areas by reviewing the physical or biological features essential to the conservation of the species. *Even if no critical habitat has been designated for a species, the evaluation of the project effects must include effects to the habitat, not just the species.*

7. What is your decision? The Federal action agency must make a determination of effect.

Quite frequently, effect determinations are not necessarily *wrong;* they simply are not justified in the assessment. The assessment should lead the reviewer through a discussion of effects to a logical, well-supported conclusion. Do not assume that the Service biologist is familiar with the project and/or its location and that there is no need to fully explain the impact the project may have on listed species. If there is little or no connection or rationale provided to lead the reader from the project description to the effect determination, we cannot assume conditions that are not presented in the assessment. Decisions must be justified biologically. The responsibility for making the determination of effect falls on the Federal action agency; however, the Service may ask the agency to revisit its decision or provide more data if the conclusion is not adequately supported by biological information.

You have three choices for each listed species or area of critical habitat:

1. "No effect" means there are absolutely no effects of the project, positive or negative. "No effect" does not include a *small* effect or an effect that is *unlikely* to occur. If effects are insignificant (in size) or discountable (extremely unlikely), a "may affect, but not likely to adversely affect" determination is appropriate.

2. "May affect - is not likely to adversely affect" means that all effects are beneficial, insignificant, or discountable. Beneficial effects have concurrent positive effects without any adverse effects to the species or habitat (i.e., there can not be "balancing," wherein the benefits of the project would be expected to outweigh the adverse effects - see #3 below). Insignificant effects relate to the size of the impact (and should not reach the

scale where take occurs). Discountable effects are those extremely unlikely to occur. These determinations require **written** concurrence from the Service. Based on best judgement, a person would not: (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur.

3. "May affect - is likely to adversely affect" means that all adverse effects can not be avoided. A combination of beneficial and adverse effects is still "likely to adversely affect," even if the net effect is neutral or positive. Adverse effects do not qualify as discountable simply because we are not certain they will occur. The probability of occurrence must be extremely small to achieve discountability. Likewise, adverse effects do not meet the definition of insignificant because they are less than major. If the adverse effect can be detected in any way or if it can be meaningfully articulated in a discussion of the results, then it is not insignificant, it is likely to adversely affect. This requires formal consultation with the Service.

A fourth finding is possible for proposed species or proposed critical habitat:

4. "Is likely to jeopardize/adversely modify proposed species/critical habitat" is the appropriate conclusion when the action agency identifies situations in which the proposed action is likely to jeopardize the proposed species, or destroy or adversely modify the proposed critical habitat. If this conclusion is reached, conference is required.

List the species experts you contacted when preparing the BE or BA but avoid statements that place the responsibility for the decision of "may affect" or "no effect" on the shoulders of the species experts. Remember, this decision is made by the Federal action agency.

Provide supporting documentation, especially any agency reports or data that may not be available to the Service. Include a list of literature cited.

Prepared by:
U.S. Fish and Wildlife Service
Arizona Ecological Services Field Office
January 1997

Revised by:
U.S. Fish and Wildlife Service
New Mexico Ecological Services Field Office
2105 Osuña NE
Albuquerque, New Mexico 87113
(505) 761-4525
April 1997

Revised by:
National Marine Fisheries Service
Southeast Regional Office
Protected Resources Division
9721 Executive Center Dr. N.
St. Petersburg, FL 33702
(727) 570-5312
November 1998

OUTLINE EXAMPLE
FOR A
BIOLOGICAL ASSESSMENT OR BIOLOGICAL EVALUATION

A. Cover Letter - **VERY IMPORTANT** - Include purpose of consultation, project title, and consultation number (if available). A determination needs to be made for each species. You have three options: 1) a "no effect" determination; 2) requesting concurrence with an "is not likely to adversely affect" determination; 3) a "may affect, is likely to adversely affect" determination, and a request for formal consultation. If proposed species or critical habitat are included, state whether the project is likely to result in jeopardy to proposed species, or the destruction or adverse modification of proposed critical habitat.

B. Project Description - Describe the proposed action and the project area. Be specific and quantify whenever possible.

B. For Each Species

1. Description of affected environment (quantify whenever possible)
2. Description of species biology
3. Describe current conditions for each species
   a. Rangewide
   b. In project area
   c. Cumulative effects of State and private actions in project area
   d. Other consultations of Federal action agency in area to date
4. Describe critical habitat (if applicable)
5. Describe effects of proposed action on each species and/or critical habitat.
   a. Direct
   b. Indirect
   c. Interrelated and interdependent actions
   d. Incidental take

D. Conservation Measures (protective measures to minimize effects for each species)

E. Conclusions (effects determination for each species)

F. Literature Cited

F. List of Contacts Made/Preparers

F. Maps/ Photographs

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2003 JUN 20 P 4:19

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
9721 Executive Center Drive North
St. Petersburg, Florida 33702

June 20, 2003 F/SER44/KS:jk
225/389-0508

USCG-2003-14294-4

Commander Mark A. Prescott
Department of Homeland Security
U.S. Coast Guard, Commandant (G-MSO-2)
Vessels and Facilities Operating Standards Division
2100 Second Street, SW
Washington, D.C. 20593-0001

Dear Commander Prescott:

The National Marine Fisheries Service (NOAA Fisheries) has received the Notice of Application (NOA) and request for public comment for the El Paso Energy Bridge Gulf of Mexico LLC Deepwater Port license application (68 FR 3299; USCG-2003-14294) dated May 29, 2003. The NOA indicates that the U.S. Coast Guard (USCG) and the Maritime Administration (MARAD) are reviewing the license application for the construction of a liquefied natural gas (LNG) deepwater port and appurtenant structures to be located approximately 146 miles south of Lake Charles, Louisiana. The proposed project would include the construction of a submerged turret loading buoy with flexible riser piping and a meter station platform in Outer Continental Shelf (OCS) block West Cameron 603. Approximately 7.3 miles of 20-inch pipeline would be installed to direct natural gas from vessels unloading at the deepwater terminal to existing gas supply systems in the Gulf of Mexico and southern Louisiana. Portions of the pipeline would extend through OCS blocks West Cameron 600, 601, 602, and East Cameron 335. The USCG and MARAD are requesting comments on resources and issues to be addressed in the Environmental Assessment (EA) for this proposed action.

NOAA Fisheries recommends the EA issued for the proposed project address the following resources and issues of concern:

Based on our review of the NOA, the El Paso Energy Bridge Gulf of Mexico Environmental Report, and our knowledge of the project area, we have developed the following list of species and life stages for which Essential Fish Habitat (EFH) has been designated in the project area:

Managed Species	Life Stages
brown shrimp	eggs, larvae, adults
white shrimp	larvae
red drum	eggs, adults

red snapper	all life stages
gray snapper	eggs, larvae, adults
lane snapper	eggs, adults
greater amberjack	all life stages
lesser amberjack	all life stages
gray triggerfish	all life stages
king mackerel	eggs, larvae, juveniles, adults
cobia	all life stages
dolphin	all life stages
bluefish	eggs, adults
little tunny	all life stages
Atlantic bluefin tuna	eggs, larvae, spawning adults

Categories of EFH in the project area include unconsolidated marine water bottoms, natural structural features (e.g., hardbottom and shoal areas), and marine water column. Detailed information on EFH for Federally managed shrimp, red drum, reef fish, and coastal migratory pelagic species is provided in the 1998 generic amendment of the Fishery Management Plans (FMPs) for the Gulf of Mexico prepared by the Gulf of Mexico Fishery Management Council. Information on EFH for Atlantic bluefin tuna is contained in the Atlantic Tunas, Swordfish, and Sharks FMP prepared by the Secretary of Commerce. The generic amendment and the Atlantic Tunas, Swordfish, and Sharks FMP were prepared as required by the Magnuson-Stevens Fishery Conservation and Management Act (P.L. 104-297).

We recommend the EA include sections titled "Essential Fish Habitat" and "Marine Fishery Resources" that describe the potential impacts of the proposed project on the sub-categories of EFH (e.g., non-vegetated water bottoms, geologic features, continental shelf features, marine water column, etc.) and marine fishery species within the project area. These sections should analyze the potential impacts of the proposed project on Federally managed species and life stages which utilize these sub-categories of EFH, and fully evaluate alternative measures to avoid, minimize, and offset adverse impacts to EFH and marine fishery species in the Gulf of Mexico. This descriptive and analytical information, coupled with a statement of the agency's conclusions regarding the effects of the action on EFH and marine fishery species, would provide the basic details necessary for an EFH assessment pursuant to the requirements of 50 CFR 600.920(e).

Impingement and entrainment of marine organisms is a major concern for structures that utilize large quantities of seawater and should be addressed in the EA for the proposed project. The Energy

Bridge Gulf of Mexico Environmental Report states that vessels utilizing the proposed deepwater port will be capable of operating in both open-loop and closed-loop regasification modes. The closed-loop mode will only be utilized when seawater temperatures are less than 42 degrees Fahrenheit. However, vessels operating in the closed-loop mode avoid impacts to marine fishery species from impingement and entrainment, and are capable of regasifying LNG with only slightly less efficiency than vessels operating in the open-loop mode. The EA for the Energy Bridge Gulf of Mexico deepwater port should evaluate alternative criteria for regasification operational modes, including requiring the sole use of closed-loop regasification systems. Detailed justification should be provided in the EA for the selection or elimination of alternatives for regasification operational modes.

The EA should evaluate the potential impacts to marine fishery species from impingement and entrainment associated with any alternative that incorporates the use of the open-loop regasification system. The open-loop configuration of the regasification process will utilize seawater at a rate of approximately 12,000 cubic meters per hour. The Energy Bridge Gulf of Mexico Environmental Report states that vessels will require six to eight days to fully unload regasified LNG, but does not state the expected frequency of port utilization by LNG vessels. This information should be provided in the EA in order to fully assess potential impacts to marine fishery species. In addition, the seawater intake velocity of 1.2 meters per second greatly exceeds the intake velocity of 0.5 feet per second (0.15 meters per second) recommended by the U.S. Environmental Protection Agency[1] to minimize entrainment of marine organisms. The 21 mm spacing of the metal grate covering the seawater intake is too large to be effective at excluding the eggs, larvae, and juveniles of marine fishery species from impingement and entrainment in the regasification system. The EA should evaluate a full range of alternatives for the design requirements of vessels utilizing the proposed Energy Bridge Gulf of Mexico LNG terminal that would avoid and minimize impacts to eggs, larvae, and juveniles of marine fishery species, including: organism exclusion mechanisms; the siting and design of intake and discharge areas; operational schedules for removing impinged organisms; and closed-loop versus open-loop regasification systems. Alternative designs for the vessels should be evaluated in relation to the vertical distribution of eggs, larvae, and juveniles of marine fishery species in the water column and the rheotactic response of non-passive swimming organisms to horizontal versus vertical currents at intake and discharge areas. The analysis of the design alternatives should include quantification of impacts to marine fishery populations. Clear rationale should be provided for the selection or elimination of design alternatives.

The effects of thermal discharge on marine fishery species also should be addressed in the EA. Seawater used in the open-loop regasification process will be approximately 14 degrees Fahrenheit cooler than ambient seawater. Eggs, larvae, and juveniles of various marine species may be particularly vulnerable to rapid and/or extreme temperature changes. In addition, seawater will be treated with copper and aluminum during the regasification process to prevent biofouling before being discharged back into the environment. The biological consequences of temperature change

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[1]U.S. Environmental Protection Agency. 1973. Reviewing Environmental Impact Statements- Power Plant Cooling Systems, Engineering Aspects. Pacific Northwest Environmental Research Laboratory, Corvallis, OR, 93 p.

and biocide contamination of the thermal discharge on marine fishery species should be quantified in the EA and minimized to the maximum extent practicable. Sole utilization of the closed-loop regasification system, which would eliminate impacts to marine fishery species from temperature change and biocide contamination of the thermal discharge, should be evaluated in the document.

NOAA Fisheries appreciates the opportunity to provide you with preliminary information regarding resources and issues of concern for the proposed Energy Bridge Gulf of Mexico project. We look forward to reviewing the draft EA. If you have any questions regarding our comments, please contact Kelly Shotts at (225) 389-0508.

Sincerely,

for Patrick Williams

Frederick C. Sutter, III
Deputy Regional Administrator

c:
FWS, Lafayette
EPA, Dallas - Lawrence
LA DNR - Consistency
F/SF1 - Rogers
F/SER3 - Cranmore
F/SER4
Files

United States Department of State

Bureau of Oceans and International Environmental and Scientific Affairs

Washington, D.C. 20520

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JUL 30 2003

USCG-2003-14294-7

Rear Admiral Thomas H. Gilmour, USCG
Commandant (G-M)
U.S. Coast Guard
2100 Second Street SW
Washington, DC 20593-0001

Dear Admiral Gilmour:

This letter serves as the State Department's response to Admiral Pluta's and Ms. Margaret Blum's letter of February 5,2003 regarding the application of El Paso Energy Bridge Gulf of Mexico, LLC for a license to establish a natural gas deepwater port in the Gulf of Mexico. This letter also serves to fulfill the State Department's requirements under Section 106(e)(1) of the Maritime Transportation Security Act of 2002 (PL 107-295), which requires the Department of State to transmit to the Department of Transportation written comments as to the expertise or jurisdiction of the Department of State concerning the construction or operation of deepwater ports for natural gas pursuant to the Deepwater Port Act of 1974 (33 U.S.C. 1501 et seq.)(DWPA). A substantively identical letter is being sent to MARAD.

The El Paso Energy Bridge Gulf of Mexico proposes to establish a deepwater port with a submerged turret natural gas loading system approximately 110 miles off the coast of Louisiana, in the United States Exclusive Economic Zone. The loading system would be connected to a submerged metering system, then tied into two existing natural gas pipelines for further transmission ashore. After reviewing their application of December 20, 2002, and subject to the comments below, the Department of State concludes that the application is adequate, and that the issuance of a license pursuant to 33 U.S.C. 1503 will have no adverse effect on programs within the jurisdiction of the Department of State. Our specific comments follow.

The DWPA at 33 U.S.C. 1505(a) requires the Department of Transportation to consult with the Department of State regarding the environmental review criteria established at Appendix A to 33 CFR Part 148 for aspects over which the Department of State has jurisdiction. The Department of State serves as the primary Executive Branch coordinator for and determines U.S. foreign policy regarding several of the criteria listed in the DWPA, including but not limited to effects on the marine environment, effects on alternate uses of the oceans, such as scientific study, fishing and exploitation of other living and non-living resources, effects of land-based developments related to deepwater port development and effects on human health and welfare.

We find the environmental review criteria for deepwater ports in Appendix A of 33 CFR 148 to be adequate. Further, after review of the El Paso Energy Bridge Gulf of Mexico license application, the Department of State determines that granting the license will not have significant adverse effects regarding United States foreign policy with regard to the criteria described above, to include global and regional fisheries agreements, international agreements for the prevention of marine pollution and international agreements regarding oceanographic research and study.

The DWPA at 33 U.S.C. 1509(d)(1) requires the Secretary of Transportation to designate, after consultation with the Secretary of State, among others, a zone of appropriate size around any deepwater port for navigation safety, and in accordance with recognized principles of international law. Under international law, such zones are governed by three principal sources: the United Nations Convention on the Law of the Sea, 1982 (UNCLOS), specifically Articles 22, 60 and 211; the International Convention on the Safety of Life at Sea, 1974, Annex, Chapter 5, primarily Regulation V/10; and the General Provisions on Ship's Routeing, adopted by the International Maritime Organization (IMO) pursuant to Assembly Resolution A.572(14), as amended. The Department of State, as the lead agency for policy matters involving UNCLOS, and as the coordinator for matters involving the IMO, has specific expertise and jurisdiction in these matters.

El Paso Energy Bridge Gulf of Mexico proposes three zones or routeing measures in its application. The first is a safety zone 500 meters in radius around the deepwater port where all marine traffic except vessels supporting Energy Bridge would be excluded. The second is a "navigation zone" 3 kilometers in radius, which would be free of all permanent installations to enable unobstructed navigation of vessels entering the deepwater port. The third is a "temporary surface craft exclusion zone," also 3 kilometers in radius around the deepwater port, to apply to all vessels except those supporting the Energy Bridge, and to be in effect whenever an Energy Bridge vessel is in the 3 kilometer zone.

Any ship's routeing measure established outside the U.S. territorial sea requires approval and adoption by the IMO, through its Safety of Navigation Subcommittee and its Maritime Safety Committee. As ship's routeing measures, the proposed "safety zone" and "surface vessel exclusion zone" would require such IMO approval, and the Department of State will assist in the forwarding and negotiation of such measures at the IMO, with a view toward adoption. The proposed "navigation zone" appears to apply only to permanent installations. Article 60 of UNCLOS governs such installations. While not a party to UNCLOS, the United States recognizes UNCLOS as reflective of customary international law. Article 60 states that coastal States shall have exclusive jurisdiction and right to regulate such installations. Thus, the "navigation zone" may be considered under domestic law without referral to IMO.

The El Paso Energy Bridge Gulf of Mexico proposal for a safety zone appears to be in compliance with international law and may be forwarded to IMO as such. There is no provision under international law for the creation of a "temporary ship exclusion zone." It appears to be analogous to a mandatory area to be avoided. We recommend that the proposal be recast as such and brought forward to the IMO for approval.

Pursuant to Article 60(7) of UNCLOS, neither the safety zone" nor the "temporary ship exclusion zone" appears to interfere with use of any established sea lanes essential to international navigation. However, in its application, El Paso Energy Bridge Gulf of Mexico indicates that it will establish, without seeking Coast Guard approval, a 10 kilometer radius "security and watch zone,"

maintained during periods when a vessel is moored to the deepwater port. It is unclear from the application whether this "security and watch zone" will interfere with navigation in the safety fairway described at 33 CFR 166.200(12) and shown in Exhibit I of the proposal. A statement indicating that the "security and watch zone" will not interfere with navigation in that fairway should be sought from the applicants.

The DWPA at 33 U.S.C. 1518(a)(3) requires the Secretary of State to notify the government of each foreign state having vessels under its authority or flying its flag that may call at a deepwater port, that the United States intends to exercise jurisdiction over such vessels. The notification shall indicate that, absent the foreign State's objection, its vessels will be subject to U.S. jurisdiction whenever calling at the deepwater port or within the 500 meter safety zone and using or interfering with the use of the deepwater port. Further, Section 1518(c)(2) states that entry by a vessel into the deepwater port is prohibited unless a bilateral agreement between the flag State of the vessel and the United States is in force, or if the flag State does not object to the exercise of U.S. jurisdiction.

Title 33 U.S.C. Section 1518 precedes the entry into force of UNCLOS article 60, which grants coastal States the exclusive right to construct and to authorize and regulate installations and structures in its Exclusive Economic Zone, including deepwater ports. It also precedes the designation of the Exclusive Economic Zone of the United States, which grants us certain rights and jurisdiction under customary international law, as stated in UNCLOS Part V. While Article 60(7) indicates that a deepwater port does not have the status of an island, has no territorial sea of its own, and its presence does not affect the delimitation of the territorial sea, the exclusive economic zone or the continental shelf, the United States interprets Article 12 to mean that any roadstead located outside the territorial sea and used for the loading or unloading of ships is included in the territorial sea.

Thus, any ship calling at a deepwater port in our Exclusive Economic Zone would be subject to U.S. jurisdiction as if it were in the territorial sea. As the proposed El Paso Energy Bridge Gulf of Mexico would be in the Exclusive Economic Zone, this principle would apply

here. Any ship flying the flag of a party to UNCLOS would be subject to Articles 12 and 60 and would be bound to the same jurisdictional principles of 33 U.S.C. Section 1518, thus obviating the need for further bilateral agreements. However, if a ship flying the flag of a non-party to UNCLOS (Liberia, for example) were to call at the deepwater port, the State Department would only object to such calls if the non-party flag State had filed an objection with us.

Pursuant to the DWPA at 33 U.S.C. 1521, upon approval of the license to construct this deepwater port, the State Department will notify the governments of Mexico and Canada of such action, and will invite bilateral or multilateral discussions with them on the subject of natural gas deepwater ports, should either country desire.

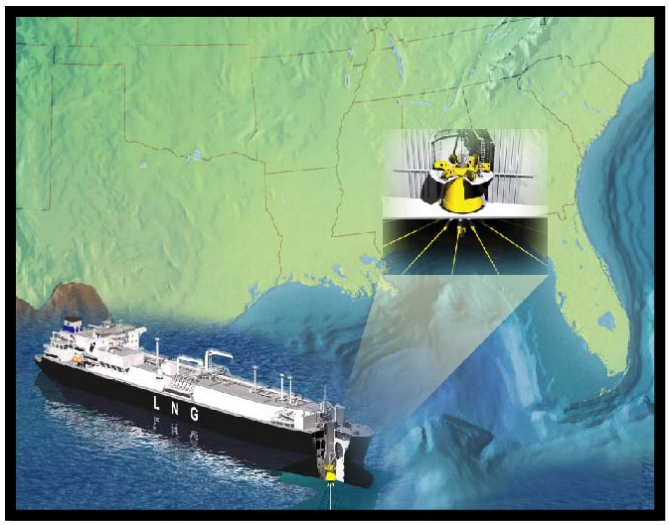
In conclusion, the State Department has no objection to granting a license for the ownership, construction and operation of the El Paso Energy Bridge Gulf of Mexico deepwater port. If you have questions or need further information, my point of contact after September 1 is Steven Poulin in the Office of Oceans Affairs. He can be reached at 202-647-3946 or by e-mail at poulinsj@state.gov.

Sincerely,

Margaret F. Hayes

Margaret F. Hayes
Acting Deputy Assistant Secretary
For Oceans and Fisheries

Appendix C
Threatened and Endangered Species Coordination



United States Department of the Interior

FISH AND WILDLIFE SERVICE
646 Cajundome Blvd.
Suite 400
Lafayette, Louisiana 70506

252139

June 13, 2003

USCG-2003-14294-5

Mark A. Prescott, Commander
U.S. Coast Guard, Commandant (G-MSO-2)
Vessels and Facilities Operating Standards Division
2100 Second Street, SW
Washington, DC 20593-0001

Dear Commander Prescott:

The U.S. Fish and Wildlife Service (Service) has received the joint U.S. Coast Guard (USCG)/Maritime Administration (MARAD) May 29, 2003, Notice of Intent to prepare an Environmental Assessment (EA) in response to a Deepwater Port License Application from El Paso Energy Bridge Gulf of Mexico, L.L.C. (Energy Bridge). Energy Bridge proposes to construct a natural gas receiving and delivery facility, which would include ship mooring facilities, a submerged turret loading system, a flexible riser pipe, and a sub-sea manifold, as well as three offshore natural gas pipelines. The proposed project would be located approximately 146 miles south of Lake Charles, Louisiana, in West Cameron Block 603. The Service has reviewed the information you provided, and offers the following comments in accordance with provisions of the National Environmental Policy Act (NEPA) of 1969 (83 Stat. 852; 42 U.S.C. 4321 et seq.), the Coastal Barrier Resources Act (CBRA) of 1982 (as amended), the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.), and the Migratory Bird Treaty Act (40 Stat. 755, as amended; 16 U.S.C. 703 et seq.).

Because the proposed project would be located approximately 116 miles off the Louisiana Gulf coast, there would likely be no impacts to either the Coastal Barrier Units located on the coasts of Vermilion and Cameron Parishes, or wetlands. Similarly, there are no threatened or endangered species within the Service's purview that are located within the proposed project area. Therefore, no further ESA consultation would be required with the Service unless there are changes in the scope or location of the action, or the action has not been initiated within one year. If the action has not been initiated within one year, follow-up consultation should be accomplished with the Service prior to making expenditures because our threatened and endangered species information is updated annually. Should the scope or location of the proposed action change, consultation should occur as soon as such changes are made.

Endangered and threatened sea turtles forage in the near-shore waters, bays and sounds of Louisiana. Threatened and endangered whales also occur throughout the Gulf of Mexico. The National Marine Fisheries Service is responsible for the above-listed aquatic marine threatened or endangered species. Please contact Eric Hawk (727/570-5312) in St. Petersburg, Florida, for information concerning those species.

Lighting, communication, and/or flare towers associated with the operation of the deepwater port could potentially impact trans-Gulf migratory birds. Impacts from lighting and towers on trans-Gulf migratory birds should, therefore, be addressed and analyzed in the forthcoming EA. For your convenience, the Service has enclosed guidelines to assist you with siting, constructing, operating and decommissioning communication towers.

We appreciate the opportunity to provide these scoping-level comments during the preliminary stages of developing the EA. If you have any questions regarding our comments, please contact Brigette Firmin (337/291-3108) of this office.

Sincerely,

Russell C. Watson
Acting Supervisor
Louisiana Field Office

Enclosure

cc: FWS, Atlanta, GA (ES/HC)
EPA, Dallas, TX
Corps of Engineers, New Orleans, LA
NMFS, Baton Rouge, LA
NMFS, St. Petersburg, FL
LDNR, CMD, Baton Rouge, LA
LDWF, Natural Heritage Program, Baton Rouge, LA

United States Department of Interior
Fish and Wildlife Service
Washington, DC 20240

September 14, 2000

To: Regional Directors
From: Director /s/ Jamie Rappaport Clark
Subject: Service Guidance on the Siting, Construction, Operation and Decommissioning of Communications Towers*

Construction of communications towers (including radio, television, cellular, and microwave) in the United States has been growing at an exponential rate, increasing at an estimated 6 percent to 8 percent annually. According to the Federal Communication Commission's *2000 Antenna Structure Registry*, the number of lighted towers greater than 199 feet above ground level (AGL) currently number over 45,000 and the total number of towers over 74,000. Non-compliance with the registry program is estimated at 24 percent to 38 percent, bringing the total to 92,000 to 102,000. By 2003, all television stations must be digital, adding potentially 1,000 new towers exceeding 1,000 feet AGL.

The construction of new towers creates a potentially significant impact on migratory birds, especially some 350 species of night-migrating birds. Communications towers are estimated to kill 4-5 million birds per year, which violates the spirit and the intent of the Migratory Bird Treaty Act and the Code of Federal Regulations at Part 50 designed to implement the MBTA. Some of the species affected are also protected under the Endangered Species Act and Bald and Golden Eagle Act.

Service personnel may become involved in the review of proposed tower sitings and/or in the evaluation of tower impacts on migratory birds through National Environmental Policy Act review; specifically, Sections 1501.6, opportunity to be a cooperating agency, and 1503.4, duty to comment on federally-licensed activities for agencies with jurisdiction by law, in this case the MBTA, or because of special expertise. Also, the National Wildlife Refuge System Improvement Act requires that any activity on Refuge lands be determined as compatible with the Refuge system mission and the Refuge purpose(s). In addition, the Service is required by the ESA to assist other Federal agencies in ensuring that any action they authorize, implement, or fund will not jeopardize the continued existence of any Federally endangered or threatened species.

A Communication Tower Working Group composed of government agencies, industry, academic researchers and NGO's has been formed to develop and implement a research protocol to determine the best ways to construct and operate towers to prevent bird strikes. Until the research study is completed, or until research efforts uncover significant new mitigation measures, all Service personnel involved in the review of proposed tower sitings and/or the evaluation of the impacts of towers on migratory birds should use the attached interim guidelines when making recommendations to all companies, license applicants, or licensees proposing new tower sitings. These guidelines were developed by Service personnel from research conducted in several eastern, midwestern, and southern states, and have been refined through Regional review. They are based on the best information available at this time, and are the most prudent and effective measures for avoiding bird strikes at towers. We believe that they will provide significant protection for migratory birds pending completion of the Working Group's recommendations. As new information becomes available, the guidelines will be updated accordingly.

Implementation of these guidelines by the communications industry is voluntary, and our recommendations must be balanced with Federal Aviation Administration requirements and local community concerns where necessary. Field offices have discretion in the use of these guidelines on a case by case basis, and may also have additional recommendations to add which are specific to their geographic area.

Also attached is a Tower Site Evaluation Form, which may prove useful in evaluating proposed towers and in streamlining the evaluation process. Copies may be provided to consultants or tower companies who regularly submit requests for consultation, as well as to those who submit individual requests that do not contain sufficient information to allow adequate evaluation. This form is for discretionary use, and may be modified as necessary.

The Migratory Bird Treaty Act (16 U.S.C. 703-712) prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Department of the Interior. While the Act has no provision for allowing unauthorized take, it must be recognized that some birds may be killed at structures such as communications towers even if all reasonable measures to avoid it are implemented. The Service's Division of Law Enforcement carries out its mission to protect migratory birds not only through investigations and enforcement, but also through fostering relationships with individuals and industries that proactively seek to eliminate their impacts on migratory birds. While it is not possible under the Act to absolve individuals or companies from liability if they follow these recommended guidelines, the Division of Law Enforcement and Department of Justice have used enforcement and prosecutorial discretion in the past regarding individuals or companies who have made good faith efforts to avoid the take of migratory birds.

Please ensure that all field personnel involved in review of FCC licensed communications tower proposals receive copies of this memorandum. Questions regarding this issue should be directed to Dr. Benjamin Tuggle, Chief, Division of Habitat Conservation, at (703)358-2161, or Jon Andrew, Chief, Division of Migratory Bird Management, at (703)358-1714. These guidelines will be incorporated in a Director's Order and placed in the Fish and Wildlife Service Manual at a future date.

Service Interim Guidelines For Recommendations On

Communications Tower Siting, Construction, Operation, and Decommissioning

1. Any company/applicant/licensee proposing to construct a new communications tower should be strongly encouraged to collocate the communications equipment on an existing communication tower or other structure (*e.g.,* billboard, water tower, or building mount). Depending on tower load factors, from 6 to 10 providers may collocate on an existing tower.

2. If collocation is not feasible and a new tower or towers are to be constructed, communications service providers should be strongly encouraged to construct towers no more than 199 feet above ground level (AGL), using construction techniques which do not require guy wires (*e.g.,* use a lattice structure, monopole, etc.). Such towers should be unlighted if Federal Aviation Administration regulations permit.

3. If constructing multiple towers, providers should consider the cumulative impacts of all of those towers to migratory birds and threatened and endangered species as well as the impacts of each individual tower.

4. If at all possible, new towers should be sited within existing "antenna farms" (clusters of towers). Towers should not be sited in or near wetlands, other known bird concentration areas (*e.g.,* state or Federal refuges, staging areas, rookeries), in known migratory or daily movement flyways, or in habitat of threatened or endangered species. Towers should not be sited in areas with a high incidence of fog, mist, and low ceilings.

5. If taller (>199 feet AGL) towers requiring lights for aviation safety must be constructed, the minimum amount of pilot warning and obstruction avoidance lighting required by the FAA should be used. Unless otherwise required by the FAA, only white (preferable) or red strobe lights should be used at night, and these should be the minimum number, minimum intensity, and minimum number of flashes per minute (longest duration between flashes) allowable by the FAA. The use of solid red or pulsating red warning lights at night should be avoided. Current research indicates that solid or pulsating (beacon) red lights attract night-migrating birds at a much higher rate than white strobe lights. Red strobe lights have not yet been studied.

6. Tower designs using guy wires for support which are proposed to be located in known raptor or waterbird concentration areas or daily movement routes, or in major diurnal migratory bird movement routes or stopover sites, should have daytime visual markers on the wires to prevent collisions by these diurnally moving species. (For guidance on markers, see *Avian Power Line Interaction Committee (APLIC). 1994. Mitigating Bird Collisions with Power Lines: The State of the Art in 1994. Edison Electric Institute, Washington, D.C., 78 pp*, and *Avian Power Line Interaction Committee (APLIC). 1996. Suggested Practices for Raptor Protection on Power Lines. Edison Electric Institute/Raptor Research Foundation, Washington, D.C., 128 pp.* Copies can be obtained via the Internet at http://www.eei.org/resources/pubcat/enviro/, or by calling 1-800/334-5453).

7. Towers and appendant facilities should be sited, designed and constructed so as to avoid or minimize habitat loss within and adjacent to the tower "footprint". However, a larger tower footprint is preferable to the use of guy wires in construction. Road access and fencing should be minimized to reduce or prevent habitat fragmentation and disturbance, and to reduce above ground obstacles to birds in flight.

8. If significant numbers of breeding, feeding, or roosting birds are known to habitually use the proposed tower construction area, relocation to an alternate site should be recommended. If this is not an option, seasonal restrictions on construction may be advisable in order to avoid disturbance during periods of high bird activity.

9. In order to reduce the number of towers needed in the future, providers should be encouraged to design new towers structurally and electrically to accommodate the applicant/licensee's antennas and comparable antennas for at least two additional users (minimum of three users for each tower structure), unless this design would require the addition of lights or guy wires to an otherwise unlighted and/or unguyed tower.

10. Security lighting for on-ground facilities and equipment should be down-shielded to keep light within the boundaries of the site.

11. If a tower is constructed or proposed for construction, Service personnel or researchers from the Communication Tower Working Group should be allowed access to the site to evaluate bird use, conduct dead-bird searches, to place net catchments below the towers but above the ground, and to place radar, Global Positioning System, infrared, thermal imagery, and acoustical monitoring equipment as necessary to assess and verify bird movements and to gain information on the impacts of various tower sizes, configurations, and lighting systems.

12. Towers no longer in use or determined to be obsolete should be removed within 12 months of cessation of use.

In order to obtain information on the extent to which these guidelines are being implemented, and to identify any recurring problems with their implementation which may necessitate modifications, letters provided in response to requests for evaluation of proposed towers should contain the following request:

> "In order to obtain information on the usefulness of these guidelines in preventing bird strikes, and to identify any recurring problems with their implementation which may necessitate modifications, please advise us of the final location and specifications of the proposed tower, and which of the measures recommended for the protection of migratory birds were implemented. If any of the recommended measures can not be implemented, please explain why they were not feasible."

** Please note that the above information can be found at the following website: http://migratorybirds.fws.gov/issues/towers/comtow.html*

TOWER SITE EVALUATION FORM

1. Location (Provide maps if possible):
State:_____County:_____ Latitude/Longitude/GPS Grid:_____City and Highway Direction (2 miles W on Hwy 20, etc.)

2. Elevation above mean sea level: _____

3. Will the equipment be co-located on an existing **FCC licensed** tower or other existing structure (building, billboard, etc.)? (y/n)_____ If yes, type of structure:
If yes, no further information is required.

4. If no, provide proposed specifications for new tower:
Height: _____ Construction type (lattice, monopole, etc.):
_____
Guy-wired? (y/n)_____ No. bands:_____ Total No. Wires:
Lighting (Security & Aviation):
_____

If tower will be lighted or guy-wired, complete items 5-19. If not, complete only items 19 and 20.

5. Area of tower footprint in acres or square feet:_____

6. Length and width of access road in feet:_____

7. General description of terrain - mountainous, rolling hills, flat to undulating, etc. Photographs of the site and surrounding area are beneficial:

8. Meteorological conditions (incidence of fog, low ceilings, etc.):

9. Soil type(s):

10. Habitat types and land use on and adjacent to the site, by acreage and percentage of total:

11. Dominant vegetative species in each habitat type:

12. Average diameter breast height of dominant tree species in forested areas:

13. Will construction at this site cause fragmentation of a larger block of habitat into two or more smaller blocks? (y/n)_____ If yes, describe:

14. Is evidence of bird roosts or rookeries present? (y/n)_____ If yes, describe:
15. Distance to nearest wetland area (forested swamp, marsh, riparian, marine, etc.), and coastline if applicable:

16. Distance to nearest telecommunications tower:

17. Potential for co-location of antennas on existing towers or other structures:

18. Have measures been incorporated for minimizing impacts to migratory birds? (y/n)
If yes, describe:

19. Has an evaluation been made to determine if the proposed facility may affect listed or proposed endangered or threatened species or their habitats as required by FCC regulation at 47 CFR 1.1307(a)(3)? (y/n) _____ If yes, present findings:

20. Additional information required:

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office
9721 Executive Center Drive North
St. Petersburg, FL 33702
(727) 570-5312, FAX 570-5517
http://caldera.sero.nmfs.gov

JUN 16 2003

Dear Colleague:

The National Marine Fisheries Service (NOAA Fisheries) Protected Resources Division has reviewed your letter pursuant to section 7(a)(2) of the Endangered Species Act (ESA) concerning EA for Deepwater Port License Application for El Paso Energy Bridge, Gulf of Mexico LLC, dated May 29, 2003.

✓ We cannot determine impacts to threatened or endangered species, or designated critical habitat, under NOAA Fisheries' purview because the letter lacks sufficient information to evaluate the project. **Enclosed are guidelines to conduct a proper biological evaluation.**

✓ **As requested, enclosed is a list of federally-protected species under the jurisdiction of NOAA Fisheries for the state of** Louisiana. Biological information on federally-protected sea turtles, sturgeon, sawfish, and other listed species and candidate species can be found at the following website addresses: NOAA Fisheries Southeast Regional Office (http://caldera.sero.nmfs.gov/protect/protect.htm); NOAA Fisheries Office of Protected Resources (http://www.nmfs.noaa.gov/prot_res/prot_res.html); U.S. Fish and Wildlife Service (http://noflorida.fws.gov/SeaTurtles/seaturtle-info.htm), http://endangered.fws.gov/wildlife.html#Species; the Ocean Conservancy (http://www.cmc-ocean.org/main.php3); the Caribbean Conservation Corporation (http://www.cccturtle.org/); Florida Fish and Wildlife Conservation Commission (http://floridaconservation.org/psm/turtles/turtle.htm); http://www.turtles.org; http://www/seaturtle.org; http://alabama.fws.gov/gs/; http://obis.env.duke.edu/data/sp_profiles.php; www.mote.org/~colins/Sawfish/SawfishHomePage.html; www.floridasawfish.com; www.flmnh.ufl.edu/fish/sharks/InNews/sawprop.htm.

It is NOAA Fisheries' opinion that the project will have no effect on listed species or critical habitat protected by the ESA under NOAA Fisheries' purview. No further consultation with NOAA Fisheries pursuant to section 7(a)(2) of the ESA is required. Consultation with NOAA Fisheries, Habitat Conservation Division, pursuant to the Magnuson-Stevens Fishery Conservation and Management Act's requirements for **essential fish habitat** consultation (16 U.S.C. 1855 (b)(2) and 50 CFR 600.905-.930, subpart K), may be required. Please contact our Habitat Conservation Division at (727) 570-5317.

If you have any questions, please contact the ESA section 7 coordinator, Eric Hawk, at (727) 570-5312, or by e-mail at eric.hawk@noaa.gov.

Sincerely,

Georgia Cranmore
Assistant Regional Administrator
for Protected Resources

✓ Enclosure BA guidelines; LA species list
File:1514-22 ~~b. General correspondence~~ H. USCG
O:\forms\no-effect letter.wpd
I/SER/2003

Endangered and Threatened Species and Critical Habitats under the Jurisdiction of the National Marine Fisheries Service

Louisiana

Listed Species	Scientific Name	Status	Date Listed
Marine Mammals			
blue whale	*Balaenoptera musculus*	Endangered	12/02/70
finback whale	*Balaenoptera physalus*	Endangered	12/02/70
humpback whale	*Megaptera novaeangliae*	Endangered	12/02/70
sei whale	*Balaenoptera borealis*	Endangered	12/02/70
sperm whale	*Physeter macrocephalus*	Endangered	12/02/70
Turtles			
green sea turtle	*Chelonia mydas*	Threatened[1]	07/28/78
hawksbill sea turtle	*Eretmochelys imbricata*	Endangered	06/02/70
Kemp's ridley sea turtle	*Lepidochelys kempii*	Endangered	12/02/70
leatherback sea turtle	*Dermochelys coriacea*	Endangered	06/02/70
loggerhead sea turtle	*Caretta caretta*	Threatened	07/28/78
Fish			
gulf sturgeon	*Acipenser oxyrinchus desotoi*	Threatened	09/30/91

Species Proposed for Listing

None

Designated Critical Habitat

None

Proposed Critical Habitat

Gulf Sturgeon: A proposed rule designating Gulf sturgeon critical habitat was published on June 6, 2002 (67 FR 39106) and 14 geographic areas (units) among the Gulf of Mexico rivers and tributaries were identified. Maps and details regarding the proposed rule can be found at alabama.fws.gov/gs

Candidate Species[1]	Scientific Name
Fish	
dusky shark	*Carcharhinus obscurus*
sand tiger shark	*Odontaspis taurus*
night shark	*Carcharinus signatus*
speckled hind	*Epinephelus drummondhayi*
saltmarsh topminnow	*Fundulus jenkensi*
Goliath grouper	*Epinephelus itajara*
Warsaw grouper	*Epinephelus nigritus*
largetooth sawfish	*Pristis perroteti*

1. Candidate species are not protected under the Endangered Species Act, but concerns about their status indicate that they may warrant listing in the future. Federal agencies and the public are encouraged to consider these species during project planning so that future listings may be avoided.

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[1] Green turtles are listed as threatened, except for breeding populations of green turtles in Florida and on the Pacific Coast of Mexico, which are listed as endangered.

National Marine Fisheries Service
Recommendations for the Contents of
Biological Assessments and Biological Evaluations

When preparing a Biological Assessment (BA) or Biological Evaluation (BE), keep in mind that the people who read or review this document may not be familiar with the project area or what is proposed by the project. Therefore your BA or BE should present a clear line of reasoning that explains the proposed project and how you determined the effects of the project on each threatened or endangered species in the project area. Try to avoid technical jargon not readily understandable to people outside your agency or area of expertise. Remember, this is a **public document**. Some things to consider and, if appropriate, to include in your BA or BE follow.

1. What is the difference between a Biological Evaluation and a Biological Assessment?

By regulation, a Biological Assessment is prepared for "major construction activities" considered to be Federal actions significantly affecting the quality of the human environment as referred to in the National Environmental Policy Act of 1969 (NEPA) [(42 U.S.C. 4332(2)(C)]. A BA is required if listed species or critical habitat may be present in the action area. A BA also may be recommended for other activities to ensure the agency's early involvement and increase the chances for resolution during informal consultation. Recommended contents for a BA are described in 50 CFR §402.12(f).

Biological Evaluation is a generic term for all other types of analyses. Although agencies are not required to prepare a Biological Assessment for non-construction activities, **if a listed species or critical habitat is likely to be affected, the agency must provide the Service with an evaluation on the likely effects of the action.** Often this information is referred to as a BE. The Service uses this documentation along with any other available information to decide if concurrence with the agency's determination is warranted. Recommended contents are the same as for a BA, as referenced above.

The BAs and BEs should not be confused with Environmental Assessments (EA) or Environmental Impact Statements (EIS) which may be required for NEPA projects. These EAs and EISs are designed to provide an analysis of multiple possible alternative actions on a variety of environmental, cultural, and social resources, and often use different definitions or standards.

2. What are you proposing to do?

- Describe the project. A project description will vary, depending on the complexity of the project. For example, describing the placement and construction of a new microwave tower may be relatively simple, but describing an alternative for improving range management likely would be more detailed and complex. Include sketches if they will help others understand your proposed action and its relationship with the species' habitat.

- How are you (or the project proponent) planning on carrying out the project? What tools or methods may be used? How will the site be accessed?

- Describe the project area. Always include a map (topographic maps are particularly helpful). Provide photographs including aerials, if available. Describe the project area (i.e., topography, vegetation, condition/trend).

- Describe current management or activities relevant to the project area. How will your project change the area?

- Supporting documents are very helpful. If you have a mining plan, research proposal, NEPA or other planning document or any other documents regarding the project, attach them to the BA or BE.

3. What threatened or endangered species may occur in the project area?

A request for a species list may be submitted to the Service, or the Federal action agency or its designated representative may develop the list. If you have information to develop your own lists, the Service should be contacted periodically to ensure that changes in species' status or additions/deletions to the list are included. Sources of information include, but are not limited to, the Forest Service or Bureau of Land Management, this office for marine species, members of the public or academic community, and books and various informational booklets. Due to budget constraints and staff shortages, we are only able to provide general, state-wide, or country-wide (territory-wide) species lists.

Use your familiarity with the project area when you develop your species lists. Sometimes a species may occur in the larger regional area near your project, but the habitat necessary to support the species is not in the project area (including areas that may be beyond the immediate project boundaries, but within the area of influence of the project). If, for example, you know that the specific habitat type used by a species does not occur in the project area, it does not need to appear on the species list for the project. However, documentation of your reasoning is helpful for Service biologists or anyone else that may review the document.

4. Have you surveyed for species that are known to occur or have potential habitat in the proposed project area?

The "not known to occur here" approach is a common flaw in many BA/BEs. The operative word here is "known." Unless adequate surveys have been conducted or adequate information sources have been referenced, this statement is difficult to interpret. It begs the questions "Have you looked?" and "How have you looked?" Always reference your information sources.

Include a clear description of your survey methods so the reader can have confidence in your results. Answer such questions as:

- How intensive was the survey? Did you look for suitable habitat or did you look for individuals? Did the survey cover the entire project area or only part of it? Include maps of areas surveyed if appropriate.

- Who did the surveys and when? Was the survey done during the time of year/day when the plant is growing or when the animal can be found (its active period)? Did the survey follow accepted protocols?

- If you are not sure how to do a good survey for the species, the Service recommends contacting species experts. Specialized training is required before you can obtain a permit to survey for some species.

- *Remember that your evaluation of potential impacts from a project does not end if the species is/are not found in the project area. You must still evaluate what effects would be expected to the habitat, even if it is not known to be occupied.*

5. Provide background information on the threatened or endangered species in the project area.

Describe the species in terms of overall range and population status. How many populations are known? How many occur in the project area? What part of the population will be affected by this project? Will the population's viability be affected? What is the current habitat condition and population size and status? Describe related items of past management for the species, such as stocking programs, habitat improvements, or loss of habitat or individuals caused by previous projects.

6. How will the project affect the threatened or endangered species or critical habitat that occurs in the project area?

- If you believe the project will not affect the species, explain why.

- If you think the project may affect the species, explain what the effects might be. The Endangered Species Act requires you consider <u>all</u> effects when determining if an action funded, permitted, or carried out by a Federal agency may affect listed species. Effects you must consider include direct, indirect, and cumulative effects. Effects include those caused by interrelated and interdependent actions, not just the proposed action. Direct effects are those caused by the action and occur at the same time and place as the action. Indirect effects are caused by the action and are later in time but are reasonably certain to occur. Interrelated actions are those that are part of a larger action and depend on the

larger action for their justification. Interdependent actions are those that have no significant independent utility apart from the action under consideration. Cumulative effects are those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal actions subject to consultation.

- Describe measures taken to avoid, reduce, or eliminate adverse effects or enhance beneficial effects to the species. Refer to conversations you had with species experts to achieve these results.

- Consider recovery potential if the project area contains historic range for a species.

- Evaluate designated critical habitat areas by reviewing the physical or biological features essential to the conservation of the species. *Even if no critical habitat has been designated for a species, the evaluation of the project effects must include effects to the habitat, not just the species.*

7. What is your decision? The Federal action agency must make a determination of effect.

Quite frequently, effect determinations are not necessarily *wrong;* they simply are not justified in the assessment. The assessment should lead the reviewer through a discussion of effects to a logical, well-supported conclusion. Do not assume that the Service biologist is familiar with the project and/or its location and that there is no need to fully explain the impact the project may have on listed species. If there is little or no connection or rationale provided to lead the reader from the project description to the effect determination, we cannot assume conditions that are not presented in the assessment. Decisions must be justified biologically. The responsibility for making the determination of effect falls on the Federal action agency; however, the Service may ask the agency to revisit its decision or provide more data if the conclusion is not adequately supported by biological information.

You have three choices for each listed species or area of critical habitat:

1. "No effect" means there are absolutely no effects of the project, positive or negative. "No effect" does not include a *small* effect or an effect that is *unlikely* to occur. If effects are insignificant (in size) or discountable (extremely unlikely), a "may affect, but not likely to adversely affect" determination is appropriate.

2. "May affect - is not likely to adversely affect" means that all effects are beneficial, insignificant, or discountable. Beneficial effects have concurrent positive effects without any adverse effects to the species or habitat (i.e., there can not be "balancing," wherein the benefits of the project would be expected to outweigh the adverse effects - see #3 below). Insignificant effects relate to the size of the impact (and should not reach the

scale where take occurs). Discountable effects are those extremely unlikely to occur. These determinations require **written** concurrence from the Service. Based on best judgement, a person would not: (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur.

3. "May affect - is likely to adversely affect" means that all adverse effects can not be avoided. A combination of beneficial and adverse effects is still "likely to adversely affect," even if the net effect is neutral or positive. Adverse effects do not qualify as discountable simply because we are not certain they will occur. The probability of occurrence must be extremely small to achieve discountability. Likewise, adverse effects do not meet the definition of insignificant because they are less than major. If the adverse effect can be detected in any way or if it can be meaningfully articulated in a discussion of the results, then it is not insignificant, it is likely to adversely affect. This requires formal consultation with the Service.

A fourth finding is possible for proposed species or proposed critical habitat:

4. "Is likely to jeopardize/adversely modify proposed species/critical habitat" is the appropriate conclusion when the action agency identifies situations in which the proposed action is likely to jeopardize the proposed species, or destroy or adversely modify the proposed critical habitat. If this conclusion is reached, conference is required.

List the species experts you contacted when preparing the BE or BA but avoid statements that place the responsibility for the decision of "may affect" or "no effect" on the shoulders of the species experts. Remember, this decision is made by the Federal action agency.

Provide supporting documentation, especially any agency reports or data that may not be available to the Service. Include a list of literature cited.

Prepared by:
U.S. Fish and Wildlife Service
Arizona Ecological Services Field Office
January 1997

Revised by:
U.S. Fish and Wildlife Service
New Mexico Ecological Services Field Office
2105 Osuña NE
Albuquerque, New Mexico 87113
(505) 761-4525
April 1997

Revised by:
National Marine Fisheries Service
Southeast Regional Office
Protected Resources Division
9721 Executive Center Dr. N.
St. Petersburg, FL 33702
(727) 570-5312
November 1998

OUTLINE EXAMPLE
FOR A
BIOLOGICAL ASSESSMENT OR BIOLOGICAL EVALUATION

A. Cover Letter - **VERY IMPORTANT** - Include purpose of consultation, project title, and consultation number (if available). A determination needs to be made for each species. You have three options: 1) a "no effect" determination; 2) requesting concurrence with an "is not likely to adversely affect" determination; 3) a "may affect, is likely to adversely affect" determination, and a request for formal consultation. If proposed species or critical habitat are included, state whether the project is likely to result in jeopardy to proposed species, or the destruction or adverse modification of proposed critical habitat.

B. Project Description - Describe the proposed action and the project area. Be specific and quantify whenever possible.

B. For Each Species

1. Description of affected environment (quantify whenever possible)
2. Description of species biology
3. Describe current conditions for each species
   a. Rangewide
   b. In project area
   c. Cumulative effects of State and private actions in project area
   d. Other consultations of Federal action agency in area to date
4. Describe critical habitat (if applicable)
5. Describe effects of proposed action on each species and/or critical habitat.
   a. Direct
   b. Indirect
   c. Interrelated and interdependent actions
   d. Incidental take

D. Conservation Measures (protective measures to minimize effects for each species)

E. Conclusions (effects determination for each species)

F. Literature Cited

F. List of Contacts Made/Preparers

F. Maps/ Photographs

U.S. Department of Homeland Security

United States Coast Guard

Commandant
United States Coast Guard

2100 Second Street, S.W.
Washington, DC 20593-0001
Staff Symbol: G-MSO-2
Phone: (202) 267-0225
Fax: (202) 267-4570

June 26, 2003

In Reply Refer To:
Docket No. USCG-2003-14294

Ms. Georgia Cranmore
Assistant Regional Administrator for Protected Resources
U.S. Department of Commerce
National Oceanic and Atmospheric Administration F/SER
9721 Executive Center Drive North
St. Petersburg, FL 33072

Subject: El Paso Energy Bridge Gulf of Mexico LLC Deepwater Port Environmental Assessment Protected Resources Information Request

Dear Ms. Cranmore:

The U.S. Coast Guard and Maritime Administration are preparing an Environmental Assessment (EA) to assist in the review of the El Paso Energy Bridge Gulf of Mexico LLC application for a deepwater port license to construct and operate a natural gas deepwater port in the Gulf of Mexico (Energy Bridge GOM Port). The EA will be prepared in accordance with the National Environmental Policy Act of 1969, as amended (NEPA) (42 U.S.C. 4321, et seq.), and pursuant to the requirements of the Deepwater Port Act (33 U.S.C. 1501, et seq.).

The Proposed Action consists of construction, operation, and decommissioning procedures associated with:

1. A Submerged Turret Loading System (STL) that is comprised of a submerged turret buoy; chains, lines, and anchors; a flexible riser; and a subsea manifold, that would receive natural gas from liquefied natural gas (LNG) carriers that have the capacity to regasify LNG;
2. Approximately 1.93 miles of 20-inch diameter pipeline that would tie into a metering platform;
3. Two 20-inch diameter pipelines (approximately 3.96 and 1.38 miles in length, respectively) that would extend from the metering platform to the existing Sea Robin and Blue Water pipeline systems, respectively.

The Sea Robin and Blue Water pipeline systems would deliver the gas to the onshore U.S. gas pipeline network. Energy Bridge GOM Port Facilities (the STL system, metering platform, and pipelines) would be located in the Gulf of Mexico in Minerals Management Service (MMS) West Cameron Lease Blocks 600, 601, 602, 603 and East Cameron Lease Block 335, in water depths ranging from 262-307 feet.

For your review, a copy of the El Paso Energy Bridge Environmental Report that the applicant provided as part of their deepwater port permit application is enclosed with this letter. A figure illustrating the location of the proposed Energy Bridge GOM Port is included in the Environmental Report (see Figure 1-3). The U.S. Coast Guard previously furnished to the Department of Commerce a complete copy of the Energy Bridge GOM application. In addition, it is our understanding that National Oceanic and Atmospheric Administration (NOAA) Fisheries and U.S. Fish and Wildlife Service (FWS) have been contacted by the permit applicant, El Paso Energy Bridge Gulf of Mexico LLC and their representatives who provided further details concerning the permit application.

Ms. Georgia Cranmore
U.S. Department of Commerce
June 26, 2003

Subject: El Paso Energy Bridge Gulf of Mexico, L.L.C Deepwater Port Environmental Assessment Protected Resources and Essential Fish Habitat Information Request

In conjunction with your office's review of the Environmental Report and in accordance with Section 7 of the Endangered Species Act, as amended, we seek to informally consult with NOAA Fisheries regarding proposed Energy Bridge GOM Port application. As previously stated, we are currently preparing an EA. We intend to have the EA stand as our Biological Assessment (BA) for this proposal. In order to fully assess the potential impacts associated with the Proposed Action on protected resources, we are requesting a list of species of concern that occur within the region of influence (ROI) and a list of any additional concerns that NOAA Fisheries may have regarding the potential impacts of the Proposed Action on federally listed species. Please review the following project-specific species lists for completeness.

A total of twenty-nine species (28 cetaceans and 1 manatee) of marine mammals occur in the Gulf of Mexico and have the potential to occur within the ROI. While six species of threatened or endangered marine mammals have the potential to occur within the ROI, the only endangered marine mammal expected to occur within the ROI is the sperm whale (*Physeter macrocephalus*). The sei whale (*Balaenoptera borealis*), blue whale (*Balaenoptera musculus*), fin whale (*Balaenoptera physalus*), northern right whale (*Eubalaena glacialis*), and humpback whale (*Megaptera novaeangliae*) are considered rare in the Gulf of Mexico; the West Indian manatee (*Trichechus manatus*) is considered rare within the ROI.

Threatened or endangered sea turtles which may occur within the ROI include the loggerhead sea turtle (*Caretta caretta*), Kemp's ridley sea turtle (*Lepidochelys kempi*), leatherback sea turtle (*Dermochelys coriacea*), hawksbill sea turtle (*Eretmochelys imbricata*), and green sea turtle (*Chelonia mydas*).

The only endangered fish species has the potential to occur within the ROI is the Gulf sturgeon (*Acipenser oxyrhynchus desotoi*). Endangered or threatened bird species that have the potential to occur within the ROI is the brown pelican (*Pelicanus occidentalis carolinensis*), southern bald eagle (*Haliaeetus leucocephalus*), and piping plover (*Charadrius melodus*). However, these species are unlikely to occur within the ROI. We will also consult with FWS regarding the presence of threatened and endangered species and migratory bird species under their jurisdiction within the ROI.

Finally, engineering-environmental Management, Inc. (e^2M) is providing the U.S. Coast Guard with technical assistance as our contractor in the preparation of the EA/BA. The U.S. Coast Guard has designated e^2M as the non-Federal representative for consultation purposes for this action. We would appreciate your cooperation with e^2M staff regarding the Section 7 consultation with NOAA Fisheries for the proposed Energy Bridge GOM Port.

We look forward to working with your office on this project. Please file any comments/correspondence to the U.S. Coast Guard to:

Mark A. Prescott, Commander
Department of Homeland Security
U.S. Coast Guard, Commandant (G-MSO-2)
Vessels and Facilities Operating Standards Division
2100 Second Street, SW
Washington, DC 20593-0001

Ms. Georgia Cranmore
U.S. Department of Commerce
June 26, 2003

Subject: El Paso Energy Bridge Gulf of Mexico, L.L.C Deepwater Port Environmental Assessment
Protected Resources and Essential Fish Habitat Information Request

Thank you for your assistance. If you have questions about the proposed Energy Bridge GOM Port or about the EA, please contact me at (202) 267-0225 or <*mprescott@comdt.uscg.mil*>.

Sincerely,

Mark Prescott
Commander U.S. Coast Guard
Acting Chief, Office of Operating and Environmental Standards
By direction of the Commandant

cc: Kyle Baker
Richard Hartman
Ken Hollingshead
Rick Ruebsamen

Appendix D
Essential Fish Habitat Information and Coordination

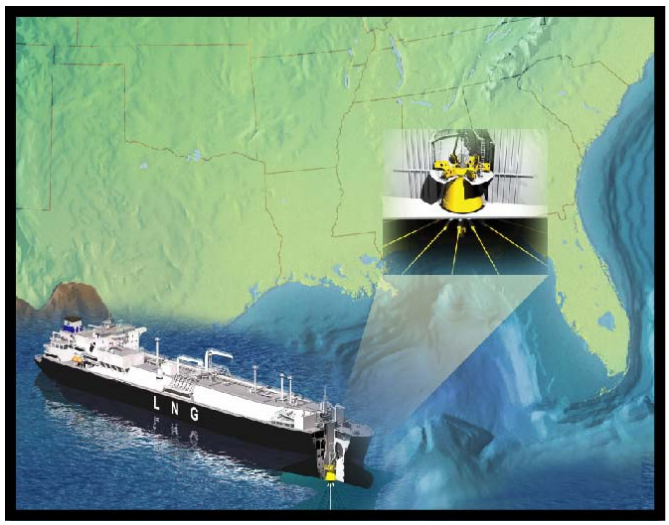

Table D-1. EFH of Federally Managed Fish Species in the Region of Influence (ROI)

Species and General EFH Description	Habitat Associations by Life Stage					EFH Life Stage Occurrence in the ROI
	Eggs	Larvae	Juvenile	Adults	Spawning Adults	
BROWN SHRIMP ♦ estuaries (where common, abundant, highly abundant) ♦ offshore areas (adult, spawning, and nursery areas) to depths of 110 m (361 ft), throughout the GOM	♦ demersal ♦ peak in fall and spring ♦ distribution similar to spawning adults ♦ hatch within 24 hours of spawning	♦ larvae - offshore ♦ postlarvae - estuaries from Apalachicola Bay, FL to Mexican border	♦ estuaries from Apalachicola Bay, FL to Mexican border ♦ shallow vegetated habitats ♦ silty, non-vegetated mud bottoms ♦ 0-70 ppt, marsh edge ♦ SAV, tidal creeks, inner marsh, shallow open water, oyster reefs	♦ abundance correlates positively with turbidity and negatively with hypoxia ♦ neritic GOM waters ♦ silt, muddy sand, sand substrates ♦ to depths of 110 m	♦ peak in fall and spring ♦ waters deeper than 64 m (210 ft)	♦ eggs ♦ larvae ♦ adults
WHITE SHRIMP ♦ estuaries (where common, abundant, highly abundant) ♦ offshore areas (adult, spawning, and nursery areas) to depths of 40 m (131 ft), in the coastal area extending from Florida's Big Bend area through Texas	♦ demersal ♦ spring to late fall ♦ distribution similar to spawning adults ♦ hatch 10-12 hours after spawning	♦ larvae - planktonic, nearshore ♦ postlarvae - upper 2 m (7 ft) of water column to mid-water depths ♦ benthic in estuaries ♦ shallow water, muddy sand bottom, ♦ estuaries from Suwanee River, FL to TX	♦ postlarve-juvenile – muddy peat bottoms, decaying organic vegetative material ♦ juvenile - low salinity waters, tidal creeks estuaries ♦ move to coastal waters as approach maturity	♦ nearshore GOM waters to depths of 30 m (98 ft), Big Bend, FL to TX ♦ soft mud or silt	♦ spring to late fall, peak in summer ♦ waters 9-34 m (30-112 ft), mostly less than 27 m (89 ft)	♦ larvae
RED DRUM ♦ estuaries (where common, abundant, highly abundant - nearly all estuaries of GOM) ♦ offshore areas (adult, spawning, and nursery areas) ♦ shallow estuarine waters to depths of 40 m (131 ft)	♦ GOM	♦ estuaries	♦ reach maturity in estuaries	♦ some estuarine waters, mostly offshore	♦ deeper waters, mouths of bays, inlets and GOM side of barrier islands	♦ eggs ♦ larvae

Table D-1. EFH of Federally Managed Fish Species in the Region of Influence (ROI) (continued)

Species and General EFH Description	Habitat Associations by Life Stage					EFH Life Stage Occurrence in the ROI
	Eggs	Larvae	Juvenile	Adults	Spawning Adults	
RED SNAPPER ♦ throughout the GOM shelf ♦ particularly abundant on Campeche Banks in the northern GOM ♦ demersal ♦ found over sandy and rocky bottoms, around reefs, and underwater objects ♦ depths of 0-656 ft (0-200 m), and possibly beyond 3,937 ft (1200 m)	♦ offshore summer and fall	♦ through Nov in shelf waters ♦ depths of 56-600 ft (17-183 m)	♦ through Nov in shelf waters ♦ depths of 56-600 ft (17-183 m) ♦ associated with structures, objects or small burrows ♦ also found over barren sand and mud bottom ♦ late juveniles taken year round in depths 66-151 ft (20-46 m)	♦ favor deeper waters in Gulf ♦ concentrated off Yucatan, Texas, and Louisiana ♦ depths of 23-479 ft (7-146 m) ♦ most are abundant at depths of 131-361 ft (40-110 m) ♦ commonly occur over submarine gullies and depressions, and over coral reefs, rock outcroppings, and gravel bottoms	♦ offshore from May to Oct ♦ depths 59-121 ft (18-37 m)	♦ all life stages
GRAY SNAPPER ♦ shelf waters of GOM ♦ abundant off south and southwest Florida ♦ all estuaries in GOM ♦ most common in Florida inshore waters out to depths of 180 m (590 ft)	♦ pelagic, June through September ♦ offshore shelf waters ♦ near coral reefs	♦ planktonic ♦ peak - June through August ♦ offshore shelf waters ♦ near coral reefs ♦ FL through TX ♦ postlarvae – move into estuarine habitat, over dense seagrass beds, *Halodule* and *Syringodium*	♦ marine, estuarine, riverine habitats, including channels, bayous, ponds, grassbeds, marshes, mangrove swamps, freshwater creeks, *Thallassia* grass flats, marl bottoms, seagrass meadows, and mangrove roots	♦ demersal and mid-waters, marine, estuarine, and riverine habitat ♦ offshore to 32 km (17 NM) ♦ inshore to coastal plain and freshwater habitat, mangroves, sandy grassbeds, coral reefs, over muddy and rocky bottoms	♦ offshore around reefs and shoals, June to August	♦ eggs ♦ larvae ♦ adults

Table D-1. EFH of Federally Managed Fish Species in the Region of Influence (ROI) (continued)

Species and General EFH Description	Habitat Associations by Life Stage					EFH Life Stage Occurrence in the ROI
	Eggs	Larvae	Juvenile	Adults	Spawning Adults	
LANE SNAPPER ♦ throughout shelf areas of GOM ♦ depths 0 – 130 m (0-426 ft) ♦ demersal ♦ occurs over all bottom types ♦ most common in reef areas and sandy bottoms	♦ present after spawning ♦ March through September with peak in July and August	♦ no data	♦ mangrove and grassy estuarine areas ♦ southern TX and FL ♦ shallow areas with sandy and muddy bottoms off all GOM states ♦ grass flats, reefs and soft bottom areas ♦ to depths of 20m (66 ft)	♦ offshore ♦ depths of 4-132 m (13-433 ft) ♦ sand bottom ♦ natural channels, banks, man-made reefs, and structures	♦ offshore waters, March – September (peak July – August)	♦ eggs ♦ adults
LESSER AMBERJACK	♦ no data	♦ no data	♦ offshore, later summer and fall in northern GOM ♦ associated with oil and gas rigs and irregular bottom	♦ no data	♦ offshore, September – December, and February through March ♦ associated with oil and gas structures and irregular bottom	♦ all life stages
GREATER AMBERJACK ♦ throughout GOM coast to depths of 400 m (1312 ft)	♦ open Gulf ♦ 30-35 ppt	♦ assumed offshore open waters	♦ pelagic ♦ attracted to floating plants and debris ♦ offshore	♦ pelagic, epibenthic ♦ occurs over reefs and wrecks and around buoys	♦ northern GOM from May to July (may be as early as April) ♦ offshore - year round	♦ all life stages
GRAY TRIGGERFISH	♦ late spring, nests in sand near natural and artificial reefs, guarded by male or female	♦ larvae and postlarvae - pelagic ♦ upper water column	♦ associated with *Sargassum* and other flotsam ♦ may be found in mangrove estuaries	♦ offshore, waters greater than 10 m (33 ft) ♦ associated with artificial and natural reefs	♦ late spring and summer, waters greater than 10 m ♦ associated with artificial and natural reefs	♦ all life stages

Table D-1. EFH of Federally Managed Fish Species in the Region of Influence (ROI) (continued)

Species and General EFH Description	Habitat Associations by Life Stage					EFH Life Stage Occurrence in the ROI
	Eggs	Larvae	Juvenile	Adults	Spawning Adults	
KING MACKEREL ♦ shore to 200 m (65 ft) depths ♦ marine pelagic waters	♦ surface waters, pelagic ♦ 30-180 m (98-590 ft)	♦ water column ♦ marine waters throughout range	♦ use estuaries occasionally	♦ migrate to northern Gulf in spring ♦ migrate to eastern and western Gulf in fall ♦ oceanic waters <80 m (262 ft)	♦ throughout range, May to October	♦ eggs ♦ larvae ♦ juveniles ♦ adults
COBIA ♦ throughout coastal waters of GOM ♦ pelagic and epibenthic ♦ near wrecks, reefs, pilings, buoys, and floating objects ♦ occasionally enter estuaries ♦ shore to 20 m (66 ft) (in eastern GOM ♦ shore to 40 m (131 ft) in northern GOM ♦ shore to 100 m (328 ft) in southern GOM	♦ surface waters ♦ pelagic, top meter of water column	♦ water column, May-September ♦ estuarine and offshore shelf waters of the northern GOM ♦ from the surface to depths of 300 m	♦ April to July in coastal waters and the offshore shelf in the northern GOM ♦ May-October in coastal waters and the offshore shelf ♦ same as adult areas ♦ includes coastal areas, bays and river mouths	♦ year round, throughout GOM ♦ seasonal migrations ♦ March-October in northern GOM ♦ November-March in southern GOM	♦ spring, summer, in northern GOM throughout all adult areas, except estuaries ♦ April-September in nearshore and shelf waters	♦ all life stages
DOLPHIN ♦ throughout GOM, oceanic waters ♦ occasionally coastal waters with ocean strength salinity ♦ coastal waters of northern GOM during summer months ♦ epipelagic, aggregates below floating objects, especially *Sargassum*	♦ surface waters	♦ water column ♦ over depths of greater than 50 m (164 ft) ♦ most abundant over 180 m (590 ft) ♦ nursery areas year round in oceanic and coastal waters with high salinity	♦ inshore and offshore ♦ associated with *Sargassum* communities	♦ over depths out to 1,800 m (5,904 ft) ♦ most common over the 40-200 m (131-656 ft) depth contour	♦ throughout adult areas of open GOM, year round ♦ peaks in spring and early fall	♦ all life stages

Table D-1. EFH of Federally Managed Fish Species in the Region of Influence (ROI) (continued)

Species and General EFH Description	Habitat Associations by Life Stage					EFH Life Stage Occurrence in the ROI
	Eggs	Larvae	Juvenile	Adults	Spawning Adults	
BLUEFISH ♦ pelagic species, in many GOM estuaries ♦ on the outer continental shelf, to depths of 200m (656 ft) ♦ most common along coasts of LA, MS, AL, FL	♦ surface waters	♦ water column ♦ inshore along beaches ♦ estuaries, inlets, and rivers	♦ inshore and offshore waters	♦ move north in spring and summer ♦ move south in fall and winter ♦ shallow waters up to 100 m (328 ft)	♦ generally along outer half of continental shelf ♦ April to November in northern GOM	♦ eggs ♦ adults
LITTLE TUNNY ♦ throughout GOM ♦ depths of lass than 200 m (656 dt) ♦ pelagic ♦ most common in coastal areas with swift currents, near shoals	♦ no data	♦ most coastal pelagic waters throughout range	♦ no data	♦ no data	♦ throughout species rage ♦ March to November	♦ all life stages
ATLANTIC BLUEFIN TUNA	♦ all waters from offshore Cape Canaveral at 28.25° N south around peninsular Florida to the U.S./Mexico border ♦ from 15 miles from shore to the EEZ boundary	♦ all waters from offshore Cape Canaveral at 28.25° N south around peninsular Florida to the U.S./Mexico border ♦ from 15 miles from shore to the EEZ boundary	♦ in the Florida Straits, from 27° N south around peninsular Florida to 81° W ♦ surface waters from the 200 m (656 ft) isobath to the EEZ boundary	♦ from offshore Terrebonne Parish, LA (90° W) to offshore Galveston, TX (95° W) ♦ from the 200 m (656 ft) isobath to the EEZ boundary	♦ all waters from offshore Cape Canaveral at 28.25° N south around peninsular Florida to the U.S./Mexico border ♦ from 15 miles from shore to the EEZ boundary	♦ eggs ♦ larvae ♦ spawning adults

Source: GMFMC 1998 and NMFS 1999

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Table D-2. Temperature Ranges and Associations of Species with EFH in the ROI

Life History Stage	Temperature Association
SHRIMP SPECIES	
Brown Shrimp	
Non-Spawning adults (females > 140 mm total length [TL])	Survival is good between 50-98.6 ºF in ponds; natural variability in temperature is less Collected as low as 36 ºF and as high as 90 ºF; few collected below 50 ºF; highest catches above 68 ºF; temperatures 40 ºF or below may cause narcosis and mortality (Lassuy 1983)
Spawning adults	No Data
Fertilized eggs (0.26 mm diameter)	Eggs do not hatch below 75.2 ºF
Larvae and presettlement post larvae; developmental stages include 5 nauplier, 3 protozoel, 3 mysis, and post-larval (< 14 mm) stage	Optimal temperature for larval development between 82.4-86.0 ºF; no growth below 61 ºF
Late postlarvae and juveniles (after settlement; 14-80 mm)	Survival is good between 44.6-95.0 ºF, this temperature tolerance decreases at low salinities; growth increases up about 86.0 ºF; post-larval burrow at low temperatures; catastrophic kills have occurred after cold fronts in shallow water; rapid change in temperature from 79 ºF to 70 ºF become inactive, convulsed, and develop muscular paralysis (Lassuy 1983)
Sub-adults	Cold fronts with air temperatures between 64.4-71.6 ºF have been documented to cause mass mortality.
White Shrimp	
Non-spawning adults (females ≥ 165 mm TL; males ≥ 119 mm TL)	Tolerant of temperatures between 44.6-95.0 ºF; 50% mortality at 46.4 ºF; 100 mortality at or below 37.4 ºF; more tolerant of high temperatures, less tolerant of low
Spawning adults	Sudden temperature increases trigger spawning and rapid deceases in temperature associated with end of spawning
Fertilized eggs (0.192-0.3 mm diameter)	No data
Larvae and pre-settlement post larvae; developmental stages include 5 nauplier, 3 protozoel, 3 mysis, and post-larval stage (0.3-8 mm) (Muncy 1984)	*Penaeus* nauplier stages occurred in offshore waters 62.6-83.3 ºF.
Late post larvae and juveniles (after settlement; 8-90 mm)	Postlarvae collected 55.4-87.8 ºF; juveniles collected between 48.2 ºF and 91.4 ºF, and most abundant 59.0-91.4 ºF; In laboratory juveniles grow and survive at constant 95 ºF; catastrophic kills have occurred in shallow water after cold fronts.
Sub-adults	Cold fronts can cause mass mortality in South Carolina, survival requires minimum temperature of >42.8 ºF.
FISH SPECIES	
Red Drum	
Eggs (0.80-0.98 mm)	68.0-86.0 ºF; 77.0 ºF optimal
Larvae (4-6 mm)	77.0 ºF optimal; 64.9-87.8 ºF
Post larvae (7 mm)	77.0ºF optimal; up to 86 ºF; 64.9-87.8 ºF
Early Juvenile	55-90°F; can survive from 36-91°F if change in temperature is gradual
Juvenile (15-300 mm)	Upper 33-43ft range from 81-84°F in August through October 75-79°F and in early November 72-73°F
Adult (305-750 mm)	36-91°F

Life History Stage	Temperature Association
Red Grouper	
Eggs	Hatch in 30h at 75.2 ºF
Larvae	Optimum report at 81.3-83.8 ºF
Early juveniles (benthic)	60.9-88.2 ºF
Adults	59-86 ºF; most common at 66-77 ºF
Early Juveniles	54.5-90 ºF; 35.6-91.4 ºF if change in temperature is gradual; 35.6-94.8 ºF; prefer 50.0-86 ºF.
Late Juveniles	Temperatures within the upper 10-13 m range from 80.6-84.2 ºF in August and September; 75.2-78.8 ºF in October; 71.6-73.4 ºF in early November; prefer 50-86 ºF.
Adults	Observed in 35.6-91.4 ºF. Moves into deep water when extreme temperatures occur.
Spawning Adults	Occurs from 68.0-86.0 ºF; may continue spawning for 90 days or more.
Red Snapper	
Eggs (0.77-0.85 mm)	No Data
Larvae (2.2 mm)	Taken at temperatures ranging from 63.1-85.5 ºF
Post Larvae	Taken at temperatures ranging from 63.1-85.5 ºF
Early Juveniles (4 mm)	Taken at temperatures ranging from 63.1-85.5 ºF
Late Juveniles (22 mm)	No data
Adults	Taken from area with bottom temperatures ranging from 57.2-86.0 ºF. Lower tolerance level 55°F and upper tolerance level 92°F.
Spawning Adults	Spawned in water ranging from 73°F-77°F.
Gray Snapper	
Eggs (0.4-0.6 mm)	No data
Larvae (transforms to juveniles between 6.3-9.6 mm)	Occurs in temperatures ranging from 60-81 ºF.
Post Larvae	No data
Adults	Occur in water temperatures from 56.1-90.5 ºF. Lower lethal limit range between 51.8°F-57.2°F.
Spawning Adults	No data
Greater Amberjack	
Eggs	No data
Larvae	Most likely warm, summer temperatures.
Post larvae	No data
Juveniles	No data
Adults	Become scarce in the northern GOM under 64.4-68.0 ºF in fall.
Spawning Adults	No data
Lane Snapper	
Eggs (0.7-.8mm)	No data
Larvae (less than 10mm)	Reared at 82.4 ºF
Juveniles	No data
Adults	Collected at water temps between 60.8 ºF and 84.2 ºF
Spawning Adults	No data

Life History Stage	Temperature Association
Tilefish	
Eggs	Usually hatch in 40 h at 71.6-76.3 ºF in lab
Larvae	No data
Juveniles	No data
Adults	Usually found at 48-58ºF
Spawning Adults	No data
Greater Amberjack	
Eggs	No data
Larvae	Most likely warm, summer temperatures.
Post larvae	No data
Juveniles	No data
Adults	Become more scarce in the northern GOM under 64.4-68.0 ºF in fall.
Spawning Adults	No data
Lesser Amberjack	
Eggs	No data
Larvae	No data
Post Larvae	No data
Juveniles	No data
Adults	No data
Spawning Adults	Appears to be a cessation of spawning during coldest month (Dec-Jan) in the northern GOM.
King Mackerel (endothermic)	
Eggs	Hatch in 18-21 h at 81ºF
Larvae (2.0-2.9 mm SL)	68-88 ºC
Early Juveniles	No data
Late Juveniles	No data
Adults	The temperature considered the main trigger for seasonal migration is 68.0 ºF.
Spawning Adults	68.0 ºF
Dolphin	
Eggs	Hatch in 40 hours at 79 ºF; 38 hours at 77 ºF
Larvae	Most abundant at 75 ºF and above; reared at 77-84 ºF in hatchery
Early Juveniles	78.8-84.2 ºF (culture experiments)
Late Juveniles	No data
Adults	68 ºF isotherm considered northern distributional limit; more numerous at 77-79ºF
Spawning Adults	Usually at >75 ºF; successfully spawned at 75-84 ºF in culture experiments
Blue Fish	
Eggs	Occur in the wild from 64.4-79.3 ºF
Larvae	Collected in northern GOM at a mean temp of 76.3 ºF with a range of 72.3-80.4 ºF
Adults	Have been recorded in temps ranging from 58.6 ºF to 88.2 ºF
Adults	Range between 64.4 ºF and 69.8 ºF but can survive temperatures as low as 45.5 ºF temporarily

Life History Stage	Temperature Association
Spawning Adults	Optimal temperature for spawning in GOM is 78.1 ºF
Little Tunny	
All life stages	No data
Cobia	
Eggs fertilized (1.2-1.5 mm diameter; pelagic)	Highest hatchery rates (lab); 82.6-85.5 ºF
Larvae (2.0-2.6 mm SL)	75.6-89.6 ºF; high is 98.1 ºF
Pre Juvenile (20-25 mm SL)	78.6-86.5 ºF; 67.3-77.4 ºF; >86 ºF
Early Juvenile	62.2-77.4 ºF
Late Juvenile	No data
Adult	73.4-82.4 ºF; 67.3-77.4 ºF (southern Atlantic)
Spawning Adult	73.4-82.4º F
Atlantic Bluefin Tuna (endothermic)	
Life stage not specified	Constrained by 54.0 ºF isotherm; individuals can dive to 43.0-46.0 ºF to feed.

Source: Adapted from NMFS 1999 and GMFMC 2003

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2003 JUN 20 P 4:19

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
9721 Executive Center Drive North
St. Petersburg, Florida 33702

June 20, 2003 F/SER44/KS:jk
225/389-0508

USCG-2003-14294-4

Commander Mark A. Prescott
Department of Homeland Security
U.S. Coast Guard, Commandant (G-MSO-2)
Vessels and Facilities Operating Standards Division
2100 Second Street, SW
Washington, D.C. 20593-0001

Dear Commander Prescott:

The National Marine Fisheries Service (NOAA Fisheries) has received the Notice of Application (NOA) and request for public comment for the El Paso Energy Bridge Gulf of Mexico LLC Deepwater Port license application (68 FR 3299; USCG-2003-14294) dated May 29, 2003. The NOA indicates that the U.S. Coast Guard (USCG) and the Maritime Administration (MARAD) are reviewing the license application for the construction of a liquefied natural gas (LNG) deepwater port and appurtenant structures to be located approximately 146 miles south of Lake Charles, Louisiana. The proposed project would include the construction of a submerged turret loading buoy with flexible riser piping and a meter station platform in Outer Continental Shelf (OCS) block West Cameron 603. Approximately 7.3 miles of 20-inch pipeline would be installed to direct natural gas from vessels unloading at the deepwater terminal to existing gas supply systems in the Gulf of Mexico and southern Louisiana. Portions of the pipeline would extend through OCS blocks West Cameron 600, 601, 602, and East Cameron 335. The USCG and MARAD are requesting comments on resources and issues to be addressed in the Environmental Assessment (EA) for this proposed action.

NOAA Fisheries recommends the EA issued for the proposed project address the following resources and issues of concern:

Based on our review of the NOA, the El Paso Energy Bridge Gulf of Mexico Environmental Report, and our knowledge of the project area, we have developed the following list of species and life stages for which Essential Fish Habitat (EFH) has been designated in the project area:

Managed Species	Life Stages
brown shrimp	eggs, larvae, adults
white shrimp	larvae
red drum	eggs, adults

red snapper	all life stages
gray snapper	eggs, larvae, adults
lane snapper	eggs, adults
greater amberjack	all life stages
lesser amberjack	all life stages
gray triggerfish	all life stages
king mackerel	eggs, larvae, juveniles, adults
cobia	all life stages
dolphin	all life stages
bluefish	eggs, adults
little tunny	all life stages
Atlantic bluefin tuna	eggs, larvae, spawning adults

Categories of EFH in the project area include unconsolidated marine water bottoms, natural structural features (e.g., hardbottom and shoal areas), and marine water column. Detailed information on EFH for Federally managed shrimp, red drum, reef fish, and coastal migratory pelagic species is provided in the 1998 generic amendment of the Fishery Management Plans (FMPs) for the Gulf of Mexico prepared by the Gulf of Mexico Fishery Management Council. Information on EFH for Atlantic bluefin tuna is contained in the Atlantic Tunas, Swordfish, and Sharks FMP prepared by the Secretary of Commerce. The generic amendment and the Atlantic Tunas, Swordfish, and Sharks FMP were prepared as required by the Magnuson-Stevens Fishery Conservation and Management Act (P.L. 104-297).

We recommend the EA include sections titled "Essential Fish Habitat" and "Marine Fishery Resources" that describe the potential impacts of the proposed project on the sub-categories of EFH (e.g., non-vegetated water bottoms, geologic features, continental shelf features, marine water column, etc.) and marine fishery species within the project area. These sections should analyze the potential impacts of the proposed project on Federally managed species and life stages which utilize these sub-categories of EFH, and fully evaluate alternative measures to avoid, minimize, and offset adverse impacts to EFH and marine fishery species in the Gulf of Mexico. This descriptive and analytical information, coupled with a statement of the agency's conclusions regarding the effects of the action on EFH and marine fishery species, would provide the basic details necessary for an EFH assessment pursuant to the requirements of 50 CFR 600.920(e).

Impingement and entrainment of marine organisms is a major concern for structures that utilize large quantities of seawater and should be addressed in the EA for the proposed project. The Energy

Bridge Gulf of Mexico Environmental Report states that vessels utilizing the proposed deepwater port will be capable of operating in both open-loop and closed-loop regasification modes. The closed-loop mode will only be utilized when seawater temperatures are less than 42 degrees Fahrenheit. However, vessels operating in the closed-loop mode avoid impacts to marine fishery species from impingement and entrainment, and are capable of regasifying LNG with only slightly less efficiency than vessels operating in the open-loop mode. The EA for the Energy Bridge Gulf of Mexico deepwater port should evaluate alternative criteria for regasification operational modes, including requiring the sole use of closed-loop regasification systems. Detailed justification should be provided in the EA for the selection or elimination of alternatives for regasification operational modes.

The EA should evaluate the potential impacts to marine fishery species from impingement and entrainment associated with any alternative that incorporates the use of the open-loop regasification system. The open-loop configuration of the regasification process will utilize seawater at a rate of approximately 12,000 cubic meters per hour. The Energy Bridge Gulf of Mexico Environmental Report states that vessels will require six to eight days to fully unload regasified LNG, but does not state the expected frequency of port utilization by LNG vessels. This information should be provided in the EA in order to fully assess potential impacts to marine fishery species. In addition, the seawater intake velocity of 1.2 meters per second greatly exceeds the intake velocity of 0.5 feet per second (0.15 meters per second) recommended by the U.S. Environmental Protection Agency[1] to minimize entrainment of marine organisms. The 21 mm spacing of the metal grate covering the seawater intake is too large to be effective at excluding the eggs, larvae, and juveniles of marine fishery species from impingement and entrainment in the regasification system. The EA should evaluate a full range of alternatives for the design requirements of vessels utilizing the proposed Energy Bridge Gulf of Mexico LNG terminal that would avoid and minimize impacts to eggs, larvae, and juveniles of marine fishery species, including: organism exclusion mechanisms; the siting and design of intake and discharge areas; operational schedules for removing impinged organisms; and closed-loop versus open-loop regasification systems. Alternative designs for the vessels should be evaluated in relation to the vertical distribution of eggs, larvae, and juveniles of marine fishery species in the water column and the rheotactic response of non-passive swimming organisms to horizontal versus vertical currents at intake and discharge areas. The analysis of the design alternatives should include quantification of impacts to marine fishery populations. Clear rationale should be provided for the selection or elimination of design alternatives.

The effects of thermal discharge on marine fishery species also should be addressed in the EA. Seawater used in the open-loop regasification process will be approximately 14 degrees Fahrenheit cooler than ambient seawater. Eggs, larvae, and juveniles of various marine species may be particularly vulnerable to rapid and/or extreme temperature changes. In addition, seawater will be treated with copper and aluminum during the regasification process to prevent biofouling before being discharged back into the environment. The biological consequences of temperature change

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[1]U.S. Environmental Protection Agency. 1973. Reviewing Environmental Impact Statements- Power Plant Cooling Systems, Engineering Aspects. Pacific Northwest Environmental Research Laboratory, Corvallis, OR, 93 p.

and biocide contamination of the thermal discharge on marine fishery species should be quantified in the EA and minimized to the maximum extent practicable. Sole utilization of the closed-loop regasification system, which would eliminate impacts to marine fishery species from temperature change and biocide contamination of the thermal discharge, should be evaluated in the document.

NOAA Fisheries appreciates the opportunity to provide you with preliminary information regarding resources and issues of concern for the proposed Energy Bridge Gulf of Mexico project. We look forward to reviewing the draft EA. If you have any questions regarding our comments, please contact Kelly Shotts at (225) 389-0508.

Sincerely,

for Patrick Williams

Frederick C. Sutter, III
Deputy Regional Administrator

c:
FWS, Lafayette
EPA, Dallas - Lawrence
LA DNR - Consistency
F/SF1 - Rogers
F/SER3 - Cranmore
F/SER4
Files

U.S. Department of Homeland Security
United States Coast Guard

Commandant
United States Coast Guard

2100 Second Street, S.W.
Washington, DC 20593-0001
Staff Symbol: G-MSO-2
Phone: (202) 267-0225
Fax: (202) 267-4570

In Reply Refer To:
Docket No. USCG-2003-14294

Mr. Frederick Sutter
Assistant Regional Administrator
U.S. Department of Commerce
National Oceanic and Atmospheric Administration F/SER
9721 Executive Center Drive North
St. Petersburg, FL 33072

Subject: El Paso Energy Bridge Gulf of Mexico LLC Deepwater Port Environmental Assessment Essential Fish Habitat Information Request

Dear Mr. Sutter:

The U.S. Coast Guard and Maritime Administration are preparing an Environmental Assessment (EA) to assist in the review of the El Paso Energy Bridge Gulf of Mexico LLC application for a deepwater port license to construct and operate a natural gas deepwater port in the Gulf of Mexico (Energy Bridge GOM Port). The EA will be prepared in accordance with the National Environmental Policy Act of 1969, as amended (NEPA) (42 U.S.C. 4321, et seq.), and pursuant to the requirements of the Deepwater Port Act (33 U.S.C. 1501, et seq.).

The Proposed Action consists of construction, operation, and decommissioning procedures associated with:

1. A Submerged Turret Loading System (STL) that is comprised of a submerged turret buoy; chains, lines, and anchors; a flexible riser; and a subsea manifold, that would receive natural gas from liquefied natural gas (LNG) carriers that have the capacity to regasify LNG;
2. Approximately 1.93 miles of 20-inch diameter pipeline that would tie into a metering platform;
3. Two 20-inch diameter pipelines (approximately 3.96 and 1.38 miles in length, respectively) that would extend from the metering platform to the existing Sea Robin and Blue Water pipeline systems, respectively.

The Sea Robin and Blue Water pipeline systems would deliver the gas to the onshore U.S. gas pipeline network. Energy Bridge GOM Port Facilities (the STL system, metering platform, and pipelines) would be located in the Gulf of Mexico in Minerals Management Service (MMS) West Cameron Lease Blocks 600, 601, 602, 603 and East Cameron Lease Block 335, in water depths ranging from 262-307 feet.

For your review, a copy of the El Paso Energy Bridge Environmental Report that the applicant provided as part of their deepwater port permit application is enclosed with this letter. A figure illustrating the location of the proposed Energy Bridge GOM Port is included in the Environmental Report (see Figure I-3). The U.S. Coast Guard previously furnished to the Department of Commerce a completed Energy Bridge GOM application. In addition, it is our understanding that National Oceanic and Atmospheric Administration (NOAA) Fisheries and U.S. Fish and Wildlife Service (FWS) have been contacted by the permit applicant, El Paso Energy Bridge Gulf of Mexico LLC and their representatives who provided further details concerning the permit application.

Mr. Frederick Sutter
U.S. Department of Commerce
June 26, 2003

Subject: El Paso Energy Bridge Gulf of Mexico, L.L.C Deepwater Port Environmental Assessment Protected Resources and Essential Fish Habitat Information Request

In conjunction with your office's review of the Environmental Report and in accordance with Section 305(b) of the Magnuson-Stevens Act, as amended, we seek to informally consult with NOAA Fisheries regarding proposed Energy Bridge GOM Port application. As previously stated, we are currently preparing an EA. We intend to have the EA stand as our EFH Assessment for this proposal. In order to fully assess the potential impacts associated with the Proposed Action on EFH, we are requesting a list of species of concern that occur within the region of influence (ROI) and a list of any additional concerns that NOAA Fisheries may have regarding the potential impacts of the Proposed Action on federally listed species. Please review the following project-specific species list for completeness.

EFH has been designated in the Gulf of Mexico for shrimp species, red drum, reef fish, coastal migratory pelagic resources, stone crabs, spiny lobsters, and corals by the Gulf of Mexico Fisheries Management Council and highly migratory species by NOAA Fisheries. Our initial review indicates that EFH for various life stages of the following species may occur in the ROI: brown shrimp (*Panaeus aztecus*), red groupers (*Epinephelus morio*), gag grouper (*Mycteroperca microlepis*), scamp grouper (*Mycteroperca phenax*), red snapper (*Lutjanus campechanus*), gray snapper (*Lutjanus griseus*), lane snapper (*Lutjanus synagris*), lesser amberjack (*Serioloa fasciata*), tilefish (*Lopholatilus chamaeleonticeps*), gray triggerfish (*Balistes capriscus*), king mackerel (*Scomberomorus maculates*), dolphin (*Coryphaena hippurus*), bluefin tuna (*Thunnus thynnus*), blacknose shark (*Carcharhinus acronotus*), white marlin (*Tetrapturus albidus*), and sailfish (Istiophorus *albicans*).

Finally, engineering-environmental Management, Inc. (e^2M) is providing the U.S. Coast Guard with technical assistance as our contractor in the preparation of the EA. The U.S. Coast Guard has designated e^2M as the non-Federal representative for consultation purposes for this action. We would appreciate your cooperation with e^2M staff regarding the EFH consultation with NOAA Fisheries for the proposed Energy Bridge GOM Port.

We look forward to working with your office on this project. Please file any comments/correspondence to the U.S. Coast Guard to:

Mark A. Prescott, Commander
Department of Homeland Security
U.S. Coast Guard, Commandant (G-MSO-2)
Vessels and Facilities Operating Standards Division
2100 Second Street, SW
Washington, DC 20593-0001

Thank you for your assistance. If you have questions about the proposed Energy Bridge GOM Port or about the EA, please contact me at (202) 267-0225 or <*mprescott@comdt.uscg.mil*>.

Sincerely,

Mark Prescott
Commander U.S. Coast Guard
Acting Chief, Office of Operating and Environmental Standards
By direction of the Commandant

Mr. Frederick Sutter
U.S. Department of Commerce
June 26, 2003

Subject: El Paso Energy Bridge Gulf of Mexico, L.L.C Deepwater Port Environmental Assessment Protected Resources and Essential Fish Habitat Information Request

cc: Kyle Baker
Richard Hartman
Ken Hollingshead
Rick Ruebsamen

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
9721 Executive Center Drive North
St. Petersburg, Florida 33702

July 16, 2003 F/SER44/KS:jk
225/389-0508

Commander Mark A. Prescott
Department of Homeland Security
U.S. Coast Guard, Commandant (G-MSO-2)
Vessels and Facilities Operating Standards Division
2100 Second Street, SW
Washington, D.C. 20593-0001

Dear Commander Prescott:

The National Marine Fisheries Service (NOAA Fisheries) has received your letter dated June 26, 2003, requesting information for the El Paso Energy Bridge Gulf of Mexico LLC Deepwater Port Environmental Assessment (USCG-2003-14294). The U.S. Coast Guard (USCG) and the Maritime Administration (MARAD) are reviewing the license application for the construction of a liquefied natural gas (LNG) deepwater port and appurtenant structures to be located approximately 146 miles south of Lake Charles, Louisiana. The proposed project would include the construction of a submerged turret loading buoy with flexible riser piping and a meter station platform in Outer Continental Shelf (OCS) block West Cameron 603. Approximately 7.3 miles of 20-inch pipeline would be installed to direct natural gas from vessels unloading at the deepwater terminal to existing gas supply systems in the Gulf of Mexico and southern Louisiana. Portions of the pipeline would extend through OCS blocks West Cameron 600, 601, 602, and East Cameron 335. The USCG and MARAD are requesting information on resources, including Essential Fish Habitat (EFH) and potential species of concern, and issues to be addressed in the Environmental Assessment (EA) for this proposed action.

NOAA Fisheries recommends the EA issued for the proposed project address the following resources and issues of concern:

Based on our review of the El Paso Energy Bridge Gulf of Mexico Environmental Report and our knowledge of the project area, we have developed the following list of species and life stages for which EFH has been designated in the project area:

Managed Species	**Life Stages**
brown shrimp	eggs, larvae, adults
white shrimp	larvae
red drum	eggs, adults

red snapper	all life stages
gray snapper	eggs, larvae, adults
lane snapper	eggs, adults
greater amberjack	all life stages
lesser amberjack	all life stages
gray triggerfish	all life stages
king mackerel	eggs, larvae, juveniles, adults
cobia	all life stages
dolphin	all life stages
bluefish	eggs, adults
little tunny	all life stages
Atlantic bluefin tuna	eggs, larvae, spawning adults

Categories of EFH in the project area include unconsolidated marine water bottoms, natural structural features (e.g., hardbottom and shoal areas), and marine water column. Detailed information on EFH for Federally managed shrimp, red drum, reef fish, and coastal migratory pelagic species is provided in the 1998 generic amendment of the Fishery Management Plans (FMPs) for the Gulf of Mexico prepared by the Gulf of Mexico Fishery Management Council. Information on EFH for Atlantic bluefin tuna is contained in the Atlantic Tunas, Swordfish, and Sharks FMP prepared by the Secretary of Commerce. The generic amendment and the Atlantic Tunas, Swordfish, and Sharks FMP were prepared as required by the Magnuson-Stevens Fishery Conservation and Management Act (P.L. 104-297).

We recommend the EA include sections titled "Essential Fish Habitat" and "Marine Fishery Resources" that describe the potential impacts of the proposed project on the sub-categories of EFH (e.g., non-vegetated water bottoms, geologic features, continental shelf features, marine water column, etc.) and marine fishery species within the project area. These sections should analyze the potential impacts of the proposed project on Federally managed species and life stages which utilize these sub-categories of EFH, and fully evaluate alternative measures to avoid, minimize, and offset adverse impacts to EFH and marine fishery species in the Gulf of Mexico. This descriptive and analytical information, coupled with a statement of the agency's conclusions regarding the effects of the action on EFH and marine fishery species, would provide the basic details necessary for an EFH assessment pursuant to the requirements of 50 CFR 600.920(e).

Impingement and entrainment of marine organisms is a major concern for structures that utilize large quantities of seawater and should be addressed in the EA for the proposed project. The Energy

Bridge Gulf of Mexico Environmental Report states that vessels utilizing the proposed deepwater port will be capable of operating in both open-loop and closed-loop regasification modes. The closed-loop mode will only be utilized when seawater temperatures are less than 42 degrees Fahrenheit. However, vessels operating in the closed-loop mode avoid impacts to marine fishery species from impingement and entrainment, and are capable of regasifying LNG with only slightly less efficiency than vessels operating in the open-loop mode. The EA for the Energy Bridge Gulf of Mexico deepwater port should evaluate alternative criteria for regasification operational modes, including requiring the sole use of closed-loop regasification systems. Detailed justification should be provided in the EA for the selection or elimination of alternatives for regasification methodologies.

The EA should evaluate the potential impacts to marine fishery species from impingement and entrainment associated with any alternative that incorporates the use of the open-loop regasification system. The open-loop configuration of the regasification process will utilize seawater at a rate of approximately 12,000 cubic meters per hour. The Energy Bridge Gulf of Mexico Environmental Report states that vessels will require six to eight days to fully unload regasified LNG, but does not state the expected frequency of port utilization by LNG vessels. This information should be provided in the EA in order to fully assess potential impacts to marine fishery species. In addition, the seawater intake velocity of 1.2 meters per second greatly exceeds the intake velocity of 0.5 feet per second (0.15 meters per second) recommended by the U.S. Environmental Protection Agency[1] to minimize entrainment of marine organisms. Additionally, the 21 mm spacing of the metal grate covering the seawater intake is too large to effectively exclude the eggs, larvae, and juveniles of marine fishery species from entrainment in the regasification system. The EA should evaluate a full range of alternatives for the design requirements of vessels utilizing the proposed Energy Bridge Gulf of Mexico LNG terminal that would avoid and minimize impacts to eggs, larvae, and juveniles of marine fishery species, including: organism exclusion mechanisms; the siting and design of intake and discharge areas; operational schedules for removing impinged organisms; and closed-loop versus open-loop regasification systems. Alternative designs for the vessels should be evaluated in relation to the vertical distribution of eggs, larvae, and juveniles of marine fishery species in the water column and the rheotactic response of non-passive swimming organisms to horizontal versus vertical currents at intake and discharge areas. The analysis of the design alternatives should include a quantification of impacts to marine fishery populations, and a clear rationale should be provided for the selection or elimination of design alternatives.

The effects of thermal discharge on marine fishery species also should be addressed in the EA. Seawater used in the open-loop regasification process will be approximately 14 degrees Fahrenheit cooler than ambient seawater. Eggs, larvae, and juveniles of various marine species may be particularly vulnerable to rapid and/or extreme temperature changes. In addition, seawater will be treated with copper and aluminum during the regasification process to prevent biofouling before being discharged back into the environment. The biological consequences of temperature change

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and biocide contamination of the thermal discharge on marine fishery species should be quantified in the EA and minimized to the maximum extent practicable. Sole utilization of the closed-loop regasification system, which would eliminate impacts to marine fishery species from temperature change and biocide contamination of the thermal discharge, should be evaluated in the document.

To our knowledge, there are currently plans for six LNG terminals to be located in the Gulf of Mexico off the coasts of Louisiana and Texas. The cumulative impacts associated with this project in conjunction with other potential LNG terminals in the Gulf should be thoroughly evaluated in the EA. As per our previous discussions with the USCG, NOAA Fisheries continues to recommend a programmatic NEPA review of the licensing of deepwater LNG ports due to the compressed review schedule and lack of concrete data on individual and cumulative environmental impacts.

NOAA Fisheries appreciates the opportunity to provide you with preliminary information regarding resources and issues of concern for the proposed Energy Bridge Gulf of Mexico project. We look forward to reviewing the draft EA. If you have any questions regarding our comments, please contact Kelly Shotts at (225) 389-0508.

Sincerely,

Richard Hartman

for Frederick C. Sutter, III
Deputy Regional Administrator

c:
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LA DNR - Consistency
F/SF1 - Rogers
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F/SER4
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